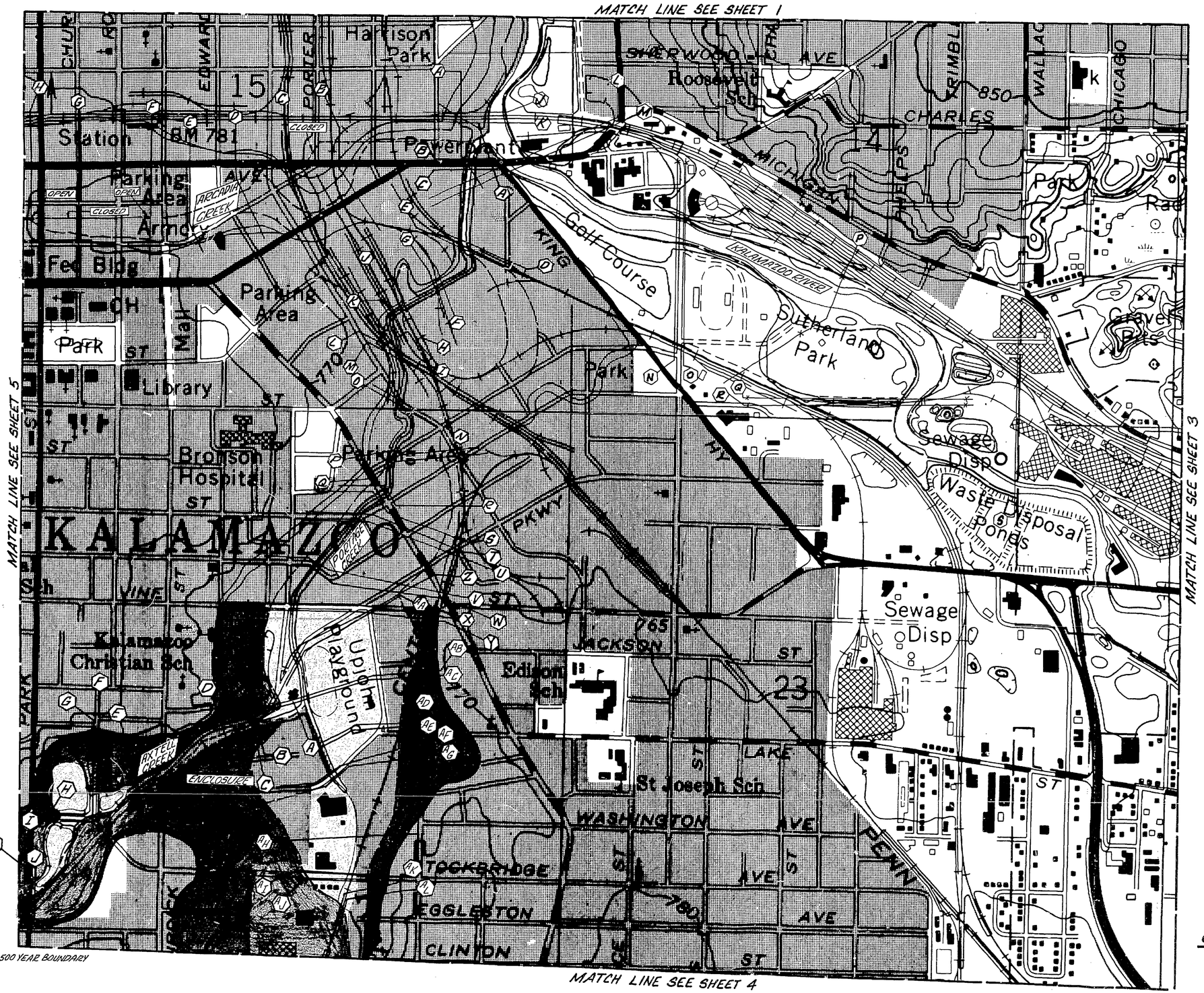


LEGEND

FLOODWAY — 100 YEAR BOUNDARY — 500 YEAR BOUNDARY

CROSS SECTION

CORPORATE BOUNDARIES

AXTELL CREEK

CITY OF KALAMAZOO

KALAMAZOO COUNTY, MICHIGAN

SCALE: 1"=400'

FLOOD MAP

1 OF 2

SHEET 2 OF 6

HUD 2027-10

SCS-347 5-57
Tabular Computations

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

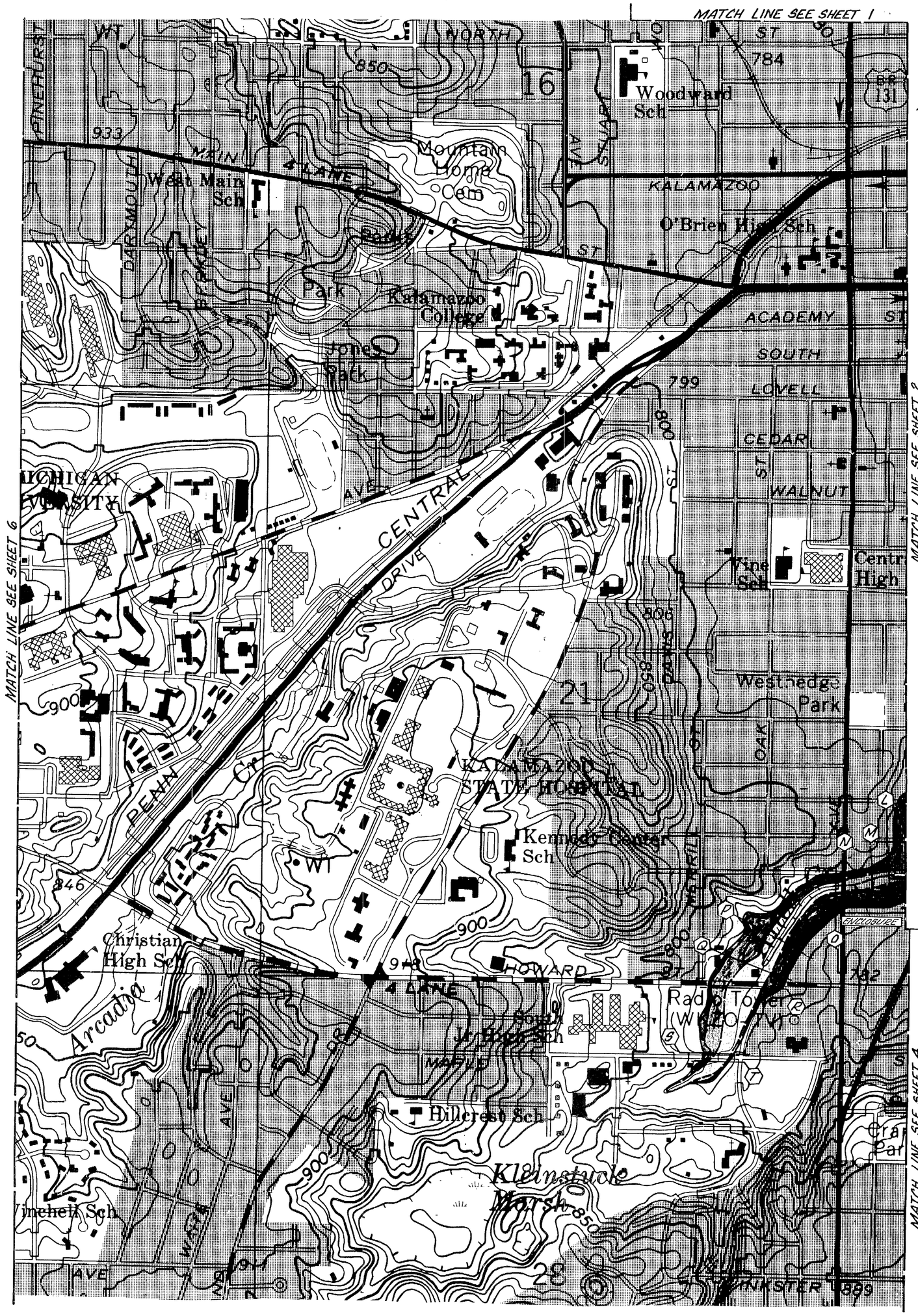
Portage Creek Flood Hazard Analyses — Kalamazoo County, Michigan

Water Surface Profile Elevations — Pg. 1

RECEIVED
OCT 25 1977
WATER MANAGEMENT

Location	Surveyed Section	Station	Main Stem Portage Creek 10-Year	50-Year	100-Year	500-Year
	14.7	1+15	812.01	813.12	813.46	814.20
Lover's Lane	15.0 D	1+32	812.13	813.13	813.47	814.20
	15.0 U	1+38	812.25	813.23	813.63	814.86
	15.2	1+85	812.56	813.24	813.64	814.87
	15.4	2+65	812.76	813.72	814.00	814.98
	15.8	5+55	813.04	813.93	814.20	815.12
Driveway Bridge	16.0 D	9+44	813.22	814.13	814.52	815.40
	16.0 U	9+66	813.34	814.35	814.68	815.58
	16.6	14+50	814.00	814.74	815.02	815.83
Driveway Bridge	17.0 D	16+87	814.24	814.96	815.21	815.97
	17.0 U	17+13	814.48	815.00	815.99	816.73
	17.4	23+75	815.73	816.53	816.92	817.54
Lover's Lane	18.0 D	29+60	817.93	818.61	818.88	819.34
	18.0 U	29+90	818.03	818.87	819.18	819.86
	18.5	32+00	818.33	819.24	819.55	820.22
Kilgore Road	19.0 D	34+38	818.65	819.59	819.90	820.56
	19.0 U	35+02	818.73	819.71	820.18	821.02
	19.2	35+40	818.79	819.87	820.25	821.10

SOIL CONSERVATION SERVICE, MT. MORRIS, MICH.



LEGEND

FLOODWAY — 100 YEAR BOUNDARY — 500 YEAR BOUNDARY

A — A CROSS SECTION

CORPORATE BOUNDARIES

FLOOD MAP

AXTELL CREEK

CITY OF KALAMAZOO

KALAMAZOO COUNTY, MICHIGAN

SCALE: 1" = 400'

2 of 2

SHEET 5 of 16

HUD 2027-10

SCS-347 5-57
Tabular Computations

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Portage Creek Flood Hazard Analyses — Kalamazoo County, Michigan

Water Surface Profile Elevations — P9.2

Location	Surveyed Section	Station	10-Year	Main Stem Portage Creek 50-Year	100-Year	500-Year
Railroad	20.0 D	36+73	818.88	819.96	820.32	821.18
Bridge	20.0 U	36+87	818.90	820.06	820.48	821.82
	20.5	38+20	819.03	820.15	820.57	821.88
Railroad	21.0 D	43+68	820.41	821.35	821.57	822.52
Bridge	21.0 U	43+82	820.43	821.39	821.63	823.14
	21.2	46+60	820.68	821.70	821.98	823.35
Railroad	22.0 D	51+33	821.89	822.86	823.13	824.13
Bridge	22.0 U	51+47	822.01	823.08	823.37	824.37
	22.1	56+00	822.20	823.28	823.58	824.55
	22.5	57+55	822.74	823.66	823.90	824.77
	22.9	71+86	824.96	825.77	826.14	826.80
Railroad	23.0 D	72+23	825.01	825.84	826.20	826.86
Bridge	23.0 U	72+37	825.19	826.14	826.52	827.24
Railroad Bridge	23.1 D	72+63	825.22	826.17	826.54	827.26
Channel	23.1 U	72+77	825.22	826.17	826.54	827.26
	23.2	76+65	825.88	826.84	827.20	827.94
	23.4	95+80	826.94	827.93	828.25	828.92
	23.6	105+00	833.33	834.93	835.67	836.67
	23.8	113+30	833.99	833.58	836.27	837.21

USDA SCS HYATTSVILLE, MD 1980

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Tabular Computations

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Portage Creek Flood Hazard Analyses — Kalamazoo County, Michigan

Water Surface Profile Elevations — Pg. 3

Main Stem Portage Creek

Location	Surveyed Section	Station	10-Year	50-Year	100 Year	500 YR
Milham Road	24.0 D	119+12	837.32	838.46	838.84	839.62
	24.0 U	119+49	837.54	838.98	839.52	840.90
	24.2	129+05	837.55	839.00	839.54	840.91
	24.6	132+40	837.57	839.01	839.55	840.92
	24.8	143+20	837.91	839.31	839.80	841.04
Rail Road Bridge	25.0 D	168+77	839.76	840.93	841.25	841.91
Destroyed 2/12/76	25.0 U	168+93	839.76	840.97	841.35	842.23
	25.4	173+80	839.88	841.08	841.43	842.27
Garden Lane	26.0 D	177+98	839.90	841.09	841.45	842.28
Confluence Consolidated Drain #1	26.0 U	178+43	839.98	841.25	841.69	842.76
	26.2	182+20	840.08	841.33	841.75	842.79
	26.6	191+40	841.18	842.25	842.64	843.43
	26.9	197+35	843.18	844.04	844.24	844.94
Westnedge	27.0 D	197+76	843.27	844.17	844.38	845.09
Ave.	27.0 U	198+44	843.29	844.25	844.48	845.25
	27.1	199+30	843.44	844.43	844.68	845.44
	27.3	203+80	843.63	844.58	844.84	845.57
	27.45 D	208+03	843.78	844.69	844.94	845.64
	27.45 U	208+27	843.78	844.93	845.34	846.20

SCS-347 5-57
Tabular Computations

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Portage Creek Flood Hazard Analyses — Kalamazoo County, Michigan

Water Surface Profile Elevations — pg. 4

	Location		Surveyed Section	Station	Main Stem 10-year	Portage Creek 50-year			100-year			500-year		
			27.6	209+65	844.60	845.51			845.82			846.50		
			27.9	217+15	846.21	847.15			847.59			848.17		
	Centre		28.0 D	221+62	846.70	847.77	105 CFS		848.15	130 CFS		848.78	190 CFS	
	Street		29.0 U	222+78	847.10	848.73			849.27			850.78		
			28.1	223+15	847.16	848.77			849.31			850.81		
			28.4	238+80	847.48	849.16			849.68			850.94		
			28.6	257+35	848.71	849.86			850.22			851.13		
			28.8	275+80	849.02	850.20			850.59			851.37		
			28.9	285+85	849.69	850.74			851.14			851.91		
	Oakland		29.0 D	290+96	850.10	851.66			851.43			852.13		
	Drive		29.0 U	291+54	850.50	852.62			852.87			853.41		
			29.1	292+55	850.54	852.04			852.89			853.41		
			29.5	331+55	852.34	853.18			853.75			855.51		
			29.7	365+75	859.22	858.62			858.85			859.13		
			29.9	421+30	864.95	865.52			865.60			865.95		
	Angling		30.0 D	420+91	864.97	865.35			865.63			865.98		
	Road		30.0 U	421+66	864.97	865.43			865.27			866.38		

LEDA-SCS HYATTSVILLE, MD 1961

SCS-347 5-57
Tabular Computations

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Portage Creek Flood Hazard Analyses — Kalamazoo County, Michigan

Water Surface Profile Elevations pg. 5

	Location		Surveyed Section	Station		10-year		Main Stem Portage Creek	50-year			100-year			500-year		
	US-131		31.0 D	422+33		864.98			865.44			865.88			866.38		
			31.0 U	425+75		865.78			866.48			867.32			868.18		
			31.2	426+20		865.84			866.53			867.35			868.20		
			31.8	432+35		866.43			866.87			867.52			868.21		
	12TH		32.0 D	433+15		866.67			867.04			867.61			868.22		
	Street		32.0 U	433+75		867.95			868.80			870.09			872.50		
							West	Fork	Portage	Creek							
			52.5	1+45		812.47			813.35			813.66			814.33		
	Railroad		53.0 D	2+18		812.52			813.38			813.68			814.35		
	Bridge		53.0 U	2+32		812.56			813.42			813.72			814.43		
	Old Road		54.0 D	2+63		812.57			813.42			813.73			814.44		
	Bridge		54.0 U	2+78		812.59			813.62			814.07			814.72		
			54.5	12+45		820.76			821.18			821.46			821.92		
	Burdick		55.0 D	21+58		825.81			826.51			826.67			827.05		
	Street		55.0 U	23+23		827.01			828.03			828.51			829.69		
			55.2	24+25		828.00			828.67			829.05			830.03		
			55.6	27+25		829.50			830.05			830.35			831.04		
	Driveway		55.80	28+95		830.17			830.88			831.17			831.73		
	Bridge		55.8U	29+36		830.73			831.48			832.05			832.77		

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Tabular Computations

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Portage Creek Flood Hazard Analyses — Kalamazoo County, Michigan

Water Surface Profile Elevations p7.6

West Fork Partridge Creek

Location	Surveyed Section	Station	10-year	50-year	100-year	500-year
Pratt's	56.0 D	30+17	831.71	832.42	832.69	833.24
Road	56.0 U	30+43	832.15	833.00	833.31	833.96
	56.2	32+20	833.53	834.41	834.36	834.78
Driveway	56.3 D	32+82	833.54	834.26	834.60	835.06
Bridge	56.3 U	32+99	833.94	834.82	835.16	835.70
Driveway	56.6 D	35+17	836.24	836.88	837.16	837.53
Bridge	56.6 U	35+34	838.24	839.92	840.44	840.75
Driveway	56.7 D	35+96	838.27	839.53	840.45	840.76
Bridge	56.7 U	36+25	838.27	839.97	840.51	840.86
	56.8	36+60	838.31	839.99	840.52	840.88
Pratt's	57.0 D	38+33	838.45	840.04	840.56	840.93
Road	57.0 U	38+67	838.61	840.30	840.60	840.97
	57.2	41+96	739.21	840.55	840.82	841.21
Dam	57.7 D	45+65	842.30	843.09	745.27	843.58
	57.7 U	45+85	842.64	845.29	843.51	843.88
	57.8	50+20	844.63	845.44	745.71	846.41
Parking lot	57.9D	51+10	844.74	845.59	845.90	846.63
Underground Culvert	58.4 U	58+00	845.22	846.55	847.18	849.69
	58.6	59+20	846.41	847.14	847.61	849.76

USDA-SCS HYATTSVILLE, MD 1967

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Tabular Computations

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Portage Creek Flood Hazard Analyses — Kalamazoo County, Michigan

Water Surface Profile Elevations — pg-7

West Fork Portage Creek

	Location		Surveyed Section	Station		10-year			50-year			100-year			500-year		
	Old Kilgore		59.0 D	60+25		846.86			847.65			848.10			849.94		
	Road		59.0 U	60+85		846.94			847.81			848.34			850.18		
			59.5	61+60		847.88			848.67			849.06			850.31		
	Westnedge		60.0 D	64+25		849.33			850.11			850.48			851.11		
	Ave.		60.0 U	65+05		849.45			850.65			851.38			851.75		
			60-1	67+25		851.66			852.21			852.56			852.74		
			60.2	70+90		851.87			852.37			852.64			852.84		
	Driveway		60.3 D	73+39		851.87			852.37			852.64			852.84		
	Bridge		60.3 U	73+62		851.87			852.37			852.64			852.92		
			60.4	78+20		851.88			852.39			852.67			852.96		
			60.5	87+80		851.93			852.47			852.76			853.10		
			60.6	122+60		854.61			855.04			855.28			855.73		
	Driveway		60.7 D	126+27		855.80			856.15			856.29			856.62		
	Bridge		60.7 U	126+43		856.28			857.35			857.97			859.66		
			60.8	142+20		856.65			857.61			858.18			859.75		
			60.95	160+10		858.53			859.33			859.66			860.40		
	Oakland		61.0 D	160+65		858.84			859.52			859.84			860.50		
	Drive		61.0 U	161+85		861.43			862.14			862.53			863.28		
			61.2	175+10		862.57			863.11			863.37			863.95		

USDA-SCS-HYATTSVILLE, MD. 1962

SCS-347 5-57
Tabular Computations

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Portage Creek Flood Hazard Analysis — Kalamazoo County, Michigan

Water Surface Profile Elevations — pg. 8

	Location		Surveyed Section	Station		10-year	West	Fork	Portage 50-year	Creek		100-year			500-year		
	Driveway		61.3 D	176+03		862.59			863.13			863.39			863.97		
	Bridge		61.3 U	176+17		862.63			863.27			863.61			864.27		
			61.7	181+90		862.65			863.30			863.64			864.31		
			62.0 D	185+54		862.67			863.34			863.68			864.36		
			62.0 U	186+26		862.83			863.34			863.68			864.36		
			62.1	186+60		862.83			863.34			863.68			864.37		
			62.2	200+00		862.84			863.35			863.69			864.38		
	Driveway		62.3 D	201+20		862.84			863.35			863.69			864.38		
	Bridge		62.3 U	201+30		862.84			863.35			863.71			864.46		
			62.4	222+30		863.42			864.02			864.37			865.03		
			62.5	244+90		863.57			864.15			864.53			865.12		
			62.6	263+40		864.05			864.47			864.85			865.33		
	North Bound		63.0 D	269+17		865.42			865.68			866.02			866.14		
	US-131		63.0 U	271+03		865.44			865.74			866.16			866.32		
	South Bound		64.0 D	271+61		865.84			866.17			866.65			866.81		
	US-131		64.0 U	274+39		865.84			866.17			866.65			866.81		
			64.2	276+40		866.16			866.54			867.10			867.27		
			64.4	286+80		866.31			866.67			867.19			867.37		
			64.6	291+85		867.23			867.43			867.92			868.16		

SCS-347 5-57
Tabular Computations

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Portage Creek Flood Hazard Analyses — Kalamazoo County, Michigan

Water Surface Profile Elevations Pg. 9

Location	Surveyed Section	Station	10-year	50-year	100-year	500-year
			West Fork Portage Creek			
I-94	65.0 D	292+38	868.38	868.65	869.03	869.15
	65.0 U	296+03	868.44	868.73	869.21	869.37
	65.5	302+55	868.58	868.84	869.28	869.43
	65.9	310+85	870.15	870.28	870.35	870.46
12TH	66.0 D	311+73	870.35	870.50	870.55	870.64
Street	66.0 U	312+57	870.83	870.98	871.03	871.20
			Portage Township Consolidated Drain Number 1			
Confluence with Portage Cr	70.0 D	0+03	839.90	841.09	841.45	842.28
Garden Lane	70.0 U	0+48	839.98	841.25	841.69	842.76
Driveway	70.6 D	6+25	840.58	841.61	841.99	842.95
Bridge	70.6 U	7+15	840.74	841.85	842.23	843.19
	70.8	7+70	841.08	842.01	842.35	843.25
Westnedge	71.0 D	8+76	841.56	842.31	842.59	843.39
Ave.	71.0 U	9+65	841.56	842.33	842.61	843.41
	71.1	11+00	842.21	842.78	842.99	843.64
	71.3 D	19+58	842.83	843.47	843.62	844.21
	71.3 U	19+83	842.83	843.63	843.78	844.45
	71.5 D	24+07	843.26	844.01	844.12	844.64
	71.5 U	24+34	843.42	844.17	844.28	844.88
	71.55	24+60	843.47	844.21	844.33	844.90

SCS-347 5-57
Tabular Computations

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Portage Creek Flood Hazard Analyses — Kalamazoo County, Michigan

Water Surface Profile Elevations, pg. 10

Portage Township Consolidated Drain Number 1

Location		Surveyed Section	Station		10-year			50-year			100-year			500-year		
		71.6 D	24+71		843.50			844.24			844.36			844.91		
		71.6 U	24+99		843.50			844.40			844.52			845.15		
		71.8 D	28+45		843.31			844.24			844.44			845.32		
		71.8 U	28+65		843.31			844.34			844.44			845.40		
		71.9	30+68		844.27			845.05			845.18			845.70		
Romence Road		72.0 D	32+72		844.41			845.52			845.73			846.17		
		72.0 U	33+39		845.69			846.42			846.63			846.97		
					Main Stem of Portage Creek below study limits (not included in final report)											
Railroad Bridge Dam		12.0			811.14			812.02			812.16			812.30		
Railroad Bridge		13.0 D	20' wide		811.57			812.62			812.92			813.55		
		13.0 U			811.57			812.64			812.94			813.57		
		13.2			811.59			812.67			812.97			813.62		
		13.9			811.76			812.91			813.24			813.93		
Railroad Bridge		14.0 D	20' wide		811.77			812.92			813.26			813.96		
		14.0 U			811.77			812.94			813.27			814.00		
		14.7			812.01			813.12			813.46			814.20		

AXTELL CREEK PROFILES

CITY OF KALAMAZOO

BURDICK STREET

ROSE STREET

STOCKBRIDGE AVENUE

PARK AVENUE

REACH 1 ZONE A3

PORTAGE CREEK BACKWATER

ELEVATION IN FEET (NGVD)

778
774
770
766
762
758
754
750

A B C D E F G H I J K

0 200 400 600 800 1000 1200 1400 1600 1800 2000 2200 2400 2600 2800 3000 3200

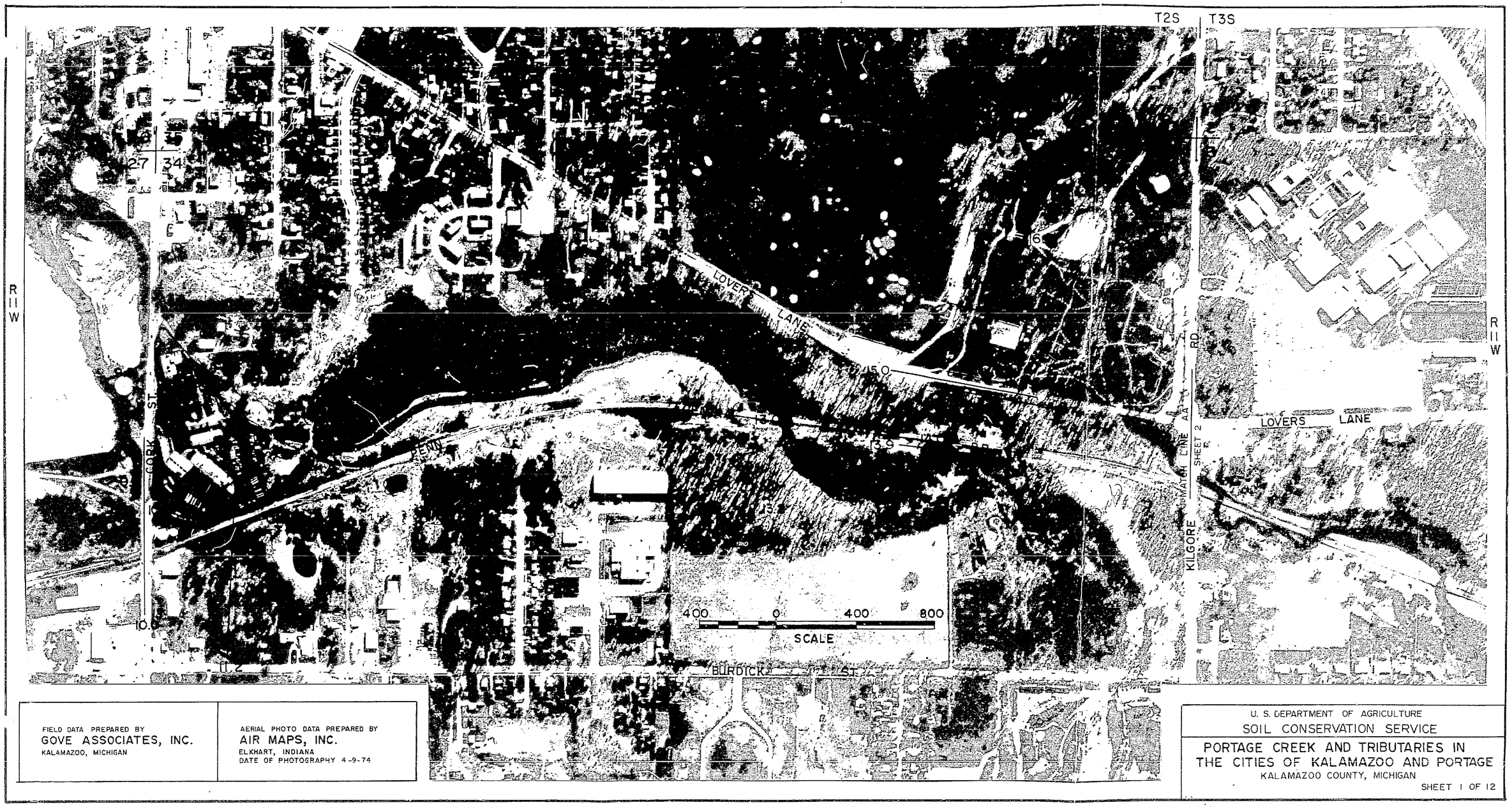
DISTANCE IN FEET

LEGEND

500 YEAR WATER SURFACE
100 YEAR WATER SURFACE
50 YEAR WATER SURFACE
10 YEAR WATER SURFACE
CHANNEL BOTTOM
ENCLOSURE

SCALE
HORIZ. 1"=200'
VERT. 1"=4'

2/81
SHEET 1 OF 2
HUD 2827-07



FIELD DATA PREPARED BY
GOVE ASSOCIATES, INC.
KALAMAZOO, MICHIGAN

AERIAL PHOTO DATA PREPARED BY
AIR MAPS, INC.
ELKHART, INDIANA
DATE OF PHOTOGRAPHY 4-9-74

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

PORTAGE CREEK AND TRIBUTARIES IN THE CITIES OF KALAMAZOO AND PORTAGE

KALAMAZOO COUNTY, MICHIGAN

SHEET 1 OF 12

AXTELL CREEK PROFILES

CITY OF KALAMAZOO

WESTNEDGE AVENUE

HOWARD STREET

WAPLE STREET

REACH 1
ZONE A3
PORTAGE CREEK BACKWATER

REACH 2 ZONE A1

ELEVATION IN FEET (NGVD)

778
774
770
766
762
758
754
750

K L M N O P Q R S T

3200 3400 3600 3800 4000 4200 4400 4600 4800 5000 5200 5400 5600 5800 6000 6200 6400

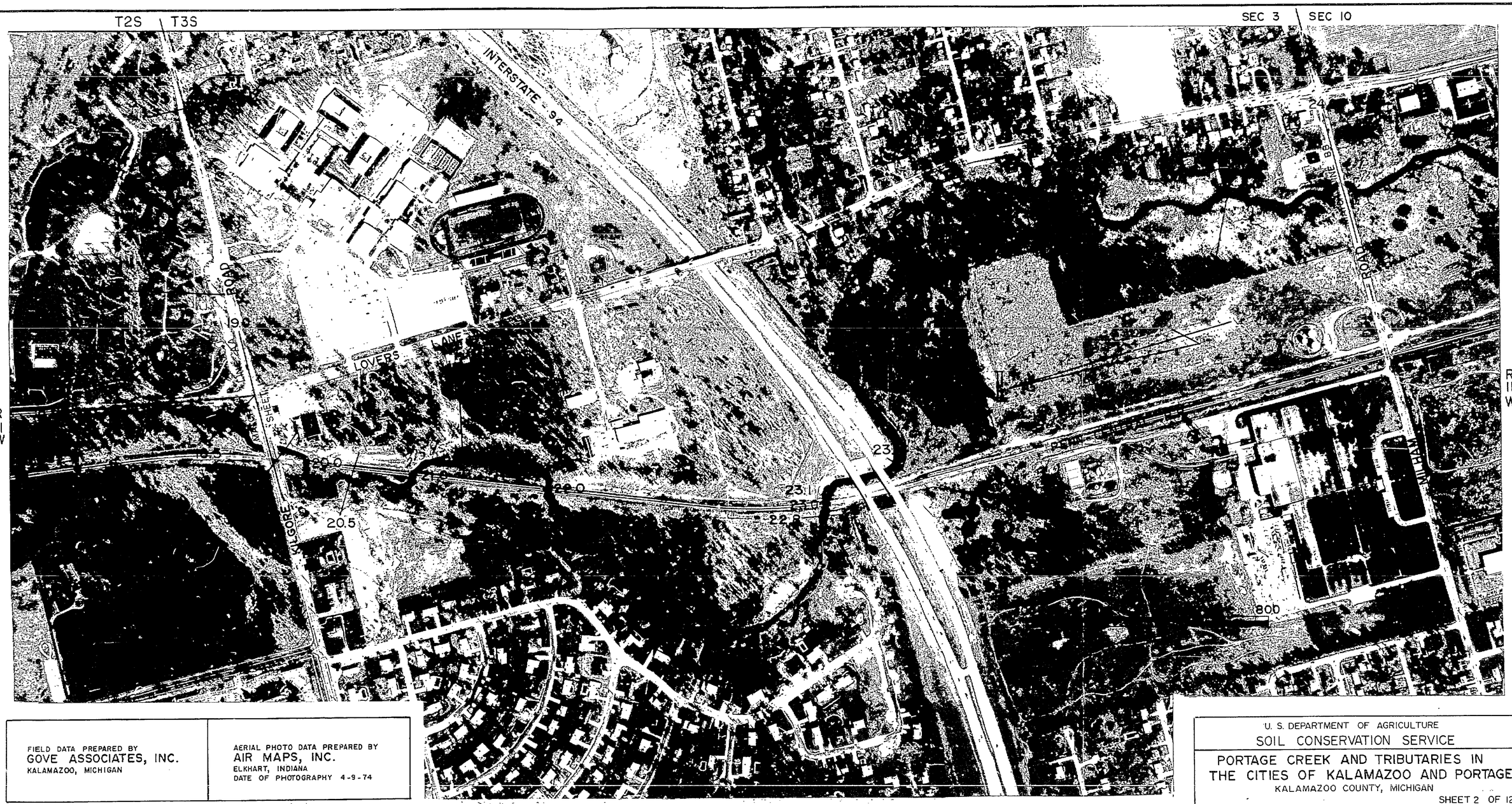
DISTANCE IN FEET

LEGEND

- 500 YEAR WATER SURFACE
- 100 YEAR WATER SURFACE
- 50 YEAR WATER SURFACE
- 10 YEAR WATER SURFACE
- CHANNEL BOTTOM
- ENCLOSURE

SCALE
HORIZ. 1"=200'
VERT. 1"=4'

2181
SHEET 2 OF 2
HUD 2027-07



FIELD DATA PREPARED BY
GOVE ASSOCIATES, INC.
KALAMAZOO, MICHIGAN

AERIAL PHOTO DATA PREPARED BY
AIR MAPS, INC.
ELKHART, INDIANA
DATE OF PHOTOGRAPHY 4-9-74

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

PORTAGE CREEK AND TRIBUTARIES IN THE CITIES OF KALAMAZOO AND PORTAGE

KALAMAZOO COUNTY, MICHIGAN

SHEET 2 OF 12

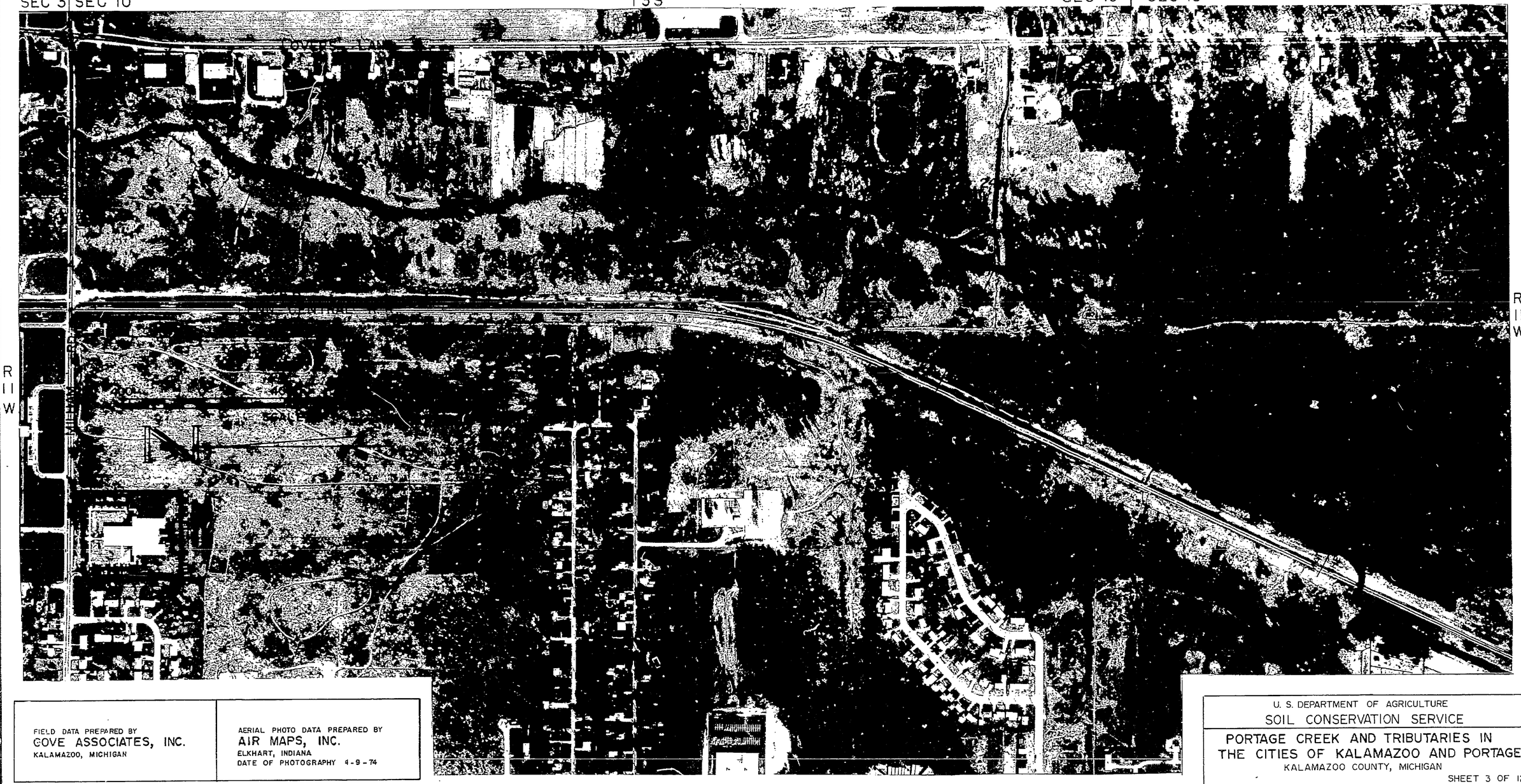
SEC 3 | SEC 10

T3S

SEC 10 | SEC 15

R 11 W

R 11 W



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U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

PORTAGE CREEK AND TRIBUTARIES IN THE CITIES OF KALAMAZOO AND PORTAGE

KALAMAZOO COUNTY, MICHIGAN

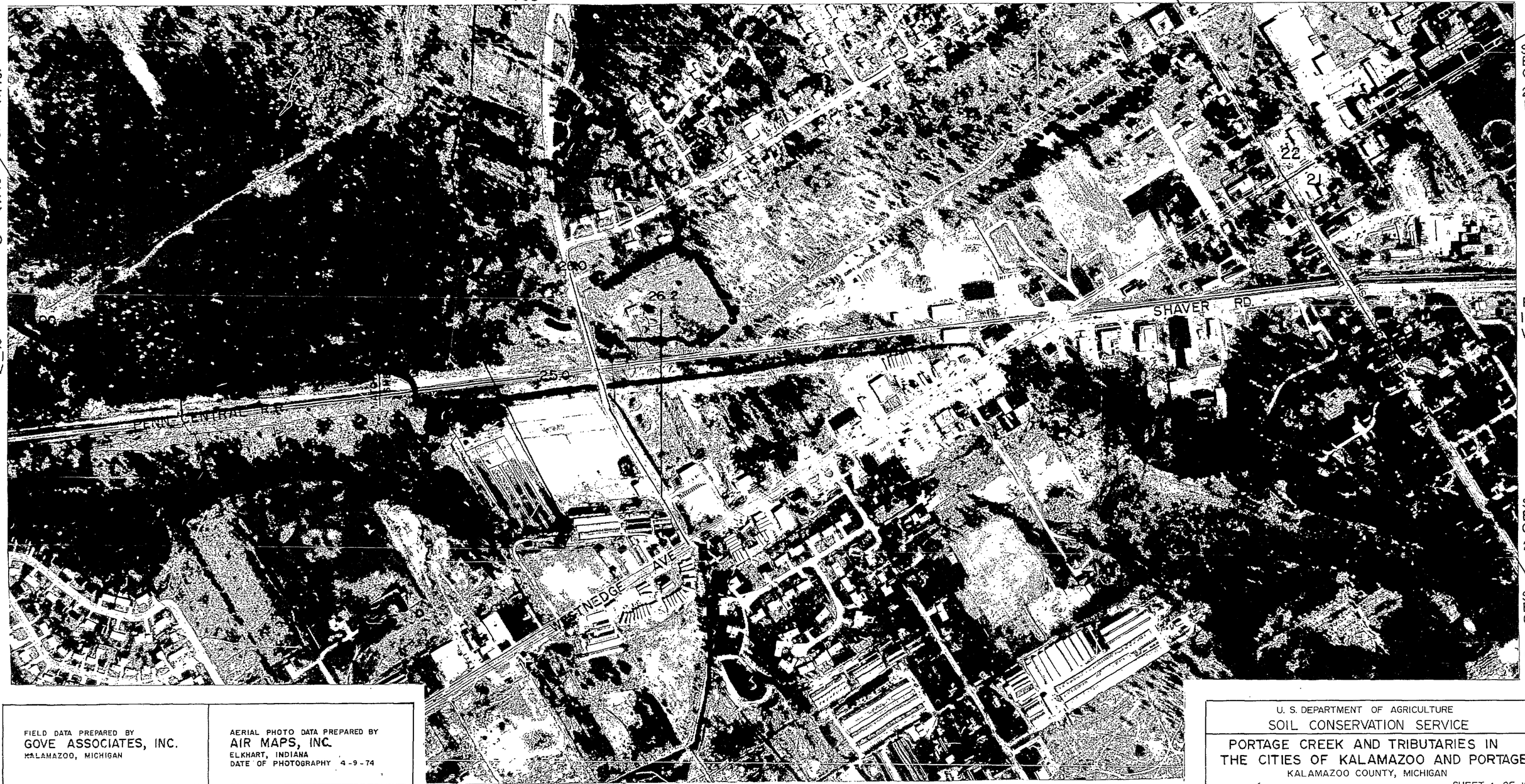
SHEET 3 OF 12

T3S

SEC 15 | SEC 22

SEC 15 | SEC 10

R 11 W



SEC 21

R 11 W

SEC 21 | SEC 16

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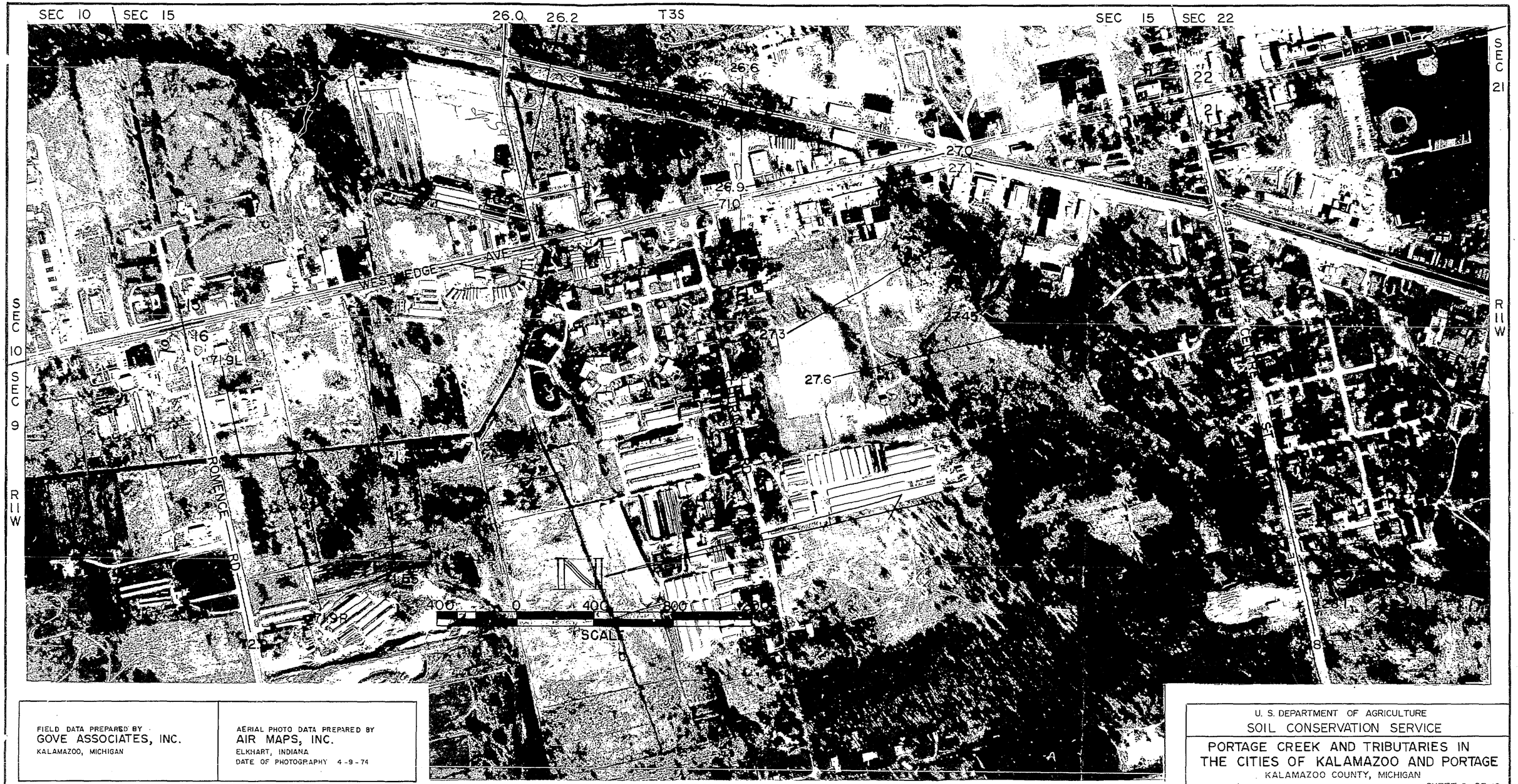
ELKHART, INDIANA
DATE OF PHOTOGRAPHY 4-9-74

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

PORTAGE CREEK AND TRIBUTARIES IN THE CITIES OF KALAMAZOO AND PORTAGE

KALAMAZOO COUNTY, MICHIGAN

SHEET 4 OF 12



FIELD DATA PREPARED BY
GOVE ASSOCIATES, INC.
KALAMAZOO, MICHIGAN

AERIAL PHOTO DATA PREPARED BY
AIR MAPS, INC.
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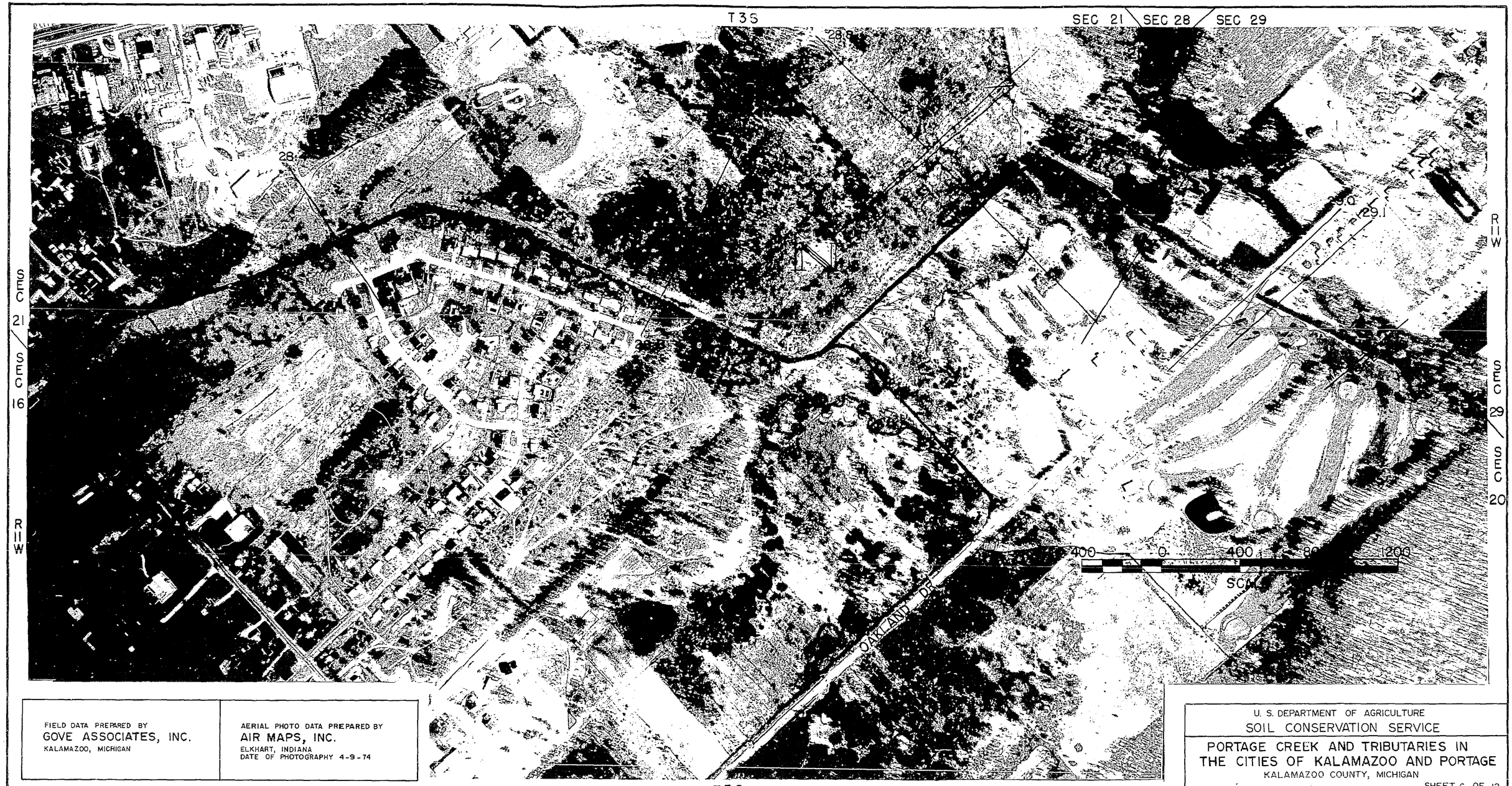
DATE OF PHOTOGRAPHY 4-9-74

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

PORTAGE CREEK AND TRIBUTARIES IN THE CITIES OF KALAMAZOO AND PORTAGE

KALAMAZOO COUNTY, MICHIGAN

SHEET 5 OF 12



FIELD DATA PREPARED BY
GOVE ASSOCIATES, INC.
KALAMAZOO, MICHIGAN

AERIAL PHOTO DATA PREPARED BY
AIR MAPS, INC.
ELKHART, INDIANA
DATE OF PHOTOGRAPHY 4-9-74

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

PORTAGE CREEK AND TRIBUTARIES IN THE CITIES OF KALAMAZOO AND PORTAGE

KALAMAZOO COUNTY, MICHIGAN

SHEET 6 OF 12

SEC 19 | SEC 20 R11W

T3S

SEC 19 | SEC 30

T3S

SEC 20 | SEC 29



SEC 30 | SEC 29 R11W

FIELD DATA PREPARED BY
GOVE ASSOCIATES, INC.
KALAMAZOO, MICHIGAN

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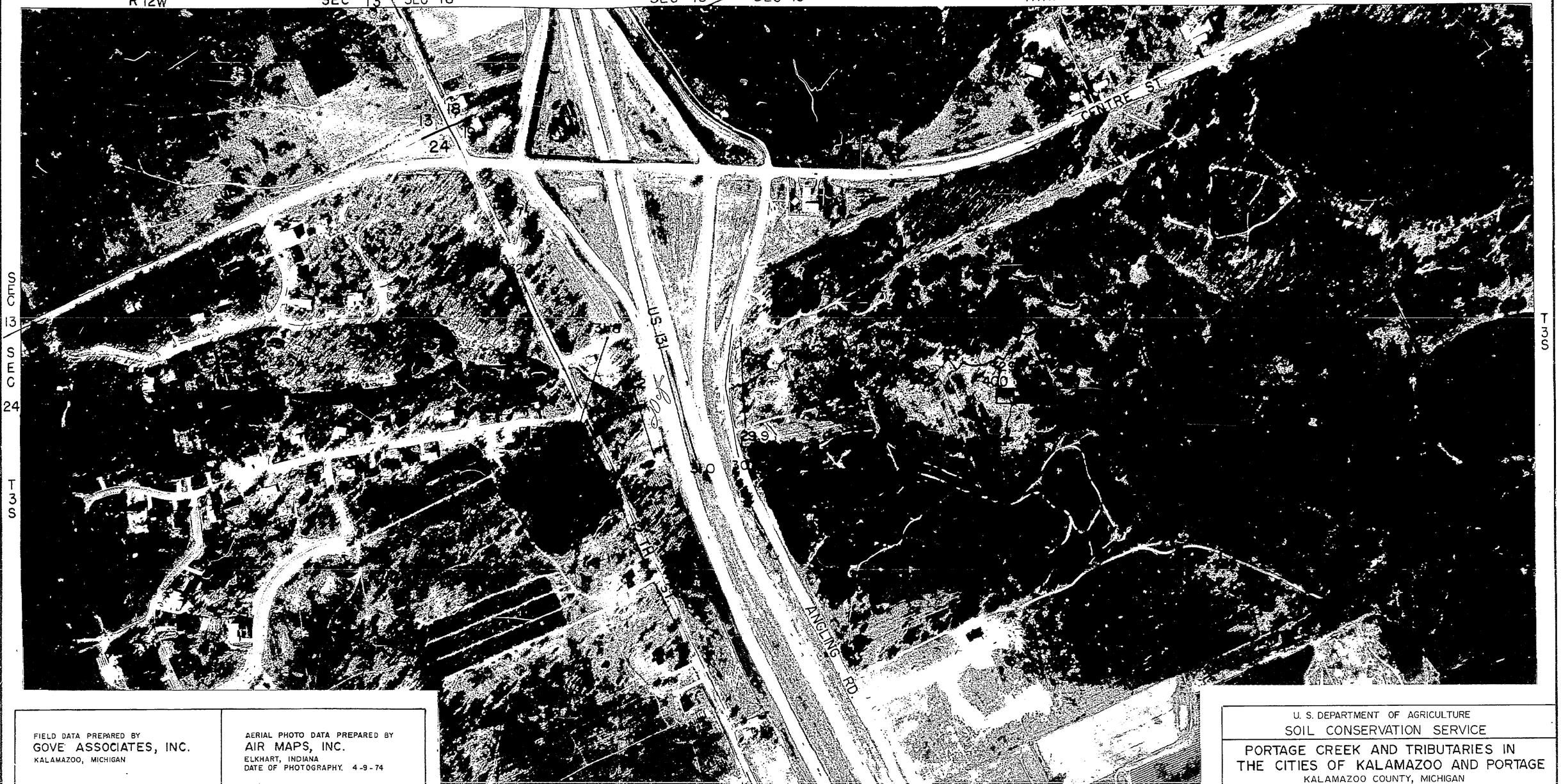
ELKHART, INDIANA
DATE OF PHOTOGRAPHY 4-9-74

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

PORTAGE CREEK AND TRIBUTARIES IN THE CITIES OF KALAMAZOO AND PORTAGE

KALAMAZOO COUNTY, MICHIGAN

SHEET 7 OF 12



FIELD DATA PREPARED BY
GOVE ASSOCIATES, INC.
KALAMAZOO, MICHIGAN

AERIAL PHOTO DATA PREPARED BY
AIR MAPS, INC.
ELKHART, INDIANA
DATE OF PHOTOGRAPHY. 4-9-74

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

PORTAGE CREEK AND TRIBUTARIES IN THE CITIES OF KALAMAZOO AND PORTAGE

KALAMAZOO COUNTY, MICHIGAN

SHEET 8 OF 12



FIELD DATA PREPARED BY	AERIAL PHOTO DATA PREPARED BY
GOVE ASSOCIATES, INC. KALAMAZOO, MICHIGAN	AIR MAPS, INC. ELKHART, INDIANA DATE OF PHOTOGRAPHY 4-9-74

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

PORTAGE CREEK AND TRIBUTARIES IN THE CITIES OF KALAMAZOO AND PORTAGE

KALAMAZOO COUNTY, MICHIGAN



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KALAMAZOO, MICHIGAN

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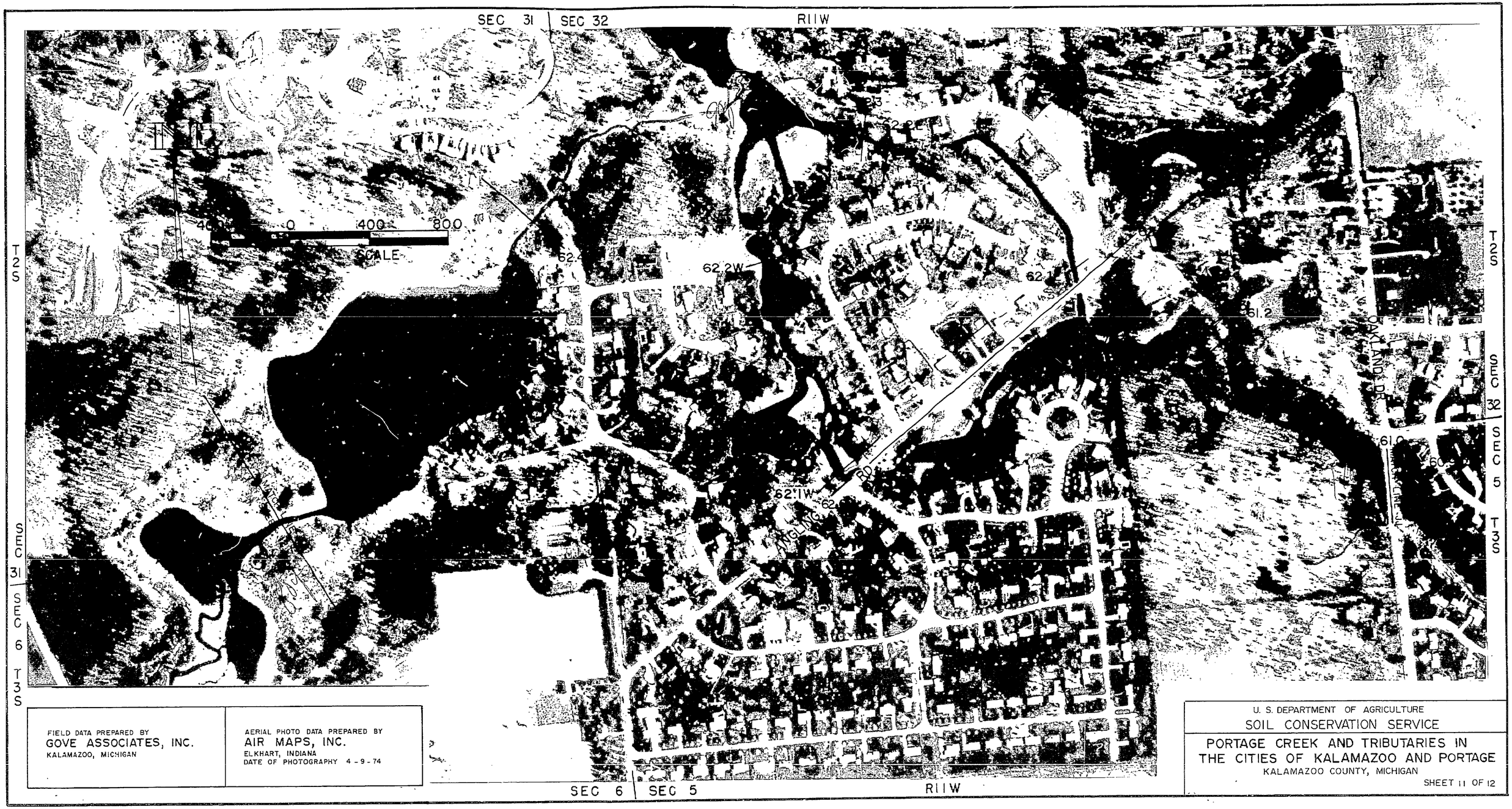
DATE OF PHOTOGRAPHY 4-9-74

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

PORTAGE CREEK AND TRIBUTARIES IN THE CITIES OF KALAMAZOO AND PORTAGE

KALAMAZOO COUNTY, MICHIGAN



FIELD DATA PREPARED BY
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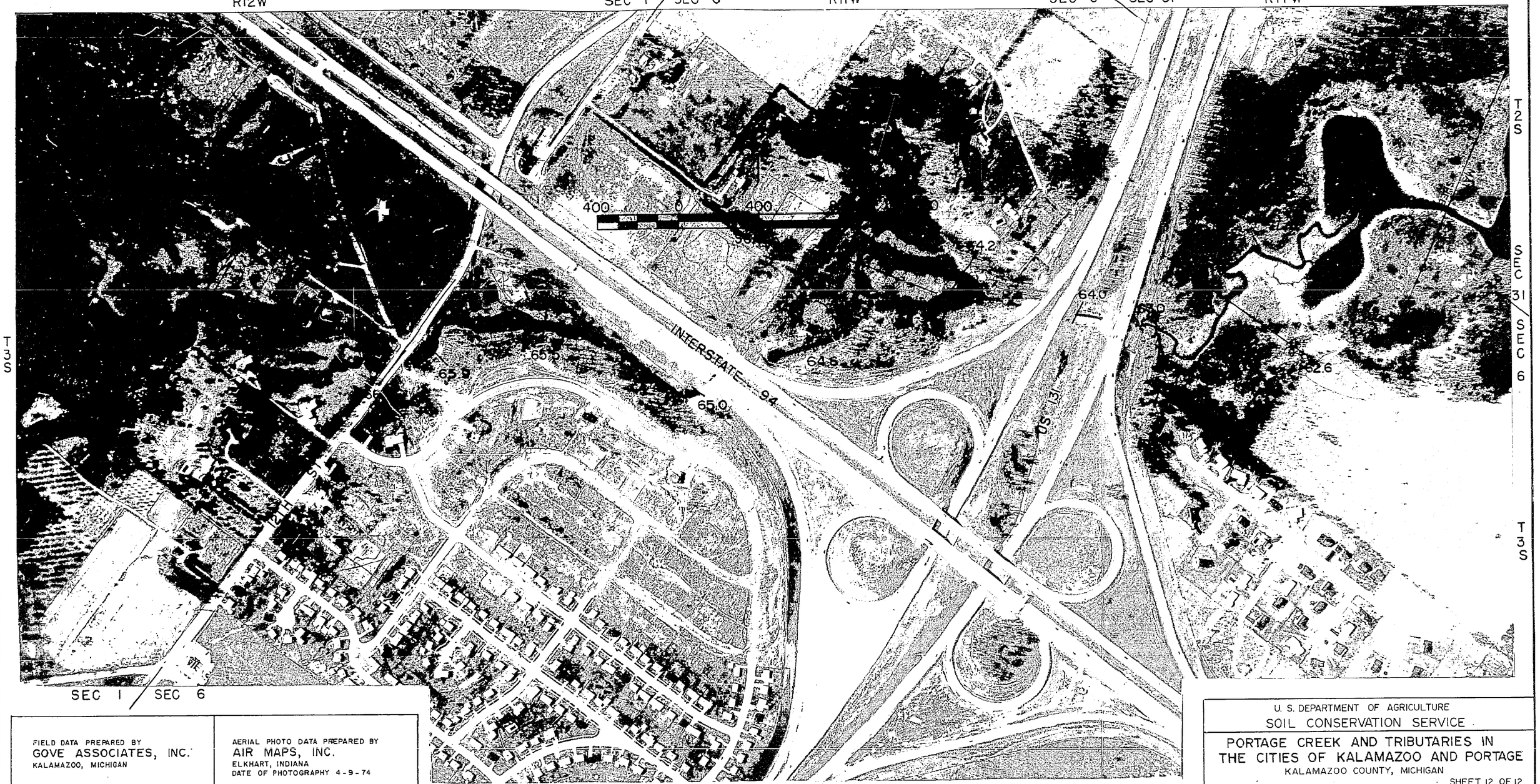
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

PORTAGE CREEK AND TRIBUTARIES IN
THE CITIES OF KALAMAZOO AND PORTAGE
KALAMAZOO COUNTY, MICHIGAN

SHEET 11 OF 12



FIELD DATA PREPARED BY
GOVE ASSOCIATES, INC.
KALAMAZOO, MICHIGAN

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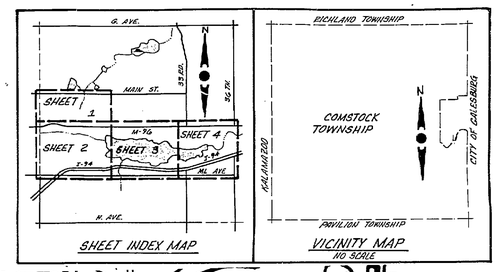
AIR MAPS, INC.
ELKHART, INDIANA
DATE OF PHOTOGRAPHY 4-9-74

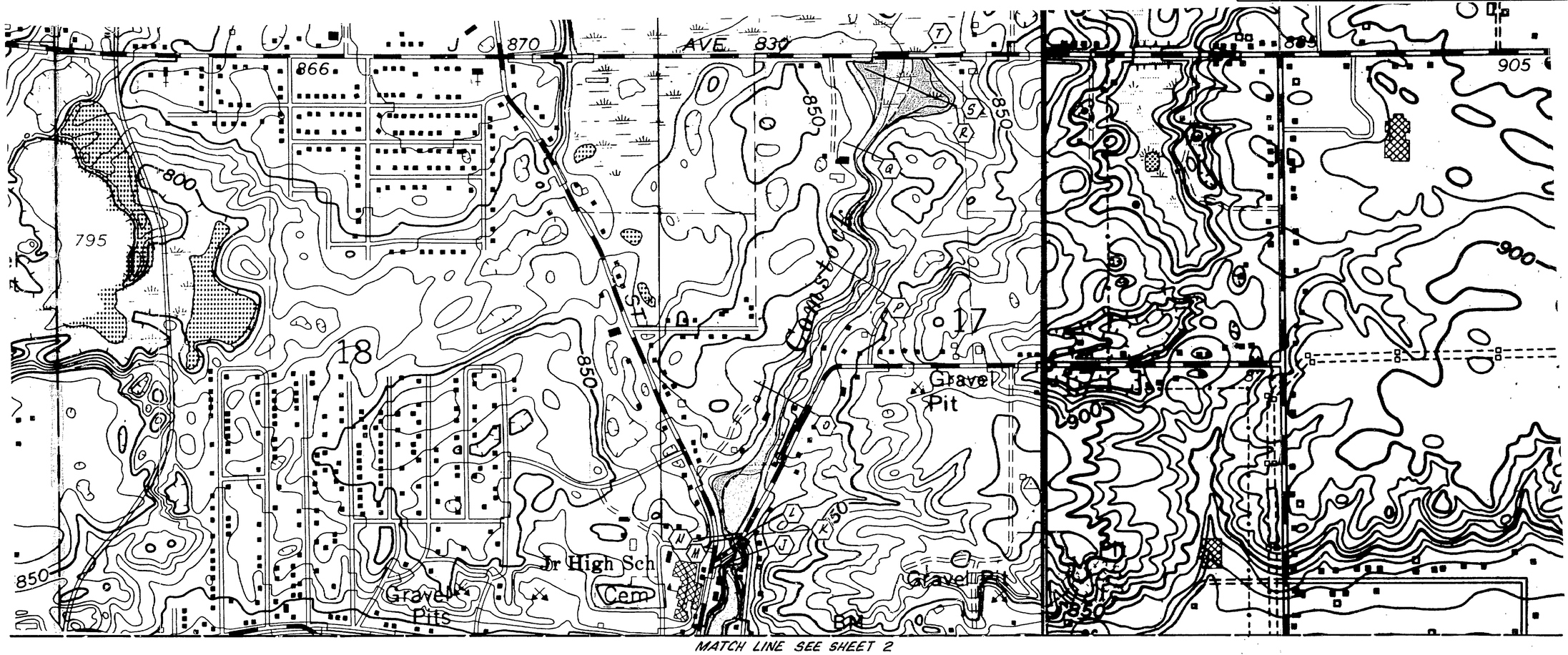
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

PORTAGE CREEK AND TRIBUTARIES IN THE CITIES OF KALAMAZOO AND PORTAGE

KALAMAZOO COUNTY, MICHIGAN

SHEET 12 OF 12





MATCH LINE SEE SHEET 2

FLOOD MAP

LEGEND

FLOODWAY — 100 YEAR BOUNDARY — 500 YEAR BOUNDARY

A — A CROSS SECTION

CORPORATE BOUNDARIES

COMSTOCK TOWNSHIP

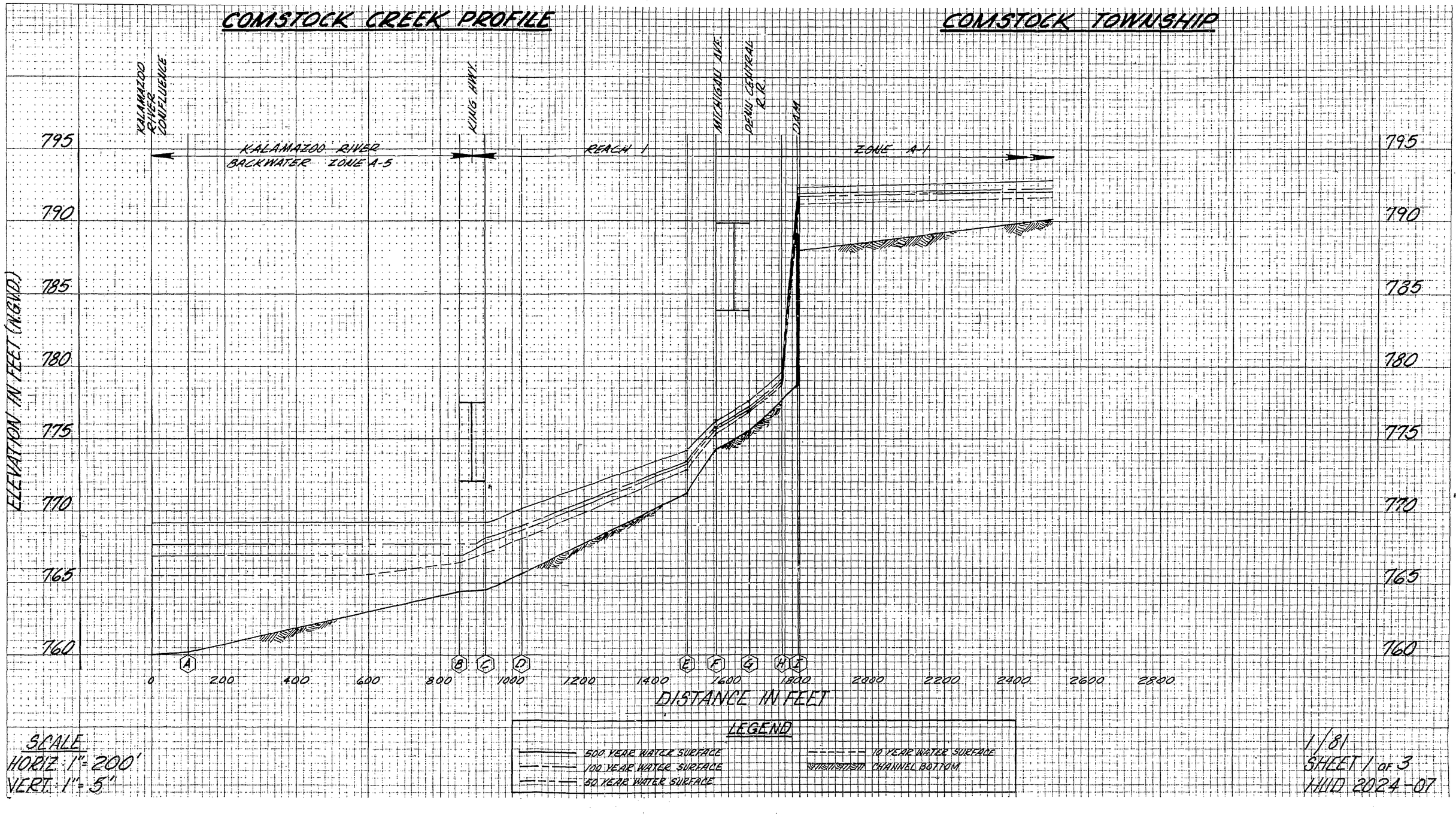
KALAMAZOO COUNTY, MICHIGAN

SCALE: 1"=400'

SHEET 1 of 4
HUD 2024-10

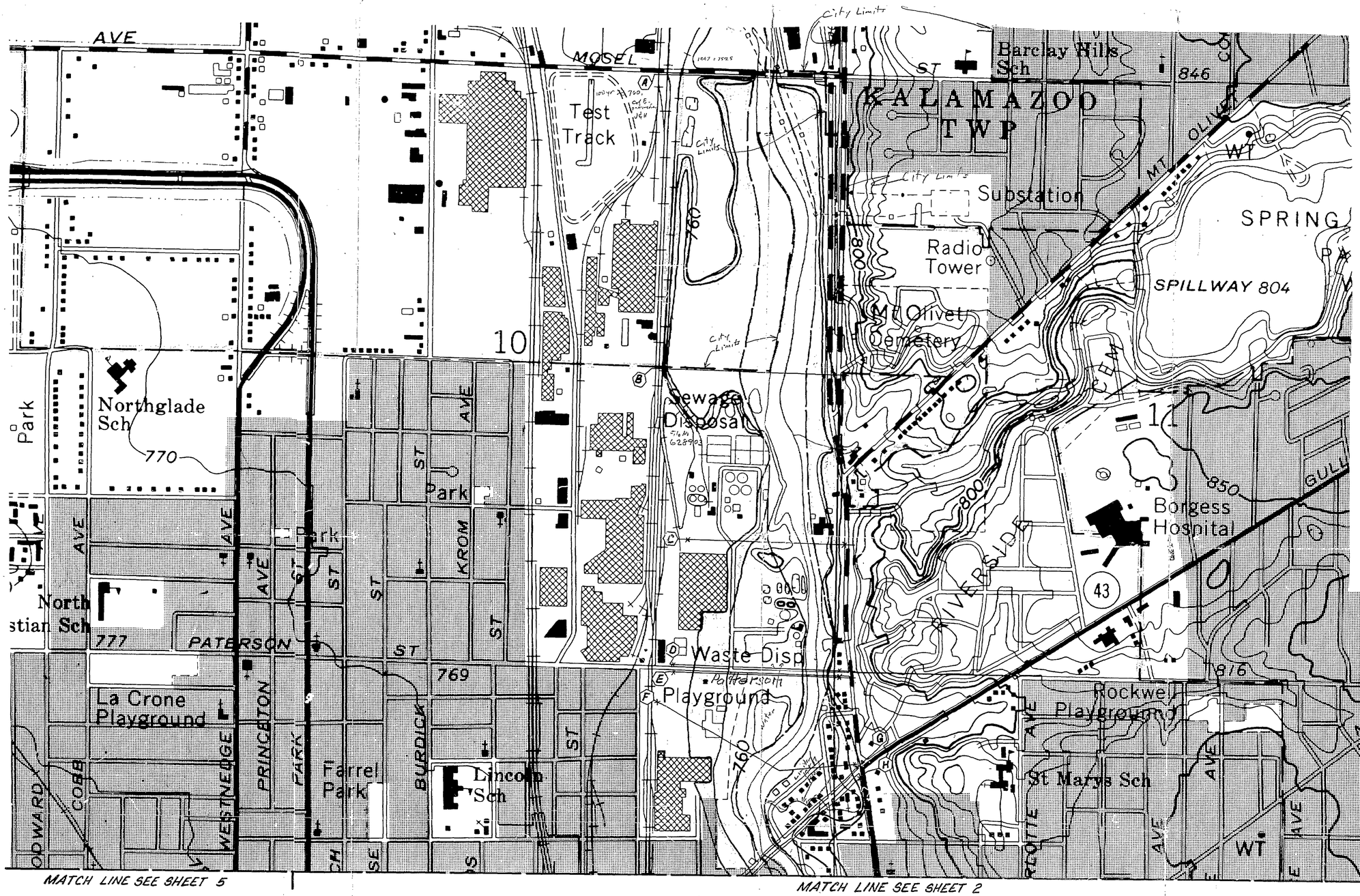
COMSTOCK CREEK PROFILE

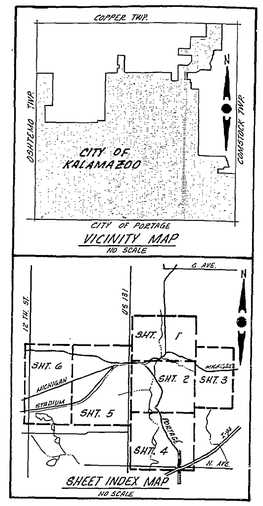
COMSTOCK TOWNSHIP



SCALE
HORIZ. 1" = 200'
VERT. 1" = 5'

1/81
SHEET 1 OF 3
HUD 2024-07





LEGEND

FLOODWAY — 100 YEAR BOUNDARY — 500 YEAR BOUNDARY

A — A CROSS SECTION

CORPORATE BOUNDARIES

FLOOD MAP

CITY OF KALAMAZOO

KALAMAZOO COUNTY, MICHIGAN

SCALE: 1"=400'

SHEET 1 of 6
HUD 2027-10

FLOOD INSURANCE STUDY

KALAMAZOO RIV., GALESBURG-AUGUSTA

100 YEAR

ELEVATION IN FEET
760.00
764.00
768.00
772.00
776.00
780.00
784.00
788.00

0.00 50.00 100.00 150.00 200.00 250.00 300.00 350.00 400.00 450.00 500.00 550.00 600.00 650.00

DISTANCE IN FEET x10

#70 HU02024 07 Exhibit#11

```
**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
  ERROR CORR -  01
  MODIFICATION -  50,51,52
**************************************************
```

Main Channel Rating Curve

```
C
T1RATING CURVE
T2EASTERLY BYPASS IN COMSTOCK TWP.
T3      KALAMAZOO R-COMSTOCK TWP

J1  ICHECK     INQ      NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ
        0.       2.        0.        0.  0.000000      0.00      0.0       0.    766.870   0.000

J2  NPROF      IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE
    1.000      0.000    -1.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

J5  LPRNT      NUMSEC                    ********REQUESTED SECTION NUMBERS********
   -10.000    -10.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
QT      5.000  6780.000  6780.000  6780.000  6780.000  6780.000     0.000     0.000     0.000     0.000
NC      0.120     0.120     0.035     0.100     0.300     0.000     0.000     0.000     0.000     0.000

          VALLEY SECT. JUST D/S OF OXBOW (COMSTOCK TWP.)

X1     15.000    34.000  2073.000  2222.000     0.000     0.000     0.000     0.000     0.000     0.000
GR    769.800   224.000   767.000   426.000   784.400   552.000   764.200   720.000   778.200  1088.000
GR    769.200  1412.000   766.000  1772.000   767.100  1880.000   766.400  1950.000   762.000  2018.000
GR    763.000  2066.000   762.700  2073.000   757.800  2085.000   753.300  2123.000   753.600  2148.000
GR    754.000  2173.000   757.600  2210.000   760.900  2222.000   763.000  2280.000   763.200  2420.000
GR    768.800  2508.000   766.400  2566.000   763.500  2590.000   764.400  2728.000   767.600  2736.000
GR    770.400  2820.000   768.700  3246.000   772.200  3260.000   770.600  3294.000   776.200  3456.000
GR    779.200  3474.000   779.200  3758.000   782.800  3774.000   783.400  3902.000     0.000     0.000
NC      0.100     0.100     0.035     0.100     0.300     0.000     0.000     0.000     0.000     0.000
QT      5.000  5000.000  5500.000  6500.000  6700.000  6780.000     0.000     0.000     0.000     0.000

          VALLEY SECT. APPROX. 2325 FT. D/S OF RIVER ST. BRIDGE

X1     16.000    19.000  2056.000  2206.000   450.000   450.000   450.000     0.000     0.000     0.000
GR    769.000   146.000   768.700   390.000   767.600   592.000   772.900   838.000   771.600  1172.000
GR    766.000  1728.000   767.900  1860.000   764.600  2018.000   763.200  2056.000   758.900  2064.000
GR    753.700  2106.000   754.200  2131.000   754.400  2156.000   757.800  2193.000   758.900  2198.000
GR    762.000  2206.000   764.300  2214.000   765.000  2242.000   764.400  2334.000     0.000     0.000

          VALLEY  SECT. APPROX. 1700 FT. D/S OF RIVER ST. BRIDGE

X1     17.000    29.000  2424.000  2576.000   640.000   660.000   650.000     0.000     0.000     0.000
GR    771.000   104.000   768.800   494.000   769.500   632.000   772.200   664.000   768.400   684.000
GR    772.600   818.000   770.600   902.000   777.800  1092.000   774.200  1222.000   776.600  1282.000
GR    769.600  1464.000   769.600  1530.000   771.800  1580.000   770.400  1784.000   765.500  2054.000
GR    769.600  2306.000   763.700  2424.000   758.300  2431.000   755.200  2464.000   754.500  2484.000
GR    755.300  2500.000   756.300  2544.000   758.200  2564.000   762.000  2576.000   765.600  2582.000
GR    763.800  2600.000   763.600  2704.000   767.800  2716.000   769.600  2748.000     0.000     0.000

          VALLEY SECT. APPROX. 1100  FT. D/S OF RIVER ST. BRIDGE

X1     18.000    31.000  2874.000  3018.000   540.000   590.000   560.000     0.000     0.000     0.000
GR    771.100   210.000   770.200   458.000   770.600   714.000   770.000   952.000   770.400  1250.000
GR    776.000  1394.000   775.200  1428.000   777.400  1574.000   776.800  1738.000   771.300  1842.000
GR    769.600  1906.000   768.500  2012.000   768.400  2038.000   770.400  2084.000   771.300  2216.000
GR    765.800  2454.000   768.800  2568.000   767.400  2662.000   768.000  2796.000   767.200  2826.000
GR    763.100  2874.000   759.500  2878.000   756.000  2909.000   755.300  2929.000   756.300  2945.000
GR    759.500  3012.000   763.600  3018.000   764.600  3048.000   763.000  3084.000   760.600  3096.000
GR    764.200  3130.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

          VALLEY SECT. JUST D/S OF OXBOW CONFLUENCE

X1     19.000     0.000     0.000     0.000   300.000   300.000   300.000     0.000     0.000     0.000
EJ      0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
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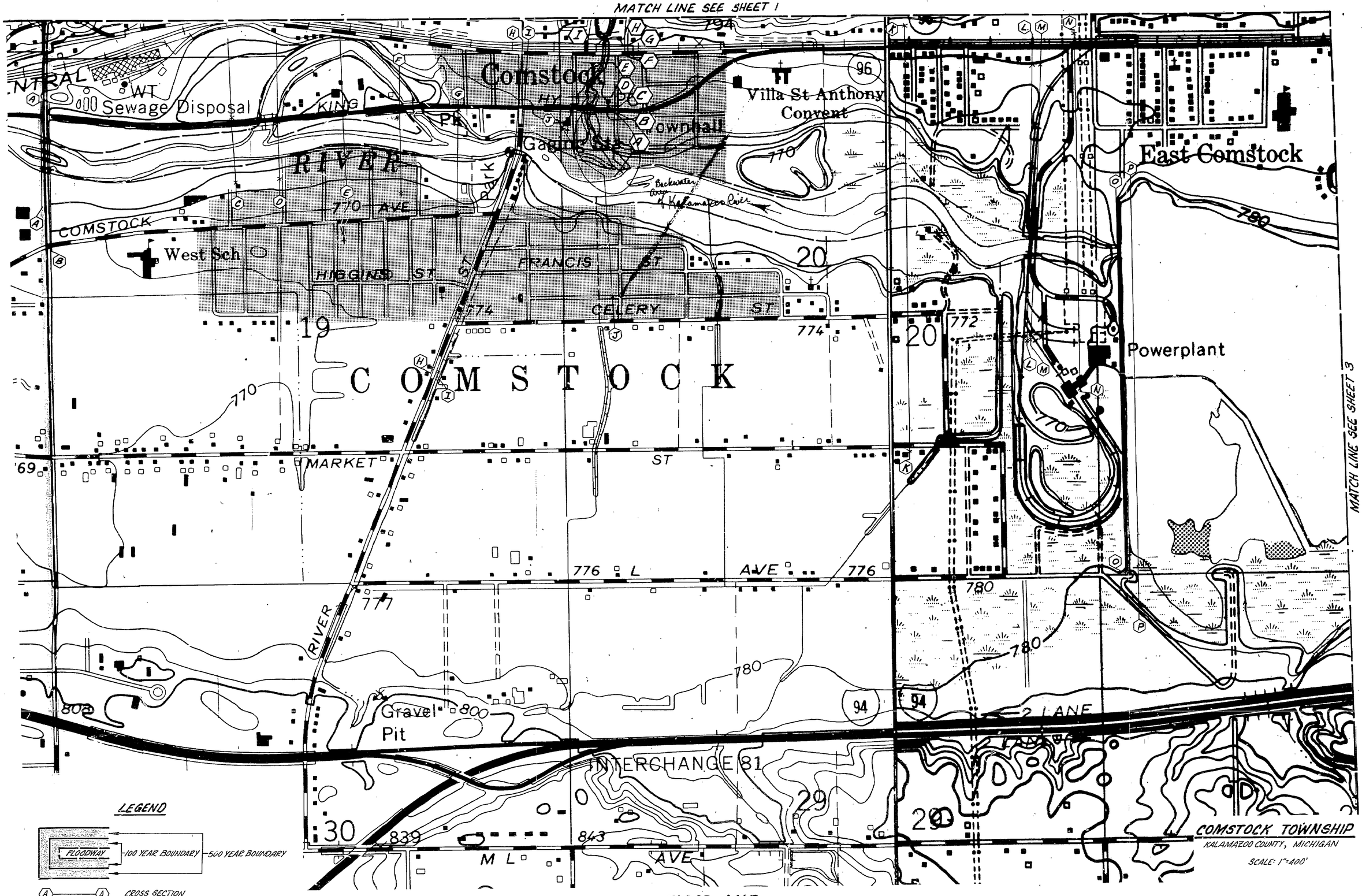
MATCH LINE SEE SHEET 1



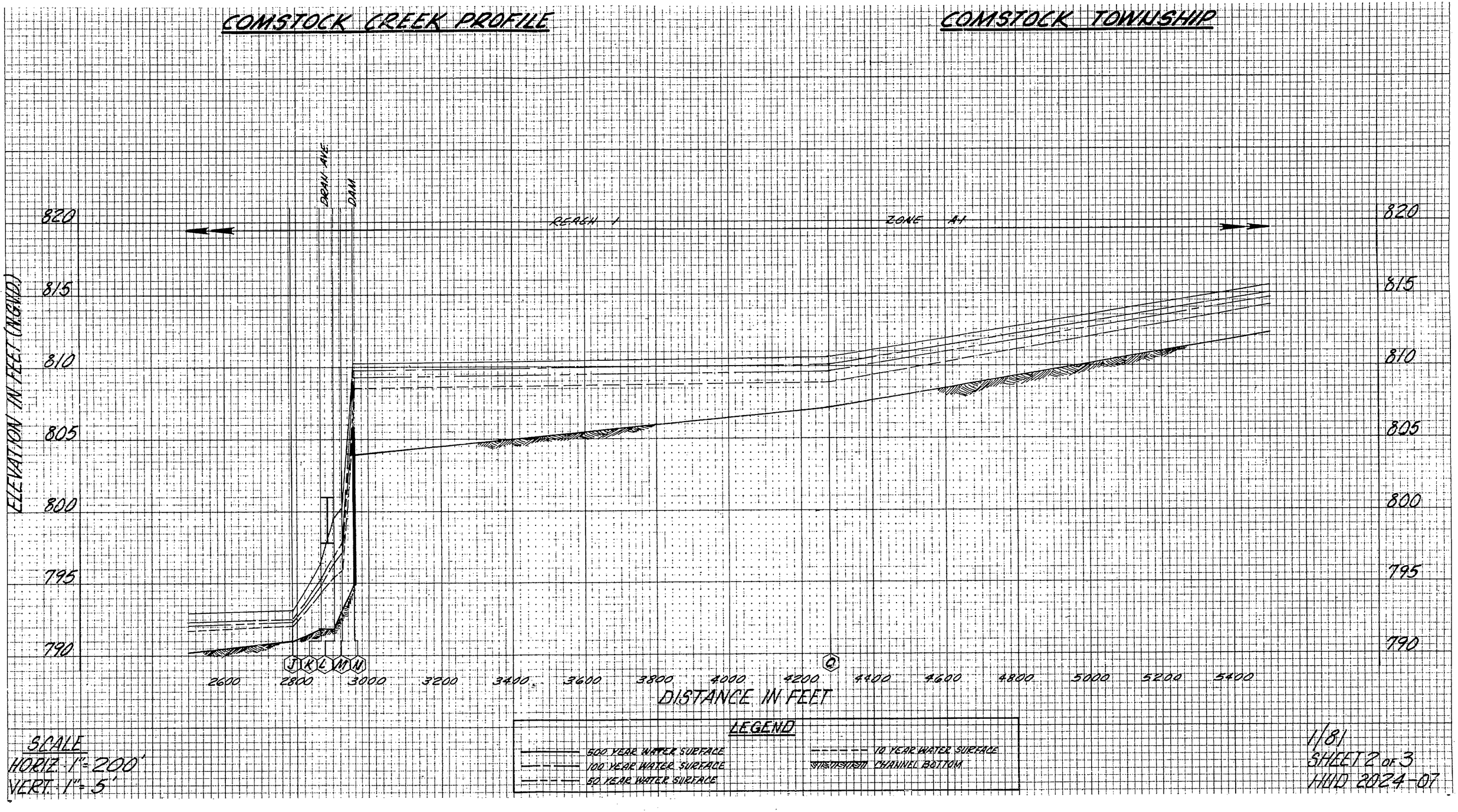
MATCH LINE SEE SHEET 3

COMSTOCK TOWNSHIP
KALAMAZOO COUNTY, MICHIGAN
SCALE: 1"=400'

FLOOD MAP

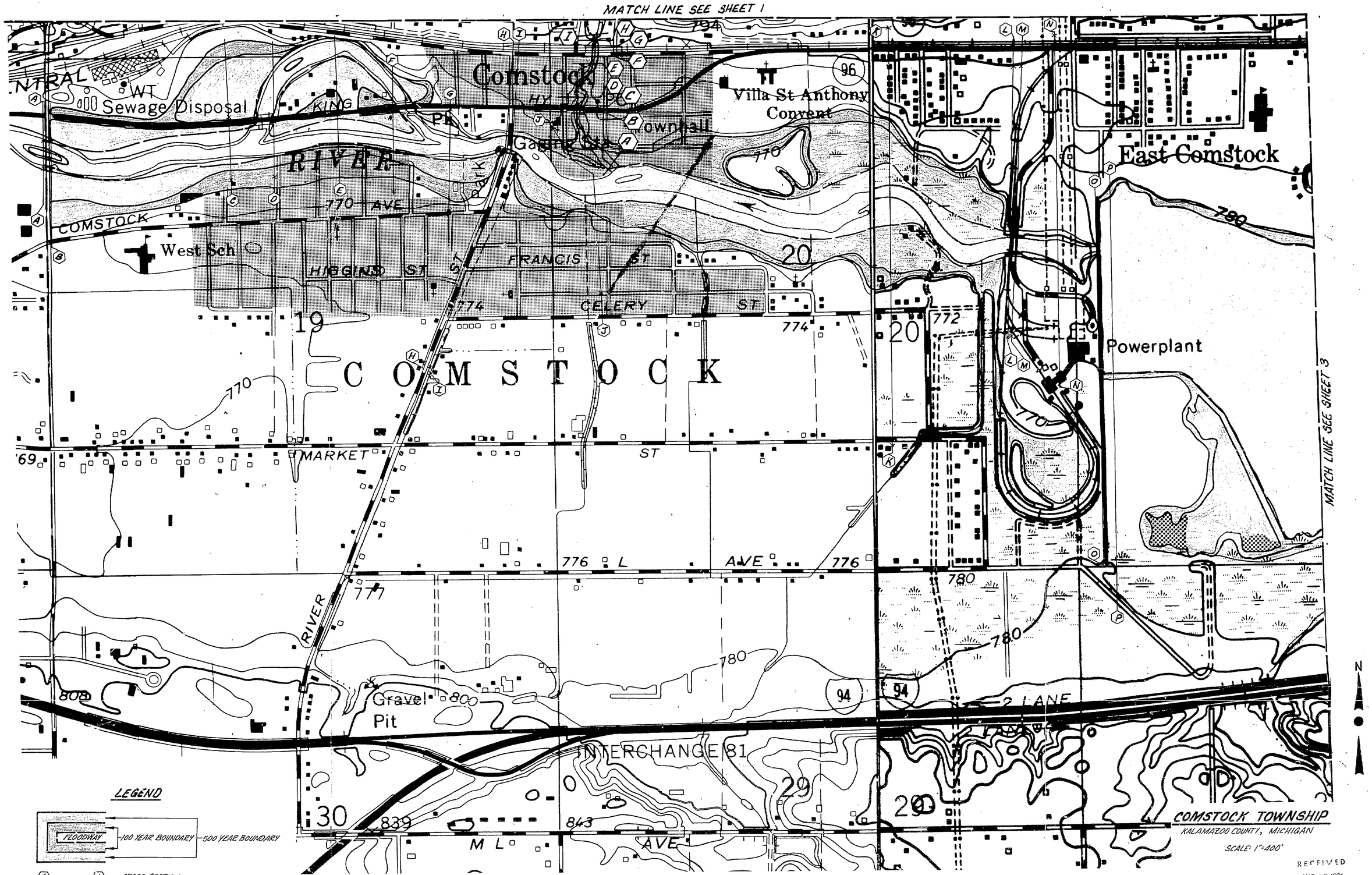
COMSTOCK CREEK PROFILE

COMSTOCK TOWNSHIP



SCALE
HORIZ. 1" = 200'
VERT. 1" = 5'

1/81
SHEET 2 OF 3
IHD 2024-07



FLOOD MAP

RECEIVED
MAR 12 1981
WATER MANAGEMENT

SHEET 2 of 4
HUD 2024-10

KALAMAZOO RIVER, CALEDONIA - AUGUSTA

FLOOD INSURANCE STUDY

100 YEAR

ELEVATION IN FEET
756.00
760.00
764.00
768.00
772.00
776.00
780.00
784.00
788.00
792.00

150.00 200.00 250.00 300.00 350.00 400.00 450.00 500.00 550.00 600.00 650.00 700.00 750.00 800.00

DISTANCE IN FEET ×10

HUD 202907 Exhibit #11

SECTION NO. 71.000

```
**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
  ERROR CORR -  01
  MODIFICATION -  50,51,52
**************************************************
```

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

KALAMAZOO R-COMSTOCK TWP

SUMMARY PRINTOUT TABLE 150

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
15.000	0.00	0.00	0.00	753.30	6780.00	766.87	0.00	767.04	2.77	3.52	3684.92	4070.
15.000	0.00	0.00	0.00	753.30	6780.00	766.87	0.00	767.04	2.77	3.52	3684.92	4070.
15.000	0.00	0.00	0.00	753.30	6780.00	766.87	0.00	767.04	2.77	3.52	3684.92	4070.
15.000	0.00	0.00	0.00	753.30	6780.00	766.87	0.00	767.04	2.77	3.52	3684.92	4070.
15.000	0.00	0.00	0.00	753.30	6780.00	766.87	0.00	767.04	2.77	3.52	3684.92	4070.
16.000	450.00	0.00	0.00	753.70	5000.00	767.02	0.00	767.15	1.97	2.91	2301.50	3560.
16.000	450.00	0.00	0.00	753.70	5500.00	767.00	0.00	767.16	2.41	3.21	2284.91	3543.
16.000	450.00	0.00	0.00	753.70	6500.00	766.97	0.00	767.19	3.39	3.81	2272.24	3529.
16.000	450.00	0.00	0.00	753.70	6700.00	766.97	0.00	767.20	3.61	3.93	2268.91	3526.
16.000	450.00	0.00	0.00	753.70	6780.00	766.97	0.00	767.20	3.70	3.97	2267.61	3524.
17.000	650.00	0.00	0.00	754.50	5000.00	767.15	0.00	767.28	2.10	2.93	2331.18	3451.
17.000	650.00	0.00	0.00	754.50	5500.00	767.16	0.00	767.32	2.52	3.22	2340.23	3461.
17.000	650.00	0.00	0.00	754.50	6500.00	767.20	0.00	767.41	3.48	3.79	2357.89	3482.
17.000	650.00	0.00	0.00	754.50	6700.00	767.21	0.00	767.44	3.69	3.90	2363.22	3488.
17.000	650.00	0.00	0.00	754.50	6780.00	767.22	0.00	767.44	3.77	3.95	2365.68	3491.
18.000	560.00	0.00	0.00	755.30	5000.00	767.27	0.00	767.43	3.03	3.32	2037.51	2870.
18.000	560.00	0.00	0.00	755.30	5500.00	767.31	0.00	767.50	3.62	3.64	2051.82	2889.
18.000	560.00	0.00	0.00	755.30	6500.00	767.40	0.00	767.66	4.88	4.25	2092.55	2942.
18.000	560.00	0.00	0.00	755.30	6700.00	767.42	0.00	767.69	5.14	4.36	2102.10	2954.
18.000	560.00	0.00	0.00	755.30	6780.00	767.43	0.00	767.71	5.25	4.41	2106.17	2960.
19.000	300.00	0.00	0.00	755.30	5000.00	767.37	0.00	767.52	2.93	3.28	2075.52	2920.29
19.000	300.00	0.00	0.00	755.30	5500.00	767.42	0.00	767.60	3.46	3.58	2102.31	2955.22
19.000	300.00	0.00	0.00	755.30	6500.00	767.55	0.00	767.80	4.59	4.16	2166.16	3033.29
19.000	300.00	0.00	0.00	755.30	6700.00	767.58	0.00	767.84	4.82	4.27	2181.47	3051.01
19.000	300.00	0.00	0.00	755.30	6780.00	767.59	0.00	767.86	4.91	4.32	2188.18	3058.67

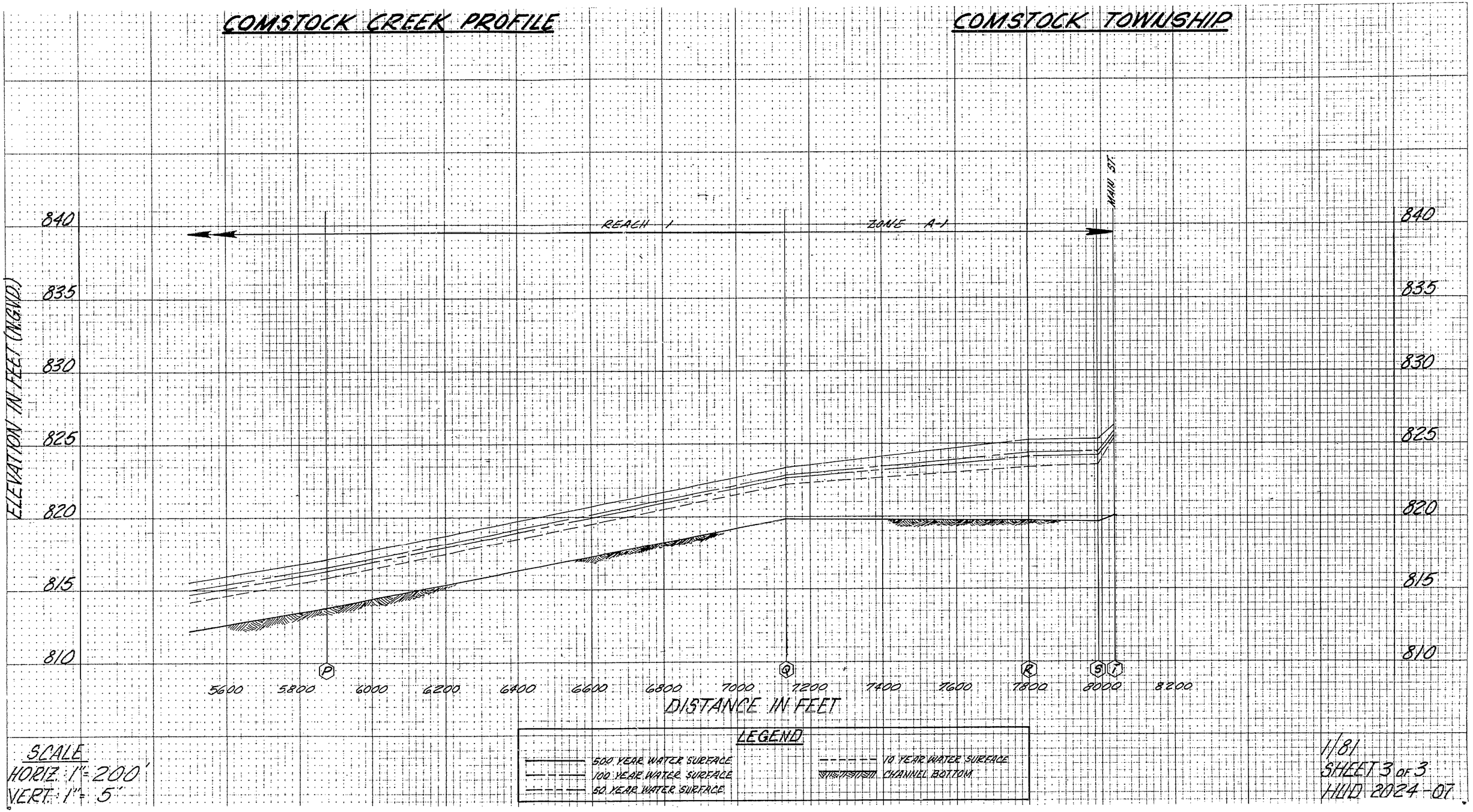
KALAMAZOO R-COMSTOCK TWP

SUMMARY PRINTOUT TABLE 150

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
15.000	6780.00	766.87	0.00	0.00	0.00	1029.93	0.00
15.000	6780.00	766.87	0.00	0.00	0.00	1029.93	0.00
15.000	6780.00	766.87	0.00	0.00	0.00	1029.93	0.00
15.000	6780.00	766.87	0.00	0.00	0.00	1029.93	0.00
15.000	6780.00	766.87	0.00	0.00	0.00	1029.93	0.00
16.000	5000.00	767.02	0.00	0.15	0.00	604.54	450.00
16.000	5500.00	767.00	0.00	0.13	0.00	598.56	450.00
16.000	6500.00	766.97	0.00	0.10	0.00	593.96	450.00
16.000	6700.00	766.97	0.00	0.10	0.00	592.74	450.00
16.000	6780.00	766.97	0.00	0.10	0.00	592.27	450.00
17.000	5000.00	767.15	0.00	0.13	0.00	552.04	650.00
17.000	5500.00	767.16	0.00	0.16	0.00	554.32	650.00
17.000	6500.00	767.20	0.00	0.23	0.00	558.75	650.00
17.000	6700.00	767.21	0.00	0.24	0.00	560.07	650.00
17.000	6780.00	767.22	0.00	0.25	0.00	560.69	650.00
18.000	5000.00	767.27	0.00	0.12	0.00	425.98	560.00
18.000	5500.00	767.31	0.00	0.14	0.00	429.95	560.00
18.000	6500.00	767.40	0.00	0.20	0.00	441.06	560.00
18.000	6700.00	767.42	0.00	0.21	0.00	448.72	560.00
18.000	6780.00	767.43	0.00	0.21	0.00	452.41	560.00
19.000	5000.00	767.37	0.00	0.09	0.00	436.45	300.00
19.000	5500.00	767.42	0.00	0.11	0.00	448.82	300.00
19.000	6500.00	767.55					

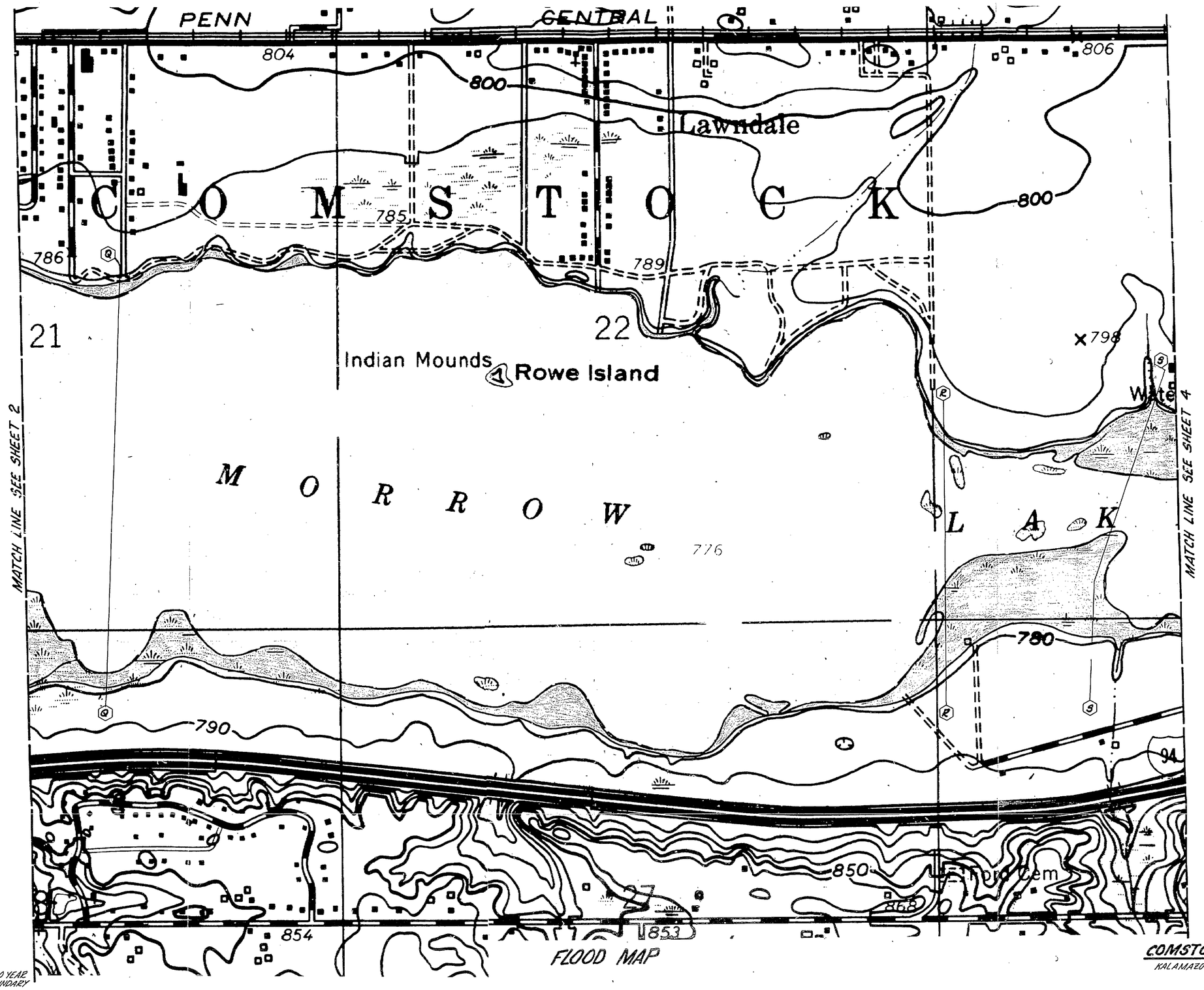
COMSTOCK CREEK PROFILE

COMSTOCK TOWNSHIP



SCALE
HORIZ. 1" = 200'
VERT. 1" = 5'

1/81
SHEET 3 OF 3
HUD 2024-07



FLOOD MAP

LEGEND

FLOODWAY — 100 YEAR BOUNDARY — 500 YEAR BOUNDARY

(A)——(A) CROSS SECTION

CORPORATE BOUNDARIES

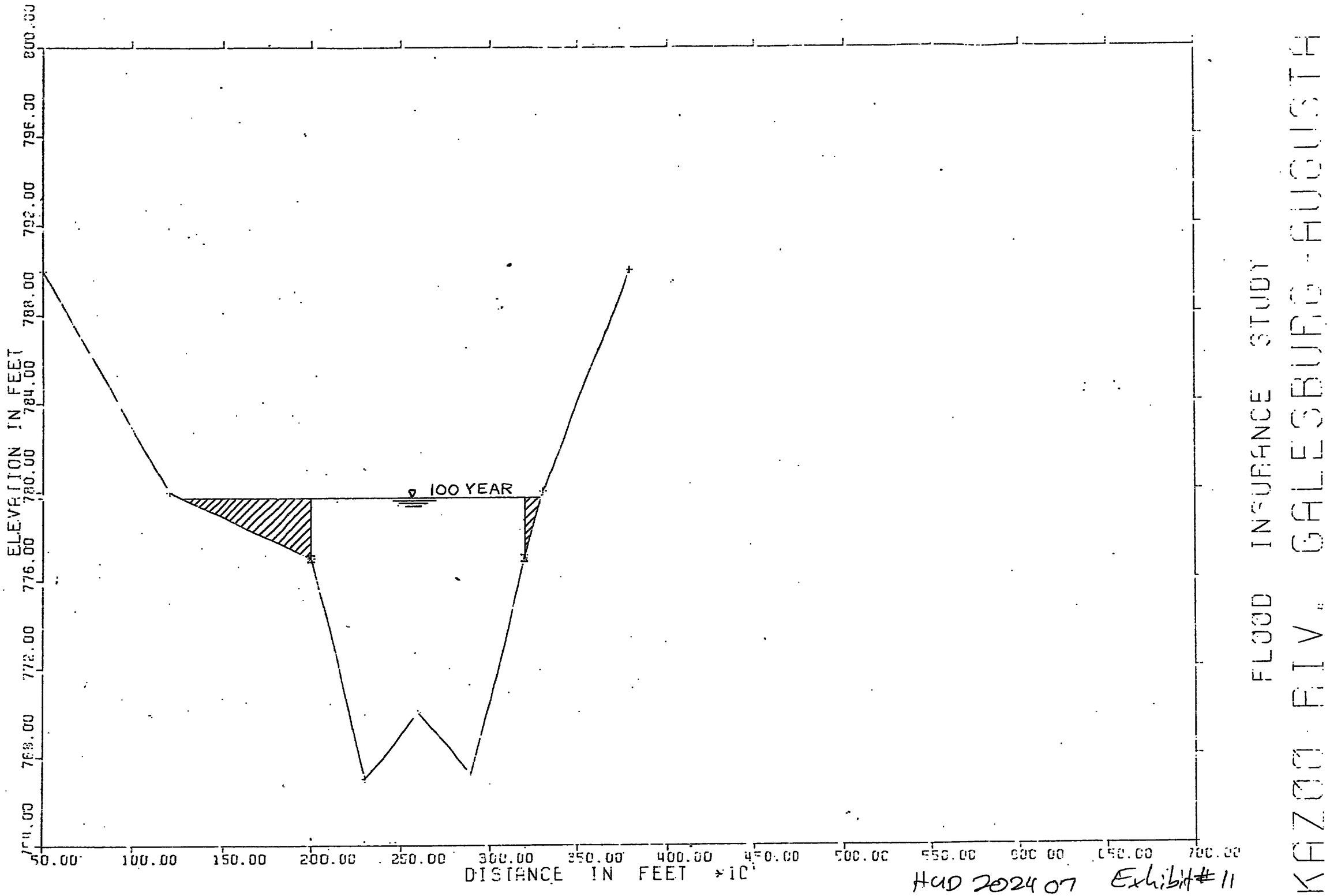
COMSTOCK TOWNSHIP

KALAMAZOO COUNTY, MICHIGAN

SCALE: 1"=400'

RECEIVED
MAR 12 1981
WATER MANAGEMENT

SHEET 3 of 4
HUD 2024-10



FLOOD INSURANCE STUDY

KAZOO RIV. GALESBURG - AUGUSTA

HUD 202407 Exhibit #11

SECTION NO. 72.000

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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
  ERROR CORR -  01
  MODIFICATION -  50,51,52
**************************************************
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Oxbow Rating Curve

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C
T1RATING CURVE
T2EASTERLY BYPASS IN COMSTOCK TWP.
T3       KALAMAZOO R-COMSTOCK TWP

J1  ICHECK     INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ
          0.        2.        0.        0.  0.000000      0.00      0.0       0.   766.870     0.000

J2  NPROF      IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE
        1.000     0.000    -1.000     0.000     0.000     0.000     0.000     0.000     0.000    15.000

J5  LPRNT      NUMSEC                        ********REQUESTED SECTION NUMBERS********
       -10.000   -10.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
QT       5.000  6780.000  6780.000  6780.000  6780.000  6780.000     0.000     0.000     0.000     0.000
NC       0.120     0.120     0.035     0.100     0.300     0.000     0.000     0.000     0.000     0.000

          VALLEY SECT. JUST D/S OF OXBOW (COMSTOCK TWP.)
X1      15.000    34.000  2073.000  2222.000     0.000     0.000     0.000     0.000     0.000     0.000
GR     769.800   224.000   767.000   426.000   784.400   552.000   764.200   720.000   778.200  1088.000
GR     769.200  1412.000   766.000  1772.000   767.100  1880.000   766.400  1950.000   762.000  2018.000
GR     763.000  2066.000   762.700  2073.000   757.800  2085.000   753.300  2123.000   753.600  2148.000
GR     754.000  2173.000   757.600  2210.000   760.900  2222.000   763.000  2280.000   763.200  2420.000
GR     768.800  2508.000   766.400  2566.000   763.500  2590.000   764.400  2728.000   767.600  2736.000
GR     770.400  2820.000   768.700  3246.000   772.200  3260.000   770.600  3294.000   776.200  3456.000
GR     779.200  3474.000   779.200  3758.000   782.800  3774.000   783.400  3902.000     0.000     0.000
QT       5.000    50.000    80.000   100.000   150.000   200.000     0.000     0.000     0.000     0.000
NC       0.100     0.120     0.035     0.600     0.800     0.000     0.000     0.000     0.000     0.000

          D/S FACE OF WESTERLY KING HWY. BRIDGE EASTERLY BYPASS CHANNEL
X1      16.100    14.000  2669.500  2682.500   600.000   225.000   425.000     0.000     0.000     0.000
GR     769.200  2458.000   768.100  2568.500   757.700  2663.200   756.200  2669.500   756.200  2669.600
GR     756.200  2675.600   756.200  2675.700   756.200  2676.300   756.200  2676.400   756.200  2682.400
GR     756.200  2682.500   759.000  2688.800   768.200  2783.000   769.200  2800.000     0.000     0.000
SB       1.250     2.150     2.600     0.000    10.800     0.800    57.600     0.000   755.900   755.500

          U/S FACE OF WESTERLY KING HWY. BRIDGE EASTERLY BYPASS CHANNEL
X1      16.400    14.000  2669.500  2682.500    81.000    81.000    81.000     0.000     0.000     0.000
X2       0.000     0.000     1.000   761.700   769.200     0.000     0.000     0.000     0.000     0.000
BT      10.000  2458.000   769.200     0.000  2669.500   769.200     0.000  2669.600   769.200   761.700
BT    2675.600   769.200   761.700  2675.700   769.200     0.000  2676.300   769.200     0.000  2676.400
BT     769.200   761.700  2682.400   769.200   761.700  2682.500   769.200     0.000  2800.000   769.200
BT       0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
GR     769.200  2458.000   768.400  2568.500   758.200  2663.200   755.900  2669.500   755.900  2669.600
GR     755.900  2675.600   755.900  2675.700   756.900  2676.300   756.900  2676.400   756.900  2682.400
GR     756.900  2682.500   758.900  2688.800   767.800  2783.000   769.200  2800.000     0.000     0.000

          VALLEY SECT. THRU CENTER OF OXBOW
X1      17.000    16.000  3344.500  3504.000   875.000  1450.000  1175.000     0.000     0.000     0.000
GR     769.600  2748.000   766.400  3150.000   762.800  3164.000   763.400  3250.000   762.600  3304.000
GR     764.500  3344.500   758.700  3359.500   758.100  3364.500   755.900  3404.500   755.200  3422.000
GR     755.000  3444.500   758.700  3479.500   760.500  3484.500   761.600  3489.500   766.000  3504.000
GR     769.600  3534.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

          D/S FACE OF EASTERLY KING HWY.BRIDGE - EASTERLY BYPASS CHANNEL
X1      18.200    11.000  3200.900  3207.100   750.000  1250.000  1010.000     0.000     0.000     0.000
GR     769.500  3002.000   769.500  3088.000   769.100  3096.000   758.200  3194.800   757.000  3200.900
GR     757.000  3201.000   757.000  3207.000   757.000  3207.100   757.800  3213.200   769.400  3312.000
GR     770.800  3380.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
SB       0.000     1.740     3.000     0.000     6.000     0.000    31.500     0.000   757.600   757.000

          U/S FACE OF EASTERLY KING HWY. BRIDGE - EASTERLY BYPASS CHANNEL
X1      18.500    11.000  3200.900  3207.100    77.000    77.000    77.000     0.000     0.000     0.000
X2       0.000     0.000     1.000   762.800   769.500     0.000     0.000     0.000     0.000     0.000
BT       6.000  3088.000   769.500     0.000  3200.900   770.000     0.000  3201.000   770.000   762.800
BT    3207.000   770.000   762.800  3207.100   770.000     0.000  3380.000   770.800     0.000     0.000
GR     769.200  3002.000   769.500  3088.000   769.100  3096.000   759.300  3194.800   757.600  3200.900
GR     757.600  3201.000   757.600  3207.000   757.600  3207.100   758.400  3213.200   769.400  3312.000
GR     770.800  3380.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
EJ       0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

FLOW DISTRIBUTION FOR SECNO=      15.00          CWSEL=     766.87

STA=        698      2066      2073      2222      2420      2728      2734.
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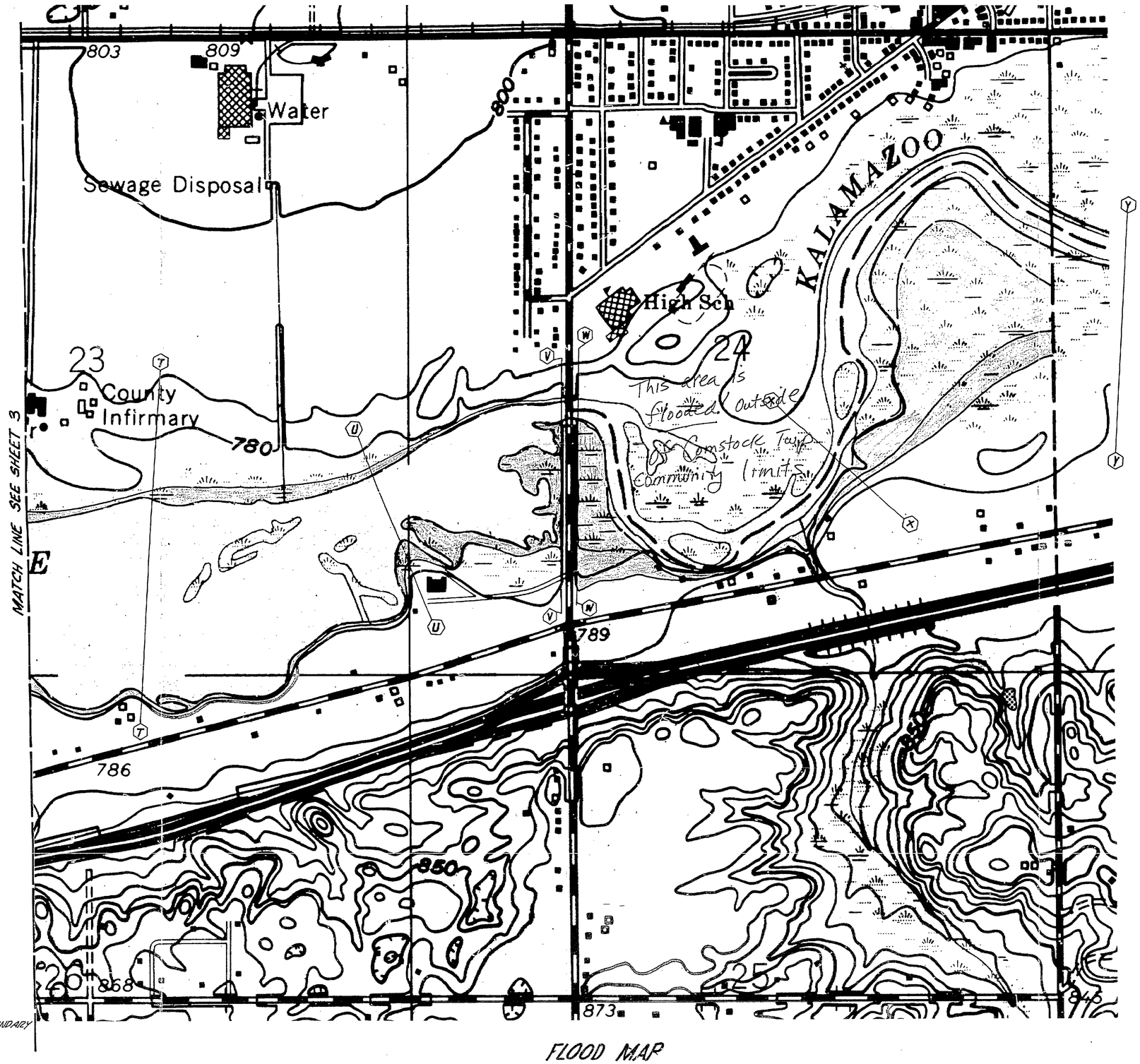


N

LEGEND

FLOODWAY — 100 YEAR BOUNDARY — 500 YEAR BOUNDARY

CROSS SECTION

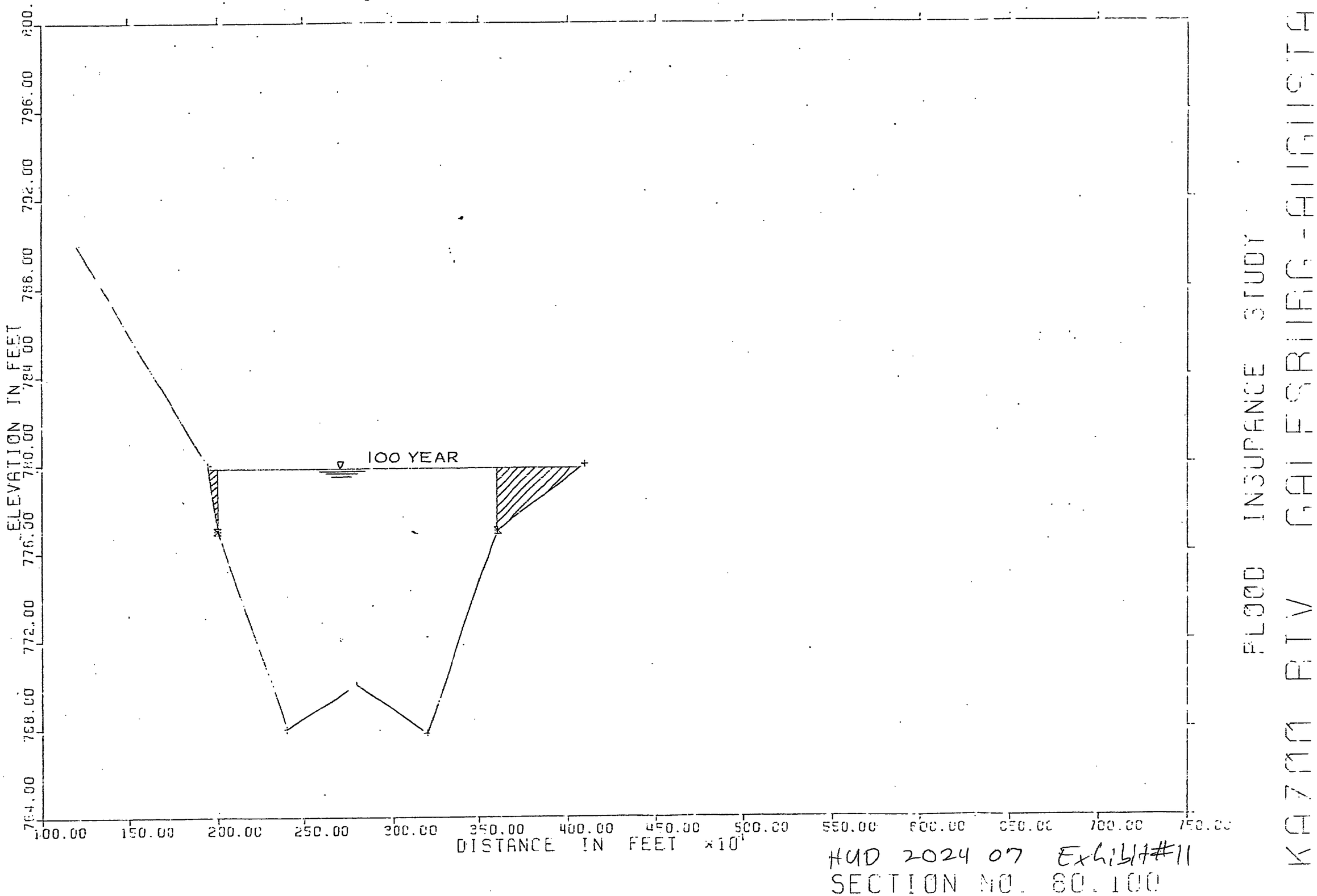
FLOOD MAP

COMSTOCK TOWNSHIP
KALAMAZOO COUNTY, MICHIGAN

SCALE: 1"=400'

RECEIVED
MAR 1 2 1981
WATER MANAGEMENT

SHEET 4 of 4
HUD 2024-10



HUD 2024 07 Exhibit #11
SECTION NO. 80.100

****
HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
ERROR CORR - 01
MODIFICATION - 50,51,52
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

KALAMAZOO R-COMSTOCK TWP

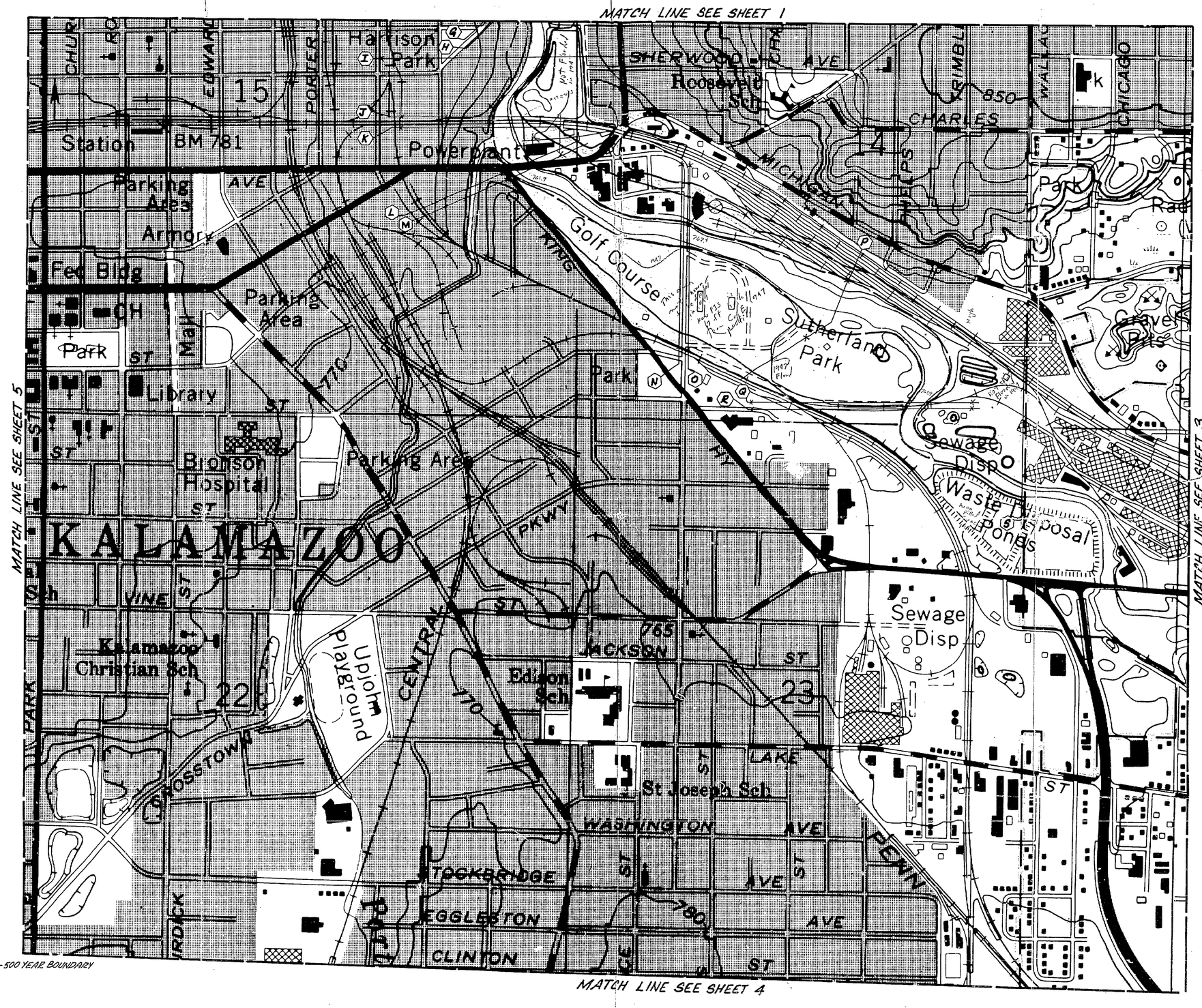
SUMMARY PRINTOUT TABLE 150

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
15.000	0.00	0.00	0.00	753.30	6780.00	766.87	0.00	767.04	2.77	3.52	3684.92	4070.
15.000	0.00	0.00	0.00	753.30	6780.00	766.87	0.00	767.04	2.77	3.52	3684.92	4070.
15.000	0.00	0.00	0.00	753.30	6780.00	766.87	0.00	767.04	2.77	3.52	3684.92	4070.
15.000	0.00	0.00	0.00	753.30	6780.00	766.87	0.00	767.04	2.77	3.52	3684.92	4070.
15.000	0.00	0.00	0.00	753.30	6780.00	766.87	0.00	767.04	2.77	3.52	3684.92	4070.
16.100	425.00	0.00	0.00	756.20	50.00	767.23	0.00	767.23	0.01	0.16	1028.22	660.
16.100	425.00	0.00	0.00	756.20	80.00	767.23	0.00	767.23	0.01	0.25	1028.36	661.
16.100	425.00	0.00	0.00	756.20	100.00	767.23	0.00	767.23	0.02	0.32	1028.31	661.
16.100	425.00	0.00	0.00	756.20	150.00	767.23	0.00	767.23	0.05	0.48	1028.31	661.
16.100	425.00	0.00	0.00	756.20	200.00	767.23	0.00	767.23	0.09	0.64	1028.07	660.
16.400	81.00	769.20	761.70	755.90	50.00	767.25	0.00	767.25	0.01	0.16	1013.61	631.
16.400	81.00	769.20	761.70	755.90	80.00	767.29	0.00	767.29	0.02	0.25	1021.45	637.
16.400	81.00	769.20	761.70	755.90	100.00	767.33	0.00	767.33	0.02	0.32	1028.70	642.
16.400	81.00	769.20	761.70	755.90	150.00	767.45	0.00	767.45	0.05	0.47	1053.89	660.
16.400	81.00	769.20	761.70	755.90	200.00	767.63	0.00	767.63	0.09	0.60	1089.66	685.
17.000	1175.00	0.00	0.00	755.00	50.00	767.25	0.00	767.25	0.00	0.03	2326.34	3105.
17.000	1175.00	0.00	0.00	755.00	80.00	767.29	0.00	767.29	0.00	0.05	2345.44	3130.
17.000	1175.00	0.00	0.00	755.00	100.00	767.33	0.00	767.33	0.00	0.06	2363.23	3154.
17.000	1175.00	0.00	0.00	755.00	150.00	767.45	0.00	767.45	0.00	0.09	2426.08	3236.
17.000	1175.00	0.00	0.00	755.00	200.00	767.63	0.00	767.63	0.00	0.11	2517.25	3354.
18.200	1010.00	0.00	0.00	757.00	50.00	767.25	0.00	767.25	0.01	0.21	934.26	482.
18.200	1010.00	0.00	0.00	757.00	80.00	767.29	0.00	767.29	0.03	0.33	941.56	487.
18.200	1010.00	0.00	0.00	757.00	100.00	767.33	0.00	767.33	0.04	0.41	948.32	491.
18.200	1010.00	0.00	0.00	757.00	150.00	767.45	0.00	767.46	0.09	0.60	971.74	506.
18.200	1010.00	0.00	0.00	757.00	200.00	767.63	0.00	767.63	0.14	0.78	1004.91	528.
18.500	77.00	769.50	762.80	757.60	50.00	767.32	0.00	767.32	0.01	0.23	852.66	421.
18.500	77.00	769.50	762.80	757.60	80.00	767.46	0.00	767.47	0.03	0.36	879.05	437.
18.500	77.00	769.50	762.80	757.60	100.00	767.60	0.00	767.60	0.05	0.44	903.77	452.
18.500	77.00	769.50	762.80	757.60	150.00	768.06	0.00	768.07	0.09	0.60	992.02	507.
18.500	77.00	769.50	762.80	757.60	200.00	768.72	0.00	768.72	0.11	0.72	1122.63	590.

KALAMAZOO R-COMSTOCK TWP

SUMMARY PRINTOUT TABLE 150

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
15.000	6780.00	766.87	0.00	0.00	0.00	1029.93	0.00
15.000	6780.00	766.87	0.00	0.00	0.00	1029.93	0.00
15.000	6780.00	766.87	0.00	0.00	0.00	1029.93	0.00
15.000	6780.00	766.87	0.00	0.00	0.00	1029.93	0.00
15.000	6780.00	766.87	0.00	0.00	0.00	1029.93	0.00
16.100	50.00	767.23	0.00	0.36	0.00	196.56	425.00
16.100	80.00	767.23	0.00	0.36	0.00	196.57	425.00
16.100	100.00	767.23	0.00	0.36	0.00	196.57	425.00
16.100	150.00	767.23	0.00	0.36	0.00	196.57	425.00
16.100	200.00	767.23	0.00	0.36	0.00	196.55	425.00
16.400	50.00	767.25	0.00	0.02	0.00	198.02	81.00
16.400	80.00	767.29	0.00	0.06	0.00	198.81	81.00
16.400	100.00	767.33	0.00	0.10	0.00	199.53	81.00
16.400	150.00	767.45	0.00	0.22	0.00	202.02	81.00
16.400	200.00	767.63	0.00	0.40	0.00	205.51	81.00
17.000	50.00	767.25	0.00	0.00	0.00	471.40	1175.00
17.000	80.00	767.29	0.00	0.00	0.00	476.80	1175.00
17.000	100.00	767.33	0.00	0.00	0.00	481.77	1175.00
17.000	150.00	767.45	0.00	0.00	0.00	498.94	1175.00
17.000	200.00	767.63	0.00	0.01	0.00	522.84	1175.00
18.200	50.00	767.25	0.00	0.00	0.00	180.94	1010.00
18.200	80.00	767.29	0.00	0.00	0.00	181.65	1010.00
18.200	100.00	767.33	0.00	0.00	0.00	182.31	1010.00
18.200	150.00	767.45	0.00	0.00	0.00	184.55	1010.00
18.200	200.00	767.63	0.00	0.00	0.00	187.68	1010.00
18.500	50.00	767.32	0.00	0.07	0.00	179.36	77.00



LEGEND

FLOODWAY — 100 YEAR BOUNDARY — 500 YEAR BOUNDARY

(A)——(A) CROSS SECTION

CORPORATE BOUNDARIES

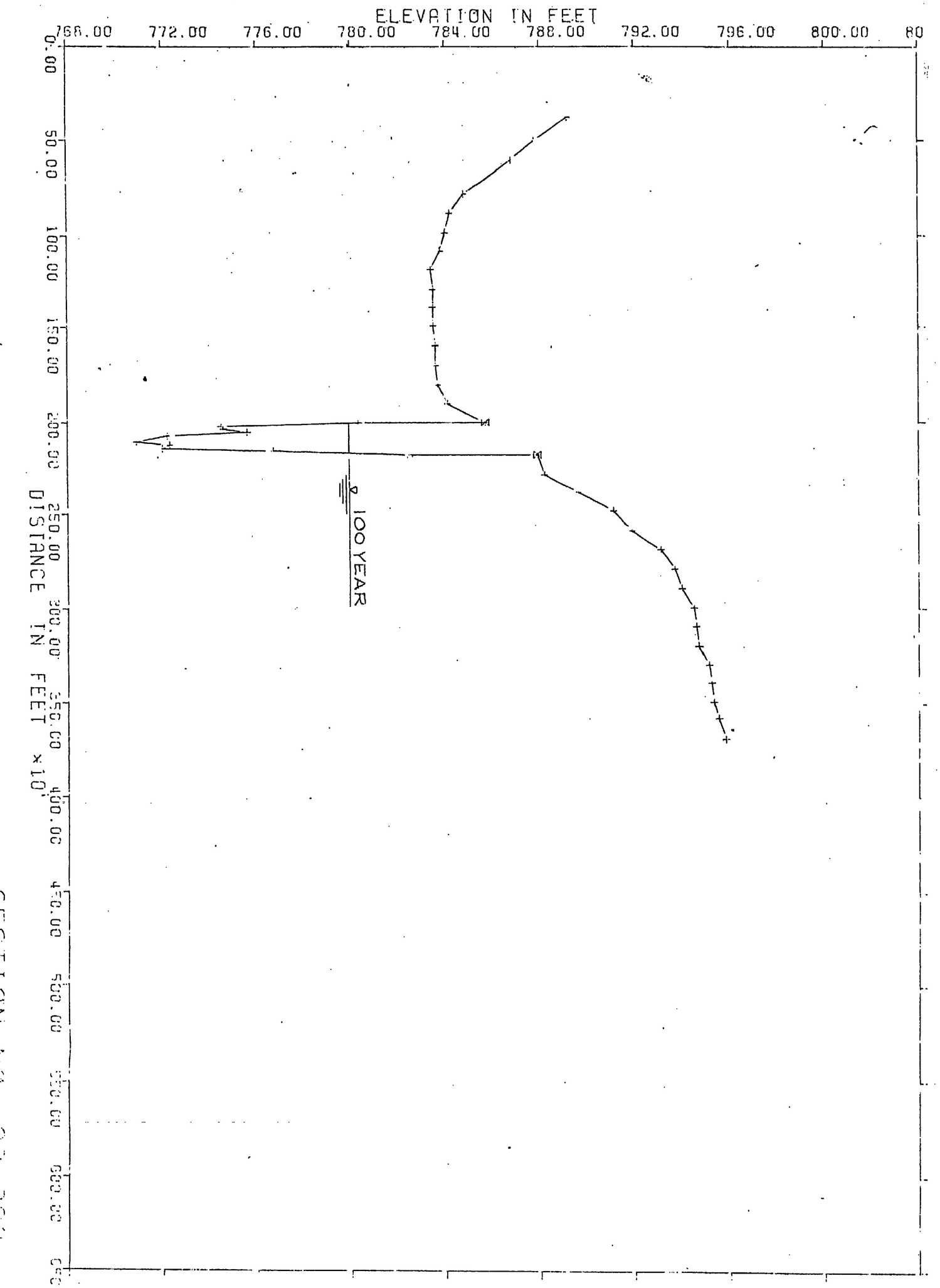
FLOOD MAP

CITY OF KALAMAZOO

KALAMAZOO COUNTY, MICHIGAN

SCALE: 1"=400'

SHEET 2 of 6
HUD 2027-10


ELEVATION IN FEET
768.00
772.00
776.00
780.00
784.00
788.00
792.00
796.00
800.00
0.00
50.00
100.00
150.00
200.00
250.00
300.00
350.00
400.00
450.00
500.00
550.00
600.00
650.00
700.00
750.00
800.00
850.00
900.00
950.00
1000.00
1050.00
1100.00
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1500.00
1550.00
1600.00
1650.00
1700.00
1750.00
1800.00
1850.00
1900.00
1950.00

ELEVATION IN FEET

764.00 768.00 772.00 776.00 780.00 784.00 788.00 792.00 796.00 800.00

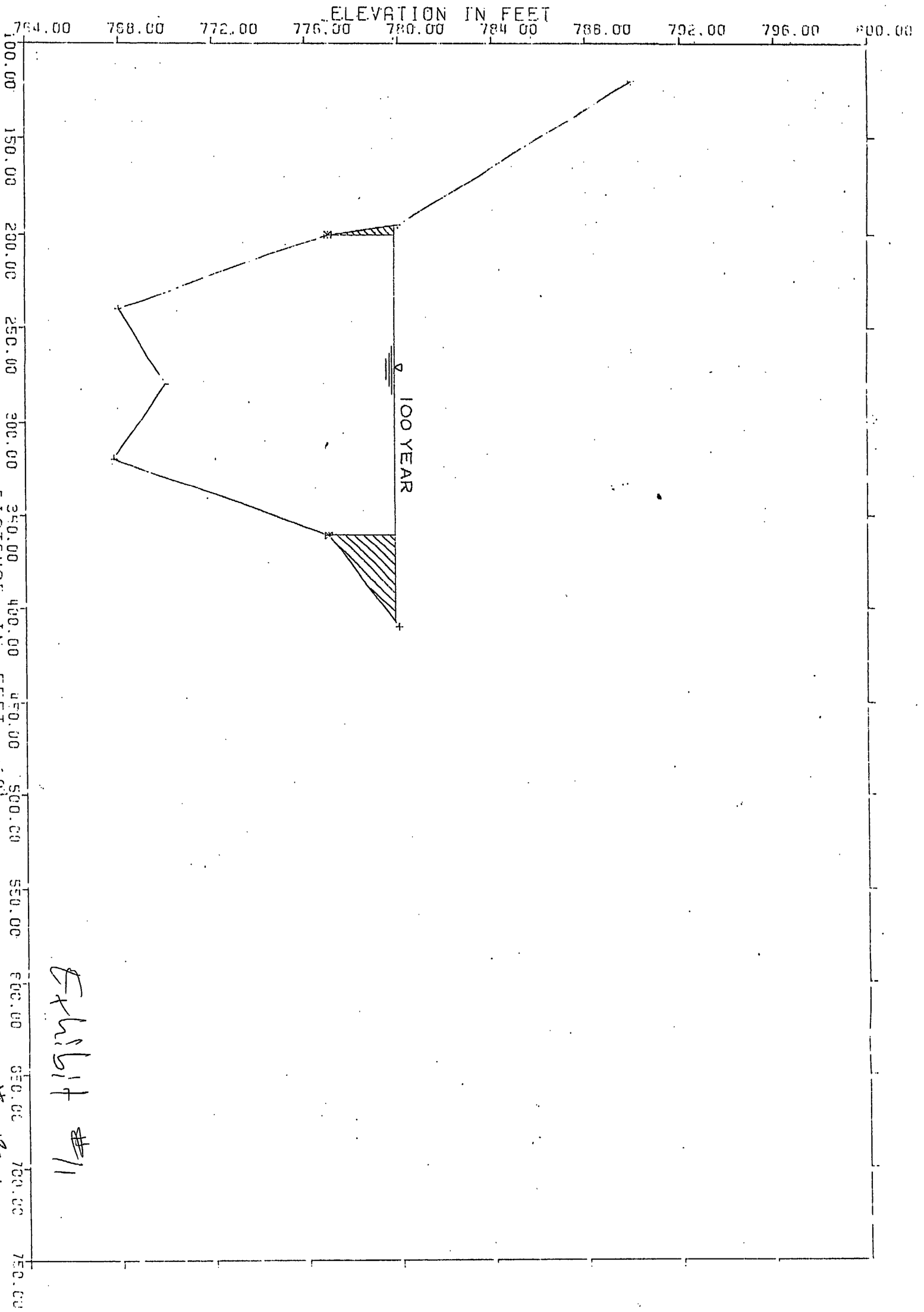
0.00 50.00 100.00 150.00 200.00 250.00 300.00 350.00 400.00 450.00

DISTANCE IN FEET

100 YEAR

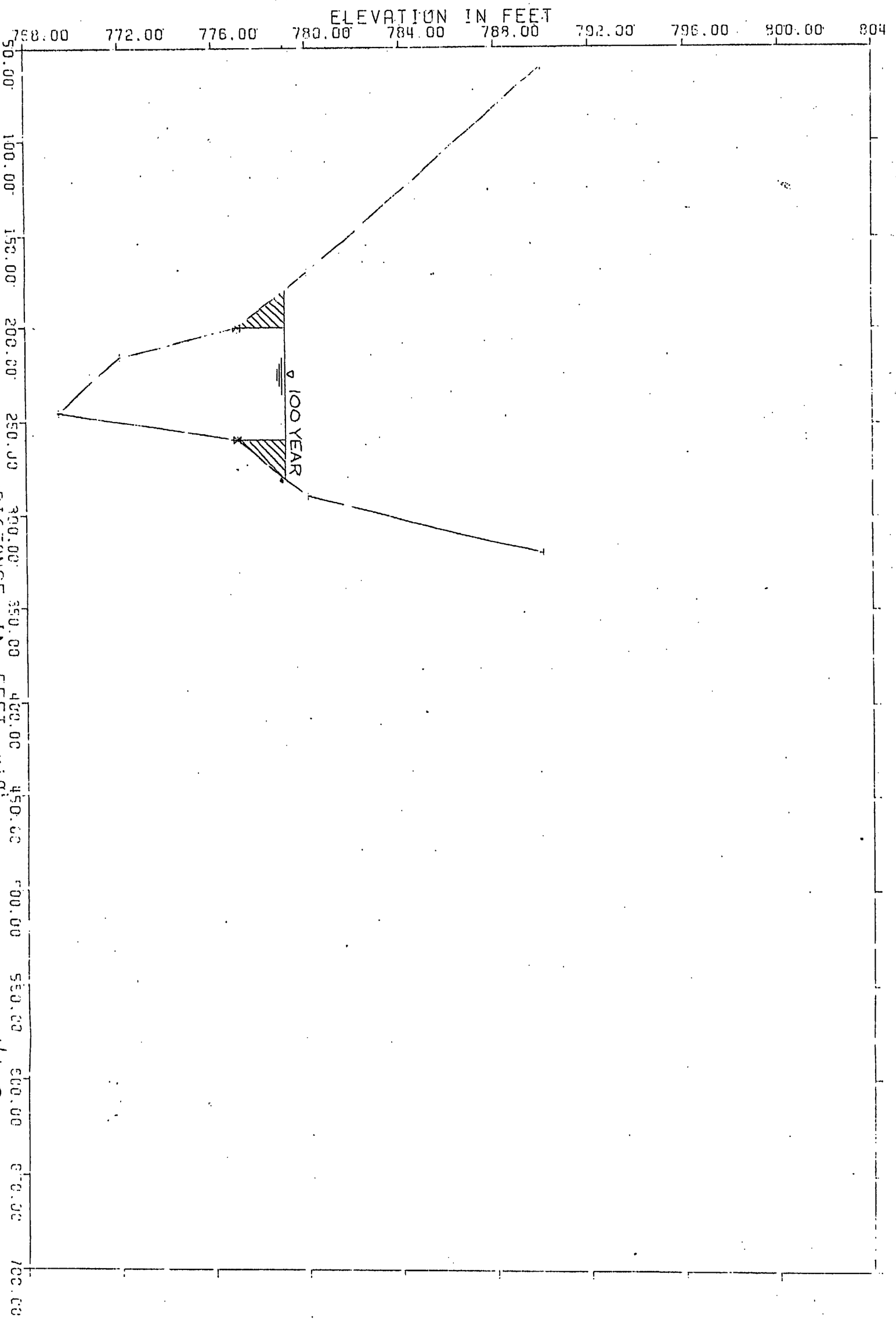
KAZOO RIV. GALESBURG-AUGUSTA

FLOOD INSURANCE STUDY



FLOOD INSURANCE STUDY

KAZOO RIV. GALESBURG-AUGUSTA



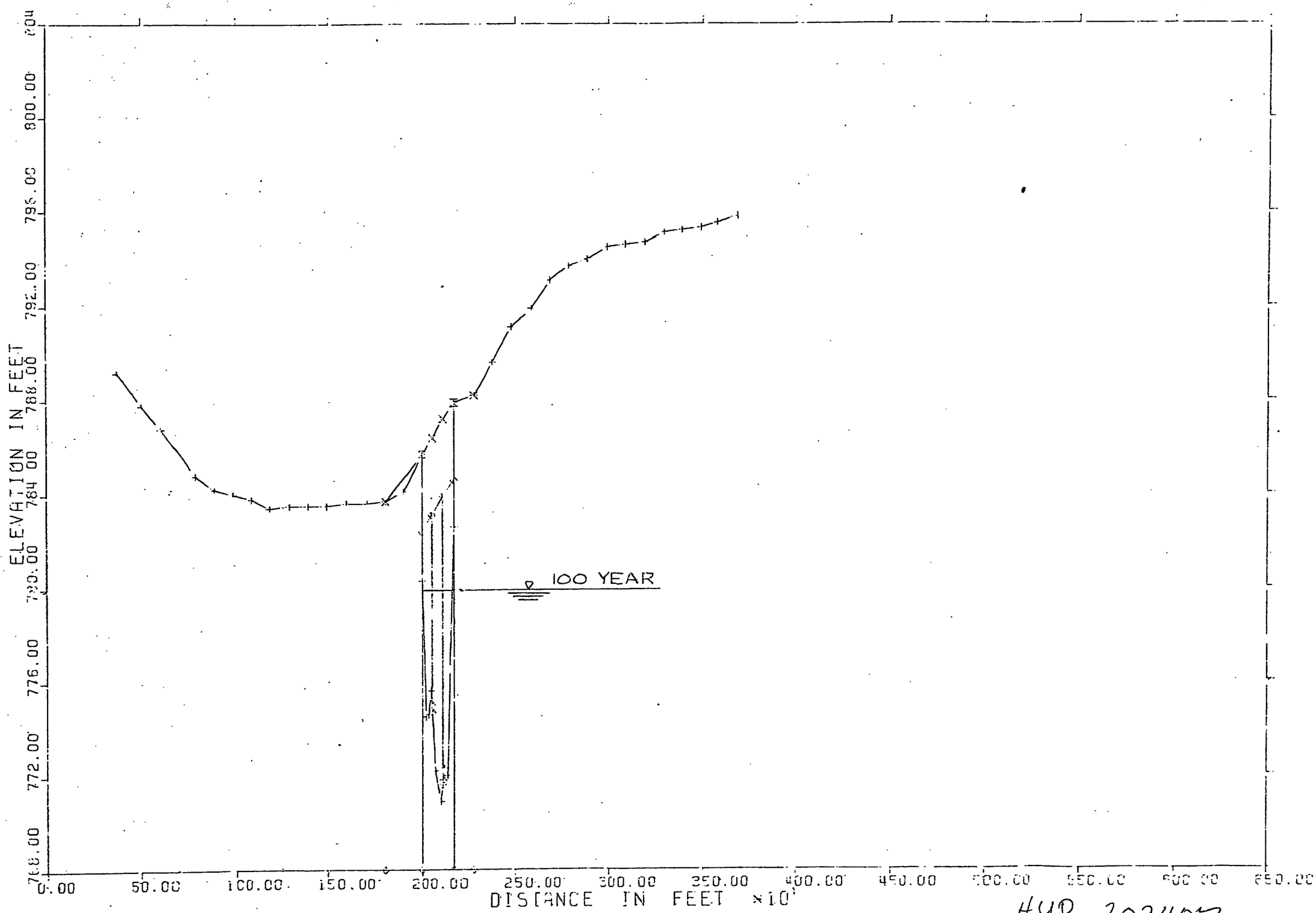
SECTION NO 88.200

HYD 20407

Exhibit #11

FLOOD INSURANCE STUDY

KLAMATH RIVER, OREGON AND CALIFORNIA



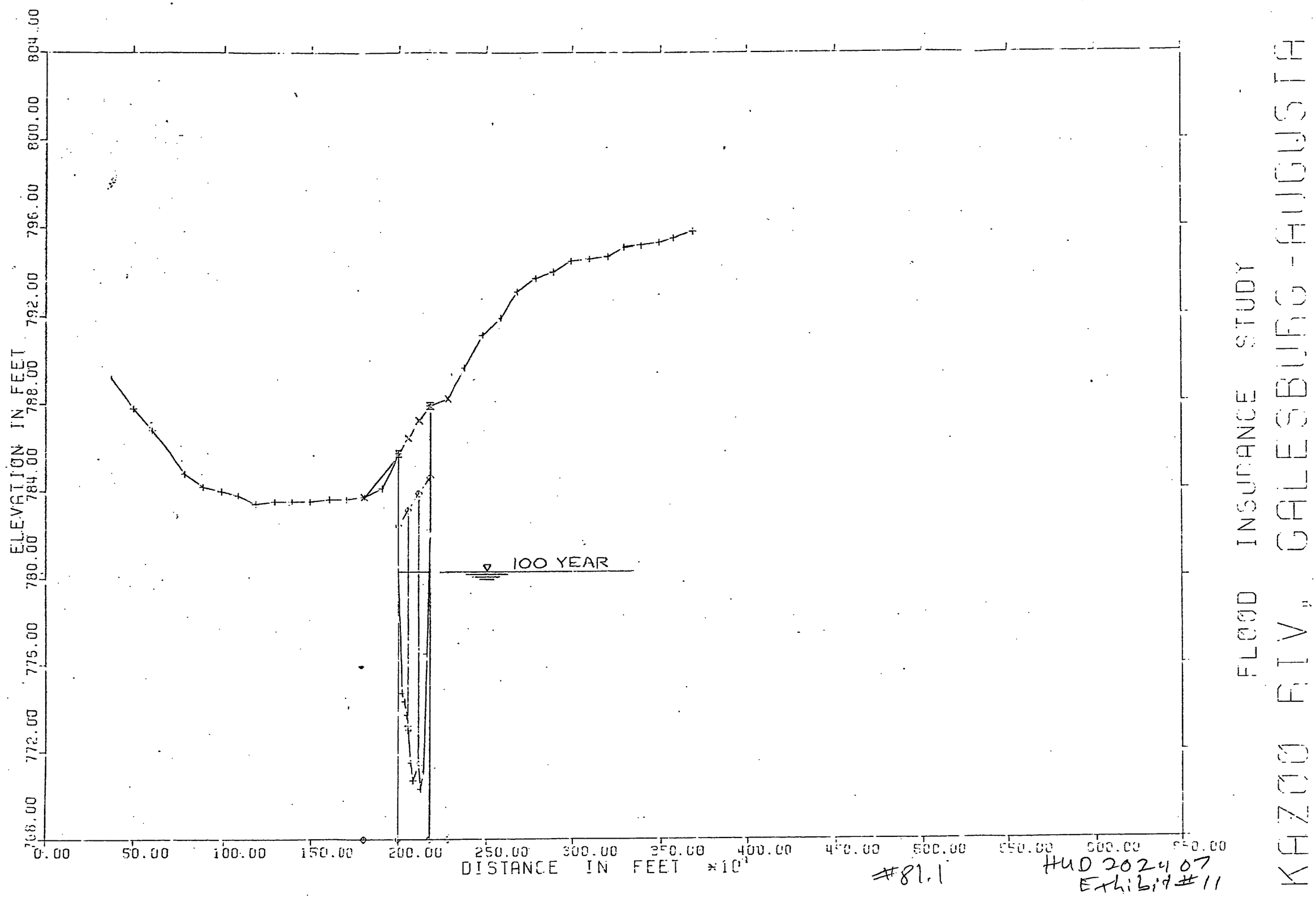
FLOOD INSURANCE STUDY

KAZOO RIV. GALESBURG-AUGUSTA

HUD 202407

SECTION NO. 61.000

Exhibit #11



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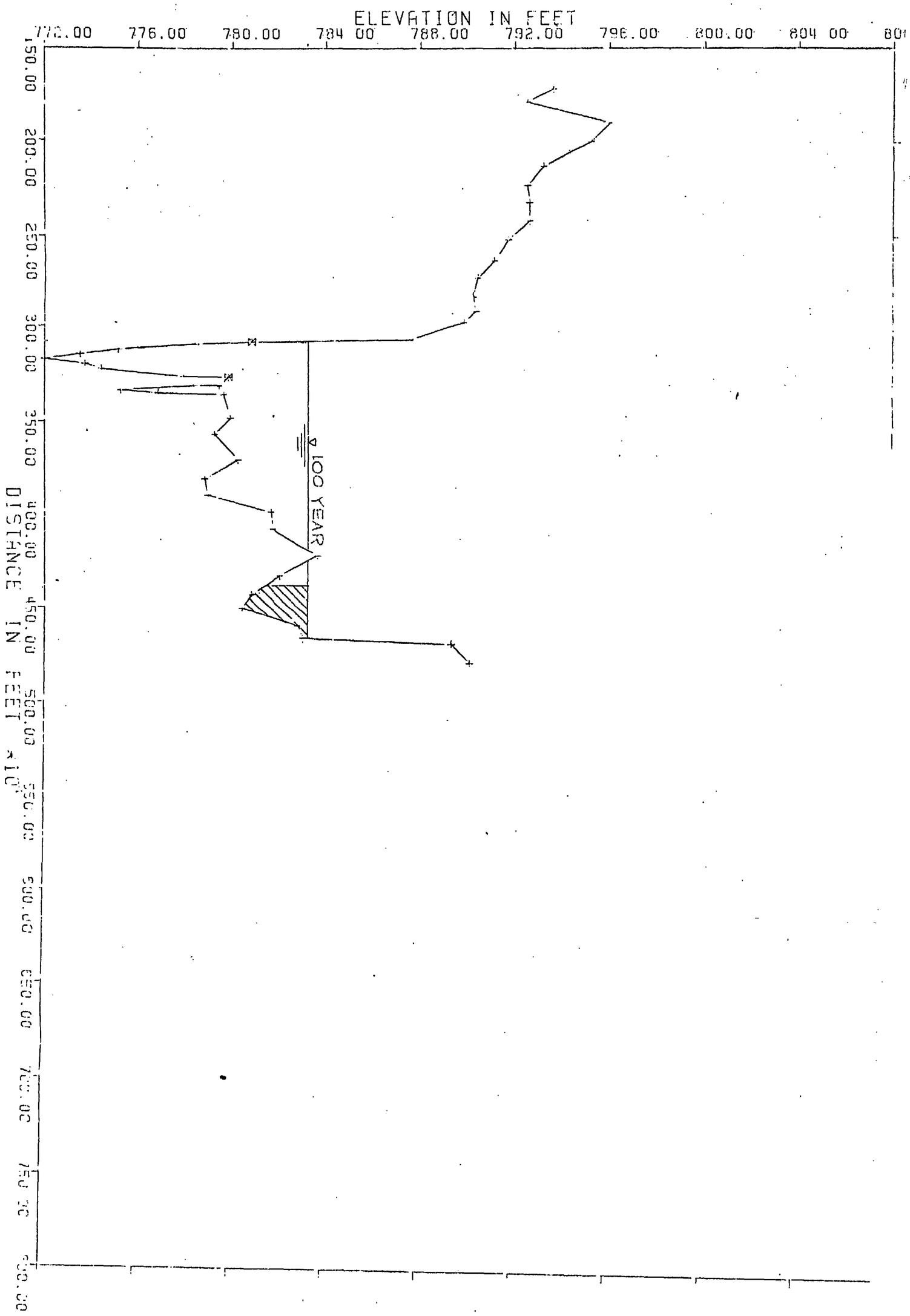
HUD 202407
Exhibit #11

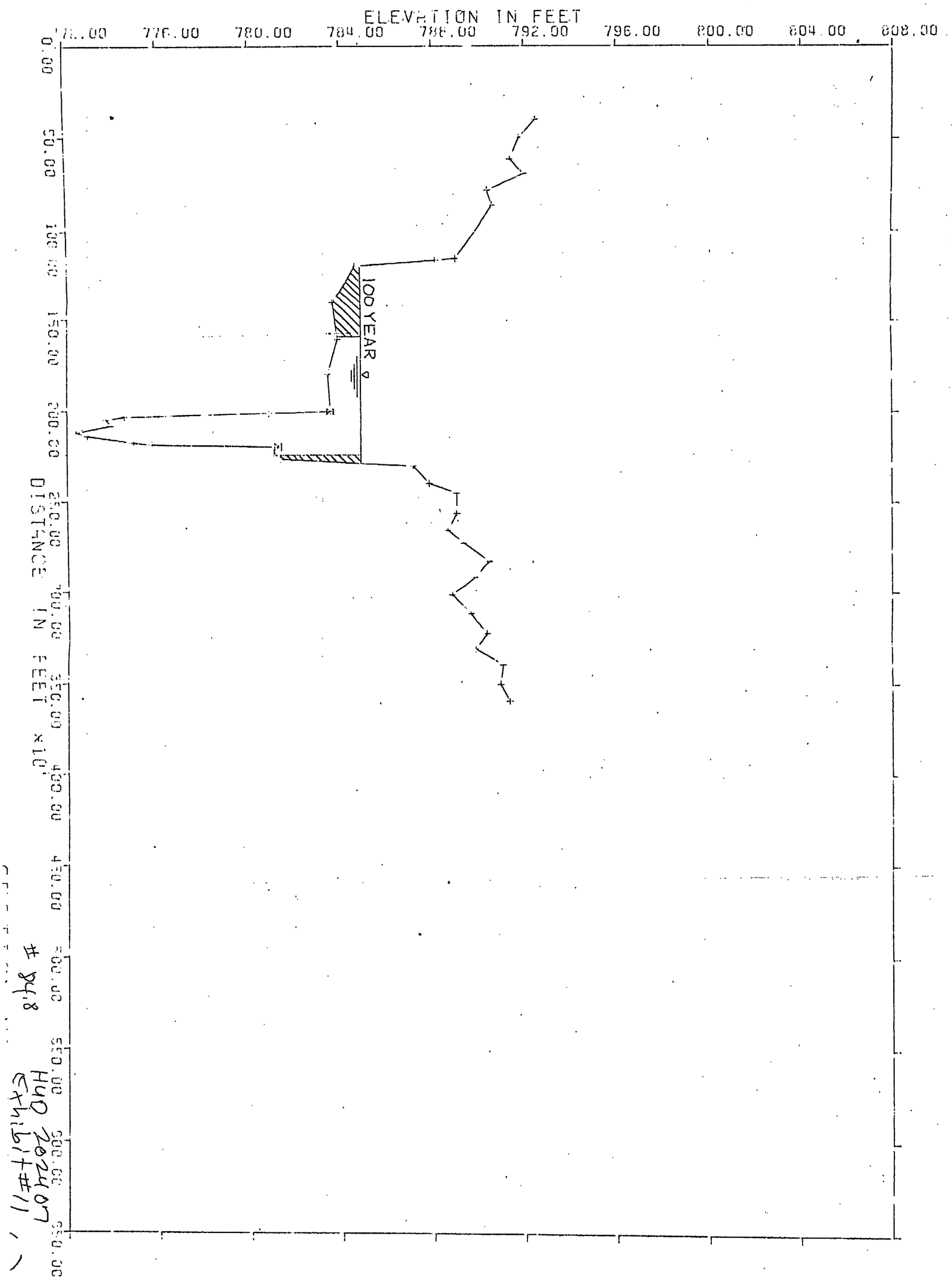


SECTION NO. 33 0000

HUD 2024 07
Exhibit #11

FLOOD INSURANCE STUDY

KAZOO RIV. GALESBURG-AUGUST



FLOOD INSURANCE STUDY

KALAMAZOO RIVER, GALESBURG-AUGUSTA

KALAMAZOO RIVER PROFILE

CITY OF KALAMAZOO

GULL STREET · E.E. BRIDGE · MICHIGAN AVENUE · MILL STREET · REACH 1 ZONE A4 · E.P. BRIDGE · CORPORATE LIMIT

ELEVATION IN FEET (N.G.V.D.)

762 · 758 · 754 · 750 · 746 · 742

G H · I · J K · L M · N O · P · Q R · S

7200 · 7600 · 8000 · 8400 · 8800 · 9200 · 9600 · 10000 · 10400 · 10800 · 11200 · 11600 · 12000 · 12400 · 12800 · 13200 · 13600 · 14000 · 14400

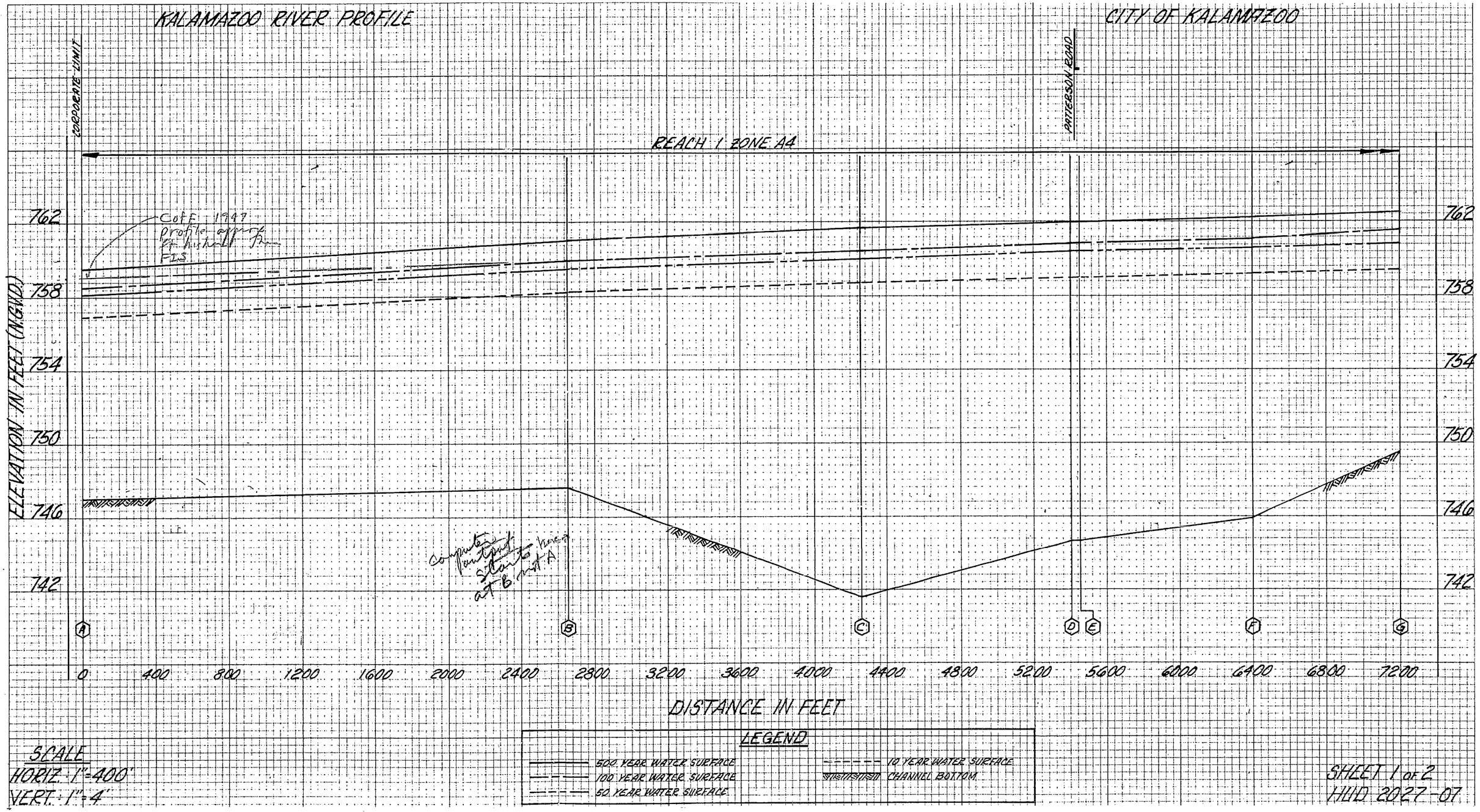
DISTANCE IN FEET

LEGEND

- 500 YEAR WATER SURFACE
- 100 YEAR WATER SURFACE
- 50 YEAR WATER SURFACE
- 10 YEAR WATER SURFACE
- CHANNEL BOTTOM

SCALE
HORIZ. 1"=400'
VERT. 1"=4'

SHEET 2 OF 2
HUD 2027-07


KALAMAZOO RIVER PROFILE
CITY OF KALAMAZOO
CORPORATE LIMIT
PATTERSON ROAD
REACH 1 ZONE A4
C of E 1947 profile approx. of hishell from FIS
computer output starts here at B not A
ELEVATION IN FEET (N.G.V.D.)
762
758
754
750
746
742
A
B
C
D
E
F
G
0
400
800
1200
1600
2000
2400
2800
3200
3600
4000
4400
4800
5200
5600
6000
6400
6800
7200
DISTANCE IN FEET
LEGEND
500 YEAR WATER SURFACE
100 YEAR WATER SURFACE
50 YEAR WATER SURFACE
10 YEAR WATER SURFACE
CHANNEL BOTTOM
SCALE
HORIZ. 1"=400'
VERT. 1"=4'
SHEET 1 OF 2
HUD 2027-07

KALAMAZOO RIVER PROFILE

COMSTOCK TOWNSHIP

35TH STREET

CORPORATE LIMIT

REACH 1 ZONE A-1

REACH 2 ZONE A-1

ELEVATION IN FEET (NGVD)

790
785
780
775
770
765

V W X Y

27000 27500 28000 28500 29000 29500 30000 30500 31000 31500 32000 32500 33000 33500 34000 34500 35000 35500 36000

DISTANCE IN FEET

NOTE: CONSUMERS POWER CO. INC. HAS RETAINED FLOWAGE RIGHTS TO ELEVATION 783.0. THEREFORE, HUMAN INTERVENTION AT THE MORROW LAKE DAM CAN CAUSE HIGHER FLOOD LEVELS THAN THOSE INDICATED ON THE PROFILES.

LEGEND

500 YEAR WATER SURFACE
100 YEAR WATER SURFACE
50 YEAR WATER SURFACE
10 YEAR WATER SURFACE
CHANNEL BOTTOM

SCALE
HORIZ. 1"=500'
VERT. 1"=5'

RECEIVED
MAR 12 1981
WATER MANAGEMENT

REVISED 2-4-81

SHEET 4 OF 4
HUD-2024-07

KALAMAZOO RIVER PROFILE

COMSTOCK TOWNSHIP

REACH 1 ZONE A1

ELEVATION IN FEET (NGVD)

785
780
775
770
765
760

NOTE: CONSUMERS POWER CO. INC. HAS RETAINED FLOWAGE RIGHTS TO ELEVATION 783.0'. THEREFORE, HUMAN INTERVENTION AT THE MORROW LAKE DAM CAN CAUSE HIGHER FLOOD LEVELS THAN THOSE INDICATED ON THE PROFILES.

R S T U

18000 18500 19000 19500 20000 20500 21000 21500 22000 22500 23000 23500 24000 24500 25000 25500 26000 26500 27000

DISTANCE IN FEET

LEGEND

- 500 YEAR WATER SURFACE
- 100 YEAR WATER SURFACE
- 50 YEAR WATER SURFACE
- 10 YEAR WATER SURFACE
- CHANNEL BOTTOM

SCALE

HORIZ. 1"=500'
VERT. 1"=5'

RECEIVED
MAR 1 2 1981
WATER MANAGEMENT

REVISED 2-4-81

SHEET 3 OF 4
HUD-2024-07

KALAMAZOO RIVER PROFILE

COMSTOCK TOWNSHIP

CONSUMERS POWER'S BRIDGE

MORROW DAM

REACH 1 ZONE A1

ELEVATION IN FEET (N.G.V.D.)

780
775
770
765
760
755

L M N O P Q

9000 9500 10000 10500 11000 11500 12000 12500 13000 13500 14000 14500 15000 15500 16000 16500 17000 17500 18000

DISTANCE IN FEET

NOTE: CONSUMERS POWER CO. INC. HAS RETAINED FLOWAGE RIGHTS TO ELEVATION 783.0. THEREFORE, HUMAN INTERVENTION AT THE MORROW LAKE DAM CAN CAUSE HIGHER FLOOD LEVELS THAN THOSE INDICATED ON THE PROFILES.

LEGEND

500 YEAR WATER SURFACE
100 YEAR WATER SURFACE
50 YEAR WATER SURFACE
10 YEAR WATER SURFACE
CHANNEL BOTTOM

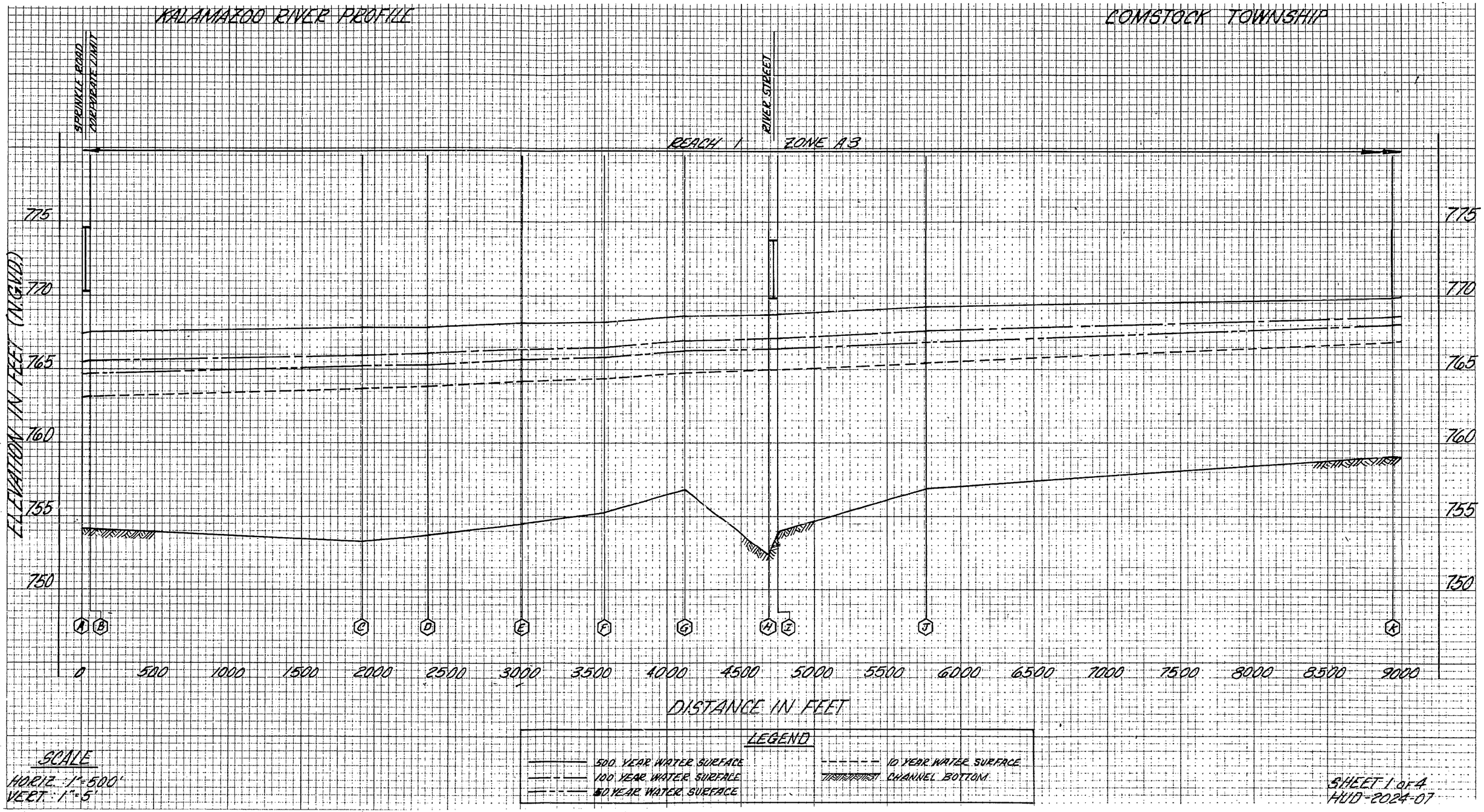
SCALE
HORIZ. 1"=500'
VERT. 1"=5'

RECEIVED
MAR 12 1981
WATER MANAGEMENT

REVISED

KALAMAZOO RIVER PROFILE

COMSTOCK TOWNSHIP



SCALE
HORIZ. 1"=500'
VERT. 1"=5'

00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: Cities of Kalamazoo and Portage

3) WATERCOURSE: PORTAGE CREEK

4) DOCUMENT TYPE: 100 yr RUN

00BREAK00

COMPUTE 12.0 14.6+ 12.0 530A

----------STARTING DATA FROM GIVEN ELEVATION----------

RATING TABLE FOR SECTION 12.0 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	809.30	0.0	0.0						
BANK FULL	809.3	0.0	0.0	0.00	0.00	0.00			
1	811.14	62.6	195.0	0.00	0.00	0.00	195.00	810.5	.00566
2	812.02	109.7	395.0	0.00	0.00	0.00	395.00	811.1	.00579
3	812.16	118.0	485.0	0.00	0.00	0.00	485.00	811.3	.00729
4	812.30	126.4	705.0	0.00	0.00	0.00	705.00	811.8	.01296

SEGMENT TABLE FOR SECTION 12.0

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	195.	6.	187.	2.
195.	VELOCITY FPS	3.66	.67	3.73	.54
2	DISCHARGE CFS	395.	21.	363.	11.
395.	VELOCITY FPS	4.71	.92	4.89	.88
3	DISCHARGE CFS	485.	27.	443.	15.
485.	VELOCITY FPS	5.45	1.06	5.67	1.03
4	DISCHARGE CFS	705.	41.	641.	23.
705.	VELOCITY FPS	7.47	1.46	7.82	1.42
1	ELEV 811.14 KD	2590.	80.	2491.	19.
2	ELEV 812.02 KD	5162.	266.	4780.	135.
3	ELEV 812.16 KD	5675.	311.	5197.	167.
4	ELEV 812.30 KD	6193.	360.	5628.	205.

195 395 485 705

0.12, 0.045, 0.1

RATING TABLE FOR SECTION 12.9+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSN	CRIT ELEV	FRICTION SLOPE
0	807.20	0.0	0.0						
BANK FULL	810.0	170.8	125.2	0.00	0.00	0.00			
1	811.56	442.1	195.0	0.00	0.00	0.00	195.00	808.8	.00007
2	812.62	671.2	395.0	0.00	0.00	0.00	395.00	809.3	.00009
3	812.91	736.2	485.0	0.00	0.00	0.00	485.00	809.4	.00011
4	813.55	878.5	705.0	0.00	0.00	0.00	705.00	809.7	.00013

SEGMENT TABLE FOR SECTION 12.9+

CSN		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	195.	0.	192.	3.
195.	VELOCITY FPS	.48	.06	.48	.07
2	DISCHARGE CFS	395.	1.	381.	14.
395.	VELOCITY FPS	.67	.10	.68	.13
3	DISCHARGE CFS	485.	1.	464.	20.
485.	VELOCITY FPS	.76	.11	.77	.16
4	DISCHARGE CFS	705.	2.	667.	36.
705.	VELOCITY FPS	.94	.15	.96	.21
1	ELEV 811.56 KO	23234.	9.	22919.	306.
2	ELEV 812.62 KO	41247.	52.	39760.	1435.
3	ELEV 812.91 KO	47134.	74.	45129.	1927.
4	ELEV 813.55 KO	60833.	135.	57582.	3115.

TABLE OF VALUES FOR BPR EQUATION

COEFK	AKB	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
1.7866	1.5816	.2627	.5805	0.0000	-.0577	.4323	1.0000	1.0000	184.3299	425.9460	421.7006
DCRIT	808.81	KBCRIT=									
1.8398	1.6317	.2727	.5678	0.0000	-.0645	.4207	1.0000	1.0000	252.9100	658.9856	650.1863
DCRIT	808.65	KBCRIT=									
1.8449	1.6345	.2753	.5671	0.0000	-.0649	.4200	1.0000	1.0000	272.0074	723.9459	714.9990
DCRIT	808.66	KBCRIT=									
1.8986	1.6569	.3097	.5615	0.0000	-.0679	.4149	1.0000	1.0000	283.9111	866.5093	857.5624
DCRIT	809.27	KBCRIT=									

ROAD SECTION 13.0

NO.	HW	CFS	HL	TW	CSM
0	807.30	0.00	0.00	0.00	0.00
1	811.57	195.00	0.00	811.57	195.00
2	812.64	395.00	.02	812.62	395.00
3	812.94	485.00	.02	812.92	485.00
4	813.57	705.00	.02	813.55	705.00

MIN ROAD ELEVATION 810.00

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 813.10 OPENING NO.= 1

812 16
812 3

RATING TABLE FOR SECTION 13.1+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	807.20	0.0	0.0						
BANK FULL	810.0	170.8	125.0	0.00	0.00	0.00			
1	811.57	443.7	195.0	0.00	0.00	0.00	195.00	808.8	.00007
2	812.65	677.7	395.0	0.00	0.00	0.00	395.00	809.3	.00009
3	812.94	743.1	485.0	0.00	0.00	0.00	485.00	809.4	.00010
4	813.58	886.0	705.0	0.00	0.00	0.00	705.00	809.7	.00013

SEGMENT TABLE FOR SECTION 13.1+

CSN		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	195.	0.	192.	3.
195.	VELOCITY FPS	.48	.06	.48	.07
2	DISCHARGE CFS	395.	1.	380.	15.
395.	VELOCITY FPS	.67	.10	.68	.13
3	DISCHARGE CFS	485.	1.	464.	20.
485.	VELOCITY FPS	.75	.11	.77	.16
4	DISCHARGE CFS	705.	2.	667.	37.
705.	VELOCITY FPS	.93	.15	.95	.21
1	ELEV 811.57 KO	23343.	9.	23023.	311.
2	ELEV 812.65 KO	41832.	54.	40294.	1484.
3	ELEV 812.94 KO	47746.	76.	45695.	1975.
4	ELEV 813.58 KO	61624.	139.	58293.	3191.

RATING TABLE FOR SECTION 13.2 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	807.20	0.0	0.0						
BANK FULL	810.0	170.8	124.4	0.00	0.00	0.00			
1	811.59	448.3	195.0	0.00	0.00	0.00	195.00	808.8	.00007
2	812.68	683.7	395.0	0.00	0.00	0.00	395.00	809.3	.00009
3	812.97	759.3	485.0	0.00	0.00	0.00	485.00	809.4	.00010
4	813.62	895.2	705.0	0.00	0.00	0.00	705.00	809.7	.00013

SEGMENT TABLE FOR SECTION 13.2

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	195.	0.	192.	3.
195.	VELOCITY FPS	.47	.66	.47	.07
2	DISCHARGE CFS	395.	1.	380.	15.
395.	VELOCITY FPS	.66	.10	.67	.13
3	DISCHARGE CFS	485.	1.	463.	21.
485.	VELOCITY FPS	.75	.11	.76	.15
4	DISCHARGE CFS	705.	2.	666.	37.
705.	VELOCITY FPS	.92	.14	.95	.21
1	ELEV 811.59 KD	23659.	10.	23326.	324.
2	ELEV 812.68 KD	42304.	56.	40797.	1532.
3	ELEV 812.97 KD	48386.	78.	46284.	2026.
4	ELEV 813.62 KD	62551.	144.	59131.	3276.

RATING TABLE FOR SECTION 13.9 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-CAM	CSM	CRIT ELEV	FRICTION SLOPE
0	807.50	0.0	0.0						
BANK FULL	810.7	137.9	146.5	0.00	0.00	0.00			
1	811.76	226.4	195.0	0.00	0.00	0.00	195.00	808.8	.00022
2	812.91	368.5	395.0	0.00	0.00	0.00	395.00	809.4	.00031
3	813.24	416.7	485.0	0.00	0.00	0.00	485.00	809.6	.00036
4	813.95	529.8	705.0	0.00	0.00	0.00	705.00	810.0	.00045

SEGMENT TABLE FOR SECTION 13.9

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	195.	2.	193.	0.
195.	VELOCITY FPS	.94	.10	.94	0.00
2	DISCHARGE CFS	395.	18.	377.	0.
395.	VELOCITY FPS	1.32	.20	1.35	0.00
3	DISCHARGE CFS	485.	28.	457.	0.
485.	VELOCITY FPS	1.48	.24	1.51	0.00
4	DISCHARGE CFS	705.	57.	648.	0.
705.	VELOCITY FPS	1.78	.32	1.85	.10
1	ELEV 811.76 KD	13076.	143.	12932.	1.
2	ELEV 812.91 KD	22295.	965.	21329.	1.
3	ELEV 813.24 KD	25534.	1401.	24131.	1.
4	ELEV 813.95 KD	33326.	2655.	30667.	3.

TABLE OF VALUES FOR BPR EQUATION

COEFK	AKB	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
.4811	.0760	.4000	.9907	0.0000	.0051	.9406	1.0000	1.0000	123.9947	173.5746	171.7491
DCRIT	810.31	KBCRIT=									
.5103	.1036	.4000	.9862	0.0000	.0067	.9229	1.0000	1.0000	192.1724	295.3453	289.9798
DCRIT	810.61	KBCRIT=									
.5381	.1301	.4000	.9815	0.0000	.0081	.9069	1.0000	1.0000	212.1976	340.2298	334.8643
DCRIT	810.82	KBCRIT=									
.5864	.1760	.4000	.9723	0.0000	.0104	.8801	1.0000	1.0000	254.6418	445.9064	436.3995
DCRIT	811.31	KBCRIT=									

ROAD SECTION 14.0

NO.	HW	CFS	HL	TW	CSM
0	808.10	0.00	0.00	0.00	0.00
1	811.77	195.00	0.00	811.77	195.00
2	812.94	395.00	.02	812.92	395.00
3	813.28	485.00	.02	813.26	485.00
4	814.00	705.00	.04	813.96	705.00

MIN ROAD ELEVATION 817.10

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 814.70 OPENING NO.= 1

RATING TABLE FOR SECTION 14.1+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	808.20	0.0	0.0						
BANK FULL	811.4	137.9	173.5	0.00	0.00	0.00			
1	811.80	164.8	195.0	0.00	0.00	0.00	195.00	809.5	.00048
2	812.97	283.4	395.0	0.00	0.00	0.00	395.00	810.1	.00055
3	813.30	327.9	485.0	0.00	0.00	0.00	485.00	810.3	.00061
4	814.04	432.1	705.0	0.00	0.00	0.00	705.00	810.7	.00071

SEGMENT TABLE FOR SECTION 14.1+

CSM		TOTAL	SEG NO 1	SEG NO 2	SEG NO 3
			N	C	N
1	DISCHARGE CFS	195.	0.	195.	0.
195.	VELOCITY FPS	1.20	.07	1.20	0.00
2	DISCHARGE CFS	395.	10.	385.	0.
395.	VELOCITY FPS	1.61	.21	1.62	0.00
3	DISCHARGE CFS	485.	18.	467.	0.
485.	VELOCITY FPS	1.78	.26	1.80	0.00
4	DISCHARGE CFS	705.	42.	663.	0.
705.	VELOCITY FPS	2.09	.34	2.15	0.00
1	ELEV 811.80 KO	8304.	10.	8893.	1.
2	ELEV 812.97 KO	16840.	396.	16442.	1.
3	ELEV 813.30 KO	19582.	640.	18941.	1.
4	ELEV 814.04 KO	26484.	1502.	24981.	1.

RATING TABLE FOR SECTION 14.6+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED			CSM	CRIT ELEV	FRICTION SLOPE
				DAMAGE	CHANNEL	NON-DAM			
0	808.99	0.0	0.0						
BANK FULL	811.1	76.2	138.5	0.00	0.00	0.00			
1	812.30	221.6	195.0	0.00	0.00	0.00	195.00	810.2	.00092
2	813.11	563.7	395.0	0.00	0.00	0.00	395.00	810.9	.00056
3	813.45	684.4	485.0	0.00	0.00	0.00	485.00	811.3	.00053
4	814.19	952.6	705.0	0.00	0.00	0.00	705.00	811.5	.00047

SEGMENT TABLE FOR SECTION 14.6+

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	195.	14.	171.	10.
195.	VELOCITY FPS	1.27	.30	1.34	.22
2	DISCHARGE CFS	395.	52.	270.	74.
395.	VELOCITY FPS	1.17	.41	1.39	.30
3	DISCHARGE CFS	485.	67.	307.	111.
485.	VELOCITY FPS	1.13	.44	1.43	.35
4	DISCHARGE CFS	705.	103.	396.	206.
705.	VELOCITY FPS	1.20	.50	1.53	.42
1	ELEV 812.00 KD	6380.	437.	5669.	274.
2	ELEV 813.11 KD	16762.	2186.	11448.	3128.
3	ELEV 813.45 KD	21071.	2885.	13498.	4687.
4	ELEV 814.19 KD	32487.	4730.	18453.	9304.

----------80/80 LIST OF INPUT DATA----------

```
CHANGE    DISCHARGE
DISCHARGE -1.       125.      260.      315.      455.                4
END
COMPUTE   14.7      23.2      14.6+                                   5308
```

----------END OF 80/80 LIST----------

COMPUTE 14.7 23.2 14.6* 530B

----------STARTING DATA FROM PREVIOUS COMPUTATIONS----------

RATING TABLE FOR SECTION 14.7 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED			CSM	CRIT ELEV	FRICTION SLOPE
				DAMAGE	CHANNEL	NON-DAM			
0	808.00	0.0	0.0						
BANK FULL	811.1	76.2	88.3	0.00	0.00	0.00			
1	812.01	225.6	125.0	0.00	0.00	0.00	125.00	809.9	.00037
2	813.12	568.2	260.0	0.00	0.00	0.00	260.00	810.4	.00024
3	813.46	668.9	315.0	0.00	0.00	0.00	315.00	810.6	.00022
4	814.20	957.5	455.0	0.00	0.00	0.00	455.00	811.3	.00019

SEGMENT TABLE FOR SECTION 14.7

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	125.	9.	109.	7.
125.	VELOCITY FPS	.81	.19	.85	.14
2	DISCHARGE CFS	260.	34.	177.	49.
260.	VELOCITY FPS	.76	.27	.91	.20
3	DISCHARGE CFS	315.	43.	199.	73.
315.	VELOCITY FPS	.76	.29	.92	.23
4	DISCHARGE CFS	455.	66.	255.	133.
455.	VELOCITY FPS	.77	.32	.98	.27
1	ELEV 812.01 KD	6472.	450.	5735.	286.
2	ELEV 813.12 KD	16903.	2209.	11518.	3175.
3	ELEV 813.46 KD	21249.	2914.	13578.	4756.
4	ELEV 814.20 KD	32716.	4767.	18548.	9402.

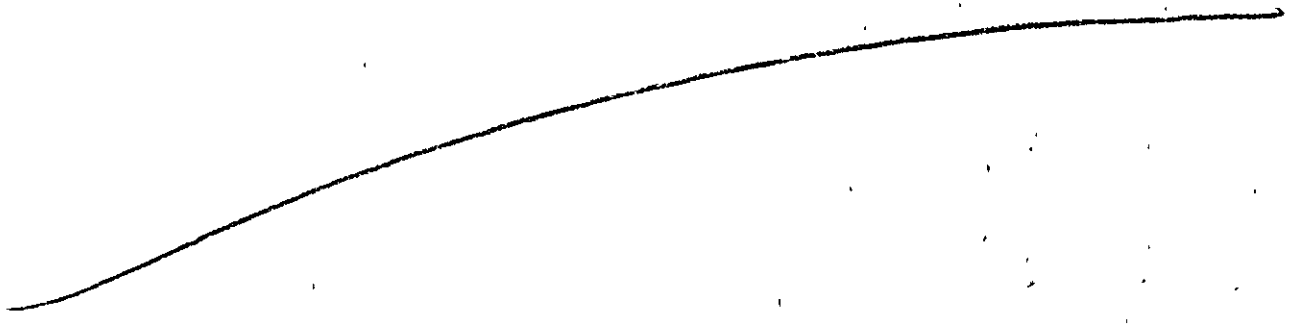


TABLE OF VALUES FOR BPR EQUATION

COEFK	AKB	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
.6615	.6615	0.0000	0.0000	0.0000	0.0000	.6589	1.0000	1.0000	62.6858	126.1850	201.6351
DCRIT	810.33	KBCRIT=									
.8831	.8831	0.0000	0.0000	0.0000	0.0000	.5883	1.0000	1.0000	84.5106	235.2212	536.4981
DCRIT	810.92	KBCRIT=									
1.0311	1.0311	0.0000	0.0000	0.0000	0.0000	.5474	1.0000	1.0000	90.3968	302.4417	655.6261
DCRIT	811.12	KBCRIT=									
1.3012	1.3012	0.0000	0.0000	0.0000	0.0000	.4757	1.0000	1.0000	98.9450	456.7363	922.7720
DCRIT	811.58	KBCRIT=									

ROAD SECTION 15.0

NO.	HW	CFS	HL	TW	CSM
0	809.00	0.00	0.00	0.00	0.00
1	812.05	125.00	.02	812.03	125.00
2	813.23	260.00	.10	813.13	260.00
3	813.63	315.00	.16	813.47	315.00
4	814.86	455.00	.66	814.20	455.00

MIN ROAD ELEVATION 818.20

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 810.40 OPENING NO.= 1

RATING TABLE FOR SECTION 15.2 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	808.90	0.0	0.0						
BANK FULL	810.0	25.5	43.6	0.00	0.00	0.00			
1	812.06	131.5	125.0	0.00	0.00	0.00	125.00	810.1	.00021
2	813.24	250.7	260.0	0.00	0.00	0.00	260.00	810.5	.00023
3	813.64	317.8	315.0	0.00	0.00	0.00	315.00	810.6	.00021
4	814.87	593.2	455.0	0.00	0.00	0.00	455.00	810.9	.00013

SEGMENT TABLE FOR SECTION 15.2

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	125.	0.	124.	1.
125.	VELOCITY FPS	.97	.09	.97	.33
2	DISCHARGE CFS	260.	12.	243.	6.
260.	VELOCITY FPS	1.26	.30	1.29	.24
3	DISCHARGE CFS	315.	22.	280.	13.
315.	VELOCITY FPS	1.27	.35	1.34	.28
4	DISCHARGE CFS	455.	66.	332.	57.
455.	VELOCITY FPS	1.08	.42	1.23	.34
1	ELEV 812.06 KO	8620.	2.	8546.	72.
2	ELEV 813.24 KO	17220.	682.	16224.	314.
3	ELEV 813.64 KO	21582.	1472.	19258.	853.
4	ELEV 814.87 KO	40444.	5735.	29906.	4802.

RATING TABLE FOR SECTION 15.4 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	809.40	0.0	0.0						
1	812.76	43.0	125.0	0.00	0.00	0.00	125.00	811.4	.01106
2	813.72	128.1	260.0	0.00	0.00	0.00	260.00	813.0	.00655
3	814.00	167.0	315.0	0.00	0.00	0.00	315.00	813.1	.00511
BANK FULL	814.2	195.2	343.8	0.00	0.00	0.00			
4	814.98	382.2	455.0	0.00	0.00	0.00	455.00	813.3	.00133

SEGMENT TABLE FOR SECTION 15.4

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	125.	9.	98.	18.
125.	VELOCITY FPS	3.58	1.33	3.90	1.61
2	DISCHARGE CFS	260.	68.	100.	92.
260.	VELOCITY FPS	2.42	1.75	3.09	1.62
3	DISCHARGE CFS	315.	92.	95.	128.
315.	VELOCITY FPS	2.14	1.73	2.76	1.61
4	DISCHARGE CFS	455.	141.	109.	205.
455.	VELOCITY FPS	1.20	1.25	1.23	1.13
1	ELEV 812.76 KD	1135.	27.	948.	172.
2	ELEV 813.72 KD	3174.	811.	1279.	1083.
3	ELEV 814.00 KD	4339.	1247.	1378.	1714.
4	ELEV 814.98 KD	12497.	3571.	2991.	5635.

RATING TABLE FOR SECTION 15.5 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED			CSM	CRIT ELEV	FRICTION SLOPE
				DAMAGE	CHANNEL	NON-DAM			
0	809.90	0.0	0.0						
1	813.04	171.5	125.0	0.00	0.00	0.00	125.00	810.9	.00028
2	813.93	237.5	260.0	0.00	0.00	0.00	260.00	811.3	.00045
3	814.20	258.2	315.0	0.00	0.00	0.00	315.00	811.4	.00051
4	815.12	331.7	455.0	0.00	0.00	0.00	455.00	811.6	.00049

SEGMENT TABLE FOR SECTION 15.5

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	125.	0.	125.	0.
125.	VELOCITY FPS	.73	0.00	.73	0.00
2	DISCHARGE CFS	260.	0.	260.	0.
260.	VELOCITY FPS	1.10	0.00	1.09	0.00
3	DISCHARGE CFS	315.	0.	315.	0.
315.	VELOCITY FPS	1.22	0.00	1.22	0.00
4	DISCHARGE CFS	455.	0.	455.	0.
455.	VELOCITY FPS	1.39	.08	1.38	0.00
1	ELEV 813.04 KD	7414.	1.	7412.	1.
2	ELEV 813.93 KD	12289.	1.	12287.	1.
3	ELEV 814.20 KD	14011.	1.	14009.	1.
4	ELEV 815.12 KD	20564.	5.	20558.	1.

RATING TABLE FOR SECTION 15.9+ OA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED			CSM	CRIT ELEV	FRICTION SLOPE
				DAMAGE	CHANNEL	NON-DAM			
0	810.60	0.0	0.0						
1	813.25	136.9	125.0	0.00	0.00	0.00	125.00	811.6	.00058
2	814.19	204.5	260.0	0.00	0.00	0.00	260.00	812.0	.00071
3	814.48	226.3	315.0	0.00	0.00	0.00	315.00	812.1	.00076
4	815.37	294.0	455.0	0.00	0.00	0.00	455.00	812.3	.00070

SEGMENT TABLE FOR SECTION 15.9+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	125.	0.	125.	0.
125.	VELOCITY FPS	.92	0.00	.91	0.00
2	DISCHARGE CFS	260.	0.	260.	0.
260.	VELOCITY FPS	1.27	0.00	1.27	0.00
3	DISCHARGE CFS	315.	0.	315.	0.
315.	VELOCITY FPS	1.40	0.00	1.39	0.00
4	DISCHARGE CFS	455.	0.	455.	0.
455.	VELOCITY FPS	1.55	0.00	1.55	0.00
1	ELEV 813.25 KD	5206.	1.	5204.	1.
2	ELEV 814.19 KD	9739.	1.	9737.	1.
3	ELEV 814.48 KD	11392.	1.	11390.	1.
4	ELEV 815.37 KD	17223.	1.	17221.	1.

TABLE OF VALUES FOR BPR EQUATION

COEFK	AKB	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
2.0905	1.9298	.1607	.5154	0.0000	0.0000	.3271	1.0000	1.0000	83.4541	222.8529	138.9404
DCRIT	811.60	KBCRIT=									
2.2479	2.1036	.1444	.4701	0.0000	0.0000	.2891	1.0000	1.0000	115.6704	378.9198	207.1261
DCRIT	811.98	KBCRIT=									
2.2696	2.1276	.1420	.4638	0.0000	0.0000	.2639	1.0000	1.0000	125.6307	443.9820	229.2157
DCRIT	812.08	KBCRIT=									
2.3496	2.2155	.1340	.4410	0.0000	0.0000	.2652	1.0000	1.0000	155.7042	652.8976	296.6823
DCRIT	812.32	KBCRIT=									

ROAD SECTION 16.0

NO.	HW	CFS	HL	TW	CSM.
0	810.60	0.00	0.00	0.00	0.00
1	813.34	125.00	.06	813.28	125.00
2	814.35	260.00	.12	814.23	260.00
3	814.68	315.00	.16	814.52	315.00
4	815.58	455.00	.18	815.40	455.00

MIN ROAD ELEVATION 812.50

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 813.00 OPENING NO.= 1

RATING TABLE FOR SECTION 16.1* DA= 1.0

	NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
	0	811.10	0.0	0.0						
	1	813.35	166.9	125.0	0.00	0.00	0.00	125.00	811.9	.00027
BANK FULL		813.8	216.1	185.5	0.00	0.00	0.00			
	2	814.35	290.7	260.0	0.00	0.00	0.00	260.00	812.2	.00023
	3	814.69	344.0	315.0	0.00	0.00	0.00	315.00	812.3	.00022
	4	815.59	523.5	455.0	0.00	0.00	0.00	455.00	812.5	.00016

SEGMENT TABLE FOR SECTION 16.1*

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	125.	0.	125.	0.
125.	VELOCITY FPS	.75	0.00	.75	0.00
2	DISCHARGE CFS	260.	3.	256.	1.
260.	VELOCITY FPS	.94	.22	.94	.19
3	DISCHARGE CFS	315.	7.	307.	1.
315.	VELOCITY FPS	.98	.24	.99	.20
4	DISCHARGE CFS	455.	33.	414.	8.
455.	VELOCITY FPS	.99	.34	1.02	.30
1	ELEV 813.35 KO	7558.	1.	7556.	1.
2	ELEV 814.35 KO	16869.	94.	16765.	10.
3	ELEV 814.69 KO	21127.	456.	20599.	71.
4	ELEV 815.59 KO	35383.	2429.	32401.	552.

RATING TABLE FOR SECTION 16.6 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	812.40	0.0	0.0						
1	814.00	101.9	125.0	0.00	0.00	0.00	125.00	813.2	.00127
2	814.76	177.9	260.0	0.00	0.00	0.00	260.00	813.5	.00096
3	815.02	206.3	315.0	0.00	0.00	0.00	315.00	813.6	.00089
BANK FULL	815.1	216.1	329.0	0.00	0.00	0.00			
4	815.83	319.8	455.0	0.00	0.00	0.00	455.00	813.8	.00056

SEGMENT TABLE FOR SECTION 16.6

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	125.	0.	125.	0.
125.	VELOCITY FPS	1.23	0.00	1.23	0.00
2	DISCHARGE CFS	260.	0.	260.	0.
260.	VELOCITY FPS	1.46	0.00	1.46	0.00
3	DISCHARGE CFS	315.	0.	315.	0.
315.	VELOCITY FPS	1.54	.22	1.53	0.00
4	DISCHARGE CFS	455.	6.	445.	1.
455.	VELOCITY FPS	1.51	.37	1.52	.31
1	ELEV 814.00 KD	3503.	1.	3501.	1.
2	ELEV 814.76 KD	8384.	1.	8382.	1.
3	ELEV 815.02 KD	10527.	4.	10523.	1.
4	ELEV 815.83 KD	19057.	227.	18801.	30.

RATING TABLE FOR SECTION 16.9+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED			CSM	CRIT ELEV	FRICTION SLOPE
				DAMAGE	CHANNEL	NON-DAM			
0	812.40	0.0	0.0						
1	814.18	119.1	125.0	0.00	0.00	0.00	125.00	813.2	.00080
2	814.92	195.6	260.0	0.00	0.00	0.00	260.00	813.5	.00072
BANK FULL	815.1	216.1	299.4	0.00	0.00	0.00			
3	815.17	224.3	315.0	0.00	0.00	0.00	315.00	813.6	.00070
4	815.94	336.6	455.0	0.00	0.00	0.00	455.00	813.8	.00049

SEGMENT TABLE FOR SECTION 16.9+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	125.	0.	125.	0.
125.	VELOCITY FPS	1.06	0.00	1.05	0.00
2	DISCHARGE CFS	260.	0.	260.	0.
260.	VELOCITY FPS	1.34	.22	1.33	0.00
3	DISCHARGE CFS	315.	0.	315.	0.
315.	VELOCITY FPS	1.43	.19	1.42	0.00
4	DISCHARGE CFS	455.	10.	444.	2.
455.	VELOCITY FPS	1.45	.35	1.46	.30
1	ELEV 814.18 KD	4432.	1.	4430.	1.
2	ELEV 814.92 KD	9672.	2.	9669.	1.
3	ELEV 815.17 KD	11913.	8.	11904.	2.
4	ELEV 815.94 KD	20464.	370.	20040.	55.

TABLE OF VALUES FOR BPR EQUATION

COEFK	AKB	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
1.2232	1.2232	0.0000	0.0000	0.0000	0.0000	.4957	1.0000	1.0000	32.8230	85.9448	105.3945
DCRIT	813.70	KBCRIT=									
1.4710	1.4710	0.0000	0.0000	0.0000	0.0000	.4334	1.0000	1.0000	48.0322	176.9069	178.4521
DCRIT	814.35	KBCRIT=									
1.5760	1.5760	0.0000	0.0000	0.0000	0.0000	.4081	1.0000	1.0000	56.2250	220.7497	206.4009
DCRIT	814.56	KBCRIT=									
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	.4094	1.0000	1.0000	56.2250	217.4431	308.6394
DCRIT	815.12	KBCRIT=									

MAIN BRANCH PORTAGE CREEK, MICHIGAN
PRELIMINARY FINAL RUN

ROAD SECTION 17.0

NO.	HW	CFS	HL	TW	CSM
0	812.60	0.00	0.00	0.00	0.00
1	814.48	125.00	.24	814.24	125.00
2	815.60	260.00	.64	814.96	260.00
3	815.99	315.00	.78	815.21	315.00
4	816.73	455.00	.76	815.97	455.00

MIN ROAD ELEVATION 815.70

BRIDGE TYPE 2 GIRDER BOTTON ELEVATION = 815.40 OPENING NO.= 1

RATING TABLE FOR SECTION 17.1+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	812.70	0.0	0.0						
BANK FULL	814.2	63.7	99.9	0.00	0.00	0.00			
1	814.58	84.7	125.0	0.00	0.00	0.00	125.00	813.5	.00168
2	815.66	170.7	260.0	0.00	0.00	0.00	260.00	813.9	.00116
3	816.04	214.8	315.0	0.00	0.00	0.00	315.00	814.0	.00101
4	816.77	312.1	455.0	0.00	0.00	0.00	455.00	814.3	.00088

SEGMENT TABLE FOR SECTION 17.1+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	125.	1.	124.	0.
125.	VELOCITY FPS	1.50	.33	1.50	0.00
2	DISCHARGE CFS	260.	12.	244.	4.
260.	VELOCITY FPS	1.71	.55	1.75	.39
3	DISCHARGE CFS	315.	22.	284.	9.
315.	VELOCITY FPS	1.71	.61	1.78	.46
4	DISCHARGE CFS	455.	51.	377.	28.
455.	VELOCITY FPS	1.78	.74	1.92	.59
1	ELEV 814.58 KO	3046.	11.	3035.	1.
2	ELEV 815.66 KO	7611.	354.	7163.	94.
3	ELEV 816.04 KO	9850.	653.	8946.	252.
4	ELEV 816.77 KO	15310.	1666.	12754.	891.

RATING TABLE FOR SECTION 17.4 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	813.80	0.0	0.0						
BANK FULL	815.3	63.7	97.4	0.00	0.00	0.00			
1	815.73	87.5	125.0	0.00	0.00	0.00	125.00	814.6	.00152
2	816.55	151.5	260.0	0.00	0.00	0.00	260.00	815.0	.00158
3	816.92	188.9	315.0	0.00	0.00	0.00	315.00	815.1	.00136
4	817.54	265.9	455.0	0.00	0.00	0.00	455.00	815.4	.00128

SEGMENT TABLE FOR SECTION 17.4

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	125.	1.	124.	0.
125.	VELOCITY FPS	1.46	.31	1.46	0.00
2	DISCHARGE CFS	260.	10.	247.	3.
260.	VELOCITY FPS	1.90	.60	1.93	.44
3	DISCHARGE CFS	315.	18.	290.	7.
315.	VELOCITY FPS	1.91	.65	1.97	.50
4	DISCHARGE CFS	455.	42.	392.	21.
455.	VELOCITY FPS	2.05	.79	2.18	.64
1	ELEV 815.73 KO	3202.	14.	3188.	1.
2	ELEV 816.55 KO	6505.	225.	6243.	36.
3	ELEV 816.92 KO	8520.	467.	7902.	152.
4	ELEV 817.54 KO	12674.	1131.	10992.	551.

RATING TABLE FOR SECTION 17.9+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	816.20	0.0	0.0						
BANK FULL	817.7	63.7	117.6	0.00	0.00	0.00			
1	817.79	68.5	125.0	0.00	0.00	0.00	125.00	817.0	.00314
2	818.45	108.8	260.0	0.00	0.00	0.00	260.00	817.4	.00359
3	818.73	131.3	315.0	0.00	0.00	0.00	315.00	817.5	.00327
4	819.18	172.3	455.0	0.00	0.00	0.00	455.00	817.8	.00347

SEGMENT TABLE FOR SECTION 17.9+

	CSM	TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	125.	0.	125.	0.
125.	VELOCITY FPS	1.83	0.00	1.83	0.00
2	DISCHARGE CFS	260.	4.	256.	0.
260.	VELOCITY FPS	2.50	.66	2.51	.37
3	DISCHARGE CFS	315.	9.	304.	2.
315.	VELOCITY FPS	2.58	.77	2.61	.56
4	DISCHARGE CFS	455.	22.	427.	6.
455.	VELOCITY FPS	2.96	.96	3.05	.68
1	ELEV 817.79 KD	2232.	2.	2229.	1.
2	ELEV 818.45 KD	4327.	55.	4269.	3.
3	ELEV 818.73 KD	5484.	135.	5337.	12.
4	ELEV 819.18 KD	7712.	367.	7243.	102.

TABLE OF VALUES FOR BPR EQUATION

COEFK	AKB	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
.6768	.6627	0.0000	0.0000	0.0000	.0160	.6585	1.0000	1.0000	42.5579	82.6554	76.0999
DCRIT	817.30	KBCRIT=									
.8355	.8212	0.0000	0.0000	0.0000	.0143	.6083	1.0000	1.0000	62.8262	139.9543	120.0779
DCRIT	817.82	KBCRIT=									
.8560	.8439	0.0000	0.0000	0.0000	.0141	.6015	1.0000	1.0000	70.9669	162.7121	144.9723
DCRIT	818.00	KBCRIT=									
.9908	.9851	0.0000	0.0000	0.0000	.0057	.5603	1.0000	1.0000	84.7997	218.2801	191.0673
DCRIT	818.43	KBCRIT=									

ROAD SECTION 18.0

NO.	HW	CFS	HL	TW	CSM
0	816.20	0.00	0.00	0.00	0.00
1	818.03	125.00	.10	817.93	125.00
2	818.67	260.00	.26	816.61	260.00
3	819.18	315.00	.30	818.88	315.00
4	819.86	455.00	.52	819.34	455.00

MIN ROAD ELEVATION 819.80

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 819.40 OPENING NO.= 1

RATING TABLE FOR SECTION 18.1+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	816.10	0.0	0.0						
1	818.16	96.2	125.0	0.00	0.00	0.00	125.00	817.0	.00227
2	819.00	155.7	260.0	0.00	0.00	0.00	260.00	817.4	.00238
3	819.31	179.5	315.0	0.00	0.00	0.00	315.00	817.5	.00229
BANK FULL	819.5	194.6	354.7	0.00	0.00	0.00			
4	819.98	237.0	455.0	0.00	0.00	0.00	455.00	817.8	.00210

SEGMENT TABLE FOR SECTION 18.1+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	125.	0.	125.	0.
125.	VELOCITY FPS	1.30	0.00	1.30	0.00
2	DISCHARGE CFS	260.	0.	260.	0.
260.	VELOCITY FPS	1.67	0.00	1.67	0.00
3	DISCHARGE CFS	315.	0.	315.	0.
315.	VELOCITY FPS	1.76	0.00	1.76	0.00
4	DISCHARGE CFS	455.	0.	454.	1.
455.	VELOCITY FPS	1.95	.23	1.95	.30
1	ELEV 818.16 KO	2621.	1.	2619.	1.
2	ELEV 819.00 KO	5330.	1.	5328.	1.
3	ELEV 819.31 KO	6576.	1.	6574.	1.
4	ELEV 819.98 KO	9925.	4.	9913.	7.

RATING TABLE FOR SECTION 18.5 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	815.80	0.0	0.0						
1	818.35	129.9	125.0	0.00	0.00	0.00	125.00	816.7	.00094
BANK FULL	819.2	194.6	254.0	0.00	0.00	0.00			
2	819.24	197.8	260.0	0.00	0.00	0.00	260.00	817.1	.00117
3	819.55	224.6	315.0	0.00	0.00	0.00	315.00	817.2	.00118
4	820.22	292.2	455.0	0.00	0.00	0.00	455.00	817.5	.00117

SEGMENT TABLE FOR SECTION 18.5

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	125.	0.	125.	0.
125.	VELOCITY FPS	.97	0.00	.96	0.00
2	DISCHARGE CFS	260.	0.	260.	0.
260.	VELOCITY FPS	1.32	0.00	1.32	0.00
3	DISCHARGE CFS	315.	0.	315.	0.
315.	VELOCITY FPS	1.42	.19	1.41	.23
4	DISCHARGE CFS	455.	2.	451.	2.
455.	VELOCITY FPS	1.63	.21	1.63	.28
1	ELEV 818.35 KD	4079.	1.	4077.	1.
2	ELEV 819.24 KD	7607.	1.	7605.	2.
3	ELEV 819.55 KD	9176.	2.	9172.	4.
4	ELEV 820.22 KD	13280.	38.	13197.	45.

RATING TABLE FOR SECTION 18.9+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED			CSM	CRIT ELEV	FRICTION SLOPE
				DAMAGE	CHANNEL	NON-DAM			
0	816.10	0.0	0.0						
1	818.59	125.5	125.0	0.00	0.00	0.00	125.00	817.0	.00104
BANK FULL	819.5	194.6	257.0	0.00	0.00	0.00			
2	819.52	196.3	260.0	0.00	0.00	0.00	260.00	817.4	.00120
3	819.83	223.1	315.0	0.00	0.00	0.00	315.00	817.5	.00120
4	820.50	289.9	455.0	0.00	0.00	0.00	455.00	817.8	.00119

SEGMENT TABLE FOR SECTION 18.9+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	125.	0.	125.	0.
125.	VELOCITY FPS	1.00	0.00	1.00	0.00
2	DISCHARGE CFS	260.	0.	260.	0.
260.	VELOCITY FPS	1.33	0.00	1.33	0.00
3	DISCHARGE CFS	315.	0.	315.	0.
315.	VELOCITY FPS	1.43	.19	1.42	.23
4	DISCHARGE CFS	455.	2.	451.	2.
455.	VELOCITY FPS	1.64	.21	1.64	.28
1	ELEV 818.59 KO	3885.	1.	3883.	1.
2	ELEV 819.52 KO	7521.	1.	7518.	2.
3	ELEV 819.83 KO	9040.	2.	9034.	4.
4	ELEV 820.50 KO	13152.	36.	13074.	43.

TABLE OF VALUES FOR BPR EQUATION

COEFK	AKB	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
.9690	.9690	0.0000	0.0000	0.0000	0.0000	.5649	1.0000	1.0000	46.4659	83.4177	122.5860
DCRIT	817.44	KBCRIT=									
1.0727	1.0727	0.0000	0.0000	0.0000	0.0000	.5359	1.0000	1.0000	66.0504	137.7043	193.5253
DCRIT	818.10	KBCRIT=									
1.1103	1.1103	0.0000	0.0000	0.0000	0.0000	.5257	1.0000	1.0000	72.5711	157.7853	213.9044
DCRIT	818.33	KBCRIT=									
1.1618	1.1618	0.0000	0.0000	0.0000	0.0000	.5119	1.0000	1.0000	86.4282	205.0559	285.6846
DCRIT	818.87	KBCRIT=									

ROAD SECTION 19.0

NO.	HW	CFS	HL	TW	CSM
0	816.20	0.00	0.00	0.00	0.00
1	818.73	125.00	.08	818.65	125.00
2	819.81	260.00	.22	819.59	260.00
3	820.18	315.00	.28	819.90	315.00
4	821.02	455.00	.46	820.56	455.00

MIN ROAD ELEVATION 823.10

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 822.60 OPENING NO.= 1

RATING TABLE FOR SECTION 19.2 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED			CSM	CRIT ELEV	FRICTION SLOPE
				DAMAGE	CHANNEL	NON-DAM			
0	815.40	0.0	0.0						
1	816.78	125.0	125.0	0.00	0.00	0.00	125.00	816.7	.00044
2	819.87	184.1	260.0	0.00	0.00	0.00	260.00	817.1	.00059
3	820.25	205.5	315.0	0.00	0.00	0.00	315.00	817.3	.00062
4	821.10	256.6	455.0	0.00	0.00	0.00	455.00	817.6	.00067

SEGMENT TABLE FOR SECTION 19.2

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	125.	0.	125.	0.
125.	VELOCITY FPS	1.00	0.00	1.00	0.00
2	DISCHARGE CFS	260.	0.	260.	0.
260.	VELOCITY FPS	1.41	0.00	1.41	0.00
3	DISCHARGE CFS	315.	0.	315.	0.
315.	VELOCITY FPS	1.53	0.00	1.53	0.00
4	DISCHARGE CFS	455.	0.	455.	0.
455.	VELOCITY FPS	1.76	0.00	1.77	0.00
1	ELEV 816.78 KO	5983.	1.	5987.	1.
2	ELEV 819.87 KO	10746.	1.	10744.	1.
3	ELEV 820.25 KO	12666.	1.	12664.	1.
4	ELEV 821.10 KO	17550.	1.	17547.	1.

RATING TABLE FOR SECTION 19.9+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	816.00	0.0	0.0						
BANK FULL	818.3	68.1	101.1	0.00	0.00	0.00			
1	818.84	101.1	125.0	0.00	0.00	0.00	125.00	817.1	.00076
2	819.93	160.0	260.0	0.00	0.00	0.00	260.00	817.6	.00070
3	820.30	208.9	315.0	0.00	0.00	0.00	315.00	817.8	.00068
4	821.15	279.7	455.0	0.00	0.00	0.00	455.00	818.3	.00064

SEGMENT TABLE FOR SECTION 19.9+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	125.	0.	122.	3.
125.	VELOCITY FPS	1.33	.28	1.34	.33
2	DISCHARGE CFS	260.	2.	234.	24.
260.	VELOCITY FPS	1.63	.46	1.69	.65
3	DISCHARGE CFS	315.	4.	277.	35.
315.	VELOCITY FPS	1.71	.51	1.30	.73
4	DISCHARGE CFS	455.	8.	382.	65.
455.	VELOCITY FPS	1.88	.47	2.01	.89
1	ELEV 818.84 KD	4479.	6.	4419.	54.
2	ELEV 819.93 KD	9789.	78.	8836.	876.
3	ELEV 820.30 KD	12068.	138.	10631.	1319.
4	ELEV 821.15 KD	17978.	311.	15142.	2525.

TABLE OF VALUES FOR BPR EQUATION

COEFK	AKB	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
.5953	.2408	.3545	.9612	0.0000	0.0000	.8483	1.0000	1.0000	73.5075	106.1507	103.5551
DCRIT	817.40	KHCRIT=									
1.1135	.7920	.3215	.8329	0.0000	0.0000	.6412	1.0000	1.0000	109.1431	191.8343	182.7005
DCRIT	817.96	KBCRIT=									
1.2846	.9525	.3322	.7929	0.0000	0.0000	.5935	1.0000	1.0000	113.6352	224.2768	211.5636
DCRIT	818.15	KBCRIT=									
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000	100.9300	224.2768	211.5636
DCRIT	-1.00	KBCRIT=									

ROAD SECTION 20.0

NO.	HW	CFS	HL	TW	CSM
0	816.00	0.00	0.00	0.00	0.00
1	818.90	125.00	.02	818.88	125.00
2	820.06	260.00	.10	819.96	260.00
3	820.48	315.00	.14	820.34	315.00
4	821.82	455.00	.64	821.18	455.00

MIN ROAD ELEVATION 822.30

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 820.10 OPENING NO.= 1

RATING TABLE FOR SECTION 20.1+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	816.00	0.0	0.0						
BANK FULL	818.3	68.1	98.0	0.00	0.00	0.00			
1	818.93	107.1	125.0	0.00	0.00	0.00	125.00	817.1	.00065
2	820.09	192.6	260.0	0.00	0.00	0.00	260.00	817.6	.00058
3	820.51	224.9	315.0	0.00	0.00	0.00	315.00	817.8	.00055
4	821.84	349.8	455.0	0.00	0.00	0.00	455.00	818.3	.00037

SEGMENT TABLE FOR SECTION 20.1+

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	125.	0.	121.	4.
125.	VELOCITY FPS	1.26	.25	1.28	.31
2	DISCHARGE CFS	260.	3.	231.	26.
260.	VELOCITY FPS	1.52	.44	1.60	.63
3	DISCHARGE CFS	315.	4.	273.	38.
315.	VELOCITY FPS	1.59	.49	1.68	.70
4	DISCHARGE CFS	455.	12.	372.	71.
455.	VELOCITY FPS	1.56	.35	1.69	.75
1	ELEV 818.93 KD	4864.	7.	4755.	101.
2	ELEV 820.09 KD	10796.	102.	9613.	1065.
3	ELEV 820.51 KD	13397.	177.	11648.	1572.
4	ELEV 821.84 KD	23516.	572.	19292.	3654.

RATING TABLE FOR SECTION 20.5 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	816.40	0.0	0.0						
BANK FULL	818.7	68.1	109.4	0.00	0.00	0.00			
1	819.03	87.3	125.0	0.00	0.00	0.00	125.00	817.5	.00111
2	820.16	167.5	260.0	0.00	0.00	0.00	260.00	818.0	.00086
3	820.57	198.2	315.0	0.00	0.00	0.00	315.00	818.2	.00078
4	821.88	309.0	455.0	0.00	0.00	0.00	455.00	818.7	.00049

SEGMENT TABLE FOR SECTION 20.5

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	125.	0.	123.	2.
125.	VELOCITY FPS	1.51	0.00	1.50	.40
2	DISCHARGE CFS	260.	2.	236.	22.
260.	VELOCITY FPS	1.74	.48	1.81	.66
3	DISCHARGE CFS	315.	3.	279.	33.
315.	VELOCITY FPS	1.79	.52	1.88	.74
4	DISCHARGE CFS	455.	8.	378.	69.
455.	VELOCITY FPS	1.72	.38	1.85	.84
1	ELEV 819.03 KD	3713.	4.	3698.	12.
2	ELEV 820.16 KD	8867.	59.	8093.	715.
3	ELEV 820.57 KD	11247.	115.	9973.	1159.
4	ELEV 821.88 KD	20533.	377.	17064.	3092.

RATING TABLE FOR SECTION 20.9+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	818.10	0.0	0.0						
1	820.29	63.6	125.0	0.00	0.00	0.00	125.00	819.2	.00252
BANK FULL	820.4	68.1	139.7	0.00	0.00	0.00			
2	821.26	122.8	260.0	0.00	0.00	0.00	260.00	819.7	.00193
3	821.47	138.2	315.0	0.00	0.00	0.00	315.00	819.9	.00205
4	822.46	213.3	455.0	0.00	0.00	0.00	455.00	820.4	.00126

SEGMENT TABLE FOR SECTION 20.9+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	125.	0.	125.	0.
125.	VELOCITY FPS	1.97	0.00	1.97	0.00
2	DISCHARGE CFS	260.	1.	244.	15.
260.	VELOCITY FPS	2.29	.70	2.33	.91
3	DISCHARGE CFS	315.	2.	289.	25.
315.	VELOCITY FPS	2.47	.81	2.54	1.10
4	DISCHARGE CFS	455.	7.	383.	65.
455.	VELOCITY FPS	2.31	.93	2.45	1.32
1	FLEV 820.29 KD	2488.	2.	2485.	2.
2	ELEV 821.26 KD	5894.	18.	5580.	296.
3	FLEV 821.47 KD	6917.	32.	6412.	474.
4	ELEV 822.46 KD	12923.	195.	10905.	1828.

TABLE OF VALUES FOR BPR EQUATION

COEFK	AKD	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
.3278	0.0000	.3278	.9990	0.0000	0.0000	.9999	1.0000	1.0000	70.4860	78.3706	68.5304
DCRIT	819.28	KBCRIT=									
.4537	.1252	.3284	.9829	0.0000	0.0000	.9098	1.0000	1.0000	107.6626	123.6206	129.8158
DCRIT	819.79	KBCRIT=									
.5108	.1759	.3350	.9739	0.0000	0.0000	.8813	1.0000	1.0000	113.4100	135.6163	145.4611
DCRIT	819.95	KBCRIT=									
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000	102.3200	135.6163	145.4611
DCRIT	-1.00	KBCRIT=									

ROAD SECTION 21.0

NO.	HW	CFS	HL	TW	CSM
0	818.10	0.00	0.00	0.00	0.00
1	820.43	125.00	.02	820.41	125.00
2	821.39	260.00	.04	821.35	260.00
3	821.63	315.00	.06	821.57	315.00
4	823.14	455.00	.62	822.52	455.00

MIN ROAD ELEVATION 823.90

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 821.50 OPENING NO.= 1

RATING TABLE FOR SECTION 21.1+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	818.00	0.0	0.0						
BANK FULL	819.7	52.0	85.4	0.00	0.00	0.00			
1	820.44	84.5	125.0	0.00	0.00	0.00	125.00	819.0	.00100
2	821.46	131.3	260.0	0.00	0.00	0.00	260.00	819.4	.00119
3	821.71	144.6	315.0	0.00	0.00	0.00	315.00	819.6	.00133
4	823.18	254.7	455.0	0.00	0.00	0.00	455.00	820.0	.00074

SEGMENT TABLE FOR SECTION 21.1+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	126.	0.	125.	0.
125.	VELOCITY FPS	1.50	.18	1.50	0.00
2	DISCHARGE CFS	260.	2.	258.	0.
260.	VELOCITY FPS	2.08	.31	2.08	.14
3	DISCHARGE CFS	315.	3.	312.	0.
315.	VELOCITY FPS	2.32	.36	2.33	.18
4	DISCHARGE CFS	455.	13.	437.	5.
455.	VELOCITY FPS	2.19	.35	2.23	.25
1	ELEV 820.49 KD	3951.	6.	3944.	1.
2	ELEV 821.46 KD	7534.	55.	7475.	4.
3	ELEV 821.71 KD	8625.	78.	8539.	9.
4	ELEV 823.18 KD	16716.	442.	16091.	184.

RATING TABLE FOR SECTION 21.2 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	819.00	0.0	0.0						
BANK FULL	819.7	52.0	79.2	0.00	0.00	0.00			
1	820.68	93.3	125.0	0.00	0.00	0.00	125.00	819.0	.00075
2	821.70	144.3	260.0	0.00	0.00	0.00	260.00	819.4	.00091
3	821.98	160.3	315.0	0.00	0.00	0.00	315.00	819.6	.00101
4	823.35	268.9	455.0	0.00	0.00	0.00	455.00	820.0	.00065

SEGMENT TABLE FOR SECTION 21.2

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	125.	0.	125.	0.
125.	VELOCITY FPS	1.37	.18	1.37	0.00
2	DISCHARGE CFS	260.	2.	257.	0.
260.	VELOCITY FPS	1.92	.30	1.92	.14
3	DISCHARGE CFS	315.	4.	311.	1.
315.	VELOCITY FPS	2.13	.34	2.14	.18
4	DISCHARGE CFS	455.	14.	435.	6.
455.	VELOCITY FPS	2.10	.35	2.14	.25
1	ELEV 820.68 KO	4562.	11.	4550.	1.
2	ELEV 821.70 KO	8605.	77.	8517.	8.
3	ELEV 821.98 KO	9890.	108.	9762.	20.
4	ELEV 823.35 KO	17800.	529.	17047.	224.

RATING TABLE FOR SECTION 21.9+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	819.30	0.0	0.0						
BANK FULL	821.6	52.0	114.7	0.00	0.00	0.00			
1	821.75	58.0	125.0	0.00	0.00	0.00	125.00	820.9	.00315
2	822.74	100.2	260.0	0.00	0.00	0.00	260.00	821.3	.00263
3	823.00	112.5	315.0	0.00	0.00	0.00	315.00	821.5	.00274
4	824.04	170.2	455.0	0.00	0.00	0.00	455.00	821.9	.00179

SEGMENT TABLE FOR SECTION 21.9+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	125.	0.	125.	0.
125.	VELOCITY FPS	2.17	0.00	2.15	0.00
2	DISCHARGE CFS	260.	1.	259.	0.
260.	VELOCITY FPS	2.66	.36	2.66	0.00
3	DISCHARGE CFS	315.	2.	313.	0.
315.	VELOCITY FPS	2.89	.41	2.89	0.00
4	DISCHARGE CFS	455.	6.	448.	1.
455.	VELOCITY FPS	2.92	.47	2.94	.25
1	ELEV 821.75 KO	2227.	2.	2225.	1.
2	ELEV 822.74 KO	5072.	16.	5055.	1.
3	ELEV 823.00 KO	6015.	29.	5984.	1.
4	ELEV 824.04 KO	10744.	132.	10579.	33.

TABLE OF VALUES FOR BPR EQUATION

COEFK	AKB	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
1.1240	.8376	.2343	.7685	0.0000	0.0000	.6118	1.0000	1.0000	51.7788	82.3688	63.4039
DCRIT	821.09	KBCRIT=									
1.3599	1.1653	.1945	.6909	0.0000	0.0000	.5351	1.0000	1.0000	92.4786	155.2446	105.8658
DCRIT	821.66	KBCRIT=									
1.2542	1.0379	.2163	.7264	0.0000	0.0000	.5695	1.0000	1.0000	104.8058	176.4199	119.1968
DCRIT	821.85	KBCRIT=									
1.2237	.9197	.3040	.7600	0.0000	0.0000	.6030	1.0000	1.0000	152.5465	260.6874	176.2243
DCRIT	822.26	KBCRIT=									

ROAD SECTION 22.0

NO.	HW	CFS	HL	TW	CSM
0	819.90	0.00	0.00	0.00	0.00
1	822.61	125.00	.12	821.89	125.00
2	823.06	260.00	.22	822.86	260.00
3	823.37	315.00	.24	823.13	315.00
4	824.37	455.00	.24	824.13	455.00

MIN ROAD ELEVATION 827.00

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 826.70 OPENING NO.= 1

RATING TABLE FOR SECTION +22.05 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSN	CRIT ELEV	FRICTION SLOPE
0	819.10	0.0	0.0						
1	822.06	137.2	125.0	0.00	0.00	0.00	125.00	820.2	.00040
BANK FULL	822.4	162.5	168.4	0.00	0.00	0.00			
2	823.13	219.6	260.0	0.00	0.00	0.00	260.00	820.6	.00041
3	823.41	244.3	315.0	0.00	0.00	0.00	315.00	820.7	.00044
4	824.41	340.1	455.0	0.00	0.00	0.00	455.00	821.0	.00036

SEGMENT TABLE FOR SECTION +22.05

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	125.	0.	125.	0.
125.	VELOCITY FPS	.91	0.00	.91	0.00
2	DISCHARGE CFS	260.	1.	259.	0.
260.	VELOCITY FPS	1.20	.17	1.20	0.00
3	DISCHARGE CFS	315.	1.	314.	0.
315.	VELOCITY FPS	1.32	.21	1.32	0.00
4	DISCHARGE CFS	455.	8.	447.	0.
455.	VELOCITY FPS	1.42	.29	1.43	0.00
1	ELEV 822.06 KO	6236.	1.	6234.	1.
2	ELEV 823.13 KO	12873.	20.	12857.	1.
3	ELEV 823.41 KO	15073.	60.	15012.	1.
4	ELEV 824.41 KO	23801.	378.	23422.	1.

RATING TABLE FOR SECTION 22.1 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	819.10	0.0	0.0						
1	822.20	147.6	125.0	0.00	0.00	0.00	125.00	820.2	.00032
BANK FULL	822.4	162.5	150.2	0.00	0.00	0.00			
2	823.28	232.0	260.0	0.00	0.00	0.00	260.00	820.6	.00034
3	823.58	259.0	315.0	0.00	0.00	0.00	315.00	820.7	.00037
4	824.55	354.2	455.0	0.00	0.00	0.00	455.00	821.0	.00033

SEGMENT TABLE FOR SECTION 22.1

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	125.	0.	125.	0.
125.	VELOCITY FPS	.85	0.00	.85	0.00
2	DISCHARGE CFS	260.	1.	259.	0.
260.	VELOCITY FPS	1.14	.16	1.14	0.00
3	DISCHARGE CFS	315.	2.	313.	0.
315.	VELOCITY FPS	1.25	.22	1.25	0.00
4	DISCHARGE CFS	455.	9.	446.	0.
455.	VELOCITY FPS	1.37	.29	1.38	0.00
1	ELEV 822.20 KO	6956.	1.	6954.	1.
2	ELEV 823.28 KO	14023.	41.	13980.	1.
3	ELEV 823.58 KO	16357.	89.	16267.	1.
4	ELEV 824.55 KO	25232.	464.	24737.	1.

RATING TABLE FOR SECTION 22.5 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	821.20	0.0	0.0						
1	822.74	56.8	125.0	0.00	0.00	0.00	125.00	822.1	.00451
BANK FULL	823.6	101.0	250.7	0.00	0.00	0.00			
2	823.66	106.4	260.0	0.00	0.00	0.00	260.00	822.5	.00299
3	823.90	126.6	315.0	0.00	0.00	0.00	315.00	822.7	.00292
4	824.77	228.6	455.0	0.00	0.00	0.00	455.00	823.0	.00169

SEGMENT TABLE FOR SECTION 22.5

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	125.	0.	125.	0.
125.	VELOCITY FPS	2.21	0.00	2.20	0.00
2	DISCHARGE CFS	260.	0.	259.	1.
260.	VELOCITY FPS	2.48	0.00	2.48	.58
3	DISCHARGE CFS	315.	0.	310.	4.
315.	VELOCITY FPS	2.64	.35	2.64	.54
4	DISCHARGE CFS	455.	3.	416.	36.
455.	VELOCITY FPS	2.42	.41	2.52	.69
1	ELEV 822.74 KD	1661.	1.	1659.	1.
2	ELEV 823.66 KD	4740.	1.	4736.	2.
3	ELEV 823.90 KD	5773.	3.	5755.	15.
4	ELEV 824.77 KD	11056.	73.	10142.	840.

RATING TABLE FOR SECTION 22.8 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	823.00	0.0	0.0						
1	824.96	76.9	125.0	0.00	0.00	0.00	125.00	823.9	.00142
BANK FULL	825.3	94.9	181.6	0.00	0.00	0.00			
2	825.77	124.3	260.0	0.00	0.00	0.00	260.00	824.3	.00158
3	826.14	150.1	315.0	0.00	0.00	0.00	315.00	824.5	.00139
4	826.80	206.3	455.0	0.00	0.00	0.00	455.00	824.8	.00126

SEGMENT TABLE FOR SECTION 22.8

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	125.	0.	125.	0.
125.	VELOCITY FPS	1.63	0.00	1.63	0.00
2	DISCHARGE CFS	260.	1.	259.	0.
260.	VELOCITY FPS	2.14	.43	2.13	0.00
3	DISCHARGE CFS	315.	4.	311.	0.
315.	VELOCITY FPS	2.18	.50	2.18	0.00
4	DISCHARGE CFS	455.	15.	440.	0.
455.	VELOCITY FPS	2.38	.66	2.41	.40
1	ELEV 824.96 KO	3313.	1.	3311.	1.
2	ELEV 825.77 KO	6530.	17.	6512.	1.
3	ELEV 826.14 KO	8430.	77.	8352.	1.
4	ELEV 826.80 KO	12815.	383.	12429.	4.

TABLE OF VALUES FOR BPR EQUATION

COEFK	AKB	DGTAK	SIGMA	DKE	DKS	N	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
.9845	.8204	.1331	.7864	0.0000	.0310	.6325	1.0000	1.0000	40.1542	107.6951	95.6983
DCRIT	824.10	KBCRIT=									
.8926	.6541	.1992	.8365	0.0000	.0392	.6854	1.0000	1.0000	61.6788	176.2004	150.4541
DCRIT	824.86	KBCRIT=									
.8782	.6258	.2117	.8447	0.0000	.0407	.6949	1.0000	1.0000	72.1171	210.2458	179.3607
DCRIT	825.12	KBCRIT=									
.8377	.5733	.2238	.8599	0.0000	.0407	.7131	1.0000	1.0000	93.0090	284.1201	240.7746
DCRIT	825.68	KBCRIT=									

ROAD SECTION 23.0

NO.	HW	CFS	HL	TW	CSM
0	822.70	0.00	0.00	0.00	0.00
1	825.19	125.00	.18	825.01	125.00
2	826.14	260.00	.30	825.84	260.00
3	826.52	315.00	.32	826.20	315.00
4	827.24	455.00	.38	826.86	455.00

MIN ROAD ELEVATION 833.00

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 833.40 OPENING NO.= 1

RATING TABLE FOR SECTION +23.01 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	823.00	0.0	0.0						
1	825.19	89.3	125.0	0.00	0.00	0.00	125.00	823.9	.00092
BANK FULL	825.3	94.9	140.1	0.00	0.00	0.00			
2	826.14	150.3	260.0	0.00	0.00	0.00	260.00	824.3	.00095
3	826.52	180.8	315.0	0.00	0.00	0.00	315.00	824.5	.00085
4	827.24	248.5	455.0	0.00	0.00	0.00	455.00	824.8	.00078

SEGMENT TABLE FOR SECTION +23.01

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	125.	0.	125.	0.
125.	VELOCITY FPS	1.40	0.00	1.40	0.00
2	DISCHARGE CFS	260.	3.	257.	0.
260.	VELOCITY FPS	1.80	.35	1.80	0.00
3	DISCHARGE CFS	315.	6.	309.	0.
315.	VELOCITY FPS	1.85	.40	1.87	0.00
4	DISCHARGE CFS	455.	19.	436.	1.
455.	VELOCITY FPS	2.04	.51	2.08	.32
1	ELEV 825.19 KQ	4122.	1.	4120.	1.
2	ELEV 826.14 KQ	8434.	66.	8366.	1.
3	ELEV 826.52 KQ	10772.	186.	10585.	1.
4	ELEV 827.24 KQ	16312.	665.	15625.	23.

RATING TABLE FOR SECTION +23.02 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	GRIT ELEV	FRICTION SLOPE
0	823.00	0.0	0.0						
1	825.20	89.8	125.0	0.00	0.00	0.00	125.00	823.9	.00090
BANK FULL	825.3	94.9	138.8	0.00	0.00	0.00			
2	826.15	151.0	260.0	0.00	0.00	0.00	260.00	824.3	.00094
3	826.52	181.4	315.0	0.00	0.00	0.00	315.00	824.5	.00084
4	827.24	249.4	455.0	0.00	0.00	0.00	455.00	824.9	.00077

SEGMENT TABLE FOR SECTION +23.02

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	125.	0.	125.	0.
125.	VELOCITY FPS	1.40	0.00	1.39	0.00
2	DISCHARGE CFS	260.	3.	257.	0.
260.	VELOCITY FPS	1.79	.36	1.80	0.00
3	DISCHARGE CFS	315.	6.	309.	0.
315.	VELOCITY FPS	1.85	.40	1.86	0.00
4	DISCHARGE CFS	455.	19.	435.	1.
455.	VELOCITY FPS	2.03	.51	2.07	.32
1	ELEV 825.20 KO	4156.	1.	4153.	1.
2	ELEV 826.15 KO	8488.	68.	8419.	1.
3	ELEV 826.52 KO	10830.	191.	10636.	1.
4	ELEV 827.24 KO	16376.	671.	15683.	23.

TABLE OF VALUES FOR BPR EQUATION

COEFK	AKB	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
.1269	0.0000	.1268	.9990	0.0000	.0000	.9999	1.0000	1.0000	76.1535	70.9057	96.1357
DCRIT	823.92	KDCRIT=									
.1257	0.0000	.1257	.9990	0.0000	.0000	.9999	1.0000	1.0000	120.0378	119.0251	160.7506
DCRIT	824.43	KDCRIT=									
.1235	0.0000	.1235	.9990	0.0000	.0000	.9999	1.0000	1.0000	139.1715	139.7170	191.6699
DCRIT	824.59	KDCRIT=									
.1189	0.0000	.1182	.9987	0.0000	.0008	.9959	1.0000	1.0000	178.3065	181.2465	262.3561
DCRIT	824.98	KDCRIT=									

ROAD SECTION 23.1

NO.	HW	CFS	HL	TW	CSM
0	822.90	0.00	0.00	0.00	0.00
1	825.22	125.00	0.00	825.22	125.00
2	826.17	260.00	0.00	826.17	260.00
3	826.54	315.00	0.00	826.54	315.00
4	827.26	455.00	0.00	827.26	455.00

MIN ROAD ELEVATION 827.80

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 829.20 OPENING NO.= 1

RATING TABLE FOR SECTION +23.15 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED			CSM	CRIT ELEV	FRICTION SLOPE
				DAMAGE	CHANNEL	NON-DAM			
3	823.10	0.0	0.0						
1	825.39	68.7	125.0	0.00	0.00	0.00	125.00	824.3	.00323
BANK FULL	826.3	114.2	256.5	0.00	0.00	0.00			
2	826.32	115.6	260.0	0.00	0.00	0.00	260.00	824.8	.00304
3	826.68	135.1	315.0	0.00	0.00	0.00	315.00	825.0	.00274
4	827.39	175.5	455.0	0.00	0.00	0.00	455.00	825.3	.00253

SEGMENT TABLE FOR SECTION +23.15

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	125.	0.	125.	0.
125.	VELOCITY FPS	1.83	0.00	1.82	0.00
2	DISCHARGE CFS	260.	0.	260.	0.
260.	VELOCITY FPS	2.26	0.00	2.25	0.00
3	DISCHARGE CFS	315.	0.	315.	0.
315.	VELOCITY FPS	2.34	0.00	2.33	0.00
4	DISCHARGE CFS	455.	1.	454.	0.
455.	VELOCITY FPS	2.61	.49	2.61	0.00
1	ELEV 825.39 KO	2200.	1.	2198.	1.
2	ELEV 826.32 KO	4716.	1.	4714.	1.
3	ELEV 826.68 KO	6016.	2.	6015.	1.
4	ELEV 827.39 KO	9042.	12.	9029.	1.

RATING TABLE FOR SECTION 23.2 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	823.10	0.0	0.0						
1	825.88	92.4	125.0	0.00	0.00	0.00	125.00	824.3	.00137
BANK FULL	826.3	114.2	182.6	0.00	0.00	0.00			
2	826.86	145.4	260.0	0.00	0.00	0.00	260.00	824.8	.00149
3	827.20	164.4	315.0	0.00	0.00	0.00	315.00	825.0	.00149
4	827.94	208.9	455.0	0.00	0.00	0.00	455.00	825.3	.00149

SEGMENT TABLE FOR SECTION 23.2

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	125.	0.	125.	0.
125.	VELOCITY FPS	1.36	0.00	1.35	0.00
2	DISCHARGE CFS	260.	0.	260.	0.
260.	VELOCITY FPS	1.80	0.00	1.79	0.00
3	DISCHARGE CFS	315.	0.	315.	0.
315.	VELOCITY FPS	1.93	.34	1.93	0.00
4	DISCHARGE CFS	455.	1.	454.	0.
455.	VELOCITY FPS	2.20	.48	2.20	0.00
1	FLEV 825.88 KD	3376.	1.	3374.	1.
2	ELEV 826.86 KD	6731.	3.	6727.	1.
3	FLEV 827.20 KD	8164.	7.	8155.	1.
4	FLEV 827.94 KD	11806.	36.	11769.	1.

----------80/80 LIST OF INPUT DATA----------

```
LINK                                                                  530C
REACH     23.4      1.        915.      850.                           531
SEGMENT   23.4      1         N         -25.                           532
NVALUE    .125                                                         533
SEGMENT   23.4      2         C         20.                            534
NVALUE    .05                                                          535
SEGMENT   23.4      3         N         100.1                          536
NVALUE    .065                                                         537
SECTION   23.4                                                         538
          -270.     844.      -270.     834.8     -260.     832.3      539
          -252.     831.      -250.     829.7     -240.     829.6      540
          -230.     830.      -200.     831.6     -150.     831.2      541
          -100.     823.8     -50.      828.1     -25.      827.7      542
          -20.      825.6     -10.      825.1     0.        824.8      543
          10.       825.1     17.       825.3     20.       826.7      544
          50.       831.1     80.       833.      100.      836.4      545
          100.1     844.                                               546
ENDTABLE                                                               547
REACH     23.6      1.        1920.     1920.                          548
SEGMENT   23.6      1         N         3.                             549
NVALUE    .125                                                         550
SEGMENT   23.6      2         C         15.1                           551
NVALUE    .035                                                         552
SEGMENT   23.6      3         N         115.                           553
NVALUE    .095                                                         554
SEGMENT   23.6      4         C         124.6                          555
NVALUE    .04                                                          556
SEGMENT   23.6      5         N         226.                           557
NVALUE    .125                                                         558
SECTION   23.6                                                         559
          -100.     857.      -100.     837.2     0.        837.2      560
          3.        837.2     3.1       835.7     6.        835.7      561
          6.        831.9     11.       831.9     11.       835.7      562
          15.       835.7     15.1      838.7     115.      836.4      563
          115.1     831.2     124.5     830.2     124.6     836.4      564
          225.      836.4     226.      856.                           565
ENDTABLE                                                               566
REACH     23.8      1.        830.      830.                           567
SEGMENT   23.8      1         N         -15.                           568
NVALUE    .1                                                           569
SEGMENT   23.8      2         C         20.                            570
NVALUE    .06                                                          571
SEGMENT   23.8      3         N         230.1                          572
NVALUE    .07                                                          573
SECTION   23.8                                                         574
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115 836.4
835.7

80/80 LIST OF INPUT DATA

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          -385.     843.      -365.     840.6     -310.     839.3     575
          -210.     835.9     -110.     834.9     -15.      834.5     576
          -10.      823.4     0.        830.9     18.       833.      577
          20.       835.2     50.       838.2     100.      839.9     578
          150.      841.2     200.      842.      230.      843.7     579
          230.1     844.                                              580
ENDTABLE                                                            581
REACH     23.9+     1.        550.      550.                          582
REACH2    23.8      4.6                                             583
ROAD      24.0      2.7       50.       50.                           584
BPP       24.0      B         3                                       585
GIRDER    839.      833.4     0.        0.7       2.7                 586
          -11.25    843.8     -11.24    833.6     -10.45    833.6     587
          -10.44    835.6     -6.3      838.      -2.15     836.6     588
          -2.14     833.4     -.15      833.4     -.14      836.6     589
          3.75      831.      7.65      836.6     7.65      833.6     590
          11.24     833.6     11.25     840.8                         591
ENDTABLE                                                            592
SECTION   24.0                                                      593
          -600.     853.      -600.     845.3     -500.     844.1     594
          -400.     842.9     -300.     842.2     -200.     841.2     595
          -100.     841.8     -11.25    840.8     -11.24    833.6     596
          -2.15     833.4     11.24     833.6     11.25     840.8     597
          100.      841.5     200.      843.1     300.      845.      598
          360.      847.      360.1     853.                          599
ENDTABLE                                                            600
REACH     24.1+     1.        50.       50.                           601
REACH2    24.2      .8                                              602
REACH     24.2      1.        925.      925.                          603
SEGMENT   24.2      1         N         -30.                          604
NVALUE    .1                                                        605
SEGMENT   24.2      2         C         50.                           606
NVALUE    .055                                                      607
SEGMENT   24.2      3         N         400.1                         608
NVALUE    .1                                                        609
SECTION   24.2                                                      610
          -450.     852.      -450.     845.8     -400.     843.      611
          -350.     841.5     -300.     841.4     -250.     840.2     612
          -200.     837.4     -150.     835.5     -100.     834.2     613
          -50.      834.      -30.      834.8     -15.      832.6     614
          0.        833.3     15.       833.4     25.       833.8     615
          50.       835.6     100.      838.2     150.      837.8     616
          200.      843.4     250.      841.3     300.      842.3     617
          350.      844.      400.      846.      400.1     852.      618
ENDTABLE                                                            619
```

----------80/80 LIST OF INPUT DATA----------

```
REACH     24.6      1.        335.      280.                              620
SEGMENT   24.6      1         N         -100.                             621
NVALUE    .1                                                             622
SEGMENT   24.6      2         C         20.                               623
NVALUE    .07                                                            624
SEGMENT   24.6      3         N         450.1                             625
NVALUE    .1                                                             626
SECTION   24.6                                                           627
          -530.     853.      -530.     845.7     -450.     844.        628
          -400.     843.5     -350.     843.4     -300.     842.2       629
          -250.     843.      -200.     838.2     -150.     837.        630
          -100.     836.2     -25.      834.2     -20.      833.4       631
          -10.      833.2     0.        833.4     10.       833.4       632
          20.       837.3     50.       838.7     150.      839.2       633
          250.      833.8     350.      841.1     450.      841.6       634
          450.1     860.                                                635
ENDTABLE                                                                636
REACH     24.8      1.        1086.     1080.                             637
SEGMENT   24.8      1         N         -30.                              638
NVALUE    .125                                                           639
SEGMENT   24.8      2         C         35.                               640
NVALUE    .05                                                            641
SEGMENT   24.8      3         N         380.1                             642
NVALUE    .125                                                           643
SECTION   24.8                                                           644
          -775.     854.      -775.     849.8     -750.     844.4       645
          -700.     844.      -600.     842.4     -500.     841.5       646
          -475.     843.      -375.     840.7     -275.     840.2       647
          -175.     833.9     -75.      838.7     -30.      840.        648
          -20.      837.7     -10.      834.7     0.        835.8       649
          10.       834.6     25.       837.2     35.       838.6       650
          125.      843.2     175.      841.1     280.      844.2       651
          380.      846.4     380.1     854.                              652
ENDTABLE                                                                653
REACH     24.8+     1.        2514.     2400.                             653A
REACH2    25.1+     .1                                                   653B
REACH     24.9+     1.        1.        1.                                654
REACH2    25.1+     .2                                                   655
ROAD      25.1      2.7       50.       50.                               668
APP       25.0      0         3         2                                 669
PIER      837.4     1.        837.9     1.        838.8     1.          670
GIRDEP    841.5     841.9     0.        .7        2.7                     671
          -13.75    843.6     -13.65    840.9     13.65     840.9       672
          13.75     843.6                                               673
ENDTABLE                                                                674
```

80/80 LIST OF INPUT DATA

```
SECTION   25.0                                                          675
          -600.     857.      -600.     843.7     -500.     843.6     676
          -400.     843.5     -300.     843.6     -200.     843.6     677
          -100.     843.6     -13.75    843.6     -13.65    837.9     678
          -.25      837.4     13.65     838.8     13.75     843.6     679
          100.      843.7     200.      843.8     300.      843.9     680
          400.      844.      500.      844.2     600.      844.5     681
          600.1     857.                                              682
ENDTABLE                                                              683
REACH     25.1+     1.        50.       50.                           684
SEGMENT   25.1+     1         N         -25.                          685
NVALUE    .1                                                          686
SEGMENT   25.1+     2         C         22.                           687
NVALUE    .06                                                         688
SEGMENT   25.1+     3         N         291.                          689
NVALUE    .13                                                         690
SECTION   25.1+                                                       691
          -325.     861.      -325.     840.5     -225.     840.6     692
          -125.     841.1     -25.      841.      -20.      838.5     693
          -10.      837.2     0.        837.2     10.       837.      694
          18.       833.2     22.       840.2     55.       842.7     695
          70.       841.3     90.       844.3     190.      841.8     696
          290.      841.7     291.      861.                          697
ENDTABLE                                                              698
REACH     25.4      1.        445.      440.                          699
SEGMENT   25.4      1         N         -25.                          700
NVALUE    .1                                                          701
SEGMENT   25.4      2         C         22.                           702
NVALUE    .06                                                         703
SEGMENT   25.4      3         N         690.1                         704
NVALUE    .13                                                         705
SECTION   25.4                                                       706
          -590.     857.      -590.     843.5     -525.     841.5     707
          -425.     841.2     -325.     840.5     -225.     840.6     708
          -125.     841.1     -25.      841.      -20.      838.5     709
          -10.      837.2     0.        837.2     10.       837.      710
          18.       833.2     22.       840.2     55.       842.7     711
          70.       841.3     90.       844.3     190.      841.8     712
          290.      841.7     390.      842.3     490.      842.3     713
          590.      843.2     690.      844.4     690.1     857.      714
ENDTABLE                                                              715
REACH     25.9+     1.        390.      390.                          716
REACH2    25.4      -1.                                             717
ROAD      26.0      2.7       50.       50.                           929
CULV1     26.0      1         12311                                   930
```

80/80 LIST OF INPUT DATA

```
CULV2     5.0       0.        45.       836.4     836.0                 931
CULV1     26.0      1         12111                                     932
CULV2     5.        0.        45.       835.73    836.23                933
CULV1     26.0      1         32111                                     933A
CULV2     6.3       6.3       45.       837.9     837.58                933B
SECTION   26.0                                                          934
          -600.     861.      -600.     845.2     -500.     844.1       935
          -400.     843.4     -300.     843.      -200.     842.8       936
          -100.     843.6     0.        844.7     93.       846.        937
          200.      845.7     300.      846.9     400.      849.4       938
          500.      853.7     500.1     861.                            939
ENDTABLE                                                                940
REACH     26.14     1.        50.       50.                             941
REACH2    26.2      -1.1                                                942
REACH     26.2      1.        350.      350.                            943
SEGMENT   26.2      1         N         -35.                            944
NVALUE    .04                                                           945
SEGMENT   26.2      2         C         18.                             946
NVALUE    .055                                                          947
SEGMENT   26.2      3         N         375.1                           948
NVALUE    .03                                                           949
SECTION   26.2                                                          950
          -200.     557.      -200.     840.2     -100.     841.2       951
          -35.      841.3     -18.      839.      -6.       837.3       952
          0.        837.8     6.        837.3     12.       838.6       953
          18.       843.3     43.       844.4     68.       842.2       954
          83.       845.9     98.       842.5     200.      844.8       955
          300.      847.8     375.      850.3     375.1     857.        956
ENDTABLE                                                                957
REACH     25.6      1.        920.      920.                            958
SEGMENT   25.6      1         N         -16.                            959
NVALUE    .125                                                          960
SEGMENT   26.6      2         C         13.                             961
NVALUE    .055                                                          962
SEGMENT   26.6      3         N         340.1                           963
NVALUE    .125                                                          964
SECTION   26.6                                                          965
          -160.     859.      -160.     845.6     -116.     845.1       966
          -16.      842.9     -10.      840.1     -5.       839.6       967
          0.        839.      5.        839.4     10.       840.2       968
          13.       841.2     43.       841.7     75.       849.2       969
          100.      848.5     120.      847.5     220.      849.2       970
          320.      848.5     340.      852.4     340.1     859.        971
ENDTABLE                                                                972
REACH     26.9      1.        595.      595.                            973
```

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-----------------------------80/80 LIST OF INPUT DATA-----------------------------
SEGMENT   26.0     1        N        -20.                                  974
NVALUE    .085                                                             975
SEGMENT   26.9     2        C        20.                                   976
NVALUE    .055                                                             977
SEGMENT   26.9     3        N        300.1                                 978
NVALUE    .09                                                              979
SECTION   26.9                                                             980
          -1200.   861.     -1200.   852.2    -1100.   851.7               981
          -1000.   851.8    -900.    851.     -800.    848.5               982
          -700.    843.2    -600.    848.5    -500.    848.2               983
          -400.    847.6    -300.    847.2    -200.    846.9               984
          -100.    847.2    -20.     848.     -10.     842.3               985
          0.       841.3    10.      842.4    20.      848.3               986
          100.     849.     200.     851.     300.     853.2               987
          300.1    861.                                                    988
ENDTABLE                                                                   989
ROAD      27.0     2.7      75.      75.                                   990
BPP       27.0     A        2                                              991
GIRDEP    846.5    846.     24.      .6       2.4                           992
          -6.5     843.4    -6.4     846.     6.4      846.                993
          6.5      843.4                                                   994
ENDTABLE                                                                   995
SECTION   27.0                                                             996
          -600.    861.     -600.    849.2    -500.    848.7               997
          -400.    843.1    -300.    847.3    -200.    847.                998
          -100.    847.5    -6.5     848.4    -6.4     840.8               999
          0.       841.3    6.4      841.2    6.5      848.4               1000
          100.     849.7    200.     851.2    300.     853.                1001
          400.     855.     400.1    861.                                  1002
ENDTABLE                                                                   1003
REACH     +27.05   1.       50.      50.                                   1004
REACH2    27.1     .4                                                      1005
REACH     27.1     1.       70.      70.                                   1006
SEGMENT   27.1     1        N        -20.                                  1007
NVALUE    .085                                                             1008
SEGMENT   27.1     2        C        20.                                   1009
NVALUE    .055                                                             1010
SEGMENT   27.1     3        N        190.1                                 1011
NVALUE    .09                                                              1012
SECTION   27.1                                                             1013
          -40.     861.     -40.     847.7    -20.     847.9               1014
          -10.     842.5    -5.      841.2    0.       841.                1015
          5.       841.     10.      842.3    20.      848.1               1016
          70.      849.4    120.     850.2    170.     851.2               1017
          190.     851.5    190.1    861.                                  1018
```

----------80/80 LIST OF INPUT DATA----------

```
ENDTABLE                                                        1019
CHANGE    DISCHARGE                                             1019-1
DISCHARGE -1.       110.      230.      285.      405.          1019-2
END                                                             1019-3
COMPUTE   23.4      24.6      23.2                              1019A
```

----------END OF 80/80 LIST----------

COMPUTE 23.4 24.6 23.2 1019A

----------STARTING DATA FROM PREVIOUS COMPUTATIONS----------

RATING TABLE FOR SECTION 23.4 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	824.80	0.0	0.0						
BANK FULL	826.7	62.6	97.6	0.00	0.00	0.00			
1	826.94	73.2	110.0	0.00	0.00	0.00	110.00	825.7	.00131
2	827.93	125.1	230.0	0.00	0.00	0.00	230.00	826.2	.00123
3	828.25	150.0	285.0	0.00	0.00	0.00	285.00	826.3	.00124
4	828.92	214.3	405.0	0.00	0.00	0.00	405.00	826.6	.00116

SEGMENT TABLE FOR SECTION 23.4

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	110.	0.	110.	0.
110.	VELOCITY FPS	1.51	0.00	1.51	0.00
2	DISCHARGE CFS	230.	1.	226.	3.
230.	VELOCITY FPS	1.93	.24	1.94	.62
3	DISCHARGE CFS	285.	2.	276.	6.
285.	VELOCITY FPS	2.09	.24	2.11	.72
4	DISCHARGE CFS	405.	12.	378.	15.
405.	VELOCITY FPS	2.28	.34	2.34	.87
1	ELEV 826.94 KD	3349.	1.	3036.	3.
2	ELEV 827.93 KD	6549.	5.	6459.	85.
3	ELEV 828.25 KD	8056.	39.	7858.	159.
4	ELEV 828.92 KD	11867.	340.	11105.	422.

RATING TABLE FOR SECTION 23.6 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	830.20	0.0	0.0						
1	833.33	36.7	110.0	0.00	0.00	0.00	110.00	831.8	.00314
2	834.93	60.0	230.0	0.00	0.00	0.00	230.00	832.8	.00373
3	835.67	71.3	285.0	0.00	0.00	0.00	285.00	833.1	.00408
BANK FULL	836.4	102.0	372.3	0.00	0.00	0.00			
4	836.67	124.6	405.0	0.00	0.00	0.00	405.00	833.7	.00400

SEGMENT TABLE FOR SECTION 23.6

CSM		TOTAL	SEG NO 1 H	2 C	3 N	4 C	5 N
1	DISCHARGE CFS	110.	0.	16.	0.	94.	0.
110.	VELOCITY FPS	3.06	0.00	2.24	0.00	3.18	0.00
2	DISCHARGE CFS	230.	0.	49.	0.	181.	0.
230.	VELOCITY FPS	3.88	0.00	3.20	0.00	4.05	0.00
3	DISCHARGE CFS	285.	0.	55.	0.	230.	0.
285.	VELOCITY FPS	4.18	0.00	2.84	0.00	4.43	0.00
4	DISCHARGE CFS	405.	1.	104.	1.	287.	12.
405.	VELOCITY FPS	4.33	.28	3.40	.51	4.67	.42
1	ELEV 833.33 KO	1962.	1.	281.	1.	1678.	1.
2	ELEV 834.93 KO	3764.	1.	793.	1.	2968.	1.
3	ELEV 835.67 KO	4462.	1.	863.	1.	3596.	1.
4	ELEV 836.67 KO	6326.	2.	1646.	4.	4568.	106.

RATING TABLE FOR SECTION 23.8 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	828.40	0.0	0.0						
1	833.99	93.1	110.0	0.00	0.00	0.00	110.00	831.0	.00066
BANK FULL	834.5	117.1	146.7	0.00	0.00	0.00			
2	835.58	242.9	230.0	0.00	0.00	0.00	230.00	831.9	.00053
3	836.27	369.5	285.0	0.00	0.00	0.00	285.00	832.2	.00039
4	837.21	587.9	405.0	0.00	0.00	0.00	405.00	832.7	.00030

SEGMENT TABLE FOR SECTION 23.8

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	110.	0.	110.	0.
110.	VELOCITY FPS	1.16	0.00	1.18	0.00
2	DISCHARGE CFS	230.	27.	203.	0.
230.	VELOCITY FPS	1.30	.28	1.38	0.00
3	DISCHARGE CFS	285.	66.	219.	0.
285.	VELOCITY FPS	1.14	.33	1.28	0.00
4	DISCHARGE CFS	405.	144.	259.	2.
405.	VELOCITY FPS	1.05	.38	1.27	.26
1	ELEV 833.99 KO	4283.	1.	4281.	1.
2	ELEV 835.58 KO	9910.	1109.	8800.	1.
3	ELEV 836.27 KO	14368.	3178.	11189.	1.
4	ELEV 837.21 KO	23027.	7989.	14969.	68.

RATING TABLE FOR SECTION 23.9+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	833.00	0.0	0.0						
1	836.99	43.8	110.0	0.00	0.00	0.00	110.00	835.6	.00589
2	838.18	79.9	230.0	0.00	0.00	0.00	230.00	836.5	.01475
3	838.58	92.9	285.0	0.00	0.00	0.00	285.00	836.8	.00447
BANK FULL	839.1	117.1	361.5	0.00	0.00	0.00			
4	839.40	131.1	405.0	0.00	0.00	0.00	405.00	837.3	.00396

SEGMENT TABLE FOR SECTION 23.9+

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	110.	0.	110.	0.
110.	VELOCITY FPS	2.53	0.00	2.51	0.00
2	DISCHARGE CFS	230.	0.	230.	0.
230.	VELOCITY FPS	2.91	0.00	2.88	0.00
3	DISCHARGE CFS	285.	0.	285.	0.
285.	VELOCITY FPS	3.07	0.00	3.07	0.00
4	DISCHARGE CFS	405.	3.	402.	0.
405.	VELOCITY FPS	3.33	.26	3.34	0.00
1	ELEV 836.99 KO	1434.	1.	1432.	1.
2	ELEV 838.18 KO	3338.	1.	3336.	1.
3	ELEV 838.58 KO	4263.	1.	4261.	1.
4	ELEV 839.40 KO	6435.	44.	6390.	1.

TABLE OF VALUES FOR BPR EQUATION

COEFK	AKB	DELTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
2.4163	2.4163	0.0000	0.0000	0.0000	0.0000	.2549	1.0000	1.0000	58.7380	547.4785	42.0747
DCRIT	834.41	KBCRIT=									
2.6486	2.6486	0.0000	0.0000	0.0000	0.0000	.2102	1.0000	1.0000	61.3890	964.8947	75.9844
DCRIT	834.98	KBCRIT=									
2.6453	2.6453	0.0000	0.0000	0.0000	0.0000	.2108	1.0000	1.0000	61.3890	952.1924	88.3713
DCRIT	835.20	KBCRIT=									
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000	61.3890	952.1924	88.3713
DCRIT	-1.00	KBCRIT=									

ROAD SECTION 24.0

NO.	HW	CFS	HL	TW	CSN
0	833.40	0.00	0.00	0.00	0.00
1	837.54	110.00	.22	837.32	110.00
2	838.98	230.00	.52	838.46	230.00
3	839.52	285.00	.68	838.84	285.00
4	840.90	495.00	1.28	839.62	495.00

MIN ROAD ELEVATION 840.80

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 833.40 OPENING NO.= 1

RATING TABLE FOR SECTION 24.1+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	833.40	0.0	0.0						
BANK FULL	835.6	136.2	58.4	0.00	0.00	0.00			
1	837.54	543.0	110.0	0.00	0.00	0.00	110.00	834.6	.00003
2	838.98	965.4	230.0	0.00	0.00	0.00	230.00	835.0	.00003
3	839.52	1172.8	285.0	0.00	0.00	0.00	285.00	835.1	.00003
4	840.90	1748.1	405.0	0.00	0.00	0.00	405.00	835.3	.00002

SEGMENT TABLE FOR SECTION 24.1+

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	110.	37.	72.	1.
110.	VELOCITY FPS	.26	.13	.31	.06
2	DISCHARGE CFS	230.	88.	137.	5.
230.	VELOCITY FPS	.32	.16	.39	.06
3	DISCHARGE CFS	285.	111.	162.	12.
285.	VELOCITY FPS	.33	.17	.41	.09
4	DISCHARGE CFS	405.	160.	209.	36.
405.	VELOCITY FPS	.32	.17	.41	.11
1	ELEV 837.54 KQ	19935.	6743.	13068.	124.
2	ELEV 838.98 KQ	42650.	16371.	25387.	892.
3	ELEV 839.52 KQ	53911.	21081.	30772.	2058.
4	ELEV 840.90 KQ	89755.	35576.	46432.	7746.

RATING TABLE FOR SECTION 24.2 DAF 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	832.60	0.0	0.0						
BANK FULL	834.0	136.2	48.9	0.00	0.00	0.00			
1	837.55	768.3	110.0	0.00	0.00	0.00	110.00	833.8	.00001
2	839.00	1279.8	230.0	0.00	0.00	0.00	230.00	834.2	.00001
3	839.54	1503.7	285.0	0.00	0.00	0.00	285.00	834.3	.00001
4	840.91	2139.3	405.0	0.00	0.00	0.00	405.00	834.5	.00001

SEGMENT TABLE FOR SECTION 24.2

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	110.	40.	63.	2.
110.	VELOCITY FPS	.19	.09	.23	.05
2	DISCHARGE CFS	230.	90.	128.	12.
230.	VELOCITY FPS	.24	.13	.31	.07
3	DISCHARGE CFS	285.	113.	152.	20.
285.	VELOCITY FPS	.26	.14	.33	.08
4	DISCHARGE CFS	405.	156.	204.	45.
405.	VELOCITY FPS	.27	.14	.36	.10
1	ELEV 837.55 KO	31631.	11534.	19595.	502.
2	ELEV 839.00 KO	60569.	23769.	33717.	3083.
3	ELEV 839.54 KO	74183.	29377.	39722.	5084.
4	ELEV 840.91 KO	112667.	43638.	56827.	12202.

RATING TABLE FOR SECTION 24.6 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	833.20	0.0	0.0						
BANK FULL	836.2	183.1	75.5	0.00	0.00	0.00			
1	837.57	404.3	110.0	0.00	0.00	0.00	110.00	834.1	.00005
2	839.01	772.6	230.0	0.00	0.00	0.00	230.00	834.5	.00005
3	839.55	974.3	285.0	0.00	0.00	0.00	285.00	834.7	.00004
4	840.92	1713.4	405.0	0.00	0.00	0.00	405.00	835.0	.00003

SEGMENT TABLE FOR SECTION 24.6

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	110.	6.	104.	0.
110.	VELOCITY FPS	.30	.10	.30	.06
2	DISCHARGE CFS	230.	31.	195.	4.
230.	VELOCITY FPS	.35	.15	.38	.08
3	DISCHARGE CFS	285.	45.	231.	9.
285.	VELOCITY FPS	.36	.17	.40	.08
4	DISCHARGE CFS	405.	80.	272.	52.
405.	VELOCITY FPS	.31	.17	.36	.11
1	FLEV 837.57 KU	15496.	716.	14777.	5.
2	ELEV 839.01 KU	33959.	4464.	29075.	420.
3	FLEV 839.55 KU	43648.	6876.	35396.	1376.
4	FLEV 840.92 KU	78879.	15613.	53532.	9735.

----------80/80 LIST OF INPUT DATA----------

```
CHANGE    DISCHARGE                                                  1019AA
DISCHARGE -1.       85.       185.      230.      330.               1019AB
END                                                                  1019AC
COMPUTE   24.8      24.8+     24.6                                   1019AD
```

----------END OF 80/80 LIST----------

COMPUTE 24.8 24.8+ 24.6 1019AD

----------STARTING DATA FROM PREVIOUS COMPUTATIONS----------

RATING TABLE FOR SECTION 24.8 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	834.60	0.0	0.0						
1	837.91	103.1	85.0	0.00	0.00	0.00	85.00	835.8	.00031
BANK FULL	838.6	142.3	134.6	0.00	0.00	0.00			
2	839.31	223.4	185.0	0.00	0.00	0.00	185.00	836.3	.00027
3	839.80	347.0	230.0	0.00	0.00	0.00	230.00	836.4	.00023
4	841.04	873.6	330.0	0.00	0.00	0.00	330.00	836.7	.00011

SEGMENT TABLE FOR SECTION 24.8

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	85.	0.	85.	0.
85.	VELOCITY FPS	.83	0.00	.82	0.00
2	DISCHARGE CFS	185.	2.	181.	2.
185.	VELOCITY FPS	.98	.10	.99	.10
3	DISCHARGE CFS	230.	10.	213.	6.
230.	VELOCITY FPS	.97	.12	.99	.14
4	DISCHARGE CFS	330.	56.	250.	24.
330.	VELOCITY FPS	.74	.14	.85	.14
1	ELEV 837.91 KO	4812.	1.	4810.	1.
2	ELEV 839.31 KO	11259.	88.	11103.	67.
3	ELEV 839.80 KO	14942.	472.	14165.	306.
4	ELEV 841.04 KO	31283.	5258.	23759.	2266.

RATING TABLE FOR SECTION 24.8+ DA= 1.6

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	837.10	0.0	0.0						
1	839.73	87.0	85.0	0.00	0.00	0.00	85.00	838.0	.00063
BANK FULL	840.3	127.4	133.8	0.00	0.00	0.00			
2	840.90	246.3	185.0	0.00	0.00	0.00	185.00	838.4	.00054
3	841.22	357.8	231.0	0.00	0.00	0.00	230.00	838.6	.00047
4	841.89	613.5	330.0	0.00	0.00	0.00	330.00	838.9	.00031

SEGMENT TABLE FOR SECTION 24.8+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	85.	0.	85.	0.
85.	VELOCITY FPS	.98	0.00	.98	0.00
2	DISCHARGE CFS	185.	23.	161.	1.
185.	VELOCITY FPS	1.11	.23	1.15	.14
3	DISCHARGE CFS	230.	49.	179.	1.
230.	VELOCITY FPS	1.04	.26	1.16	.15
4	DISCHARGE CFS	330.	126.	201.	3.
330.	VELOCITY FPS	.87	.32	1.08	.08
1	ELEV 839.73 KD	3387.	1.	3385.	1.
2	ELEV 840.90 KD	7622.	507.	7100.	15.
3	ELEV 841.22 KD	10345.	1924.	8363.	58.
4	ELEV 841.89 KD	18645.	7113.	11373.	159.

----------80/80 LIST OF INPUT DATA----------

```
CHANGE    DISCHARGE                                                  1019AE
DISCHARGE -1.       60.       135.      170.      240.               1019AF
END                                                                  1019AG
COMPUTE   24.9+     26.1+     24.8+                                  1019AH
```

----------END OF 80/80 LIST----------

COMPUTE 24.4+ 26.1+ 24.6+ 1019AH

----------STARTING DATA FROM PREVIOUS COMPUTATIONS----------

RATING TABLE FOR SECTION 24.9+ OA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	837.20	0.0	0.0						
1	839.73	63.0	60.0	0.00	0.00	0.00	60.00	837.9	.00036
BANK FULL	840.4	127.4	102.9	0.00	0.00	0.00			
2	840.91	214.0	135.0	0.00	0.00	0.00	135.00	838.3	.00034
3	841.23	325.1	170.0	0.00	0.00	0.00	170.00	838.5	.00030
4	841.90	576.6	240.0	0.00	0.00	0.00	240.00	838.7	.00020

SEGMENT TABLE FOR SECTION 24.9+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	60.	0.	60.	0.
60.	VELOCITY FPS	.73	0.00	.72	0.00
2	DISCHARGE CFS	135.	11.	123.	0.
135.	VELOCITY FPS	.09	.15	.31	.10
3	DISCHARGE CFS	170.	32.	137.	1.
170.	VELOCITY FPS	.84	.19	.91	.12
4	DISCHARGE CFS	240.	87.	151.	2.
240.	VELOCITY FPS	.69	.24	.83	.06
1	ELEV 839.73 KQ	3153.	1.	3151.	1.
2	ELEV 840.91 KQ	7093.	330.	6754.	9.
3	ELEV 841.23 KQ	9307.	1286.	7982.	38.
4	ELEV 841.90 KQ	17021.	5966.	10915.	140.

TABLE OF VALUES FOR BPR EQUATION

COEFK	AKB	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
.8952	.4952	.4000	.8824	0.0000	0.0000	.7413	1.0000	1.0000	51.3142	76.2104	75.3824
DCRIT	838.39	KBCRIT=									
1.3374	.9374	.4000	.7549	0.0000	0.0000	.5979	1.0000	1.0000	82.5977	174.6201	167.3430
DCRIT	838.83	KBCRIT=									
1.6881	1.2881	.4000	.6574	0.0000	0.0000	.5034	1.0000	1.0000	82.6261	303.2072	261.4582
DCRIT	834.00	KBCRIT=									
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000	74.1250	303.2072	261.4582
DCRIT	-1.00	KBCRIT=									

ROAD SECTION 25.0

NO.	HW	CFS	HL	TW	CSM
0	837.40	0.00	0.00	0.00	0.00
1	839.76	60.00	0.00	839.76	60.00
2	840.97	135.00	.04	840.93	135.00
3	841.35	170.00	.10	841.25	170.00
4	842.23	240.00	.32	841.91	240.00

MIN ROAD ELEVATION 843.50

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 840.90 OPENING NO.= 1

RATING TABLE FOR SECTION 25.1+ DA= 41.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	837.00	0.0	0.0						
1	839.77	93.4	60.0	0.00	0.00	0.00	60.00	837.7	.00025
BANK FULL	840.2	127.4	86.3	0.00	0.00	0.00			
2	840.99	310.8	135.0	0.00	0.00	0.00	135.00	838.1	.00021
3	841.36	446.8	170.0	0.00	0.00	0.00	170.00	838.3	.00017
4	842.23	338.5	240.0	0.00	0.00	0.00	240.00	838.5	.00009

SEGMENT TABLE FOR SECTION 25.1+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	60.	0.	60.	0.
60.	VELOCITY FPS	.65	0.00	.64	0.00
2	DISCHARGE CFS	135.	24.	110.	1.
135.	VELOCITY FPS	.69	.16	.74	.09
3	DISCHARGE CFS	170.	48.	121.	1.
170.	VELOCITY FPS	.63	.18	.73	.07
4	DISCHARGE CFS	240.	106.	125.	9.
240.	VELOCITY FPS	.47	.20	.60	.09
1	ELEV 839.77 KD	3773.	1.	3771.	1.
2	ELEV 840.99 KD	8935.	1085.	7813.	32.
3	ELEV 841.36 KD	12367.	3396.	9377.	34.
4	ELEV 842.23 KD	25120.	10966.	13551.	603.

RATING TABLE FOR SECTION 25.4 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED			CSM	CRIT ELEV	FRICTION SLOPE
				DAMAGE	CHANNEL	NON-DAM			
0	837.00	0.0	0.0						
1	839.88	97.8	60.0	0.00	0.00	0.00	60.00	837.7	.00022
BANK FULL	840.2	127.7	80.2	0.00	0.00	0.00			
2	841.08	370.0	135.0	0.00	0.00	0.00	135.00	838.1	.00017
3	841.43	551.2	170.0	0.00	0.00	0.00	170.00	838.3	.00014
4	842.27	1155.9	240.0	0.00	0.00	0.00	240.00	838.5	.00007

SEGMENT TABLE FOR SECTION 25.4

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	60.	0.	60.	0.
60.	VELOCITY FPS	.61	0.00	.61	0.00
2	DISCHARGE CFS	135.	28.	106.	1.
135.	VELOCITY FPS	.63	.14	.69	.09
3	DISCHARGE CFS	170.	56.	112.	1.
170.	VELOCITY FPS	.57	.16	.66	.06
4	DISCHARGE CFS	240.	122.	107.	10.
240.	VELOCITY FPS	.38	.16	.51	.06
1	ELEV 839.88 KD	4056.	1.	4054.	1.
2	ELEV 841.08 KD	9877.	1652.	8178.	47.
3	ELEV 841.43 KD	14077.	4278.	9697.	102.
4	ELEV 842.27 KD	28966.	14499.	13715.	752.

RATING TABLE FOR SECTION 25.9+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	836.00	0.0	0.0						
BANK FULL	839.2	127.7	49.2	0.00	0.00	0.00			
1	839.90	297.9	60.0	0.00	0.00	0.00	60.00	836.7	.00005
2	841.09	1008.4	135.0	0.00	0.00	0.00	135.00	837.1	.00003
3	841.45	1309.2	170.0	0.00	0.00	0.00	170.00	837.3	.00002
4	842.27	2169.6	240.0	0.00	0.00	0.00	240.00	837.5	.00002

SEGMENT TABLE FOR SECTION 25.9+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	60.	10.	50.	0.
60.	VELOCITY FPS	.33	.07	.35	.04
2	DISCHARGE CFS	135.	65.	65.	4.
135.	VELOCITY FPS	.25	.09	.33	.04
3	DISCHARGE CFS	170.	90.	72.	9.
170.	VELOCITY FPS	.23	.10	.33	.04
4	DISCHARGE CFS	241.	137.	75.	29.
240.	VELOCITY FPS	.18	.10	.29	.05
1	ELEV 839.90 KQ	8266.	772.	7472.	22.
2	ELEV 841.09 KQ	25043.	11788.	12834.	420.
3	ELEV 841.45 KQ	33646.	17650.	14661.	1336.
4	ELEV 842.27 KQ	60871.	34737.	19301.	6833.

ROAD SECTION 26.0

NO.	HW	CFS	HL	TW	CSM
0	836.23	0.00	0.00	0.00	0.00
1	839.98	60.00	.08	839.90	60.00
2	841.25	135.00	.16	841.09	135.00
3	841.69	170.00	.24	841.45	170.00
4	842.76	240.00	.48	842.28	240.00

MIN ROAD ELEVATION 842.80

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	12311.	5.00		45.00	836.40	836.00	.024
2	1	12311.	5.00		45.00	835.73	836.23	.024
3	1	32111.	4.91	6.77	45.00	837.90	837.58	.032

RATING TABLE FOR SECTION 26.1+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	836.20	0.0	0.0						
1	839.99	163.4	60.0	0.00	0.00	0.00	60.00	837.1	.00010
BANK FULL	840.2	199.7	72.7	0.00	0.00	0.00			
2	841.26	421.2	135.0	0.00	0.00	0.00	135.00	837.6	.00007
3	841.69	519.1	170.0	0.00	0.00	0.00	170.00	837.8	.00007
4	842.76	816.8	240.0	0.00	0.00	0.00	240.00	838.0	.00004

SEGMENT TABLE FOR SECTION 26.1+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	60.	5.	55.	0.
60.	VELOCITY FPS	.46	.10	.47	0.00
2	DISCHARGE CFS	135.	43.	92.	0.
135.	VELOCITY FPS	.44	.18	.51	.06
3	DISCHARGE CFS	170.	62.	107.	0.
170.	VELOCITY FPS	.44	.20	.53	.05
4	DISCHARGE CFS	240.	105.	128.	6.
240.	VELOCITY FPS	.39	.22	.49	.09
1	ELEV 839.99 KD	5921.	348.	5572.	1.
2	ELEV 841.26 KD	15800.	4786.	11010.	4.
3	ELEV 841.69 KD	20876.	7560.	13288.	28.
4	ELEV 842.76 KD	36696.	16127.	19769.	800.

----------80/80 LIST OF INPUT DATA----------

```
CHANGE    DISCHARGE                                                  1019B
DISCHARGE -1.       45.       105.      130.      190.               1019C
END                                                                  1019D
COMPUTE   26.2      27.1      26.1+                                  1019E
```

----------END OF 80/80 LIST----------

COMPUTE 26.2 27.1 26.14 1819E

----------STARTING DATA FROM PREVIOUS COMPUTATIONS----------

RATING TABLE FOR SECTION 26.2 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	837.30	0.0	0.0						
1	840.08	72.8	45.0	0.00	0.00	0.00	45.00	838.1	.00025
BANK FULL	841.3	199.7	103.3	0.00	0.00	0.00			
2	841.33	205.5	105.0	0.00	0.00	0.00	105.00	838.5	.00021
3	841.75	287.6	130.0	0.00	0.00	0.00	130.00	838.7	.00017
4	842.79	517.9	190.0	0.00	0.00	0.00	190.00	838.9	.00008

SEGMENT TABLE FOR SECTION 26.2

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	45.	0.	45.	0.
45.	VELOCITY FPS	.62	0.00	.62	0.00
2	DISCHARGE CFS	105.	12.	93.	0.
105.	VELOCITY FPS	.69	.16	.72	0.00
3	DISCHARGE CFS	130.	27.	103.	0.
130.	VELOCITY FPS	.63	.20	.69	0.00
4	DISCHARGE CFS	190.	70.	120.	0.
190.	VELOCITY FPS	.49	.23	.59	.06
1	ELEV 840.08 KO	2853.	1.	2851.	1.
2	ELEV 841.33 KO	7155.	707.	6447.	1.
3	ELEV 841.75 KO	9973.	1838.	8133.	1.
4	ELEV 842.79 KO	20808.	7521.	13259.	28.

RATING TABLE FOR SECTION 26.6 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED			CSN	CRIT ELEV	FRICTION SLOPE
				DAMAGE	CHANNEL	NON-DAM			
0	839.00	0.0	0.0						
1	841.18	36.2	45.0	0.00	0.00	0.00	45.00	840.0	.00141
BANK FULL	841.2	36.7	46.1	0.00	0.00	0.00			
2	842.25	88.8	105.0	0.00	0.00	0.00	105.00	840.5	.00107
3	842.64	112.6	130.0	0.00	0.00	0.00	130.00	840.6	.00093
4	843.43	172.2	190.0	0.00	0.00	0.00	190.00	841.0	.00074

SEGMENT TABLE FOR SECTION 26.6

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	45.	0.	45.	0.
45.	VELOCITY FPS	1.27	0.00	1.26	.13
2	DISCHARGE CFS	105.	0.	96.	9.
105.	VELOCITY FPS	1.46	0.00	1.51	.34
3	DISCHARGE CFS	130.	0.	115.	15.
130.	VELOCITY FPS	1.46	0.00	1.54	.39
4	DISCHARGE CFS	190.	1.	157.	31.
190.	VELOCITY FPS	1.49	.17	1.61	.47
1	ELEV 841.18 KD	1198.	1.	1196.	2.
2	ELEV 842.25 KD	3185.	1.	2959.	225.
3	ELEV 842.64 KD	4252.	1.	3777.	474.
4	ELEV 843.43 KD	6954.	22.	5803.	1128.

RATING TABLE FOR SECTION 26.9 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	841.30	0.0	0.0						
1	843.18	28.3	45.0	0.00	0.00	0.00	45.00	842.3	.00272
2	844.04	49.5	105.0	0.00	0.00	0.00	105.00	842.8	.00276
3	844.24	54.4	130.0	0.00	0.00	0.00	130.00	842.9	.00318
4	844.94	74.0	190.0	0.00	0.00	0.00	190.00	843.2	.00276

SEGMENT TABLE FOR SECTION 26.9

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	45.	0.	45.	0.
45.	VELOCITY FPS	1.60	0.00	1.59	0.00
2	DISCHARGE CFS	105.	0.	105.	0.
105.	VELOCITY FPS	2.13	0.00	2.12	0.00
3	DISCHARGE CFS	130.	0.	130.	0.
130.	VELOCITY FPS	2.39	0.00	2.39	0.00
4	DISCHARGE CFS	190.	0.	190.	0.
190.	VELOCITY FPS	2.57	0.00	2.57	0.00
1	ELEV 843.18 KO	863.	1.	861.	1.
2	ELEV 844.04 KO	1997.	1.	1995.	1.
3	ELEV 844.24 KO	2306.	1.	2304.	1.
4	ELEV 844.94 KO	3615.	1.	3613.	1.

TABLE OF VALUES FOR BPR EQUATION

COEFK	AKB	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
.2611	.2100	0.0000	0.0000	0.0000	.0411	.8404	1.0000	1.0000	27.1781	44.4499	42.3946
DCRIT	841.67	KBCRIT=									
.3875	.3360	0.0000	0.0000	0.0000	.0515	.7808	1.0000	1.0000	38.7456	69.0657	66.2409
DCRIT	842.42	KBCRIT=									
.4149	.3625	0.0000	0.0000	0.0000	.0524	.7695	1.0000	1.0000	41.5270	75.6004	72.2325
DCRIT	842.61	KBCRIT=									
.5085	.4531	0.0000	0.0000	0.0000	.0554	.7330	1.0000	1.0000	50.6744	98.4267	93.5378
DCRIT	843.04	KBCRIT=									

ROAD SECTION 27.0

NO.	HW	CFS	HL	TW	CSM
0	848.80	0.00	0.00	0.00	0.00
1	843.29	45.00	.02	843.27	45.00
2	844.25	105.00	.08	844.17	105.00
3	844.48	130.00	.10	844.38	130.00
4	845.25	190.00	.16	845.09	190.00

MIN ROAD ELEVATION 847.00

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 846.00 OPENING NO.= 1

RATING TABLE FOR SECTION +27.05 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	841.40	0.0	0.0						
1	843.37	32.0	45.0	0.00	0.00	0.00	45.00	842.2	.00170
2	844.33	54.8	105.0	0.00	0.00	0.00	105.00	842.7	.00192
3	844.57	61.2	130.0	0.00	0.00	0.00	130.00	842.9	.00215
4	845.33	82.2	190.0	0.00	0.00	0.00	190.00	843.2	.00198

SEGMENT TABLE FOR SECTION +27.05

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	45.	0.	45.	0.
45.	VELOCITY FPS	1.40	0.00	1.40	0.00
2	DISCHARGE CFS	105.	0.	105.	0.
105.	VELOCITY FPS	1.92	0.00	1.92	0.00
3	DISCHARGE CFS	130.	0.	130.	0.
130.	VELOCITY FPS	2.13	0.00	2.12	0.00
4	DISCHARGE CFS	190.	0.	190.	0.
190.	VELOCITY FPS	2.32	0.00	2.31	0.00
1	ELEV 843.37 KO	1091.	1.	1089.	1.
2	ELEV 844.33 KO	2396.	1.	2394.	1.
3	ELEV 844.57 KO	2806.	1.	2804.	1.
4	ELEV 845.33 KO	4270.	1.	4268.	1.

RATING TABLE FOR SECTION 27.1 UA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	841.00	0.0	0.0						
1	843.44	42.8	45.0	0.00	0.00	0.00	45.00	841.8	.00072
2	844.43	68.0	105.0	0.00	0.00	0.00	105.00	842.3	.00104
3	844.68	75.0	130.0	0.00	0.00	0.00	130.00	842.5	.00120
4	845.44	97.5	190.0	0.00	0.00	0.00	190.00	842.8	.00122

SEGMENT TABLE FOR SECTION 27.1

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	45.	0.	45.	0.
45.	VELOCITY FPS	1.05	0.00	1.05	0.00
2	DISCHARGE CFS	105.	0.	105.	0.
105.	VELOCITY FPS	1.55	0.00	1.54	0.00
3	DISCHARGE CFS	130.	0.	130.	0.
130.	VELOCITY FPS	1.73	0.00	1.73	0.00
4	DISCHARGE CFS	190.	0.	190.	0.
190.	VELOCITY FPS	1.95	0.00	1.95	0.00
1	ELEV 843.44 KO	1672.	1.	1670.	1.
2	ELEV 844.43 KO	3263.	1.	3261.	1.
3	ELEV 844.68 KO	3760.	1.	3758.	1.
4	ELEV 845.44 KO	5436.	1.	5434.	1.

----------80/80 LIST OF INPUT DATA----------

```
LINK                                                                    1019E
REACH     27.3        1.          450.        450.                      1020
SEGMENT   27.3        1           N           -60.                      1021
NVALUE    .15                                                           1022
SEGMENT   27.3        2           C           20.                       1023
NVALUE    .07                                                           1024
SEGMENT   27.3        3           N           106.1                     1025
NVALUE    .15                                                           1026
SECTION   27.3                                                          1027
          -370.       864.        -370.       847.9       -310.       847.8   1028
          -260.       844.5       -210.       844.        -160.       843.9   1029
          -110.       843.5       -60.        843.2       -10.        842.2   1030
          -5.         841.3       0.          841.5       5.          841.5   1031
          10.         842.5       20.         846.7       70.         848.6   1032
          71.         852.3       106.        854.2       106.1       864.    1033
ENDTABLE                                                                1034
REACH     27.4+       1.          385.        370.                      1035
REACH2    27.3                                                          1036
ROAD      27.45       2.7         50.         50.                       1037
CULV1     27.45       1           22551                                 1038
CULV2     3.          0.          24.7        841.65      841.45        1039
CULV1     27.45       1           22551                                 1040
CULV2     3.          0.          24.7        841.45      841.66        1041
CULV1     27.45       1           22551                                 1042
CULV2     3.          0.          24.7        841.28      841.78        1043
CULV1     27.45       1           22551                                 1044
CULV2     3.          0.          24.7        841.6       841.96        1045
SECTION   27.45                                                         1046
          -535.       863.        -535.       853.8       -500.       852.3   1047
          -420.       843.9       -300.       848.2       -200.       845.6   1048
          -100.       847.3       0.          847.        100.        846.7   1049
          200.        843.1       300.        851.3       400.        853.1   1050
          400.1       863.                                              1051
ENDTABLE                                                                1052
REACH     27.5+       1.          50.         50.                       1053
REACH2    27.6        -.8                                               1054
REACH     27.6        1.          100.        100.                      1055
SEGMENT   27.6        1           N           -14.                      1056
NVALUE    .165                                                          1057
SEGMENT   27.6        2           C           19.                       1058
NVALUE    .07                                                           1059
SEGMENT   27.6        3           N           164.1                     1060
NVALUE    .165                                                          1061
SECTION   27.6                                                          1062
          -490.       862.        -490.       849.3       -400.       849.    1063
```

80/80 LIST OF INPUT DATA

```
          -300.     847.5     -200.     846.8     -100.     846.      1064
          -50.      845.7     -14.      845.2     -7.       843.3     1065
          0.        842.4     7.        844.      14.       845.2     1066
          19.       846.7     64.       848.8     114.      851.6     1067
          164.      853.4     164.1     862.                          1068
ENDTABLE                                                              1069
REACH     27.9      1.        750.      750.                          1070
SEGMENT   27.9      1         N         -13.                          1071
NVALUE    .085                                                        1072
SEGMENT   27.9      2         C         14.                           1073
NVALUE    .055                                                        1074
SEGMENT   27.9      3         N         100.1                         1075
NVALUE    .085                                                        1076
SECTION   27.9                                                        1077
          -93.      863.      -93.      856.9     -43.      856.1     1078
          -28.      855.4     -13.      848.4     -7.       844.9     1079
          0.        843.3     7.        845.6     14.       847.2     1080
          50.       851.4     100.      857.7     100.1     863.      1081
ENDTABLE                                                              1082
REACH     +27.95    1.        455.      400.                          1083
REACH2    27.9                                                        1084
ROAD      28.0      2.7       50.       50.                           1085
CULV1     28.0      1         13322                                   1086
CULV2     5.5       9.        116.      843.72    843.44              1087
CULV1     28.0      1         22534                                   1088
CULV2     2.5       0.        75.5      847.45    847.45              1089
SECTION   28.0                                                        1090
          -600.     373.      -600.     857.6     -500.     856.1     1091
          -400.     855.6     -300.     855.4     -200.     855.4     1092
          -100.     855.5     0.        856.2     100.      857.7     1093
          200.      861.      250.      861.5     300.      862.9     1094
          300.1     873.                                              1095
ENDTABLE                                                              1096
REACH     +28.05    1.        50.       50.                           1097
REACH2    28.1                                                        1098
REACH     28.1      1.        75.       75.                           1099
SEGMENT   28.1      1         N         -10.                          1100
NVALUE    .085                                                        1101
SEGMENT   28.1      2         C         12.                           1102
NVALUE    .055                                                        1103
SEGMENT   28.1      3         N         120.1                         1104
NVALUE    .085                                                        1105
SECTION   28.1                                                        1106
          -100.     863.      -100.     855.2     -80.      854.5     1107
          -10.      851.6     -7.       844.5     0.        843.3     1108
```

80/80 LIST OF INPUT DATA

```
          7.        845.2     12.       846.8     65.       849.2     1109
          100.      851.1     102.      854.7     120.      856.4     1110
          120.1     863.                                              1111
ENDTABLE                                                              1112
REACH     28.4      1.        1535.     1490.                         1113
SEGMENT   28.4      1         N         -20.                          1114
NVALUE    .085                                                        1115
SEGMENT   28.4      2         C         15.                           1116
NVALUE    .06                                                         1117
SEGMENT   28.4      3         N         330.1                         1118
NVALUE    .085                                                        1119
SECTION   28.4                                                        1120
          -220.     864.      -220.     852.5     -200.     852.4     1121
          -100.     849.7     -20.      849.3     -10.      846.4     1122
          -5.       844.7     0.        844.7     5.        844.8     1123
          10.       840.7     15.       849.4     100.      849.2     1124
          200.      850.      300.      851.      330.      851.7     1125
          330.1     864.                                              1126
ENDTABLE                                                              1127
REACH     28.6      1.        1855.     1660.                         1128
SEGMENT   28.6      1         N         -12.                          1129
NVALUE    .15                                                         1130
SEGMENT   28.6      2         C         14.                           1131
NVALUE    .065                                                        1132
SEGMENT   28.6      3         N         610.1                         1133
NVALUE    .125                                                        1134
SECTION   28.6                                                        1135
          -130.     866.3     -130.     863.1     -105.     862.2     1136
          -75.      861.      -45.      858.1     -12.      849.1     1137
          -8.       846.3     0.        846.3     10.       846.5     1138
          14.       848.4     64.       849.8     164.      850.      1139
          264.      848.8     364.      849.4     464.      850.2     1140
          565.      850.8     610.      850.8     610.1     866.3     1141
ENDTABLE                                                              1142
REACH     28.8      1.        1845.     1700.                         1143
SEGMENT   28.8      1         N         -15.                          1144
NVALUE    .125                                                        1145
SEGMENT   28.8      2         C         15.                           1146
NVALUE    .055                                                        1147
SEGMENT   28.8      3         N         640.1                         1148
NVALUE    .1                                                          1149
SECTION   28.8                                                        1150
          -560.     866.      -560.     851.6     -500.     851.5     1151
          -400.     850.8     -300.     851.      -200.     851.      1152
          -100.     851.3     -15.      850.9     -12.      848.      1153
```

80/80 LIST OF INPUT DATA

```
          -6.       846.8     0.        846.6     6.        846.9     1154
          12.       847.9     15.       850.4     50.       851.5     1155
          100.      851.      200.      851.1     300.      851.2     1156
          400.      851.2     500.      851.5     600.      851.5     1157
          640.      851.7     640.1     866.                          1158
ENDTABLE                                                              1159
REACH     28.9      1.        1005.     880.                          1161
SEGMENT   28.9      1         N         -12.                          1162
NVALUE    .09                                                         1163
SEGMENT   28.9      2         C         15.                           1164
NVALUE    .06                                                         1165
SEGMENT   28.9      3         N         430.1                         1166
NVALUE    .1                                                          1167
SECTION   28.9                                                        1168
          -340.     867.      -390.     853.1     -300.     852.5     1169
          -200.     852.2     -100.     852.8     -12.      852.8     1170
          -1.       843.5     0.        847.2     5.        847.7     1171
          10.       848.8     15.       852.8     50.       852.2     1172
          100.      852.1     200.      854.5     300.      855.      1173
          385.      856.      400.      858.      430.      860.      1174
          430.1     867.                                              1175
ENDTABLE                                                              1176
REACH     +28.95    1.        490.      490.                          1177
REACH2    29.1                                                        1178
ROAD      29.9      2.7       50.       50.                           1179
CULV1     29.0      1         12311                                   1180
CULV2     2.24      0.        58.       848.5     849.6               1181
CULV1     29.0      1         12311                                   1182
CULV2     2.42      0.        58.       848.5     848.6               1183
CULV1     29.0      1         12311                                   1184
CULV2     2.57      0.        58.       848.5     848.72              1185
SECTION   29.0                                                        1186
          -600.     873.      -600.     859.1     -500.     858.2     1187
          -400.     857.8     -300.     857.3     -200.     856.7     1188
          -100.     855.3     0.        855.6     100.      855.9     1189
          200.      856.7     300.      857.      400.      857.6     1190
          500.      858.1     600.      858.4     600.1     870.      1191
ENDTABLE                                                              1192
REACH     +29.05    1.        50.       50.                           1193
REACH2    29.1                                                        1194
REACH     29.1      1.        80.       80.                           1195
SEGMENT   29.1      1         N         -15.                          1196
NVALUE    .065                                                        1197
SEGMENT   29.1      2         C         15.                           1198
NVALUE    .055                                                        1199
```

----------80/80 LIST OF INPUT DATA----------

```
SEGMENT   29.1     3        N        330.1                          1200
NVALUE    .15                                                      1201
SECTION   29.1                                                     1202
          -320.    863.     -320.    858.6    -250.    857.6       1203
          -150.    854.2    -50.     852.     -15.     850.8       1204
          -10.     843.2    -5.      848.4    0.       848.3       1205
          5.       843.4    10.      849.4    15.      853.6       1206
          50.      853.8    150.     851.8    250.     852.6       1207
          275.     856.4    300.     858.1    330.     860.1       1208
          330.1    863.                                            1209
ENDTABLE                                                           1210
REACH     29.5     1.       3900.    3900.                          1211
SEGMENT   29.5     1        N        -15.                           1212
NVALUE    .12                                                      1213
SEGMENT   29.5     2        C        15.                            1214
NVALUE    .065                                                     1215
SEGMENT   29.5     3        N        500.1                          1216
NVALUE    .09                                                      1217
SECTION   29.5                                                     1218
          -700.    871.     -700.    863.5    -600.    859.4       1219
          -500.    858.7    -400.    857.5    -300.    856.3       1220
          -200.    854.4    -100.    854.     -15.     854.5       1221
          -10.     851.4    -5.      850.6    0.       851.4       1222
          5.       851.     10.      851.5    15.      853.5       1223
          100.     856.4    200.     857.5    300.     857.4       1224
          400.     857.2    485.     858.1    500.     862.4       1225
          500.1    871.                                            1226
ENDTABLE                                                           1227
REACH     29.7     1.       5420.    3000.                          1228
SEGMENT   29.7     1        N        -10.                           1229
NVALUE    .155                                                     1230
SEGMENT   29.7     2        C        7.                             1231
NVALUE    .07                                                      1232
SEGMENT   29.7     3        N        550.1                          1233
NVALUE    .155                                                     1234
SECTION   29.7                                                     1235
          -650.1   876.5    -650.    875.4    -600.    862.2       1236
          -500.    862.2    -400.    861.8    -300.    860.2       1237
          -200.    863.2    -100.    860.2    -10.     858.6       1238
          -5.      856.5    0.       856.6    5.       857.        1239
          7.       859.     100.     858.1    200.     859.5       1240
          300.     863.5    400.     863.     500.     867.6       1241
          550.     863.5    550.1    876.5                          1242
ENDTABLE                                                           1243
REACH     29.9     1.       3475.    1950.                          1244
```

80/80 LIST OF INPUT DATA

```
SEGMENT   29.9     1        N        -20.                          1245
NVALUE    .15                                                      1246
SEGMENT   29.9     2        C        10.                           1247
NVALUE    .065                                                     1248
SEGMENT   29.9     3        N        220.1                         1249
NVALUE    .15                                                      1250
SECTION   29.9                                                     1251
          -240.    883.     -240.    875.6    -200.    870.        1252
          -100.    863.3    -20.     866.1    -10.     864.4       1253
          -3.      863.8    0.       863.2    3.       863.7       1254
          10.      866.7    100.     866.     160.     867.8       1255
          200.     874.2    220.     876.     220.1    883.        1256
ENDTABLE                                                           1257
ROAD      30.0     2.7      80.      80.                           1258
CULV1     30.0     1        22534                                  1259
CULV2     4.       0.       75.      862.     862.1                 1260
SECTION   30.0                                                     1261
          -300.    893.     -300.    884.3    -200.    881.        1262
          -100.    873.5    0.       878.     100.     879.        1263
          200.     881.3    300.     883.6    350.     885.        1264
          350.1    893.                                            1265
ENDTABLE                                                           1266
REACH     30.1+    1.       3.       3.                            1267
REACH2    29.9     0.2                                             1268
REACH     30.9+    1.       10.      10.                           1269
REACH2    31.2     -.3                                             1270
ROAD      31.0     2.7      3.       3.                            1271
CULV1     31.0     1        22534                                  1272
CULV2     3.       0.       342.     864.07   862.95                1273
SECTION   31.0                                                     1274
          -600.    893.     -600.    882.5    -500.    881.8       1275
          -400.    881.4    -300.    881.     -200.    880.9       1276
          -100.    880.6    0.       880.9    100.     880.8       1277
          200.     881.5    300.     881.4    400.     881.5       1278
          500.     881.8    600.     882.     600.1    893.        1279
ENDTABLE                                                           1280
REACH     31.1+    1.       100.     100.                          1281
REACH2    31.2                                                     1282
REACH     31.2     1.       150.     120.                          1283
SEGMENT   31.2     1        N        -15.                          1284
NVALUE    .15                                                      1285
SEGMENT   31.2     2        C        40.                           1286
NVALUE    .065                                                     1287
SEGMENT   31.2     3        N        75.1                          1288
NVALUE    .15                                                      1289
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-----------------------------80/80 LIST OF INPUT DATA-----------------------------
SECTION   31.2                                                                1290
          -260.     883.      -260.     875.6     -200.     871.            1291
          -100.     871.4     -15.      869.8     -7.       864.            1292
          0.        863.7     7.        864.      40.       874.9           1293
          75.       875.9     75.1      833.                                1294
ENDTABLE                                                                      1295
REACH     31.8      1.        615.      615.                                1296
SEGMENT   31.8      1         N         -10.                                1297
NVALUE    .09                                                                1298
SEGMENT   31.8      2         C         10.                                 1299
NVALUE    .055                                                               1300
SEGMENT   31.8      3         N         360.1                               1301
NVALUE    .09                                                                1302
SECTION   31.8                                                                1303
          -200.     885.      -200.     878.2     -170.     875.9           1304
          -130.     863.4     -100.     870.2     -70.      874.3           1305
          -40.      873.9     -10.      868.2     -5.       865.4           1306
          0.        865.2     5.        865.4     10.       867.2           1307
          100.      869.3     250.      872.      330.      873.8           1308
          360.      877.7     360.1     835.                                1309
ENDTABLE                                                                      1310
ROAD      32.0      2.7       110.      110.                                1311
CULV1     32.0      1         12311                                         1312
CULV2     2.        0.        60.       865.77    865.76                    1313
SECTION   32.0                                                                1314
          -200.     893.      -200.     879.9     -100.     876.2           1315
          0.        874.      100.      872.4     200.      872.6           1316
          300.      873.2     350.      874.7     400.      876.2           1317
          450.      877.7     500.      878.7     500.1     890.            1318
ENDTABLE                                                                      1319
REACH     32.1*     1.        50.       50.                                 1320
REACH2    31.8                                                                1321
COMPUTE   27.3      28.6      27.1                                          1322
-----------------------------END OF 80/80 LIST-----------------------------
```

COMPUTE 27.3 28.6 27.1 1322

----------STARTING DATA FROM PREVIOUS COMPUTATIONS----------

RATING TABLE FOR SECTION 27.3 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	841.30	0.0	0.0						
BANK FULL	843.2	57.6	36.7	0.00	0.00	0.00			
1	843.63	104.3	45.0	0.00	0.00	0.00	45.00	842.2	.00044
2	844.58	312.8	105.0	0.00	0.00	0.00	105.00	842.6	.00024
3	844.84	383.2	130.0	0.00	0.00	0.00	130.00	842.7	.00023
4	845.57	593.5	190.0	0.00	0.00	0.00	190.00	843.0	.00016

SEGMENT TABLE FOR SECTION 27.3

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	45.	1.	44.	0.
45.	VELOCITY FPS	.50	.08	.50	0.00
2	DISCHARGE CFS	105.	21.	84.	0.
105.	VELOCITY FPS	.49	.14	.53	0.00
3	DISCHARGE CFS	130.	31.	93.	0.
130.	VELOCITY FPS	.50	.15	.56	0.00
4	DISCHARGE CFS	190.	63.	127.	0.
190.	VELOCITY FPS	.46	.17	.55	0.00
1	ELEV 843.63 KO	2123.	42.	2081.	1.
2	ELEV 844.58 KO	6638.	1208.	5429.	1.
3	ELEV 844.84 KO	8576.	2004.	6571.	1.
4	ELEV 845.57 KO	15232.	4993.	10239.	1.

RATING TABLE FOR SECTION 27.4+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	841.30	0.0	0.0						
BANK FULL	843.2	57.6	34.8	0.00	0.00	0.00			
1	843.76	124.6	45.0	0.00	0.00	0.00	45.00	842.2	.00031
2	844.67	338.4	105.0	0.00	0.00	0.00	105.00	842.6	.00020
3	844.92	407.3	130.0	0.00	0.00	0.00	130.00	842.7	.00019
4	845.63	611.1	190.0	0.00	0.00	0.00	190.00	843.0	.00014

SEGMENT TABLE FOR SECTION 27.4+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	45.	2.	43.	0.
45.	VELOCITY FPS	.44	.09	.44	0.00
2	DISCHARGE CFS	105.	23.	82.	0.
105.	VELOCITY FPS	.45	.13	.50	0.00
3	DISCHARGE CFS	130.	33.	97.	0.
130.	VELOCITY FPS	.46	.15	.53	0.00
4	DISCHARGE CFS	190.	65.	125.	0.
190.	VELOCITY FPS	.44	.17	.53	0.00
1	ELEV 843.76 KD	2561.	105.	2456.	1.
2	ELEV 844.67 KD	7319.	1488.	5830.	1.
3	ELEV 844.92 KD	9354.	2374.	6979.	1.
4	ELEV 845.63 KD	15927.	5368.	10558.	1.

ROAD SECTION 27.45

NO.	HW	CFS	HL	TW	CSM.
0	841.65	0.00	0.00	0.00	0.00
1	843.78	45.00	0.00	843.78	45.00
2	844.93	105.00	.24	844.69	105.00
3	845.34	130.00	.40	844.94	130.00
4	846.20	190.00	.56	845.64	190.00

MIN ROAD ELEVATION 845.60

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	22551.	3.00		24.70	841.65	841.45	.012
2	1	22551.	3.00		24.70	841.45	841.66	.012
3	1	22551.	3.00		24.70	841.28	841.78	.012
4	1	22551.	3.00		24.70	841.60	841.96	.012

RATING TABLE FOR SECTION 27.5+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED			CSM	CRIT ELEV	FRICTION SLOPE
				DAMAGE	CHANNEL	NON-DAM			
0	841.60	0.0	0.0						
1	843.97	30.2	45.0	0.00	0.00	0.00	45.00	842.9	.00370
BANK FULL	844.4	42.6	68.8	0.00	0.00	0.00			
2	845.05	81.3	105.0	0.00	0.00	0.00	105.00	843.4	.00257
3	845.43	127.3	130.0	0.00	0.00	0.00	130.00	843.6	.00202
4	846.25	291.7	190.0	0.00	0.00	0.00	190.00	844.0	.00108

SEGMENT TABLE FOR SECTION 27.5+

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	45.	0.	45.	0.
45.	VELOCITY FPS	1.49	0.00	1.49	0.00
2	DISCHARGE CFS	105.	4.	101.	0.
105.	VELOCITY FPS	1.65	.21	1.67	0.00
3	DISCHARGE CFS	130.	14.	116.	0.
130.	VELOCITY FPS	1.55	.26	1.60	0.00
4	DISCHARGE CFS	190.	51.	139.	0.
190.	VELOCITY FPS	1.23	.27	1.41	.12
1	ELEV 843.97 KD	740.	1.	738.	1.
2	ELEV 845.05 KD	2042.	49.	1992.	1.
3	ELEV 845.43 KD	2838.	233.	2604.	1.
4	ELEV 846.25 KD	5733.	1464.	4263.	6.

RATING TABLE FOR SECTION 27.6 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED			CSM	CRIT ELEV	FRICTION SLOPE
				DAMAGE	CHANNEL	NON-DAM			
0	842.40	0.0	0.0						
1	844.60	26.3	45.0	0.00	0.00	0.00	45.00	843.7	.00542
BANK FULL	845.2	42.6	84.8	0.00	0.00	0.00			
2	845.51	56.2	105.0	0.00	0.00	0.00	105.00	844.2	.00478
3	845.82	78.6	130.0	0.00	0.00	0.00	130.00	844.4	.00419
4	846.50	170.1	190.0	0.00	0.00	0.00	190.00	844.8	.00271

SEGMENT TABLE FOR SECTION 27.6

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	45.	0.	45.	0.
45.	VELOCITY FPS	1.72	0.00	1.71	0.00
2	DISCHARGE CFS	105.	2.	103.	0.
105.	VELOCITY FPS	2.97	.26	2.06	0.00
3	DISCHARGE CFS	130.	5.	125.	0.
130.	VELOCITY FPS	2.09	.26	2.11	0.00
4	DISCHARGE CFS	190.	30.	160.	0.
190.	VELOCITY FPS	1.85	.33	1.98	0.00
1	ELEV 844.60 KD	611.	1.	609.	1.
2	ELEV 845.51 KD	1508.	6.	1501.	1.
3	ELEV 845.82 KD	1976.	39.	1935.	1.
4	ELEV 846.50 KD	3606.	513.	3093.	1.

RATING TABLE FOR SECTION 27.9 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED			CSM	CRIT ELEV	FRICTION SLOPE
				DAMAGE	CHANNEL	NON-DAM			
0	843.30	0.0	0.0						
1	846.21	29.5	45.0	0.00	0.00	0.00	45.00	844.8	.00190
2	847.15	50.1	105.0	0.00	0.00	0.00	105.00	845.5	.00250
BANK FULL	847.2	51.5	108.1	0.00	0.00	0.00			
3	847.59	61.8	130.0	0.00	0.00	0.00	130.00	845.7	.00211
4	848.17	80.3	190.0	0.00	0.00	0.00	190.00	846.1	.00223

SEGMENT TABLE FOR SECTION 27.9

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	45.	0.	45.	0.
45.	VELOCITY FPS	1.53	0.00	1.53	0.00
2	DISCHARGE CFS	105.	0.	105.	0.
105.	VELOCITY FPS	2.12	0.00	2.10	0.00
3	DISCHARGE CFS	130.	0.	130.	0.
130.	VELOCITY FPS	2.13	0.00	2.13	.37
4	DISCHARGE CFS	190.	0.	188.	2.
190.	VELOCITY FPS	2.46	0.00	2.47	.54
1	ELEV 846.21 KO	1031.	1.	1029.	1.
2	ELEV 847.15 KO	2101.	1.	2099.	1.
3	ELEV 847.59 KO	2825.	1.	2821.	3.
4	ELEV 848.17 KO	4022.	1.	3979.	41.

RATING TABLE FOR SECTION +27.95 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	843.30	0.0	0.0						
1	846.65	38.5	45.0	0.00	0.00	0.00	45.00	844.8	.00094
BANK FULL	847.2	51.5	76.3	0.00	0.00	0.00			
2	847.71	65.5	105.0	0.00	0.00	0.00	105.00	845.5	.00118
3	848.09	77.4	130.0	0.00	0.00	0.00	130.00	845.7	.00114
4	848.72	101.5	190.0	0.00	0.00	0.00	190.00	846.1	.00121

SEGMENT TABLE FOR SECTION +27.95

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	45.	0.	45.	0.
45.	VELOCITY FPS	1.18	0.00	1.17	0.00
2	DISCHARGE CFS	105.	0.	105.	0.
105.	VELOCITY FPS	1.64	0.00	1.63	.34
3	DISCHARGE CFS	130.	0.	129.	1.
130.	VELOCITY FPS	1.73	0.00	1.74	.37
4	DISCHARGE CFS	190.	0.	184.	6.
190.	VELOCITY FPS	2.01	0.00	2.03	.56
1	ELEV 846.65 KD	1466.	1.	1464.	1.
2	ELEV 847.71 KD	3044.	1.	3038.	6.
3	ELEV 848.09 KD	3850.	1.	3812.	36.
4	ELEV 848.72 KD	5450.	2.	5304.	144.

ROAD SECTION 28.0

NO.	HW	CFS	HL	TW	QSM
0	843.72	0.00	0.00	0.00	0.00
1	847.10	45.00	.40	846.70	45.00
2	848.73	105.00	.96	847.77	105.00
3	849.27	→130.00	1.12	848.15	130.00
4	850.78	190.30	2.00	848.78	190.00

MIN ROAD ELEVATION 855.40

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	13322.	5.50		116.00	843.72	843.44	.024
2	1	22534.	2.50		75.50	847.45	847.45	.012

RATING TABLE FOR SECTION +28.05 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	843.30	0.0	0.0						
BANK FULL	846.8	43.4	41.1	0.00	0.00	0.00			
1	847.13	52.0	45.0	0.00	0.00	0.00	45.00	844.7	.00038
2	848.76	126.4	105.0	0.00	0.00	0.00	105.00	845.3	.00032
3	849.29	164.6	130.0	0.00	0.00	0.00	130.00	845.5	.00029
4	850.80	299.5	190.0	0.00	0.00	0.00	190.00	845.9	.00017

SEGMENT TABLE FOR SECTION +28.05

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	45.	0.	45.	0.
45.	VELOCITY FPS	.90	0.00	.89	.17
2	DISCHARGE CFS	105.	0.	91.	14.
105.	VELOCITY FPS	1.04	0.00	1.10	.31
3	DISCHARGE CFS	130.	0.	105.	25.
130.	VELOCITY FPS	1.02	0.00	1.11	.36
4	DISCHARGE CFS	190.	0.	125.	65.
190.	VELOCITY FPS	.84	0.00	.99	.38
1	ELEV 847.13 KD	2293.	1.	2285.	7.
2	ELEV 848.76 KD	5815.	1.	5106.	708.
3	ELEV 849.29 KD	7578.	1.	6208.	1369.
4	ELEV 850.80 KD	14611.	1.	9701.	4909.

RATING TABLE FOR SECTION 28.1 OA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
J	843.30	0.0	0.0						
BANK FULL	846.8	43.4	40.0	0.00	0.00	0.00			
1	847.16	52.8	45.0	0.00	0.00	0.00	45.00	844.7	.00037
2	848.78	127.9	105.0	0.00	0.00	0.00	105.00	845.3	.00031
3	849.31	166.2	130.0	0.00	0.00	0.00	130.00	845.5	.00029
4	850.81	308.8	190.0	0.00	0.00	0.00	190.00	845.9	.00017

SEGMENT TABLE FOR SECTION 28.1

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	45.	0.	45.	0.
45.	VELOCITY FPS	.89	0.00	.88	.17
2	DISCHARGE CFS	105.	0.	91.	14.
105.	VELOCITY FPS	1.03	0.00	1.09	.31
3	DISCHARGE CFS	130.	0.	105.	25.
130.	VELOCITY FPS	1.01	0.00	1.10	.35
4	DISCHARGE CFS	190.	0.	125.	65.
190.	VELOCITY FPS	.84	0.00	.98	.37
1	ELEV 847.16 KD	2336.	1.	2327.	8.
2	ELEV 848.78 KD	5841.	1.	5155.	734.
3	ELEV 849.31 KD	7667.	1.	6254.	1402.
4	ELEV 850.81 KD	14684.	1.	9732.	4951.

RATING TABLE FOR SECTION 28.4 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	840.70	0.0	0.0						
1	847.48	76.4	45.0	0.00	0.00	0.00	45.00	843.4	.00019
2	849.16	158.5	105.0	0.00	0.00	0.00	105.00	844.9	.00022
BANK FULL	849.3	172.7	111.8	0.00	0.00	0.00			
3	849.68	213.6	130.0	0.00	0.00	0.00	130.00	845.1	.00022
4	850.94	661.2	190.0	0.00	0.00	0.00	190.00	845.5	.00008

SEGMENT TABLE FOR SECTION 28.4

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	45.	0.	45.	0.
45.	VELOCITY FPS	.59	0.00	.59	0.00
2	DISCHARGE CFS	105.	1.	101.	3.
105.	VELOCITY FPS	.79	.09	.79	.13
3	DISCHARGE CFS	130.	1.	122.	6.
130.	VELOCITY FPS	.81	.09	.84	.13
4	DISCHARGE CFS	190.	25.	108.	57.
190.	VELOCITY FPS	.47	.17	.57	.17
1	ELEV 847.48 KD	3252.	1.	3249.	1.
2	ELEV 849.16 KD	6829.	9.	6802.	18.
3	ELEV 849.68 KD	8777.	89.	8308.	380.
4	ELEV 850.94 KD	21453.	2648.	12850.	5947.

RATING TABLE FOR SECTION 28.6 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	846.30	0.0	0.0						
BANK FULL	846.4	44.2	39.2	0.00	0.00	0.00			
1	848.71	54.0	45.0	0.00	0.00	0.00	45.00	846.9	.00060
2	849.86	260.5	105.0	0.00	0.00	0.00	105.00	847.3	.00040
3	850.22	423.1	130.0	0.00	0.00	0.00	130.00	847.5	.00027
4	851.13	935.3	190.0	0.00	0.00	0.00	190.00	847.8	.00010

SEGMENT TABLE FOR SECTION 28.6

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	45.	0.	45.	0.
45.	VELOCITY FPS	.87	0.00	.87	.10
2	DISCHARGE CFS	105.	0.	76.	29.
105.	VELOCITY FPS	.81	.11	.94	.16
3	DISCHARGE CFS	130.	0.	73.	57.
130.	VELOCITY FPS	.65	.12	.81	.17
4	DISCHARGE CFS	190.	1.	66.	123.
190.	VELOCITY FPS	.37	.10	.58	.15
1	ELEV 848.71 KO	1840.	1.	1833.	6.
2	ELEV 849.86 KO	5228.	6.	3644.	1378.
3	ELEV 850.22 KO	7692.	15.	4606.	3071.
4	ELEV 851.13 KO	19389.	78.	6804.	12507.

----------80/80 LIST OF INPUT DATA----------

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CHANGE    DISCHARGE                                                    1323
DISCHARGE -1.       25.       55.       70.       100.               1324
END                                                                    1325
COMPUTE   28.8      29.1      28.6                                     1326
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----------END OF 80/80 LIST----------

COMPUTE 28.8 29.1 28.6 1326

----------STARTING DATA FROM PREVIOUS COMPUTATIONS----------

RATING TABLE FOR SECTION 28.8 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
1	846.60	0.0	0.0						
1	849.02	48.3	25.0	0.00	0.00	0.00	25.00	847.2	.00017
2	850.20	81.1	55.0	0.00	0.00	0.00	55.00	847.5	.00017
BANK FULL	850.4	87.7	62.7	0.00	0.00	0.00			
3	850.59	94.0	70.0	0.00	0.00	0.00	70.00	847.6	.00019
4	851.37	380.9	100.0	0.00	0.00	0.00	100.00	847.9	.00012

SEGMENT TABLE FOR SECTION 28.8

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	25.	0.	25.	0.
25.	VELOCITY FPS	.52	0.00	.52	0.00
2	DISCHARGE CFS	55.	0.	55.	0.
55.	VELOCITY FPS	.68	0.00	.68	0.00
3	DISCHARGE CFS	70.	0.	70.	0.
70.	VELOCITY FPS	.76	0.00	.76	.08
4	DISCHARGE CFS	100.	11.	82.	7.
100.	VELOCITY FPS	.64	.07	.71	.07
1	ELEV 849.02 KO	1905.	1.	1903.	1.
2	ELEV 850.20 KO	4162.	1.	4160.	1.
3	ELEV 850.59 KO	5066.	1.	5060.	6.
4	ELEV 851.37 KO	8707.	778.	7346.	583.

RATING TABLE FOR SECTION 28.9 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	847.20	0.0	0.0						
1	849.69	32.3	25.0	0.00	0.00	0.00	25.00	848.1	.00059
2	850.74	55.6	55.0	0.00	0.00	0.00	55.00	848.5	.00055
3	851.14	65.0	70.0	0.00	0.00	0.00	70.00	848.7	.00056
4	851.91	84.0	100.0	0.00	0.00	0.00	100.00	848.9	.00054

SEGMENT TABLE FOR SECTION 28.9

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	25.	0.	25.	0.
25.	VELOCITY FPS	.78	0.00	.77	0.00
2	DISCHARGE CFS	55.	0.	55.	0.
55.	VELOCITY FPS	.99	0.00	.99	0.00
3	DISCHARGE CFS	70.	0.	70.	0.
70.	VELOCITY FPS	1.08	0.00	1.08	0.00
4	DISCHARGE CFS	100.	0.	100.	0.
100.	VELOCITY FPS	1.19	0.00	1.19	0.00
1	ELEV 849.69 KO	1029.	1.	1027.	1.
2	ELEV 850.74 KO	2349.	1.	2347.	1.
3	ELEV 851.14 KO	2954.	1.	2952.	1.
4	ELEV 851.91 KO	4302.	1.	4300.	1.

RATING TABLE FOR SECTION +28.95 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	848.30	0.0	0.0						
1	850.03	30.0	25.0	0.00	0.00	0.00	25.00	848.9	.00071
BANK FULL	850.8	49.8	48.4	0.00	0.00	0.00			
2	851.02	57.0	55.0	0.00	0.00	0.00	55.00	849.2	.00055
3	851.40	71.5	70.0	0.00	0.00	0.00	70.00	849.3	.00050
4	852.11	127.3	100.0	0.00	0.00	0.00	100.00	849.5	.00038

SEGMENT TABLE FOR SECTION +28.95

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	25.	0.	25.	0.
25.	VELOCITY FPS	.84	0.00	.83	0.00
2	DISCHARGE CFS	55.	0.	55.	0.
55.	VELOCITY FPS	.99	.21	.99	0.00
3	DISCHARGE CFS	70.	2.	68.	0.
70.	VELOCITY FPS	1.04	.27	1.05	0.00
4	DISCHARGE CFS	100.	9.	90.	1.
100.	VELOCITY FPS	1.01	.34	1.05	.09
1	ELEV 850.03 KD	939.	1.	937.	1.
2	ELEV 851.02 KD	2345.	7.	2336.	1.
3	ELEV 851.40 KD	3116.	48.	3067.	1.
4	ELEV 852.11 KD	5067.	412.	4647.	8.

ROAD SECTION 29.0

NO.	HW	CFS	HL	TW	CSM
0	848.60	0.00	0.00	0.00	0.00
1	850.50	25.00	.40	850.10	25.00
2	852.02	55.00	.96	851.06	55.00
3	852.87	70.00	1.44	851.43	70.00
4	855.41	100.00	3.28	852.13	100.00

MIN ROAD ELEVATION 855.60

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	12311.	2.24		58.00	848.50	849.60	.024
2	1	12311.	2.42		58.00	848.50	848.60	.024
3	1	12311.	2.57		58.00	848.50	848.72	.024

RATING TABLE FOR SECTION +29.05 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED			CSM	CRIT ELEV	FRICTION SLOPE
				DAMAGE	CHANNEL	NON-DAM			
0	848.30	0.0	0.0						
1	850.51	41.8	25.0	0.00	0.00	0.00	25.00	848.9	.00026
BANK FULL	850.8	49.8	30.7	0.00	0.00	0.00			
2	852.02	115.6	55.0	0.00	0.00	0.00	55.00	849.2	.00013
3	852.88	277.6	70.0	0.00	0.00	0.00	70.00	849.3	.00006
4	855.41	1246.0	100.0	0.00	0.00	0.00	100.00	849.5	.00001

SEGMENT TABLE FOR SECTION +29.05

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	25.	0.	25.	0.
25.	VELOCITY FPS	.60	0.00	.60	0.00
2	DISCHARGE CFS	55.	4.	50.	1.
55.	VELOCITY FPS	.59	.19	.61	.05
3	DISCHARGE CFS	70.	12.	52.	6.
70.	VELOCITY FPS	.43	.17	.48	.06
4	DISCHARGE CFS	100.	36.	36.	29.
100.	VELOCITY FPS	.13	.09	.20	.04
1	ELEV 850.51 KD	1538.	1.	1536.	1.
2	ELEV 852.02 KD	4796.	348.	4444.	4.
3	ELEV 852.88 KD	8735.	1479.	6638.	619.
4	ELEV 855.41 KD	44042.	15646.	15820.	12576.

RATING TABLE FOR SECTION 29.1 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	848.30	0.0	0.0						
1	850.54	42.3	25.0	0.00	0.00	0.00	25.00	848.9	.00025
BANK FULL	850.8	49.8	30.3	0.00	0.00	0.00			
2	852.04	117.0	55.0	0.00	0.00	0.00	55.00	849.2	.00013
3	852.88	276.6	70.0	0.00	0.00	0.00	70.00	849.3	.00006
4	855.41	1246.2	100.0	0.00	0.00	0.00	100.00	849.5	.00001

SEGMENT TABLE FOR SECTION 29.1

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	25.	0.	25.	0.
25.	VELOCITY FPS	.59	0.00	.59	0.00
2	DISCHARGE CFS	55.	4.	50.	1.
55.	VELOCITY FPS	.58	.19	.60	.05
3	DISCHARGE CFS	70.	12.	52.	6.
70.	VELOCITY FPS	.43	.17	.48	.06
4	DISCHARGE CFS	100.	36.	35.	29.
100.	VELOCITY FPS	.13	.09	.20	.04
1	ELEV 850.54 KD	1567.	1.	1565.	1.
2	ELEV 852.04 KD	4827.	355.	4468.	4.
3	ELEV 852.88 KD	8768.	1469.	6652.	627.
4	ELEV 855.41 KD	44051.	15650.	15622.	12579.

----------80/80 LIST OF INPUT DATA----------

```
CHANGE    DISCHARGE                                          1327
DISCHARGE -1.       15.      25.      35.      50.          1328
END                                                         1329
COMPUTE   29.5      31.2     29.1                          1330
```

----------END OF 80/80 LIST----------

COMPUTE 29.5 31.2 29.1 1330

----------STARTING DATA FROM PREVIOUS COMPUTATIONS----------

RATING TABLE FOR SECTION 29.5 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSN	CRIT ELEV	FRICTION SLOPE
0	851.60	0.0	0.0						
1	852.34	26.1	15.0	0.00	0.00	0.00	15.00	851.3	.00058
2	853.16	47.5	25.0	0.00	0.00	0.00	25.00	851.5	.00026
BANK FULL	853.5	56.5	30.6	0.00	0.00	0.00			
3	853.75	67.5	35.0	0.00	0.00	0.00	35.00	851.5	.00021
4	855.51	448.5	50.0	0.00	0.00	0.00	50.00	851.7	.00002

SEGMENT TABLE FOR SECTION 29.5

CSN		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	15.	0.	15.	0.
15.	VELOCITY FPS	.58	0.00	.57	0.00
2	DISCHARGE CFS	25.	0.	25.	0.
25.	VELOCITY FPS	.53	0.00	.53	0.00
3	DISCHARGE CFS	35.	0.	35.	0.
35.	VELOCITY FPS	.55	.04	.55	.12
4	DISCHARGE CFS	50.	17.	29.	5.
50.	VELOCITY FPS	.20	.06	.25	.08
1	ELEV 852.34 KQ	624.	1.	622.	1.
2	ELEV 853.16 KQ	1537.	1.	1535.	1.
3	ELEV 853.75 KQ	2393.	2.	2386.	5.
4	ELEV 855.51 KQ	10797.	3518.	6311.	968.

RATING TABLE FOR SECTION 29.7 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	856.50	0.0	0.0						
1	856.22	24.1	15.0	0.00	0.00	0.00	15.00	857.1	.00091
BANK FULL	858.6	50.9	24.5	0.00	0.00	0.00			
2	858.62	53.4	25.0	0.00	0.00	0.00	25.00	857.2	.00084
3	858.85	83.1	35.0	0.00	0.00	0.00	35.00	857.4	.00080
4	859.13	141.0	50.0	0.00	0.00	0.00	50.00	857.5	.00064

SEGMENT TABLE FOR SECTION 29.7

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	15.	0.	14.	1.
15.	VELOCITY FPS	.72	0.00	.73	.14
2	DISCHARGE CFS	25.	0.	20.	4.
25.	VELOCITY FPS	.74	.14	.78	.17
3	DISCHARGE CFS	35.	0.	25.	10.
35.	VELOCITY FPS	.72	.10	.83	.19
4	DISCHARGE CFS	50.	2.	27.	22.
50.	VELOCITY FPS	.64	.16	.77	.23
1	ELEV 858.22 KD	485.	1.	479.	5.
2	ELEV 858.62 KD	834.	2.	721.	111.
3	ELEV 858.85 KD	1219.	7.	893.	318.
4	ELEV 859.13 KD	1901.	31.	1133.	736.

RATING TABLE FOR SECTION 29.9 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	863.20	0.0	0.0						
1	864.95	17.6	15.0	0.00	0.00	0.00	15.00	864.0	.00163
2	865.32	25.4	25.0	0.00	0.00	0.00	25.00	864.2	.00162
3	865.60	31.7	35.0	0.00	0.00	0.00	35.00	864.4	.00170
4	865.95	43.0	50.0	0.00	0.00	0.00	50.00	864.5	.00172

SEGMENT TABLE FOR SECTION 29.9

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	15.	0.	15.	0.
15.	VELOCITY FPS	.86	0.00	.85	0.00
2	DISCHARGE CFS	25.	0.	25.	0.
25.	VELOCITY FPS	.99	0.00	.98	0.00
3	DISCHARGE CFS	35.	0.	35.	0.
35.	VELOCITY FPS	1.10	0.00	1.10	0.00
4	DISCHARGE CFS	50.	0.	50.	0.
50.	VELOCITY FPS	1.22	0.00	1.21	.13
1	ELEV 864.95 KQ	372.	1.	369.	1.
2	ELEV 865.32 KQ	621.	1.	619.	1.
3	ELEV 865.60 KQ	847.	1.	847.	1.
4	ELEV 865.95 KQ	1236.	2.	1230.	4.

MAIN BRANCH PORTAGE CREEK, MICHIGAN
PRELIMINARY FINAL RUN

ROAD SECTION 30.0

NO.	HW	CFS	HL	TW	CSM
0	862.10	0.00	0.00	0.00	0.00
1	864.97	15.00	0.00	864.97	15.00
2	865.43	25.00	.08	865.35	25.00
3	865.87	35.00	.24	865.63	35.00
4	866.38	50.00	.40	865.98	50.00

MIN ROAD ELEVATION 873.00

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	L/S INVERT	D/S INVERT	(N) COEFF
1	1	22534.	4.00		75.00	862.00	862.10	.012

RATING TABLE FOR SECTION 30.1+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	863.40	0.0	0.0						
1	864.96	14.1	15.0	0.00	0.00	0.00	15.00	864.2	.00302
2	865.42	23.0	25.0	0.00	0.00	0.00	25.00	864.4	.00211
3	865.86	33.6	35.0	0.00	0.00	0.00	35.00	864.6	.00150
BANK FULL	866.3	48.0	48.0	0.00	0.00	0.00			
4	866.37	50.2	50.0	0.00	0.00	0.00	50.00	864.7	.00115

SEGMENT TABLE FOR SECTION 30.1+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	15.	0.	15.	0.
15.	VELOCITY FPS	1.07	0.00	1.06	0.00
2	DISCHARGE CFS	25.	0.	25.	0.
25.	VELOCITY FPS	1.09	0.00	1.09	0.00
3	DISCHARGE CFS	35.	0.	35.	0.
35.	VELOCITY FPS	1.05	0.00	1.05	0.00
4	DISCHARGE CFS	50.	0.	50.	0.
50.	VELOCITY FPS	1.06	0.00	1.06	.07
1	ELEV 864.96 KD	273.	1.	271.	1.
2	ELEV 865.42 KD	545.	1.	543.	1.
3	ELEV 865.86 KD	904.	1.	901.	1.
4	ELEV 866.37 KD	1474.	2.	1465.	6.

RATING TABLE FOR SECTION 30.9+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	863.40	0.0	0.0						
1	864.98	23.6	15.0	0.00	0.00	0.00	15.00	863.9	.00063
2	865.44	33.1	25.0	0.00	0.00	0.00	25.00	864.0	.00065
3	865.87	43.0	35.0	0.00	0.00	0.00	35.00	864.1	.00061
4	866.36	55.4	50.0	0.00	0.00	0.00	50.00	864.3	.00060

SEGMENT TABLE FOR SECTION 30.9+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	15.	0.	15.	0.
15.	VELOCITY FPS	.63	0.00	.64	0.00
2	DISCHARGE CFS	25.	0.	25.	0.
25.	VELOCITY FPS	.76	0.00	.76	0.00
3	DISCHARGE CFS	35.	0.	35.	0.
35.	VELOCITY FPS	.81	0.00	.81	0.00
4	DISCHARGE CFS	50.	0.	50.	0.
50.	VELOCITY FPS	.90	0.00	.90	0.00
1	ELEV 864.98 KD	599.	1.	597.	1.
2	ELEV 865.44 KD	978.	1.	976.	1.
3	ELEV 865.87 KD	1422.	1.	1420.	1.
4	ELEV 866.36 KD	2043.	1.	2041.	1.

MAIN BRANCH PORTAGE CREEK, MICHIGAN
PRELIMINARY FINAL RUN

ROAD SECTION 31.0

NO.	HW	CFS	HL	TW	CSM
0	864.07	0.00	0.00	0.00	0.00
1	865.78	15.00	.80	864.98	15.00
2	866.48	25.00	1.04	865.44	25.00
3	867.32	35.00	1.44	865.88	35.00
4	869.18	50.00	2.80	866.38	50.00

MIN ROAD ELEVATION 880.60

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	22534.	3.00		342.00	864.07	862.95	.012

RATING TABLE FOR SECTION 31.1+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED			CSM	CRIT ELEV	FRICTION SLOPE
				DAMAGE	CHANNEL	NON-DAM			
0	863.70	0.0	0.0						
1	865.81	34.6	15.0	0.00	0.00	0.00	15.00	864.2	.00021
2	866.50	51.1	25.0	0.00	0.00	0.00	25.00	864.3	.00019
3	867.33	73.2	35.0	0.00	0.00	0.00	35.00	864.4	.00013
4	869.19	134.3	50.0	0.00	0.00	0.00	50.00	864.6	.00005

SEGMENT TABLE FOR SECTION 31.1+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	15.	0.	15.	0.
15.	VELOCITY FPS	.43	0.00	.43	0.00
2	DISCHARGE CFS	25.	0.	25.	0.
25.	VELOCITY FPS	.49	0.00	.49	0.00
3	DISCHARGE CFS	35.	0.	35.	0.
35.	VELOCITY FPS	.48	0.00	.48	0.00
4	DISCHARGE CFS	50.	0.	50.	0.
50.	VELOCITY FPS	.37	0.00	.37	0.00
1	ELEV 865.81 KO	1044.	1.	1042.	1.
2	ELEV 866.50 KO	1813.	1.	1811.	1.
3	ELEV 867.33 KO	3016.	1.	3014.	1.
4	ELEV 869.19 KO	6944.	1.	6942.	1.

RATING TABLE FOR SECTION 31.2 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	863.70	0.0	0.0						
1	865.84	35.3	15.0	0.00	0.00	0.00	15.00	864.2	.00020
2	866.53	51.8	25.0	0.00	0.00	0.00	25.00	864.3	.00018
3	867.35	73.9	35.0	0.00	0.00	0.00	35.00	864.4	.00013
4	869.20	134.6	50.0	0.00	0.00	0.00	50.00	864.6	.00005

SEGMENT TABLE FOR SECTION 31.2

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	15.	0.	15.	0.
15.	VELOCITY FPS	.42	0.00	.42	0.00
2	DISCHARGE CFS	25.	0.	25.	0.
25.	VELOCITY FPS	.48	0.00	.48	0.00
3	DISCHARGE CFS	35.	0.	35.	0.
35.	VELOCITY FPS	.47	0.00	.47	0.00
4	DISCHARGE CFS	50.	0.	50.	0.
50.	VELOCITY FPS	.37	0.00	.37	0.00
1	ELEV 865.84 KO	1074.	1.	1071.	1.
2	ELEV 866.53 KO	1850.	1.	1847.	1.
3	ELEV 867.35 KO	3050.	1.	3047.	1.
4	ELEV 869.20 KO	6964.	1.	6962.	1.

----------80/80 LIST OF INPUT DATA----------

```
CHANGE    DISCHARGE                                          1331
DISCHARGE -1.       10.       15.       20.       25.       1332
END                                                          1333
COMPUTE   31.8      32.1+     31.2                           1334
```

----------END OF 80/80 LIST----------

COMPUTE 31.6 32.1+ 31.2 1334

----------STARTING DATA FROM PREVIOUS COMPUTATIONS----------

RATING TABLE FOR SECTION 31.0 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	865.20	0.0	0.0						
1	866.43	13.8	10.0	0.00	0.00	0.00	10.00	865.6	.00082
2	866.87	20.7	15.0	0.00	0.00	0.00	15.00	865.7	.00057
BANK FULL	867.2	26.4	17.5	0.00	0.00	0.00			
3	867.52	35.2	20.0	0.00	0.00	0.00	20.00	865.8	.00026
4	869.21	157.2	25.0	0.00	0.00	0.00	25.00	865.9	.00002

SEGMENT TABLE FOR SECTION 31.0

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	10.	0.	10.	0.
10.	VELOCITY FPS	.72	0.00	.73	0.00
2	DISCHARGE CFS	15.	0.	15.	0.
15.	VELOCITY FPS	.72	0.00	.72	0.00
3	DISCHARGE CFS	20.	0.	20.	0.
20.	VELOCITY FPS	.61	0.00	.61	.09
4	DISCHARGE CFS	25.	0.	18.	7.
25.	VELOCITY FPS	.24	.05	.27	.08
1	ELEV 866.43 KO	350.	1.	348.	1.
2	ELEV 866.87 KO	629.	1.	627.	1.
3	ELEV 867.52 KO	1230.	1.	1218.	11.
4	ELEV 869.21 KO	5231.	25.	3794.	1412.

MAIN BRANCH PORTAGE CREEK, MICHIGAN
PRELIMINARY FINAL RUN

ROAD SECTION 32.0

NO.	HW	CFS	HL	TW	CSM
0	865.77	0.00	0.00	0.00	0.00
1	867.95	10.00	1.28	866.67	10.00
2	868.80	15.00	1.76	867.04	15.00
3	870.09	20.00	2.48	867.61	20.00
4	872.50	25.00	3.28	869.22	25.00

MIN ROAD ELEVATION 872.40

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	12311.	2.00		60.00	865.77	865.76	.024

RATING TABLE FOR SECTION 32.1+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
	865.20	0.0	0.0						
BANK FULL	867.2	26.4	7.3	0.00	0.00	0.00			
1	867.95	54.8	10.0	0.00	0.00	0.00	10.00	865.6	.00003
2	868.80	113.2	15.0	0.00	0.00	0.00	15.00	865.7	.00002
3	870.09	288.1	20.0	0.00	0.00	0.00	20.00	865.8	.00000
4	872.50	977.1	25.0	0.00	0.00	0.00	25.00	865.9	.00000

SEGMENT TABLE FOR SECTION 32.1+

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	10.	0.	9.	1.
10.	VELOCITY FPS	.22	0.00	.23	.05
2	DISCHARGE CFS	15.	0.	12.	3.
15.	VELOCITY FPS	.19	.03	.21	.06
3	DISCHARGE CFS	20.	0.	12.	8.
20.	VELOCITY FPS	.11	.02	.14	.04
4	DISCHARGE CFS	25.	3.	8.	14.
25.	VELOCITY FPS	.04	.02	.06	.02
1	ELEV 867.95 KD	1815.	1.	1727.	87.
2	ELEV 868.80 KD	3818.	7.	3033.	778.
3	ELEV 870.09 KD	9520.	196.	5624.	3700.
4	ELEV 872.50 KD	37105.	4658.	12051.	20397.

00BREAK00

1) COUNTY: Kalamazoo

2) STUDY NAME: ~~Portage Creek~~ Cities of Kalamazoo and Portage

3) WATERCOURSE: PORTAGE CREEK

4) DOCUMENT TYPE: INPUT DATA

00BREAK00

WSP2

WSP2 REV 10/12/77
PCT 10/23/76
LOAD 12/17/76

Main Branch of Portage Creek
Sections 12.0-32.14

PAGE 1

---------- 80/80 LIST OF INPUT DATA ----------

WSP2							1
TITLE	MAIN BRANCH PORTAGE CREEK, MICHIGAN						2
TITLE	PRELIMINARY FINAL RUN						3
DISCHARGE	-1.	395.	395. 50	465. 100	715. 500		4
STARTE	12.0	811.14	812.02	812.16	812.33		5
TRIP	23.2	24.6	24.8+	25.1+	27.1	28.6	8
TRIP	29.1	31.2	14.6+				9
OUTPUT	3						10
REACH	12.0	1.	0.	0.			11
SEGMENT	12.0	1	N	-13.65			12
NVALUE	.12						13
SEGMENT	12.0	2	C	13.65			14
NVALUE	.045						15
SEGMENT	12.0	3	N	35.1			16
NVALUE	.10						17
SECTION	12.0						18
	-39.	825.	-39.	809.6	-13.75	812.9	19
	-13.65	809.3	13.65	809.3	13.75	812.9	20
	35.	813.3	35.1	825.			21
ENDTABLE							22
REACH	12.9+	1.	2750.	2750.			23
REACH2	13.2						24
POND	13.0	2.7	50.	50.			25
BRK	13.0	3	3	2			26
PIER	808.5	2.	808.2	2.	809.9	2.	27
GIRDER	813.7	813.1	19.	.7	2.7		28
	-32.5	815.8	-32.4	813.1	32.4	813.1	29
	32.5	815.6					30
ENDTABLE							31
SECTION	13.0						32
	-1420.	827.	-1420.	810.	-1300.	810.7	33
	-1200.	811.1	-1000.	812.	-800.	812.9	34
	-600.	813.8	-400.	814.7	-200.	815.6	35
	-100.	815.	-50.	816.2	-32.5	815.8	36
	-32.4	813.4	-19.5	808.	-7.	807.3	37
	8.7	808.9	19.5	808.9	32.4	810.6	38
	32.5	815.3	50.	816.4	100.	816.5	39
	200.	816.7	300.	816.9	350.	817.1	40
	390.1	827.					41
ENDTABLE							42
REACH	13.1+	1.	50.	50.			43
REACH2	13.2						44
REACH	13.2	1.	310.	310.			45
SEGMENT	13.2	1	N	-65.			46
NVALUE	.15						47

R.R DAM based on rating curve.

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80/80 LIST OF INPUT DATA

SEGMENT	13.2	2	C	83.			48
NVALUE	.05						49
SEGMENT	13.2	3	N	161.			50
NVALUE	.15						51
SECTION	13.2						52
	-250.	827.	-250.	820.2	-200.	819.	53
	-150.	813.5	-100.	817.7	-75.	815.	54
	-65.	810.4	-30.	807.2	-25.	809.	55
	-10.	809.3	0.	809.2	25.	809.2	56
	35.	807.5	63.	810.	121.	811.5	57
	131.	811.7	146.	810.5	156.	814.6	58
	160.	815.9	161.	825.			59
ENDTABLE							64
REACH	13.9	1.	760.	725.			65
SEGMENT	13.9	1	N	-50.			66
NVALUE	.15						67
SEGMENT	13.9	2	C	18.			68
NVALUE	.05						69
SEGMENT	13.9	3	N	39.			70
NVALUE	.15						71
SECTION	13.9						72
	-195.	827.	-195.	819.1	-148.	813.8	73
	-115.	812.6	-85.	811.6	-50.	810.7	74
	-25.	807.5	-15.	807.6	-6.	807.9	75
	0.	807.9	11.	809.7	18.	813.5	76
	28.	814.5	38.	817.	39.	827.	77
ENDTABLE							82
ROAD	14.0	2.7	50.	50.			83
BFR	14.0	0	3	3			84
PIER	811.1	2.4	808.5	2.4	810.6	2.4	85
GIRDER	815.	814.7	13.	.7	2.7		86
	-30.	817.3	-29.9	814.7	29.9	814.7	87
	30.	817.3					88
ENDTABLE							89
SECTION	14.0						90
	-300.	823.	-300.	817.1	-300.	817.3	91
	-200.	817.5	-100.	817.7	-50.	817.8	92
	-30.	817.3	-29.9	812.2	-18.4	810.	93
	-6.5	809.	5.5	808.1	18.1	809.7	94
	29.9	811.5	30.	817.3	50.	817.9	95
	100.	818.	150.	818.2	200.	818.3	96
	250.	818.4	250.1	828.			97
ENDTABLE							98
REACH	14.1+	1.	50.	50.			99
REACH2	13.9	0.7					100

----------80/80 LIST OF INPUT DATA----------

REACH	14.6+	1.	209.	209.			100A
REACH2	14.7						100B
REACH	14.7	1.	1.	1.			101
SEGMENT	14.7	1	N	-25.			102
NVALUE	.125						103
SEGMENT	14.7	2	C	35.			104
NVALUE	.055						105
SEGMENT	14.7	3	N	310.1			106
NVALUE	.125						107
SECTION	14.7						108
	-225.	828.	-225.	820.9	-200.	820.	109
	-176.	819.	-151.	818.2	-127.	817.	110
	-102.	815.2	-92.	811.4	-75.	811.2	111
	-50.	811.3	-25.	811.3	-20.	810.7	112
	-10.	809.1	0.	808.9	10.	808.9	113
	22.	810.7	35.	811.1	85.	811.6	114
	135.	812.2	185.	812.	235.	812.6	115
	260.	813.4	285.	815.5	295.	817.8	116
	310.	821.8	310.1	828.			117
ENDTABLE							118
ROAD	15.0	2.7	30.	30.			119
BPP	15.0	A	2				120
GIRDER	814.5	810.4	0.	.7	2.7		121
	-13.1	818.3	-13.1	810.5	-7.6	814.	122
	7.6	814.	13.1	810.4	13.1	818.3	123
ENDTABLE							124
SECTION	15.0						125
	-600.	823.	-600.	823.6	-550.	823.4	126
	-500.	823.2	-450.	822.8	-400.	822.3	127
	-350.	821.9	-300.	821.2	-250.	820.6	128
	-200.	819.9	-150.	819.2	-100.	818.6	129
	-50.	818.2	-13.1	818.3	-13.1	810.5	130
	-7.5	809.8	0.	809.3	7.5	809.	131
	13.1	809.3	13.1	818.3	50.	818.3	132
	100.	819.3	150.	820.4	200.	822.1	133
	250.	824.4	250.1	829.			134
ENDTABLE							135
REACH	15.2	1.	40.	40.			136
SEGMENT	15.2	1	N	-15.			137
NVALUE	.06						138
SEGMENT	15.2	2	C	36.			139
NVALUE	.04						140
SEGMENT	15.2	3	N	221.1			141
NVALUE	.06						142
SECTION	15.2						143

80/80 LIST OF INPUT DATA

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          -178.     829.      -178.     821.2     -160.     820.5     144
          -145.     819.8     -130.     818.2     -115.     816.      145
          -90.      814.1     -65.      812.9     -40.      812.3     146
          -15.      812.5     -13.      809.2     0.        808.9     147
          15.       809.6     36.       810.      40.       812.6     148
          90.       813.3     140.      814.5     190.      815.8     149
          200.      816.1     203.      818.2     215.      818.8     150
          221.      821.7     221.1     826.                          151
ENDTABLE                                                            152
REACH     15.4      1.        80.       80.                           153
SEGMENT   15.4      1         N         -33.75                        154
NVALUE    .06                                                       155
SEGMENT   15.4      2         C         33.75                         156
NVALUE    .045                                                      157
SEGMENT   15.4      3         N         221.1                         158
NVALUE    .06                                                       159
SECTION   15.4                                                      160
          -178.     833.      -178.     821.2     -160.     820.5     161
          -145.     819.8     -130.     818.2     -115.     816.      162
          -90.      814.1     -65.      812.9     -40.      812.3     163
          -33.75    814.2     23.25     814.2     23.25     809.4     164
          27.05     809.4     27.05     814.2     29.05     814.2     165
          29.05     809.4     32.75     809.4     32.75     814.2     166
          33.75     814.2     36.       813.      40.       812.6     167
          90.       813.3     140.      814.5     190.      815.8     168
          200.      816.1     203.      818.2     215.      818.8     169
          221.      821.7     221.1     828.                          170
ENDTABLE                                                            171
REACH     15.5      1.        290.      290.                          172
SEGMENT   15.5      1         N         -39.                          173
NVALUE    .125                                                      174
SEGMENT   15.5      2         C         39.                           175
NVALUE    .06                                                       176
SEGMENT   15.5      3         N         77.1                          177
NVALUE    .10                                                       178
SECTION   15.5                                                      179
          -230.     829.      -230.     822.2     -216.     819.2     180
          -214.     816.2     -190.     815.9     -140.     816.      181
          -89.      815.6     -39.      815.2     -37.      813.8     182
          -25.      811.1     -24.      810.6     -12.      810.8     183
          0.        810.2     10.       809.9     20.       810.4     184
          38.       813.9     39.       815.5     64.       818.2     185
          67.       821.3     74.       821.5     77.       823.6     186
          77.1      823.                                            187
ENDTABLE                                                            188
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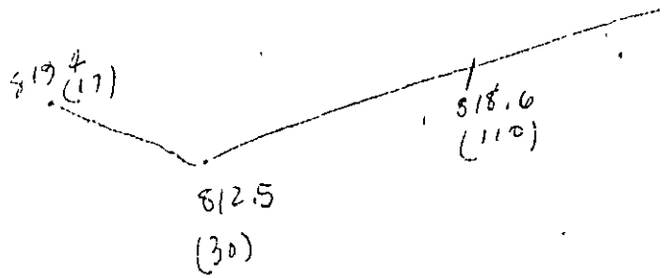
80/80 LIST OF INPUT DATA

REACH	15.9+	1.	350.	350.			189
REACH2	15.5	.7					190
ROAD	16.0	2.7	50.	50.			191
BPR	16.0	B	2	4			192
PIER	810.7	3.					193
GIRDER	818.5	818.	0.	.7	2.7		194
	-17.	819.4	-17.	820.7	-17.	816.	195
	-15.	818.	-3.5	818.	-1.5	815.6	196
	1.5	815.6	3.5	818.	14.8	818.	197
	17.	816.3	17.	820.7	17.	819.4	198
ENDTABLE							199
SECTION	16.0						200
	-420.	829.	-420.	822.7	-370.	822.	201
	-320.	821.2	-270.	821.7	-221.	821.7	202
	-202.	818.4	-140.	817.	-95.	815.7	203
	-17.	819.4	-17.	810.8	0.	810.6	205
	17.	811.3	17.	819.4	30.	812.5	206
	110.	818.6	135.	821.4	160.	822.8	208
	182.	824.2	182.1	829.			209
ENDTABLE							210
REACH	16.1+	1.	50.	50.			211
REACH2	16.6	-1.3					212
REACH	16.6	1.	445.	445.			213
SEGMENT	16.6	1	N	-47.			214
NVALUE	.06						215
SEGMENT	16.6	2	C	60.			216
NVALUE	.045						217
SEGMENT	16.6	3	N	182.1			218
NVALUE	.06						219
SECTION	16.6						220
	-420.	832.	-420.	822.7	-370.	822.	221
	-320.	821.2	-270.	821.7	-221.	821.7	222
	-202.	818.4	-140.	817.	-95.	815.7	223
	-47.	815.1	-45.	814.2	-30.	813.1	224
	-15.	813.2	0.	812.9	15.	812.7	225
	30.	812.5	45.	812.4	60.	815.2	226
	85.	816.6	110.	818.6	135.	821.4	227
	160.	822.8	182.	824.2	182.1	832.	228
ENDTABLE							229
REACH	16.9+	1.	200.	200.			230
REACH2	16.6						231
ROAD	17.0	2.7	50.	50.			232
BPR	17.0	B	2				233
GIRDER	816.	815.4	0.	.8	2.7		234
	-10.5	817.1	-10.5	820.2	-10.5	814.4	235



80/80 LIST OF INPUT DATA

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          -9.5      815.4     9.5       815.4     10.5      814.4     236
          10.5      820.2     10.5      817.1                         237
ENDTABLE                                                              238
SECTION   17.0                                                        239
          -420.     832.      -420.     822.7     -370.     822.      240
          -320.     821.2     -270.     821.7     -221.     821.7     241
          -220.     818.4     -140.     817.      -95.      815.7     242
          -10.5     817.1     -10.5     812.7     0.        812.7     244
          10.5      812.6     10.5      817.1     50.       817.7     245
          110.      813.6     135.      821.4     160.      822.8     247
          182.      824.2     182.1     832.                          248
ENDTABLE                                                              249
REACH     17.1+     1.        50.       50.                           250
REACH2    17.4      -1.1                                            251
REACH     17.4      1.        625.      625.                          252
SEGMENT   17.4      1         N         -25.                          253
NVALUE    .075                                                        254
SEGMENT   17.4      2         C         27.                           255
NVALUE    .055                                                        256
SEGMENT   17.4      3         N         345.1                         257
NVALUE    .075                                                        258
SECTION   17.4                                                       259
          -115.     933.      -115.     826.4     -105.     824.8     260
          -80.      822.1     -75.      817.7     -25.      815.3     261
          -24.      814.      -12.      813.8     0.        813.9     262
          12.       814.      24.       814.6     27.       815.9     263
          77.       813.      127.      819.7     175.      821.7     264
          225.      822.9     255.      824.      345.      826.6     265
          345.1     833.                                            266
ENDTABLE                                                              267
REACH     17.3+     1.        550.      550.                          268
REACH2    17.4      2.4                                             269
ROAD      18.0      2.7       50.       50.                           270
BPR       18.0      B         2                                       271
GIRDER    820.      819.4     10.5      .8        2.7                 272
          -15.      824.1     -14.9     819.4     14.9      819.4     273
          15.       824.1                                           274
ENDTABLE                                                              275
SECTION   18.0                                                        276
          -500.     835.      -500.     819.8     -400.     821.      277
          -300.     822.1     -200.     823.1     -100.     823.4     278
          -15.      824.1     -14.9     816.9     -5.       816.2     279
          5.        816.4     14.9      816.9     15.       824.1     280
          100.      824.2     200.      825.4     300.      827.5     281
          350.      824.1     350.1     836.                          282
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----------80/80 LIST OF INPUT DATA----------

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ENDTABLE                                                                283
REACH     18.1+     1.        50.       50.                             284
REACH2    18.5      .3                                                  285
REACH     18.5      1.        175.      175.                            286
SEGMENT   18.5      1         N         -31.                            287
NVALUE    .14                                                           288
SEGMENT   18.5      2         C         50.                             289
NVALUE    .07                                                           290
SEGMENT   18.5      3         N         190.1                           291
NVALUE    .125                                                          292
SECTION   18.5                                                          293
          -184.     835.      -184.     828.      -181.     824.7       294
          -156.     822.8     -131.     823.      -106.     821.1       295
          -56.      820.5     -31.      819.4     -25.      816.3       296
          -10.      816.      0.        815.8     10.       816.3       297
          25.       815.5     50.       819.2     75.       821.2       298
          115.      825.7     190.      827.9     190.1     835.        299
ENDTABLE                                                                300
REACH     18.9+     1.        220.      220.                            301
REACH2    18.5      .3                                                  302
ROAD      19.0      2.7       50.       50.                             303
BPP       19.0      A         2                                         304
GIRDER    823.      822.6     0.        .6        2.7                   305
          -10.5     824.4     -10.4     822.6     10.4      822.6       306
          10.5      824.4                                               307
ENDTABLE                                                                308
SECTION   19.0                                                          309
          -266.     836.      -266.     830.5     -250.     829.4       310
          -200.     827.3     -150.     825.4     -100.     823.7       311
          -53.      823.1     -10.5     824.4     -10.4     816.2       312
          -3.5      816.5     3.5       816.3     10.4      816.7       313
          10.5      824.4     50.       824.2     100.      825.2       314
          150.      826.1     200.      827.2     240.      827.9       315
          300.      823.3     350.      828.2     400.      828.        316
          450.      827.9     500.      828.      550.      827.9       317
          600.      827.6     600.1     836.                            318
ENDTABLE                                                                319
REACH     19.2      1.        70.       70.                             320
SEGMENT   19.2      1         N         -29.                            321
NVALUE    .09                                                           322
SEGMENT   19.2      2         C         35.                             323
NVALUE    .055                                                          324
SEGMENT   19.2      3         N         125.1                           325
NVALUE    .10                                                           326
SECTION   19.2                                                          327
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80/80 LIST OF INPUT DATA

```
          -219.     835.      -219.     827.4     -199.     825.2     328
          -149.     825.      -99.      823.5     -59.      823.      329
          -29.      821.3     -19.      816.9     -9.       815.4     330
          0.        815.8     15.       816.2     25.       817.1     331
          35.       822.      60.       824.8     75.       825.6     332
          125.      827.6     125.1     835.                          333
ENDTABLE                                                              334
REACH     19.9+     1.        90.       90.                           335
REACH2    20.5      -.4                                             336
ROAD      20.5      2.7       50.       50.                           337
BRP       21.0      8         3         4                             338
PIER      816.9     2.        816.9     2.                            339
GIRDER    821.      820.1     0.        .7        2.7                 340
          -16.5     822.3     -16.4     820.1     16.4      820.1     341
          16.5      822.3                                             342
ENDTABLE                                                              343
SECTION   20.0                                                        344
          -141.6    836.      -141.5    823.5     -100.     823.3     345
          -53.      823.      -16.5     822.3     -16.4     817.4     346
          -5.1      816.4     5.5       816.      16.4      817.6     347
          16.5      822.3     50.       823.      100.      823.2     348
          150.      823.1     200.      823.6     237.5     823.7     349
          237.6     836.                                            350
ENDTABLE                                                              351
REACH     20.1+     1.        50.       50.                           352
REACH2    20.5      -.4                                             353
REACH     20.5      1.        90.       90.                           354
SEGMENT   20.5      1         N         -18.                          355
NVALUE    .075                                                        356
SEGMENT   20.5      2         C         25.                           357
NVALUE    .05                                                         358
SEGMENT   20.5      3         N         64.                           359+
NVALUE    .075                                                        360
SECTION   20.5                                                       361
          -188.     836.      -188.     828.6     -168.     836.2     362
          -118.     823.6     -28.      821.5     -18.      818.7     363
          -9.       816.4     0.        816.4     6.        816.5     364
          15.       817.3     25.       818.7     50.       819.1     365
          57.       822.6     63.       822.8     64.       830.      366
ENDTABLE                                                              368
REACH     20.9+     1.        505.      290.                          369
REACH2    20.5      1.7                                             370
ROAD      21.0      2.7       50.       50.                           371
BPI       21.0      8         3         4                             372
PIER      818.8     2.        818.6     2.                            373
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80/80 LIST OF INPUT DATA

```
GIRDER    822.      821.5     0.        .7        2.7                   374
          -19.75     824.1     -19.65    821.5      19.65    821.5     375
          19.75      824.1                                              376
ENDTABLE                                                               377
SECTION   21.1                                                         378
          -237.6     838.      -237.5    823.9     -150.     824.1     379
          -100.      824.3     -50.      824.5     -19.75    824.1     380
          -19.65     813.3     -7.25     818.3     4.75      818.1     381
          19.65      813.5     19.75     824.1     50.       825.      382
          100.       825.4     150.      825.8     200.      826.2     383
          250.       825.6     305.      827.      305.1     838.      384
ENDTABLE                                                               385
REACH     21.1+      1.        50.       50.                           386
REACH2    21.2                                                         387
REACH     21.2       1.        235.      235.                          388
SEGMENT   21.2       1         N         -20.                          389
NVALUE    .15                                                          390
SEGMENT   21.2       2         C         22.                           391
NVALUE    .05                                                          392
SEGMENT   21.2       3         N         80.1                          393
NVALUE    .175                                                         394
SECTION   21.2                                                        395
          -45.       842.      -45.      822.2     -35.      822.2     399
          -30.       822.2     -20.      819.7     -16.      818.5     400
          -8.        813.      0.        818.1     8.        818.      401
          16.        813.8     22.       821.      52.       824.4     402
          71.        823.6     80.       831.5     80.1      838.      403
ENDTABLE                                                               404
REACH     21.9+      1.        430.      430.                          405
REACH2    21.2       1.9                                              406
ROAD      22.0       2.7       50.       50.                           407
BPR       22.0       R         3         2                             408
PIER      823.2      1.67      820.2     1.67      822.7     1.67      409
GIRDER    827.       826.7     0.        .7        2.7                   410
          -23.8      828.9     -23.7     826.7     23.7      826.7     411
          23.8       829.9                                              412
ENDTABLE                                                               413
SECTION   22.0                                                         414
          -305.      839.9     -305.     827.      -250.     827.7     415
          -200.      828.      -150.     828.4     -50.      829.2     416
          -23.8      828.9     -23.7     823.2     -11.8     820.7     417
          -.3        819.9     11.7      820.1     23.7      822.7     418
          23.8       823.9     50.       829.7     100.      830.      419
          200.       833.5     300.      831.      400.      831.5     420
          500.       832.      600.      832.5     700.      833.      421
```

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-----------------------------80/80 LIST OF INPUT DATA-----------------------------
          700.1     839.9                                                    422
ENDTABLE                                                                     423
REACH     +22.05    1.        50.       50.                                  424
REACH2    22.1                                                               425
REACH     22.1      1.        410.      400.                                 426
SEGMENT   22.1      1         N         -32.                                 427
NVALUE    .1                                                                 428
SEGMENT   22.1      2         C         50.                                  429
NVALUE    .05                                                                430
SEGMENT   22.1      3         N         150.1                                431
NVALUE    .125                                                               432
SECTION   22.1                                                               433
          -170.     839.      -170.     831.6     -160.     829.             434
          -130.     827.6     -80.      826.1     -32.      822.4            435
          -30.      821.4     -20.      819.3     -10.      820.1            436
          0.        819.5     10.       819.7     20.       819.1            437
          30.       821.6     40.       821.5     50.       828.2            438
          60.       829.3     70.       828.      120.      830.             439
          150.      832.1     150.1     839.                                 440
ENDTABLE                                                                     441
REACH     22.5      1.        155.      150.                                 442
SEGMENT   22.5      1         N         -25.                                 443
NVALUE    .1                                                                 444
SEGMENT   22.5      2         C         30.                                  445
NVALUE    .05                                                                446
SEGMENT   22.5      3         N         390.1                                447
NVALUE    .07                                                                448
SECTION   22.5                                                               449
          -165.     841.      -165.     833.7     -150.     832.6            450
          -120.     830.6     -70.      827.1     -25.      823.7            451
          -20.      821.7     -10.      821.2     0.        821.6            452
          10.       821.4     20.       821.5     30.       823.6            453
          75.       824.1     125.      825.2     175.      827.4            454
          200.      829.5     225.      830.8     250.      830.             455
          300.      830.6     350.      832.4     390.      833.6            456
          390.1     841.                                                     457
ENDTABLE                                                                     458
REACH     22.8      1.        1425.     1040.                                459
SEGMENT   22.8      1         N         -26.                                 460
NVALUE    .08                                                                461
SEGMENT   22.8      2         C         35.                                  462
NVALUE    .045                                                               463
SEGMENT   22.8      3         N         110.1                                464
NVALUE    .08                                                                465
SECTION   22.8                                                               466
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80/80 LIST OF INPUT DATA

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          -160.     843.      -160.     835.4     -150.     833.      467
          -100.     833.2     -75.      827.8     -26.      825.3     468
          -20.      823.5     -10.      823.7     0.        823.      469
          10.       823.1     20.       823.      25.       824.8     470
          35.       826.3     55.       830.5     95.       834.3     471
          110.      835.1     110.1     843.                          472
ENDTABLE                                                              473
ROAD      23.0      2.7       50.       50.                           474
BPR       23.0      8         3         2                             475
PIER      831.3     1.67      824.2     1.67      830.2     1.67      476
GIRDER    834.      833.4     19.5      .7        2.7                   477
          -26.65    835.1     -26.55    833.4     26.55     833.4     478
          26.65     836.1                                             479
ENDTABLE                                                              480
SECTION   23.0                                                        481
          -700.     842.      -700.     833.      -600.     833.7     482
          -500.     834.2     -400.     834.7     -300.     835.2     483
          -200.     835.8     -100.     836.3     -50.      836.5     484
          -26.65    836.1     -26.55    831.3     -13.05    826.8     485
          -.35      822.7     12.55     823.      26.55     830.2     486
          26.65     836.1     50.       836.7     100.      836.7     487
          200.      836.8     300.      836.9     400.      837.      488
          500.      837.      600.      837.1     700.      837.2     489
          800.      837.3     900.      837.3     1000.     837.4     490
          1000.1    842.                                              491
ENDTABLE                                                              492
REACH     +23.01    1.        10.       10.                           493
REACH2    22.8                                                        494
REACH     +23.02    1.        10.       10.                           495
REACH2    22.8                                                        496
ROAD      23.1      2.7       20.       20.                           497
BPR       23.1      8         2         4                             498
PIER      823.7     1.        823.4     1.                            499
GIRDER    830.      829.2     19.5      .7        2.7                   500
          -35.      831.2     -35.      829.2     35.       829.2     501
          35.       831.2                                             502
ENDTABLE                                                              503
SECTION   23.1                                                        504
          -160.     842.      -160.     835.4     -150.     833.      505
          -100.     833.2     -75.      827.8     -35.      831.2     506
          -35.      829.2     -16.      823.7     -6.       822.9     507
          6.        823.      16.       823.4     35.       829.2     508
          35.       831.2     55.       830.5     95.       834.3     509
          110.      835.1     112.      842.                          510
ENDTABLE                                                              512
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80/80 LIST OF INPUT DATA

REACH	+23.15	1.	50.	50.			513
REACH2	23.2						514
REACH	23.2	1.	345.	345.			516
SEGMENT	23.2	1	N	-30.			517
NVALUE	.1						518
SEGMENT	23.2	2	C	30.			519
NVALUE	.06						520
SEGMENT	23.2	3	N	45.1			521
NVALUE	.1						522
SECTION	23.2						523
	-60.	843.	-60.	836.2	-50.	834.9	525
	-40.	831.9	-30.	826.3	-20.	824.9	526
	-10.	824.2	0.	823.1	10.	823.1	527
	20.	824.2	30.	829.1	40.	833.	528
	45.	835.4	45.1	843.			529
ENDTABLE							530
COMPUTE	12.0	14.6+	12.0				530A

END OF 80/80 LIST

00BREAK00

1) COUNTY: Kalamazoo

2) STUDY NAME: Cities of Kalamazoo and Portage

3) WATERCOURSE: Portage Township Drain #1

4) DOCUMENT TYPE: 100 yr run

00BREAK00

RATING TABLE FOR SECTION 70.1+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-OAM	CSM	CRIT ELEV	FRICTION SLOPE
0	837.90	0.0	0.0						
BANK FULL	839.6	14.1	12.3	0.00	0.00	0.00			
1	839.98	19.4	15.0	0.00	0.00	0.00	15.00	838.6	.00068
2	841.25	46.6	30.0	0.00	0.00	0.00	30.00	838.9	.00032
3	841.69	57.9	35.0	0.00	0.00	0.00	35.00	839.0	.00025
4	842.76	87.1	50.0	0.00	0.00	0.00	50.00	839.2	.00017

SEGMENT TABLE FOR SECTION 70.1+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	15.	0.	15.	0.
15.	VELOCITY FPS	.80	.16	.80	0.00
2	DISCHARGE CFS	30.	3.	27.	0.
30.	VELOCITY FPS	.74	.27	.78	0.00
3	DISCHARGE CFS	35.	5.	30.	0.
35.	VELOCITY FPS	.70	.29	.75	0.00
4	DISCHARGE CFS	50.	10.	40.	0.
50.	VELOCITY FPS	.67	.32	.73	0.00
1	ELEV 839.98 KD	575.	3.	572.	1.
2	ELEV 841.25 KD	1667.	165.	1501.	1.
3	ELEV 841.69 KD	2205.	311.	1893.	1.
4	ELEV 842.76 KD	3642.	801.	3038.	2.

RATING TABLE FOR SECTION 70.5+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	838.70	0.0	0.0						
BANK FULL	840.4	14.1	13.9	0.00	0.00	0.00			
1	840.54	15.9	15.0	0.00	0.00	0.00	15.00	839.4	.00118
2	841.58	35.2	30.0	0.00	0.00	0.00	30.00	839.7	.00063
3	841.97	44.5	35.0	0.00	0.00	0.00	35.00	839.8	.00049
4	842.94	69.7	50.0	0.00	0.00	0.00	50.00	840.0	.00031

SEGMENT TABLE FOR SECTION 70.5+

CSN		TOTAL	SEG NO 1	2	3
			N	C	N
1	DISCHARGE CFS	15.	0.	15.	0.
15.	VELOCITY FPS	.96	0.00	.96	0.00
2	DISCHARGE CFS	30.	2.	28.	0.
30.	VELOCITY FPS	.96	.27	.99	0.00
3	DISCHARGE CFS	35.	4.	31.	0.
35.	VELOCITY FPS	.91	.31	.94	0.00
4	DISCHARGE CFS	50.	9.	41.	0.
50.	VELOCITY FPS	.83	.37	.90	0.00
1	ELEV 840.54 KD	437.	1.	434.	1.
2	ELEV 841.58 KD	1186.	64.	1121.	1.
3	ELEV 841.97 KD	1575.	143.	1431.	1.
4	ELEV 842.94 KD	2825.	498.	2326.	1.

ROAD SECTION 70.6

NO.	HW	CFS	HL	TW	CSM.
0	838.90	0.00	0.00	0.00	0.00
1	840.74	15.00	.16	840.58	15.00
2	841.85	30.00	.24	841.61	30.00
3	842.23	35.00	.24	841.99	35.00
4	843.19	50.00	.24	842.95	50.00

MIN ROAD ELEVATION 845.70

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	12311.	5.50		89.50	838.90	838.46	.024

RATING TABLE FOR SECTION 70.8 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	839.70	0.0	0.0						
1	841.08	10.3	15.0	0.00	0.00	0.00	15.00	840.4	.00418
BANK FULL	841.4	14.1	20.2	0.00	0.00	0.00			
2	842.01	23.3	30.0	0.00	0.00	0.00	30.00	840.7	.00169
3	842.35	30.2	35.0	0.00	0.00	0.00	35.00	840.8	.00126
4	843.25	51.8	50.0	0.00	0.00	0.00	50.00	841.0	.00068

SEGMENT TABLE FOR SECTION 70.8

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	15.	0.	15.	0.
15.	VELOCITY FPS	1.46	0.00	1.46	0.00
2	DISCHARGE CFS	30.	1.	29.	0.
30.	VELOCITY FPS	1.37	.29	1.37	0.00
3	DISCHARGE CFS	35.	2.	33.	0.
35.	VELOCITY FPS	1.29	.35	1.30	0.00
4	DISCHARGE CFS	50.	6.	44.	0.
50.	VELOCITY FPS	1.12	.42	1.18	0.00
1	ELEV 841.08 KO	232.	1.	230.	1.
2	ELEV 842.01 KO	727.	10.	716.	1.
3	ELEV 842.35 KO	981.	34.	946.	1.
4	ELEV 843.25 KO	1914.	233.	1681.	1.

RATING TABLE FOR SECTION 70.9+ OA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	840.00	0.0	0.0						
1	841.42	10.7	15.0	0.00	0.00	0.00	15.00	840.7	.00367
BANK FULL	841.7	14.1	20.2	0.00	0.00	0.00			
2	842.22	21.7	30.0	0.00	0.00	0.00	30.00	841.0	.00202
3	842.51	27.2	35.0	0.00	0.00	0.00	35.00	841.1	.00159
4	843.35	46.6	50.0	0.00	0.00	0.00	50.00	841.3	.00089

SEGMENT TABLE FOR SECTION 70.9+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	15.	0.	15.	0.
15.	VELOCITY FPS	1.40	0.00	1.40	0.00
2	DISCHARGE CFS	30.	0.	30.	0.
30.	VELOCITY FPS	1.45	.31	1.45	0.00
3	DISCHARGE CFS	35.	1.	34.	0.
35.	VELOCITY FPS	1.40	.35	1.41	0.00
4	DISCHARGE CFS	50.	5.	45.	0.
50.	VELOCITY FPS	1.24	.44	1.30	0.00
1	ELEV 841.42 KD	247.	1.	245.	1.
2	ELEV 842.22 KD	665.	6.	657.	1.
3	ELEV 842.51 KD	875.	23.	851.	1.
4	ELEV 843.35 KD	1666.	164.	1500.	1.

TABLE OF VALUES FOR BPR EQUATION

COEFK	AKB	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
.2434	.2434	0.0000	0.0000	0.0000	0.0000	.8470	1.0000	1.0000	13.3336	12.3557	12.2931
DCRIT	840.57	KBCRIT=									
.5590	.5590	0.0000	0.0000	0.0000	0.0000	.7181	1.0000	1.0000	20.4797	26.6541	23.3090
DCRIT	840.81	KBCRIT=									
.6486	.6486	0.0000	0.0000	0.0000	0.0000	.6872	1.0000	1.0000	23.1273	32.2211	28.9420
DCRIT	840.89	KBCRIT=									
.7537	.7537	0.0000	0.0000	0.0000	0.0000	.6531	1.0000	1.0000	30.7498	48.9363	47.7194
DCRIT	841.10	KBCRIT=									

ROAD SECTION 71.0

NO.	HW	CFS	HL	TW	CSM.
0	840.00	0.00	0.00	0.00	0.00
1	841.56	15.00	0.00	841.56	15.00
2	842.33	30.00	.02	842.31	30.00
3	842.61	35.00	.02	842.59	35.00
4	843.41	50.00	.02	843.39	50.00

MIN ROAD ELEVATION 847.90

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 845.70 OPENING NO.= 1

RATING TABLE FOR SECTION +71.05 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	840.20	0.0	0.0						
1	841.74	11.8	15.0	0.00	0.00	0.00	15.00	841.1	.00432
2	842.43	24.4	30.0	0.00	0.00	0.00	30.00	841.4	.00197
3	842.69	29.5	35.0	0.00	0.00	0.00	35.00	841.5	.00150
4	843.46	45.1	50.0	0.00	0.00	0.00	50.00	841.7	.00085

SEGMENT TABLE FOR SECTION +71.05

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	15.	0.	15.	0.
15.	VELOCITY FPS	1.27	0.00	1.27	0.00
2	DISCHARGE CFS	30.	0.	30.	0.
30.	VELOCITY FPS	1.24	0.00	1.23	0.00
3	DISCHARGE CFS	35.	0.	35.	0.
35.	VELOCITY FPS	1.19	0.00	1.19	0.00
4	DISCHARGE CFS	50.	0.	50.	0.
50.	VELOCITY FPS	1.11	0.00	1.11	0.00
1	ELEV 841.74 KD	228.	1.	226.	1.
2	ELEV 842.43 KD	676.	1.	674.	1.
3	ELEV 842.69 KD	903.	1.	901.	1.
4	ELEV 843.46 KD	1711.	1.	1709.	1.

RATING TABLE FOR SECTION 71.1 OA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	840.70	0.0	0.0						
1	842.21	11.4	15.0	0.00	0.00	0.00	15.00	841.6	.00474
2	842.78	21.5	30.0	0.00	0.00	0.00	30.00	841.9	.00289
3	842.99	25.4	35.0	0.00	0.00	0.00	35.00	842.0	.00235
4	843.64	38.4	50.0	0.00	0.00	0.00	50.00	842.2	.00137

SEGMENT TABLE FOR SECTION 71.1

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	15.	0.	15.	0.
15.	VELOCITY FPS	1.32	0.00	1.32	0.00
2	DISCHARGE CFS	30.	0.	30.	0.
30.	VELOCITY FPS	1.40	0.00	1.40	0.00
3	DISCHARGE CFS	35.	0.	35.	0.
35.	VELOCITY FPS	1.38	0.00	1.38	0.00
4	DISCHARGE CFS	50.	0.	50.	0.
50.	VELOCITY FPS	1.30	0.00	1.30	0.00
1	ELEV 842.21 KO	218.	1.	216.	1.
2	ELEV 842.78 KO	558.	1.	556.	1.
3	ELEV 842.99 KO	722.	1.	720.	1.
4	ELEV 843.64 KO	1351.	1.	1349.	1.

RATING TABLE FOR SECTION 71.2+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	840.70	0.0	0.0						
1	842.77	21.2	15.0	0.00	0.00	0.00	15.00	841.6	.00076
2	843.42	34.0	30.0	0.00	0.00	0.00	30.00	841.9	.00072
3	843.57	37.0	35.0	0.00	0.00	0.00	35.00	842.0	.00075
4	844.17	49.7	50.0	0.00	0.00	0.00	50.00	842.2	.00064

SEGMENT TABLE FOR SECTION 71.2+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	15.	0.	15.	0.
15.	VELOCITY FPS	.71	0.00	.71	0.00
2	DISCHARGE CFS	30.	0.	30.	0.
30.	VELOCITY FPS	.89	0.00	.88	0.00
3	DISCHARGE CFS	35.	0.	35.	0.
35.	VELOCITY FPS	.95	0.00	.95	0.00
4	DISCHARGE CFS	50.	0.	50.	0.
50.	VELOCITY FPS	1.01	0.00	1.01	0.00
1	ELEV 842.77 KO	545.	1.	543.	1.
2	ELEV 843.42 KO	1119.	1.	1117.	1.
3	ELEV 843.57 KO	1275.	1.	1273.	1.
4	ELEV 844.17 KO	1976.	1.	1974.	1.

ROAD SECTION 71.3

NO.	HW	CFS	HL	TW	CSM.
0	840.89	0.00	0.00	0.00	0.00
1	842.83	15.00	0.00	842.83	15.00
2	843.63	30.00	.16	843.47	30.00
3	843.78	35.00	.16	843.62	35.00
4	844.45	50.00	.24	844.21	50.00

MIN ROAD ELEVATION 846.60

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	32111.	4.58	6.08	25.40	840.89	840.89	.032

RATING TABLE FOR SECTION +71.35 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	841.00	0.0	0.0						
1	842.86	20.8	15.0	0.00	0.00	0.00	15.00	841.5	.00058
2	843.65	74.1	30.0	0.00	0.00	0.00	30.00	841.7	.00044
3	843.80	100.5	35.0	0.00	0.00	0.00	35.00	841.8	.00040
4	844.45	340.3	50.0	0.00	0.00	0.00	50.00	842.0	.00009

SEGMENT TABLE FOR SECTION +71.35

CSN		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	15.	0.	15.	0.
15.	VELOCITY FPS	.72	0.00	.72	0.00
2	DISCHARGE CFS	30.	6.	24.	0.
30.	VELOCITY FPS	.70	.14	.72	0.00
3	DISCHARGE CFS	35.	9.	26.	0.
35.	VELOCITY FPS	.66	.14	.72	0.00
4	DISCHARGE CFS	50.	32.	18.	0.
50.	VELOCITY FPS	.26	.11	.36	0.00
1	ELEV 842.86 KO	622.	1.	620.	1.
2	ELEV 843.65 KO	1231.	19.	1212.	1.
3	ELEV 843.80 KO	1437.	91.	1345.	1.
4	ELEV 844.45 KO	5083.	3056.	2026.	1.

RATING TABLE FOR SECTION 71.4+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	841.60	0.0	0.0						
1	843.20	17.1	15.0	0.00	0.00	0.00	15.00	842.1	.00100
2	843.96	28.6	30.0	0.00	0.00	0.00	30.00	842.3	.00095
3	844.07	42.2	35.0	0.00	0.00	0.00	35.00	842.4	.00098
4	844.62	145.2	50.0	0.00	0.00	0.00	50.00	842.6	.00046

SEGMENT TABLE FOR SECTION 71.4+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	15.	0.	15.	0.
15.	VELOCITY FPS	.87	0.00	.88	0.00
2	DISCHARGE CFS	30.	0.	30.	0.
30.	VELOCITY FPS	1.05	0.00	1.05	0.00
3	DISCHARGE CFS	35.	3.	32.	0.
35.	VELOCITY FPS	1.07	.22	1.06	0.00
4	DISCHARGE CFS	50.	17.	33.	0.
50.	VELOCITY FPS	.69	.17	.81	0.00
1	ELEV 843.20 KD	473.	1.	471.	1.
2	ELEV 843.96 KD	975.	1.	973.	1.
3	ELEV 844.07 KD	1063.	2.	1060.	1.
4	ELEV 844.62 KD	2316.	758.	1557.	1.

ROAD SECTION 71.5

NO.	HW	CFS	HL	TW	CSM
0	841.63	0.00	0.00	0.00	0.00
1	843.42	15.00	.16	843.26	15.00
2	844.17	30.00	.16	844.01	30.00
3	844.28	35.00	.16	844.12	35.00
4	844.88	50.00	.24	844.64	50.00

MIN ROAD ELEVATION 847.20

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	32111.	4.58	6.08	27.40	841.63	841.63	.032

RATING TABLE FOR SECTION 71.55 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	842.00	0.0	0.0						
1	843.47	15.4	15.0	0.00	0.00	0.00	15.00	842.5	.00137
2	844.21	26.3	30.0	0.00	0.00	0.00	30.00	842.7	.00121
3	844.33	28.1	35.0	0.00	0.00	0.00	35.00	842.8	.00137
4	844.90	119.0	50.0	0.00	0.00	0.00	50.00	843.0	.00063

SEGMENT TABLE FOR SECTION 71.55

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	15.	0.	15.	0.
15.	VELOCITY FPS	.97	0.00	.97	0.00
2	DISCHARGE CFS	30.	0.	30.	0.
30.	VELOCITY FPS	1.14	0.00	1.14	0.00
3	DISCHARGE CFS	35.	0.	35.	0.
35.	VELOCITY FPS	1.25	0.00	1.25	0.00
4	DISCHARGE CFS	50.	15.	35.	0.
50.	VELOCITY FPS	.82	.18	.93	0.00
1	ELEV 843.47 KD	406.	1.	404.	1.
2	ELEV 844.21 KD	862.	1.	860.	1.
3	ELEV 844.33 KD	947.	1.	945.	1.
4	ELEV 844.90 KD	1738.	265.	1442.	1.

ROAD SECTION 71.6

NO.	HW	CFS	HL	TW	CSM
0	841.75	0.00	0.00	0.00	0.00
1	843.50	15.00	0.00	843.50	15.00
2	844.40	30.00	.16	844.24	30.00
3	344.52	35.00	.16	844.36	35.00
4	845.15	50.00	.24	844.91	50.00

MIN ROAD ELEVATION 847.00

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	32111.	4.58	6.08	28.40	841.75	841.75	.032

RATING TABLE FOR SECTION +71.65 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT. ELEV	FRICTION SLOPE
0	842.00	0.0	0.0						
1	843.56	16.5	15.0	0.00	0.00	0.00	15.00	842.5	.00112
2	844.44	35.7	30.0	0.00	0.00	0.00	30.00	842.7	.00080
3	844.55	56.5	35.0	0.00	0.00	0.00	35.00	842.8	.00078
4	845.17	211.3	50.0	0.00	0.00	0.00	50.00	843.0	.00025

SEGMENT TABLE FOR SECTION +71.65

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	15.	0.	15.	0.
15.	VELOCITY FPS	.91	0.00	.91	0.00
2	DISCHARGE CFS	30.	1.	29.	0.
30.	VELOCITY FPS	.97	.21	.96	0.00
3	DISCHARGE CFS	35.	5.	30.	0.
35.	VELOCITY FPS	.94	.20	.95	0.00
4	DISCHARGE CFS	50.	26.	24.	0.
50.	VELOCITY FPS	.49	.15	.56	0.00
1	ELEV 843.56 KD	448.	1.	446.	1.
2	ELEV 844.44 KD	1033.	2.	1030.	1.
3	ELEV 844.55 KD	1134.	6.	1127.	1.
4	ELEV 845.17 KD	2952.	1242.	1709.	1.

RATING TABLE FOR SECTION 71.7+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	842.30	0.0	0.0						
1	843.85	16.5	15.0	0.00	0.00	0.00	15.00	842.8	.09112
2	844.69	29.1	30.0	0.00	0.00	0.00	30.00	843.0	.00091
3	844.80	46.5	35.0	0.00	0.00	0.00	35.00	843.1	.00091
4	845.30	136.6	50.0	0.00	0.00	0.00	50.00	843.3	.00048

SEGMENT TABLE FOR SECTION 71.7+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	15.	0.	15.	0.
15.	VELOCITY FPS	.91	0.00	.91	0.00
2	DISCHARGE CFS	30.	0.	30.	0.
30.	VELOCITY FPS	1.03	0.00	1.03	0.00
3	DISCHARGE CFS	35.	4.	31.	0.
35.	VELOCITY FPS	1.02	.23	1.02	0.00
4	DISCHARGE CFS	50.	16.	34.	0.
50.	VELOCITY FPS	.70	.17	.84	0.00
1	ELEV 843.85 KD	448.	1.	446.	1.
2	ELEV 844.69 KD	997.	1.	995.	1.
3	ELEV 844.80 KD	1084.	3.	1080.	1.
4	ELEV 845.30 KD	2286.	748.	1537.	1.

ROAD SECTION 71.8

NO.	HW	CFS	HL	TW	CSM
0	842.30	0.00	0.00	0.00	0.00
1	843.91	15.00	0.00	843.91	15.00
2	844.74	30.00	0.00	844.74	30.00
3	844.84	35.00	0.00	844.84	35.00
4	845.40	50.00	.08	845.32	50.00

MIN ROAD ELEVATION 842.30

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAH	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	32111.	4.58	6.08	20.40	842.30	842.30	.032

RATING TABLE FOR SECTION +71.85 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	842.50	0.0	0.0						
1	844.04	12.2	15.0	0.00	0.00	0.00	15.00	843.2	.00257
2	844.84	23.3	30.0	0.00	0.00	0.00	30.00	843.5	.00175
3	844.94	25.0	35.0	0.00	0.00	0.00	35.00	843.6	.00196
4	845.49	34.8	50.0	0.00	0.00	0.00	50.00	843.8	.00164

SEGMENT TABLE FOR SECTION +71.85

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	15.	0.	15.	0.
15.	VELOCITY FPS	1.23	0.00	1.23	0.00
2	DISCHARGE CFS	30.	0.	30.	0.
30.	VELOCITY FPS	1.29	0.00	1.29	0.00
3	DISCHARGE CFS	35.	0.	35.	0.
35.	VELOCITY FPS	1.40	0.00	1.40	0.00
4	DISCHARGE CFS	50.	0.	50.	0.
50.	VELOCITY FPS	1.44	0.00	1.44	0.00
1	ELEV 844.04 KD	296.	1.	294.	1.
2	ELEV 844.84 KD	718.	1.	716.	1.
3	ELEV 844.94 KD	790.	1.	788.	1.
4	ELEV 845.49 KD	1235.	1.	1233.	1.

RATING TABLE FOR SECTION 71.9 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	842.50	0.0	0.0						
1	844.27	15.2	15.0	0.00	0.00	0.00	15.00	843.2	.00143
2	845.05	27.0	30.0	0.00	0.00	0.00	30.00	843.5	.00119
3	845.18	29.2	35.0	0.00	0.00	0.00	35.00	843.6	.00131
4	845.70	39.4	50.0	0.00	0.00	0.00	50.00	843.8	.00119

SEGMENT TABLE FOR SECTION 71.9

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	15.	0.	15.	0.
15.	VELOCITY FPS	.99	0.00	.99	0.00
2	DISCHARGE CFS	30.	0.	30.	0.
30.	VELOCITY FPS	1.12	0.00	1.11	0.00
3	DISCHARGE CFS	35.	0.	35.	0.
35.	VELOCITY FPS	1.20	0.00	1.20	0.00
4	DISCHARGE CFS	50.	0.	50.	0.
50.	VELOCITY FPS	1.28	0.00	1.27	0.00
1	ELEV 844.27 KD	397.	1.	395.	1.
2	ELEV 845.05 KD	870.	1.	868.	1.
3	ELEV 845.18 KD	968.	1.	966.	1.
4	ELEV 845.70 KD	1448.	1.	1446.	1.

RATING TABLE FOR SECTION 71.9+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	843.30	0.0	0.0						
1	844.77	11.3	15.0	0.00	0.00	0.00	15.00	844.0	.00321
2	845.48	20.9	30.0	0.00	0.00	0.00	30.00	844.3	.00237
3	845.62	23.1	35.0	0.00	0.00	0.00	35.00	844.4	.00246
4	846.07	30.8	50.0	0.00	0.00	0.00	50.00	844.6	.00231

SEGMENT TABLE FOR SECTION 71.9+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	15.	0.	15.	0.
15.	VELOCITY FPS	1.33	0.00	1.33	0.00
2	DISCHARGE CFS	30.	0.	30.	0.
30.	VELOCITY FPS	1.44	0.00	1.44	0.00
3	DISCHARGE CFS	35.	0.	35.	0.
35.	VELOCITY FPS	1.52	0.00	1.52	0.00
4	DISCHARGE CFS	50.	0.	50.	0.
50.	VELOCITY FPS	1.63	0.00	1.62	0.00
1	ELEV 844.77 KO	265.	1.	263.	1.
2	ELEV 845.48 KO	616.	1.	614.	1.
3	ELEV 845.62 KO	706.	1.	704.	1.
4	ELEV 846.07 KO	1040.	1.	1038.	1.

ROAD SECTION 72.0

NO.	HW	CFS	HL	TW	CSM
0	844.60	0.00	0.00	0.00	0.00
1	845.69	15.00	.80	844.89	15.00
2	846.22	30.00	.64	845.58	30.00
3	846.53	35.00	.80	845.73	35.00
4	846.97	50.00	.80	846.17	50.00

MIN ROAD ELEVATION 851.30

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	32111.	4.58	6.08	66.60	844.60	843.29	.032

RATING TABLE FOR SECTION 72.1+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	843.30	0.0	0.0						
1	845.77	25.6	15.0	0.00	0.00	0.00	15.00	844.0	.00034
2	846.32	35.4	30.0	0.00	0.00	0.00	30.00	844.3	.00056
3	846.61	41.7	35.0	0.00	0.00	0.00	35.00	844.4	.00051
BANK FULL	846.8	45.9	41.5	0.00	0.00	0.00			
4	847.05	79.1	50.0	0.00	0.00	0.00	50.00	844.6	.00048

SEGMENT TABLE FOR SECTION 72.1+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	15.	0.	15.	0.
15.	VELOCITY FPS	.59	0.00	.59	0.00
2	DISCHARGE CFS	30.	0.	30.	0.
30.	VELOCITY FPS	.85	0.00	.85	0.00
3	DISCHARGE CFS	35.	0.	35.	0.
35.	VELOCITY FPS	.85	0.00	.85	0.00
4	DISCHARGE CFS	50.	0.	45.	5.
50.	VELOCITY FPS	.87	0.00	.88	.18
1	ELEV 845.77 KD	812.	1.	810.	1.
2	ELEV 846.32 KD	1264.	1.	1262.	1.
3	ELEV 846.61 KD	1557.	1.	1555.	1.
4	ELEV 847.05 KD	2103.	1.	2094.	8.

00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: CITIES OF KALAMAZOO AND PORTAGE

3) WATERCOURSE: PORTAGE TOWNSHIP DRAIN #1

4) DOCUMENT TYPE: INPUT DATA

00BREAK00

125P2

WSP2 XEQ 10/04/77
REV 09/23/76
LOAD 12/17/76 Portage Township Consolidated Drain #1
Sections 70.1+ - 72.1+

----------80/80 LIST OF INPUT DATA----------

```
WSP2                                                                    1
TITLE     PORTAGE TOWNSHIP CONSOLIDATED DRAIN NO. 1  MICHIGAN          1019D
DISCHARGE -1.       15.       30.       35.       50.                   3
STARTE    70.1+     839.98    841.25    841.69    842.76                4
OUTPUT    S                                                           10
REACH     70.1+     1.        0.        0.                            728
REACH2    70.8      -1.8                                              729
REACH     70.5+     1.        545.      540.                          730
REACH2    70.8      -1.                                               731
ROAD      70.6      2.7       50.       50.                           732
CULV1     70.6      1         12311                                   733
CULV2     5.5       0.        89.5      838.9     838.46              734
SECTION   70.6                                                        735
          -90.      860.      -90.      845.7     -70.      847.4     736
          -60.      846.9     0.        847.3     50.       847.5     737
          100.      847.8     150.      848.      200.      847.9     738
          250.      849.1     250.1     860.                          739
ENDTABLE                                                            740
REACH     70.8      1.        100.      100.                          741
SEGMENT   70.8      1         N         -7.                           742
NVALUE    .1                                                        743
SEGMENT   70.8      2         C         6.                            744
NVALUE    .06                                                       745
SEGMENT   70.8      3         N         64.                           746
NVALUE    .1                                                        747
SECTION   70.8                                                       748
          -100.     859.      -100.     847.7     -84.      849.2     749
          -59.      849.2     -47.      848.1     -35.      846.6     750
          -23.      845.2     -19.      842.7     -7.       841.4     751
          -5.       840.7     -2.       839.9     0.        839.7     752
          2.        839.7     5.        840.9     6.        844.      753
          12.       848.8     62.       849.7     64.       869.      754
ENDTABLE                                                            756
REACH     70.9+     1.        100.      100.                          757
REACH2    70.8      .3                                                758
ROAD      71.0      2.7       50.       50.                           759
BPR       71.0      B         3                                       760
CIRDER    846.      845.7     0.        .6        2.6                 761
          -4.75     847.9     -4.75     840.2     -4.       840.2     762
          -4.       846.8     -3.25     845.7     3.4       845.7     763
          4.        845.      4.        840.      4.75      840.      763A
          4.75      847.9                                             763B
ENDTABLE                                                            764
SECTION   71.0                                                        765
          -900.     863.      -900.     856.2     -800.     857.9     766
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80/80 LIST OF INPUT DATA

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          -700.     853.9     -650.     859.2     -600.     859.2     767
          -521.     859.      -500.     858.8     -400.     857.7     768
          -300.     856.4     -200.     855.2     -100.     854.1     769
          -4.75     847.9     -4.75     840.2     -2.       840.2     770
          0.        840.25    2.        840.1     4.75      840.      771
          4.75      847.9     100.      852.8     200.      852.6     772
          300.      852.4     400.      852.3     500.      852.2     773
          600.      852.      600.1     860.                          774
ENDTABLE                                                            775
REACH     +71.05    1.        50.       50.                           776
REACH2    71.1      -.5                                             777
REACH     71.1      1.        130.      120.                          778
SEGMENT   71.1      1         N         -30.                          779
NVALUE    .09                                                       780
SEGMENT   71.1      2         C         16.                           781
NVALUE    .06                                                       782
SEGMENT   71.1      3         N         272.1                         783
NVALUE    .09                                                       784
SECTION   71.1                                                      785
          -60.      863.7     -60.      851.8     -30.      851.4     786
          -13.      842.4     -5.       841.4     -3.       841.1     787
          0.        843.7     3.        842.1     5.        842.1     788
          6.        847.      16.       850.2     66.       851.2     789
          116.      853.6     166.      853.9     216.      854.      790
          266.      855.6     272.      855.8     272.1     860.7     791
ENDTABLE                                                            792
REACH     71.2+     1.        820.      800.                          793
REACH2    71.1                                                      794
ROAD      71.3      2.7       50.       50.                           795
CULV1     71.3      1         32111                                   796
CULV2     4.7       6.        25.4      840.89    840.89              797
SECTION   71.3                                                      798
          -100.     846.6     0.        846.6     100.      846.6     799
ENDTABLE                                                            812
REACH     +71.35    1.        50.       50.                           813
REACH2    71.55     -1.                                             814
REACH     71.4+     1.        350.      350.                          815
REACH2    71.55     -.4                                             816
ROAD      71.5      2.7       50.       50.                           817
CULV1     71.5      1         32111                                   818
CULV2     4.7       6.        27.4      841.63    841.63              819
SECTION   71.5                                                      820
          -100.     847.2     0.        847.2     100.      847.2     821
ENDTABLE                                                            834
REACH     71.55     1.        40.       40.                           835
```

80/80 LIST OF INPUT DATA

```
SEGMENT   71.55     1         N         -20.                                  836
NVALUE    .09                                                                 837
SEGMENT   71.55     2         C         9.                                    838
NVALUE    .06                                                                 839
SEGMENT   71.55     3         N         644.1                                 840
NVALUE    .085                                                                841
SECTION   71.55                                                               842
          -705.     862.      -705.     854.3     -698.     847.6             843
          -670.     847.4     -620.     846.5     -570.     845.8             844
          -520.     844.9     -470.     845.2     -420.     844.7             845
          -370.     844.6     -320.     844.5     -270.     844.6             846
          -220.     844.7     -170.     844.9     -120.     845.1             847
          -70.      846.6     -20.      846.6     -14.      846.              848
          -4.       842.      0.        842.      4.        842.1             849
          9.        845.5     59.       846.4     109.      045.8             850
          159.      846.4     209.      846.1     259.      846.5             851
          309.      846.9     359.      847.1     409.      847.7             852
          459.      848.1     509.      849.2     559.      849.5             853
          609.      849.6     634.      852.1     644.      855.              854
          644.1     862.                                                      855
ENDTABLE                                                                      856
ROAD      71.6      2.7       25.       25.                                   857
CULV1     71.6      1         32111                                           858
CULV2     4.7       6.        28.4      841.75    841.75                      859
SECTION   71.6                                                                860
          -100.     847.      0.        847.      100.      847.              861
ENDTABLE                                                                      874
REACH     +71.65    1.        50.       50.                                   875
REACH2    71.55                                                               876
REACH     71.7+     1.        270.      240.                                  877
REACH2    71.55     .3                                                        878
ROAD      71.8      2.7       50.       50.                                   879
CULV1     71.8      1         32111                                           880
CULV2     4.7       6.        20.4      842.3     842.3                       881
SECTION   71.8                                                                882
          -100.     847.5     -5.5      847.5     -3.       842.4             883
          0.        842.3     0.        847.5     100.      847.5             884
ENDTABLE                                                                      896
REACH     +71.85    1.        50.       50.                                   897
REACH2    71.9                                                                898
REACH     71.9      1.        163.      163.                                  899
SEGMENT   71.9      1         N         -15.                                  900
NVALUE    .09                                                                 901
SEGMENT   71.9      2         C         13.                                   902
NVALUE    .06                                                                 903
```

----------80/80 LIST OF INPUT DATA----------

```
SEGMENT   71.9      3         N         290.1                                 904
NVALUE    .09                                                                 905
SECTION   71.9                                                                906
          -190.     862.      -190.     849.4     -171.     849.4             907
          -121.     850.2     -71.      849.8     -21.      850.5             908
          -15.      849.2     -3.       843.1     0.        842.5             909
          3.        842.6     13.       846.      63.       846.4             910
          113.      846.6     163.      846.2     213.      846.2             911
          263.      846.3     290.      846.3     290.1     862.              912
ENDTABLE                                                                      913
REACH     71.9+     1.        187.      187.                                  914
REACH2    71.9      .8                                                        915
ROAD      72.0      2.7       50.       50.                                   916
CULV1     72.0      1         32111                                           917
CULV2     4.7       6.        66.6      844.6     843.29                      918
SECTION   72.0                                                                919
          -500.     866.      -500.     853.3     -400.     852.              920
          -300.     851.6     -200.     851.3     -100.     851.4             921
          0.        851.9     100.      852.4     200.      852.4             922
          300.      852.4     400.      852.6     500.      852.5             923
          600.      852.4     700.      852.7     800.      853.4             924
          900.      855.5     900.1     866.                                  925
ENDTABLE                                                                      926
REACH     72.1+     1.        50.       50.                                   927
REACH2    71.9      .8                                                        928
COMPUTE   70.1+     72.1+     70.1+                                           1019C
```

----------END OF 80/80 LIST----------

COMPUTE 70.1+ 72.1+ 70.1+ 1019C

----------STARTING DATA FROM GIVEN ELEVATION----------

00BREAK00

1) COUNTY: Kalamazoo

2) STUDY NAME: Cities of Kalamazoo and Portage

3) WATERCOURSE: Portage Township Drain #1

4) DOCUMENT TYPE: 100 yr run

00BREAK00

RATING TABLE FOR SECTION 70.1+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-OAM	CSM	CRIT ELEV	FRICTION SLOPE
0	837.90	0.0	0.0						
BANK FULL	839.6	14.1	12.3	0.00	0.00	0.00			
1	839.98	19.4	15.0	0.00	0.00	0.00	15.00	838.6	.00068
2	841.25	46.6	30.0	0.00	0.00	0.00	30.00	838.9	.00032
3	841.69	57.9	35.0	0.00	0.00	0.00	35.00	839.0	.00025
4	842.76	87.1	50.0	0.00	0.00	0.00	50.00	839.2	.00017

SEGMENT TABLE FOR SECTION 70.1+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	15.	0.	15.	0.
15.	VELOCITY FPS	.80	.16	.80	0.00
2	DISCHARGE CFS	30.	3.	27.	0.
30.	VELOCITY FPS	.74	.27	.78	0.00
3	DISCHARGE CFS	35.	5.	30.	0.
35.	VELOCITY FPS	.70	.29	.75	0.00
4	DISCHARGE CFS	50.	10.	40.	0.
50.	VELOCITY FPS	.67	.32	.73	0.00
1	ELEV 839.98 KD	575.	3.	572.	1.
2	ELEV 841.25 KD	1667.	165.	1501.	1.
3	ELEV 841.69 KD	2205.	311.	1893.	1.
4	ELEV 842.76 KD	3642.	801.	3038.	2.

RATING TABLE FOR SECTION 70.5+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED			CSM	CRIT ELEV	FRICTION SLOPE
				DAMAGE	CHANNEL	NON-DAM			
0	838.70	0.0	0.0						
BANK FULL	840.4	14.1	13.9	0.00	0.00	0.00			
1	840.54	15.9	15.0	0.00	0.00	0.00	15.00	839.4	.00118
2	841.58	35.2	30.0	0.00	0.00	0.00	30.00	839.7	.00063
3	841.97	44.5	35.0	0.00	0.00	0.00	35.00	839.8	.00049
4	842.94	69.7	50.0	0.00	0.00	0.00	50.00	840.0	.00031

SEGMENT TABLE FOR SECTION 70.5+

CSM		TOTAL	SEG NO 1	2	3
			N	C	N
1	DISCHARGE CFS	15.	0.	15.	0.
15.	VELOCITY FPS	.96	0.00	.96	0.00
2	DISCHARGE CFS	30.	2.	28.	0.
30.	VELOCITY FPS	.96	.27	.99	0.00
3	DISCHARGE CFS	35.	4.	31.	0.
35.	VELOCITY FPS	.91	.31	.94	0.00
4	DISCHARGE CFS	50.	9.	41.	0.
50.	VELOCITY FPS	.83	.37	.90	0.00
1	ELEV 840.54 KD	437.	1.	434.	1.
2	ELEV 841.58 KD	1186.	64.	1121.	1.
3	ELEV 841.97 KD	1575.	143.	1431.	1.
4	ELEV 842.94 KD	2825.	498.	2326.	1.

ROAD SECTION 70.6

NO.	HW	CFS	HL	TW	CSM.
0	838.90	0.00	0.00	0.00	0.00
1	840.74	15.00	.16	840.58	15.00
2	841.85	30.00	.24	841.61	30.00
3	842.23	35.00	.24	841.99	35.00
4	843.19	50.00	.24	842.95	50.00

MIN ROAD ELEVATION 845.70

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	12311.	5.50		89.50	838.90	838.46	.024

RATING TABLE FOR SECTION 70.8 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSH	CRIT ELEV	FRICTION SLOPE
0	839.70	0.0	0.0						
1	841.08	10.3	15.0	0.00	0.00	0.00	15.00	840.4	.00418
BANK FULL	841.4	14.1	20.2	0.00	0.00	0.00			
2	842.01	23.3	30.0	0.00	0.00	0.00	30.00	840.7	.00169
3	842.35	30.2	35.0	0.00	0.00	0.00	35.00	840.8	.00126
4	843.25	51.8	50.0	0.00	0.00	0.00	50.00	841.0	.00068

SEGMENT TABLE FOR SECTION 70.8

CSH		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	15.	0.	15.	0.
15.	VELOCITY FPS	1.46	0.00	1.46	0.00
2	DISCHARGE CFS	30.	1.	29.	0.
30.	VELOCITY FPS	1.37	.29	1.37	0.00
3	DISCHARGE CFS	35.	2.	33.	0.
35.	VELOCITY FPS	1.29	.35	1.30	0.00
4	DISCHARGE CFS	50.	6.	44.	0.
50.	VELOCITY FPS	1.12	.42	1.18	0.00
1	ELEV 841.08 KQ	232.	1.	230.	1.
2	ELEV 842.01 KQ	727.	10.	716.	1.
3	ELEV 842.35 KQ	981.	34.	946.	1.
4	ELEV 843.25 KQ	1914.	233.	1681.	1.

RATING TABLE FOR SECTION 70.9+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	840.00	0.0	0.0						
1	841.42	10.7	15.0	0.00	0.00	0.00	15.00	840.7	.00367
BANK FULL	841.7	14.1	20.2	0.00	0.00	0.00			
2	842.22	21.7	30.0	0.00	0.00	0.00	30.00	841.0	.00202
3	842.51	27.2	35.0	0.00	0.00	0.00	35.00	841.1	.00159
4	843.35	46.6	50.0	0.00	0.00	0.00	50.00	841.3	.00089

SEGMENT TABLE FOR SECTION 70.9+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	15.	0.	15.	0.
15.	VELOCITY FPS	1.40	0.00	1.40	0.00
2	DISCHARGE CFS	30.	0.	30.	0.
30.	VELOCITY FPS	1.45	.31	1.45	0.00
3	DISCHARGE CFS	35.	1.	34.	0.
35.	VELOCITY FPS	1.40	.35	1.41	0.00
4	DISCHARGE CFS	50.	5.	45.	0.
50.	VELOCITY FPS	1.24	.44	1.30	0.00
1	ELEV 841.42 KD	247.	1.	245.	1.
2	ELEV 842.22 KD	665.	6.	657.	1.
3	ELEV 842.51 KD	875.	23.	851.	1.
4	ELEV 843.35 KD	1666.	164.	1500.	1.

TABLE OF VALUES FOR BPR EQUATION

COEFK	AKD	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
.2434	.2434	0.0000	0.0000	0.0000	0.0000	.8470	1.0000	1.0000	13.3336	12.3557	12.2931
DCRIT	840.57	KBCRIT=									
.5590	.5590	0.0000	0.0000	0.0000	0.0000	.7181	1.0000	1.0000	20.4797	26.6541	23.3090
DCRIT	840.81	KBCRIT=									
.6486	.6486	0.0000	0.0000	0.0000	0.0000	.6872	1.0000	1.0000	23.1273	32.2211	28.9420
DCRIT	840.89	KBCRIT=									
.7537	.7537	0.0000	0.0000	0.0000	0.0000	.6531	1.0000	1.0000	30.7498	48.9363	47.7194
DCRIT	841.10	KBCRIT=									

ROAD SECTION 71.0

NO.	HW	CFS	HL	TW	CSN.
0	840.00	0.00	0.00	0.00	0.00
1	841.56	15.00	0.00	841.56	15.00
2	842.33	30.00	.02	842.31	30.00
3	842.61	35.00	.02	842.59	35.00
4	843.41	50.00	.02	843.39	50.00

MIN ROAD ELEVATION 847.90

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 845.70 OPENING NO.= 1

RATING TABLE FOR SECTION +71.05 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	840.20	0.0	0.0						
1	841.74	11.8	15.0	0.00	0.00	0.00	15.00	841.1	.00432
2	842.43	24.4	30.0	0.00	0.00	0.00	30.00	841.4	.00197
3	842.69	29.5	35.0	0.00	0.00	0.00	35.00	841.5	.00150
4	843.46	45.1	50.0	0.00	0.00	0.00	50.00	841.7	.00085

SEGMENT TABLE FOR SECTION +71.05

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	15.	0.	15.	0.
15.	VELOCITY FPS	1.27	0.00	1.27	0.00
2	DISCHARGE CFS	30.	0.	30.	0.
30.	VELOCITY FPS	1.24	0.00	1.23	0.00
3	DISCHARGE CFS	35.	0.	35.	0.
35.	VELOCITY FPS	1.19	0.00	1.19	0.00
4	DISCHARGE CFS	50.	0.	50.	0.
50.	VELOCITY FPS	1.11	0.00	1.11	0.00
1	ELEV 841.74 KD	228.	1.	226.	1.
2	ELEV 842.43 KD	676.	1.	674.	1.
3	ELEV 842.69 KD	903.	1.	901.	1.
4	ELEV 843.46 KD	1711.	1.	1709.	1.

RATING TABLE FOR SECTION 71.1 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	840.70	0.0	0.0						
1	842.21	11.4	15.0	0.00	0.00	0.00	15.00	841.6	.00474
2	842.78	21.5	30.0	0.00	0.00	0.00	30.00	841.9	.00289
3	842.99	25.4	35.0	0.00	0.00	0.00	35.00	842.0	.00235
4	843.64	38.4	50.0	0.00	0.00	0.00	50.00	842.2	.00137

SEGMENT TABLE FOR SECTION 71.1

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	15.	0.	15.	0.
15.	VELOCITY FPS	1.32	0.00	1.32	0.00
2	DISCHARGE CFS	30.	0.	30.	0.
30.	VELOCITY FPS	1.40	0.00	1.40	0.00
3	DISCHARGE CFS	35.	0.	35.	0.
35.	VELOCITY FPS	1.38	0.00	1.38	0.00
4	DISCHARGE CFS	50.	0.	50.	0.
50.	VELOCITY FPS	1.30	0.00	1.30	0.00
1	ELEV 842.21 KO	218.	1.	216.	1.
2	ELEV 842.78 KO	558.	1.	556.	1.
3	ELEV 842.99 KO	722.	1.	720.	1.
4	ELEV 843.64 KO	1351.	1.	1349.	1.

RATING TABLE FOR SECTION 71.2+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	840.70	0.0	0.0						
1	842.77	21.2	15.0	0.00	0.00	0.00	15.00	841.6	.00076
2	843.42	34.0	30.0	0.00	0.00	0.00	30.00	841.9	.00072
3	843.57	37.0	35.0	0.00	0.00	0.00	35.00	842.0	.00075
4	844.17	49.7	50.0	0.00	0.00	0.00	50.00	842.2	.00064

SEGMENT TABLE FOR SECTION 71.2+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	15.	0.	15.	0.
15.	VELOCITY FPS	.71	0.00	.71	0.00
2	DISCHARGE CFS	30.	0.	30.	0.
30.	VELOCITY FPS	.89	0.00	.88	0.00
3	DISCHARGE CFS	35.	0.	35.	0.
35.	VELOCITY FPS	.95	0.00	.95	0.00
4	DISCHARGE CFS	50.	0.	50.	0.
50.	VELOCITY FPS	1.01	0.00	1.01	0.00
1	ELEV 842.77 KD	545.	1.	543.	1.
2	ELEV 843.42 KD	1119.	1.	1117.	1.
3	ELEV 843.57 KD	1275.	1.	1273.	1.
4	ELEV 844.17 KD	1976.	1.	1974.	1.

ROAD SECTION 71.3

NO.	HW	CFS	HL	TW	CSM.
0	840.89	0.00	0.00	0.00	0.00
1	842.83	15.00	0.00	842.83	15.00
2	843.63	30.00	.16	843.47	30.00
3	843.78	35.00	.16	843.62	35.00
4	844.45	50.00	.24	844.21	50.00

MIN ROAD ELEVATION 846.60

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	32111.	4.58	6.08	25.40	840.89	840.89	.032

RATING TABLE FOR SECTION +71.35 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED			CSM	CRIT ELEV	FRICTION SLOPE
				DAMAGE	CHANNEL	NON-DAM			
0	841.00	0.0	0.0						
1	842.86	20.8	15.0	0.00	0.00	0.00	15.00	841.5	.00058
2	843.65	74.1	30.0	0.00	0.00	0.00	30.00	841.7	.00044
3	843.80	100.5	35.0	0.00	0.00	0.00	35.00	841.8	.00040
4	844.45	340.3	50.0	0.00	0.00	0.00	50.00	842.0	.00009

SEGMENT TABLE FOR SECTION +71.35

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	15.	0.	15.	0.
15.	VELOCITY FPS	.72	0.00	.72	0.00
2	DISCHARGE CFS	30.	6.	24.	0.
30.	VELOCITY FPS	.70	.14	.72	0.00
3	DISCHARGE CFS	35.	9.	26.	0.
35.	VELOCITY FPS	.66	.14	.72	0.00
4	DISCHARGE CFS	50.	32.	18.	0.
50.	VELOCITY FPS	.26	.11	.36	0.00
1	ELEV 842.86 KO	622.	1.	620.	1.
2	ELEV 843.65 KO	1231.	19.	1212.	1.
3	ELEV 843.80 KO	1437.	91.	1345.	1.
4	ELEV 844.45 KO	5083.	3056.	2026.	1.

RATING TABLE FOR SECTION 71.4+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED			CSM	CRIT ELEV	FRICTION SLOPE
				DAMAGE	CHANNEL	NON-DAM			
0	841.60	0.0	0.0						
1	843.20	17.1	15.0	0.00	0.00	0.00	15.00	842.1	.00100
2	843.96	28.6	30.0	0.00	0.00	0.00	30.00	842.3	.00095
3	844.07	42.2	35.0	0.00	0.00	0.00	35.00	842.4	.00098
4	844.62	145.2	50.0	0.00	0.00	0.00	50.00	842.6	.00046

SEGMENT TABLE FOR SECTION 71.4+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	15.	0.	15.	0.
15.	VELOCITY FPS	.87	0.00	.86	0.00
2	DISCHARGE CFS	30.	0.	30.	0.
30.	VELOCITY FPS	1.05	0.00	1.05	0.00
3	DISCHARGE CFS	35.	3.	32.	0.
35.	VELOCITY FPS	1.07	.22	1.06	0.00
4	DISCHARGE CFS	50.	17.	33.	0.
50.	VELOCITY FPS	.69	.17	.81	0.00
1	ELEV 843.20 KD	473.	1.	471.	1.
2	ELEV 843.96 KD	975.	1.	973.	1.
3	ELEV 844.07 KD	1063.	2.	1060.	1.
4	ELEV 844.62 KD	2316.	758.	1557.	1.

ROAD SECTION 71.5

NO.	HW	CFS	HL	TW	CSM
0	841.63	0.00	0.00	0.00	0.00
1	843.42	15.00	.16	843.26	15.00
2	844.17	30.00	.16	844.01	30.00
3	844.28	35.00	.16	844.12	35.00
4	844.88	50.00	.24	844.64	50.00

MIN ROAD ELEVATION 847.20

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	32111.	4.58	6.08	27.40	841.63	841.63	.032

RATING TABLE FOR SECTION 71.55 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	842.00	0.0	0.0						
1	843.47	15.4	15.0	0.00	0.00	0.00	15.00	842.5	.00137
2	844.21	26.3	30.0	0.00	0.00	0.00	30.00	842.7	.00121
3	844.33	28.1	35.0	0.00	0.00	0.00	35.00	842.8	.00137
4	844.90	119.0	50.0	0.00	0.00	0.00	50.00	843.0	.00063

SEGMENT TABLE FOR SECTION 71.55

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	15.	0.	15.	0.
15.	VELOCITY FPS	.97	0.00	.97	0.00
2	DISCHARGE CFS	30.	0.	30.	0.
30.	VELOCITY FPS	1.14	0.00	1.14	0.00
3	DISCHARGE CFS	35.	0.	35.	0.
35.	VELOCITY FPS	1.25	0.00	1.25	0.00
4	DISCHARGE CFS	50.	15.	35.	0.
50.	VELOCITY FPS	.82	.18	.93	0.00
1	ELEV 843.47 KD	406.	1.	404.	1.
2	ELEV 844.21 KD	862.	1.	860.	1.
3	ELEV 844.33 KD	947.	1.	945.	1.
4	ELEV 844.90 KD	1708.	265.	1442.	1.

ROAD SECTION 71.6

NO.	HW	CFS	HL	TW	CSM
0	841.75	0.00	0.00	0.00	0.00
1	843.50	15.00	0.00	843.50	15.00
2	844.40	30.00	.16	844.24	30.00
3	344.52	35.00	.16	844.36	35.00
4	845.15	50.00	.24	844.91	50.00

MIN ROAD ELEVATION 847.00

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	32111.	4.58	6.08	28.40	841.75	841.75	.032

RATING TABLE FOR SECTION +71.65 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT. ELEV	FRICTION SLOPE
0	842.00	0.0	0.0						
1	843.56	16.5	15.0	0.00	0.00	0.00	15.00	842.5	.00112
2	844.44	35.7	30.0	0.00	0.00	0.00	30.00	842.7	.00080
3	844.55	56.5	35.0	0.00	0.00	0.00	35.00	842.8	.00078
4	845.17	211.3	50.0	0.00	0.00	0.00	50.00	843.0	.00025

SEGMENT TABLE FOR SECTION +71.65

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	15.	0.	15.	0.
15.	VELOCITY FPS	.91	0.00	.91	0.00
2	DISCHARGE CFS	30.	1.	29.	0.
30.	VELOCITY FPS	.97	.21	.96	0.00
3	DISCHARGE CFS	35.	5.	30.	0.
35.	VELOCITY FPS	.94	.20	.95	0.00
4	DISCHARGE CFS	50.	26.	24.	0.
50.	VELOCITY FPS	.49	.15	.56	0.00
1	ELEV 843.56 KO	448.	1.	446.	1.
2	ELEV 844.44 KO	1033.	2.	1030.	1.
3	ELEV 844.55 KO	1134.	6.	1127.	1.
4	ELEV 845.17 KO	2952.	1242.	1709.	1.

RATING TABLE FOR SECTION 71.7+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	842.30	0.0	0.0						
1	843.85	16.5	15.0	0.00	0.00	0.00	15.00	842.8	.09112
2	844.69	29.1	30.0	0.00	0.00	0.00	30.00	843.0	.00891
3	844.80	46.5	35.0	0.00	0.00	0.00	35.00	843.1	.00891
4	845.30	136.6	50.0	0.00	0.00	0.00	50.00	843.3	.00048

SEGMENT TABLE FOR SECTION 71.7+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	15.	0.	15.	0.
15.	VELOCITY FPS	.91	0.00	.91	0.00
2	DISCHARGE CFS	30.	0.	30.	0.
30.	VELOCITY FPS	1.03	0.00	1.03	0.00
3	DISCHARGE CFS	35.	4.	31.	0.
35.	VELOCITY FPS	1.02	.23	1.02	0.00
4	DISCHARGE CFS	50.	16.	34.	0.
50.	VELOCITY FPS	.70	.17	.84	0.00
1	ELEV 843.85 KO	448.	1.	446.	1.
2	ELEV 844.69 KO	997.	1.	995.	1.
3	ELEV 844.80 KO	1084.	3.	1080.	1.
4	ELEV 845.30 KO	2286.	748.	1537.	1.

ROAD SECTION 71.8

NO.	HW	CFS	HL	TW	CSM
0	842.30	0.00	0.00	0.00	0.00
1	843.91	15.00	0.00	843.91	15.00
2	844.74	30.00	0.00	844.74	30.00
3	844.84	35.00	0.00	844.84	35.00
4	845.48	50.00	.08	845.32	50.00

MIN ROAD ELEVATION 842.30

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	32111.	4.58	6.08	20.40	842.30	842.30	.032

RATING TABLE FOR SECTION +71.85 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	842.50	0.0	0.0						
1	844.04	12.2	15.0	0.00	0.00	0.00	15.00	843.2	.00257
2	844.84	23.3	30.0	0.00	0.00	0.00	30.00	843.5	.00175
3	844.94	25.0	35.0	0.00	0.00	0.00	35.00	843.6	.00196
4	845.49	34.8	50.0	0.00	0.00	0.00	50.00	843.8	.00164

SEGMENT TABLE FOR SECTION +71.85

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	15.	0.	15.	0.
15.	VELOCITY FPS	1.23	0.00	1.23	0.00
2	DISCHARGE CFS	30.	0.	30.	0.
30.	VELOCITY FPS	1.29	0.00	1.29	0.00
3	DISCHARGE CFS	35.	0.	35.	0.
35.	VELOCITY FPS	1.40	0.00	1.40	0.00
4	DISCHARGE CFS	50.	0.	50.	0.
50.	VELOCITY FPS	1.44	0.00	1.44	0.00
1	ELEV 844.04 KD	296.	1.	294.	1.
2	ELEV 844.84 KD	718.	1.	716.	1.
3	ELEV 844.94 KD	790.	1.	788.	1.
4	ELEV 845.49 KD	1235.	1.	1233.	1.

RATING TABLE FOR SECTION 71.9 OA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	842.50	0.0	0.0						
1	844.27	15.2	15.0	0.00	0.00	0.00	15.00	843.2	.00143
2	845.05	27.0	30.0	0.00	0.00	0.00	30.00	843.5	.00119
3	845.18	29.2	35.0	0.00	0.00	0.00	35.00	843.6	.00131
4	845.70	39.4	50.0	0.00	0.00	0.00	50.00	843.8	.00119

SEGMENT TABLE FOR SECTION 71.9

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	15.	0.	15.	0.
15.	VELOCITY FPS	.99	0.00	.99	0.00
2	DISCHARGE CFS	30.	0.	30.	0.
30.	VELOCITY FPS	1.12	0.00	1.11	0.00
3	DISCHARGE CFS	35.	0.	35.	0.
35.	VELOCITY FPS	1.20	0.00	1.20	0.00
4	DISCHARGE CFS	50.	0.	50.	0.
50.	VELOCITY FPS	1.28	0.00	1.27	0.00
1	ELEV 844.27 KD	397.	1.	395.	1.
2	ELEV 845.05 KD	870.	1.	868.	1.
3	ELEV 845.18 KD	968.	1.	966.	1.
4	ELEV 845.70 KD	1448.	1.	1446.	1.

RATING TABLE FOR SECTION 71.9+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	843.30	0.0	0.0						
1	844.77	11.3	15.0	0.00	0.00	0.00	15.00	844.0	.00321
2	845.48	20.9	30.0	0.00	0.00	0.00	30.00	844.3	.00237
3	845.62	23.1	35.0	0.00	0.00	0.00	35.00	844.4	.00246
4	846.07	30.8	50.0	0.00	0.00	0.00	50.00	844.6	.00231

SEGMENT TABLE FOR SECTION 71.9+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	15.	0.	15.	0.
15.	VELOCITY FPS	1.33	0.00	1.33	0.00
2	DISCHARGE CFS	30.	0.	30.	0.
30.	VELOCITY FPS	1.44	0.00	1.44	0.00
3	DISCHARGE CFS	35.	0.	35.	0.
35.	VELOCITY FPS	1.52	0.00	1.52	0.00
4	DISCHARGE CFS	50.	0.	50.	0.
50.	VELOCITY FPS	1.63	0.00	1.62	0.00
1	ELEV 844.77 KD	265.	1.	263.	1.
2	ELEV 845.48 KD	616.	1.	614.	1.
3	ELEV 845.62 KD	706.	1.	704.	1.
4	ELEV 846.07 KD	1040.	1.	1038.	1.

ROAD SECTION 72.0

NO.	HW	CFS	HL	TW	CSM
0	844.60	0.00	0.00	0.00	0.00
1	845.69	15.00	.80	844.89	15.00
2	846.22	30.00	.64	845.58	30.00
3	846.53	35.00	.80	845.73	35.00
4	846.97	50.00	.80	846.17	50.00

MIN ROAD ELEVATION 851.30

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	32111.	4.58	6.08	66.60	844.60	843.29	.032

RATING TABLE FOR SECTION 72.1+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	843.30	0.0	0.0						
1	845.77	25.6	15.0	0.00	0.00	0.00	15.00	844.0	.00034
2	846.32	35.4	30.0	0.00	0.00	0.00	30.00	844.3	.00056
3	846.61	41.7	35.0	0.00	0.00	0.00	35.00	844.4	.00051
BANK FULL	846.8	45.9	41.5	0.00	0.00	0.00			
4	847.05	79.1	50.0	0.00	0.00	0.00	50.00	844.6	.00048

SEGMENT TABLE FOR SECTION 72.1+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	15.	0.	15.	0.
15.	VELOCITY FPS	.59	0.00	.59	0.00
2	DISCHARGE CFS	30.	0.	30.	0.
30.	VELOCITY FPS	.85	0.00	.85	0.00
3	DISCHARGE CFS	35.	0.	35.	0.
35.	VELOCITY FPS	.85	0.00	.85	0.00
4	DISCHARGE CFS	50.	0.	45.	5.
50.	VELOCITY FPS	.87	0.00	.88	.18
1	ELEV 845.77 KD	812.	1.	810.	1.
2	ELEV 846.32 KD	1264.	1.	1262.	1.
3	ELEV 846.61 KD	1557.	1.	1555.	1.
4	ELEV 847.05 KD	2103.	1.	2094.	8.

00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: CITIES OF KALAMAZOO AND PORTAGE

3) WATERCOURSE: PORTAGE TOWNSHIP DRAIN #1

4) DOCUMENT TYPE: INPUT DATA

00BREAK00

125P2

WSP2 XEQ 10/04/77
REV 09/23/76
LOAD 12/17/76 Portage Township Consolidated Drain #1
Sections 70.14 - 72.14

----------80/80 LIST OF INPUT DATA----------

```
WSP2                                                                    1
TITLE     PORTAGE TOWNSHIP CONSOLIDATED DRAIN NO. 1  MICHIGAN           1019D
DISCHARGE -1.       15.       30.       35.       50.                   3
STARTE    70.1+     839.98    841.25    841.69    842.76                4
OUTPUT    S-                                                          10
REACH     70.1+     1.        0.        0.                            728
REACH2    70.8      -1.8                                              729
REACH     70.5+     1.        545.      540.                          730
REACH2    70.8      -1.                                               731
ROAD      70.6      2.7       50.       50.                           732
CULV1     70.6      1         12311                                   733
CULV2     5.5       0.        89.5      838.9     838.46              734
SECTION   70.6                                                        735
          -90.      863.      -90.      845.7     -70.      847.4     736
          -60.      845.9     0.        847.3     50.       847.5     737
          100.      847.8     150.      848.      200.      847.9     738
          250.      849.1     250.1     860.                          739
ENDTABLE                                                            740
REACH     70.8      1.        100.      100.                          741
SEGMENT   70.8      1         N         -7.                           742
NVALUE    .1                                                        743
SEGMENT   70.8      2         C         6.                            744
NVALUE    .06                                                       745
SEGMENT   70.8      3         N         64.                           746
NVALUE    .1                                                        747
SECTION   70.8                                                       748
          -100.     859.      -100.     847.7     -84.      849.2     749
          -59.      849.2     -47.      848.1     -35.      846.6     750
          -23.      845.2     -19.      842.7     -7.       841.4     751
          -5.       840.7     -2.       839.9     0.        839.7     752
          2.        839.7     5.        840.9     6.        844.      753
          12.       848.8     62.       849.7     64.       869.      754
ENDTABLE                                                            756
REACH     70.9+     1.        100.      100.                          757
REACH2    70.8      .3                                                758
ROAD      71.0      2.7       50.       50.                           759
BPR       71.0      B         3                                       760
GIRDER    846.      845.7     0.        .6        2.6                 761
          -4.75     847.9     -4.75     840.2     -4.       840.2     762
          -4.       844.8     -3.25     845.7     3.4       845.7     763
          4.        845.      4.        840.      4.75      840.      763A
          4.75      847.9                                             763B
ENDTABLE                                                            764
SECTION   71.0                                                      765
          -900.     863.      -900.     856.2     -800.     857.9     766
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80/80 LIST OF INPUT DATA

```
          -700.     853.9     -650.     859.2     -600.     859.2     767
          -521.     853.      -500.     858.8     -400.     857.7     768
          -300.     856.4     -200.     855.2     -100.     854.1     769
          -4.75     847.9     -4.75     840.2     -2.       840.2     770
          0.        840.25    2.        840.1     4.75      840.      771
          4.75      847.9     100.      852.8     200.      852.6     772
          300.      852.4     400.      852.3     500.      852.2     773
          600.      852.      600.1     860.                          774
ENDTABLE                                                            775
REACH     +71.05    1.        50.       50.                           776
REACH2    71.1      -.5                                             777
REACH     71.1      1.        130.      120.                          778
SEGMENT   71.1      1         N         -30.                          779
NVALUE    .09                                                       780
SEGMENT   71.1      2         C         16.                           781
NVALUE    .06                                                       782
SEGMENT   71.1      3         N         272.1                         783
NVALUE    .09                                                       784
SECTION   71.1                                                      785
          -60.      861.7     -60.      851.8     -30.      851.4     786
          -13.      842.4     -5.       841.4     -3.       841.1     787
          0.        841.7     3.        842.1     5.        842.1     788
          6.        847.      16.       850.2     66.       851.2     789
          116.      853.6     166.      853.9     216.      854.      790
          266.      855.6     272.      855.8     272.1     860.7     791
ENDTABLE                                                            792
REACH     71.2+     1.        820.      800.                          793
REACH2    71.1                                                      794
ROAD      71.3      2.7       50.       50.                           795
CULV1     71.3      1         32111                                   796
CULV2     4.7       6.        25.4      840.89    840.89              797
SECTION   71.3                                                      798
          -100.     846.6     0.        846.6     100.      846.6     799
ENDTABLE                                                            812
REACH     +71.35    1.        50.       50.                           813
REACH2    71.55     -1.                                             814
REACH     71.4+     1.        350.      350.                          815
REACH2    71.55     -.4                                             816
ROAD      71.5      2.7       50.       50.                           817
CULV1     71.5      1         32111                                   818
CULV2     4.7       6.        27.4      841.63    841.63              819
SECTION   71.5                                                      820
          -100.     847.2     0.        847.2     100.      847.2     821
ENDTABLE                                                            834
REACH     71.55     1.        40.       40.                           835
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----------80/80 LIST OF INPUT DATA----------

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SEGMENT   71.55    1       N       -20.                          836
NVALUE    .09                                                    837
SEGMENT   71.55    2       C       9.                            838
NVALUE    .06                                                    839
SEGMENT   71.55    3       N       644.1                         840
NVALUE    .085                                                   841
SECTION   71.55                                                  842
          -705.    862.    -705.   854.3   -690.   847.6        843
          -670.    847.4   -620.   846.5   -570.   845.8        844
          -520.    844.9   -470.   845.2   -420.   844.7        845
          -370.    844.6   -320.   844.5   -270.   844.6        846
          -220.    844.7   -170.   844.9   -120.   845.1        847
          -70.     845.6   -20.    846.6   -14.    846.         848
          -4.      842.    0.      842.    4.      842.1        849
          9.       845.5   59.     846.4   109.    845.8        850
          159.     846.4   209.    846.1   259.    846.5        851
          309.     846.9   359.    847.1   409.    847.7        852
          459.     848.1   509.    849.2   559.    849.5        853
          609.     849.6   634.    852.1   644.    855.         854
          644.1    862.                                          855
ENDTABLE                                                         856
ROAD      71.6     2.7     25.     25.                           857
CULV1     71.6     1       32111                                 858
CULV2     4.7      6.      28.4    841.75  841.75                859
SECTION   71.6                                                   860
          -100.    847.    0.      847.    100.    847.         861
ENDTABLE                                                         874
REACH     +71.65   1.      50.     50.                           875
REACH2    71.55                                                  876
REACH     71.7+    1.      270.    240.                          877
REACH2    71.55    .3                                            878
ROAD      71.8     2.7     50.     50.                           879
CULV1     71.8     1       32111                                 880
CULV2     4.7      6.      20.4    842.3   842.3                 881
SECTION   71.8                                                   882
          -100.    847.5   -5.5    847.5   -3.     842.4        883
          0.       842.3   0.      847.5   100.    847.5        884
ENDTABLE                                                         896
REACH     +71.85   1.      50.     50.                           897
REACH2    71.9                                                   898
REACH     71.9     1.      163.    163.                          899
SEGMENT   71.9     1       N       -15.                          900
NVALUE    .09                                                    901
SEGMENT   71.9     2       C       13.                           902
NVALUE    .06                                                    903
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----------80/80 LIST OF INPUT DATA----------

SEGMENT	71.9	3	N	290.1			904
NVALUE	.09						905
SECTION	71.9						906
	-193.	862.	-190.	849.4	-171.	849.4	907
	-121.	850.2	-71.	849.8	-21.	850.5	908
	-15.	849.2	-3.	843.1	0.	842.5	909
	3.	842.6	13.	846.	63.	846.4	910
	113.	846.6	163.	846.2	213.	846.2	911
	263.	846.3	290.	846.3	290.1	862.	912
ENDTABLE							913
REACH	71.9+	1.	187.	187.			914
REACH2	71.9	.8					915
ROAD	72.0	2.7	50.	50.			916
CULV1	72.0	1	32111				917
CULV2	4.7	6.	66.6	844.6	843.29		918
SECTION	72.0						919
	-500.	866.	-500.	853.3	-400.	852.	920
	-300.	851.6	-200.	851.3	-100.	851.4	921
	0.	851.9	100.	852.4	200.	852.4	922
	300.	852.4	400.	852.6	500.	852.5	923
	600.	852.4	700.	852.7	800.	853.4	924
	900.	855.5	900.1	866.			925
ENDTABLE							926
REACH	72.1+	1.	50.	50.			927
REACH2	71.9	.8					928
COMPUTE	70.1+	72.1+	70.1+				1019C

----------END OF 80/80 LIST----------

COMPUTE 70.1+ 72.1+ 70.1+ 1019C

----------STARTING DATA FROM GIVEN ELEVATION----------

00BREAK00

1) COUNTY: Kalamazoo

2) STUDY NAME: Cities of Kalamazoo and Portage

3) WATERCOURSE: West Branch Portage Creek

4) DOCUMENT TYPE: 100 yr run

00BREAK00

RATING TABLE FOR SECTION 61.1+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM.	CSM	CRIT ELEV	FRICTION SLOPE
0	860.00	0.0	0.0						
BANK FULL	861.9	24.6	49.7	0.00	0.00	0.00			
1	861.91	24.8	50.0	0.00	0.00	0.00	50.00	861.2	.00943
2	862.43	44.2	90.0	0.00	0.00	0.00	90.00	861.5	.00720
3	862.76	67.9	115.0	0.00	0.00	0.00	115.00	861.8	.00532
4	863.40	134.0	170.0	0.00	0.00	0.00	170.00	862.1	.00292

SEGMENT TABLE FOR SECTION 61.1+

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	50.	0.	50.	0.
50.	VELOCITY FPS	2.03	0.00	2.02	0.00
2	DISCHARGE CFS	90.	2.	88.	0.
90.	VELOCITY FPS	2.18	.44	2.19	0.00
3	DISCHARGE CFS	115.	7.	108.	0.
115.	VELOCITY FPS	2.07	.45	2.09	0.00
4	DISCHARGE CFS	170.	28.	141.	1.
170.	VELOCITY FPS	1.77	.49	1.89	.34
1	ELEV 861.91 KD	515.	2.	512.	1.
2	ELEV 862.43 KD	1058.	15.	1043.	1.
3	ELEV 862.76 KD	1553.	62.	1490.	2.
4	ELEV 863.40 KD	3105.	455.	2642.	8.

RATING TABLE FOR SECTION 61.2 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED			CSM	CRIT ELEV	FRICTION SLOPE
				DAMAGE	CHANNEL	NON-OAM			
0	859.40	0.0	0.0						
BANK FULL	861.3	24.6	30.0	0.00	0.00	0.00			
1	862.57	106.1	50.0	0.00	0.00	0.00	50.00	860.6	.00040
2	863.11	174.4	90.0	0.00	0.00	0.00	90.00	860.9	.00043
3	863.37	210.7	115.0	0.00	0.00	0.00	115.00	861.2	.00043
4	863.95	295.6	170.0	0.00	0.00	0.00	170.00	861.5	.00038

SEGMENT TABLE FOR SECTION 61.2

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	50.	7.	43.	0.
50.	VELOCITY FPS	.62	.18	.65	.12
2	DISCHARGE CFS	90.	22.	68.	0.
90.	VELOCITY FPS	.71	.25	.79	.17
3	DISCHARGE CFS	115.	33.	81.	1.
115.	VELOCITY FPS	.74	.30	.84	.19
4	DISCHARGE CFS	170.	61.	107.	1.
170.	VELOCITY FPS	.76	.36	.90	.20
1	ELEV 862.57 KO	2475.	283.	2187.	4.
2	ELEV 863.11 KO	4341.	988.	3333.	19.
3	ELEV 863.37 KO	5473.	1499.	3943.	31.
4	ELEV 863.95 KO	8721.	3086.	5562.	73.

TABLE OF VALUES FOR BPR EQUATION

COEFK	AKB	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
2.7265	2.8758	0.0000	0.0000	0.0000	-.1472	.1306	1.0000	1.0000	45.4186	393.7366	156.7342
DCRIT	860.36	KBCRIT=									
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000	45.7200	393.7366	156.7342
DCRIT	-1.00	KBCRIT=									
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000	45.7200	393.7366	156.7342
DCRIT	-1.00	KBCRIT=									
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000	45.7200	393.7366	156.7342
DCRIT	-1.00	KBCRIT=									

ROAD SECTION 61.3

NO.	HW	CFS	HL	TW	CSM
0	859.00	0.00	0.00	0.00	0.00
1	862.63	50.00	.04	862.59	50.00
2	863.27	90.00	.14	863.13	90.00
3	863.61	115.00	.22	863.39	115.00
4	864.27	170.00	.30	863.97	170.00

MIN ROAD ELEVATION 861.90

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 862.60 OPENING NO.= 1

RATING TABLE FOR SECTION 61.4+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	859.10	0.0	0.0						
BANK FULL	859.6	4.2	7.1	0.00	0.00	0.00			
1	862.63	375.4	50.0	0.00	0.00	0.00	50.00	859.9	.00003
2	863.27	476.8	90.0	0.00	0.00	0.00	90.00	860.1	.00005
3	863.61	533.6	115.0	0.00	0.00	0.00	115.00	860.1	.00006
4	864.27	650.2	170.0	0.00	0.00	0.00	170.00	860.3	.00008

SEGMENT TABLE FOR SECTION 61.4+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	50.	9.	9.	32.
50.	VELOCITY FPS	.16	.11	.26	.12
2	DISCHARGE CFS	90.	16.	15.	58.
90.	VELOCITY FPS	.22	.16	.37	.17
3	DISCHARGE CFS	115.	22.	20.	73.
115.	VELOCITY FPS	.25	.19	.43	.20
4	DISCHARGE CFS	170.	33.	29.	108.
170.	VELOCITY FPS	.31	.23	.54	.24
1	ELEV 862.63 KO	8778.	1545.	1549.	5683.
2	ELEV 863.27 KO	12773.	2334.	2183.	8256.
3	ELEV 863.61 KO	14785.	2797.	2546.	9441.
4	ELEV 864.27 KO	19616.	3820.	3325.	12471.

----------80/80 LIST OF INPUT DATA----------

```
CHANGE    DISCHARGE                                                  610
DISCHARGE -1.       45.       80.       100.      150.               611
END                                                                  612
COMPUTE   61.7      62.4      61.4*                                  613
```

----------END OF 80/80 LIST----------

COMPUTE 61.7 62.4 61.4+ 613

----------STARTING DATA FROM PREVIOUS COMPUTATIONS----------

RATING TABLE FOR SECTION 61.7 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	859.50	0.0	0.0						
BANK FULL	860.0	4.2	7.1	0.00	0.00	0.00			
1	862.65	317.8	45.0	0.00	0.00	0.00	45.00	860.3	.00004
2	863.30	418.7	80.0	0.00	0.00	0.00	80.00	860.4	.00006
3	863.64	472.2	100.0	0.00	0.00	0.00	100.00	860.5	.00006
4	864.31	585.4	150.0	0.00	0.00	0.00	150.00	860.7	.00008

SEGMENT TABLE FOR SECTION 61.7

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	45.	8.	8.	29.
45.	VELOCITY FPS	.16	.12	.27	.13
2	DISCHARGE CFS	80.	14.	14.	52.
80.	VELOCITY FPS	.22	.16	.37	.18
3	DISCHARGE CFS	100.	18.	17.	65.
100.	VELOCITY FPS	.24	.18	.41	.20
4	DISCHARGE CFS	150.	29.	26.	95.
150.	VELOCITY FPS	.30	.23	.52	.23
1	ELEV 862.65 KD	6846.	1172.	1220.	4455.
2	ELEV 863.30 KD	10570.	1900.	1809.	6861.
3	ELEV 863.64 KD	12778.	2339.	2152.	8286.
4	ELEV 864.31 KD	16977.	3318.	2897.	10763.

RATING TABLE FOR SECTION 61.9+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED			CSM	CRIT ELEV	FRICTION SLOPE
				DAMAGE	CHANNEL	NON-DAM.			
0	858.50	0.0	0.0						
BANK FULL	861.8	149.1	35.6	0.00	0.00	0.00			
1	862.67	209.6	45.0	0.00	0.00	0.00	45.00	859.1	.00001
2	863.34	259.7	80.0	0.00	0.00	0.00	80.00	859.3	.00002
3	863.68	290.9	100.0	0.00	0.00	0.00	100.00	859.4	.00002
4	864.36	360.2	150.0	0.00	0.00	0.00	150.00	859.7	.00003

SEGMENT TABLE FOR SECTION 61.9+

CSM		TOTAL	SEG NO 1 N	2 C	3 N	4 C	5 N
1	DISCHARGE CFS	45.	0.	11.	0.	34.	0.
45.	VELOCITY FPS	.22	0.00	.18	0.00	.23	.08
2	DISCHARGE CFS	80.	0.	20.	0.	60.	0.
80.	VELOCITY FPS	.32	0.00	.26	.14	.33	.14
3	DISCHARGE CFS	100.	0.	25.	0.	73.	1.
100.	VELOCITY FPS	.36	0.00	.30	.15	.37	.13
4	DISCHARGE CFS	150.	0.	39.	1.	106.	4.
150.	VELOCITY FPS	.44	.15	.37	.20	.46	.19
1	ELEV 862.67 KD	12698.	2.	3018.	9.	9657.	11.
2	ELEV 863.34 KD	17580.	2.	4321.	39.	13167.	51.
3	ELEV 863.68 KD	20494.	4.	5171.	64.	15131.	124.
4	ELEV 864.36 KD	27265.	15.	7133.	161.	19376.	580.

ROAD SECTION 62.0

NO.	HW	CFS	HL	TW	CSN
0	859.53	0.00	0.00	0.00	0.00
1	862.83	45.00	.16	862.67	45.00
2	863.34	80.00	0.00	863.34	80.00
3	863.68	100.00	0.00	863.68	100.00
4	864.36	150.00	0.00	864.36	150.00

MIN ROAD ELEVATION 863.00

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	32111.	2.96	4.82	60.20	859.53	858.68	.032
2	1	22552.	4.00		71.50	859.77	858.92	.012

RATING TABLE FOR SECTION 62.1 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	857.30	0.0	0.0						
BANK FULL	861.0	174.5	30.1	0.00	0.00	0.00			
1	862.83	319.5	45.0	0.00	0.00	0.00	45.00	858.1	.00000
2	863.34	374.6	80.0	0.00	0.00	0.00	80.00	858.2	.00001
3	863.68	413.3	100.0	0.00	0.00	0.00	100.00	858.3	.00001
4	864.37	512.8	150.0	0.00	0.00	0.00	150.00	858.5	.00001

SEGMENT TABLE FOR SECTION 62.1

CSM		TOTAL	SEG NO 1 N	2 C	3 N	4 C	5 N
1	DISCHARGE CFS	45.	0.	16.	0.	29.	0.
45.	VELOCITY FPS	.14	.02	.14	.03	.15	.02
2	DISCHARGE CFS	80.	0.	29.	0.	50.	1.
80.	VELOCITY FPS	.23	.05	.22	.05	.23	.04
3	DISCHARGE CFS	100.	0.	35.	1.	63.	1.
100.	VELOCITY FPS	.26	.06	.26	.06	.27	.04
4	DISCHARGE CFS	150.	1.	52.	1.	92.	4.
150.	VELOCITY FPS	.34	.06	.33	.07	.35	.07
1	ELEV 862.83 KO	23353.	21.	8378.	52.	14865.	36.
2	ELEV 863.34 KO	28429.	58.	10163.	120.	17949.	139.
3	ELEV 863.68 KO	32320.	102.	11475.	197.	20207.	340.
4	ELEV 864.37 KO	40685.	183.	14217.	367.	24929.	989.

RATING TABLE FOR SECTION 62.2 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	856.80	0.0	0.0						
BANK FULL	861.2	223.8	32.8	0.00	0.00	0.00			
1	862.84	377.1	45.0	0.00	0.00	0.00	45.00	857.6	.00000
2	863.35	429.8	80.0	0.00	0.00	0.00	80.00	857.8	.00001
3	863.69	468.4	100.0	0.00	0.00	0.00	100.00	858.0	.00001
4	864.38	552.6	150.0	0.00	0.00	0.00	150.00	858.2	.00001

SEGMENT TABLE FOR SECTION 62.2

CSM		TOTAL	SEG NO 1 N	2 C	3 N	4 C	5 N
1	DISCHARGE CFS	45.	0.	2.	0.	43.	0.
45.	VELOCITY FPS	.12	0.00	.07	.02	.13	.03
2	DISCHARGE CFS	80.	0.	5.	0.	75.	0.
80.	VELOCITY FPS	.19	0.00	.12	.04	.20	.04
3	DISCHARGE CFS	100.	0.	7.	1.	92.	0.
100.	VELOCITY FPS	.22	.03	.14	.05	.23	.04
4	DISCHARGE CFS	150.	0.	12.	1.	136.	1.
150.	VELOCITY FPS	.29	.05	.20	.07	.30	.06
1	ELEV 862.84 KO	28909.	2.	1368.	52.	27458.	29.
2	ELEV 863.35 KO	35052.	3.	2062.	135.	32786.	65.
3	ELEV 863.69 KO	39480.	8.	2576.	214.	36577.	105.
4	ELEV 864.38 KO	49131.	37.	3756.	445.	44606.	286.

RATING TABLE FOR SECTION +62.25 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED			CSM	CRIT ELEV	FRICTION SLOPE
				DAMAGE	CHANNEL	NON-DAM.			
0	857.10	0.0	0.0						
BANK FULL	861.5	232.6	34.5	0.00	0.00	0.00			
1	862.84	359.4	45.0	0.00	0.00	0.00	45.00	857.9	.00000
2	863.35	411.6	80.0	0.00	0.00	0.00	80.00	858.1	.00001
3	863.69	449.5	100.0	0.00	0.00	0.00	100.00	858.3	.00001
4	864.38	530.3	150.0	0.00	0.00	0.00	150.00	858.5	.00001

SEGMENT TABLE FOR SECTION +62.25

CSM		TOTAL	SEG NO 1 N	2 C	3 N	4 C	5 N
1	DISCHARGE CFS	45.	0.	3.	0.	42.	0.
45.	VELOCITY FPS	.13	0.00	.08	.02	.13	.02
2	DISCHARGE CFS	80.	0.	6.	0.	73.	0.
80.	VELOCITY FPS	.20	.03	.14	.04	.21	.04
3	DISCHARGE CFS	100.	0.	8.	1.	91.	0.
100.	VELOCITY FPS	.23	.04	.16	.05	.24	.04
4	DISCHARGE CFS	150.	0.	14.	1.	134.	1.
150.	VELOCITY FPS	.30	.05	.22	.07	.31	.05
1	ELEV 862.84 KD	26377.	3.	1767.	52.	24339.	16.
2	ELEV 863.35 KD	32308.	8.	2513.	127.	29622.	38.
3	ELEV 863.69 KD	36652.	16.	3081.	206.	33283.	65.
4	ELEV 864.38 KD	46052.	58.	4343.	436.	41045.	170.

TABLE OF VALUES FOR BPR EQUATION

COEFK	AKB	OGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
2.0686	2.0686	0.0000	0.0000	0.0000	0.0000	.2967	1.0000	1.0000	41.5913	364.6593	349.1535
DCRIT	859.94	KBCRIT=									
2.1434	2.1434	0.0000	0.0000	0.0000	0.0000	.2805	1.0000	1.0000	49.7167	418.3865	401.4156
DCRIT	860.70	KBCRIT=									
2.1838	2.1838	0.0000	0.0000	0.0000	0.0000	.2719	1.0000	1.0000	55.2266	458.5320	438.0310
DCRIT	859.97	KBCRIT=									
2.2479	2.2479	0.0000	0.0000	0.0000	0.0000	.2583	1.0000	1.0000	63.3248	539.5389	517.1303
DCRIT	860.82	KBCRIT=									

ROAD SECTION 62.3

NO.	HW	CFS	HL	TW	CSM
0	857.20	0.00	0.00	0.00	0.00
1	862.84	45.00	0.00	862.84	45.00
2	863.35	80.00	0.00	863.35	80.00
3	863.71	100.00	.02	863.69	100.00
4	864.40	150.00	.02	864.38	150.00

MIN ROAD ELEVATION 857.20

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 864.20 OPENING NO.= 1

RATING TABLE FOR SECTION +62.35 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	857.40	0.0	0.0						
BANK FULL	861.2	189.9	31.5	0.00	0.00	0.00			
1	862.84	342.7	45.0	0.00	0.00	0.00	45.00	858.2	.00000
2	863.35	395.3	80.0	0.00	0.00	0.00	80.00	858.4	.00001
3	863.71	433.8	100.0	0.00	0.00	0.00	100.00	858.6	.00001
4	864.40	513.4	150.0	0.00	0.00	0.00	150.00	858.8	.00001

SEGMENT TABLE FOR SECTION +62.35

CSM		TOTAL	SEG NO 1 N	2 C	3 N	4 C	5 N
1	DISCHARGE CFS	45.	0.	4.	0.	41.	0.
45.	VELOCITY FPS	.14	.02	.10	.03	.14	.02
2	DISCHARGE CFS	80.	0.	8.	0.	71.	0.
80.	VELOCITY FPS	.21	.04	.16	.05	.21	.04
3	DISCHARGE CFS	100.	0.	11.	1.	88.	0.
100.	VELOCITY FPS	.24	.04	.19	.06	.25	.05
4	DISCHARGE CFS	150.	0.	17.	2.	130.	0.
150.	VELOCITY FPS	.31	.06	.25	.08	.32	.05
1	ELEV 862.84 KD	23990.	4.	2190.	62.	21724.	9.
2	ELEV 863.35 KD	29759.	14.	2999.	143.	26580.	23.
3	ELEV 863.71 KD	34235.	32.	3653.	233.	30325.	43.
4	ELEV 864.40 KD	43448.	87.	4978.	472.	37799.	111.

RATING TABLE FOR SECTION 62.4 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED			CSM	CRIT ELEV	FRICTION SLOPE
				DAMAGE	CHANNEL	NON-DAM.			
0	860.00	0.0	0.0						
BANK FULL	862.5	35.7	32.9	0.00	0.00	0.00			
1	863.42	77.1	45.0	0.00	0.00	0.00	45.00	861.4	.00030
2	864.02	120.2	80.0	0.00	0.00	0.00	80.00	861.8	.00035
3	864.37	153.6	100.0	0.00	0.00	0.00	100.00	861.9	.00033
4	865.03	245.1	150.0	0.00	0.00	0.00	150.00	862.2	.00031

SEGMENT TABLE FOR SECTION 62.4

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	45.	0.	43.	2.
45.	VELOCITY FPS	.67	.13	.67	.18
2	DISCHARGE CFS	80.	1.	71.	9.
80.	VELOCITY FPS	.82	.20	.86	.26
3	DISCHARGE CFS	100.	2.	84.	14.
100.	VELOCITY FPS	.85	.24	.91	.26
4	DISCHARGE CFS	150.	6.	113.	31.
150.	VELOCITY FPS	.90	.29	1.00	.28
1	ELEV 863.42 KD	2571.	6.	2463.	101.
2	ELEV 864.02 KD	4272.	48.	3802.	421.
3	ELEV 864.37 KD	5527.	112.	4688.	726.
4	ELEV 865.03 KD	8484.	324.	6538.	1622.

----------80/80 LIST OF INPUT DATA----------

```
CHANGE    DISCHARGE                                          614
DISCHARGE -1.       35.       50.       80.       90.       615
END                                                          616
COMPUTE   62.5      65.1+     62.4                           617
```

----------END OF 80/80 LIST----------

COMPUTE 62.5 65.1+ 62.4 617

----------STARTING DATA FROM PREVIOUS COMPUTATIONS----------

RATING TABLE FOR SECTION 62.5 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	860.3)	0.0	0.0						
BANK FULL	861.6	26.6	13.9	0.00	0.00	0.00			
1	863.58	222.1	35.0	0.00	0.00	0.00	35.00	860.9	.00007
2	864.15	410.1	50.0	0.00	0.00	0.00	50.00	861.0	.00005
3	864.53	579.9	80.0	0.00	0.00	0.00	80.00	861.2	.00006
4	865.12	918.1	90.0	0.00	0.00	0.00	90.00	861.3	.00003

SEGMENT TABLE FOR SECTION 62.5

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	35.	6.	28.	1.
35.	VELOCITY FPS	.30	.05	.32	.05
2	DISCHARGE CFS	50.	14.	33.	3.
50.	VELOCITY FPS	.27	.05	.32	.06
3	DISCHARGE CFS	80.	27.	47.	6.
80.	VELOCITY FPS	.31	.07	.40	.08
4	DISCHARGE CFS	90.	41.	43.	7.
90.	VELOCITY FPS	.22	.06	.31	.05
1	ELEV 863.59 KD	4212.	609.	3532.	71.
2	ELEV 864.15 KD	7080.	1824.	4839.	416.
3	ELEV 864.53 KD	9972.	3376.	5842.	754.
4	ELEV 865.12 KD	15767.	7079.	7495.	1193.

RATING TABLE FOR SECTION 62.6 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	861.70	0.0	0.0						
BANK FULL	862.7	13.2	14.9	0.00	0.00	0.00			
1	864.05	144.4	35.0	0.00	0.00	0.00	35.00	862.5	.00028
2	864.47	279.7	50.0	0.00	0.00	0.00	50.00	862.7	.00018
3	864.85	422.0	80.0	0.00	0.00	0.00	80.00	862.9	.00017
4	865.29	609.4	90.0	0.00	0.00	0.00	90.00	863.0	.00008

SEGMENT TABLE FOR SECTION 62.6

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	35.	7.	24.	4.
35.	VELOCITY FPS	.45	.13	.54	.09
2	DISCHARGE CFS	50.	11.	26.	13.
50.	VELOCITY FPS	.36	.11	.47	.11
3	DISCHARGE CFS	80.	21.	33.	26.
80.	VELOCITY FPS	.36	.13	.52	.13
4	DISCHARGE CFS	90.	27.	31.	32.
90.	VELOCITY FPS	.26	.11	.41	.11
1	ELEV 864.05 KD	2068.	399.	1441.	229.
2	ELEV 864.47 KD	3670.	835.	2017.	818.
3	ELEV 864.85 KD	6049.	1533.	2609.	1906.
4	ELEV 865.29 KD	9832.	2944.	3365.	3524.

RATING TABLE FOR SECTION 62.9+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM.	CSM	CRIT ELEV	FRICTION SLOPE
0	863.60	0.0	0.0						
BANK FULL	864.6	13.2	20.0	0.00	0.00	0.00			
1	865.35	53.3	35.0	0.00	0.00	0.00	35.00	864.4	.00165
2	865.61	77.6	50.0	0.00	0.00	0.00	50.00	864.6	.00153
3	865.95	143.4	80.0	0.00	0.00	0.00	80.00	864.8	.00161
4	866.08	179.5	90.0	0.00	0.00	0.00	90.00	864.9	.00143

SEGMENT TABLE FOR SECTION 62.9+

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	35.	4.	30.	1.
35.	VELOCITY FPS	.95	.21	.99	.21
2	DISCHARGE CFS	50.	7.	40.	2.
50.	VELOCITY FPS	.99	.24	1.10	.22
3	DISCHARGE CFS	80.	14.	57.	8.
80.	VELOCITY FPS	1.10	.27	1.28	.18
4	DISCHARGE CFS	90.	17.	59.	14.
90.	VELOCITY FPS	1.05	.27	1.23	.21
1	ELEV 865.35 KD	849.	69.	755.	25.
2	ELEV 865.61 KD	1279.	184.	1035.	60.
3	ELEV 865.95 KD	1983.	350.	1435.	199.
4	ELEV 866.08 KD	2348.	443.	1603.	302.

TABLE OF VALUES FOR BPR EQUATION

COEFK	AK8	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
1.0670	.9956	.0685	.8030	0.0000	.0029	.5573	1.0000	1.0000	25.3193	67.4831	63.9766
DCRIT	864.25	KBCRIT=									
1.2915	1.2333	.0633	.7515	0.0000	-.0051	.4931	1.0000	1.0000	29.0695	116.7481	100.9285
DCRIT	864.42	KBCRIT=									
1.7098	1.6779	.0544	.6542	0.0000	-.0225	.3842	1.0000	1.0000	34.0046	231.6315	177.4646
DCRIT	864.69	KBCRIT=									
1.8381	1.8139	.0517	.6243	0.0000	-.0275	.3530	1.0000	1.0000	35.7579	285.7497	218.1035
DCRIT	864.77	KBCRIT=									

ROAD SECTION 63.0

NO.	HW	CFS	HL	TW	CSM
0	863.55	0.00	0.00	0.00	0.00
1	865.44	35.00	.02	865.42	35.00
2	865.74	50.00	.06	865.68	50.00
3	866.16	80.00	.14	866.02	80.00
4	866.32	90.00	.18	866.14	90.00

MIN ROAD ELEVATION 871.00

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 868.50 OPENING NO.= 1

RATING TABLE FOR SECTION 63.1+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	863.60	0.0	0.0						
BANK FULL	864.6	13.2	18.4	0.00	0.00	0.00			
1	865.51	66.8	35.0	0.00	0.00	0.00	35.00	864.4	.00106
2	865.80	113.7	50.0	0.00	0.00	0.00	50.00	864.6	.00097
3	866.21	223.6	80.0	0.00	0.00	0.00	80.00	864.8	.00084
4	866.36	275.0	90.0	0.00	0.00	0.00	90.00	864.9	.00072

SEGMENT TABLE FOR SECTION 63.1+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	35.	4.	29.	1.
35.	VELOCITY FPS	.81	.17	.66	.17
2	DISCHARGE CFS	50.	8.	38.	4.
50.	VELOCITY FPS	.84	.18	.93	.13
3	DISCHARGE CFS	80.	15.	50.	15.
80.	VELOCITY FPS	.82	.19	.97	.17
4	DISCHARGE CFS	90.	18.	52.	20.
90.	VELOCITY FPS	.76	.18	.94	.17
1	ELEV 865.51 KO	1067.	114.	915.	38.
2	ELEV 865.80 KO	1590.	238.	1246.	106.
3	ELEV 866.21 KO	2685.	502.	1779.	403.
4	ELEV 866.36 KO	3272.	650.	1997.	626.

RATING TABLE FOR SECTION 63.9+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM.	CSM	CRITR ELEV	FRICTION SLOPE
0	863.00	0.0	0.0						
BANK FULL	865.6	30.8	33.1	0.00	0.00	0.00			
1	865.75	33.8	35.0	0.00	0.00	0.00	35.00	864.2	.00127
2	866.08	40.6	50.0	0.00	0.00	0.00	50.00	864.4	.00149
3	866.54	51.9	80.0	0.00	0.00	0.00	80.00	864.7	.00189
4	866.70	56.4	90.0	0.00	0.00	0.00	90.00	864.7	.00194

SEGMENT TABLE FOR SECTION 63.9+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	35.	0.	35.	0.
35.	VELOCITY FPS	1.05	0.00	1.04	0.00
2	DISCHARGE CFS	50.	0.	50.	0.
50.	VELOCITY FPS	1.25	0.00	1.25	0.00
3	DISCHARGE CFS	80.	0.	79.	0.
80.	VELOCITY FPS	1.61	.17	1.61	.23
4	DISCHARGE CFS	90.	0.	89.	0.
90.	VELOCITY FPS	1.70	.21	1.70	.25
1	ELEV 865.75 KO	933.	1.	981.	2.
2	ELEV 866.08 KO	1294.	1.	1290.	2.
3	ELEV 866.54 KO	1837.	4.	1826.	7.
4	ELEV 866.70 KO	2043.	7.	2026.	10.

TABLE OF VALUES FOR 6PR EQUATION

CDEFK	AKB	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
.0614	.0056	.0553	.9975	0.0000	.0006	.9834	1.0000	1.0000	39.1593	31.9537	31.5571
DCRIT	864.09	KBCRIT=									
.0550	0.0000	.0550	.9989	0.0000	.0300	.9999	1.0000	1.0000	45.5519	38.6267	38.2300
DCRIT	864.29	KBCRIT=									
.2266	.1689	.0531	.9720	0.0000	.0046	.8626	1.0000	1.0000	54.5427	50.1889	49.6990
DCRIT	864.58	KBCRIT=									
.3477	.2893	.0517	.9495	0.0000	.0066	.8016	1.0000	1.0000	57.5637	54.2523	53.6325
DCRIT	864.68	KBCRIT=									

ROAD SECTION 64.0

NO.	HW	CFS	HL	TW	CSN
0	863.20	0.00	0.00	0.00	0.00
1	865.84	35.00	0.00	865.84	35.00
2	866.17	50.00	0.00	866.17	50.00
3	866.65	80.00	0.00	866.65	80.00
4	866.81	90.00	0.00	866.81	90.00

MIN ROAD ELEVATION 871.20

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 869.10 OPENING NO.= 1

RATING TABLE FOR SECTION 64.1+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM.	CSM	CRIT ELEV	FRICTION SLOPE
0	863.50	0.0	0.0						
1	865.95	27.8	35.0	0.00	0.00	0.00	35.00	864.7	.00223
BANK FULL	866.1	30.8	41.5	0.00	0.00	0.00			
2	866.29	34.7	50.0	0.00	0.00	0.00	50.00	864.9	.00239
3	866.78	45.7	80.0	0.00	0.00	0.00	80.00	865.2	.00275
4	866.94	49.6	90.0	0.00	0.00	0.00	90.00	865.2	.00275

SEGMENT TABLE FOR SECTION 64.1+

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	35.	0.	35.	0.
35.	VELOCITY FPS	1.26	0.00	1.26	0.00
2	DISCHARGE CFS	50.	0.	50.	0.
50.	VELOCITY FPS	1.46	0.00	1.45	0.00
3	DISCHARGE CFS	80.	0.	80.	0.
80.	VELOCITY FPS	1.81	.24	1.80	.29
4	DISCHARGE CFS	90.	0.	89.	0.
90.	VELOCITY FPS	1.89	.21	1.89	.28
1	ELEV 865.95 KD	742.	1.	740.	1.
2	ELEV 866.29 KD	1022.	1.	1019.	2.
3	ELEV 866.78 KD	1525.	2.	1519.	4.
4	ELEV 866.94 KD	1716.	3.	1707.	6.

RATING TABLE FOR SECTION 64.2 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM.	CSM	CRIT ELEV	FRICTION SLOPE
0	863.00	0.0	0.0						
BANK FULL	865.6	30.8	20.8	0.00	0.00	0.00			
1	866.16	42.7	35.0	0.00	0.00	0.00	35.00	864.2	.00064
2	866.54	52.0	50.0	0.00	0.00	0.00	50.00	864.4	.00074
3	867.10	68.9	80.0	0.00	0.00	0.00	80.00	864.7	.00093
4	867.27	74.8	90.0	0.00	0.00	0.00	90.00	864.7	.00096

SEGMENT TABLE FOR SECTION 64.2

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	35.	0.	35.	0.
35.	VELOCITY FPS	.84	0.00	.84	.16
2	DISCHARGE CFS	50.	0.	50.	0.
50.	VELOCITY FPS	1.01	.11	1.01	.15
3	DISCHARGE CFS	80.	1.	78.	1.
80.	VELOCITY FPS	1.28	.19	1.29	.23
4	DISCHARGE CFS	90.	1.	88.	1.
90.	VELOCITY FPS	1.35	.21	1.37	.25
1	ELEV 866.16 KD	1388.	2.	1383.	3.
2	ELEV 866.54 KD	1843.	5.	1830.	8.
3	ELEV 867.10 KD	2624.	27.	2572.	25.
4	ELEV 867.27 KD	2896.	41.	2822.	34.

RATING TABLE FOR SECTION 64.4 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM.	CSM	CRIT ELEV	FRICTION SLOPE
J	863.80	0.0	0.0						
BANK FULL	864.1	1.3	4.2	0.00	0.00	0.00			
1	866.31	212.9	35.0	0.00	0.00	0.00	35.00	864.7	.00013
2	866.66	323.2	50.0	0.00	0.00	0.00	50.00	864.8	.00009
3	867.19	517.7	80.0	0.00	0.00	0.00	80.00	865.1	.00006
4	867.37	583.9	90.0	0.00	0.00	0.00	90.00	865.1	.00005

SEGMENT TABLE FOR SECTION 64.4

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	35.	15.	11.	9.
35.	VELOCITY FPS	.31	.12	.47	.14
2	DISCHARGE CFS	50.	24.	12.	14.
50.	VELOCITY FPS	.26	.12	.43	.14
3	DISCHARGE CFS	80.	43.	14.	22.
80.	VELOCITY FPS	.22	.13	.42	.15
4	DISCHARGE CFS	90.	50.	15.	25.
90.	VELOCITY FPS	.21	.13	.41	.15
1	ELEV 866.31 KQ	2991.	1190.	1028.	773.
2	ELEV 866.66 KQ	5186.	2405.	1340.	1442.
3	ELEV 867.19 KQ	10139.	5419.	1884.	2836.
4	ELEV 867.37 KQ	12253.	6777.	2078.	3398.

RATING TABLE FOR SECTION 64.6 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	865.40	0.0	0.0						
BANK FULL	866.3	12.7	17.2	0.00	0.00	3.00			
1	867.23	38.9	35.0	0.00	0.00	0.00	35.00	866.1	.00147
2	867.43	45.3	50.0	0.00	0.00	0.00	50.00	866.2	.00181
3	867.92	62.6	80.0	0.00	0.00	0.00	80.00	866.5	.00167
4	868.16	70.9	90.0	0.00	0.00	0.00	90.00	866.5	.00143

SEGMENT TABLE FOR SECTION 64.6

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	35.	0.	35.	0.
35.	VELOCITY FPS	.92	0.00	.91	0.00
2	DISCHARGE CFS	50.	0.	50.	0.
50.	VELOCITY FPS	1.12	0.00	1.12	.31
3	DISCHARGE CFS	80.	0.	79.	0.
80.	VELOCITY FPS	1.32	.23	1.32	.24
4	DISCHARGE CFS	90.	0.	89.	0.
90.	VELOCITY FPS	1.32	.23	1.32	.24
1	ELEV 867.23 KD	912.	3.	906.	4.
2	ELEV 867.43 KD	1176.	3.	1169.	4.
3	ELEV 867.92 KD	1958.	5.	1946.	7.
4	ELEV 868.16 KD	2331.	8.	2364.	10.

RATING TABLE FOR SECTION 64.9+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM.	CSM	CRIT ELEV	FRICTION SLOPE
0	866.80	0.0	0.0						
BANK FULL	867.7	12.7	22.3	0.00	0.00	0.00			
1	868.21	25.4	35.0	0.00	0.00	3.00	35.00	867.5	.01495
2	868.50	34.3	50.0	0.00	0.00	0.00	50.00	867.6	.00450
3	868.86	46.6	80.0	0.00	0.00	0.00	80.00	867.9	.00424
4	868.98	50.6	90.0	0.00	0.00	0.00	90.00	867.9	.00413

SEGMENT TABLE FOR SECTION 64.9+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	35.	0.	35.	0.
35.	VELOCITY FPS	1.39	0.00	1.38	0.00
2	DISCHARGE CFS	50.	0.	50.	0.
50.	VELOCITY FPS	1.49	0.00	1.48	0.00
3	DISCHARGE CFS	80.	0.	80.	0.
80.	VELOCITY FPS	1.74	0.00	1.75	.45
4	DISCHARGE CFS	90.	0.	90.	0.
90.	VELOCITY FPS	1.82	0.00	1.82	.39
1	ELEV 868.21 KD	437.	1.	493.	3.
2	ELEV 868.50 KD	745.	2.	740.	3.
3	ELEV 868.86 KD	1229.	3.	1222.	4.
4	ELEV 868.98 KD	1400.	3.	1392.	5.

TABLE OF VALUES FOR BPR EQUATION

COEFK	AK0	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
.9963	.9446	.0417	.8314	0.0000	.0100	.5958	1.0000	1.0000	21.5707	52.6239	30.5738
DCRIT	867.59	KBCRIT=									
1.2555	1.2167	.0406	.7749	0.0000	-.0019	.5216	1.0000	1.0000	26.1211	74.1562	39.5524
DCRIT	867.75	KBCRIT=									
1.5983	1.5799	.0381	.6990	0.0000	-.0197	.4326	1.0000	1.0000	32.4469	116.4733	52.3397
DCRIT	867.93	KBCRIT=									
1.7487	1.7395	.0366	.6655	0.0000	-.0275	.3962	1.0000	1.0000	34.4189	132.7432	56.3686
DCRIT	868.07	KBCRIT=									

ROAD SECTION 65.0

NO.	HW	CFS	HL	TW	CSM
0	866.80	0.00	0.00	0.00	0.00
1	868.44	35.00	.06	868.38	35.00
2	868.73	50.00	.08	868.65	50.00
3	869.21	80.00	.18	869.03	80.00
4	869.37	90.00	.22	869.15	90.00

MIN ROAD ELEVATION 872.60

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 870.40 OPENING NO.= 1

RATING TABLE FOR SECTION 65.1+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM.	CSM	CRIT ELEV	FRICTION SLOPE
0	866.80	0.0	0.0						
1	868.53	57.8	35.0	0.00	0.00	0.00	35.00	867.6	.00131
2	868.80	77.9	50.0	0.00	0.00	0.00	50.00	867.8	.00113
3	869.26	119.6	80.0	0.00	0.00	0.00	80.00	868.0	.00089
4	869.41	135.2	90.0	0.00	0.00	0.00	90.00	868.0	.00080

SEGMENT TABLE FOR SECTION 65.1+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	35.	0.	35.	0.
35.	VELOCITY FPS	.62	0.00	.61	0.00
2	DISCHARGE CFS	50.	0.	50.	0.
50.	VELOCITY FPS	.64	0.00	.64	0.00
3	DISCHARGE CFS	80.	0.	80.	0.
80.	VELOCITY FPS	.67	0.00	.67	0.00
4	DISCHARGE CFS	90.	0.	90.	0.
90.	VELOCITY FPS	.68	0.00	.67	0.00
1	ELEV 868.53 KD	969.	1.	967.	1.
2	ELEV 868.80 KD	1490.	1.	1488.	1.
3	ELEV 869.26 KD	2677.	1.	2675.	1.
4	ELEV 869.41 KD	3191.	1.	3189.	1.

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-----------------------------80/80 LIST OF INPUT DATA-----------------------------
CHANGE    DISCHARGE                                                        618
DISCHARGE -1.       24.       29.       31.       35.                      619
END                                                                        620
COMPUTE   65.1+     66.1+     65.1+                                        621
-----------------------------END OF 80/80 LIST-----------------------------
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COMPUTE 65.1+ 66.1+ 65.1+ 621

----------STARTING DATA FROM PREVIOUS COMPUTATIONS----------

RATING TABLE FOR SECTION 65.1+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	866.80	0.0	0.0						
1	868.57	60.3	24.0	0.00	0.00	0.00	24.00	867.5	.00055
2	868.83	79.9	29.0	0.00	0.00	0.00	29.00	867.6	.00035
3	869.27	120.9	31.0	0.00	0.00	0.00	31.00	867.6	.00013
4	869.42	136.5	35.0	0.00	0.00	0.00	35.00	867.6	.00012

SEGMENT TABLE FOR SECTION 65.1+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	24.	0.	24.	0.
24.	VELOCITY FPS	.41	0.00	.40	0.00
2	DISCHARGE CFS	29.	0.	29.	0.
29.	VELOCITY FPS	.36	0.00	.36	0.00
3	DISCHARGE CFS	31.	0.	31.	0.
31.	VELOCITY FPS	.26	0.00	.26	0.00
4	DISCHARGE CFS	35.	0.	35.	0.
35.	VELOCITY FPS	.26	0.00	.26	0.00
1	ELEV 868.57 KO	1026.	1.	1024.	1.
2	ELEV 868.83 KO	1540.	1.	1538.	1.
3	ELEV 869.27 KO	2718.	1.	2716.	1.
4	ELEV 869.42 KO	3235.	1.	3233.	1.

RATING TABLE FOR SECTION 65.5 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	864.90	0.0	0.0						
1	868.58	250.0	24.0	0.00	0.00	0.00	24.00	865.6	.00001
2	868.84	279.6	29.0	0.00	0.00	0.00	29.00	865.7	.00001
BANK FULL	868.9	287.0	29.3	0.00	0.00	0.00			
3	869.28	331.3	31.0	0.00	0.00	0.00	31.00	865.7	.00001
4	869.43	349.3	35.0	0.00	0.00	0.00	35.00	865.7	.00001

SEGMENT TABLE FOR SECTION 65.5

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	24.	0.	24.	0.
24.	VELOCITY FPS	.10	0.00	.10	0.00
2	DISCHARGE CFS	29.	0.	29.	0.
29.	VELOCITY FPS	.10	0.00	.10	0.00
3	DISCHARGE CFS	31.	0.	31.	0.
31.	VELOCITY FPS	.09	0.00	.09	.01
4	DISCHARGE CFS	35.	0.	35.	0.
35.	VELOCITY FPS	.10	0.00	.10	.01
1	ELEV 868.58 KO	8383.	1.	8381.	1.
2	ELEV 868.84 KO	9990.	1.	9988.	1.
3	ELEV 869.28 KO	13110.	1.	13105.	3.
4	ELEV 869.43 KO	14268.	1.	14262.	5.

RATING TABLE FOR SECTION 65.9 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED- DAMAGE	CHANNEL	NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	868.80	0.0	0.0						
1	870.15	38.6	24.0	0.00	0.00	0.00	24.00	869.5	.00133
2	870.28	44.6	29.0	0.00	0.00	0.00	29.00	869.5	.00122
3	870.35	47.9	31.0	0.00	0.00	0.00	31.00	869.5	.00109
4	870.46	53.2	35.0	0.00	0.00	0.00	35.00	869.5	.00099

SEGMENT TABLE FOR SECTION 65.9

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	24.	0.	24.	0.
24.	VELOCITY FPS	.63	0.00	.62	0.00
2	DISCHARGE CFS	29.	0.	29.	0.
29.	VELOCITY FPS	.66	0.00	.65	0.00
3	DISCHARGE CFS	31.	0.	31.	0.
31.	VELOCITY FPS	.65	0.00	.65	0.00
4	DISCHARGE CFS	35.	0.	35.	0.
35.	VELOCITY FPS	.66	0.00	.66	0.00
1	ELEV 870.15 KO	659.	1.	657.	1.
2	ELEV 870.28 KO	831.	1.	829.	1.
3	ELEV 870.35 KO	941.	1.	938.	1.
4	ELEV 870.46 KO	1112.	1.	1110.	1.

RATING TABLE FOR SECTION +65.95 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM.	CSM	CRIT ELEV	FRICTION SLOPE
0	868.80	0.0	0.0						
1	870.24	42.6	24.0	0.00	0.00	0.00	24.00	869.5	.00097
2	870.38	49.2	29.0	0.00	0.00	0.00	29.00	869.5	.00087
3	870.44	52.1	31.0	0.00	0.00	0.00	31.00	869.5	.00083
4	870.54	57.1	35.0	0.00	0.00	0.00	35.00	869.5	.00080

SEGMENT TABLE FOR SECTION +65.95

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	24.	0.	24.	0.
24.	VELOCITY FPS	.57	0.00	.56	0.00
2	DISCHARGE CFS	29.	0.	29.	0.
29.	VELOCITY FPS	.59	0.00	.59	0.00
3	DISCHARGE CFS	31.	0.	31.	0.
31.	VELOCITY FPS	.60	0.00	.59	0.00
4	DISCHARGE CFS	35.	0.	35.	0.
35.	VELOCITY FPS	.62	0.00	.61	0.00
1	ELEV 870.24 KD	771.	1.	769.	1.
2	ELEV 870.38 KD	982.	1.	980.	1.
3	ELEV 870.44 KD	1077.	1.	1075.	1.
4	ELEV 870.54 KD	1239.	1.	1237.	1.

ROAD SECTION 66.0

NO.	HW	CFS	HL	TW	CSM
0	869.20	0.00	0.00	0.00	0.00
1	870.83	24.00	.48	870.35	24.00
2	870.98	29.00	.48	870.50	29.00
3	871.03	31.00	.48	870.55	31.00
4	871.20	35.00	.56	870.64	35.00

MIN ROAD ELEVATION 875.80

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	O/S INVERT	(N) COEFF
1	1	32111.	5.27	7.25	83.50	869.04	869.20	.032

RATING TABLE FOR SECTION 66.1+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	868.80	0.0	0.0						
1	870.84	72.0	24.0	0.00	0.00	0.00	24.00	869.5	.00018
2	870.99	79.4	29.0	0.00	0.00	0.00	29.00	869.5	.00019
3	871.04	82.3	31.0	0.00	0.00	0.00	31.00	869.5	.00020
BANK FULL	871.2	90.4	34.7	0.00	0.00	0.00			
4	871.21	91.2	35.0	0.00	0.00	0.00	35.00	869.5	.00018

SEGMENT TABLE FOR SECTION 66.1+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	24.	0.	24.	0.
24.	VELOCITY FPS	.33	0.00	.33	0.00
2	DISCHARGE CFS	29.	0.	29.	0.
29.	VELOCITY FPS	.37	0.00	.37	0.00
3	DISCHARGE CFS	31.	0.	31.	0.
31.	VELOCITY FPS	.38	0.00	.38	0.00
4	DISCHARGE CFS	35.	0.	35.	0.
35.	VELOCITY FPS	.38	0.00	.38	0.00
1	ELEV 870.84 KD	1793.	1.	1791.	1.
2	ELEV 870.99 KD	2083.	1.	2081.	1.
3	ELEV 871.04 KD	2202.	1.	2200.	1.
4	ELEV 871.21 KD	2588.	1.	2586.	1.



1) COUNTY: Kalamazoo

2) STUDY NAME: Cities of Kalamazoo and Portage

3) WATERCOURSE: West Branch Portage Creek

4) DOCUMENT TYPE: Input data



WSP2

WSP2 XEQ 10/05/77
REV 09/23/76
LOAD 12/17/76

West Branch Portage Creek
Sections 61.1+ - 66.1+

----------80/80 LIST OF INPUT DATA----------

```
WSP2                                                                    1
TITLE     WEST BRANCH PORTAGE CREEK, MICHIGAN                           2
TITLE     PRELIMINARY FINAL RUN  SECTIONS 61.1+-66.1+                   3
DISCHARGE -1.       50.       90.       115.      170.                  4
STARTE    61.1+     861.91    862.43    862.76    863.40                5
TRIB      61.4+     62.4      65.1+                                     9
OUTPUT    S                                                           9
REACH     61.1+     1.        0.        0.                            267
REACH2    61.2      .6                                                268
REACH     61.2      1.        1365.     1100.                         269
SEGMENT   61.2      1         N         -22.                          270
NVALUE    .125                                                        271
SEGMENT   61.2      2         C         17.                           272
NVALUE    .065                                                        273
SEGMENT   61.2      3         N         130.1                         274
NVALUE    .125                                                        275
SECTION   61.2                                                       276
          -144.     879.      -144.     873.4     -132.     866.      277
          -117.     862.2     -92.      862.9     -62.      862.      278
          -37.      862.      -22.      861.3     -12.      861.3     279
          -6.       860.2     0.        859.4     6.        860.      280
          11.       862.4     12.       861.6     17.       863.5     281
          32.       867.1     47.       869.4     62.       870.2     282
          87.       871.8     105.      870.4     130.      861.8     283
          130.1     879.                                              284
ENDTABLE                                                            285
ROAD      61.3      2.7       70.       70.                           286
BPP       61.3      A         2                                       287
CIRCCR    363.      862.6     14.       .6        2.5                   288
          -6.       363.7     -7.9      862.6     7.9       862.6     289
          3.        863.7                                             290
ENDTABLE                                                            291
SECTION   61.3                                                      292
          -108.     879.      -108.     870.4     -33.      868.4     293
          -58.      865.4     -33.      864.8     -4.       863.7     294
          -7.9      859.      -4.       859.7     0.        859.6     295
          4.        859.9     7.9       860.4     8.        863.7     296
          23.       864.7     48.       866.1     60.       866.8     297
          72.       867.2     82.       861.9     82.1      879.      298
ENDTABLE                                                            299
REACH     61.4+     1.        50.       50.                           300
REACH2    61.7      -.4                                               301
REACH     61.7      1.        530.      510.                          302
SEGMENT   61.7      1         N         -6.                           303
NVALUE    .125                                                        304
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----------80/80 LIST OF INPUT DATA----------

```
SEGMENT   61.7      2         C         6.                                  305
NVALUE    .065                                                              306
SEGMENT   61.7      3         N         164.1                               307
NVALUE    .125                                                              308
SECTION   61.7                                                              309
          -62.      879.      -62.      872.4     -50.      865.8           310
          -38.      861.5     -26.      860.8     -6.       860.            311
          -3.       861.2     0.        860.2     3.        860.2           312
          6.        861.4     26.       860.5     30.       859.6           313
          50.       861.8     70.       860.8     82.       860.6           314
          94.       859.5     106.      861.7     116.      863.7           315
          133.      864.3     158.      870.6     164.      872.6           316
          164.1     879.                                                    317
ENDTABLE                                                                    318
REACH     61.9+     1.        1510.     270.                                10
SEGMENT   61.9+     1         N         -14.                                11
NVALUE    .08                                                               12
SEGMENT   61.9+     2         C         14.                                 13
NVALUE    .05                                                               14
SEGMENT   61.9+     3         N         199.                                15
NVALUE    .08                                                               16
SEGMENT   61.9+     4         C         245.                                17
NVALUE    .05                                                               18
SEGMENT   61.9+     5         N         498.                                19
NVALUE    .08                                                               20
SECTION   61.9+                                                             21
          -107.     885.      -107.     867.8     -71.      871.2           22
          -65.      871.6     -41.      866.8     -21.      866.            23
          -14.      863.6     -7.       860.1     0.        859.2           24
          7.        859.6     14.       863.6     22.       865.9           25
          58.       868.      59.       872.7     94.       870.7           26
          144.      867.4     194.      866.3     199.      861.8           27
          211.      858.8     223.      858.5     235.      858.7           28
          245.      861.8     247.      863.3     297.      865.            29
          347.      866.2     397.      867.2     447.      868.8           30
          477.      870.3     497.      872.2     498.      890.            31
ENDTABLE                                                                    32
ROAD      62.0      2.7       50.       50.                                 33
CULV1     62.0      1         32111                                         34
CULV2     5.        3.        60.2      859.53    858.68                    35
CULV1     62.0      1         22552                                         36
CULV2     4.        0.        71.5      859.77    858.92                    37
SECTION   62.0                                                              38
          -450.     869.2     -400.     867.3     -300.     864.8           39
          -200.     864.      -100.     864.1     0.        863.9           40
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80/80 LIST OF INPUT DATA

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          100.      863.      200.      863.      300.      863.4     41
          400.      863.5     500.      864.8     600.      865.5     42
          700.      866.4     800.      868.4     826.      868.7     43
          900.      863.3     1000.     866.8     1100.     865.2     44
          1200.     865.1     1300.     865.5     1400.     865.6     45
          1419.     865.8     1500.     866.8     1600.     870.8     46
          1633.     873.1                                             47
ENDTABLE                                                            48
REACH     62.1      1.        70.       70.                           49
SEGMENT   62.1      1         N         -14.                          50
NVALUE    .08                                                       51
SEGMENT   62.1      2         C         14.                           52
NVALUE    .05                                                       53
SEGMENT   62.1      3         N         199.                          54
NVALUE    .08                                                       55
SEGMENT   62.1      4         C         245.                          56
NVALUE    .05                                                       57
SEGMENT   62.1      5         N         498.                          58
NVALUE    .08                                                       59
SECTION   62.1                                                      60
          -107.     885.      -107.     865.9     -71.      869.3     61
          -65.      868.7     -41.      864.9     -21.      864.1     62
          -14.      861.7     -7.       858.2     0.        857.3     63
          7.        857.7     14.       861.7     22.       864.      64
          58.       866.1     59.       871.9     94.       869.9     65
          144.      866.6     194.      865.5     199.      861.      66
          211.      853.      223.      857.7     235.      857.9     67
          245.      861.      247.      862.5     297.      864.2     68
          347.      865.4     397.      866.4     447.      868.      69
          477.      869.5     497.      871.4     498.      890.      70
ENDTABLE                                                            71
REACH     62.2      1.        1340.     1150.                         72
SEGMENT   62.2      1         N         -9.                           73
NVALUE    .08                                                       74
SEGMENT   62.2      2         C         8.                            75
NVALUE    .05                                                       76
SEGMENT   62.2      3         N         186.                          77
NVALUE    .08                                                       78
SEGMENT   62.2      4         C         260.                          79
NVALUE    .05                                                       80
SEGMENT   62.2      5         N         564.                          81
NVALUE    .08                                                       82
SECTION   62.2                                                      83
          -161.     890.      -151.     873.7     -151.     868.8     84
          -131.     867.      -113.     866.9     -102.     869.      85
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80/80 LIST OF INPUT DATA

```
          -52.      869.6     -27.      869.3     -21.      868.8     86
          -9.       862.8     -8.       861.3     -4.       860.5     87
          0.        863.7     4.        860.8     8.        861.8     88
          23.       867.2     43.       872.1     68.       872.6     89
          93.       873.6     98.       874.7     99.       872.5     90
          110.      871.8     122.      868.8     144.      867.3     91
          156.      866.4     168.      865.6     180.      864.1     92
          186.      861.3     199.      857.9     211.      858.3     93
          223.      857.3     235.      856.8     247.      857.8     94
          260.      861.2     263.      863.2     313.      866.4     95
          363.      867.7     413.      869.      463.      869.      96
          513.      869.4     563.      873.1     564.      890.      97
ENDTABLE                                                            98
REACH     +62.25    1.        75.       75.                           99
SEGMENT   +62.25    1         N         -9.                           100
NVALUE    .08                                                       101
SEGMENT   +62.25    2         C         8.                            102
NVALUE    .05                                                       103
SEGMENT   +62.25    3         N         186.                          104
NVALUE    .08                                                       105
SEGMENT   +62.25    4         C         260.                          106
NVALUE    .05                                                       107
SEGMENT   +62.25    5         N         564.                          108
NVALUE    .08                                                       109
SECTION   +62.25                                                    110
          -161.     890.      -161.     873.4     -151.     868.5     111
          -131.     866.6     -113.     866.6     -102.     868.7     112
          -52.      869.3     -27.      869.      -21.      868.5     113
          -9.       862.5     -8.       861.      -4.       860.2     114
          0.        863.4     4.        860.5     8.        861.5     115
          23.       866.9     43.       871.8     68.       872.3     116
          93.       873.3     98.       874.4     99.       872.8     117
          110.      871.1     122.      869.1     144.      867.6     118.
          156.      865.7     168.      865.9     180.      864.4     119
          186.      861.6     199.      858.2     211.      858.6     120
          223.      857.6     235.      857.1     247.      858.1     121
          260.      861.5     263.      863.5     313.      866.4     122
          363.      869.      413.      869.3     463.      869.3     123
          513.      869.7     563.      873.4     564.      890.      124
ENDTABLE                                                            125
ROAD      62.3      2.7       50.       50.                           126
BPR       62.3      8         2                                       127
GIRDER    865.      864.2     0.        .6        2.7                 128
          -8.       865.5     -7.9      864.2     7.9       864.2     129
          8.        863.5                                             130
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----------80/80 LIST OF INPUT DATA----------

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ENDTABLE                                                                    131
SECTION   62.3                                                              132
          -137.     881.      -137.     871.5     -135.     870.9           133
          -120.     866.9     -110.     866.      -60.      865.4           134
          -10.      865.6     -8.       865.5     -7.9      860.7           135
          -4.       861.2     0.        859.8     4.        860.1           136
          7.9       865.8     8.        865.5     10.       865.5           137
          60.       865.8     110.      869.5     135.      872.4           138
          136.      872.9     147.      871.2     159.      869.2           139
          181.      867.7     193.      866.8     205.      866.            140
          217.      865.5     223.      861.7     230.      858.3           141
          248.      858.7     260.      857.7     272.      857.2           142
          284.      858.2     297.      861.6     300.      863.6           143
          350.      865.8     400.      868.1     450.      869.4           144
          500.      869.4     550.      869.8     600.      873.5           145
ENDTABLE                                                                    146
REACH     +62.35    1.        50.       50.                                 147
SEGMENT   +62.35    1         N         -9.                                 148
NVALUE    .08                                                               149
SEGMENT   +62.35    2         C         8.                                  150
NVALUE    .05                                                               151
SEGMENT   +62.35    3         N         186.                                152
NVALUE    .08                                                               153
SEGMENT   +62.35    4         C         260.                                154
NVALUE    .05                                                               155
SEGMENT   +62.35    5         N         564.                                156
NVALUE    .08                                                               157
SECTION   +62.35                                                            158
          -161.     890.      -161.     873.1     -151.     868.2           159
          -131.     866.4     -113.     866.3     -102.     868.4           160
          -52.      869.      -27.      868.7     -21.      868.2           161
          -9.       862.2     -8.       860.7     -4.       859.9           162
          0.        861.1     4.        860.2     8.        861.2           163
          23.       865.6     43.       871.5     68.       872.            164
          93.       871.      98.       874.1     99.       873.1           165
          110.      871.4     122.      869.4     144.      867.9           166
          156.      867.      168.      866.2     180.      864.7           167
          186.      861.9     199.      858.5     211.      858.9           168
          223.      857.9     235.      857.4     247.      858.4           169
          260.      861.8     263.      863.8     313.      867.            170
          363.      863.3     413.      869.8     463.      869.8           171
          513.      870.      563.      873.7     564.      890.            172
ENDTABLE                                                                    173
REACH     62.4      1.        2055.     1700.                               396
SEGMENT   62.4      1         N         -16.                                397
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----------80/80 LIST OF INPUT DATA----------

```
NVALUE    .1                                                          398
SEGMENT   62.4      2         C         15.                           399
NVALUE    .06                                                         400
SEGMENT   62.4      3         N         348.1                         401
NVALUE    .1                                                          402
SECTION   62.4                                                        403
          -206.     881.      -206.     874.5     -196.     872.8     404
          -146.     867.      -131.     869.7     -116.     869.1     405
          -66.      863.1     -16.      863.      -12.      861.7     406
          -6.       861.3     0.        860.      6.        861.3     407
          12.       862.      15.       862.5     65.       864.3     408
          115.      864.9     165.      865.3     215.      865.9     409
          260.      867.1     315.      867.8     333.      869.8     410
          348.      874.9     348.1     880.                          411
ENDTABLE                                                              412
REACH     62.5      1.        2260.     1970.                         413
SEGMENT   62.5      1         N         -16.                          414
NVALUE    .175                                                        415
SEGMENT   62.5      2         C         16.                           416
NVALUE    .07                                                         417
SEGMENT   62.5      3         N         536.1                         418
NVALUE    .175                                                        419
SECTION   62.5                                                        420
          -744.     881.      -744.     872.6     -724.     868.6     421
          -709.     865.1     -633.     866.3     -553.     865.5     422
          -499.     864.9     -429.     864.6     -353.     864.2     423
          -271.     863.9     -216.     863.3     -163.     863.3     424
          -116.     863.1     -72.      863.2     -16.      861.6     425
          -8.       861.5     0.        860.4     8.        860.3     426
          16.       867.      69.       863.8     65.       863.3     427
          118.      866.3     165.      866.3     214.      866.1     428
          259.      865.2     296.      864.9     349.      866.1     429
          393.      865.8     448.      865.7     501.      865.8     430
          514.      963.      536.      874.3     536.1     880.      431
ENDTABLE                                                              432
----------DATA POINTS ON SECTION 62.5  REORDERED BY PROGRAM ACCORDING TO X VALUES
          DUPLICATE X POINTS NOT CHANGED----------
REACH     62.6      1.        1850.     1170.                         433
SEGMENT   62.6      1         N         -12.                          434
NVALUE    .175                                                        435
SEGMENT   62.6      2         C         12.                           436
NVALUE    0.07                                                        437
SEGMENT   62.6      3         N         477.1                         438
NVALUE    .175                                                        439
SECTION   62.6                                                        440
          -350.     881.      -350.     873.9     -300.     870.3     441
          -250.     867.2     -219.     865.9     -153.     863.9     442
```

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----------------------------80/80 LIST OF INPUT DATA-------------------------------
          -96.      864.7     -58.      863.4     -12.      862.8     443
          -6.       861.7     -2.       861.7     0.        862.1     444
          6.        862.3     12.       862.7     35.       863.9     445
          80.       863.8     142.      863.8     202.      864.4     446
          272.      865.6     338.      865.5     376.      865.2     447
          402.      867.4     452.      872.9     477.      874.4     448
          477.1     881.                                              449
ENDTABLE                                                            450
REACH     62.3+     1.        620.      500.                          451
REACH2    62.6      1.3                                             452
ROAD      63.1      2.7       50.       50.                           453
BPP       63.0      A         2         7                             454
PIER      863.55    .67                                             455
GIRDER    869.      863.5     6.        .7        2.6                 456
          -7.3      871.      -7.3      868.5     7.3       869.5     457
          7.3       871.                                              458
ENDTABLE                                                            459
SECTION   63.0                                                      460
          -450.     903.      -300.     904.      -60.      900.      461
          -7.3      871.      -7.3      863.7     -3.5      863.7     462
          0.        863.55    3.5       863.7     7.3       863.9     463
          7.3       871.      365.      896.                          464
ENDTABLE                                                            465
----------------MAX ELEV DIFFERENCE BETWEEN POINTS ON SECTION 63.0   EXCEEDS  20. FEET-----------
REACH     63.1+     1.        50.       50.                           466
REACH2    62.6      1.3                                             467
REACH     63.9+     1.        190.      190.                          468
REACH2    64.2                                                      469
ROAD      64.0      2.7       50.       50.                           470
BPP       64.0      A         2         7                             471
PIER      863.7     .67                                             472
GIRDER    870.      863.1     5.        .7        2.6                 473
          -9.5      871.2     -9.5      869.1     9.5       869.1     474
          9.5       871.2                                             475
ENDTABLE                                                            476
SECTION   64.0                                                      477
          -570.     904.      -366.     900.      -155.     896.      478
          -9.5      871.2     -9.5      864.3     -4.5      864.4     479
          0.        863.7     4.5       863.2     9.5       863.3     480
          9.5       871.2     215.      892.                          481
ENDTABLE                                                            482
----------------MAX ELEV DIFFERENCE BETWEEN POINTS ON SECTION 64.0   EXCEEDS  20. FEET-----------
REACH     64.1+     1.        50.       50.                           483
REACH2    64.2      .5                                              484
REACH     64.2      1.        290.      250.                          485
SEGMENT   64.2      1         N         -10.                          486
NVALUE    .175                                                      487
```

----------80/80 LIST OF INPUT DATA----------

```
SEGMENT   64.2     2        C        10.                                  488
NVALUE    .07                                                             489
SEGMENT   64.2     3        N        84.1                                 490
NVALUE    .175                                                            491
SECTION   64.2                                                            492
          -140.    883.     -140.    878.8    -120.    872.8              493
          -95.     872.9    -70.     870.1    -45.     868.9              494
          -20.     867.3    -10.     866.     -5.      863.               495
          0.       863.9    5.       863.6    10.      865.6              496
          20.      868.8    30.      870.7    42.      872.5              497
          52.      873.7    77.      876.3    84.      877.9              498
          84.1     883.                                                   499
ENDTABLE                                                                  500
REACH     64.4     1.       1040.    700.                                 501
SEGMENT   64.4     1        N        -6.                                  502
NVALUE    .125                                                            503
SEGMENT   64.4     2        C        6.                                   504
NVALUE    .055                                                            505
SEGMENT   64.4     3        N        131.                                 506
NVALUE    .125                                                            507
SECTION   64.4                                                            508
          -398.    897.     -398.    877.4    -344.    872.3              509
          -318.    869.4    -278.    866.9    -250.    866.8              510
          -203.    866.3    -159.    866.     -109.    865.7              511
          -70.     865.6    -33.     865.7    -6.      864.1              512
          -3.      863.8    0.       863.9    3.       864.9              513
          6.       865.1    49.      865.7    86.      865.6              514
          96.      866.4    108.     867.9    120.     874.4              515
          130.     873.3    131.     898.                                 516
ENDTABLE                                                                  517
REACH     64.6     1.       505.     470.                                 518
SEGMENT   64.6     1        N        -16.                                 519
NVALUE    .175                                                            520
SEGMENT   64.6     2        C        16.                                  521
NVALUE    .07                                                             522
SEGMENT   64.6     3        N        44.1                                 523
NVALUE    .175                                                            524
SECTION   64.6                                                            525
          -50.     885.     -50.     877.8    -45.     877.3              526
          -33.     873.7    -21.     870.2    -16.     866.8              527
          -8.      866.7    0.       865.5    8.       865.4              528
          16.      866.3    19.      869.7    31.      872.3              529
          41.      877.     44.      878.6    44.1     885.               530
ENDTABLE                                                                  531
REACH     64.9+    1.       185.     185.                                 532
```

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-----------------------------80/80 LIST OF INPUT DATA-----------------------------
REACH2    64.6      1.4                                                  533
ROAD      65.0      2.7       50.       50.                              534
BPP       65.0      A         3         7                                535
PIER      867.28    .67                                                  536
GIRDER    871.      870.4     8.        .7        2.5                    537
          -8.4      872.6     -8.4      870.4     8.4       870.4        538
          8.4       872.6                                                539
ENDTABLE                                                                 540
SECTION   65.0                                                           541
          -735.     900.      -50.      900.      -8.4      872.6        542
          -8.4      867.4     -4.       866.8     0.        867.28       543
          4.        867.15    8.4       866.95    8.4       872.6        544
          50.       900.      520.      900.                             545
ENDTABLE                                                                 546
---------------HAX ELEV DIFFERENCE BETWEEN POINTS ON SECTION 65.0   EXCEEDS  20. FEET-------------
REACH     65.1+     1.        50.       50.                              547
REACH2    65.5      1.9                                                  548
REACH     65.5      1.        785.      780.                             549
SEGMENT   65.5      1         N         -76.                             550
NVALUE    .16                                                            551
SEGMENT   65.5      2         C         40.                              552
NVALUE    .075                                                           553
SEGMENT   65.5      3         N         100.1                            554
NVALUE    .17                                                            555
SECTION   65.5                                                           556
          -100.     884.      -100.     878.3     -88.      873.9        557
          -76.      869.3     -72.      868.      -60.      866.5        558
          -48.      867.4     -36.      866.3     -24.      865.9        559
          -12.      865.1     0.        864.9     12.       865.7        560
          24.       865.8     36.       867.8     40.       868.9        561
          52.       870.7     64.       872.      76.       873.         562
          88.       874.4     100.      878.9     100.1     884.         563
ENDTABLE                                                                 564
REACH     65.9      1.        830.      570.                             565
SEGMENT   65.9      1         N         -28.                             566
NVALUE    .16                                                            567
SEGMENT   65.9      2         C         30.                              568
NVALUE    .075                                                           569
SEGMENT   65.9      3         N         78.1                             570
NVALUE    .16                                                            571
SECTION   65.9                                                           572
          -113.     889.      -113.     877.      -77.      877.3        573
          -68.      877.2     -55.      874.4     -40.      873.3        574
          -28.      871.2     -26.      870.      -18.      869.1        575
          -13.      869.1     -7.       869.4     0.        869.3        576
          7.        869.4     13.       869.2     16.       868.8        577
```

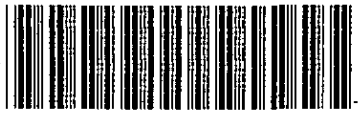
80/80 LIST OF INPUT DATA

```
          18.       869.4     30.       872.8     42.       876.1     578
          54.       877.7     66.       879.2     68.       879.7     579
          73.       880.8     78.1      889.                          580
ENDTABLE                                                              581
REACH     +65.95    1.        80.       80.                           582
REACH2    65.9                                                        583
ROAD      66.0      2.7       50.       50.                           584
CULV1     66.0      1         32111                                   585
CULV2     5.4       7.2       83.5      869.04    869.2               586
SECTION   66.0                                                        587
          -550.     895.      -550.     877.      -500.     876.1     588
          -450.     875.8     -400.     875.9     -350.     876.2     589
          -300.     876.4     -250.     876.7     -200.     876.6     590
          -150.     876.77    -100.     877.      -50.      877.8     591
          0.        873.9     50.       880.4     100.      882.6     592
          145.      883.1     145.1     895.                          593
ENDTABLE                                                              594
REACH     66.1+     1.        50.       50.                           595
REACH2    65.9                                                        596
COMPUTE   61.1+     61.4+     61.1+                                   609A
```

END OF 80/80 LIST

COMPUTE 61.1+ 61.4+ 61.1+ 609A

----------STARTING DATA FROM GIVEN ELEVATION----------



1) COUNTY: Kalamazoo

2) STUDY NAME: Cities of Kalamazoo and Portage

3) WATERCOURSE: WSP2 West Branch Portage Creek

4) DOCUMENT TYPE: 100 yr run



RATING TABLE FOR SECTION 14.7 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	808.90	0.0	0.0						
BANK FULL	811.1	76.2	53.1	0.00	0.00	0.00			
1	812.01	224.8	75.0	0.00	0.00	0.00	75.00	809.7	.00013
2	813.12	567.9	140.0	0.00	0.00	0.00	140.00	810.0	.00007
3	813.46	688.9	180.0	0.00	0.00	0.00	180.00	810.1	.00007
4	814.20	958.0	275.0	0.00	0.00	0.00	275.00	810.5	.00007

SEGMENT TABLE FOR SECTION 14.7

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	6.	65.	4.
75.	VELOCITY FPS	.49	.11	.51	.09
2	DISCHARGE CFS	140.	18.	95.	26.
140.	VELOCITY FPS	.41	.14	.49	.11
3	DISCHARGE CFS	180.	25.	114.	41.
180.	VELOCITY FPS	.43	.16	.53	.13
4	DISCHARGE CFS	275.	40.	154.	81.
275.	VELOCITY FPS	.47	.19	.59	.16
1	ELEV 812.01 KD	6451.	447.	5720.	283.
2	ELEV 813.12 KD	16892.	2207.	11513.	3172.
3	ELEV 813.46 KD	21246.	2914.	13577.	4755.
4	ELEV 814.20 KD	32741.	4771.	18558.	9412.

RATING TABLE FOR SECTION 52.5 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	810.40	0.0	0.0						
1	812.47	48.0	75.0	0.00	0.00	0.00	75.00	811.4	.00255
BANK FULL	813.0	116.1	114.2	0.00	0.00	0.00			
2	813.35	191.2	140.0	0.00	0.00	0.00	140.00	811.8	.00128
3	813.66	272.3	180.0	0.00	0.00	0.00	180.00	812.0	.00107
4	814.33	456.2	275.0	0.00	0.00	0.00	275.00	812.6	.00071

SEGMENT TABLE FOR SECTION 52.5

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	1.	74.	0.
75.	VELOCITY FPS	1.67	.17	1.67	0.00
2	DISCHARGE CFS	140.	27.	113.	0.
140.	VELOCITY FPS	1.37	.23	1.51	0.00
3	DISCHARGE CFS	180.	53.	127.	0.
180.	VELOCITY FPS	1.28	.29	1.45	0.00
4	DISCHARGE CFS	275.	117.	158.	0.
275.	VELOCITY FPS	1.09	.34	1.38	0.00
1	ELEV 812.47 KD	1478.	4.	1474.	1.
2	ELEV 813.35 KD	3844.	664.	3180.	1.
3	ELEV 813.66 KD	5410.	1442.	3968.	1.
4	ELEV 814.33 KD	10249.	4267.	5980.	1.

TABLE OF VALUES FOR BPR EQUATION

COEFK	AKB	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
1.2693	.9797	.2696	.7861	0.0000	0.0000	.5858	1.0000	1.0000	109.4564	469.6282	453.2393
DCRIT	809.75	KBCRIT=									
1.5711	1.3097	.2614	.7029	0.0000	0.0000	.4979	1.0000	1.0000	140.1274	707.0498	689.8581
DCRIT	810.15	KBCRIT=									
1.6697	1.4179	.2518	.6756	0.0000	0.0000	.4712	1.0000	1.0000	151.1041	796.4787	778.9787
DCRIT	810.32	KBCRIT=									
1.8150	1.5772	.2378	.6355	0.0000	0.0000	.4333	1.0000	1.0000	175.0684	1007.3157	976.6015
DCRIT	810.69	KBCRIT=									

ROAD SECTION 53.0

NO.	HW	CFS	HL	TW	CSM
0	808.60	0.00	0.00	0.00	0.00
1	812.56	75.00	.04	812.52	75.00
2	813.42	140.00	.04	813.38	140.00
3	813.72	180.00	.04	813.68	180.00
4	814.43	275.00	.08	814.35	275.00

MIN ROAD ELEVATION 817.80

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 816.00 OPENING NO.= 1

RATING TABLE FOR SECTION 53.1+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	808.80	0.0	0.0						
BANK FULL	811.4	116.1	51.8	0.00	0.00	0.00			
1	812.56	409.6	75.0	0.00	0.00	0.00	75.00	809.8	.00007
2	813.42	645.5	140.0	0.00	0.00	0.00	140.00	810.2	.00007
3	813.73	732.4	180.0	0.00	0.00	0.00	180.00	810.4	.00008
4	814.43	939.9	275.0	0.00	0.00	0.00	275.00	811.0	.00009

SEGMENT TABLE FOR SECTION 53.1+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	30.	45.	0.
75.	VELOCITY FPS	.34	.10	.42	0.00
2	DISCHARGE CFS	140.	69.	71.	0.
140.	VELOCITY FPS	.37	.14	.50	.03
3	DISCHARGE CFS	180.	92.	88.	0.
180.	VELOCITY FPS	.41	.16	.56	.05
4	DISCHARGE CFS	275.	148.	126.	1.
275.	VELOCITY FPS	.48	.20	.67	.07
1	ELEV 812.56 KO	8926.	3486.	5439.	1.
2	ELEV 813.42 KO	16696.	8171.	8521.	3.
3	ELEV 813.73 KO	20064.	10216.	9838.	9.
4	ELEV 814.43 KO	28973.	15603.	13257.	112.

RATING TABLE FOR SECTION 53.9♦ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	810.00	0.0	0.0						
1	812.57	108.9	75.0	0.00	0.00	0.00	75.00	811.0	.00087
BANK FULL	812.6	116.1	77.5	0.00	0.00	0.00			
2	813.42	316.9	140.0	0.00	0.00	0.00	140.00	811.4	.00046
3	813.73	400.3	180.0	0.00	0.00	0.00	180.00	811.6	.00043
4	814.44	595.1	275.0	0.00	0.00	0.00	275.00	812.2	.00034

SEGMENT TABLE FOR SECTION 53.9♦

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	75.	8.	67.	0.
75.	VELOCITY FPS	1.08	.16	1.10	0.00
2	DISCHARGE CFS	140.	47.	93.	0.
140.	VELOCITY FPS	.84	.21	1.00	0.00
3	DISCHARGE CFS	180.	71.	109.	0.
180.	VELOCITY FPS	.83	.24	1.03	0.00
4	DISCHARGE CFS	275.	132.	143.	0.
275.	VELOCITY FPS	.80	.29	1.06	.08
1	ELEV 812.57 KD	2464.	127.	2337.	1.
2	ELEV 813.42 KD	6442.	2017.	4424.	1.
3	ELEV 813.73 KD	8681.	3346.	5335.	1.
4	ELEV 814.44 KD	14838.	7049.	7787.	2.

*****SECT.54.1♦ KD VALUES REVERSED ON SEGMENT 1 AT ELEVATION 820.80 VALUE CHANGED TO EQUAL PREVIOUS VALUE*****

TABLE OF VALUES FOR BPR EQUATION

COEFK	AKB	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
.5304	.5304	0.0000	0.0000	0.0000	0.0000	.7042	1.0000	1.0000	28.7900	85.4901	55.0987
DCRIT	811.62	KBCRIT=									
1.3599	1.3599	0.0000	0.0000	0.0000	0.0000	.4608	1.0000	1.0000	42.2732	247.1259	207.6983
DCRIT	812.08	KBCRIT=									
1.6611	1.6611	0.0000	0.0000	0.0000	0.0000	.3881	1.0000	1.0000	47.1699	328.4559	291.1330
DCRIT	812.30	KBCRIT=									
2.1248	2.1248	0.0000	0.0000	0.0000	0.0000	.2845	1.0000	1.0000	58.4908	451.5917	484.7643
DCRIT	812.27	KBCRIT=									

ROAD SECTION 54.0

NO.	HW	CFS	HL	TW	CSM
0	810.40	0.00	0.00	0.00	0.00
1	812.59	75.00	.02	812.57	75.00
2	813.62	140.00	.20	813.42	140.00
3	814.07	180.00	.34	813.73	180.00
4	814.72	275.00	.28	814.44	275.00

MIN ROAD ELEVATION 813.70

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 814.70 OPENING NO.= 1

RATING TABLE FOR SECTION 54.1+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	810.80	0.0	0.0						
BANK FULL	811.4	3.9	22.6	0.00	0.00	0.00			
1	812.79	63.6	75.0	0.00	0.00	0.00	75.00	811.9	.00415
2	813.71	189.7	140.0	0.00	0.00	0.00	140.00	812.2	.00198
3	814.13	263.6	180.0	0.00	0.00	0.00	180.00	812.3	.00144
4	814.77	381.8	275.0	0.00	0.00	0.00	275.00	812.6	.00126

SEGMENT TABLE FOR SECTION 54.1+

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	75.	24.	51.	0.
75.	VELOCITY FPS	2.05	.57	2.47	.36
2	DISCHARGE CFS	140.	69.	71.	1.
140.	VELOCITY FPS	1.66	.44	2.24	.35
3	DISCHARGE CFS	180.	102.	77.	1.
180.	VELOCITY FPS	1.45	.46	2.10	.30
4	DISCHARGE CFS	275.	176.	97.	2.
275.	VELOCITY FPS	1.39	.53	2.19	.31
1	ELEV 812.79 KD	1164.	375.	785.	4.
2	ELEV 813.71 KD	3122.	1495.	1610.	16.
3	ELEV 814.13 KD	4727.	2644.	2059.	24.
4	ELEV 814.77 KD	7928.	5051.	2830.	47.

*****SECT.54.5 KD VALUES REVERSED ON SEGMENT 1 AT ELEVATION 829.00 VALUE CHANGED TO EQUAL PREVIOUS VALUE*****

RATING TABLE FOR SECTION 54.5 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	819.00	0.0	0.0						
BANK FULL	819.6	3.9	25.6	0.00	0.00	0.00			
1	820.76	50.2	75.0	0.00	0.00	0.00	75.00	820.1	.00715
2	821.18	82.6	140.0	0.00	0.00	0.00	140.00	820.4	.00956
3	821.46	114.9	180.0	0.00	0.00	0.00	180.00	820.5	.00918
4	821.92	190.6	275.0	0.00	0.00	0.00	275.00	820.8	.00704

SEGMENT TABLE FOR SECTION 54.5

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	23.	51.	0.
75.	VELOCITY FPS	2.47	.73	2.90	.67
2	DISCHARGE CFS	140.	48.	91.	1.
140.	VELOCITY FPS	3.29	.82	4.01	.65
3	DISCHARGE CFS	180.	68.	111.	1.
180.	VELOCITY FPS	3.45	.78	4.24	.69
4	DISCHARGE CFS	275.	140.	134.	1.
275.	VELOCITY FPS	3.08	.89	4.23	.70
1	ELEV 820.76 KD	885.	269.	612.	4.
2	ELEV 821.18 KD	1432.	492.	934.	6.
3	ELEV 821.46 KD	1868.	683.	1175.	10.
4	ELEV 821.92 KD	3256.	1623.	1616.	17.

*****SECT.54.9+ KD VALUES REVERSED ON SEGMENT 1 AT ELEVATION 833.70 VALUE CHANGED TO EQUAL PREVIOUS VALUE*****

RATING TABLE FOR SECTION 54.9+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	823.70	0.0	0.0						
BANK FULL	824.3	3.9	25.0	0.00	0.00	0.00			
1	825.50	52.7	75.0	0.00	0.00	0.00	75.00	824.8	.00634
2	826.26	131.2	140.0	0.00	0.00	0.00	140.00	825.1	.00428
3	826.40	154.3	180.0	0.00	0.00	0.00	180.00	825.2	.00499
4	826.78	218.5	275.0	0.00	0.00	0.00	275.00	825.5	.00497

SEGMENT TABLE FOR SECTION 54.9+

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	75.	24.	51.	0.
75.	VELOCITY FPS	2.36	.70	2.79	.59
2	DISCHARGE CFS	140.	59.	80.	1.
140.	VELOCITY FPS	2.36	.58	2.94	.49
3	DISCHARGE CFS	180.	84.	95.	1.
180.	VELOCITY FPS	2.57	.68	3.29	.55
4	DISCHARGE CFS	275.	149.	124.	1.
275.	VELOCITY FPS	2.61	.82	3.71	.61
1	ELEV 825.50 KD	940.	293.	643.	4.
2	ELEV 826.26 KD	2113.	838.	1265.	11.
3	ELEV 826.40 KD	2508.	1098.	1397.	13.
4	ELEV 826.78 KD	3893.	2088.	1785.	21.

ROAD SECTION 55.0

NO.	HW	CFS	HL	TW	CSM.
0	824.62	0.00	0.00	0.00	0.00
1	827.01	75.00	1.20	825.81	75.00
2	828.03	140.00	1.52	826.51	140.00
3	828.51	180.00	1.84	826.67	180.00
4	829.69	275.00	2.64	827.05	275.00

MIN ROAD ELEVATION 836.10

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	32111.	9.53	13.52	144.70	824.62	824.02	.038

RATING TABLE FOR SECTION 55.1+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	824.70	0.0	0.0						
1	827.11	34.8	75.0	0.00	0.00	0.00	75.00	826.1	.00190
2	828.11	59.1	140.0	0.00	0.00	0.00	140.00	826.5	.00154
3	828.58	72.7	180.0	0.00	0.00	0.00	180.00	826.8	.00147
BANK FULL	828.8	79.4	197.9	0.00	0.00	0.00			
4	829.74	110.3	275.0	0.00	0.00	0.00	275.00	827.2	.00095

SEGMENT TABLE FOR SECTION 55.1+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	2.16	0.00	2.16	0.00
2	DISCHARGE CFS	140.	0.	140.	0.
140.	VELOCITY FPS	2.38	0.00	2.37	0.00
3	DISCHARGE CFS	180.	0.	180.	0.
180.	VELOCITY FPS	2.48	0.00	2.48	0.00
4	DISCHARGE CFS	275.	0.	275.	0.
275.	VELOCITY FPS	2.52	0.00	2.51	.53
1	ELEV 827.11 KD	1722.	1.	1720.	1.
2	ELEV 828.11 KD	3563.	1.	3561.	1.
3	ELEV 828.58 KD	4701.	1.	4698.	1.
4	ELEV 829.74 KD	8928.	4.	8915.	9.

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-----------------------------80/80 LIST OF INPUT DATA-----------------------------
CHANGE    DISCHARGE                                                        598
DISCHARGE -1.       75.       140.      168.      226.                     599
END                                                                        600
COMPUTE   55.2      +57.75    55.1+                                      601
-----------------------------END OF 80/80 LIST-----------------------------
```

COMPUTE 55.2 +57.75 55.1* 601

----------STARTING DATA FROM PREVIOUS COMPUTATIONS----------

RATING TABLE FOR SECTION 55.2 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	826.10	0.0	0.0						
1	828.00	24.2	75.0	0.00	0.00	0.00	75.00	827.5	.00552
2	828.67	38.4	140.0	0.00	0.00	0.00	140.00	827.9	.00504
3	829.05	47.2	168.0	0.00	0.00	0.00	168.00	828.1	.00400
4	830.03	74.1	226.0	0.00	0.00	0.00	226.00	828.4	.00219

SEGMENT TABLE FOR SECTION 55.2

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	3.11	0.00	3.09	0.00
2	DISCHARGE CFS	140.	0.	140.	0.
140.	VELOCITY FPS	3.66	0.00	3.65	0.00
3	DISCHARGE CFS	168.	0.	168.	0.
168.	VELOCITY FPS	3.57	0.00	3.56	0.00
4	DISCHARGE CFS	226.	0.	226.	0.
226.	VELOCITY FPS	3.06	0.00	3.05	0.00
1	ELEV 828.00 KD	1009.	1.	1007.	1.
2	ELEV 828.67 KD	1972.	1.	1970.	1.
3	ELEV 829.05 KD	2656.	1.	2654.	1.
4	ELEV 830.03 KD	4825.	1.	4822.	1.

RATING TABLE FOR SECTION 55.6 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED			CSM	CRIT ELEV	FRICTION SLOPE
				DAMAGE	CHANNEL	NON-DAM			
0	827.60	0.0	0.0						
1	829.50	25.8	75.0	0.00	0.00	0.00	75.00	828.9	.00429
2	830.05	36.9	140.0	0.00	0.00	0.00	140.00	829.3	.00517
3	830.35	43.4	168.0	0.00	0.00	0.00	168.00	829.5	.00468
4	831.04	59.1	226.0	0.00	0.00	0.00	226.00	829.8	.00348

SEGMENT TABLE FOR SECTION 55.6

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	2.91	0.00	2.90	0.00
2	DISCHARGE CFS	140.	0.	140.	0.
140.	VELOCITY FPS	3.79	0.00	3.79	0.00
3	DISCHARGE CFS	168.	0.	168.	0.
168.	VELOCITY FPS	3.89	0.00	3.87	0.00
4	DISCHARGE CFS	226.	0.	226.	0.
226.	VELOCITY FPS	3.83	0.00	3.82	0.00
1	ELEV 829.50 KO	1145.	1.	1143.	1.
2	ELEV 830.05 KO	1948.	1.	1945.	1.
3	ELEV 830.35 KO	2455.	1.	2452.	1.
4	ELEV 831.04 KO	3832.	1.	3829.	1.

RATING TABLE FOR SECTION 55.7+ OA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-OAM	CSM	CRIT ELEV	FRICTION SLOPE
0	828.30	0.0	0.0						
1	829.81	24.6	75.0	0.00	0.00	0.00	75.00	829.3	.00665
2	830.41	36.7	140.0	0.00	0.00	0.00	140.00	829.7	.00691
3	830.68	42.6	168.0	0.00	0.00	0.00	168.00	829.9	.00637
4	831.28	56.3	226.0	0.00	0.00	0.00	226.00	830.2	.00511

SEGMENT TABLE FOR SECTION 55.7+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	3.06	0.00	3.05	0.00
2	DISCHARGE CFS	140.	0.	140.	0.
140.	VELOCITY FPS	3.82	0.00	3.82	0.00
3	DISCHARGE CFS	168.	0.	168.	0.
168.	VELOCITY FPS	3.94	0.00	3.94	0.00
4	DISCHARGE CFS	226.	0.	226.	0.
226.	VELOCITY FPS	4.02	0.00	4.02	0.00
1	ELEV 829.81 KD	920.	1.	918.	1.
2	ELEV 830.41 KD	1684.	1.	1682.	1.
3	ELEV 830.68 KD	2105.	1.	2103.	1.
4	ELEV 831.28 KD	3162.	1.	3160.	1.

ROAD SECTION 55.8

NO.	HW	CFS	HL	TW	CSM.
0	828.29	0.00	0.00	0.00	0.00
1	830.73	75.00	.56	830.17	75.00
2	831.68	140.00	.80	830.88	140.00
3	832.05	168.00	.88	831.17	168.00
4	832.77	226.00	1.04	831.73	226.00

MIN ROAD ELEVATION 837.10

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	32111.	9.36	13.28	40.60	828.29	828.07	.032

RATING TABLE FOR SECTION 55.9* DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED			CSM	CRIT ELEV	FRICTION SLOPE
				DAMAGE	CHANNEL	NON-DAM			
0	830.10	0.0	0.0						
1	831.30	18.6	75.0	0.00	0.00	0.00	75.00	831.1	.01540
2	832.02	32.7	140.0	0.00	0.00	0.00	140.00	831.5	.00972
3	832.31	39.0	168.0	0.00	0.00	0.00	168.00	831.7	.03833
4	832.93	52.3	226.0	0.00	0.00	0.00	226.00	832.0	.00616

SEGMENT TABLE FOR SECTION 55.9*

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	4.01	0.00	4.02	0.00
2	DISCHARGE CFS	140.	0.	140.	0.
140.	VELOCITY FPS	4.28	0.00	4.28	0.00
3	DISCHARGE CFS	168.	0.	168.	0.
168.	VELOCITY FPS	4.32	0.00	4.31	0.00
4	DISCHARGE CFS	226.	0.	226.	0.
226.	VELOCITY FPS	4.28	0.00	4.28	0.00
1	ELEV 831.30 KO	604.	1.	602.	1.
2	ELEV 832.02 KO	1420.	1.	1418.	1.
3	ELEV 832.31 KO	1841.	1.	1839.	1.
4	ELEV 832.93 KO	2879.	1.	2877.	1.

TABLE OF VALUES FOR BPR EQUATION

COEFK	AKB	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
.7937	.7937	0.0000	0.0000	0.0000	0.0000	.6407	1.0000	1.0000	15.8167	36.0116	26.5939
DCRIT	831.44	KBCRIT=									
.7694	.7694	0.0000	0.0000	0.0000	0.0000	.6482	1.0000	1.0000	24.1841	54.8527	41.2847
DCRIT	832.00	KBCRIT=									
.7814	.7814	0.0000	0.0000	0.0000	0.0000	.6445	1.0000	1.0000	27.4388	62.4461	47.4290
DCRIT	832.21	KBCRIT=									
.8249	.8249	0.0000	0.0000	0.0000	0.0000	.6311	1.0000	1.0000	33.9575	80.8534	60.2044
DCRIT	832.62	KBCRIT=									

ROAD SECTION 56.0

NO.	HW	CFS	HL	TW	CSM
0	830.10	0.00	0.00	0.00	0.00
1	832.15	75.00	.44	831.71	75.00
2	833.00	140.00	.58	832.42	140.00
3	833.31	168.00	.62	832.69	168.00
4	833.96	226.00	.72	833.24	226.00

MIN ROAD ELEVATION 836.90

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 834.60 OPENING NO.= 1

RATING TABLE FOR SECTION 56.1+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	830.40	0.0	0.0						
1	832.29	32.2	75.0	0.00	0.00	0.00	75.00	831.4	.00 292
2	833.12	50.3	140.0	0.00	0.00	0.00	140.00	831.8	.00 273
3	833.43	57.5	168.0	0.00	0.00	0.00	168.00	832.0	.00 266
BANK FULL	833.9	69.0	211.0	0.00	0.00	0.00			
4	834.06	73.6	226.0	0.00	0.00	0.00	226.00	832.3	.00 238

SEGMENT TABLE FOR SECTION 56.1+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	2.33	0.00	2.33	0.00
2	DISCHARGE CFS	140.	0.	140.	0.
140.	VELOCITY FPS	2.79	0.00	2.78	0.00
3	DISCHARGE CFS	168.	0.	168.	0.
168.	VELOCITY FPS	2.93	0.00	2.92	0.00
4	DISCHARGE CFS	226.	0.	226.	0.
226.	VELOCITY FPS	3.09	.49	3.09	0.00
1	ELEV 832.29 KD	1388.	1.	1386.	1.
2	ELEV 833.12 KD	2680.	1.	2678.	1.
3	ELEV 833.43 KD	3258.	1.	3256.	1.
4	ELEV 834.06 KD	4631.	3.	4627.	1.

RATING TABLE FOR SECTION 56.2 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	832.00	0.0	0.0						
1	833.35	21.5	75.0	0.00	0.00	0.00	75.00	833.0	.01008
2	834.01	34.6	140.0	0.00	0.00	0.00	140.00	833.4	.00822
3	834.36	42.0	168.0	0.00	0.00	0.00	168.00	833.6	.00663
4	834.78	51.6	226.0	0.00	0.00	0.00	226.00	833.9	.00660

SEGMENT TABLE FOR SECTION 56.2

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	3.50	0.00	3.49	0.00
2	DISCHARGE CFS	140.	0.	140.	0.
140.	VELOCITY FPS	4.05	0.00	4.05	0.00
3	DISCHARGE CFS	168.	0.	168.	0.
168.	VELOCITY FPS	4.00	0.00	4.00	0.00
4	DISCHARGE CFS	226.	0.	226.	0.
226.	VELOCITY FPS	4.39	0.00	4.38	0.00
1	ELEV 833.35 KD	747.	1.	745.	1.
2	ELEV 834.01 KD	1544.	1.	1542.	1.
3	ELEV 834.36 KD	2063.	1.	2061.	1.
4	ELEV 834.78 KD	2782.	1.	2780.	1.

ROAD SECTION 56.3

NO.	HW	CFS	HL	TW	CSM.
0	829.80	0.00	0.00	0.00	0.00
1	833.94	75.00	.40	833.54	75.00
2	834.82	140.00	.56	834.26	140.00
3	835.16	168.00	.56	834.60	168.00
4	835.70	226.00	.64	835.06	226.00

MIN ROAD ELEVATION 829.80

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	22551.	4.50		16.60	833.27	833.12	.012

RATING TABLE FOR SECTION 56.4+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	833.80	0.0	0.0						
1	834.81	15.2	75.0	0.00	0.00	0.00	75.00	834.8	.02982
2	835.32	24.8	140.0	0.00	0.00	0.00	140.00	835.2	.02252
3	835.62	30.8	168.0	0.00	0.00	0.00	168.00	835.4	.01687
4	835.98	38.4	226.0	0.00	0.00	0.00	226.00	835.7	.01579

SEGMENT TABLE FOR SECTION 56.4+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	4.98	0.00	4.95	0.00
2	DISCHARGE CFS	140.	0.	140.	0.
140.	VELOCITY FPS	5.65	0.00	5.65	0.00
3	DISCHARGE CFS	168.	0.	168.	0.
168.	VELOCITY FPS	5.47	0.00	5.46	0.00
4	DISCHARGE CFS	226.	0.	226.	0.
226.	VELOCITY FPS	5.90	0.00	5.89	0.00
1	ELEV 834.81 KD	434.	1.	432.	1.
2	ELEV 835.32 KD	933.	1.	931.	1.
3	ELEV 835.62 KD	1293.	1.	1291.	1.
4	ELEV 835.98 KD	1799.	1.	1797.	1.

RATING TABLE FOR SECTION +56.45 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	834.50	0.0	0.0						
1	835.94	23.3	75.0	0.00	0.00	0.00	75.00	835.5	.00785
2	836.53	35.2	140.0	0.00	0.00	0.00	140.00	835.9	.00782
3	836.84	41.7	168.0	0.00	0.00	0.00	168.00	836.1	.00678
4	837.21	50.2	226.0	0.00	0.00	0.00	226.00	836.4	.00719

SEGMENT TABLE FOR SECTION +56.45

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	3.23	0.00	3.22	0.00
2	DISCHARGE CFS	140.	0.	140.	0.
140.	VELOCITY FPS	3.98	0.00	3.98	0.00
3	DISCHARGE CFS	168.	0.	168.	0.
168.	VELOCITY FPS	4.03	0.00	4.02	0.00
4	DISCHARGE CFS	226.	0.	226.	0.
226.	VELOCITY FPS	4.52	0.00	4.51	0.00
1	ELEV 835.94 KD	847.	1.	845.	1.
2	ELEV 836.53 KD	1583.	1.	1581.	1.
3	ELEV 836.84 KD	2041.	1.	2039.	1.
4	ELEV 837.21 KD	2666.	1.	2664.	1.

ROAD SECTION 56.6

NO.	HW	CFS	HL	TW	CSM.
0	834.62	0.00	0.00	0.00	0.00
1	838.24	75.00	2.00	836.24	75.00
2	839.92	140.00	3.04	836.88	140.00
3	840.44	168.00	3.28	837.16	168.00
4	840.75	226.00	3.20	837.55	226.00

MIN ROAD ELEVATION 840.20

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	22551.	5.00		17.00	834.52	834.62	.012

RATING TABLE FOR SECTION +56.65 OA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	835.30	0.0	0.0						
1	838.25	55.5	75.0	0.00	0.00	0.00	75.00	836.3	.00059
BANK FULL	838.8	69.0	96.5	0.00	0.00	0.00			
2	839.92	111.9	140.0	0.00	0.00	0.00	140.00	836.7	.00035
3	840.44	144.1	168.0	0.00	0.00	0.00	168.00	836.9	.00031
4	840.75	165.5	226.0	0.00	0.00	0.00	226.00	837.2	.00042

SEGMENT TABLE FOR SECTION +56.65

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	1.35	0.00	1.35	0.00
2	DISCHARGE CFS	140.	3.	137.	0.
140.	VELOCITY FPS	1.39	.22	1.40	.13
3	DISCHARGE CFS	168.	7.	159.	2.
168.	VELOCITY FPS	1.40	.29	1.43	.21
4	DISCHARGE CFS	226.	13.	210.	3.
226.	VELOCITY FPS	1.71	.38	1.76	.27
1	ELEV 838.25 KD	3098.	1.	3096.	1.
2	ELEV 839.92 KD	7465.	125.	7333.	7.
3	ELEV 840.44 KD	9491.	357.	9087.	47.
4	ELEV 840.75 KD	10927.	586.	10215.	126.

TABLE OF VALUES FOR BPR EQUATION

COEFK	AKB	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
.1185	.1185	0.0000	0.0000	0.0000	0.0000	.8927	1.0000	1.0000	40.3612	60.8273	56.0849
DCRIT	836.65	KBCRIT=									
.6017	.6017	0.0000	0.0000	0.0000	0.0000	.6791	1.0000	1.0000	70.0385	149.7672	112.6152
DCRIT	837.15	KBCRIT=									
.8328	.8328	0.0000	0.0000	0.0000	0.0000	.6048	1.0000	1.0000	78.4116	202.1056	145.0409
DCRIT	837.31	KBCRIT=									
.9338	.9338	0.0000	0.0000	0.0000	0.0000	.5750	1.0000	1.0000	78.4489	238.5485	166.8065
DCRIT	837.49	KBCRIT=									

ROAD SECTION 56.7

NO.	HW	CFS	HL	TW	CSM.
0	835.30	0.00	0.00	0.00	0.00
1	838.27	75.00	0.00	838.27	75.00
2	839.97	140.00	.04	839.93	140.00
3	840.51	168.00	.06	840.45	168.00
4	840.86	226.00	.10	840.76	226.00

MIN ROAD ELEVATION 840.20

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 840.40 OPENING NO.= 1

RATING TABLE FOR SECTION 56.8 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	835.40	0.0	0.0						
1	838.31	58.2	75.0	0.00	0.00	0.00	75.00	836.7	.00082
BANK FULL	839.5	107.8	121.1	0.00	0.00	0.00			
2	839.99	141.7	140.0	0.00	0.00	0.00	140.00	837.2	.00028
3	840.52	190.7	168.0	0.00	0.00	0.00	168.00	837.3	.00021
4	840.88	227.4	226.0	0.00	0.00	0.00	226.00	837.6	.00026

SEGMENT TABLE FOR SECTION 56.8

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	1.29	0.00	1.29	0.00
2	DISCHARGE CFS	140.	0.	139.	1.
140.	VELOCITY FPS	1.06	.15	1.06	.12
3	DISCHARGE CFS	168.	1.	162.	5.
168.	VELOCITY FPS	1.03	.17	1.04	.16
4	DISCHARGE CFS	226.	1.	215.	10.
226.	VELOCITY FPS	1.22	.21	1.24	.21
1	ELEV 838.31 KD	2622.	1.	2620.	1.
2	ELEV 839.99 KD	8313.	6.	8279.	28.
3	ELEV 840.52 KD	11414.	23.	11149.	242.
4	ELEV 840.88 KD	13887.	56.	13283.	547.

RATING TABLE FOR SECTION 56.9+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED			CSM	CRIT ELEV	FRICTION SLOPE
				DAMAGE	CHANNEL	NON-DAM			
0	835.40	0.0	0.0						
1	838.42	61.8	75.0	0.00	0.00	0.00	75.00	836.7	.00069
BANK FULL	839.5	107.8	118.7	0.00	0.00	0.00			
2	840.03	144.6	140.0	0.00	0.00	0.00	140.00	837.2	.00027
3	840.55	193.8	168.0	0.00	0.00	0.00	168.00	837.3	.00021
4	840.91	231.2	226.0	0.00	0.00	0.00	226.00	837.6	.00025

SEGMENT TABLE FOR SECTION 56.9+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	1.21	0.00	1.21	0.00
2	DISCHARGE CFS	140.	0.	139.	1.
140.	VELOCITY FPS	1.05	.14	1.04	.12
3	DISCHARGE CFS	168.	1.	162.	5.
168.	VELOCITY FPS	1.02	.17	1.03	.16
4	DISCHARGE CFS	226.	1.	215.	10.
226.	VELOCITY FPS	1.20	.21	1.22	.20
1	ELEV 838.42 KO	2852.	1.	2850.	1.
2	ELEV 840.03 KO	8526.	6.	8483.	36.
3	ELEV 840.55 KO	11604.	25.	11320.	259.
4	ELEV 840.91 KO	14172.	61.	13517.	594.

TABLE OF VALUES FOR BPR EQUATION

COEFK	AKB	OGTAK	SIGMA	DKE	DKS	N	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
1.8329	1.8329	0.0000	0.0000	0.0000	0.0000	.3755	1.0000	1.0000	32.5160	199.5275	70.8900
OCRIT	836.58	KBCRIT=									
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000	32.5800	199.5275	70.8900
OCRIT	-1.00	KBCRIT=									
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000	32.5800	199.5275	70.8900
OCRIT	-1.00	KBCRIT=									
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000	32.5800	199.5275	70.8900
OCRIT	-1.00	KBCRIT=									

WEST BRANCH PORTAGE CREEK, MICHIGAN
PRELIMINARY FINAL RUN , SECTIONS 52.5-60.95

ROAD SECTION 57.0

NO.	HW	CFS	HL	TW	CSM.
0	835.20	0.00	0.00	0.00	0.00
1	838.61	75.00	.16	838.45	75.00
2	840.30	140.00	.26	840.04	140.00
3	840.68	168.00	.04	840.56	160.00
4	840.97	226.00	.04	840.93	226.00

MIN ROAD ELEVATION 840.00

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 838.10 OPENING NO.= 1

RATING TABLE FOR SECTION 57.1+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	836.10	0.0	0.0						
BANK FULL	836.7	12.6	17.8	0.00	0.00	0.00			
1	838.63	111.3	75.0	0.00	0.00	0.00	75.00	836.9	.00050
2	840.30	293.8	140.0	0.00	0.00	0.00	140.00	837.2	.00016
3	840.61	334.8	168.0	0.00	0.00	0.00	168.00	837.3	.00019
4	840.97	385.2	226.0	0.00	0.00	0.00	226.00	837.5	.00024

SEGMENT TABLE FOR SECTION 57.1+

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	75.	10.	65.	1.
75.	VELOCITY FPS	.89	.25	.94	.16
2	DISCHARGE CFS	140.	34.	99.	7.
140.	VELOCITY FPS	.71	.25	.83	.19
3	DISCHARGE CFS	168.	43.	114.	11.
168.	VELOCITY FPS	.76	.27	.89	.23
4	DISCHARGE CFS	226.	61.	148.	17.
226.	VELOCITY FPS	.89	.33	1.07	.29
1	ELEV 838.63 KD	3359.	423.	2910.	26.
2	ELEV 840.30 KD	10336.	2476.	7308.	552.
3	ELEV 840.61 KD	12085.	3065.	8258.	762.
4	ELEV 840.97 KD	14454.	3892.	9482.	1081.

RATING TABLE FOR SECTION 57.4 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	837.50	0.0	0.0						
BANK FULL	838.1	12.6	26.3	0.00	0.00	0.00			
1	839.21	56.6	75.0	0.00	0.00	0.00	75.00	838.3	.00251
2	840.53	156.3	140.0	0.00	0.00	0.00	140.00	838.6	.00079
3	840.82	188.1	168.0	0.00	0.00	0.00	168.00	838.7	.00076
4	841.21	232.3	226.0	0.00	0.00	0.00	226.00	838.9	.00084

SEGMENT TABLE FOR SECTION 57.4

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	5.	70.	0.
75.	VELOCITY FPS	1.55	.41	1.59	0.00
2	DISCHARGE CFS	140.	23.	114.	3.
140.	VELOCITY FPS	1.25	.37	1.37	.26
3	DISCHARGE CFS	168.	31.	132.	5.
168.	VELOCITY FPS	1.29	.40	1.43	.29
4	DISCHARGE CFS	226.	48.	169.	9.
226.	VELOCITY FPS	1.43	.47	1.63	.35
1	ELEV 839.21 KD	1494.	98.	1395.	1.
2	ELEV 840.53 KD	4971.	802.	4070.	100.
3	ELEV 840.82 KD	6077.	1110.	4801.	166.
4	ELEV 841.21 KD	7792.	1633.	5858.	301.

RATING TABLE FOR SECTION +57.69 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	841.10	0.0	0.0						
BANK FULL	841.7	12.6	35.6	0.00	0.00	0.00			
1	842.37	35.5	75.0	0.00	0.00	0.00	75.00	841.9	.00822
2	842.94	63.8	140.0	0.00	0.00	0.00	140.00	842.2	.00648
3	843.11	73.2	168.0	0.00	0.00	0.00	168.00	842.3	.00653
4	843.39	92.4	226.0	0.00	0.00	0.00	226.00	842.5	.00685

SEGMENT TABLE FOR SECTION +57.69

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	3.	72.	0.
75.	VELOCITY FPS	2.32	.55	2.35	0.00
2	DISCHARGE CFS	140.	11.	129.	0.
140.	VELOCITY FPS	2.61	.71	2.70	0.00
3	DISCHARGE CFS	168.	15.	153.	0.
168.	VELOCITY FPS	2.77	.76	2.90	.29
4	DISCHARGE CFS	226.	25.	200.	1.
226.	VELOCITY FPS	3.10	.87	3.27	.47
1	ELEV 842.37 KD	826.	25.	800.	1.
2	ELEV 842.94 KD	1737.	131.	1604.	1.
3	ELEV 843.11 KD	2079.	186.	1891.	2.
4	ELEV 843.39 KD	2725.	297.	2418.	10.

TABLE OF VALUES FOR BPR EQUATION

COEFK	AKB	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
1.0880	.8844	.2036	.8268	0.0000	0.0000	.5894	1.0000	1.0000	24.9959	83.4497	72.4832
DCRIT	841.71	KBCRIT=									
1.2972	1.1053	.1919	.7793	0.0000	0.0000	.5270	1.0000	1.0000	34.8929	136.0094	116.7594
DCRIT	842.07	KBCRIT=									
1.3423	1.1530	.1894	.7690	0.0000	0.0000	.5142	1.0000	1.0000	37.9060	155.9409	132.5467
DCRIT	842.15	KBCRIT=									
1.4637	1.2812	.1825	.7411	0.0000	0.0000	.4808	1.0000	1.0000	43.0607	196.1633	161.2503
DCRIT	842.31	KBCRIT=									

RDAO SECTION 57.7

NO.	HW	CFS	HL	TW	CSM.
0	840.50	0.00	0.00	0.00	0.00
1	842.64	75.00	.14	842.50	75.00
2	843.29	140.00	.20	843.09	140.00
3	843.51	168.00	.24	843.27	168.00
4	843.88	226.00	.30	843.58	226.00

MIN ROAD ELEVATION 840.50

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 848.20 OPENING NO.= 1

RATING TABLE FOR SECTION +57.75 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	841.20	0.0	0.0						
BANK FULL	841.8	12.6	28.3	0.00	0.00	0.00			
1	842.79	50.1	75.0	0.00	0.00	0.00	75.00	842.0	.00339
2	843.42	87.5	140.0	0.00	0.00	0.00	140.00	842.3	.00300
3	843.63	102.8	168.0	0.00	0.00	0.00	168.00	842.4	.00294
4	843.99	134.6	226.0	0.00	0.00	0.00	226.00	842.6	.00294

SEGMENT TABLE FOR SECTION +57.75

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	4.	71.	0.
75.	VELOCITY FPS	1.71	.43	1.76	0.00
2	DISCHARGE CFS	140.	15.	124.	1.
140.	VELOCITY FPS	2.01	.56	2.11	.30
3	DISCHARGE CFS	168.	20.	147.	1.
168.	VELOCITY FPS	2.11	.59	2.24	.34
4	DISCHARGE CFS	226.	34.	189.	4.
226.	VELOCITY FPS	2.30	.67	2.47	.46
1	ELEV 842.79 KO	1288.	73.	1215.	1.
2	ELEV 843.42 KO	2550.	265.	2278.	7.
3	ELEV 843.63 KO	3097.	369.	2708.	20.
4	ELEV 843.99 KO	4154.	600.	3498.	55.

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----------------------------80/80 LIST OF INPUT DATA-------------------------------
CHANGE    DISCHARGE                                                        602
DISCHARGE -1.       75.       140.      180.      275.                     603
END                                                                        604
COMPUTE   57.8      60.5      +57.75                                       605
----------------------------END OF 80/80 LIST--------------------------------
```

COMPUTE 57.8 60.5 +57.75 605

----------STARTING DATA FROM PREVIOUS COMPUTATIONS----------

RATING TABLE FOR SECTION 57.8 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	842.70	0.0	0.0						
1	844.63	32.2	75.0	0.00	0.00	0.00	75.00	843.7	.00532
2	845.44	50.5	140.0	0.00	0.00	0.00	140.00	844.2	.00502
3	845.71	57.2	180.0	0.00	0.00	0.00	180.00	844.4	.00576
4	846.41	75.6	275.0	0.00	0.00	0.00	275.00	844.9	.00609

SEGMENT TABLE FOR SECTION 57.8

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	2.33	0.00	2.33	0.00
2	DISCHARGE CFS	140.	0.	140.	0.
140.	VELOCITY FPS	2.78	0.00	2.77	0.00
3	DISCHARGE CFS	180.	0.	180.	0.
180.	VELOCITY FPS	3.15	0.00	3.15	0.00
4	DISCHARGE CFS	275.	0.	275.	0.
275.	VELOCITY FPS	3.64	0.00	3.64	0.00
1	ELEV 844.63 KD	1028.	1.	1026.	1.
2	ELEV 845.44 KD	1976.	1.	1974.	1.
3	ELEV 845.71 KD	2371.	1.	2369.	1.
4	ELEV 846.41 KD	3523.	1.	3521.	1.

ROAD SECTION 57.9

NO.	HW	CFS	HL	TW	CSM.
0	841.53	0.00	0.00	0.00	0.00
1	845.22	75.00	.48	844.74	75.00
2	846.55	140.00	.96	845.59	140.00
3	847.18	180.00	1.28	845.90	180.00
4	849.69	275.00	3.04	846.65	275.00

MIN ROAD ELEVATION 850.70

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	12333.	6.00		690.00	842.08	840.91	.024
2	1	12333.	6.00		690.00	841.53	840.91	.024

RATING TABLE FOR SECTION 58.5+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	843.30	0.0	0.0						
1	845.39	32.3	75.0	0.00	0.00	0.00	75.00	844.5	.00446
2	846.62	61.7	140.0	0.00	0.00	0.00	140.00	844.9	.00244
3	847.23	78.6	180.0	0.00	0.00	0.00	180.00	845.1	.00205
BANK FULL	848.6	135.1	232.9	0.00	0.00	0.00			
ZERO DAMG	849.6	220.6	271.6	0.00	0.00	0.00			
4	849.69	229.2	275.0	0.00	0.00	0.00	275.00	845.6	.00051

**********PROFILE NO 4 EXCEEDS SURVEY DATA**********

SEGMENT TABLE FOR SECTION 58.5+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	2.32	0.00	2.32	0.00
2	DISCHARGE CFS	140.	0.	140.	0.
140.	VELOCITY FPS	2.27	0.00	2.27	0.00
3	DISCHARGE CFS	180.	0.	180.	0.
180.	VELOCITY FPS	2.29	0.00	2.29	0.00
4	DISCHARGE CFS	275.	0.	251.	24.
275.	VELOCITY FPS	1.49	0.00	1.56	.35
1	ELEV 845.39 KD	1123.	1.	1121.	1.
2	ELEV 846.62 KD	2835.	1.	2833.	1.
3	ELEV 847.23 KD	3980.	1.	3978.	1.
4	ELEV 849.69 KD	12168.	2.	11105.	1061.

RATING TABLE FOR SECTION 58.6 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	844.80	0.0	0.0						
1	846.41	22.7	75.0	0.00	0.00	0.00	75.00	846.0	.01267
2	847.14	37.9	140.0	0.00	0.00	0.00	140.00	846.4	.00978
3	847.61	48.9	180.0	0.00	0.00	0.00	180.00	846.6	.00777
4	849.76	114.9	275.0	0.00	0.00	0.00	275.00	847.1	.00182

SEGMENT TABLE FOR SECTION 58.6

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	3.30	0.00	3.31	0.00
2	DISCHARGE CFS	140.	0.	140.	0.
140.	VELOCITY FPS	3.70	0.00	3.70	0.00
3	DISCHARGE CFS	180.	0.	180.	0.
180.	VELOCITY FPS	3.69	0.00	3.68	0.00
4	DISCHARGE CFS	275.	0.	273.	2.
275.	VELOCITY FPS	2.47	0.00	2.47	.53
1	ELEV 846.41 KD	666.	1.	664.	1.
2	ELEV 847.14 KD	1416.	1.	1414.	1.
3	ELEV 847.61 KD	2042.	1.	2040.	1.
4	ELEV 849.76 KD	6400.	1.	6393.	6.

RATING TABLE FOR SECTION 58.9+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	844.80	0.0	0.0						
1	846.76	29.6	75.0	0.00	0.00	0.00	75.00	846.0	.00578
2	847.51	46.4	140.0	0.00	0.00	0.00	140.00	846.4	.00549
3	847.94	57.0	180.0	0.00	0.00	0.00	180.00	846.6	.00503
4	849.85	120.3	275.0	0.00	0.00	0.00	275.00	847.1	.00168

SEGMENT TABLE FOR SECTION 58.9+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	2.54	0.00	2.54	0.00
2	DISCHARGE CFS	140.	0.	140.	0.
140.	VELOCITY FPS	3.03	0.00	3.02	0.00
3	DISCHARGE CFS	180.	0.	180.	0.
180.	VELOCITY FPS	3.16	0.00	3.16	0.00
4	DISCHARGE CFS	275.	0.	272.	3.
275.	VELOCITY FPS	2.39	0.00	2.39	.51
1	ELEV 846.76 KD	986.	1.	984.	1.
2	ELEV 847.51 KD	1893.	1.	1889.	1.
3	ELEV 847.94 KD	2539.	1.	2537.	1.
4	ELEV 849.85 KD	6658.	1.	6647.	10.

ROAD SECTION 59.0

NO.	HW	CFS	HL	TW	CSM.
0	842.27	0.00	0.00	0.00	0.00
1	846.94	75.00	.08	846.86	75.00
2	847.81	140.00	.16	847.65	140.00
3	848.34	180.00	.24	848.10	180.00
4	850.18	275.00	.24	849.94	275.00

MIN ROAD ELEVATION 850.00

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	12311.	6.50		60.00	842.27	842.25	.024
2	1	12311.	6.50		60.00	842.27	841.78	.024

RATING TABLE FOR SECTION 59.1+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	845.30	0.0	0.0						
1	847.44	19.5	75.0	0.00	0.00	0.00	75.00	847.0	.01518
2	848.19	32.1	140.0	0.00	0.00	0.00	140.00	847.5	.01346
BANK FULL	848.2	32.3	140.6	0.00	0.00	0.00			
3	848.60	42.2	180.0	0.00	0.00	0.00	180.00	847.8	.01159
4	850.21	207.3	275.0	0.00	0.00	0.00	275.00	848.5	.00186

SEGMENT TABLE FOR SECTION 59.1+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	3.86	0.00	3.85	0.00
2	DISCHARGE CFS	140.	0.	140.	0.
140.	VELOCITY FPS	4.38	0.00	4.37	0.00
3	DISCHARGE CFS	180.	2.	178.	0.
180.	VELOCITY FPS	4.48	1.00	4.47	0.00
4	DISCHARGE CFS	275.	99.	176.	0.
275.	VELOCITY FPS	2.02	.74	2.38	0.00
1	ELEV 847.44 KO	609.	1.	607.	1.
2	ELEV 848.19 KO	1207.	2.	1204.	1.
3	ELEV 848.60 KO	1662.	10.	1651.	1.
4	ELEV 850.21 KO	6310.	2138.	4171.	1.

RATING TABLE FOR SECTION 59.5 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	845.30	0.0	0.0						
1	847.88	26.5	75.0	0.00	0.00	0.00	75.00	847.0	.00656
BANK FULL	848.2	32.3	101.3	0.00	0.00	0.00			
2	848.67	44.3	140.0	0.00	0.00	0.00	140.00	847.5	.00625
3	849.06	61.7	180.0	0.00	0.00	0.00	180.00	847.8	.00572
4	850.31	225.3	275.0	0.00	0.00	0.00	275.00	848.5	.00156

SEGMENT TABLE FOR SECTION 59.5

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	2.84	0.00	2.83	0.00
2	DISCHARGE CFS	140.	2.	138.	0.
140.	VELOCITY FPS	3.35	.73	3.34	0.00
3	DISCHARGE CFS	180.	9.	171.	0.
180.	VELOCITY FPS	3.43	.74	3.48	0.00
4	DISCHARGE CFS	275.	108.	167.	0.
275.	VELOCITY FPS	1.85	.73	2.19	0.00
1	ELEV 847.88 KD	926.	1.	923.	1.
2	ELEV 848.67 KD	1760.	15.	1744.	1.
3	ELEV 849.06 KD	2351.	81.	2269.	1.
4	ELEV 850.31 KD	6844.	2486.	4357.	1.

RATING TABLE FOR SECTION 59.9+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	846.30	0.0	0.0						
1	849.14	31.2	75.0	0.00	0.00	0.00	75.00	848.0	.00419
BANK FULL	849.2	32.3	79.9	0.00	0.00	0.00			
2	849.91	50.8	140.0	0.00	0.00	0.00	140.00	848.5	.00443
3	850.29	77.1	180.0	0.00	0.00	0.00	180.00	848.8	.00405
4	850.98	167.9	275.0	0.00	0.00	0.00	275.00	849.5	.00274

SEGMENT TABLE FOR SECTION 59.9+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	2.41	0.00	2.41	0.00
2	DISCHARGE CFS	140.	3.	137.	0.
140.	VELOCITY FPS	2.96	.65	2.99	0.00
3	DISCHARGE CFS	180.	16.	164.	0.
180.	VELOCITY FPS	2.97	.67	3.06	0.00
4	DISCHARGE CFS	275.	82.	193.	0.
275.	VELOCITY FPS	2.46	.82	2.82	0.00
1	ELEV 849.14 KO	1159.	2.	1156.	1.
2	ELEV 849.91 KO	2101.	48.	2052.	1.
3	ELEV 850.29 KO	2780.	182.	2596.	1.
4	ELEV 850.98 KO	5130.	1384.	3744.	1.

TABLE OF VALUES FOR BFR EQUATION

COEFK	AKB	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
.7860	.7860	0.0000	0.0000	0.0000	0.0000	.6430	1.0000	1.0000	37.0123	78.8098	34.7622
DCRIT	847.62	KBCRIT=									
1.0481	1.0481	0.0000	0.0000	0.0000	0.0000	.5667	1.0000	1.0000	39.1175	121.8393	64.6215
DCRIT	848.12	KBCRIT=									
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	.5630	1.0000	1.0000	39.1175	125.1946	89.9909
DCRIT	848.39	KBCRIT=									
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000	39.1175	125.1946	89.9909
DCRIT	-1.00	KBCRIT=									

ROAD SECTION 60.0

NO.	HW	CFS	HL	TW	CSM
0	846.30	0.00	0.00	0.00	0.00
1	849.45	75.00	.12	849.33	75.00
2	850.65	140.00	.54	850.11	140.00
3	851.38	180.00	.90	850.48	180.00
4	851.75	275.00	.64	851.11	275.00

MIN ROAD ELEVATION 851.40

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 850.00 OPENING NO.= 1

RATING TABLE FOR SECTION +60.05 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	846.80	0.0	0.0						
1	849.50	59.8	75.0	0.00	0.00	0.00	75.00	848.1	.00111
2	850.67	110.7	140.0	0.00	0.00	0.00	140.00	848.5	.00067
3	851.40	146.2	180.0	0.00	0.00	0.00	180.00	848.7	.00049
4	851.78	166.2	275.0	0.00	0.00	0.00	275.00	849.0	.00078

SEGMENT TABLE FOR SECTION +60.05

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	1.27	0.00	1.25	0.00
2	DISCHARGE CFS	140.	0.	140.	0.
140.	VELOCITY FPS	1.27	0.00	1.26	0.00
3	DISCHARGE CFS	180.	0.	180.	0.
180.	VELOCITY FPS	1.24	0.00	1.23	0.00
4	DISCHARGE CFS	275.	0.	275.	0.
275.	VELOCITY FPS	1.66	0.00	1.66	0.00
1	ELEV 849.50 KD	2255.	1.	2253.	1.
2	ELEV 850.67 KD	5409.	1.	5407.	1.
3	ELEV 851.40 KD	8155.	1.	8153.	1.
4	ELEV 851.78 KD	9856.	1.	9854.	1.

RATING TABLE FOR SECTION 60.1 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	848.20	0.0	0.0						
BANK FULL	851.2	11.3	65.0	0.00	0.00	0.00			
1	851.66	23.8	75.0	0.00	0.00	0.00	75.00	851.1	.01340
2	852.21	74.7	140.0	0.00	0.00	0.00	140.00	851.8	.00873
3	852.56	147.9	180.0	0.00	0.00	0.00	180.00	851.9	.00386
4	852.74	205.1	275.0	0.00	0.00	0.00	275.00	852.2	.00412

SEGMENT TABLE FOR SECTION 60.1

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	2.	70.	3.
75.	VELOCITY FPS	3.62	1.17	3.60	1.26
2	DISCHARGE CFS	140.	11.	98.	31.
140.	VELOCITY FPS	3.11	1.36	3.39	.82
3	DISCHARGE CFS	180.	14.	81.	85.
180.	VELOCITY FPS	2.10	.98	2.32	.86
4	DISCHARGE CFS	275.	20.	98.	156.
275.	VELOCITY FPS	2.14	1.10	2.57	1.05
1	ELEV 851.66 KQ	635.	14.	605.	17.
2	ELEV 852.21 KQ	1420.	99.	1094.	227.
3	ELEV 852.56 KQ	2712.	236.	1526.	951.
4	ELEV 852.74 KQ	3949.	329.	1761.	1859.

RATING TABLE FOR SECTION +60.15 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	847.10	0.0	0.0						
1	851.86	154.6	75.0	0.00	0.00	0.00	75.00	848.4	.00007
2	852.36	180.7	140.0	0.00	0.00	0.00	140.00	848.8	.00016
3	852.63	195.1	180.0	0.00	0.00	0.00	180.00	849.0	.00021
4	852.81	204.8	275.0	0.00	0.00	0.00	275.00	849.3	.00041

SEGMENT TABLE FOR SECTION +60.15

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	.49	0.00	.49	0.00
2	DISCHARGE CFS	140.	0.	140.	0.
140.	VELOCITY FPS	.78	0.00	.77	0.00
3	DISCHARGE CFS	180.	0.	180.	0.
180.	VELOCITY FPS	.92	0.00	.92	0.00
4	DISCHARGE CFS	275.	0.	275.	0.
275.	VELOCITY FPS	1.35	0.00	1.34	0.00
1	ELEV 851.86 KO	8869.	1.	8867.	1.
2	ELEV 852.36 KO	11164.	1.	11162.	1.
3	ELEV 852.63 KO	12556.	1.	12554.	1.
4	ELEV 852.81 KO	13520.	1.	13518.	1.

RATING TABLE FOR SECTION 60.2 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	840.50	0.0	0.0						
BANK FULL	850.6	468.1	66.6	0.00	0.00	0.00			
1	851.87	569.9	75.0	0.00	0.00	0.00	75.00	841.8	.00000
2	852.37	621.5	140.0	0.00	0.00	0.00	140.00	842.2	.00000
3	852.64	656.6	180.0	0.00	0.00	0.00	180.00	842.4	.00001
4	852.84	685.9	275.0	0.00	0.00	0.00	275.00	842.7	.00001

SEGMENT TABLE FOR SECTION 60.2

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	.14	.02	.14	.01
2	DISCHARGE CFS	140.	1.	139.	0.
140.	VELOCITY FPS	.24	.04	.24	.02
3	DISCHARGE CFS	180.	2.	177.	1.
180.	VELOCITY FPS	.29	.06	.29	.05
4	DISCHARGE CFS	275.	5.	268.	2.
275.	VELOCITY FPS	.43	.10	.44	.09
1	ELEV 851.87 KD	59936.	172.	59759.	5.
2	ELEV 852.37 KD	66000.	505.	65451.	43.
3	ELEV 852.64 KD	69693.	797.	68775.	111.
4	ELEV 852.84 KD	72426.	1012.	71228.	186.

RATING TABLE FOR SECTION +60.25 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	842.30	0.0	0.0						
1	851.87	433.4	75.0	0.00	0.00	0.00	75.00	843.6	.00000
2	852.37	465.7	140.0	0.00	0.00	0.00	140.00	844.0	.00001
BANK FULL	852.4	468.1	144.8	0.00	0.00	0.00			
3	852.64	485.3	180.0	0.00	0.00	0.00	180.00	844.2	.00001
4	852.84	499.3	275.0	0.00	0.00	0.00	275.00	844.5	.00003

SEGMENT TABLE FOR SECTION +60.25

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	.17	0.00	.17	0.00
2	DISCHARGE CFS	140.	0.	140.	0.
140.	VELOCITY FPS	.30	0.00	.30	0.00
3	DISCHARGE CFS	180.	0.	180.	0.
180.	VELOCITY FPS	.37	.05	.37	0.00
4	DISCHARGE CFS	275.	0.	275.	0.
275.	VELOCITY FPS	.55	.07	.55	0.00
1	ELEV 851.87 KD	41330.	1.	41327.	1.
2	ELEV 852.37 KD	46074.	1.	46071.	1.
3	ELEV 852.64 KD	48839.	5.	48833.	1.
4	ELEV 852.84 KD	50874.	12.	50861.	1.

ROAD SECTION 60.3

NO.	HW	CFS	HL	TW	CSM.
0	846.77	0.00	0.00	0.00	0.00
1	851.87	75.00	0.00	851.87	75.00
2	852.37	140.00	0.00	852.37	140.00
3	852.64	180.00	0.00	852.64	180.00
4	852.92	275.00	.08	852.84	275.00

MIN ROAD ELEVATION 851.10

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	12311.	3.60		22.50	845.74	846.77	.024
2	1	12311.	3.60		22.50	845.60	846.82	.024

RATING TABLE FOR SECTION +60.35 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED			CSM	CRIT ELEV	FRICTION SLOPE
				DAMAGE	CHANNEL	NON-DAM			
0	846.30	0.0	0.0						
BANK FULL	849.0	131.3	36.4	0.00	0.00	0.00			
1	851.87	1258.2	75.0	0.00	0.00	0.00	75.00	847.7	.00001
2	852.37	1589.0	140.0	0.00	0.00	0.00	140.00	848.2	.00002
3	852.64	1774.0	180.0	0.00	0.00	0.00	180.00	848.4	.00003
4	852.92	1970.1	275.0	0.00	0.00	0.00	275.00	848.6	.00005

SEGMENT TABLE FOR SECTION +60.35

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	75.	42.	24.	9.
75.	VELOCITY FPS	.10	.05	.16	.04
2	DISCHARGE CFS	140.	80.	39.	20.
140.	VELOCITY FPS	.14	.08	.24	.06
3	DISCHARGE CFS	180.	104.	48.	28.
180.	VELOCITY FPS	.16	.09	.27	.06
4	DISCHARGE CFS	275.	161.	69.	45.
275.	VELOCITY FPS	.22	.13	.37	.09
1	ELEV 851.87 KD	22074.	12245.	7139.	2691.
2	ELEV 852.37 KD	29952.	17116.	8589.	4247.
3	ELEV 852.64 KD	35269.	20452.	9446.	5371.
4	ELEV 852.92 KD	40715.	23796.	10326.	6593.

RATING TABLE FOR SECTION 60.4 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	GRIT ELEV	FRICTION SLOPE
0	847.00	0.0	0.0						
BANK FULL	849.7	131.3	41.5	0.00	0.00	0.00			
1	851.88	901.9	75.0	0.00	0.00	0.00	75.00	848.4	.00002
2	852.39	1165.3	140.0	0.00	0.00	0.00	140.00	848.9	.00005
3	852.67	1320.6	180.0	0.00	0.00	0.00	180.00	849.1	.00006
4	852.96	1516.8	275.0	0.00	0.00	0.00	275.00	849.3	.00009

SEGMENT TABLE FOR SECTION 60.4

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	75.	43.	25.	6.
75.	VELOCITY FPS	.13	.07	.20	.04
2	DISCHARGE CFS	140.	79.	45.	16.
140.	VELOCITY FPS	.20	.10	.32	.07
3	DISCHARGE CFS	180.	101.	56.	23.
180.	VELOCITY FPS	.23	.11	.37	.08
4	DISCHARGE CFS	275.	157.	79.	39.
275.	VELOCITY FPS	.30	.16	.49	.11
1	ELEV 851.88 KO	15776.	9168.	5305.	1303.
2	ELEV 852.39 KO	20398.	11499.	6631.	2268.
3	ELEV 852.67 KO	23600.	13180.	7422.	2998.
4	ELEV 852.96 KO	28302.	16125.	8266.	3911.

RATING TABLE FOR SECTION 60.5 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	848.30	0.0	0.0						
BANK FULL	850.4	64.6	43.4	0.00	0.00	0.00			
1	851.93	429.9	75.0	0.00	0.00	0.00	75.00	849.7	.00005
2	852.47	573.3	140.0	0.00	0.00	0.00	140.00	850.2	.00007
3	852.76	659.9	180.0	0.00	0.00	0.00	180.00	850.3	.00009
4	853.10	763.5	275.0	0.00	0.00	0.00	275.00	850.4	.00014

SEGMENT TABLE FOR SECTION 60.5

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	75.	33.	21.	21.
75.	VELOCITY FPS	.20	.14	.27	.17
2	DISCHARGE CFS	140.	63.	35.	42.
140.	VELOCITY FPS	.27	.21	.37	.24
3	DISCHARGE CFS	180.	78.	45.	57.
180.	VELOCITY FPS	.31	.22	.43	.28
4	DISCHARGE CFS	275.	115.	69.	91.
275.	VELOCITY FPS	.41	.29	.59	.37
1	ELEV 851.93 KO	10505.	4632.	2983.	2890.
2	ELEV 852.47 KO	16406.	7326.	4147.	4932.
3	ELEV 852.76 KO	19296.	8378.	4842.	6075.
4	ELEV 853.10 KO	22895.	9589.	5733.	7573.

----------80/80 LIST OF INPUT DATA----------

```
CHANGE    DISCHARGE                                          606
DISCHARGE -1.       50.       90.       115.      170.      607
END                                                          608
COMPUTE   60.6      +61.95    60.5                           609
```

----------END OF 80/80 LIST----------

COMPUTE 60.6 +60.95 60.5 609

----------STARTING DATA FROM PREVIOUS COMPUTATIONS----------

RATING TABLE FOR SECTION 60.6 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	851.90	0.0	0.0						
BANK FULL	853.0	8.9	20.3	0.00	0.00	0.00			
1	854.61	160.3	50.0	0.00	0.00	0.00	50.00	853.1	.00071
2	855.04	250.7	90.0	0.00	0.00	0.00	90.00	853.5	.00069
3	855.28	303.3	115.0	0.00	0.00	0.00	115.00	853.9	.00068
4	855.73	406.0	170.0	0.00	0.00	0.00	170.00	854.8	.00065

SEGMENT TABLE FOR SECTION 60.6

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	50.	1.	25.	24.
50.	VELOCITY FPS	.60	.15	.75	.20
2	DISCHARGE CFS	90.	3.	35.	52.
90.	VELOCITY FPS	.61	.18	.88	.27
3	DISCHARGE CFS	115.	4.	41.	70.
115.	VELOCITY FPS	.61	.20	.92	.30
4	DISCHARGE CFS	170.	9.	52.	110.
170.	VELOCITY FPS	.63	.22	1.01	.35
1	ELEV 854.61 KD	1820.	40.	1003.	778.
2	ELEV 855.04 KD	3401.	103.	1378.	1920.
3	ELEV 855.28 KD	4400.	158.	1602.	2640.
4	ELEV 855.73 KD	6641.	317.	2052.	4271.

RATING TABLE FOR SECTION +60.65 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	853.40	0.0	0.0						
BANK FULL	854.5	8.9	24.0	0.00	0.00	0.00			
1	855.69	79.7	50.0	0.00	0.00	0.00	50.00	854.6	.00292
2	856.03	144.4	90.0	0.00	0.00	0.00	90.00	855.0	.00295
3	856.17	172.4	115.0	0.00	0.00	0.00	115.00	855.4	.00311
4	856.50	241.6	170.0	0.00	0.00	0.00	170.00	855.5	.00273

SEGMENT TABLE FOR SECTION +60.65

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	50.	1.	36.	13.
50.	VELOCITY FPS	1.21	.27	1.35	.26
2	DISCHARGE CFS	90.	2.	48.	40.
90.	VELOCITY FPS	1.23	.31	1.48	.38
3	DISCHARGE CFS	115.	3.	55.	57.
115.	VELOCITY FPS	1.26	.33	1.61	.44
4	DISCHARGE CFS	170.	5.	69.	96.
170.	VELOCITY FPS	1.20	.36	1.72	.51
1	ELEV 855.69 KO	854.	14.	691.	149.
2	ELEV 856.03 KO	1606.	33.	940.	633.
3	ELEV 856.17 KO	1939.	46.	1052.	902.
4	ELEV 856.50 KO	3243.	95.	1341.	1807.

ROAD SECTION 60.7

NO.	HW	CFS	HL	TW	CSM.
0	853.85	0.00	0.00	0.00	0.00
1	856.28	50.00	.48	855.80	50.00
2	857.35	90.00	1.20	856.15	90.00
3	857.97	115.00	1.68	856.29	115.00
4	859.66	170.00	3.04	856.62	170.00

MIN ROAD ELEVATION 859.60

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	32133.	3.70	6.02	16.50	853.85	853.40	.032

RATING TABLE FOR SECTION +60.75 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	854.90	0.0	0.0						
1	856.39	31.9	50.0	0.00	0.00	0.00	50.00	855.6	.00260
2	857.38	65.0	90.0	0.00	0.00	0.00	90.00	855.9	.00104
BANK FULL	857.7	77.4	103.1	0.00	0.00	0.00			
3	857.99	89.9	115.0	0.00	0.00	0.00	115.00	856.0	.00066
4	859.66	245.9	170.0	0.00	0.00	0.00	170.00	856.3	.00020

SEGMENT TABLE FOR SECTION +60.75

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	50.	0.	50.	0.
50.	VELOCITY FPS	1.58	0.00	1.57	0.00
2	DISCHARGE CFS	90.	0.	90.	0.
90.	VELOCITY FPS	1.39	0.00	1.39	0.00
3	DISCHARGE CFS	115.	0.	115.	0.
115.	VELOCITY FPS	1.30	.12	1.30	0.00
4	DISCHARGE CFS	170.	8.	158.	4.
170.	VELOCITY FPS	1.00	.11	1.03	.17
1	ELEV 856.39 KD	981.	1.	979.	1.
2	ELEV 857.38 KD	2791.	1.	2789.	1.
3	ELEV 857.99 KD	4467.	3.	4461.	3.
4	ELEV 859.66 KD	12019.	521.	11227.	271.

RATING TABLE FOR SECTION 60.8 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	853.60	0.0	0.0						
BANK FULL	856.4	77.4	46.0	0.00	0.00	0.00			
1	856.65	87.6	50.0	0.00	0.00	0.00	50.00	854.3	.00013
2	857.61	148.2	90.0	0.00	0.00	0.00	90.00	854.6	.00012
3	858.18	219.8	115.0	0.00	0.00	0.00	115.00	854.7	.00011
4	859.75	516.1	170.0	0.00	0.00	0.00	170.00	855.0	.00005

SEGMENT TABLE FOR SECTION 60.8

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	50.	0.	50.	0.
50.	VELOCITY FPS	.58	.07	.58	0.00
2	DISCHARGE CFS	90.	1.	88.	1.
90.	VELOCITY FPS	.70	.06	.71	.19
3	DISCHARGE CFS	115.	5.	107.	3.
115.	VELOCITY FPS	.71	.09	.73	.15
4	DISCHARGE CFS	170.	23.	125.	23.
170.	VELOCITY FPS	.53	.11	.60	.20
1	ELEV 856.65 KD	4322.	3.	4316.	3.
2	ELEV 857.61 KD	8037.	87.	7876.	74.
3	ELEV 858.18 KD	11027.	392.	10393.	241.
4	ELEV 859.75 KD	25007.	3251.	18571.	3184.

RATING TABLE FOR SECTION 60.95 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	856.30	0.0	0.0						
BANK FULL	857.2	7.5	20.2	0.00	0.00	0.00			
1	858.53	41.7	50.0	0.00	0.00	0.00	50.00	857.4	.00126
2	859.33	90.0	90.0	0.00	0.00	0.00	90.00	857.7	.00082
3	859.66	129.8	115.0	0.00	0.00	0.00	115.00	857.9	.00073
4	860.40	238.0	170.0	0.00	0.00	0.00	170.00	858.3	.00041

SEGMENT TABLE FOR SECTION 60.95

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	50.	1.	46.	4.
50.	VELOCITY FPS	1.44	.49	1.48	.39
2	DISCHARGE CFS	90.	2.	70.	18.
90.	VELOCITY FPS	1.40	.54	1.56	.43
3	DISCHARGE CFS	115.	3.	80.	32.
115.	VELOCITY FPS	1.37	.56	1.57	.43
4	DISCHARGE CFS	170.	4.	90.	76.
170.	VELOCITY FPS	1.07	.49	1.39	.46
1	ELEV 858.53 KD	1389.	19.	1293.	77.
2	ELEV 859.33 KD	3138.	67.	2472.	599.
3	ELEV 859.66 KD	4223.	98.	3028.	1097.
4	ELEV 860.40 KD	8333.	194.	4464.	3676.

RATING TABLE FOR SECTION +60.95 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	856.90	0.0	0.0						
BANK FULL	857.8	7.5	24.8	0.00	0.00	0.00			
1	858.72	26.2	50.0	0.00	0.00	0.00	50.00	858.0	.01358
2	859.44	58.2	90.0	0.00	0.00	0.00	90.00	858.3	.00209
3	859.76	77.5	115.0	0.00	0.00	0.00	115.00	858.5	.00188
4	860.45	153.0	170.0	0.00	0.00	0.00	170.00	858.9	.00121

SEGMENT TABLE FOR SECTION +60.95

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	50.	0.	49.	1.
50.	VELOCITY FPS	2.09	.61	2.09	.37
2	DISCHARGE CFS	90.	1.	78.	11.
90.	VELOCITY FPS	2.03	.67	2.14	.55
3	DISCHARGE CFS	115.	2.	94.	18.
115.	VELOCITY FPS	2.07	.71	2.24	.57
4	DISCHARGE CFS	170.	4.	117.	49.
170.	VELOCITY FPS	1.81	.69	2.14	.53
1	ELEV 858.72 KO	831.	6.	817.	8.
2	ELEV 859.44 KO	1957.	30.	1717.	210.
3	ELEV 859.76 KO	2636.	49.	2190.	397.
4	ELEV 860.45 KO	4879.	110.	3378.	1391.

00BREAK00

1) COUNTY: Kalamazoo

2) STUDY NAME: Cities of Kalamazoo and Portage

3) WATERCOURSE: WSP2 West Branch Portage Creek

4) DOCUMENT TYPE: Input Data

00BREAK00

WSP2 XEQ 10/04/77
REV 09/23/76
LOAD 12/17/76

WSP2 West Branch
Sections 52.5-60.95+

80/80 LIST OF INPUT DATA

```
WSP2
TITLE    WEST BRANCH PORTAGE CREEK, MICHIGAN
TITLE    PRELIMINARY FINAL RUN  SECTIONS 52.5-60.95+
*DISCHARGE -1.      75.      140.     180.     275.
*STARTE  14.7      812.01   813.12   813.46   814.20
TRIB     55.1+     +57.75   60.5     +60.95
OUTPUT   S
REACH    14.7      1.       0.       0.
SEGMENT  14.7      1        N        -25.
NVALUE   .125
SEGMENT  14.7      2        C        35.
NVALUE   .055
SEGMENT  14.7      3        N        310.1
NVALUE   .125
SECTION  14.7
         -225.     823.     -225.    820.9    -200.    820.
         -176.     818.     -151.    818.2    -127.    817.
         -102.     815.2    -92.     811.4    -75.     811.2
         -50.      811.3    -25.     811.3    -20.     810.7
         -10.      809.1    0.       808.9    10.      808.9
         22.       811.7    35.      811.1    85.      811.6
         135.      812.2    185.     812.     235.     812.6
         260.      813.4    285.     815.5    295.     817.8
         310.      821.8    310.1    828.
ENDTABLE
REACH    52.5      1.       195.     195.
SEGMENT  52.5      1        N        -18.
NVALUE   .15
SEGMENT  52.5      2        C        25.
NVALUE   .055
SEGMENT  52.5      3        N        240.1
NVALUE   .15
SECTION  52.5
         -250.     830.     -250.    812.3    -200.    813.
         -150.     813.2    -100.    812.9    -50.     812.5
         -18.      813.     -8.      810.8    -4.      810.5
         0.        811.4    4.       810.5    8.       810.5
         10.       811.5    15.      812.1    25.      814.8
         50.       816.     100.     818.8    150.     821.6
         200.      821.8    240.     822.1    240.1    830.
ENDTABLE
ROAD     53.0      2.7      80.      80.
BRP      53.0      B        3        4
PIER     808.9     2.       810.25   2.
GIRDER   816.5     815.     0.       .7       2.7
```

80/80 LIST OF INPUT DATA

```
          -17.9     819.      -17.9     816.      17.9      816.      49
          17.9      819.                                             50
ENDTABLE                                                           51
SECTION   53.0                                                      52
          -150.     823.      -150.     817.8     -100.     818.1     53
          -50.      819.4     -17.9     819.      -17.9     810.      54
          -15.      811.      -10.      808.8     -4.       808.6     55
          0.        809.2     5.        809.      10.       809.6     56
          15.       811.9     17.9      811.      17.9      819.      57
          50.       813.4     100.      820.      150.      820.6     58
          200.      821.      250.      821.4     300.      821.8     59
          350.      822.2     350.1     830.                          60
ENDTABLE                                                           61
REACH     53.1+     1.        10.       10.                           62
REACH2    52.5      -1.6                                            63
REACH     53.9+     1.        25.       25.                           64
REACH2    52.5      -.4                                             65
ROAD      54.0      2.7       10.       10.                           66
BPP       54.0      8         2                                       67
GIPDER    815.      814.7     0.        .6        2.7               68
          -8.       816.2     -7.9      813.3     0.        814.7     69
          7.9       813.3     8.        816.2                         70
ENDTABLE                                                           71
SECTION   54.0                                                      72
          -215.     833.      -215.     822.2     -210.     821.4     73
          -200.     823.1     -175.     818.      -150.     816.1     74
          -100.     814.4     -45.      814.      -35.      813.7     75
          -25.      815.4     -12.      816.      -8.       816.2     76
          -7.9      811.2     -4.       810.9     0.        810.8     77
          4.        813.4     7.9       810.6     8.        816.2     78
          12.       816.1     25.       818.2     31.       819.2     79
          31.1      830.                                            80
ENDTABLE                                                           81
REACH     54.1+     1.        50.       50.                           82
REACH2    54.5      -8.2                                            83
REACH     54.5      1.        925.      800.                          84
SEGMENT   54.5      1         N         -6.                           85
NVALUE    .15                                                       86
SEGMENT   54.5      2         C         6.                            87
NVALUE    .055                                                      88
SEGMENT   54.5      3         N         43.1                          89
NVALUE    .15                                                       90
SECTION   54.5                                                      91
          -475.     833.      -475.     831.8     -450.     829.9     92
          -425.     823.8     -400.     828.8     -375.     828.8     93
```

80/80 LIST OF INPUT DATA

```
          -350.     828.5     -325.     828.4     -300.     828.2     94
          -275.     828.2     -250.     828.      -225.     828.      95
          -200.     826.6     -175.     822.5     -150.     821.      96
          -125.     821.2     -100.     821.3     -75.      821.6     97
          -50.      820.8     -25.      819.8     -8.       819.6     98
          -6.       819.8     -4.       819.4     0.        819.2     99
          4.        819.      6.        819.6     8.        822.2     100
          12.       823.3     15.       825.4     23.       827.7     101
          28.       823.4     35.       830.3     43.       830.5     102
          43.1      839.                                              103
ENDTABLE                                                            104
REACH     54.9+     1.        935.      800.                          105
REACH2    54.5      4.7                                               106
ROAD      55.0      2.7       50.       50.                           107
CULV1     55.0      1         32111                                   108
CULV2     9.        14.5      144.7     824.62    824.02    .038      109
SECTION   55.0                                                        110
          -295.     852.      -295.     841.5     -250.     840.1     111
          -200.     838.7     -150.     837.5     -100.     836.7     112
          -50.      836.2     0.        836.1     50.       836.2     113
          100.      836.4     150.      837.4     200.      838.7     114
          250.      840.3     280.      841.6     280.1     852.      115
ENDTABLE                                                            116
REACH     55.1+     1.        50.       50.                           117
REACH2    55.2      -1.4                                              118
REACH     55.2      1.        145.      145.                          119
SEGMENT   55.2      1         N         -16.                          120
NVALUE    .055                                                        121
SEGMENT   55.2      2         C         16.                           122
NVALUE    .04                                                         123
SEGMENT   55.2      3         N         45.1                          124
NVALUE    .055                                                        125
SECTION   55.2                                                        126
          -40.      851.      -40.      833.1     -37.      833.4     127
          -17.      832.2     -16.      830.2     -12.      829.2     128
          -8.       827.4     -4.       827.      0.        826.3     129
          4.        826.1     8.        826.7     12.       828.9     130
          16.       831.2     22.       834.      40.       835.5     130A
          45.       835.4     45.1      851.                          130B
ENDTABLE                                                            131
REACH     55.6      1.        300.      220.                          10
SEGMENT   55.6      1         N         -15.                          11
NVALUE    .055                                                        12
SEGMENT   55.6      2         C         15.                           13
NVALUE    .04                                                         14
```

----------80/80 LIST OF INPUT DATA----------

SEGMENT	56.6	3	N	45.1			15
NVALUE	.055						16
SECTION	55.6						17
	-50.	852.	-50.	835.6	-40.	835.4	18
	-15.	832.9	-11.	830.9	-7.	828.8	19
	-4.	827.9	1.	827.6	5.	827.8	20
	10.	829.9	15.	832.9	24.	833.2	21
	36.	837.9	45.	838.3	45.1	852.	21A
ENDTABLE							22
REACH	55.7+	1.	50.	50.			23
REACH2	56.2	-3.7					24
ROAD	55.8	2.7	140.	140.			25
CULV1	55.8	1	32111				26
CULV2	8.1	15.4	40.6	828.29	828.07		27
SECTION	55.8						28
	-300.	857.	-300.	837.1	-250.	837.7	29
	-200.	837.9	-150.	838.2	-100.	838.2	30
	-50.	839.6	0.	838.8	50.	839.3	31
	100.	839.7	150.	840.2	200.	841.4	32
	250.	842.3	250.1	857.			33
ENDTABLE							34
REACH	55.9+	1.	57.5	57.5			35
REACH2	56.2	-1.9					36
ROAD	56.0	2.7	57.5	57.5			37
BPR	56.0	A	3				38
GIRDER	835.	834.6	0.	.6	2.7		39
	-6.	835.9	-5.9	834.6	5.9	834.6	40
	6.	836.9					41
ENDTABLE							42
SECTION	56.0						43
	-150.	850.	-150.	842.1	-100.	839.3	44
	-50.	837.3	-6.	836.9	-5.9	830.7	45
	-3.	831.1	0.	830.6	3.	830.2	46
	5.9	831.5	6.	836.9	50.	837.1	47
	100.	837.1	150.	837.3	200.	837.6	48
	250.	839.	300.	838.5	350.	839.1	49
	400.	839.9	450.	840.3	500.	840.4	50
	550.	839.3	550.1	850.			51
ENDTABLE							52
REACH	56.1+	1.	50.	50.			53
REACH2	56.2	-1.6					54
REACH	56.2	1.	140.	140.			55
SEGMENT	56.2	1	N	-13.			56
NVALUE	.09						57
SEGMENT	56.2	2	C	13.			58

----------80/80 LIST OF INPUT DATA----------

```
NVALUE    .045                                                          59
SEGMENT   56.2      3         N         34.                             60
NVALUE    .09                                                           61
SECTION   56.2                                                          62
          -128.1    843.3     -128.     849.      -98.      846.9       63
           -68.     842.2     -53.      839.3     -38.      836.8       64
          -13.      835.5     -8.       832.3     -4.       832.1       65
          0.        832.1     4.        832.      8.        832.2       66
          13.       836.3     33.       837.4     34.       857.        67
ENDTABLE                                                                68
ROAD      56.3      2.7       70.       70.                             69
CULV1     56.3      1         22551                                     70
CULV2     4.5       0.        16.6      833.27    833.12                  71
SECTION   56.3                                                          72
          -60.1     849.      -60.      843.1     -55.      842.7       73
          -45.      841.8     -35.      841.      -20.      839.9       74
          0.        838.7     12.       838.3     22.       837.7       75
          28.       837.9     38.       837.4     48.       836.6       76
          58.       834.1     68.       829.8     68.1      849.        77
ENDTABLE                                                                78
REACH     56.4+     1.        50.       50.                             79
REACH2    56.2      1.3                                                 80
REACH     +56.45    1.        135.      135.                            81
REACH2    56.2      2.5                                                 82
ROAD      56.6      2.7       50.       50.                             83
CULV1     56.6      1         22551                                     84
CULV2     5.        0.        17.       834.52    834.62                  85
SECTION   56.6                                                          86
          -65.      856.      -65.      845.9     -55.      845.        87
          -45.      844.1     -35.      843.5     -25.      842.7       88
          0.        841.4     12.       840.8     27.       840.2       89
          37.       843.3     47.       840.2     69.       840.4       90
          69.1      856.                                                91
ENDTABLE                                                                92
REACH     +56.65    1.        42.       42.                             93
REACH2    56.2      3.3                                                 94
ROAD      56.7      2.7       43.       43.                             95
BPR       56.7      A         2                                         96
GIPDER    841.      840.4     0.        .6        2.7                     97
          -9.       841.5     -8.9      840.4     8.9       840.4       98
          9.        841.5                                               99
ENDTABLE                                                                100
SECTION   56.7                                                          101
          -60.      855.      -60.      845.8     -55.      845.2       102
          -40.      843.7     -25.      842.2     -9.       841.5       103
```

80/80 LIST OF INPUT DATA

```
          -8.9        833.        -6.         836.7       -2.         835.4       104
          2.          835.3       6.          835.8       8.9         836.5       105
          9.          841.5       15.         840.6       25.         840.4       106
          34.         841.4       43.         840.2       55.         840.8       107
          55.1        855.                                                        108
ENDTABLE                                                                          109
REACH     56.8        1.          50.         50.                                 110
SEGMENT   56.8        1           N           -35.                                111
NVALUE    .09                                                                     112
SEGMENT   56.8        2           C           13.                                 113
NVALUE    .045                                                                    114
SEGMENT   56.8        3           N           72.                                 115
NVALUE    .11                                                                     116
SECTION   56.8                                                                   117
          -110.       869.        -110.       849.2       -90.        848.1       118
          -60.        844.4       -50.        842.5       -35.        839.5       119
          -2.         835.5       0.          835.4       2.          835.5       120
          5.          836.        13.         839.5       23.         840.        121
          41.         839.6       71.         841.        72.         861.        122
ENDTABLE                                                                          123
REACH     56.9+       1.          140.        140.                                124
REACH2    56.8                                                                    125
ROAD      57.0        2.7         50.         50.                                 126
BPP       57.0        B           3                                               127
GIRDER    838.7       839.1       0.          .6          2.7                     128
          -6.5        840.        -6.4        838.1       6.4         838.1       129
          6.5         841.                                                        130
ENDTABLE                                                                          131
SECTION   57.0                                                                    132
          -227.       855.        -227.       846.        -200.       845.        133
          -150.       843.3       -100.       842.        -50.        840.9       134
          -6.5        841.        -6.4        836.3       -3.5        835.2       135
          0.          835.4       3.5         835.6       6.4         836.        136
          6.5         841.        50.         840.        100.        840.1       137
          150.        841.4       200.        840.4       250.        840.3       138
          250.1       855.                                                        139
ENDTABLE                                                                          140
REACH     57.1+       1.          50.         50.                                 141
REACH2    57.4        -1.4                                                        142
REACH     57.4        1.          290.        290.                                143
SEGMENT   57.4        1           N           -12.                                144
NVALUE    .125                                                                    145
SEGMENT   57.4        2           C           18.                                 146
NVALUE    .06                                                                     147
SEGMENT   57.4        3           N           49.                                 148
```

----------80/80 LIST OF INPUT DATA----------

```
NVALUE    .125                                                          149
SECTION   57.4                                                          150
          -164.     857.      -164.     849.5     -134.     843.9     151
          -122.     843.8     -102.     843.1     -72.      840.8     152
          -42.      839.6     -12.      838.1     -6.       837.6     153
          0.        837.5     6.        837.5     12.       837.5     154
          18.       839.2     48.       841.6     49.       861.      155
ENDTABLE                                                                156
REACH     +57.69    1.        335.      335.                          157
REACH2    57.4      3.6                                               158
ROAD      57.7      2.7       50.       50.                           159
BPR       57.7      B         2         7                             160
PIER      841.      2.                                                161
GIRDER    848.8     849.2     0.        .6        2.6                 162
          -8.35     849.      -8.35     848.2     8.35      848.2     163
          8.35      849.                                              164
ENDTABLE                                                                165
SECTION   57.7                                                          166
          -165.     871.      -165.     851.8     -153.     851.7     167
          -133.     851.8     -113.     849.      -88.      848.8     168
          -63.      844.5     -38.      844.1     -30.      848.7     169
          -8.35     849.      -8.35     841.      8.35      841.      170
          8.35      843.      15.       849.4     40.       849.7     171
          55.       845.4     70.       844.1     85.       843.2     172
          100.      840.5     101.      860.                          173
ENDTABLE                                                                174
REACH     +57.75    1.        50.       50.                           175
REACH2    57.4      3.7                                               176
REACH     57.8      1.        390.      390.                          177
SEGMENT   57.8      1         N         -16.                          178
NVALUE    .05                                                         179
SEGMENT   57.8      2         C         16.                           180
NVALUE    .06                                                         181
SEGMENT   57.8      3         N         91.1                          182
NVALUE    .125                                                        183
SECTION   57.8                                                        184
          -283.     862.      -283.     849.6     -250.     849.3     185
          -200.     843.2     -150.     848.      -100.     848.      186
          -50.      843.5     -26.      848.6     -16.      847.5     187
          -8.       843.2     -4.       842.9     0.        842.7     188
          4.        842.7     8.        843.1     16.       847.9     189
          26.       853.1     41.       851.9     66.       852.4     190
          81.       853.5     91.       854.7     91.1      862.      191
ENDTABLE                                                                192
ROAD      57.9      2.7       90.       80.                           26
```

----------80/80 LIST OF INPUT DATA----------

```
CULV1     57.9      1         12333                                        27
CULV2     6.        0.        690.      842.08    840.91                   28
CULV1     57.9      1         12333                                        29
CULV2     6.        0.        690.      841.53    840.91                   30
SECTION   57.9                                                            31
          -560.     873.      -560.     855.3     -550.     855.3          32
          -500.     854.6     -450.     854.1     -400.     853.4          33
          -350.     852.7     -300.     852.1     -250.     851.5          34
          -200.     851.7     -150.     850.8     -100.     850.7          35
          -50.      850.8     0.        851.1     50.       851.5          36
          100.      852.      150.      852.8     200.      853.6          37
          250.      854.9     250.      870.                               38
ENDTABLE                                                                  39
REACH     58.5+     1.        50.       50.                                40
REACH2    58.6      -1.5                                                   41
REACH     58.6      1.        70.       70.                                42
SEGMENT   58.6      1         N         -22.                               43
NVALUE    .075                                                           44
SEGMENT   58.6      2         C         17.                                46
NVALUE    .055                                                           47
SEGMENT   58.6      3         N         119.1                              48
NVALUE    .075                                                           49
SECTION   58.6                                                            50
          -50.      851.1     -22.      852.2     -8.       845.4          51
          -4.       844.8     0.        845.1     4.        845.1          52
          7.        845.2     12.       847.8     17.       850.1          53
          26.       851.1     50.       851.      80.       850.8          54
          86.       849.5     119.      850.2     119.1     864.           55
ENDTABLE                                                                  56
REACH     58.9+     1.        50.       50.                                57
REACH2    58.6                                                           58
ROAD      59.0      2.7       85.       85.                                59
CULV1     59.0      1         12311                                        60
CULV2     6.5       0.        60.       842.27    842.25                   61
CULV1     59.0      1         12311                                        62
CULV2     6.5       0.        60.       842.27    841.78                   63
SECTION   59.0                                                           64
          -380.     866.      -380.     853.2     -350.     853.           65
          -300.     852.2     -250.     851.5     -200.     850.9          66
          -150.     851.6     -100.     850.4     -50.      850.2          67
          0.        850.1     50.       850.      100.      850.1          68
          150.      850.1     200.      850.2     250.      850.1          69
          268.      851.      290.      852.2     300.      852.           70
          350.      852.8     400.      853.2     405.      855.2          71
          405.1     866.                                                   72
```

----------80/80 LIST OF INPUT DATA----------

```
ENDTABLE                                                                  73
REACH     59.1+     1.        50.       50.                               74
REACH2    59.5                                                            75
REACH     59.5      1.        55.       55.                               76
SEGMENT   59.5      1         N         -10.                              77
NVALUE    .08                                                             78
SEGMENT   59.5      2         C         20.                               79
NVALUE    .055                                                            80
SEGMENT   59.5      3         N         190.1                             81
NVALUE    .08                                                             82
SECTION   59.5                                                            83
          -231.     865.      -231.     852.8     -201.     852.1         84
          -151.     849.6     -101.     849.6     -76.      849.3         85
          -26.      849.      -10.      848.2     -5.       846.5         86
          -2.5      845.8     0.        845.3     2.5       845.3         87
          5.        846.5     20.       853.6     40.       855.4         88
          65.       856.4     90.       858.      115.      858.6         89
          165.      853.9     190.      859.5     190.1     865.          90
ENDTABLE                                                                  91
REACH     59.9+     1.        255.      230.                              92
REACH2    59.5      1.                                                    93
ROAD      60.0      2.7       50.       50.                               94
BPR       60.0      B         3                                           95
GIRDER    850.5     850.      0.        .6        2.7                     96
          -6.95     852.7     -6.95     846.9     -5.95     846.9         97
          -5.95     849.1     -4.95     850.      4.95      850.          98
          5.95      849.      5.95      846.8     6.95      846.8         99
          6.95      852.7                                                 100
ENDTABLE                                                                 101
SECTION   60.0                                                           102
          -500.1    865.      -500.     855.4     -400.     854.9         103
          -300.     854.2     -200.     853.6     -112.     853.2         104
          -100.     853.1     -6.95     852.7     -6.95     846.9         105
          -3.       846.3     0.        846.8     3.        846.7         106
          6.95      846.8     6.95      852.7     100.      852.3         107
          200.      851.9     300.      851.6     400.      851.4         108
          500.      851.5     600.      851.7     600.1     866.          109
ENDTABLE                                                                 110
REACH     +60.05    1.        50.       50.                               111
REACH2    60.2      6.3                                                   112
REACH     60.1      1.        210.      180.                              113
SEGMENT   60.1      1         N         -8.75                             114
NVALUE    .07                                                            115
SEGMENT   60.1      2         C         8.75                              116
NVALUE    .05                                                            117
```

----------80/80 LIST OF INPUT DATA----------

```
SEGMENT   60.1     3        N        289.1                          118
NVALUE    .065                                                      119
SECTION   60.1                                                      120
          -260.    868.     -205.    864.     -155.    860.        121
          -80.     856.     -8.75    851.2    -3.75    851.2       122
          0.       843.2    3.75     851.2    8.75     851.2       123
          23.      852.     289.     852.5    289.1    868.        124
ENDTABLE                                                            125
REACH     +60.15   1.       50.      50.                            126
REACH2    60.2     6.5                                              127
REACH     60.2     1.       315.     315.                           128
SEGMENT   60.2     1        N        -32.                           129
NVALUE    .07                                                       130
SEGMENT   60.2     2        C        35.                            131
NVALUE    .05                                                       132
SEGMENT   60.2     3        N        79.1                           133
NVALUE    .065                                                      134
SECTION   60.2                                                      135
          -73.     872.     -72.     852.3    -47.     851.6       136
          -32.     851.6    -30.     841.4    -25.     845.7       137
          -20.     842.4    -10.     840.5    0.       841.2       138
          10.      842.4    20.      844.1    25.      847.4       139
          30.      843.6    35.      852.7    57.      852.2       140
          79.      852.2    79.1     860.                           141
ENDTABLE                                                            142
REACH     +60.25   1.       210.     180.                           143
REACH2    60.2     1.8                                              144
ROAD      60.3     2.7      50.      50.                            145
CULV1     60.3     1        12311                                   146
CULV2     3.6      0.       22.5     845.74   846.77                147
CULV1     60.3     1        12311                                   148
CULV2     3.6      0.       22.5     845.6    846.82                149
SECTION   60.3                                                      150
          -275.    866.     -275.    855.7    -200.    854.8       151
          -150.    853.7    -100.    852.4    -50.     851.1       152
          0.       851.5    25.      851.9    50.      852.4       153
          75.      852.9    90.      853.4    90.1     866.        154
ENDTABLE                                                            155
REACH     +60.35   1.       50.      50.                            156
REACH2    60.4     -.7                                              157
REACH     60.4     1.       420.     410.                           158
SEGMENT   60.4     1        N        -19.                           159
NVALUE    .17                                                       160
SEGMENT   60.4     2        C        16.                            161
NVALUE    .08                                                       162
```

----------80/80 LIST OF INPUT DATA----------

```
SEGMENT   60.4      3         N         316.                                  163
NVALUE    .17                                                                 164
SECTION   60.4                                                                165
          -430.     871.      -430.     852.2     -380.     852.5     1654
          -330.     852.4     -285.     851.4     -278.     848.5     165K
          -271.     849.2     -231.     849.      -191.     849.6     166
          -175.     848.5     -159.     849.8     -133.     850.4     167
          -109.     849.9     -67.      849.6     -19.      849.7     168
          -14.      849.1     -7.       848.      0.        847.      169
          7.        847.8     14.       849.5     16.       850.3     170
          49.       850.9     75.       850.4     125.      851.      171
          175.      852.4     225.      852.7     265.      853.4     172
          315.      854.2     316.      870.                          173
ENDTABLE                                                              174
REACH     60.5      1.        960.      840.                          175
SEGMENT   60.5      1         N         -10.                          176
NVALUE    .11                                                         177
SEGMENT   60.5      2         C         22.                           178
NVALUE    .07                                                         179
SEGMENT   60.5      3         N         287.                          180
NVALUE    .08                                                         181
SECTION   60.5                                                        182
          -201.     870.      -201.     853.1     -175.     852.9     183
          -151.     852.7     -141.     850.1     -100.     850.      184
          -60.      850.4     -10.      850.4     -10.      850.2     185
          -5.       848.8     0.        848.3     5.        848.8     186
          10.       849.7     22.       851.      30.       853.7     187
          36.       853.      41.       850.9     91.       850.1     188
          116.      853.6     136.      852.7     186.      853.9     189
          236.      854.1     286.      856.1     287.      875.      190
ENDTABLE                                                              191
REACH     60.6      1.        3480.     2980.                         192
SEGMENT   60.6      1         N         -8.                           193
NVALUE    .17                                                         194
SEGMENT   60.6      2         C         8.                            195
NVALUE    .08                                                         196
SEGMENT   60.6      3         N         468.1                         197
NVALUE    .17                                                         198
SECTION   60.6                                                        199
          -164.     871.      -164.     865.1     -134.     862.7     200
          -114.     862.4     -78.      861.6     -67.      856.2     201
          -37.      855.3     -20.      854.5     -12.      854.1     202
          -8.       853.      -4.       851.9     0.        852.1     203
          4.        852.7     8.        853.7     38.       854.      204
          74.       854.      109.      853.8     157.      853.8     205
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----------80/80 LIST OF INPUT DATA----------

```
          177.      854.4     197.      856.6     247.      856.8     206
          237.      857.9     347.      859.1     368.      861.      207
          378.      862.4     388.      862.4     413.      861.9     208
          438.      862.6     468.      863.9     468.1     871.      209
ENDTABLE                                                              210
REACH     +60.65    1.        325.      280.                          211
REACH2    60.6      1.5                                               212
ROAD      60.7      2.7       50.       50.                           213
CULV1     60.7      1.        32133                                   214
CULV2     3.7       6.        16.5      853.85    853.4               215
SECTION   60.7                                                        216
          -70.      871.      -70.      863.7     -60.      862.2     217
          -50.      861.      -25.      859.8     0.        859.6     218
          25.       859.7     50.       860.2     60.       860.6     219
          60.1      871.                                              220
ENDTABLE                                                              221
REACH     +60.75    1.        50.       50.                           222
REACH2    60.8      1.3                                               223
REACH     60.8      1.        1535.     1030.                         224
SEGMENT   60.8      1         N         -19.                          225
NVALUE    .17                                                         226
SEGMENT   60.8      2         C         20.                           227
NVALUE    .05                                                         228
SEGMENT   60.8      3         N         148.1                         229
NVALUE    .08                                                         230
SECTION   60.8                                                        231
          -134.     873.      -134.     865.8     -129.     863.3     232
          -119.     859.7     -94.      857.8     -69.      857.6     233
          -44.      857.7     -19.      856.4     -15.      855.2     234
          -10.      853.7     -5.       853.7     0.        853.6     235
          5.        853.6     10.       854.5     15.       855.      236
          20.       856.4     30.       857.9     55.       858.1     237
          80.       853.7     105.      860.5     130.      861.5     238
          148.      861.9     148.1     873.                          239
ENDTABLE                                                              240
REACH     60.95     1.        1790.     1500.                         241
SEGMENT   60.95     1         N         -9.                           242
NVALUE    .08                                                         243
SEGMENT   60.95     2         C         9.                            244
NVALUE    .05                                                         245
SEGMENT   60.95     3         N         228.1                         246
NVALUE    .08                                                         247
SECTION   60.95                                                       248
          -43.      876.      -43.      870.      -35.      868.7     249
          -30.      865.5     -20.      863.6     -19.      861.5     250
```

----------80/80 LIST OF INPUT DATA----------

	-14.	860.4	-9.	857.2	-4.	856.3	251
	0.	856.7	4.	856.8	9.	857.6	252
	11.	859.8	21.	859.8	61.	859.4	253
	85.	859.2	88.	858.1	103.	858.1	254
	153.	861.7	198.	863.2	213.	866.2	255
	228.	867.5	228.1	876.			256
ENDTABLE							257
REACH	+60.95	1.	65.	65.			258
REACH2	60.95	.6					259
COMPUTE	14.7	55.1+	14.7				597

----------END OF 80/80 LIST----------

COMPUTE 14.7 55.1+ 14.7 597

----------STARTING DATA FROM GIVEN ELEVATION----------

00BREAK00

1) COUNTY: Kalamazoo

2) STUDY NAME: Cities of Kalamazoo and Portage

3) WATERCOURSE: WSP2 West Branch Portage Creek

4) DOCUMENT TYPE: 100 yr run

00BREAK00

RATING TABLE FOR SECTION 14.7 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	808.90	0.0	0.0						
BANK FULL	811.1	76.2	53.1	0.00	0.00	0.00			
1	812.01	224.8	75.0	0.00	0.00	0.00	75.00	809.7	.00013
2	813.12	567.9	140.0	0.00	0.00	0.00	140.00	810.0	.00007
3	813.46	688.9	180.0	0.00	0.00	0.00	180.00	810.1	.00007
4	814.20	958.0	275.0	0.00	0.00	0.00	275.00	810.5	.00007

SEGMENT TABLE FOR SECTION 14.7

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	6.	65.	4.
75.	VELOCITY FPS	.49	.11	.51	.09
2	DISCHARGE CFS	140.	18.	95.	26.
140.	VELOCITY FPS	.41	.14	.49	.11
3	DISCHARGE CFS	180.	25.	114.	41.
180.	VELOCITY FPS	.43	.16	.53	.13
4	DISCHARGE CFS	275.	40.	154.	81.
275.	VELOCITY FPS	.47	.19	.59	.16
1	ELEV 812.01 KD	6451.	447.	5720.	283.
2	ELEV 813.12 KD	16892.	2207.	11513.	3172.
3	ELEV 813.46 KD	21246.	2914.	13577.	4755.
4	ELEV 814.20 KD	32741.	4771.	18558.	9412.

RATING TABLE FOR SECTION 52.5 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	810.40	0.0	0.0						
1	812.47	48.8	75.0	0.00	0.00	0.00	75.00	811.4	.00255
BANK FULL	813.0	116.1	114.2	0.00	0.00	0.00			
2	813.35	191.2	140.0	0.00	0.00	0.00	140.00	811.8	.00928
3	813.66	272.3	180.0	0.00	0.00	0.00	180.00	812.0	.00107
4	814.33	456.2	275.0	0.00	0.00	0.00	275.00	812.6	.00071

SEGMENT TABLE FOR SECTION 52.5

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	1.	74.	0.
75.	VELOCITY FPS	1.67	.17	1.67	0.00
2	DISCHARGE CFS	140.	27.	113.	0.
140.	VELOCITY FPS	1.37	.23	1.51	0.00
3	DISCHARGE CFS	180.	53.	127.	0.
180.	VELOCITY FPS	1.28	.29	1.45	0.00
4	DISCHARGE CFS	275.	117.	158.	0.
275.	VELOCITY FPS	1.09	.34	1.38	0.00
1	ELEV 812.47 KO	1478.	4.	1474.	1.
2	ELEV 813.35 KO	3844.	664.	3180.	1.
3	ELEV 813.66 KO	5410.	1442.	3968.	1.
4	ELEV 814.33 KO	10249.	4267.	5980.	1.

TABLE OF VALUES FOR BPR EQUATION

COEFK	AKB	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
1.2693	.9797	.2896	.7861	0.0000	0.0000	.5858	1.0000	1.0000	109.4564	469.6282	453.2393
DCRIT	809.75	KBCRIT=									
1.5711	1.3097	.2614	.7029	0.0000	0.0000	.4979	1.0000	1.0000	140.1274	707.0498	689.8581
DCRIT	810.15	KBCRIT=									
1.6697	1.4179	.2518	.6756	0.0000	0.0000	.4712	1.0000	1.0000	151.1041	796.4787	778.9787
DCRIT	810.32	KBCRIT=									
1.8150	1.5772	.2378	.6355	0.0000	0.0000	.4333	1.0000	1.0000	175.0684	1007.3157	976.6015
DCRIT	810.69	KBCRIT=									

ROAD SECTION 53.0

NO.	HW	CFS	HL	TW	CSM
0	808.60	0.00	0.00	0.00	0.00
1	812.56	75.00	.04	812.52	75.00
2	813.42	140.00	.04	813.38	140.00
3	813.72	180.00	.04	813.68	180.00
4	814.43	275.00	.08	814.35	275.00

MIN ROAD ELEVATION 817.80

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 816.00 OPENING NO.= 1

RATING TABLE FOR SECTION 53.1+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	808.80	0.0	0.0						
BANK FULL	811.4	116.1	51.8	0.00	0.00	0.00			
1	812.56	409.6	75.0	0.00	0.00	0.00	75.00	809.8	.00007
2	813.42	645.5	140.0	0.00	0.00	0.00	140.00	810.2	.00007
3	813.73	732.4	180.0	0.00	0.00	0.00	180.00	810.4	.00008
4	814.43	939.9	275.0	0.00	0.00	0.00	275.00	811.0	.00009

SEGMENT TABLE FOR SECTION 53.1+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	30.	45.	0.
75.	VELOCITY FPS	.34	.10	.42	0.00
2	DISCHARGE CFS	140.	69.	71.	0.
140.	VELOCITY FPS	.37	.14	.50	.03
3	DISCHARGE CFS	180.	92.	88.	0.
180.	VELOCITY FPS	.41	.16	.56	.05
4	DISCHARGE CFS	275.	148.	126.	1.
275.	VELOCITY FPS	.48	.20	.67	.07
1	ELEV 812.56 KD	8926.	3486.	5439.	1.
2	ELEV 813.42 KD	16696.	8171.	8521.	3.
3	ELEV 813.73 KD	20064.	10216.	9838.	9.
4	ELEV 814.43 KD	28973.	15603.	13257.	112.

RATING TABLE FOR SECTION 53.9+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	810.00	0.0	0.0						
1	812.57	108.9	75.0	0.00	0.00	0.00	75.00	811.0	.00087
BANK FULL	812.6	116.1	77.5	0.00	0.00	0.00			
2	813.42	316.9	140.0	0.00	0.00	0.00	140.00	811.4	.00046
3	813.73	400.3	180.0	0.00	0.00	0.00	180.00	811.6	.00043
4	814.44	595.1	275.0	0.00	0.00	0.00	275.00	812.2	.00034

SEGMENT TABLE FOR SECTION 53.9+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	8.	67.	0.
75.	VELOCITY FPS	1.08	.16	1.10	0.00
2	DISCHARGE CFS	140.	47.	93.	0.
140.	VELOCITY FPS	.84	.21	1.00	0.00
3	DISCHARGE CFS	180.	71.	109.	0.
180.	VELOCITY FPS	.83	.24	1.03	0.00
4	DISCHARGE CFS	275.	132.	143.	0.
275.	VELOCITY FPS	.80	.29	1.06	.08
1	ELEV 812.57 KD	2464.	127.	2337.	1.
2	ELEV 813.42 KD	6442.	2017.	4424.	1.
3	ELEV 813.73 KD	8681.	3346.	5335.	1.
4	ELEV 814.44 KD	14838.	7049.	7787.	2.

*****SECT.54.1+ KD VALUES REVERSED ON SEGMENT 1 AT ELEVATION 820.80 VALUE CHANGED TO EQUAL PREVIOUS VALUE*****

TABLE OF VALUES FOR BPR EQUATION

COEFK	AKB	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
.5304	.5304	0.0000	0.0000	0.0000	0.0000	.7042	1.0000	1.0000	28.7900	85.4901	55.0987
DCRIT	811.62	KBCRIT=									
1.3599	1.3599	0.0000	0.0000	0.0000	0.0000	.4608	1.0000	1.0000	42.2732	247.1259	207.6983
DCRIT	812.08	KBCRIT=									
1.6611	1.6611	0.0000	0.0000	0.0000	0.0000	.3881	1.0000	1.0000	47.1699	328.4559	291.1330
DCRIT	812.30	KBCRIT=									
2.1248	2.1248	0.0000	0.0000	0.0000	0.0000	.2845	1.0000	1.0000	58.4908	451.5917	484.7643
DCRIT	812.27	KBCRIT=									

ROAD SECTION 54.0

NO.	HW	CFS	HL	TW	CSM
0	810.40	0.00	0.00	0.00	0.00
1	812.59	75.00	.02	812.57	75.00
2	813.62	140.00	.20	813.42	140.00
3	814.07	180.00	.34	813.73	180.00
4	814.72	275.00	.28	814.44	275.00

MIN ROAD ELEVATION 813.70

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 814.70 OPENING NO.= 1

RATING TABLE FOR SECTION 54.1+ OA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	810.80	0.0	0.0						
BANK FULL	811.4	3.9	22.6	0.00	0.00	0.00			
1	812.79	63.6	75.0	0.00	0.00	0.00	75.00	811.9	.00415
2	813.71	189.7	140.0	0.00	0.00	0.00	140.00	812.2	.00198
3	814.13	263.6	180.0	0.00	0.00	0.00	180.00	812.3	.00144
4	814.77	381.8	275.0	0.00	0.00	0.00	275.00	812.6	.00126

SEGMENT TABLE FOR SECTION 54.1+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	24.	51.	0.
75.	VELOCITY FPS	2.05	.57	2.47	.36
2	DISCHARGE CFS	140.	69.	71.	1.
140.	VELOCITY FPS	1.66	.44	2.24	.35
3	DISCHARGE CFS	180.	102.	77.	1.
180.	VELOCITY FPS	1.45	.46	2.10	.30
4	DISCHARGE CFS	275.	176.	97.	2.
275.	VELOCITY FPS	1.39	.53	2.19	.31
1	ELEV 812.79 KD	1164.	375.	785.	4.
2	ELEV 813.71 KD	3122.	1495.	1610.	16.
3	ELEV 814.13 KD	4727.	2644.	2059.	24.
4	ELEV 814.77 KD	7928.	5051.	2830.	47.

*****SECT.54.5 KD VALUES REVERSED ON SEGMENT 1 AT ELEVATION 829.00 VALUE CHANGED TO EQUAL PREVIOUS VALUE*****

RATING TABLE FOR SECTION 54.5 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	819.00	0.0	0.0						
BANK FULL	819.6	3.9	25.6	0.00	0.00	0.00			
1	820.76	50.2	75.0	0.00	0.00	0.00	75.00	820.1	.00715
2	821.18	82.6	140.0	0.00	0.00	0.00	140.00	820.4	.00956
3	821.46	114.9	180.0	0.00	0.00	0.00	180.00	820.5	.00918
4	821.92	190.6	275.0	0.00	0.00	0.00	275.00	820.8	.00704

SEGMENT TABLE FOR SECTION 54.5

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	23.	51.	0.
75.	VELOCITY FPS	2.47	.73	2.90	.67
2	DISCHARGE CFS	140.	48.	91.	1.
140.	VELOCITY FPS	3.29	.82	4.01	.65
3	DISCHARGE CFS	180.	68.	111.	1.
180.	VELOCITY FPS	3.45	.78	4.24	.69
4	DISCHARGE CFS	275.	140.	134.	1.
275.	VELOCITY FPS	3.08	.89	4.23	.70
1	ELEV 820.76 KD	885.	269.	612.	4.
2	ELEV 821.18 KD	1432.	492.	934.	6.
3	ELEV 821.46 KD	1868.	683.	1179.	10.
4	ELEV 821.92 KD	3256.	1623.	1616.	17.

*****SECT.54.9* KD VALUES REVERSED ON SEGMENT 1 AT ELEVATION 833.70 VALUE CHANGED TO EQUAL PREVIOUS VALUE*****

RATING TABLE FOR SECTION 54.9+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	823.70	0.0	0.0						
BANK FULL	824.3	3.9	25.0	0.00	0.00	0.00			
1	825.50	52.7	75.0	0.00	0.00	0.00	75.00	824.8	.00634
2	826.26	131.2	140.0	0.00	0.00	0.00	140.00	825.1	.00428
3	826.40	154.3	180.0	0.00	0.00	0.00	180.00	825.2	.00499
4	826.78	218.5	275.0	0.00	0.00	0.00	275.00	825.5	.00497

SEGMENT TABLE FOR SECTION 54.9+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	24.	51.	0.
75.	VELOCITY FPS	2.36	.70	2.79	.59
2	DISCHARGE CFS	140.	59.	80.	1.
140.	VELOCITY FPS	2.36	.58	2.94	.49
3	DISCHARGE CFS	180.	84.	95.	1.
180.	VELOCITY FPS	2.57	.68	3.29	.55
4	DISCHARGE CFS	275.	149.	124.	1.
275.	VELOCITY FPS	2.61	.82	3.71	.61
1	ELEV 825.50 KD	940.	293.	643.	4.
2	ELEV 826.26 KD	2113.	838.	1265.	11.
3	ELEV 826.40 KD	2508.	1098.	1397.	13.
4	ELEV 826.78 KD	3893.	2088.	1785.	21.

ROAD SECTION 55.0

NO.	HW	CFS	HL	TW	CSM.
0	824.62	0.00	0.00	0.00	0.00
1	827.01	75.00	1.20	825.81	75.00
2	828.03	140.00	1.52	826.51	140.00
3	828.51	180.00	1.84	826.67	180.00
4	829.69	275.00	2.64	827.05	275.00

MIN ROAD ELEVATION 836.10

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	32111.	9.53	13.52	144.70	824.62	824.02	.038

RATING TABLE FOR SECTION 55.1+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	824.70	0.0	0.0						
1	827.11	34.8	75.0	0.00	0.00	0.00	75.00	826.1	.00190
2	828.11	59.1	140.0	0.00	0.00	0.00	140.00	826.5	.00154
3	828.58	72.7	180.0	0.00	0.00	0.00	180.00	826.8	.00147
BANK FULL	828.8	79.4	197.9	0.00	0.00	0.00			
4	829.74	110.3	275.0	0.00	0.00	0.00	275.00	827.2	.00095

SEGMENT TABLE FOR SECTION 55.1+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	2.16	0.00	2.16	0.00
2	DISCHARGE CFS	140.	0.	140.	0.
140.	VELOCITY FPS	2.38	0.00	2.37	0.00
3	DISCHARGE CFS	180.	0.	180.	0.
180.	VELOCITY FPS	2.48	0.00	2.48	0.00
4	DISCHARGE CFS	275.	0.	275.	0.
275.	VELOCITY FPS	2.52	0.00	2.51	.53
1	ELEV 827.11 KD	1722.	1.	1720.	1.
2	ELEV 828.11 KD	3563.	1.	3561.	1.
3	ELEV 828.58 KD	4701.	1.	4695.	1.
4	ELEV 829.74 KD	8928.	4.	8915.	9.

----------80/80 LIST OF INPUT DATA----------

```
CHANGE    DISCHARGE                                                  598
DISCHARGE -1.       75.       140.      168.      226.               599
END                                                                  600
COMPUTE   55.2      +57.75    55.1+                                  601
```

----------END OF 80/80 LIST----------

COMPUTE 55.2 +57.75 55.1+ 601

----------STARTING DATA FROM PREVIOUS COMPUTATIONS----------

RATING TABLE FOR SECTION 55.2 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	826.10	0.0	0.0						
1	828.00	24.2	75.0	0.00	0.00	0.00	75.00	827.5	.00552
2	828.67	38.4	140.0	0.00	0.00	0.00	140.00	827.9	.00504
3	829.05	47.2	168.0	0.00	0.00	0.00	168.00	828.1	.00400
4	830.03	74.1	226.0	0.00	0.00	0.00	226.00	828.4	.00219

SEGMENT TABLE FOR SECTION 55.2

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	3.11	0.00	3.09	0.00
2	DISCHARGE CFS	140.	0.	140.	0.
140.	VELOCITY FPS	3.66	0.00	3.65	0.00
3	DISCHARGE CFS	168.	0.	168.	0.
168.	VELOCITY FPS	3.57	0.00	3.56	0.00
4	DISCHARGE CFS	226.	0.	226.	0.
226.	VELOCITY FPS	3.06	0.00	3.05	0.00
1	ELEV 828.00 KD	1009.	1.	1007.	1.
2	ELEV 828.67 KD	1972.	1.	1970.	1.
3	ELEV 829.05 KD	2656.	1.	2654.	1.
4	ELEV 830.03 KD	4825.	1.	4822.	1.

RATING TABLE FOR SECTION 55.6 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	827.60	0.0	0.0						
1	829.50	25.8	75.0	0.00	0.00	0.00	75.00	828.9	.00429
2	830.05	36.9	140.0	0.00	0.00	0.00	140.00	829.3	.00517
3	830.35	43.4	168.0	0.00	0.00	0.00	168.00	829.5	.00468
4	831.04	59.1	226.0	0.00	0.00	0.00	226.00	829.8	.00348

SEGMENT TABLE FOR SECTION 55.6

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	2.91	0.00	2.90	0.00
2	DISCHARGE CFS	140.	0.	140.	0.
140.	VELOCITY FPS	3.79	0.00	3.79	0.00
3	DISCHARGE CFS	168.	0.	168.	0.
168.	VELOCITY FPS	3.89	0.00	3.87	0.00
4	DISCHARGE CFS	226.	0.	226.	0.
226.	VELOCITY FPS	3.83	0.00	3.82	0.00
1	ELEV 829.50 KD	1145.	1.	1143.	1.
2	ELEV 830.05 KD	1948.	1.	1945.	1.
3	ELEV 830.35 KD	2455.	1.	2452.	1.
4	ELEV 831.04 KD	3832.	1.	3829.	1.

RATING TABLE FOR SECTION 55.7+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	828.30	0.0	0.0						
1	829.81	24.6	75.0	0.00	0.00	0.00	75.00	829.3	.00665
2	830.41	36.7	140.0	0.00	0.00	0.00	140.00	829.7	.00691
3	830.68	42.6	168.0	0.00	0.00	0.00	168.00	829.9	.00637
4	831.28	56.3	226.0	0.00	0.00	0.00	226.00	830.2	.00511

SEGMENT TABLE FOR SECTION 55.7+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	3.06	0.00	3.05	0.00
2	DISCHARGE CFS	140.	0.	140.	0.
140.	VELOCITY FPS	3.82	0.00	3.82	0.00
3	DISCHARGE CFS	168.	0.	168.	0.
168.	VELOCITY FPS	3.94	0.00	3.94	0.00
4	DISCHARGE CFS	226.	0.	226.	0.
226.	VELOCITY FPS	4.02	0.00	4.02	0.00
1	ELEV 829.81 KD	920.	1.	918.	1.
2	ELEV 830.41 KD	1684.	1.	1682.	1.
3	ELEV 830.68 KD	2105.	1.	2103.	1.
4	ELEV 831.28 KD	3162.	1.	3160.	1.

ROAD SECTION 55.8

NO.	HW	CFS	HL	TW	CSM.
0	828.29	0.00	0.00	0.00	0.00
1	830.73	75.00	.56	830.17	75.00
2	831.68	140.00	.80	830.88	140.00
3	832.05	168.00	.88	831.17	168.00
4	832.77	226.00	1.04	831.73	226.00

MIN ROAD ELEVATION 837.10

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	32111.	9.36	13.28	40.60	828.29	828.07	.032

RATING TABLE FOR SECTION 55.9* OA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	830.10	0.0	0.0						
1	831.30	18.6	75.0	0.00	0.00	0.00	75.00	831.1	.01540
2	832.02	32.7	140.0	0.00	0.00	0.00	140.00	831.5	.00972
3	832.31	39.0	168.0	0.00	0.00	0.00	168.00	831.7	.03833
4	832.93	52.3	226.0	0.00	0.00	0.00	226.00	832.0	.00616

SEGMENT TABLE FOR SECTION 55.9*

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	4.01	0.00	4.02	0.00
2	DISCHARGE CFS	140.	0.	140.	0.
140.	VELOCITY FPS	4.28	0.00	4.28	0.00
3	DISCHARGE CFS	168.	0.	168.	0.
168.	VELOCITY FPS	4.32	0.00	4.31	0.00
4	DISCHARGE CFS	226.	0.	226.	0.
226.	VELOCITY FPS	4.28	0.00	4.28	0.00
1	ELEV 831.30 KO	604.	1.	602.	1.
2	ELEV 832.02 KO	1420.	1.	1418.	1.
3	ELEV 832.31 KO	1841.	1.	1839.	1.
4	ELEV 832.93 KO	2879.	1.	2877.	1.

TABLE OF VALUES FOR BPR EQUATION

COEFK	AKB	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
.7937	.7937	0.0000	0.0000	0.0000	0.0000	.6407	1.0000	1.0000	15.8167	36.0116	26.5939
DCRIT	831.44	KBCRIT=									
.7694	.7694	0.0000	0.0000	0.0000	0.0000	.6482	1.0000	1.0000	24.1841	54.8527	41.2847
DCRIT	832.00	KBCRIT=									
.7814	.7814	0.0000	0.0000	0.0000	0.0000	.6445	1.0000	1.0000	27.4388	62.4461	47.4290
DCRIT	832.21	KBCRIT=									
.8249	.8249	0.0000	0.0000	0.0000	0.0000	.6311	1.0000	1.0000	33.9575	80.8534	60.2044
DCRIT	832.62	KBCRIT=									

ROAD SECTION 56.0

NO.	HW	CFS	HL	TW	CSM
0	830.10	0.00	0.00	0.00	0.00
1	832.15	75.00	.44	831.71	75.00
2	833.00	140.00	.58	832.42	140.00
3	833.31	168.00	.62	832.69	168.00
4	833.96	226.00	.72	833.24	226.00

MIN ROAD ELEVATION 836.90

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 834.60 OPENING NO.= 1

RATING TABLE FOR SECTION 56.1+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	830.40	0.0	0.0						
1	832.29	32.2	75.0	0.00	0.00	0.00	75.00	831.4	.00292
2	833.12	50.3	140.0	0.00	0.00	0.00	140.00	831.8	.00273
3	833.43	57.5	168.0	0.00	0.00	0.00	168.00	832.0	.00266
BANK FULL	833.9	69.0	211.0	0.00	0.00	0.00			
4	834.06	73.6	226.0	0.00	0.00	0.00	226.00	832.3	.00238

SEGMENT TABLE FOR SECTION 56.1+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	2.33	0.00	2.33	0.00
2	DISCHARGE CFS	140.	0.	140.	0.
140.	VELOCITY FPS	2.79	0.00	2.78	0.00
3	DISCHARGE CFS	168.	0.	168.	0.
168.	VELOCITY FPS	2.93	0.00	2.92	0.00
4	DISCHARGE CFS	226.	0.	226.	0.
226.	VELOCITY FPS	3.09	.49	3.09	0.00
1	ELEV 832.29 KD	1388.	1.	1386.	1.
2	ELEV 833.12 KD	2680.	1.	2678.	1.
3	ELEV 833.43 KD	3258.	1.	3256.	1.
4	ELEV 834.06 KD	4631.	3.	4627.	1.

RATING TABLE FOR SECTION 56.2 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	832.00	0.0	0.0						
1	833.35	21.5	75.0	0.00	0.00	0.00	75.00	833.0	.01008
2	834.01	34.6	140.0	0.00	0.00	0.00	140.00	833.4	.00822
3	834.36	42.0	168.0	0.00	0.00	0.00	168.00	833.6	.00663
4	834.78	51.6	226.0	0.00	0.00	0.00	226.00	833.9	.00660

SEGMENT TABLE FOR SECTION 56.2

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	3.50	0.00	3.49	0.00
2	DISCHARGE CFS	140.	0.	140.	0.
140.	VELOCITY FPS	4.05	0.00	4.05	0.00
3	DISCHARGE CFS	168.	0.	168.	0.
168.	VELOCITY FPS	4.00	0.00	4.00	0.00
4	DISCHARGE CFS	226.	0.	226.	0.
226.	VELOCITY FPS	4.39	0.00	4.38	0.00
1	ELEV 833.35 KO	747.	1.	745.	1.
2	ELEV 834.01 KO	1544.	1.	1542.	1.
3	ELEV 834.36 KO	2063.	1.	2061.	1.
4	ELEV 834.78 KO	2782.	1.	2780.	1.

ROAD SECTION 56.3

NO.	HW	CFS	HL	TW	CSM.
0	829.80	0.00	0.00	0.00	0.00
1	833.94	75.00	.40	833.54	75.00
2	834.82	140.00	.56	834.26	140.00
3	835.16	168.00	.56	834.60	168.00
4	835.70	226.00	.64	835.06	226.00

MIN ROAD ELEVATION 829.80

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	22551.	4.50		16.60	833.27	833.12	.012

RATING TABLE FOR SECTION 56.4+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	833.80	0.0	0.0						
1	834.81	15.2	75.0	0.00	0.00	0.00	75.00	834.8	.02982
2	835.32	24.8	140.0	0.00	0.00	0.00	140.00	835.2	.02252
3	835.62	30.8	168.0	0.00	0.00	0.00	168.00	835.4	.01687
4	835.98	38.4	226.0	0.00	0.00	0.00	226.00	835.7	.01579

SEGMENT TABLE FOR SECTION 56.4+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	4.98	0.00	4.95	0.00
2	DISCHARGE CFS	140.	0.	140.	0.
140.	VELOCITY FPS	5.65	0.00	5.65	0.00
3	DISCHARGE CFS	168.	0.	168.	0.
168.	VELOCITY FPS	5.47	0.00	5.46	0.00
4	DISCHARGE CFS	226.	0.	226.	0.
226.	VELOCITY FPS	5.90	0.00	5.89	0.00
1	ELEV 834.81 KD	434.	1.	432.	1.
2	ELEV 835.32 KD	933.	1.	931.	1.
3	ELEV 835.62 KD	1293.	1.	1291.	1.
4	ELEV 835.98 KD	1799.	1.	1797.	1.

RATING TABLE FOR SECTION *56.45 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	834.50	0.0	0.0						
1	835.94	23.3	75.0	0.00	0.00	0.00	75.00	835.5	.00785
2	836.53	35.2	140.0	0.00	0.00	0.00	140.00	835.9	.00782
3	836.84	41.7	168.0	0.00	0.00	0.00	168.00	836.1	.00678
4	837.21	50.2	226.0	0.00	0.00	0.00	226.00	836.4	.00719

SEGMENT TABLE FOR SECTION *56.45

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	3.23	0.00	3.22	0.00
2	DISCHARGE CFS	140.	0.	140.	0.
140.	VELOCITY FPS	3.98	0.00	3.98	0.00
3	DISCHARGE CFS	168.	0.	168.	0.
168.	VELOCITY FPS	4.03	0.00	4.02	0.00
4	DISCHARGE CFS	226.	0.	226.	0.
226.	VELOCITY FPS	4.52	0.00	4.51	0.00
1	ELEV 835.94 KD	847.	1.	845.	1.
2	ELEV 836.53 KD	1583.	1.	1581.	1.
3	ELEV 836.84 KD	2041.	1.	2039.	1.
4	ELEV 837.21 KD	2666.	1.	2664.	1.

ROAD SECTION 56.6

NO.	HW	CFS	HL	TW	CSM.
0	834.62	0.00	0.00	0.00	0.00
1	838.24	75.00	2.00	836.24	75.00
2	839.92	140.00	3.04	836.88	140.00
3	840.44	168.00	3.28	837.16	168.00
4	840.75	226.00	3.20	837.55	226.00

MIN ROAD ELEVATION 840.20

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	22551.	5.00		17.00	834.52	834.62	.012

RATING TABLE FOR SECTION +56.65 OA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	835.30	0.0	0.0						
1	838.25	55.5	75.0	0.00	0.00	0.00	75.00	836.3	.00059
BANK FULL	838.8	69.0	96.5	0.00	0.00	0.00			
2	839.92	111.9	140.0	0.00	0.00	0.00	140.00	836.7	.00035
3	840.44	144.1	168.0	0.00	0.00	0.00	168.00	836.9	.00031
4	840.75	165.5	226.0	0.00	0.00	0.00	226.00	837.2	.00042

SEGMENT TABLE FOR SECTION +56.65

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	1.35	0.00	1.35	0.00
2	DISCHARGE CFS	140.	3.	137.	0.
140.	VELOCITY FPS	1.39	.22	1.40	.13
3	DISCHARGE CFS	168.	7.	159.	2.
168.	VELOCITY FPS	1.40	.29	1.43	.21
4	DISCHARGE CFS	226.	13.	210.	3.
226.	VELOCITY FPS	1.71	.38	1.76	.27
1	ELEV 838.25 KD	3098.	1.	3096.	1.
2	ELEV 839.92 KD	7465.	125.	7333.	7.
3	ELEV 840.44 KD	9491.	357.	9087.	47.
4	ELEV 840.75 KD	10927.	586.	10215.	126.

TABLE OF VALUES FOR BPR EQUATION

COEFK	AKB	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
.1185	.1185	0.0000	0.0000	0.0000	0.0000	.8927	1.0000	1.0000	40.3612	60.8273	56.0849
DCRIT	836.65	KBCRIT=									
.6017	.6017	0.0000	0.0000	0.0000	0.0000	.6791	1.0000	1.0000	70.0385	149.7672	112.6152
DCRIT	837.15	KBCRIT=									
.8328	.8328	0.0000	0.0000	0.0000	0.0000	.6048	1.0000	1.0000	78.4116	202.1056	145.0409
DCRIT	837.31	KBCRIT=									
.9338	.9338	0.0000	0.0000	0.0000	0.0000	.5750	1.0000	1.0000	78.4489	238.5485	166.8065
DCRIT	837.49	KBCRIT=									

WEST BRANCH PORTAGE CREEK, MICHIGAN
PRELIMINARY FINAL RUN ..SECTIONS 52.5-6(.95+

ROAD SECTION 56.7

NO.	HW	CFS	HL	TW	CSM.
0	835.30	0.00	0.00	0.00	0.00
1	838.27	75.00	0.00	838.27	75.00
2	839.97	140.00	.04	839.93	140.00
3	840.51	168.00	.06	840.45	168.00
4	840.86	226.00	.10	840.76	226.00

MIN ROAD ELEVATION 840.20

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 840.40 OPENING NO.= 1

RATING TABLE FOR SECTION 56.8 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	835.40	0.0	0.0						
1	838.31	58.2	75.0	0.00	0.00	0.00	75.00	836.7	.00082
BANK FULL	839.5	107.8	121.1	0.00	0.00	0.00			
2	839.99	141.7	140.0	0.00	0.00	0.00	140.00	837.2	.00028
3	840.52	190.7	168.0	0.00	0.00	0.00	168.00	837.3	.00021
4	840.88	227.4	226.0	0.00	0.00	0.00	226.00	837.6	.00026

SEGMENT TABLE FOR SECTION 56.8

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	1.29	0.00	1.29	0.00
2	DISCHARGE CFS	140.	0.	139.	1.
140.	VELOCITY FPS	1.06	.15	1.06	.12
3	DISCHARGE CFS	168.	1.	162.	5.
168.	VELOCITY FPS	1.03	.17	1.04	.16
4	DISCHARGE CFS	226.	1.	215.	10.
226.	VELOCITY FPS	1.22	.21	1.24	.21
1	ELEV 838.31 KD	2622.	1.	2620.	1.
2	ELEV 839.99 KD	8313.	6.	8279.	28.
3	ELEV 840.52 KD	11414.	23.	11149.	242.
4	ELEV 840.88 KD	13887.	56.	13283.	547.

RATING TABLE FOR SECTION 56.9+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	835.40	0.0	0.0						
1	838.42	61.8	75.0	0.00	0.00	0.00	75.00	836.7	.00069
BANK FULL	839.5	107.8	118.7	0.00	0.00	0.00			
2	840.03	144.6	140.0	0.00	0.00	0.00	140.00	837.2	.00027
3	840.55	193.8	168.0	0.00	0.00	0.00	168.00	837.3	.00021
4	840.91	231.2	226.0	0.00	0.00	0.00	226.00	837.6	.00025

SEGMENT TABLE FOR SECTION 56.9+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	1.21	0.00	1.21	0.00
2	DISCHARGE CFS	140.	0.	139.	1.
140.	VELOCITY FPS	1.05	.14	1.04	.12
3	DISCHARGE CFS	168.	1.	162.	5.
168.	VELOCITY FPS	1.02	.17	1.03	.16
4	DISCHARGE CFS	226.	1.	215.	10.
226.	VELOCITY FPS	1.20	.21	1.22	.20
1	ELEV 838.42 KO	2852.	1.	2850.	1.
2	ELEV 840.03 KO	8526.	6.	8483.	36.
3	ELEV 840.55 KO	11604.	25.	11320.	259.
4	ELEV 840.91 KO	14172.	61.	13517.	594.

TABLE OF VALUES FOR BPR EQUATION

COEFK	AKB	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
1.8329	1.8329	0.0000	0.0000	0.0000	0.0000	.3755	1.0000	1.0000	32.5160	199.5275	70.8900
DCRIT	836.58	KBCRIT=									
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000	32.5800	199.5275	70.8900
DCRIT	-1.00	KBCRIT=									
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000	32.5800	199.5275	70.8900
DCRIT	-1.00	KBCRIT=									
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000	32.5800	199.5275	70.8900
DCRIT	-1.00	KBCRIT=									

ROAD SECTION 57.0

NO.	HH	CFS	HL	TW	CSM.
0	835.20	0.00	0.00	0.00	0.00
1	838.61	75.00	.16	838.45	75.00
2	840.30	140.00	.26	840.04	140.00
3	840.68	168.00	.04	840.56	168.00
4	840.97	226.00	.04	840.93	226.00

MIN ROAD ELEVATION 840.00

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 838.10 OPENING NO.= 1

RATING TABLE FOR SECTION 57.1+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	836.10	0.0	0.0						
BANK FULL	836.7	12.6	17.8	0.00	0.00	0.00			
1	838.63	111.3	75.0	0.00	0.00	0.00	75.00	836.9	.00050
2	840.30	293.8	140.0	0.00	0.00	0.00	140.00	837.2	.00018
3	840.61	334.8	168.0	0.00	0.00	0.00	168.00	837.3	.00019
4	840.97	385.2	226.0	0.00	0.00	0.00	226.00*	837.5	.00024

SEGMENT TABLE FOR SECTION 57.1+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	10.	65.	1.
75.	VELOCITY FPS	.89	.25	.94	.16
2	DISCHARGE CFS	140.	34.	99.	7.
140.	VELOCITY FPS	.71	.25	.83	.19
3	DISCHARGE CFS	168.	43.	114.	11.
168.	VELOCITY FPS	.76	.27	.89	.23
4	DISCHARGE CFS	226.	61.	148.	17.
226.	VELOCITY FPS	.89	.33	1.07	.29
1	ELEV 838.63 KO	3359.	423.	2910.	26.
2	ELEV 840.30 KO	10336.	2476.	7308.	552.
3	ELEV 840.61 KO	12085.	3065.	8258.	762.
4	ELEV 840.97 KO	14454.	3892.	9482.	1081.

RATING TABLE FOR SECTION 57.4 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	837.50	0.0	0.0						
BANK FULL	838.1	12.6	26.3	0.00	0.00	0.00			
1	839.21	56.6	75.0	0.00	0.00	0.00	75.00	838.3	.00251
2	840.53	156.3	140.0	0.00	0.00	0.00	140.00	838.6	.00079
3	840.82	188.1	168.0	0.00	0.00	0.00	168.00	838.7	.00076
4	841.21	232.3	226.0	0.00	0.00	0.00	226.00	838.9	.00084

SEGMENT TABLE FOR SECTION 57.4

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	5.	70.	0.
75.	VELOCITY FPS	1.55	.41	1.59	0.00
2	DISCHARGE CFS	140.	23.	114.	3.
140.	VELOCITY FPS	1.25	.37	1.37	.26
3	DISCHARGE CFS	168.	31.	132.	5.
168.	VELOCITY FPS	1.29	.40	1.43	.29
4	DISCHARGE CFS	226.	48.	169.	9.
226.	VELOCITY FPS	1.43	.47	1.63	.35
1	ELEV 839.21 KD	1494.	98.	1395.	1.
2	ELEV 840.53 KD	4971.	802.	4070.	100.
3	ELEV 840.82 KD	6077.	1110.	4801.	166.
4	ELEV 841.21 KD	7792.	1633.	5858.	301.

RATING TABLE FOR SECTION +57.69 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	841.10	0.0	0.0						
BANK FULL	841.7	12.6	35.6	0.00	0.00	0.00			
1	842.37	35.5	75.0	0.00	0.00	0.00	75.00	841.9	.00822
2	842.94	63.8	140.0	0.00	0.00	0.00	140.00	842.2	.00648
3	843.11	73.2	168.0	0.00	0.00	0.00	168.00	842.3	.00653
4	843.39	92.4	226.0	0.00	0.00	0.00	226.00	842.5	.00685

SEGMENT TABLE FOR SECTION +57.69

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	3.	72.	0.
75.	VELOCITY FPS	2.32	.55	2.35	0.00
2	DISCHARGE CFS	140.	11.	129.	0.
140.	VELOCITY FPS	2.61	.71	2.70	0.00
3	DISCHARGE CFS	168.	15.	153.	0.
168.	VELOCITY FPS	2.77	.76	2.90	.29
4	DISCHARGE CFS	226.	25.	200.	1.
226.	VELOCITY FPS	3.10	.87	3.27	.47
1	ELEV 842.37 KQ	826.	25.	800.	1.
2	ELEV 842.94 KQ	1737.	131.	1604.	1.
3	ELEV 843.11 KQ	2079.	186.	1891.	2.
4	ELEV 843.39 KQ	2725.	297.	2418.	10.

TABLE OF VALUES FOR BPR EQUATION

COEFK	AKB	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
1.0880	.8844	.2036	.8268	0.0000	0.0000	.5894	1.0000	1.0000	24.9959	83.4497	72.4832
DCRIT	841.71	KBCRIT=									
1.2972	1.1053	.1919	.7793	0.0000	0.0000	.5270	1.0000	1.0000	34.8929	136.0094	116.7594
DCRIT	842.07	KBCRIT=									
1.3423	1.1530	.1894	.7690	0.0000	0.0000	.5142	1.0000	1.0000	37.9060	155.9409	132.5467
DCRIT	842.15	KBCRIT=									
1.4637	1.2812	.1825	.7411	0.0000	0.0000	.4808	1.0000	1.0000	43.0607	196.1633	161.2503
DCRIT	842.31	KBCRIT=									

ROAD SECTION 57.7

NO.	HW	CFS	HL	TW	CSM.
0	840.50	0.00	0.00	0.00	0.00
1	842.64	75.00	.14	842.50	75.00
2	843.29	140.00	.20	843.09	140.00
3	843.51	168.00	.24	843.27	168.00
4	843.88	226.00	.30	843.58	226.00

MIN ROAD ELEVATION 840.50

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 848.20 OPENING NO.= 1

RATING TABLE FOR SECTION +57.75 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	841.20	0.0	0.0						
BANK FULL	841.8	12.6	28.3	0.00	0.00	0.00			
1	842.79	50.1	75.0	0.00	0.00	0.00	75.00	842.0	.00339
2	843.42	87.5	140.0	0.00	0.00	0.00	140.00	842.3	.00300
3	843.63	102.8	168.0	0.00	0.00	0.00	168.00	842.4	.00294
4	843.99	134.6	226.0	0.00	0.00	0.00	226.00	842.6	.00294

SEGMENT TABLE FOR SECTION +57.75

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	4.	71.	0.
75.	VELOCITY FPS	1.71	.43	1.76	0.00
2	DISCHARGE CFS	140.	15.	124.	1.
140.	VELOCITY FPS	2.01	.56	2.11	.30
3	DISCHARGE CFS	168.	20.	147.	1.
168.	VELOCITY FPS	2.11	.59	2.24	.34
4	DISCHARGE CFS	226.	34.	189.	4.
226.	VELOCITY FPS	2.30	.67	2.47	.46
1	ELEV 842.79 KD	1288.	73.	1215.	1.
2	ELEV 843.42 KD	2550.	265.	2278.	7.
3	ELEV 843.63 KD	3097.	369.	2708.	20.
4	ELEV 843.99 KD	4154.	600.	3498.	55.

----------80/80 LIST OF INPUT DATA----------

```
CHANGE    DISCHARGE                                                  602
DISCHARGE -1.       75.       140.      180.      275.               603
END                                                                  604
COMPUTE   57.8      60.5      +57.75                                 605
```

----------END OF 80/80 LIST----------

COMPUTE 57.8 60.5 +57.75 605

----------STARTING DATA FROM PREVIOUS COMPUTATIONS----------

RATING TABLE FOR SECTION 57.8 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	842.70	0.0	0.0						
1	844.63	32.2	75.0	0.00	0.00	0.00	75.00	843.7	.00532
2	845.44	50.5	140.0	0.00	0.00	0.00	140.00	844.2	.00502
3	845.71	57.2	180.0	0.00	0.00	0.00	180.00	844.4	.00576
4	846.41	75.6	275.0	0.00	0.00	0.00	275.00	844.9	.00609

SEGMENT TABLE FOR SECTION 57.8

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	2.33	0.00	2.33	0.00
2	DISCHARGE CFS	140.	0.	140.	0.
140.	VELOCITY FPS	2.78	0.00	2.77	0.00
3	DISCHARGE CFS	180.	0.	180.	0.
180.	VELOCITY FPS	3.15	0.00	3.15	0.00
4	DISCHARGE CFS	275.	0.	275.	0.
275.	VELOCITY FPS	3.64	0.00	3.64	0.00
1	ELEV 844.63 KD	1028.	1.	1026.	1.
2	ELEV 845.44 KD	1976.	1.	1974.	1.
3	ELEV 845.71 KD	2371.	1.	2369.	1.
4	ELEV 846.41 KD	3523.	1.	3521.	1.

ROAD SECTION 57.9

NO.	HW	CFS	HL	TW	CSM.
0	841.53	0.00	0.00	0.00	0.00
1	845.22	75.00	.48	844.74	75.00
2	846.55	140.00	.96	845.59	140.00
3	847.18	180.00	1.28	845.90	180.00
4	849.69	275.00	3.04	846.65	275.00

MIN ROAD ELEVATION 850.70

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	12333.	6.00		690.00	842.08	840.91	.024
2	1	12333.	6.00		690.00	841.53	840.91	.024

RATING TABLE FOR SECTION 58.5+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	843.30	0.0	0.0						
1	845.39	32.3	75.0	0.00	0.00	0.00	75.00	844.5	.00446
2	846.62	61.7	140.0	0.00	0.00	0.00	140.00	844.9	.00244
3	847.23	78.6	180.0	0.00	0.00	0.00	180.00	845.1	.00205
BANK FULL	848.6	135.1	232.9	0.00	0.00	0.00			
ZERO DAMG	849.6	220.6	271.6	0.00	0.00	0.00			
4	849.69	229.2	275.0	0.00	0.00	0.00	275.00	845.6	.00051

**********PROFILE NO 4 EXCEEDS SURVEY DATA**********

SEGMENT TABLE FOR SECTION 58.5+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	2.32	0.00	2.32	0.00
2	DISCHARGE CFS	140.	0.	140.	0.
140.	VELOCITY FPS	2.27	0.00	2.27	0.00
3	DISCHARGE CFS	180.	0.	180.	0.
180.	VELOCITY FPS	2.29	0.00	2.29	0.00
4	DISCHARGE CFS	275.	0.	251.	24.
275.	VELOCITY FPS	1.49	0.00	1.56	.35
1	ELEV 845.39 KD	1123.	1.	1121.	1.
2	ELEV 846.62 KD	2835.	1.	2833.	1.
3	ELEV 847.23 KD	3980.	1.	3978.	1.
4	ELEV 849.69 KD	12168.	2.	11105.	1061.

RATING TABLE FOR SECTION 58.6 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED			CSM	CRIT ELEV	FRICTION SLOPE
				DAMAGE	CHANNEL	NON-DAM			
0	844.80	0.0	0.0						
1	846.41	22.7	75.0	0.00	0.00	0.00	75.00	846.0	.01267
2	847.14	37.9	140.0	0.00	0.00	0.00	140.00	846.4	.00978
3	847.61	48.9	180.0	0.00	0.00	0.00	180.00	846.6	.00777
4	849.76	114.9	275.0	0.00	0.00	0.00	275.00	847.1	.00182

SEGMENT TABLE FOR SECTION 58.6

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	3.30	0.00	3.31	0.00
2	DISCHARGE CFS	140.	0.	140.	0.
140.	VELOCITY FPS	3.70	0.00	3.70	0.00
3	DISCHARGE CFS	180.	0.	180.	0.
180.	VELOCITY FPS	3.69	0.00	3.68	0.00
4	DISCHARGE CFS	275.	0.	273.	2.
275.	VELOCITY FPS	2.47	0.00	2.47	.53
1	ELEV 846.41 KD	666.	1.	664.	1.
2	ELEV 847.14 KD	1416.	1.	1414.	1.
3	ELEV 847.61 KD	2042.	1.	2040.	1.
4	ELEV 849.76 KD	6400.	1.	6393.	6.

RATING TABLE FOR SECTION 58.9+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	844.80	0.0	0.0						
1	846.76	29.6	75.0	0.00	0.00	0.00	75.00	846.0	.00578
2	847.51	46.4	140.0	0.00	0.00	0.00	140.00	846.4	.00549
3	847.94	57.0	180.0	0.00	0.00	0.00	180.00	846.6	.00503
4	849.85	120.3	275.0	0.00	0.00	0.00	275.00	847.1	.00168

SEGMENT TABLE FOR SECTION 58.9+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	2.54	0.00	2.54	0.00
2	DISCHARGE CFS	140.	0.	140.	0.
140.	VELOCITY FPS	3.03	0.00	3.02	0.00
3	DISCHARGE CFS	180.	0.	180.	0.
180.	VELOCITY FPS	3.16	0.00	3.16	0.00
4	DISCHARGE CFS	275.	0.	272.	3.
275.	VELOCITY FPS	2.39	0.00	2.39	.51
1	ELEV 846.76 KD	986.	1.	984.	1.
2	ELEV 847.51 KD	1890.	1.	1888.	1.
3	ELEV 847.94 KD	2539.	1.	2537.	1.
4	ELEV 849.85 KD	6658.	1.	6647.	10.

ROAD SECTION 59.0

NO.	HW	CFS	HL	TW	CSM.
0	842.27	0.00	0.00	0.00	0.00
1	846.94	75.00	.08	846.86	75.00
2	847.81	140.00	.16	847.65	140.00
3	848.34	180.00	.24	848.10	180.00
4	850.18	275.00	.24	849.94	275.00

MIN ROAD ELEVATION 850.00

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	12311.	6.50		60.00	842.27	842.25	.024
2	1	12311.	6.50		60.00	842.27	841.78	.024

RATING TABLE FOR SECTION 59.1+ DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	845.30	0.0	0.0						
1	847.44	19.5	75.0	0.00	0.00	0.00	75.00	847.0	.01518
2	848.19	32.1	140.0	0.00	0.00	0.00	140.00	847.5	.01346
BANK FULL	848.2	32.3	140.6	0.00	0.00	0.00			
3	848.60	42.2	180.0	0.00	0.00	0.00	180.00	847.8	.01159
4	850.21	207.3	275.0	0.00	0.00	0.00	275.00	848.5	.00186

SEGMENT TABLE FOR SECTION 59.1+

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	3.86	0.00	3.85	0.00
2	DISCHARGE CFS	140.	0.	140.	0.
140.	VELOCITY FPS	4.38	0.00	4.37	0.00
3	DISCHARGE CFS	180.	2.	178.	0.
180.	VELOCITY FPS	4.48	1.00	4.47	0.00
4	DISCHARGE CFS	275.	99.	176.	0.
275.	VELOCITY FPS	2.02	.74	2.38	0.00
1	ELEV 847.44 KO	609.	1.	607.	1.
2	ELEV 848.19 KO	1207.	2.	1204.	1.
3	ELEV 848.60 KO	1662.	10.	1651.	1.
4	ELEV 850.21 KO	6310.	2138.	4171.	1.

RATING TABLE FOR SECTION 59.5 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	845.30	0.0	0.0						
1	847.88	26.5	75.0	0.00	0.00	0.00	75.00	847.0	.00656
BANK FULL	848.2	32.3	101.3	0.00	0.00	0.00			
2	848.67	44.3	140.0	0.00	0.00	0.00	140.00	847.5	.00625
3	849.06	61.7	180.0	0.00	0.00	0.00	180.00	847.8	.00572
4	850.31	225.3	275.0	0.00	0.00	0.00	275.00	848.5	.00156

SEGMENT TABLE FOR SECTION 59.5

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	2.84	0.00	2.83	0.00
2	DISCHARGE CFS	140.	2.	138.	0.
140.	VELOCITY FPS	3.35	.73	3.34	0.00
3	DISCHARGE CFS	180.	9.	171.	0.
180.	VELOCITY FPS	3.43	.74	3.48	0.00
4	DISCHARGE CFS	275.	108.	167.	0.
275.	VELOCITY FPS	1.85	.73	2.19	0.00
1	ELEV 847.88 KO	926.	1.	923.	1.
2	ELEV 848.67 KO	1760.	15.	1744.	1.
3	ELEV 849.06 KO	2351.	81.	2269.	1.
4	ELEV 850.31 KO	6844.	2486.	4357.	1.

RATING TABLE FOR SECTION 59.9* DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	846.30	0.0	0.0						
1	849.14	31.2	75.0	0.00	0.00	0.00	75.00	848.0	.00419
BANK FULL	849.2	32.3	79.9	0.00	0.00	0.00			
2	849.91	50.8	140.0	0.00	0.00	0.00	140.00	848.5	.00443
3	850.29	77.1	180.0	0.00	0.00	0.00	180.00	848.8	.00485
4	850.98	167.9	275.0	0.00	0.00	0.00	275.00	849.5	.00274

SEGMENT TABLE FOR SECTION 59.9*

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	2.41	0.00	2.41	0.00
2	DISCHARGE CFS	140.	3.	137.	0.
140.	VELOCITY FPS	2.96	.65	2.99	0.00
3	DISCHARGE CFS	180.	16.	164.	0.
180.	VELOCITY FPS	2.97	.67	3.06	0.00
4	DISCHARGE CFS	275.	82.	193.	0.
275.	VELOCITY FPS	2.46	.82	2.82	0.00
1	ELEV 849.14 KQ	1159.	2.	1156.	1.
2	ELEV 849.91 KQ	2101.	48.	2052.	1.
3	ELEV 850.29 KQ	2780.	182.	2596.	1.
4	ELEV 850.98 KQ	5130.	1384.	3744.	1.

TABLE OF VALUES FOR BFR EQUATION

COEFK	AKB	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	A EXIT
.7860	.7860	0.0000	0.0000	0.0000	0.0000	.6430	1.0000	1.0000	37.0123	78.8098	34.7622
DCRIT	847.62	KBCRIT=									
1.0481	1.0481	0.0000	0.0000	0.0000	0.0000	.5667	1.0000	1.0000	39.1175	121.8393	64.6215
DCRIT	848.12	KBCRIT=									
0.9000	0.0000	0.0000	0.0000	0.0000	0.0000	.5630	1.0000	1.0000	39.1175	125.1946	89.9909
DCRIT	848.39	KBCRIT=									
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000	39.1175	125.1946	89.9909
DCRIT	-1.00	KBCRIT=									

ROAD SECTION 60.0

NO.	HW	CFS	HL	TW	CSM
0	846.30	0.00	0.00	0.00	0.00
1	849.45	75.00	.12	849.33	75.00
2	850.65	140.00	.54	850.11	140.00
3	851.38	180.00	.90	850.48	180.00
4	851.75	275.00	.64	851.11	275.00

MIN ROAD ELEVATION 851.40

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 850.00 OPENING NO.= 1

RATING TABLE FOR SECTION +60.05 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	846.80	0.0	0.0						
1	849.50	59.8	75.0	0.00	0.00	0.00	75.00	848.1	.00111
2	850.67	110.7	140.0	0.00	0.00	0.00	140.00	848.5	.00067
3	851.40	146.2	180.0	0.00	0.00	0.00	180.00	848.7	.00049
4	851.78	166.2	275.0	0.00	0.00	0.00	275.00	849.0	.00078

SEGMENT TABLE FOR SECTION +60.05

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	1.27	0.00	1.25	0.00
2	DISCHARGE CFS	140.	0.	140.	0.
140.	VELOCITY FPS	1.27	0.00	1.26	0.00
3	DISCHARGE CFS	180.	0.	180.	0.
180.	VELOCITY FPS	1.24	0.00	1.23	0.00
4	DISCHARGE CFS	275.	0.	275.	0.
275.	VELOCITY FPS	1.66	0.00	1.66	0.00
1	ELEV 849.50 KD	2255.	1.	2253.	1.
2	ELEV 850.67 KD	5409.	1.	5407.	1.
3	ELEV 851.40 KD	8155.	1.	8153.	1.
4	ELEV 851.78 KD	9856.	1.	9854.	1.

RATING TABLE FOR SECTION 60.1 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	848.20	0.0	0.0						
BANK FULL	851.2	11.3	65.0	0.00	0.00	0.00			
1	851.66	23.8	75.0	0.00	0.00	0.00	75.00	851.1	.01340
2	852.21	74.7	140.0	0.00	0.00	0.00	140.00	851.8	.00873
3	852.56	147.9	180.0	0.00	0.00	0.00	180.00	851.9	.00386
4	852.74	205.1	275.0	0.00	0.00	0.00	275.00	852.2	.00412

SEGMENT TABLE FOR SECTION 60.1

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	2.	70.	3.
75.	VELOCITY FPS	3.62	1.17	3.60	1.26
2	DISCHARGE CFS	140.	11.	98.	31.
140.	VELOCITY FPS	3.11	1.36	3.39	.82
3	DISCHARGE CFS	180.	14.	81.	85.
180.	VELOCITY FPS	2.10	.98	2.32	.86
4	DISCHARGE CFS	275.	20.	98.	156.
275.	VELOCITY FPS	2.14	1.10	2.57	1.05
1	ELEV 851.66 KD	635.	14.	605.	17.
2	ELEV 852.21 KD	1420.	99.	1094.	227.
3	ELEV 852.56 KD	2712.	236.	1526.	951.
4	ELEV 852.74 KD	3949.	329.	1761.	1859.

RATING TABLE FOR SECTION +60.15 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	847.10	0.0	0.0						
1	851.86	154.6	75.0	0.00	0.00	0.00	75.00	848.4	.00007
2	852.36	180.7	140.0	0.00	0.00	0.00	140.00	848.8	.00016
3	852.63	195.1	180.0	0.00	0.00	0.00	180.00	849.0	.00021
4	852.81	204.8	275.0	0.00	0.00	0.00	275.00	849.3	.00041

SEGMENT TABLE FOR SECTION +60.15

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	.49	0.00	.49	0.00
2	DISCHARGE CFS	140.	0.	140.	0.
140.	VELOCITY FPS	.78	0.00	.77	0.00
3	DISCHARGE CFS	180.	0.	180.	0.
180.	VELOCITY FPS	.92	0.00	.92	0.00
4	DISCHARGE CFS	275.	0.	275.	0.
275.	VELOCITY FPS	1.35	0.00	1.34	0.00
1	ELEV 851.86 KD	8869.	1.	8867.	1.
2	ELEV 852.36 KD	11164.	1.	11162.	1.
3	ELEV 852.63 KD	12556.	1.	12554.	1.
4	ELEV 852.81 KD	13520.	1.	13518.	1.

RATING TABLE FOR SECTION 60.2 OA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	840.50	0.0	0.0						
BANK FULL	850.6	468.1	66.6	0.00	0.00	0.00			
1	851.87	569.9	75.0	0.00	0.00	0.00	75.00	841.8	.00000
2	852.37	621.5	140.0	0.00	0.00	0.00	140.00	842.2	.00000
3	852.64	656.6	180.0	0.00	0.00	0.00	180.00	842.4	.00001
4	852.84	685.9	275.0	0.00	0.00	0.00	275.00	842.7	.00001

SEGMENT TABLE FOR SECTION 60.2

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	.14	.02	.14	.01
2	DISCHARGE CFS	140.	1.	139.	0.
140.	VELOCITY FPS	.24	.04	.24	.02
3	DISCHARGE CFS	180.	2.	177.	1.
180.	VELOCITY FPS	.29	.06	.29	.05
4	DISCHARGE CFS	275.	5.	268.	2.
275.	VELOCITY FPS	.43	.10	.44	.09
1	ELEV 851.87 KD	59936.	172.	59759.	5.
2	ELEV 852.37 KD	66000.	505.	65451.	43.
3	ELEV 852.64 KD	69683.	797.	68775.	111.
4	ELEV 852.84 KD	72426.	1012.	71228.	186.

RATING TABLE FOR SECTION +60.25 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	842.30	0.0	0.0						
1	851.87	433.4	75.0	0.00	0.00	0.00	75.00	843.6	.00000
2	852.37	465.7	140.0	0.00	0.00	0.00	140.00	844.0	.00001
BANK FULL	852.4	468.1	144.8	0.00	0.00	0.00			
3	852.64	485.3	180.0	0.00	0.00	0.00	180.00	844.2	.00001
4	852.84	499.3	275.0	0.00	0.00	0.00	275.00	844.5	.00003

SEGMENT TABLE FOR SECTION +60.25

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	0.	75.	0.
75.	VELOCITY FPS	.17	0.00	.17	0.00
2	DISCHARGE CFS	140.	0.	140.	0.
140.	VELOCITY FPS	.30	0.00	.30	0.00
3	DISCHARGE CFS	180.	0.	180.	0.
180.	VELOCITY FPS	.37	.05	.37	0.00
4	DISCHARGE CFS	275.	0.	275.	0.
275.	VELOCITY FPS	.55	.07	.55	0.00
1	ELEV 851.87 KD	41330.	1.	41327.	1.
2	ELEV 852.37 KD	46074.	1.	46071.	1.
3	ELEV 852.64 KD	48839.	5.	48833.	1.
4	ELEV 852.84 KD	50874.	12.	50861.	1.

ROAD SECTION 60.3

NO.	HW	CFS	HL	TW	CSM
0	846.77	0.00	0.00	0.00	0.00
1	851.87	75.00	0.00	851.67	75.00
2	852.37	140.00	0.00	852.37	140.00
3	852.64	180.00	0.00	852.64	180.00
4	852.92	275.00	.08	852.84	275.00

MIN ROAD ELEVATION 851.10

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	12311.	3.60		22.50	845.74	846.77	.024
2	1	12311.	3.60		22.50	845.60	846.82	.024

RATING TABLE FOR SECTION +60.35 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	846.30	0.0	0.0						
BANK FULL	849.0	131.3	36.4	0.00	0.00	0.00			
1	851.87	1258.2	75.0	0.00	0.00	0.00	75.00	847.7	.00001
2	852.37	1589.0	140.0	0.00	0.00	0.00	140.00	848.2	.00002
3	852.64	1774.0	180.0	0.00	0.00	0.00	180.00	848.4	.00003
4	852.92	1970.1	275.0	0.00	0.00	0.00	275.00	848.6	.00005

SEGMENT TABLE FOR SECTION +60.35

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	42.	24.	9.
75.	VELOCITY FPS	.10	.05	.16	.04
2	DISCHARGE CFS	140.	80.	39.	20.
140.	VELOCITY FPS	.14	.08	.24	.06
3	DISCHARGE CFS	180.	104.	48.	28.
180.	VELOCITY FPS	.16	.09	.27	.06
4	DISCHARGE CFS	275.	161.	69.	45.
275.	VELOCITY FPS	.22	.13	.37	.09
1	ELEV 851.87 KD	22074.	12245.	7139.	2691.
2	ELEV 852.37 KD	29952.	17116.	8589.	4247.
3	ELEV 852.64 KD	35269.	20452.	9446.	5371.
4	ELEV 852.92 KD	40715.	23796.	10326.	6593.

RATING TABLE FOR SECTION 60.4 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	GRIT ELEV	FRICTION SLOPE
0	847.00	0.0	0.0						
BANK FULL	849.7	131.3	41.5	0.00	0.00	0.00			
1	851.88	901.9	75.0	0.00	0.00	0.00	75.00	848.4	.00002
2	852.39	1165.3	140.0	0.00	0.00	0.00	140.00	848.9	.00005
3	852.67	1320.6	180.0	0.00	0.00	0.00	180.00	849.1	.00006
4	852.96	1516.8	275.0	0.00	0.00	0.00	275.00	849.3	.00009

SEGMENT TABLE FOR SECTION 60.4

CSM		TOTAL	SEC NO 1 N	2 C	3 N
1	DISCHARGE CFS	75.	43.	25.	6.
75.	VELOCITY FPS	.13	.07	.20	.04
2	DISCHARGE CFS	140.	79.	45.	16.
140.	VELOCITY FPS	.20	.10	.32	.07
3	DISCHARGE CFS	180.	101.	56.	23.
180.	VELOCITY FPS	.23	.11	.37	.08
4	DISCHARGE CFS	275.	157.	79.	39.
275.	VELOCITY FPS	.30	.16	.49	.11
1	ELEV 851.88 KD	15776.	9168.	5305.	1303.
2	ELEV 852.39 KD	20398.	11499.	6631.	2268.
3	ELEV 852.67 KD	23600.	13180.	7422.	2998.
4	ELEV 852.96 KD	28302.	16125.	8266.	3911.

RATING TABLE FOR SECTION 60.5 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	848.30	0.0	0.0						
BANK FULL	850.4	64.6	43.4	0.00	0.00	0.00			
1	851.93	429.9	75.0	0.00	0.00	0.00	75.00	849.7	.00005
2	852.47	573.3	140.0	0.00	0.00	0.00	140.00	850.2	.00007
3	852.76	659.9	180.0	0.00	0.00	0.00	180.00	850.3	.00009
4	853.10	763.6	275.0	0.00	0.00	0.00	275.00	850.4	.00014

SEGMENT TABLE FOR SECTION 60.5

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	75.	33.	21.	21.
75.	VELOCITY FPS	.20	.14	.27	.17
2	DISCHARGE CFS	140.	63.	35.	42.
140.	VELOCITY FPS	.27	.21	.37	.24
3	DISCHARGE CFS	180.	78.	45.	57.
180.	VELOCITY FPS	.31	.22	.43	.28
4	DISCHARGE CFS	275.	115.	69.	91.
275.	VELOCITY FPS	.41	.29	.59	.37
1	ELEV 851.93 KO	10505.	4632.	2983.	2890.
2	ELEV 852.47 KO	16406.	7326.	4147.	4932.
3	ELEV 852.76 KO	19296.	8378.	4842.	6075.
4	ELEV 853.10 KO	22895.	9589.	5733.	7573.

----------80/80 LIST OF INPUT DATA----------

```
CHANGE    DISCHARGE                                          606
DISCHARGE -1.       50.       90.       115.      170.      607
END                                                          608
COMPUTE   60.6      +60.95    60.5                           609
```

----------END OF 80/80 LIST----------

COMPUTE 60.6 +60.95 60.5 609

----------STARTING DATA FROM PREVIOUS COMPUTATIONS----------

RATING TABLE FOR SECTION 60.6 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	851.90	0.0	0.0						
BANK FULL	853.0	8.9	20.3	0.00	0.00	0.00			
1	854.61	160.3	50.0	0.00	0.00	0.00	50.00	853.1	.00071
2	855.04	250.7	90.0	0.00	0.00	0.00	90.00	853.5	.00069
3	855.28	303.3	115.0	0.00	0.00	0.00	115.00	853.9	.00068
4	855.73	406.0	170.0	0.00	0.00	0.00	170.00	854.8	.00065

SEGMENT TABLE FOR SECTION 60.6

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	50.	1.	25.	24.
50.	VELOCITY FPS	.60	.15	.75	.20
2	DISCHARGE CFS	90.	3.	35.	52.
90.	VELOCITY FPS	.61	.18	.88	.27
3	DISCHARGE CFS	115.	4.	41.	70.
115.	VELOCITY FPS	.61	.20	.92	.30
4	DISCHARGE CFS	170.	9.	52.	110.
170.	VELOCITY FPS	.63	.22	1.01	.35
1	ELEV 854.61 KD	1820.	40.	1003.	778.
2	ELEV 855.04 KD	3401.	103.	1378.	1920.
3	ELEV 855.28 KD	4400.	158.	1602.	2640.
4	ELEV 855.73 KD	6641.	317.	2052.	4271.

RATING TABLE FOR SECTION +60.65 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	853.40	0.0	0.0						
BANK FULL	854.5	8.9	24.0	0.00	0.00	0.00			
1	855.69	79.7	50.0	0.00	0.00	0.00	50.00	854.6	.00292
2	856.03	144.4	90.0	0.00	0.00	0.00	90.00	855.0	.00295
3	856.17	172.4	115.0	0.00	0.00	0.00	115.00	855.4	.00311
4	856.50	241.6	170.0	0.00	0.00	0.00	170.00	855.5	.00273

SEGMENT TABLE FOR SECTION +60.65

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	50.	1.	36.	13.
50.	VELOCITY FPS	1.21	.27	1.35	.26
2	DISCHARGE CFS	90.	2.	48.	40.
90.	VELOCITY FPS	1.23	.31	1.48	.38
3	DISCHARGE CFS	115.	3.	55.	57.
115.	VELOCITY FPS	1.26	.33	1.61	.44
4	DISCHARGE CFS	170.	5.	69.	96.
170.	VELOCITY FPS	1.20	.36	1.72	.51
1	ELEV 855.69 KO	854.	14.	691.	149.
2	ELEV 856.03 KO	1606.	33.	940.	633.
3	ELEV 856.17 KO	1999.	46.	1052.	902.
4	ELEV 856.50 KO	3243.	95.	1341.	1807.

WEST BRANCH PORTAGE CREEK, MICHIGAN
PRELIMINARY FINAL RUN SECTIONS 52.5-60.95+

ROAD SECTION 60.7

NO.	HW	CFS	HL	TW	CSM
0	853.85	0.00	0.00	0.00	0.00
1	856.28	50.00	.48	855.80	50.00
2	857.35	90.00	1.20	856.15	90.00
3	857.97	115.00	1.68	856.29	115.00
4	859.66	170.00	3.04	856.62	170.00

MIN ROAD ELEVATION 859.60

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	32133.	3.70	6.02	16.50	853.85	853.40	.032

RATING TABLE FOR SECTION +60.75 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	854.90	0.0	0.0						
1	856.39	31.9	50.0	0.00	0.00	0.00	50.00	855.6	.00260
2	857.38	65.0	90.0	0.00	0.00	0.00	90.00	855.9	.00104
BANK FULL	857.7	77.4	103.1	0.00	0.00	0.00			
3	857.99	89.9	115.0	0.00	0.00	0.00	115.00	856.0	.00066
4	859.66	245.9	170.0	0.00	0.00	0.00	170.00	856.3	.00020

SEGMENT TABLE FOR SECTION +60.75

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	50.	0.	50.	0.
50.	VELOCITY FPS	1.58	0.00	1.57	0.00
2	DISCHARGE CFS	90.	0.	90.	0.
90.	VELOCITY FPS	1.39	0.00	1.39	0.00
3	DISCHARGE CFS	115.	0.	115.	0.
115.	VELOCITY FPS	1.30	.12	1.30	0.00
4	DISCHARGE CFS	170.	8.	158.	4.
170.	VELOCITY FPS	1.00	.11	1.03	.17
1	ELEV 856.39 KD	981.	1.	979.	1.
2	ELEV 857.38 KD	2791.	1.	2789.	1.
3	ELEV 857.99 KD	4467.	3.	4461.	3.
4	ELEV 859.66 KD	12019.	521.	11227.	271.

RATING TABLE FOR SECTION 60.8 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSN	CRIT ELEV	FRICTION SLOPE
0	853.60	0.0	0.0						
BANK FULL	856.4	77.4	46.0	0.00	0.00	0.00			
1	856.65	87.6	50.0	0.00	0.00	0.00	50.00	854.3	.00013
2	857.61	148.2	90.0	0.00	0.00	0.00	90.00	854.6	.00012
3	858.18	219.8	115.0	0.00	0.00	0.00	115.00	854.7	.00011
4	859.75	516.1	170.0	0.00	0.00	0.00	170.00	855.0	.00005

SEGMENT TABLE FOR SECTION 60.8

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	50.	0.	50.	0.
50.	VELOCITY FPS	.58	.07	.58	0.00
2	DISCHARGE CFS	90.	1.	88.	1.
90.	VELOCITY FPS	.70	.06	.71	.19
3	DISCHARGE CFS	115.	5.	107.	3.
115.	VELOCITY FPS	.71	.09	.73	.15
4	DISCHARGE CFS	170.	23.	125.	23.
170.	VELOCITY FPS	.53	.11	.60	.20
1	ELEV 856.65 KD	4322.	3.	4316.	3.
2	ELEV 857.61 KD	8037.	87.	7876.	74.
3	ELEV 858.18 KD	11027.	392.	10393.	241.
4	ELEV 859.75 KD	25007.	3251.	18571.	3184.

RATING TABLE FOR SECTION 60.95 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	856.30	0.0	0.0						
BANK FULL	857.2	7.5	20.2	0.00	0.00	0.00			
1	858.53	41.7	50.0	0.00	0.00	0.00	50.00	857.4	.00126
2	859.33	90.0	90.0	0.00	0.00	0.00	90.00	857.7	.00082
3	859.66	129.8	115.0	0.00	0.00	0.00	115.00	857.9	.00073
4	860.40	238.0	170.0	0.00	0.00	0.00	170.00	858.3	.00041

SEGMENT TABLE FOR SECTION 60.95

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	50.	1.	46.	4.
50.	VELOCITY FPS	1.44	.49	1.48	.39
2	DISCHARGE CFS	90.	2.	70.	18.
90.	VELOCITY FPS	1.40	.54	1.56	.43
3	DISCHARGE CFS	115.	3.	80.	32.
115.	VELOCITY FPS	1.37	.56	1.57	.43
4	DISCHARGE CFS	170.	4.	90.	76.
170.	VELOCITY FPS	1.07	.49	1.39	.46
1	ELEV 858.53 KD	1389.	19.	1293.	77.
2	ELEV 859.33 KD	3138.	67.	2472.	599.
3	ELEV 859.66 KD	4223.	98.	3028.	1097.
4	ELEV 860.40 KD	8333.	194.	4464.	3676.

RATING TABLE FOR SECTION +60.95 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT. ELEV	FRICTION SLOPE
0	856.90	0.0	0.0						
BANK FULL	857.8	7.5	24.8	0.00	0.00	0.00			
1	858.72	26.2	50.0	0.00	0.00	0.00	50.00	858.0	.00358
2	859.44	58.2	90.0	0.00	0.00	0.00	90.00	858.3	.00209
3	859.76	77.5	115.0	0.00	0.00	0.00	115.00	858.5	.00188
4	860.45	153.0	170.0	0.00	0.00	0.00	170.00	858.9	.00121

SEGMENT TABLE FOR SECTION +60.95

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	50.	0.	49.	1.
50.	VELOCITY FPS	2.09	.61	2.09	.37
2	DISCHARGE CFS	90.	1.	78.	11.
90.	VELOCITY FPS	2.03	.67	2.14	.55
3	DISCHARGE CFS	115.	2.	94.	18.
115.	VELOCITY FPS	2.07	.71	2.24	.57
4	DISCHARGE CFS	170.	4.	117.	49.
170.	VELOCITY FPS	1.81	.69	2.14	.53
1	ELEV 858.72 KO	831.	6.	817.	8.
2	ELEV 859.44 KO	1957.	30.	1717.	210.
3	ELEV 859.76 KO	2636.	49.	2190.	397.
4	ELEV 860.45 KO	4879.	110.	3378.	1391.



1) COUNTY: Kalamazoo

2) STUDY NAME: Cities of Kalamazoo and Portage

3) WATERCOURSE: WSPZ West Branch Portage Creek

4) DOCUMENT TYPE: Input Data



WSP2 West Branch
Sections 52.5-60.95+

----------80/80 LIST OF INPUT DATA----------

```
WSP2                                                                    1
TITLE    WEST BRANCH PORTAGE CREEK, MICHIGAN                            2
TITLE    PRELIMINARY FINAL RUN  SECTIONS 52.5-60.95+                    3
*DISCHARGE -1.      75.       140.      180.      275.                  4
START    14.7       812.01    813.12    813.46    814.20                5
TRIB     55.1+      +57.75    60.5      +60.95                          6
OUTPUT   S                                                             9
REACH    14.7       1.        0.        0.                              10
SEGMENT  14.7       1         N         -25.                            11
NVALUE   .125                                                          12
SEGMENT  14.7       2         C         35.                             13
NVALUE   .055                                                          14
SEGMENT  14.7       3         N         310.1                           15
NVALUE   .125                                                          16
SECTION  14.7                                                          17
         -225.      823.      -225.     820.9     -200.     820.       18
         -176.      818.      -151.     818.2     -127.     817.       19
         -102.      815.2     -92.      811.4     -75.      811.2      20
         -50.       811.3     -25.      811.3     -20.      810.7      21
         -10.       809.1     0.        808.9     10.       808.9      22
         22.        811.7     35.       811.1     85.       811.6      23
         135.       812.2     185.      812.      235.      812.6      24
         260.       813.4     285.      815.5     295.      817.8      25
         310.       821.8     310.1     828.                           26
ENDTABLE                                                               27
REACH    52.5       1.        195.      195.                            28
SEGMENT  52.5       1         N         -18.                            29
NVALUE   .15                                                           30
SEGMENT  52.5       2         C         25.                             31
NVALUE   .055                                                          32
SEGMENT  52.5       3         N         240.1                           33
NVALUE   .15                                                           34
SECTION  52.5                                                          35
         -250.      836.      -250.     812.3     -200.     813.       36
         -150.      813.2     -100.     812.9     -50.      812.5      37
         -10.       813.      -8.       810.8     -4.       810.5      38
         0.         811.4     4.        810.5     8.        810.5      39
         10.        811.5     15.       812.1     25.       814.8      40
         50.        816.      100.      818.8     150.      821.6      41
         200.       821.8     240.      822.1     240.1     830.       42
ENDTABLE                                                               43
ROAD     53.0       2.7       80.       80.                             44
BRR      53.0       B         3         4                               45
PIER     808.9      2.        810.25    2.                              46
GIRDER   816.5      815.      0.        .7        2.7                   48
```

----------80/80 LIST OF INPUT DATA----------

```
          -17.9     819.     -17.9     816.     17.9      816.      49
          17.9      819.                                           50
ENDTABLE                                                         51
SECTION   53.0                                                     52
          -150.     823.     -150.     817.8    -100.     818.1     53
          -50.      819.4    -17.9     819.     -17.9     810.      54
          -15.      813.     -10.      808.8    -4.       808.6     55
          0.        809.2    5.        809.     10.       809.6     56
          15.       810.9    17.9      811.     17.9      819.      57
          50.       819.4    100.      820.     150.      820.6     58
          200.      821.     250.      821.4    300.      821.8     59
          350.      822.2    350.1     830.                        60
ENDTABLE                                                         61
REACH     53.1+     1.       10.       10.                         62
REACH2    52.5      -1.6                                          63
REACH     53.9+     1.       25.       25.                         64
REACH2    52.5      -.4                                           65
ROAD      54.0      2.7      10.       10.                         66
BPR       54.0      B        2                                     67
GIRDER    815.      814.7    0.        .6       2.7               68
          -8.       816.2    -7.9      813.3    0.        814.7   69
          7.9       813.3    8.        816.2                       70
ENDTABLE                                                         71
SECTION   54.0                                                   72
          -215.     831.     -215.     822.2    -210.     821.4   73
          -200.     820.1    -175.     818.     -150.     816.1   74
          -100.     814.4    -45.      814.     -35.      813.7   75
          -25.      815.4    -12.      816.     -8.       816.2   76
          -7.9      811.2    -4.       810.9    0.        810.8   77
          4.        813.4    7.9       810.6    8.        816.2   78
          12.       816.1    25.       818.2    31.       819.2   79
          31.1      830.                                          80
ENDTABLE                                                         81
REACH     54.1+     1.       50.       50.                         82
REACH2    54.5      -8.2                                          83
REACH     54.5      1.       925.      800.                        84
SEGMENT   54.5      1        N         -6.                         85
NVALUE    .15                                                    86
SEGMENT   54.5      2        C         6.                          87
NVALUE    .055                                                   88
SEGMENT   54.5      3        N         43.1                        89
NVALUE    .15                                                    90
SECTION   54.5                                                   91
          -475.     839.     -475.     831.8    -450.     829.9   92
          -425.     823.8    -400.     828.8    -375.     828.8   93
```

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```
                -350.     824.5     -325.     828.4     -300.     828.2     94
                -275.     828.2     -250.     828.      -225.     828.      95
                -200.     826.6     -175.     822.5     -150.     821.      96
                -125.     821.2     -100.     821.3     -75.      821.6     97
                -50.      820.8     -25.      819.8     -8.       819.6     98
                -6.       819.8     -4.       819.4     0.        819.2     99
                4.        819.      6.        819.6     8.        822.2     100
                12.       823.3     15.       825.4     23.       827.7     101
                28.       823.4     35.       830.3     43.       830.5     102
                43.1      839.                                              103
ENDTABLE                                                                    104
REACH           54.9+     1.        935.      800.                          105
REACH2          54.5      4.7                                               106
ROAD            55.0      2.7       50.       50.                           107
CULV1           55.0      1         32111                                   108
CULV2           9.        14.5      144.7     824.62    824.02    .038      109
SECTION         55.0                                                        110
                -295.     852.      -295.     841.5     -250.     840.1     111
                -200.     838.7     -150.     837.5     -100.     836.7     112
                -50.      836.2     0.        836.1     50.       836.2     113
                100.      836.4     150.      837.4     200.      838.7     114
                250.      841.3     280.      841.6     280.1     852.      115
ENDTABLE                                                                    116
REACH           55.1+     1.        50.       50.                           117
REACH2          55.2      -1.4                                              118
REACH           55.2      1.        145.      145.                          119
SEGMENT         55.2      1         N         -16.                          120
NVALUE          .055                                                        121
SEGMENT         55.2      2         C         16.                           122
NVALUE          .04                                                         123
SEGMENT         55.2      3         N         45.1                          124
NVALUE          .055                                                        125
SECTION         55.2                                                        126
                -40.      851.      -40.      833.1     -37.      833.4     127
                -17.      832.2     -16.      830.2     -12.      829.2     128
                -8.       827.4     -4.       827.      0.        826.3     129
                4.        826.1     8.        826.7     12.       828.9     130
                16.       831.2     22.       834.      40.       835.5     130A
                45.       835.4     45.1      851.                          130B
ENDTABLE                                                                    131
REACH           55.6      1.        300.      220.                          10
SEGMENT         55.6      1         N         -15.                          11
NVALUE          .055                                                        12
SEGMENT         55.6      2         C         15.                           13
NVALUE          .04                                                         14
```

----------80/80 LIST OF INPUT DATA----------

```
SEGMENT   55.6     3        N        45.1                          15
NVALUE    .055                                                     16
SECTION   55.6                                                     17
          -50.     852.     -50.     835.6    -40.     835.4      18
          -15.     832.9    -11.     830.9    -7.      828.8      19
          -4.      827.9    1.       827.6    5.       827.8      20
          10.      828.9    15.      832.9    24.      833.2      21
          36.      837.9    45.      838.3    45.1     852.       21A
ENDTABLE                                                           22
REACH     55.7+    1.       50.      50.                           23
REACH2    56.2     -3.7                                            24
ROAD      55.8     2.7      140.     140.                          25
CULV1     55.8     1        32111                                  26
CULV2     8.1      15.4     40.6     828.29   828.07               27
SECTION   55.8                                                     28
          -300.    857.     -300.    837.1    -250.    837.7      29
          -200.    837.9    -150.    838.2    -100.    838.2      30
          -50.     838.6    0.       838.8    50.      839.3      31
          100.     839.7    150.     840.2    200.     841.4      32
          250.     842.3    250.1    857.                          33
ENDTABLE                                                           34
REACH     55.9+    1.       57.5     57.5                          35
REACH2    56.2     -1.9                                            36
ROAD      56.0     2.7      57.5     57.5                          37
BPR       56.0     A        3                                      38
GIRDER    835.     834.6    0.       .6       2.7                  39
          -6.      836.9    -5.9     834.6    5.9      834.6      40
          6.       836.9                                           41
ENDTABLE                                                           42
SECTION   56.0                                                     43
          -150.    850.     -150.    842.1    -100.    839.3      44
          -50.     837.3    -6.      836.9    -5.9     830.7      45
          -3.      830.1    0.       830.6    3.       830.2      46
          5.9      830.5    6.       836.9    50.      837.1      47
          100.     837.1    150.     837.3    200.     837.6      48
          250.     838.     300.     838.5    350.     839.1      49
          400.     839.9    450.     840.3    500.     840.4      50
          550.     839.3    550.1    850.                          51
ENDTABLE                                                           52
REACH     56.1+    1.       50.      50.                           53
REACH2    56.2     -1.6                                            54
REACH     56.2     1.       140.     140.                          55
SEGMENT   56.2     1        N        -13.                          56
NVALUE    .09                                                      57
SEGMENT   56.2     2        C        13.                           58
```

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```
NVALUE   .045
SEGMENT  56.2      3          N          34.
NVALUE   .09
SECTION  56.2
         -128.1    849.3      -128.      849.       -98.       846.9
          -68.     842.2      -53.       839.3      -38.       836.8
          -13.     835.5      -8.        832.3      -4.        832.1
          0.       832.1      4.         832.       8.         832.2
          13.      836.3      33.        837.4      34.        857.
ENDTABLE
ROAD     56.3      2.7        70.        70.
CULV1    56.3      1          22551
CULV2    4.5       0.         16.6       833.27     833.12
SECTION  56.3
         -60.1     849.       -60.       843.1      -55.       842.7
         -45.      841.8      -35.       841.       -20.       839.9
          0.       833.7      12.        838.3      22.        837.7
          28.      837.9      38.        837.4      48.        836.6
          58.      834.1      68.        829.8      68.1       849.
ENDTABLE
REACH    56.4+     1.         50.        50.
REACH2   56.2      1.3
REACH    +56.45    1.         135.       135.
REACH2   56.2      2.5
ROAD     56.6      2.7        50.        50.
CULV1    56.6      1          22551
CULV2    5.        0.         17.        834.52     834.62
SECTION  56.6
         -65.      856.       -65.       845.9      -55.       845.
         -45.      844.1      -35.       843.5      -25.       842.7
          0.       841.4      12.        840.8      27.        840.2
          37.      843.3      47.        840.2      69.        840.4
          69.1     856.
ENDTABLE
REACH    +56.65    1.         42.        42.
REACH2   56.2      3.3
ROAD     56.7      2.7        43.        43.
BPR      56.7      A          2
GIRDER   841.      840.4      0.         .6         2.7
         -9.       841.5      -8.9       840.4      8.9        840.4
          9.       841.5
ENDTABLE
SECTION  56.7
         -60.      855.       -60.       845.8      -55.       845.2
         -40.      843.7      -25.       842.2      -9.        841.5
```

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```
          -8.9      833.      -6.       836.7     -2.       835.4     104
          2.        835.3     6.        835.8     8.9       836.5     105
          9.        841.5     15.       840.6     25.       840.4     106
          34.       841.4     43.       840.2     55.       840.8     107
          55.1      855.                                              108
ENDTABLE                                                            109
REACH     56.8      1.        50.       50.                           110
SEGMENT   56.8      1         N         -35.                          111
NVALUE    .09                                                       112
SEGMENT   56.8      2         C         13.                           113
NVALUE    .045                                                      114
SEGMENT   56.8      3         N         72.                           115
NVALUE    .11                                                       116
SECTION   56.8                                                      117
          -110.     869.      -110.     849.2     -90.      848.1     118
          -60.      844.4     -50.      842.5     -35.      839.5     119
          -2.       835.5     0.        835.4     2.        835.5     120
          5.        836.      13.       839.5     23.       840.      121
          41.       839.6     71.       841.      72.       861.      122
ENDTABLE                                                            123
REACH     56.9+     1.        140.      140.                          124
REACH2    56.8                                                      125
ROAD      57.0      2.7       50.       50.                           126
BPR       57.0      B         3                                       127
GIRDER    838.7     838.1     0.        .6        2.7               128
          -6.5      840.      -6.4      838.1     6.4       838.1     129
          6.5       841.                                              130
ENDTABLE                                                            131
SECTION   57.0                                                      132
          -227.     855.      -227.     846.      -200.     845.      133
          -150.     843.3     -100.     842.      -50.      840.9     134
          -6.5      841.      -6.4      836.3     -3.5      835.2     135
          0.        835.4     3.5       835.6     6.4       836.      136
          6.5       841.      50.       840.      100.      840.1     137
          150.      841.4     200.      840.4     250.      840.3     138
          250.1     855.                                              139
ENDTABLE                                                            140
REACH     57.1+     1.        50.       50.                           141
REACH2    57.4      -1.4                                            142
REACH     57.4      1.        290.      290.                          143
SEGMENT   57.4      1         N         -12.                          144
NVALUE    .125                                                      145
SEGMENT   57.4      2         C         18.                           146
NVALUE    .06                                                       147
SEGMENT   57.4      3         N         49.                           148
```

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```
NVALUE    .125
SECTION   57.4
          -164.     857.      -164.     849.5     -134.     843.9
          -122.     843.8     -102.     843.1     -72.      840.8
          -42.      839.6     -12.      838.1     -6.       837.6
          0.        837.5     6.        837.5     12.       837.5
          18.       839.2     48.       841.6     49.       861.
ENDTABLE
REACH     +57.69    1.        335.      335.
REACH2    57.4      3.6
ROAD      57.7      2.7       50.       50.
BPR       57.7      B         2         7
PIER      841.      2.
GIRDER    848.8     848.2     0.        .6        2.6
          -8.35     849.      -8.35     848.2     8.35      848.2
          8.35      849.
ENDTABLE
SECTION   57.7
          -165.     871.      -165.     851.8     -153.     851.7
          -133.     851.8     -113.     849.      -88.      848.8
          -63.      844.5     -38.      844.1     -30.      848.7
          -8.35     849.      -8.35     841.      8.35      841.
          8.35      843.      15.       849.4     40.       849.7
          55.       845.4     70.       844.1     85.       843.2
          100.      843.5     101.      860.
ENDTABLE
REACH     +57.75    1.        50.       50.
REACH2    57.4      3.7
REACH     57.8      1.        390.      390.
SEGMENT   57.8      1         N         -16.
NVALUE    .05
SEGMENT   57.8      2         C         16.
NVALUE    .06
SEGMENT   57.8      3         N         91.1
NVALUE    .125
SECTION   57.8
           -283.    862.      -283.     849.6     -250.     849.3
          -200.     848.2     -150.     848.      -100.     848.
          -50.      843.5     -26.      848.6     -16.      847.5
          -0.       843.2     -4.       842.9     0.        842.7
          4.        842.7     8.        843.1     16.       847.9
          26.       853.1     41.       851.9     66.       852.4
          81.       853.5     91.       854.7     91.1      862.
ENDTABLE
ROAD      57.9      2.7       90.       80.
```

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```
CULV1     57.9      1         12333                                          27
CULV2     6.        0.        690.      842.08    840.91                     28
CULV1     57.9      1         12333                                          29
CULV2     6.        0.        690.      841.53    840.91                     30
SECTION   57.9                                                               31
          -560.     873.      -560.     855.3     -550.     855.3            32
          -500.     854.6     -450.     854.1     -400.     853.4            33
          -350.     852.7     -300.     852.1     -250.     851.5            34
          -200.     851.7     -150.     850.8     -100.     850.7            35
          -50.      850.8     0.        851.1     50.       851.5            36
          100.      852.      150.      852.8     200.      853.6            37
          250.      854.9     250.      870.                                 38
ENDTABLE                                                                     39
REACH     58.5+     1.        50.       50.                                  40
REACH2    58.6      -1.5                                                     41
REACH     58.6      1.        70.       70.                                  42
SEGMENT   58.6      1         N         -22.                                 43
NVALUE    .075                                                               44
SEGMENT   58.6      2         C         17.                                  46
NVALUE    .055                                                               47
SEGMENT   58.6      3         N         119.1                                48
NVALUE    .075                                                               49
SECTION   58.6                                                               50
          -50.      851.1     -22.      852.2     -8.       845.4            51
          -4.       844.8     0.        845.1     4.        845.1            52
          7.        845.2     12.       847.8     17.       850.1            53
          26.       851.1     50.       851.      80.       850.8            54
          86.       849.5     119.      850.2     119.1     864.             55
ENDTABLE                                                                     56
REACH     58.9+     1.        50.       50.                                  57
REACH2    58.6                                                               58
ROAD      59.0      2.7       85.       85.                                  59
CULV1     59.0      1         12311                                          60
CULV2     6.5       0.        60.       842.27    842.25                     61
CULV1     59.0      1         12311                                          62
CULV2     6.5       0.        60.       842.27    841.78                     63
SECTION   59.9                                                               64
          -380.     866.      -380.     853.2     -350.     853.             65
          -300.     852.2     -250.     851.5     -200.     850.9            66
          -150.     850.6     -100.     850.4     -50.      850.2            67
          0.        850.1     50.       850.      100.      850.1            68
          150.      850.1     200.      850.2     250.      850.1            69
          268.      853.      290.      852.2     300.      852.             70
          350.      852.8     400.      853.2     405.      855.2            71
          405.1     866.                                                     72
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----------80/80 LIST OF INPUT DATA----------

```
ENDTABLE                                                                  73
REACH     59.1+     1.        50.       50.                               74
REACH2    59.5                                                            75
REACH     59.5      1.        55.       55.                               76
SEGMENT   59.5      1         N         -10.                              77
NVALUE    .08                                                             78
SEGMENT   59.5      2         C         20.                               79
NVALUE    .055                                                            80
SEGMENT   59.5      3         N         190.1                             81
NVALUE    .08                                                             82
SECTION   59.5                                                            83
          -231.     865.      -231.     852.8     -201.     852.1         84
          -151.     849.6     -101.     849.6     -76.      849.3         85
          -26.      849.      -10.      848.2     -5.       846.5         86
          -2.5      845.8     0.        845.3     2.5       845.3         87
          5.        846.5     20.       853.6     40.       855.4         88
          65.       856.4     90.       858.      115.      858.6         89
          165.      858.9     190.      859.5     190.1     865.          90
ENDTABLE                                                                  91
REACH     59.9+     1.        255.      230.                              92
REACH2    59.5      1.                                                    93
ROAD      60.0      2.7       50.       50.                               94
BPR       60.0      B         3                                           95
GIRDER    850.5     850.      0.        .6        2.7                     96
          -6.95     852.7     -6.95     846.9     -5.95     846.9         97
          -5.95     849.1     -4.95     850.      4.95      850.          98
          5.95      849.      5.95      846.8     6.95      846.8         99
          6.95      852.7                                                 100
ENDTABLE                                                                  101
SECTION   60.0                                                            102
          -500.1    865.      -500.     855.4     -400.     854.9         103
          -300.     854.2     -200.     853.6     -112.     853.2         104
          -100.     853.1     -6.95     852.7     -6.95     846.9         105
          -3.       846.3     0.        846.8     3.        846.7         106
          6.95      846.8     6.95      852.7     100.      852.3         107
          200.      851.9     300.      851.6     400.      851.4         108
          500.      851.5     600.      851.7     600.1     866.          109
ENDTABLE                                                                  110
REACH     +60.05    1.        50.       50.                               111
REACH2    60.2      6.3                                                   112
REACH     60.1      1.        210.      180.                              113
SEGMENT   60.1      1         N         -8.75                             114
NVALUE    .07                                                             115
SEGMENT   60.1      2         C         8.75                              116
NVALUE    .05                                                             117
```

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-----------------------------80/80 LIST OF INPUT DATA-----------------------------
SEGMENT   60.1     3        N        289.1                                  118
NVALUE    .065                                                              119
SECTION   60.1                                                              120
          -260.    868.     -205.    864.     -155.    860.                 121
          -80.     856.     -8.75    851.2    -3.75    851.2                122
          0.       843.2    3.75     851.2    8.75     851.2                123
          23.      852.     289.     852.5    289.1    868.                 124
ENDTABLE                                                                    125
REACH     +60.15   1.       50.      50.                                    126
REACH2    60.2     6.6                                                      127
REACH     60.2     1.       315.     315.                                   128
SEGMENT   60.2     1        N        -32.                                   129
NVALUE    .07                                                               130
SEGMENT   60.2     2        C        35.                                    131
NVALUE    .05                                                               132
SEGMENT   60.2     3        N        79.1                                   133
NVALUE    .065                                                              134
SECTION   60.2                                                              135
          -73.     872.     -72.     852.3    -47.     851.6                136
          -32.     853.6    -30.     841.4    -25.     845.7                137
          -20.     842.4    -10.     840.5    0.       841.2                138
          10.      842.4    20.      844.1    25.      847.4                139
          30.      843.6    35.      852.7    57.      852.2                140
          79.      852.2    79.1     860.                                   141
ENDTABLE                                                                    142
REACH     +60.25   1.       210.     180.                                   143
REACH2    60.2     1.8                                                      144
ROAD      60.3     2.7      50.      50.                                    145
CULV1     60.3     1        12311                                           146
CULV2     3.6      0.       22.5     845.74   846.77                         147
CULV1     60.3     1        12311                                           148
CULV2     3.6      0.       22.5     845.6    846.82                         149
SECTION   60.3                                                              150
          -275.    866.     -275.    855.7    -200.    854.8                151
          -150.    853.7    -100.    852.4    -50.     851.1                152
          0.       851.5    25.      851.9    50.      852.4                153
          75.      852.9    90.      853.4    90.1     866.                 154
ENDTABLE                                                                    155
REACH     +60.35   1.       50.      50.                                    156
REACH2    60.4     -.7                                                      157
REACH     60.4     1.       420.     410.                                   158
SEGMENT   60.4     1        N        -19.                                   159
NVALUE    .17                                                               160
SEGMENT   60.4     2        C        16.                                    161
NVALUE    .08                                                               162
```

----------80/80 LIST OF INPUT DATA----------

SEGMENT	60.4	3	N	316.			163
NVALUE	.17						164
SECTION	60.4						165
	-430.	870.	-430.	852.2	-380.	852.5	1654
	-330.	852.4	-285.	851.4	-278.	848.5	165K
	-271.	849.2	-231.	849.	-191.	849.6	166
	-175.	848.5	-159.	849.8	-133.	850.4	167
	-109.	849.9	-67.	849.6	-19.	849.7	168
	-14.	849.1	-7.	848.	0.	847.	169
	7.	847.8	14.	849.5	16.	850.3	170
	49.	851.9	75.	850.4	125.	851.	171
	175.	852.4	225.	852.7	265.	853.4	172
	315.	854.2	316.	870.			173
ENDTABLE							174
REACH	60.5	1.	960.	840.			175
SEGMENT	60.5	1	N	-10.			176
NVALUE	.11						177
SEGMENT	60.5	2	C	22.			178
NVALUE	.07						179
SEGMENT	60.5	3	N	287.			180
NVALUE	.08						181
SECTION	60.5						182
	-201.	870.	-201.	853.1	-175.	852.9	183
	-151.	852.7	-141.	850.1	-100.	850.	184
	-60.	850.4	-10.	850.4	-10.	850.2	185
	-5.	848.8	0.	848.3	5.	848.8	186
	10.	849.7	22.	851.	30.	853.7	187
	36.	853.	41.	850.9	91.	850.1	188
	116.	853.6	136.	852.7	186.	853.9	189
	236.	854.1	286.	856.1	287.	875.	190
ENDTABLE							191
REACH	60.6	1.	3480.	2980.			192
SEGMENT	60.6	1	N	-8.			193
NVALUE	.17						194
SEGMENT	60.6	2	C	8.			195
NVALUE	.08						196
SEGMENT	60.6	3	N	468.1			197
NVALUE	.17						198
SECTION	60.6						199
	-164.	871.	-164.	865.1	-134.	862.7	200
	-114.	862.4	-78.	861.6	-67.	856.2	201
	-37.	855.3	-20.	854.5	-12.	854.1	202
	-8.	853.	-4.	851.9	0.	852.1	203
	4.	852.7	8.	853.7	38.	854.	204
	74.	854.	109.	853.8	157.	853.8	205

----------80/80 LIST OF INPUT DATA----------

```
          177.      854.4     197.      856.6     247.      856.8     206
          297.      857.9     347.      859.1     368.      861.      207
          378.      862.4     388.      862.4     413.      861.9     208
          438.      862.6     468.      863.9     468.1     871.      209
ENDTABLE                                                              210
REACH     +60.65    1.        325.      280.                          211
REACH2    60.6      1.5                                               212
ROAD      60.7      2.7       50.       50.                           213
CULV1     60.7      1         32133                                   214
CULV2     3.7       6.        16.5      853.85    853.4               215
SECTION   60.7                                                        216
          -70.      871.      -70.      863.7     -60.      862.2     217
          -50.      861.      -25.      859.8     0.        859.6     218
          25.       859.7     50.       860.2     60.       860.6     219
          60.1      871.                                              220
ENDTABLE                                                              221
REACH     +60.75    1.        50.       50.                           222
REACH2    60.8      1.3                                               223
REACH     60.8      1.        1535.     1030.                         224
SEGMENT   60.8      1         N         -19.                          225
NVALUE    .17                                                         226
SEGMENT   60.8      2         C         20.                           227
NVALUE    .05                                                         228
SEGMENT   60.8      3         N         148.1                         229
NVALUE    .08                                                         230
SECTION   60.8                                                        231
          -134.     873.      -134.     865.8     -129.     863.3     232
          -119.     859.7     -94.      857.8     -69.      857.6     233
          -44.      857.7     -19.      856.4     -15.      855.2     234
          -10.      853.7     -5.       853.7     0.        853.6     235
          5.        853.6     10.       854.5     15.       855.      236
          20.       856.4     30.       857.9     55.       858.1     237
          80.       853.7     105.      860.5     130.      861.5     238
          148.      861.9     148.1     873.                          239
ENDTABLE                                                              240
REACH     60.95     1.        1790.     1500.                         241
SEGMENT   60.95     1         N         -9.                           242
NVALUE    .08                                                         243
SEGMENT   60.95     2         C         9.                            244
NVALUE    .05                                                         245
SEGMENT   60.95     3         N         228.1                         246
NVALUE    .08                                                         247
SECTION   60.95                                                       248
          -43.      876.      -43.      870.      -35.      868.7     249
          -30.      865.5     -20.      863.6     -19.      861.5     250
```

80/80 LIST OF INPUT DATA

```
                -14.    860.4   -9.     857.2   -4.     856.3   251
                0.      856.7   4.      856.8   9.      857.6   252
                11.     858.8   21.     859.8   61.     859.4   253
                85.     853.2   88.     858.1   103.    858.1   254
                153.    861.7   198.    863.2   213.    866.2   255
                228.    867.5   228.1   876.                    256
ENDTABLE                                                        257
REACH           +60.95  1.      65.     65.                     258
REACH2          60.95   .6                                      259
COMPUTE         14.7    55.1+   14.7                            597
```

END OF 80/80 LIST

----------STARTING DATA FROM GIVEN ELEVATION----------

00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: CITY OF KALAMAZOO

3) WATERCOURSE: AXTELL CREEK ~~KALAMAZOO RIVER~~

4) DOCUMENT TYPE: 100-YR ENCROACHED RUN

00BREAK00

```
*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
  ERROR CORR -  01
  MODIFICATION -  50,51,52
*****************************************************

T1 ENCROACHMENT RUN
T2STARTING WATER SURFACE PORTAGE CREEK MEAN WATER SURFACE ELEVATION
T3       AXTELL CREEK KALAMAZOO

J1  ICHECK     INQ       NINV      IDIA      STRT      METRIC    HVINS     Q         WSEL      FQ
       0.        5.        0.        0.  0.000000      0.00       0.0        0.   760.150     0.000

J2  NPROF     IPLOT     PREVS     XSECV     XSECH     FN        ALLDC     IBW       CBNIM     ITRACE
    15.000     0.000    -1.000     0.000     0.000     0.000     0.000     0.000     0.000    15.000
```

```
*PROF 2

CCHV=   0.100 CEHV=   0.300
*SECNO 1.000
 2800 NAT Q1=      55.24  WSEL=     760.15  ENC Q1=      58.43  WSEL=     760.25  RATIO= -0.0576
 NAT Q1=     58.  RATIOS LOB,CH,ROB=  0.0000  1.0000  0.0000  WSEL=     760.25
    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IH2       ICONT     CORAR     TOPWID      ENDST


3470 ENCROACHMENT STATIONS=     1439.0     1528.0  TYPE=      4  TARGET=         0.000

            VALLEY SECT. APPROX. 90 FT. U/S OF CONFLUENCE W/PORTAGE CREEK SECT. 114.

       1.00      3.85    760.15      0.00    760.15    760.56      0.41      0.00      0.00    761.30
      385.        0.     385.        0.        0.       75.        3.        0.        0.     761.30
        0.00      0.00      5.15      0.00      0.080     0.035     0.080     0.000   756.30  1493.06
 0.004357         0.        0.        0.        0         0         0         0.00    31.36   1528.42


FLOW DISTRIBUTION FOR SECNO=      1.00          CWSEL=    760.15

STA=     1493.     1528.
  PER Q=    100.0
  AREA=     74.7
   VEL=      5.2

*SECNO 2.000
 2800 NAT Q1=     122.36  WSEL=     761.14  ENC Q1=     124.85  WSEL=     761.24  RATIO= -0.0204
 NAT Q1=    127.  RATIOS LOB,CH,ROB=  0.0181  0.9817  0.0001  WSEL=     761.24

3470 ENCROACHMENT STATIONS=      607.0      632.0  TYPE=      4  TARGET=         0.018

            VALLEY SECT. APPROX. 30 FT. D/S OF ENCLOSURE 5          SECT. 115.

       2.00      6.69    761.19      0.00    761.14    761.37      0.18      0.79      0.02    759.20
      385.        0.     385.        0.        0.      113.        0.        1.        0.     761.00
        0.03      0.00      3.40      0.00      0.080     0.035     0.080     0.035   754.50   607.00
 0.001101        380.      390.      400.         2         0         0      0.00     25.00    632.00


FLOW DISTRIBUTION FOR SECNO=      2.00          CWSEL=    761.19

STA=      607.      632.
  PER Q=    100.0
  AREA=     113.7
   VEL=      3.4

*SECNO 2.500
    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IH2       ICONT     CORAR     TOPWID      ENDST


3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=        1.0       00.0  TYPE=      1  TARGET=        89.000
```

OVERLAND FLOW, APPROX. 10 FT U/S FROM D/S OF ENCLOSURE

	2.50	0.86	762.86	762.86	762.86	763.30	0.44	0.08	0.08	762.00
1	294.	23.	247.	24.	16.	43.	17.	1.	0.	762.00
2	0.03	1.40	5.75	1.40	0.080	0.020	0.080	0.033	762.00	1.00
3	0.007336	40.	40.	40.	20	17	0	0.00	89.00	90.00

FLOW DISTRIBUTION FOR SECNO= 2.50 CWSEL= 762.86

STA=	1.	20.	70.	90.
PER Q=	7.8	84.1	8.2	
AREA=	16.3	43.0	17.2	
VEL=	1.4	5.8	1.4	

*SECNO 3.000
2800 NAT Q1= 136.05 WSEL= 763.55 ENC Q1= 136.05 WSEL= 763.65 RATIO= 0.0000
NAT Q1= 150. RATIOS LOB,CH,ROB= 0.0545 0.6876 0.2579 WSEL= 763.65

3470 ENCROACHMENT STATIONS= 16.2 155.5 TYPE= 4 TARGET= 0.090

OVERLAND FLOW,APPROX.240FT U/S FROM D/S OF ENCLOSURE

	3.00	1.58	763.58	0.00	763.55	763.64	0.07	0.31	0.04	762.00
	294.	3.	222.	69.	6.	94.	119.	2.	1.	762.00
	0.07	0.47	2.35	0.58	0.080	0.020	0.080	0.029	762.00	16.24
	0.000548	230.	230.	230.	2	0	0	0.00	139.22	155.46

FLOW DISTRIBUTION FOR SECNO= 3.00 CWSEL= 763.58

STA=	10.	20.	80.	155.
PER Q=	0.9	75.6	23.5	
AREA=	5.9	94.4	118.8	
VEL=	0.5	2.4	0.6	

*SECNO 4.000
2300 NAT Q1= 53.85 WSEL= 763.87 ENC Q1= 53.85 WSEL= 763.97 RATIO= 0.0000
NAT Q1= 65. RATIOS LOB,CH,ROB= 0.0166 0.4438 0.5396 WSEL= 763.97

	SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
	Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
	TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
	SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IN2	ICONT	CORAR	TOPWID	ENDST

3470 ENCROACHMENT STATIONS= 10.0 187.5 TYPE= 4 TARGET= 0.167

OVERLAND FLOW,APPROX.590FT U/S FROM D/S OF ENCLOSURE

	4.00	1.54	763.54	0.00	763.07	764.04	0.11	0.51	0.51	763.20
	294.	0.	155.	139.	0.	44.	124.	3.	2.	763.20
	0.11	0.00	3.51	1.12	0.080	0.020	0.080	0.026	762.40	10.00
	0.003419	360.	350.	340.	2	0	0	0.00	177.49	187.49

FLOW DISTRIBUTION FOR SECNO= 4.00 CWSEL= 763.94

STA=	10.	70.	187.
PER Q=	52.6	47.4	
AREA=	44.1	124.4	
VEL=	3.5	1.1	

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FORM 3411-GB PRINTED BY ROTARY MANIFOLD FORMS.

```
*SECNO 5.000
 2800 NAT Q1=     167.42  WSEL=     764.20  ENC Q1=     167.42  WSEL=     764.30  RATIO=  0.0000
 NAT Q1=     179.  RATIOS LOB,CH,ROB=  0.0671  0.8611  0.0719  WSEL=     764.30

3470 ENCROACHMENT STATIONS=        6.4       69.7  TYPE=      4  TARGET=        0.065

        OVERLAND FLOW;APPROX.1065FT U/S FROM D/S OF ENCLOSURE

     5.00      2.51    764.31      0.00    764.20    764.39      0.08      0.34      0.00    761.80
     294.       11.      271.       12.       22.      113.       24.        5.        3.    761.80
     0.17      0.51      2.40      0.51     0.080     0.020     0.080     0.024    761.80      6.39
 0.000305      475.      475.      475.         3         0         0      0.00     63.26     69.65

FLOW DISTRIBUTION FOR SECNO=       5.00          CWSEL=     764.31

STA=        6.       15.       60.       70.
  PER Q=       3.7      92.1       4.2
   AREA=      21.6     112.9      24.2
    VEL=       0.5       2.4       0.5

*SECNO 5.010
 2800 NAT Q1=     412.87  WSEL=     764.26  ENC Q1=     412.87  WSEL=     764.36  RATIO=  0.0000
 NAT Q1=     423.  RATIOS LOB,CH,ROB=  0.0682  0.8065  0.1252  WSEL=     764.36

3470 ENCROACHMENT STATIONS=     1110.9     1172.2  TYPE=      4  TARGET=        0.023

        VALLEY SECT.APPROX. 10FT U/S OF ENCLOSURE

     5.01      9.18    764.38      0.00    764.26    764.42      0.04      0.02      0.00    755.20
     385.       22.      318.       45.       49.      184.      114.        6.        4.    755.20
     0.20      0.45      1.73      0.39     0.080     0.035     0.080     0.025    755.20   1110.95
 0.000086      155.      160.      165.         2         0         0      0.00     61.26   1172.21

FLOW DISTRIBUTION FOR SECNO=       5.01          CWSEL=     764.38

STA=     1111.     1112.     1120.     1140.     1146.     1158.     1164.     1172.
  PER Q=       0.1       5.7      82.5       5.2       3.9       1.3       1.4
   AREA=       2.6      46.6     183.6      39.5      39.3      15.5      19.7
    VEL=       0.1       0.5       1.7       0.5       0.4       0.3       0.3

*SECNO 5.020
 2800 NAT Q1=     954.49  WSEL=     764.31  ENC Q1=     954.49  WSEL=     764.41  RATIO=  0.0000
 NAT Q1=     978.  RATIOS LOB,CH,ROB=  0.3769  0.2373  0.3858  WSEL=     764.41

3470 ENCROACHMENT STATIONS=      689.9      880.1  TYPE=      4  TARGET=        0.024
     5.02     11.73    764.43      0.00    764.31    764.43      0.00      0.01      0.00    755.50
     385.      144.       94.      147.      560.      124.      573.       11.        4.    755.50
     0.39      0.26      0.76      0.26     0.020     0.075     0.050     0.026    752.70    689.95
 0.000016      255.      267.      265.         2         0         0      0.00    192.14    [illegible]

FLOW DISTRIBUTION FOR SECNO=       5.02          CWSEL=     764.43

STA=      690.      700.      778.      790.      870.      880.
  PER Q=       1.5      35.9      24.3      36.8       1.5
   AREA=      38.9     520.7     123.6     534.1      35.9
    VEL=       0.2       0.3       0.8       0.3       0.2

CCHV=   0.300 CEHV=   0.500
*SECNO 5.100
 2800 NAT Q1=     954.02  WSEL=     764.31  ENC Q1=     954.02  WSEL=     764.41  RATIO=  0.0000
 NAT Q1=     978.  RATIOS LOB,CH,ROB=  0.3769  0.2373  0.3858  WSEL=     764.41
```

3470 ENCROACHMENT STATIONS= 690.2 879.8 TYPE= 4 TARGET= 0.024

D/S FACE OF ROSE ST. BRIDGE SECT. 119.

5.10	11.73	764.43	0.00	764.31	764.43	0.00	0.00	0.00	755.50	
385.	144.	94.	147.	559.	124.	572.	12.	5.	755.50	
0.42	0.26	0.76	0.26	0.080	0.035	0.080	0.027	752.70	690.1.	
0.000016	50.	50.	50.	0	0	0	0.00	189.63	879.82	

FLOW DISTRIBUTION FOR SECNO= 5.10 CWSEL= 764.43

STA=	690.	700.	778.	790.	870.	880.
PER Q=	1.5	35.9	24.3	36.8	1.5	
AREA=	38.0	520.8	123.6	534.1	38.0	
VEL=	0.2	0.3	0.8	0.3	0.2	

*SECNO 5.200

2800 NAT Q1= 207.98 WSEL= 764.31 ENC Q1= 207.98 WSEL= 764.41 RATIO= 0.0000
NAT Q1= 219. RATIOS LOB,CH,ROB= 0.3301 0.3324 0.3375 WSEL= 764.41

SECNO	DEPTH	CWSEL	CRIXS	WSELK	EG	HV	EL	QLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

3370 NORMAL BRIDGE,NRD= 8 MIN ELTRD= 762.00 MAX ELLC= 759.50

3470 ENCROACHMENT STATIONS= 693.3 876.7 TYPE= 4 TARGET= 0.052

5.20	11.72	764.42	0.00	764.31	764.44	0.02	0.00	0.01	755.50
385.	123.	135.	126.	204.	93.	208.	12.	5.	755.50
0.42	0.61	1.45	0.61	0.080	0.035	0.080	0.027	752.70	693.28
0.000342	1.	1.	1.	0	0	0	-727.83	183.44	876.72

FLOW DISTRIBUTION FOR SECNO= 5.20 CWSEL= 764.42

STA=	693.	700.	778.	790.	870.	877.
PER Q=	1.6	30.5	35.2	31.2	1.6	
AREA=	14.2	189.3	93.2	194.2	14.2	
VEL=	0.4	0.6	1.5	0.6	0.4	

*SECNO 5.300

2800 NAT Q1= 209.34 WSEL= 764.33 ENC Q1= 209.34 WSEL= 764.43 RATIO= 0.0000
NAT Q1= 222. RATIOS LOB,CH,ROB= 0.3313 0.3300 0.3387 WSEL= 764.43

3370 NORMAL BRIDGE,NRD= 8 MIN ELTRD= 762.00 MAX ELLC= 759.50

3470 ENCROACHMENT STATIONS= 694.2 875.8 TYPE= 4 TARGET= 0.057

5.30	11.74	764.44	0.00	764.33	764.46	0.02	0.02	0.00	755.50
385.	123.	135.	126.	203.	93.	208.	13.	5.	755.50
0.44	0.61	1.45	0.61	0.080	0.035	0.080	0.027	752.70	694.21
0.000340	64.	64.	64.	0	0	0	-724.36	181.58	875.79

FLOW DISTRIBUTION FOR SECNO= 5.30 CWSEL= 764.44

STA=	694.	700.	778.	790.	870.	876.
PER Q=	1.3	30.7	35.2	31.5	1.3	
AREA=	12.6	190.4	93.4	195.3	12.6	

```
    VEL=      0.4      0.6      1.4      0.6      0.4

*SECNO 5.400
 2800 NAT Q1=    959.36  WSEL=    764.34  ENC Q1=    959.36  WSEL=    764.44  RATIO=  0.0000
 NAT Q1=    985.  RATIOS LOB,CH,ROB=  0.3772  0.2366  0.3862  WSEL=    764.44

3470 ENCROACHMENT STATIONS=     690.8     879.2  TYPE=     4  TARGET=      0.026

        U/S FACE OF ROSE ST. BRIDGE                          SECT. 119.   G

     5.40    11.76   764.46     0.00   764.34   764.46     0.00     0.00     0.00   755.50
     385.     144.      94.     147.     559.     124.     572.      13.       5.   755.50
     0.44     0.26     0.76     0.26    0.080    0.035    0.080    0.027   752.70   690.81
 0.000016       1.       1.       1.        1        0        0     0.00   188.37   879.19

FLOW DISTRIBUTION FOR SECNO=      5.40          CWSEL=    764.46

STA=     691.     700.     778.     790.     870.     879.
  PER Q=      1.4     36.0     24.4     36.9      1.4
   AREA=     36.1    522.6    123.9    536.0     36.1
    VEL=      0.2      0.3      0.8      0.3      0.2

*SECNO 5.500
 2800 NAT Q1=    963.19  WSEL=    764.34  ENC Q1=    963.19  WSEL=    764.44  RATIO=  0.0000
 NAT Q1=    986.  RATIOS LOB,CH,ROB=  0.3772  0.2366  0.3862  WSEL=    764.44

3470 ENCROACHMENT STATIONS=     689.4     880.6  TYPE=     4  TARGET=      0.023
     5.50    11.76   764.46     0.00   764.34   764.46     0.00     0.00     0.00   755.50
     385.     144.      93.     148.     564.     124.     578.      14.       5.   755.50
     0.48     0.26     0.75     0.26    0.080    0.035    0.080    0.027   752.70   689.38
 0.000016      50.      50.      50.        0        0        0     0.00   191.23   880.62

FLOW DISTRIBUTION FOR SECNO=      5.50          CWSEL=    764.46

STA=     689.     700.     778.     790.     870.     881.
  PER Q=      1.6     35.8     24.2     36.7      1.6
   AREA=     41.0    523.3    124.0    536.7     41.0
    VEL=      0.2      0.3      0.8      0.3      0.2

CCHV=   0.100 CEHV=   0.300
*SECNO 5.600
 2800 NAT Q1=    475.68  WSEL=    764.34  ENC Q1=    475.68  WSEL=    764.44  RATIO=  0.0000
 NAT Q1=    492.  RATIOS LOB,CH,ROB=  0.3341  0.3307  0.3352  WSEL=    764.44

3470 ENCROACHMENT STATIONS=     757.7     903.3  TYPE=     4  TARGET=      0.033
     5.60     8.06   764.46     0.00   764.34   764.47     0.01     0.01     0.00   757.20
     385.     126.     132.     127.     304.     100.     306.      19.       6.   757.20
     0.[illegible]     0.42     1.32     0.41    0.080    0.035    0.[illegible]    0.[illegible]   756.40   757.[illegible]
 [illegible]      25.     21[illegible].     195.        [illegible]        [illegible]        [illegible]     [illegible]

FLOW DISTRIBUTION FOR SECNO=      5.60          CWSEL=    764.46

STA=     7[illegible].     760.     824.     [illegible].     [illegible].     903.
  PER Q=      0.2     32.6     34.2     32.6      0.3
   AREA=      4.9    299.5     99.6    299.5      4.7
    VEL=      0.2      0.4      1.3      0.4      0.2

CCHV=   0.300 CEHV=   0.500
*SECNO 6.100
 2800 NAT Q1=    475.52  WSEL=    764.35  ENC Q1=    475.52  WSEL=    764.45  RATIO=  0.0000
 NAT Q1=    493.  RATIOS LOB,CH,ROB=  0.3342  0.3305  0.3353  WSEL=    764.45
```

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	FLMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

3470 ENCROACHMENT STATIONS= 758.3 902.7 TYPE= 4 TARGET= 0.035

D/S FACE OF STOCKBRIDGE AVE. BRIDGE SECT. 120.

6.10	8.06	764.46	0.00	764.35	764.47	0.01	0.00	0.00	757.20
385.	126.	132.	127.	303.	100.	305.	20.	6.	757.20
0.55	0.42	1.32	0.42	0.080	0.035	0.080	0.028	756.40	758.25
0.000065	50.	50.	50.	0	0	0	0.00	144.46	902.71

FLOW DISTRIBUTION FOR SECNO= 6.10 CWSEL= 764.46

STA=	758.	760.	824.	837.	900.	903.
PER Q=	0.1	32.7	34.2	32.7	0.3	
AREA=	3.7	299.2	99.5	299.2	5.7	
VEL=	0.1	0.4	1.3	0.4	0.2	

*SECNO 6.200

2800 NAT Q1= 153.73 WSEL= 764.34 ENC Q1= 153.73 WSEL= 764.44 RATIO= 0.0000
NAT Q1= 163. RATIOS LOB,CH,ROB= 0.3140 0.3687 0.3173 WSEL= 764.44

3370 NORMAL BRIDGE,NRD= 8 MIN ELTRD= 762.30 MAX ELLC= 761.20

3470 ENCROACHMENT STATIONS= 751.0 910.1 TYPE= 4 TARGET= 0.059

6.20	8.06	764.46	0.00	764.34	764.48	0.02	0.00	0.01	757.20
385.	117.	150.	118.	155.	85.	157.	20.	6.	757.20
0.58	0.75	1.77	0.75	0.080	0.035	0.080	0.028	756.40	750.97
0.000614	1.	1.	1.	0	0	0	-338.56	159.18	910.15

FLOW DISTRIBUTION FOR SECNO= 6.20 CWSEL= 764.46

STA=	751.	760.	824.	837.	900.	910.
PER Q=	2.9	27.4	39.0	27.4	3.3	
AREA=	17.6	137.3	84.8	137.3	19.6	
VEL=	0.6	0.8	1.2	0.8	0.6	

*SECNO 6.300

2800 NAT Q1= 156.28 WSEL= 764.38 ENC Q1= 156.28 WSEL= 764.48 RATIO= 0.0000
NAT Q1= 168. RATIOS LOB,CH,ROB= 0.3168 0.3630 0.3202 WSEL= 764.48

3370 NORMAL BRIDGE,NRD= 8 MIN ELTRD= 762.30 MAX ELLC= 761.20

3470 ENCROACHMENT STATIONS= 752.1 909.0 TYPE= 4 TARGET= 0.068

6.30	8.10	764.50	0.00	764.38	764.52	0.02	0.04	0.00	757.20
385.	117.	150.	118.	155.	85.	157.	21.	6.	757.20
0.60	0.75	1.76	0.75	0.080	0.035	0.080	0.028	756.40	752.14
0.000603	64.	64.	64.	0	0	0	-335.54	156.83	909.97

FLOW DISTRIBUTION FOR SECNO= 6.30 CWSEL= 764.50

STA=	752.	760.	824.	837.	900.	909.
PER Q=	2.6	27.8	38.9	27.8	3.0	
AREA=	15.8	139.2	85.2	139.2	17.9	

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VEL= 0.6 0.8 1.8 0.8 0.6

*SECNO 6.400
2800 NAT Q1= 482.86 WSEL= 764.40 ENC Q1= 482.86 WSEL= 764.50 RATIO= 0.0000
NAT Q1= 501. RATIOS LOB,CH,ROB= 0.3352 0.3285 0.3363 WSEL= 764.50

3470 ENCROACHMENT STATIONS= 758.3 902.7 TYPE= 4 TARGET= 0.036

U/S FACE OF STOCKBRIDGE AVE. CULVERT ON FOREST STREET

	6.40	8.11	764.51	0.00	764.40	764.52	0.01	0.00	0.00	757.20
	385.	127.	131.	127.	305.	100.	308.	21.	6.	757.20
	0.60	0.41	1.31	0.41	0.080	0.035	0.080	0.028	756.40	758.33
0.000064		1.	1.	1.	1	0	0	0.00	144.33	902.66

FLOW DISTRIBUTION FOR SECNO= 6.40 CWSEL= 764.51

STA=	758.	760.	824.	837.	900.	903.
PER Q=	0.1	32.7	34.1	32.7	0.2	
AREA=	3.6	301.9	100.1	301.9	5.7	
VEL=	0.1	0.4	1.3	0.4	0.2	

*SECNO 6.500
2800 NAT Q1= 485.81 WSEL= 764.40 ENC Q1= 485.81 WSEL= 764.50 RATIO= 0.0000
NAT Q1= 502. RATIOS LOB,CH,ROB= 0.3353 0.3283 0.3364 WSEL= 764.50

3470 ENCROACHMENT STATIONS= 756.2 904.9 TYPE= 4 TARGET= 0.032

	6.50	8.12	764.52	0.00	764.40	764.53	0.01	0.00	0.00	757.20
	385.	127.	131.	127.	311.	100.	313.	21.	7.	757.20
	0.62	0.41	1.30	0.41	0.080	0.035	0.080	0.028	756.40	756.16
0.000062		50.	50.	50.	0	0	0	0.00	148.70	904.87

FLOW DISTRIBUTION FOR SECNO= 6.50 CWSEL= 764.52

STA=	756.	760.	824.	837.	900.	905.
PER Q=	0.4	32.6	33.9	32.6	0.5	
AREA=	8.2	302.6	100.2	302.6	10.3	
VEL=	0.2	0.4	1.3	0.4	0.2	

CCHV= 0.100 CEHV= 0.300
*SECNO 6.600
2800 NAT Q1= 312.32 WSEL= 764.44 ENC Q1= 312.32 WSEL= 764.54 RATIO= 0.0000
NAT Q1= 323. RATIOS LOB,CH,ROB= 0.2679 0.4724 0.2597 WSEL= 764.54

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	FLMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

3470 ENCROACHMENT STATIONS= 918.0 1000.2 TYPE= 4 TARGET= 0.033

	6.60	7.85	764.55	0.00	764.44	764.59	0.03	0.05	0.01	757.50
	385.	100.	188.	97.	158.	94.	155.	29.	8.	756.70
	3.74	0.63	2.01	0.62	0.080	0.035	0.080	0.028	756.70	918.01
0.000351		550.	570.	590.	2			0.00	22.23	1000.24

FLOW DISTRIBUTION FOR SECNO= 6.60 CWSEL= 764.55

STA=	918.	920.	952.	964.	990.	1000.
PER Q=	0.3	25.6	48.9	23.2	2.0	
AREA=	4.9	152.7	93.7	132.9	22.3	

```
    VEL=       0.2       0.6       2.0       0.7       0.3

CCHV=   0.300 CEHV=   0.500
*SECNO 7.000
 2800 NAT Q1=     313.02  WSEL=     764.45  ENC Q1=     313.02  WSEL=     764.55  RATIO=  0.0000
 NAT Q1=     324.  RATIOS LOB,CH,ROB=  0.2680  0.4720  0.2600  WSEL=     764.55

3470 ENCROACHMENT STATIONS=      913.0     1000.2  TYPE=      4  TARGET=        0.033

        D/S FACE OF PARK AVE. BRIDGE                                  SECT. 1[illegible]

      7.00      7.86    764.56      0.00    764.45    764.59      0.03      0.01      0.00    757.50
      385.      100.      188.       97.      158.       94.      155.       29.        8.    756.70
      0.75      0.63      2.01      0.62     0.030     0.035     0.030     0.029    756.70    918.03
 0.000151       50.       50.       50.        0         0         0      0.00     82.22   1000.25

FLOW DISTRIBUTION FOR SECNO=       7.00          CWSEL=     764.56

STA=      918.      920.      952.      964.      990.     1000.
  PER Q=       0.3      25.6      46.9      23.2       2.0
   AREA=       4.8     153.0      93.8     133.1      22.3
    VEL=       0.2       0.6       2.0       0.7       0.3

*SECNO 7.100
 2800 NAT Q1=      80.01  WSEL=     764.42  ENC Q1=      80.01  WSEL=     764.52  RATIO=  0.0000
 NAT Q1=      86.  RATIOS LOB,CH,ROB=  0.2570  0.4586  0.2844  WSEL=     764.52

3370 NORMAL BRIDGE,NRD= 10 MIN ELTRD=  762.00 MAX ELLC=  761.10

3470 ENCROACHMENT STATIONS=      914.0     1007.2  TYPE=      4  TARGET=        0.067
      7.10      8.64    764.54      0.00    764.42    764.62      0.02      0.00      0.02    756.70
      385.       92.      189.      104.       71.       63.       80.       29.        8.    757.00
      0.75      1.30      2.99      1.30     0.080     0.035     0.080     0.029    755.90    914.04
 0.002297        1.        1.        1.         2         0         0   -127.82     93.19   1007.23

FLOW DISTRIBUTION FOR SECNO=       7.10          CWSEL=     764.54

STA=      914.      920.      950.      951.      952.      964.      966.      967.      990.     1007.
  PER Q=       4.3      19.0       0.1       0.4      49.1       0.4       0.1      14.6      12.0
   AREA=      13.3      54.5       1.1       1.7      63.2       1.7       1.1      42.4      34.6
    VEL=       1.3       1.3       0.4       0.9       3.0       0.9       0.4       1.3       1.3

*SECNO 7.200
 2800 NAT Q1=      91.34  WSEL=     764.62  ENC Q1=      91.34  WSEL=     764.72  RATIO=  0.0000
 NAT Q1=      98.  RATIOS LOB,CH,ROB=  0.2700  0.4277  0.3024  WSEL=     764.72

3370 NORMAL BRIDGE,NRD= 10 MIN ELTRD=  762.00 MAX ELLC=  761.10

3470 ENCROACHMENT STATIONS=      912.9     1009.6  TYPE=      4  TARGET=        0.064
      7.20      8.83    764.73      0.00    764.62    764.79      0.06      0.17      0.01    756.70
      385.       97.      176.      112.       80.       65.       92.       30.        8.    757.00
      0.76      1.21      2.69      1.21     0.080     0.035     0.080     0.030    755.90    912.90
 0.001762       85.       85.       85.         2         0         0   -127.82     96.65   1009.55

FLOW DISTRIBUTION FOR SECNO=       7.20          CWSEL=     764.73

STA=      913.      920.      950.      951.      952.      964.      966.      967.      990.     1010.
  PER Q=       5.1      19.6       0.1       0.5      45.7       0.5       0.1      15.1      13.3
   AREA=      16.7      60.2       1.3       2.0      65.4       2.0       1.3      47.0      41.9
```

VEL= 1.2 1.3 0.4 0.9 2.7 0.9 0.4 1.2 1.2

*SECNO 7.300
2800 NAT Q1= 275.69 WSEL= 764.62 ENC Q1= 275.69 WSEL= 764.72 RATIO= 0.0000
NAT Q1= 285. RATIOS LOB,CH,ROB= 0.2233 0.6005 0.1761 WSEL= 764.72

3470 ENCROACHMENT STATIONS= 915.8 1005.7 TYPE= 4 TARGET= 0.034

U/S FACE OF PARK AVE. BRIDGE

7.30	8.84	764.74	0.00	764.62	764.80	0.06	0.00	0.00	756.70
385.	82.	240.	64.	134.	99.	120.	30.	8.	757.00
0.76	0.61	2.42	0.53	0.080	0.035	0.080	0.030	755.90	915.84
0.000195	1.	1.	1.	0	0	0	0.00	89.90	1005.74

FLOW DISTRIBUTION FOR SECNO= 7.30 CWSEL= 764.74

STA=	916.	920.	950.	951.	952.	964.	966.	967.	990.	1006.
PER Q=	1.0	16.2	0.6	3.5	52.2	3.1	0.4	9.2	3.3	
AREA=	10.5	104.2	6.2	12.9	99.0	12.1	5.3	67.7	35.2	
VEL=	0.4	0.6	0.4	1.0	2.4	1.0	0.3	0.5	0.4	

*SECNO 8.000
2800 NAT Q1= 497.54 WSEL= 764.68 ENC Q1= 497.54 WSEL= 764.78 RATIO= 0.0000
NAT Q1= 511. RATIOS LOB,CH,ROB= 0.1153 0.7138 0.1709 WSEL= 764.78

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	EL	QLOSS	PCNT ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

3471 ENCROACHMENT STATIONS= 814.4 917.1 TYPE= 4 TARGET= 0.027

VALLEY SECT. APPROX. 65 FT. U/S OF PARK ST. BRIDGE SECT. 122.

8.00	8.30	764.80	0.00	764.68	764.81	0.02	0.01	0.01	758.70
335.	40.	283.	63.	102.	226.	189.	30.	9.	759.20
0.78	0.39	1.25	0.33	0.080	0.035	0.080	0.030	756.50	814.44
0.000059	65.	65.	85.	2	0	0	0.00	102.68	917.12

FLOW DISTRIBUTION FOR SECNO= 8.00 CWSEL= 764.80

STA=	814.	824.	835.	864.	877.	917.
PER Q=	3.2	7.2	73.4	6.6	9.7	
AREA=	40.0	61.6	226.2	62.3	126.2	
VEL=	0.3	0.5	1.2	0.4	0.3	

CCHV= 0.100 CEHV= 0.300

*SECNO 9.00
2800 NAT Q1= 428.57 WSEL= 764.68 ENC Q1= 428.57 WSEL= 764.78 RATIO= 0.0000
NAT Q1= 441. RATIOS LOB,CH,ROB= 0.1095 0.7418 0.1487 WSEL= 764.78

3472 ENCROACHMENT STATIONS= 816.3 899.0 TYPE= 4 TARGET= 0.028

VALLEY SECT. APPROX. 50 FT. U/S OF 60 INCH PIPE

9.00	7.80	764.80	0.00	764.68	764.82	0.02	0.01	0.00	759.20
385.	37.	294.	54.	86.	212.	148.	32.	9.	759.70
0.81	0.43	1.39	0.36	0.080	0.035	0.080	0.030	757.00	816.26
0.000080	50.	135.	100.	0	0	0	0.00	93.63	909.89

FLOW DISTRIBUTION FOR SECNO= 9.00 CWSEL= 764.80

STA=	816.	824.	835.	864.	877.	910.
PER Q=	2.5	7.2	76.4	6.4	7.6	
AREA=	29.9	56.1	211.9	55.9	92.3	
VEL=	0.3	0.5	1.4	0.4	0.3	

CCHV= 0.300 CEHV= 0.500

*SECNO 9.100

2800 NAT Q1= 265.67 WSEL= 764.68 ENC Q1= 265.67 WSEL= 764.78 RATIO= 0.0000

NAT Q1= 274. RATIOS LOB,CH,ROB= 0.3018 0.4659 0.2322 WSEL= 764.78

3470 ENCROACHMENT STATIONS= 661.0 746.5 TYPE= 4 TARGET= 0.032

D/S FACE OF 60 INCH CMPS SECT. 123

9.10	7.80	764.80	0.00	764.68	764.84	0.04	0.01	0.01	757.40	
385.	114.	185.	86.	167.	80.	120.	32.	9.	757.00	
0.32	0.69	2.32	0.73	0.080	0.035	0.080	0.030	757.00	661.0	
0.000207	50.	50.	50.	1	0	0	0.00	85.46	746.49	

FLOW DISTRIBUTION FOR SECNO= 9.10 CWSEL= 764.80

STA=	661.	680.	695.	696.	705.	715.	718.	724.	725.	728.	746.
PER Q=	5.8	10.5	1.0	12.3	43.1	6.3	8.4	1.1	1.8	4.9	
AREA=	48.2	60.0	4.9	54.1	79.8	22.5	37.4	5.1	11.9	43.0	
VEL=	0.5	0.7	0.8	0.9	2.3	1.1	0.9	0.8	0.6	0.4	

*SECNO 9.200

2800 NAT Q1= 95.34 WSEL= 764.69 ENC Q1= 95.34 WSEL= 764.79 RATIO= 0.0000

NAT Q1= 102. RATIOS LOB,CH,ROB= 0.5318 0.1874 0.2808 WSEL= 764.79

3470 NORMAL BRIDGE,NRD= 18 MIN ELTRD= 759.70 MAX ELLC= 760.00

3470 ENCROACHMENT STATIONS= 659.2 748.6 TYPE= 4 TARGET= 0.048

9.20	7.80	764.80	0.00	764.69	764.84	0.04	0.02	0.00	757.40	
385.	206.	77.	102.	133.	37.	79.	32.	9.	757.00	
0.82	1.55	2.07	1.28	0.080	0.035	0.080	0.030	757.00	659.19	
0.001624	1.	1.	1.	0	0	0	-124.48	89.37	748.57	

FLOW DISTRIBUTION FOR SECNO= 9.20 CWSEL= 764.80

STA=	659.	680.	695.	696.	705.	715.	718.	724.	725.	728.	749.
PER Q=	17.4	29.2	1.5	5.3	20.1	1.8	3.3	1.6	4.9	14.8	
AREA=	51.6	60.0	3.4	17.6	37.4	5.8	11.6	3.5	11.8	46.7	
VEL=	1.3	1.9	1.7	1.2	2.1	1.2	1.1	1.	1.0	1.2	

*SECNO 9.300

2800 NAT Q1= 97.05 WSEL= 764.72 ENC Q1= 97.05 WSEL= 764.82 RATIO= 0.0000

NAT Q1= 104. RATIOS LOB,CH,ROB= 0.5314 0.1865 0.2821 WSEL= 764.82

3370 NORMAL BRIDGE,NRD= 18 MIN ELTRD= 759.70 MAX ELLC= 760.00

3470 ENCROACHMENT STATIONS= 658.9 749.0 TYPE= 4 TARGET= 0.067

9.30	7.83	764.83	0.00	764.72	764.87	0.04	0.02	0.00	757.40	
385.	205.	77.	103.	134.	38.	81.	32.	9.	757.00	
0.82	1.53	2.04	1.27	0.080	0.035	0.080	0.030	757.00	658.86	
0.001564	15.	15.	15.	0	0	0	-124.48	90.10	748.96	

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FLOW DISTRIBUTION FOR SECNO= 9.30 CWSEL= 764.83

STA=	659.	680.	695.	696.	705.	715.	718.	724.	725.	728.	749.
PER Q=	17.5	29.0	1.5	5.3	20.0	1.8	3.4	1.6	4.9	15.0	
AREA=	52.8	60.4	3.5	17.8	37.7	5.9	11.7	3.6	11.9	47.9	
VEL=	1.3	1.9	1.7	1.1	2.0	1.2	1.1	1.7	1.6	1.2	

*SECNO 9.400
2800 NAT Q1= 268.82 WSEL= 764.71 ENC Q1= 268.82 WSEL= 764.81 RATIO= 0.0000
NAT Q1= 278. RATIOS LOB,CH,ROB= 0.3030 0.4639 0.2331 WSEL= 764.81

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SST
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IN2	ICONT	CORAR	TOPWID	END T

3470 ENCROACHMENT STATIONS= 660.7 746.9 TYPE= 4 TARGET= 0.032

D/S FACE 60 INCH CMPS

9.40	7.83	764.83	0.00	764.71	764.87	0.04	0.00	0.00	757.40
385.	114.	184.	86.	169.	80.	122.	32.	9.	757.00
0.82	0.68	2.30	0.71	0.080	0.035	0.080	0.030	757.00	660.71
0.000203	1.	1.	1.	0		0	0.30	86.17	746.8

FLOW DISTRIBUTION FOR SECNO= 9.40 CWSEL= 764.83

STA=	661.	680.	695.	696.	705.	715.	718.	724.	725.	728.	747.
PER Q=	5.9	10.5	1.0	12.3	47.9	6.2	8.4	1.0	1.8	5.0	
AREA=	45.3	60.4	4.9	54.4	80.1	22.7	37.0	5.1	11.9	44.2	
VEL=	0.5	0.7	0.6	0.9	2.3	1.0	0.9	0.8	0.6	0.4	

*SECNO 9.500
2800 NAT Q1= 269.17 WSEL= 764.72 ENC Q1= 269.17 WSEL= 764.82 RATIO= 0.0000
NAT Q1= 279. RATIOS LOB,CH,ROB= 0.3034 0.4633 0.2333 WSEL= 764.82

3470 ENCROACHMENT STATIONS= 661.2 746.4 TYPE= 4 TARGET= 0.034

9.50	7.84	764.84	0.00	764.72	764.88	0.04	0.01	0.00	757.40
385.	114.	185.	86.	168.	80.	121.	33.	9.	757.00
0.83	0.68	2.30	0.71	0.080	0.035	0.080	0.030	757.00	661.15
0.000203	50.	50.	50.	0		1	0.3	85.24	746.59

FLOW DISTRIBUTION FOR SECNO= 9.50 CWSEL= 764.84

STA=	661.	680.	695.	696.	705.	715.	718.	724.	725.	728.	746.
PER Q=	5.9	10.5	1.0	12.3	47.9	6.2	8.4	1.0	1.8	5.0	
AREA=	45.3	60.4	4.9	54.4	80.1	22.7	37.0	5.1	11.9	44.2	
VEL=	0.5	0.7	0.6	0.9	2.3	1.0	0.9	0.8	0.6	0.4	

CCHV= 0.100 CEHV= 0.300
*SECNO 10.000
2800 NAT Q1= 324.98 WSEL= 764.77 ENC Q1= 324.98 WSEL= 764.87 RATIO= 0.00
NAT Q1= 344. RATIOS LOB,CH,ROB= 0.3255 0.3421 0.3324 WSEL= 764.87

3470 ENCROACHMENT STATIONS= 539.9 681.3 TYPE= 4 TARGET= 0.028

VALLEY SECT. APPROX.10FT D/S OF ENCLOSURE

10.00	6.18	764.88	0.00	764.77	764.89	0.01	0.01	0.00	758.70
385.	145.	114.	125.	365.	124.	37.	34.	9.	758.70

0.87	0.40	0.92	0.37	0.080	0.035	0.080	0.030	758.70	539.95
0.000042	80.	80.	80.	2	0	0	0.00	141.34	691.29

FLOW DISTRIBUTION FOR SECNO= 10.00 CWSEL= 764.88

STA=	540.	544.	568.	600.	620.	680.	681.
PER Q=	3.1	15.2	30.3	29.7	33.4	0.3	
AREA=	22.2	146.0	196.3	123.7	332.1	5.3	
VEL=	0.4	0.4	0.4	0.5	0.4	0.1	

*SECNO 10.100

2800 NAT Q1= 25.75 WSEL= 764.74 ENC Q1= 25.75 WSEL= 764.84 RATIO= 0.0000

NAT Q1= 30. RATIOS LOB,CH,ROB= 0.2599 0.4016 0.3385 WSEL= 764.84

'47' ENCROACHMENT STATIONS= 582.8 650.4 TYPE= 4 TARGET= 0.131

OVERLAND FLOW 10 FT U/S OF ENCLOSURE

10.10	1.65	764.85	0.00	764.74	764.91	0.17	0.05	0.02	763.20
215.	48.	99.	68.	26.	46.	31.	24.	0.	763.20
0.87	1.83	2.15	1.77	0.080	0.080	0.030	0.030	763.20	582.79
0.006872	20.	20.	20.	2	0	0	0.00	77.05	659.83

FLOW DISTRIBUTION FOR SECNO= 10.10 CWSEL= 764.85

STA=	583.	602.	630.	640.
PER Q=	22.5	46.1	31.4	
AREA=	26.4	46.1	38.0	
VEL=	1.8	2.1	1.8	

*SECNO 10.200

2400 NAT Q1= 18.91 WSEL= 765.28 ENC Q1= 18.91 WSEL= 765.38 RATIO= 0.0000

NAT Q1= 22. RATIOS LOB,CH,ROB= 0.2079 0.5737 0.2183 WSEL= 765.38

3470 ENCROACHMENT STATIONS= 587.3 653.7 TYPE= 4 TARGET= 0.148

10.20	1.38	765.38	0.00	765.28	765.47	0.19	0.55	0.01	764.00
215.	34.	144.	37.	15.	55.	16.	34.	9.	764.00
0.88	2.26	2.63	2.26	0.080	0.080	0.030	0.031	764.00	573.34
0.013061	60.	60.	60.	2	0	0	0.00	66.38	653.72

FLOW DISTRIBUTION FOR SECNO= 10.20 CWSEL= 765.28

STA=	587.	600.	640.	654.
PER Q=	15.8	67.2	17.0	
AREA=	15.0	55.0	16.2	
VEL=	2.3	2.6	2.3	

*SECNO 10.300

2400 NAT Q1= 18.71 WSEL= 766.15 ENC Q1= 18.71 WSEL= 766.25 RATIO= 0.0000

NAT Q1= 20. RATIOS LOB,CH,ROB= 0.2027 0.6105 0.1867 WSEL= 766.25

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	DLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XLOB	XCH	XROB	ATN	ELPIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IHV	ICONT	CORAR	TOPWID	ENDST

3470 ENCROACHMENT STATIONS= 582.8 650.5 TYPE= 4 TARGET= 0.158

10.30	1.25	766.25	0.00	766.15	766.36	0.11	0.88	0.00	765.00
215.	32.	156.	28.	13.	56.	11.	34.	9.	765.00
0.89	2.41	2.77	2.40	0.080	0.080	0.080	0.032	765.00	582.84

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0.016601      60.      60.      60.       2        0        0     0.00    67.64   650.47

FLOW DISTRIBUTION FOR SECNO=      10.30          CWSEL=     766.25

STA=      583.      595.      640.      650.
  PER Q=      14.8      72.4      12.8
   AREA=      13.2      56.1      11.5
    VEL=       2.4       2.8       2.4

*SECNO 10.400
 2800 NAT Q1=      15.58  WSEL=     767.21  ENC Q1=      15.58  WSEL=     767.31  RATIO=  0.0000
 NAT Q1=      19.  RATIOS LOB,CH,ROB=  0.2063  0.6471  0.1466  WSEL=     767.31

3470 ENCROACHMENT STATIONS=      576.3      651.2  TYPE=      4  TARGET=      0.175
    10.40      1.11    767.31      0.00    767.21    767.42      0.11      1.07      0.00    766.20
     215.       31.      169.       15.       13.       61.        6.       34.       10.    766.20
     0.89      2.43      2.76      2.37     0.080     0.080     0.080     0.033    766.20    576.85
 0.019093       60.       60.       60.         3         0         0      0.00     74.35    651.20

FLOW DISTRIBUTION FOR SECNO=      10.40          CWSEL=     767.31

STA=      577.      590.      645.      651.
  PER Q=      14.6      78.4       7.0
   AREA=      12.9      61.2       6.4
    VEL=       2.4       2.8       2.4

*SECNO 10.500
 2800 NAT Q1=      12.47  WSEL=     768.38  ENC Q1=      12.47  WSEL=     768.48  RATIO=  0.0000
 NAT Q1=      16.  RATIOS LOB,CH,ROB=  0.3532  0.5880  0.0588  WSEL=     768.48

3470 ENCROACHMENT STATIONS=      470.0      558.0  TYPE=      4  TARGET=      0.211

        OVERLAND FLOW AT WESTNEDGE AVENUE

    10.50      0.88    768.48      0.00    768.38    768.61      0.13      1.18      0.00    767.60
     215.       55.      160.        0.       21.       55.        0.       34.       10.    767.60
     0.90      2.70      2.92      0.00     0.080     0.080     0.000     0.037    767.60    469.9[illegible]
 0.029983       50.       50.       50.         3         0         0      0.00     88.02    553.00

FLOW DISTRIBUTION FOR SECNO=      10.50          CWSEL=     768.48

STA=      470.      496.      558.
  PER Q=      25.7      74.3
   AREA=      20.5      54.6
    VEL=       2.7       2.9

*SECNO 11.000

3470 ENCROACHMENT STATIONS=      740.[illegible]      830.0  TYPE=      1  TARGET=      [illegible]

        VALLEY SECT. APPROX. 10 FT U/S OF ENCLOSURE

                                                  768.92
    11.00      [illegible]    768.60      0.00    768.46    768.6[illegible]      0.0      0.01      0.01    759.0[illegible]
     335.       24.      310.       51.       64.      211.      16[illegible].      [illegible].      10.    75[illegible]
     0.91      0.37      1.47      0.30     0.080     0.035     0.0[illegible]      0.[illegible]    750.00    740.00
 0.000059       70.       70.       70.         2         0         0      0.00     90.00    830.00

FLOW DISTRIBUTION FOR SECNO=      11.00          CWSEL=     768.60

STA=      740.      750.      772.      778.      830.
```

PER Q=	6.2	80.6	4.7	8.4
AREA=	64.4	211.3	42.0	127.0
VEL=	0.4	1.5	0.4	0.3

*SECNO 12.000
2800 NAT Q1= 597.33 WSEL= 768.52 ENC Q1= 597.33 WSEL= 768.62 RATIO= 0.0000
NAT Q1= 616. RATIOS LOB,CH,ROB= 0.4594 0.2468 0.2938 WSEL= 768.62

3470 ENCROACHMENT STATIONS= 528.8 703.9 TYPE= 4 TARGET= 0.030

VALLEY SECT. 50 FT. D/S OF 5X7 FT CMP CULVERT SECT. 127

12.00	10.46	768.66	0.00	768.52	768.67	0.01	0.04	0.00	758.20
385.	177.	98.	111.	486.	75.	348.	46.	12.	758.20
1.26	0.36	1.30	0.32	0.080	0.035	0.080	0.034	758.20	528.37
0.000041	750.	725.	700.	2	0	0	0.00	175.04	703.82

FLOW DISTRIBUTION FOR SECNO= 12.00 CWSEL= 768.66

STA=	529.	558.	607.	616.	624.	634.	692.	704.
PER Q=	11.5	20.1	8.3	25.4	8.3	18.3	1.9	
AREA=	140.9	269.6	75.8	75.3	75.8	237.5	34.2	
VEL=	0.3	0.4	0.4	1.3	0.4	0.3	0.2	

CCHV= 0.300 CFHV= 0.500
*SECNO 12.100
2800 NAT Q1= 597.78 WSEL= 768.53 ENC Q1= 597.78 WSEL= 768.63 RATIO= 0.0000
NAT Q1= 616. RATIOS LOB,CH,ROB= 0.4594 0.2468 0.2938 WSEL= 768.63

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELTRD	SSTA
SLOPE	XLOBL	YLCH	XLOBR	ITRIAL	IB2	ICONT	CORAR	TOPWID	ESTA

3470 ENCROACHMENT STATIONS= 528.8 703.9 TYPE= 4 TARGET= 0.030

D/S FACE OF 5X7 FT. CMP CULVERT

12.10	10.46	768.66	0.00	768.53	768.67	0.01	0.00	0.00	758.20
385.	177.	98.	111.	487.	75.	348.	47.	12.	758.20
1.28	0.36	1.30	0.32	0.080	0.035	0.080	0.034	758.20	528.80
0.000041	50.	50.	50.	0	0	0	0.00	175.13	703.93

FLOW DISTRIBUTION FOR SECNO= 12.10 CWSEL= 768.66

STA=	529.	558.	607.	616.	624.	634.	692.	704.
PER Q=	11.5	26.1	8.3	25.4	8.3	18.3	1.9	
AREA=	141.1	269.7	75.6	75.	75.	237.	34.	
VEL=	0.3	0.4	0.4	1.	1.4	0.	0.	

*SECNO 12.200
2800 NAT Q1= 440.94 WSEL= 768.53 ENC Q1= 440.94 WSEL= 768.63 RATIO= 0.0000
NAT Q1= 455. RATIOS LOB,CH,ROB= 0.5592 0.1143 0.3265 WSEL= 768.63

3370 NORMAL BRIDGE,NRD= 11 MIN ELTRD= 763.80 MAX ELLC= 762.50

3470 ENCROACHMENT STATIONS= 528.4 704.6 TYPE= 4 TARGET= 0.039

12.20	10.47	768.67	0.00	768.53	768.67	0.00	0.00	0.00	758.20
385.	216.	42.	127.	459.	58.	321.	47.	12.	758.20
1.28	0.47	0.72	0.40	0.080	0.035	0.080	0.034	758.20	528.43

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0.000075 1. 1. 1. 0 0 0 -74.55 176.16 704.58

FLOW DISTRIBUTION FOR SECNO= 12.20 CWSEL= 768.67

STA=	528.	558.	607.	616.	624.	634.	692.	705.
PER Q=	15.7	35.4	5.1	10.8	5.1	25.3	2.7	
AREA=	142.3	268.7	47.1	58.2	47.1	237.6	36.0	
VEL=	0.4	0.5	0.4	0.7	0.4	0.4	0.3	

*SECNO 12.300
2800 NAT Q1= 442.36 WSEL= 768.53 ENC Q1= 442.36 WSEL= 768.64 RATIO= 0.0000
NAT Q1= 459. RATIOS LOB,CH,ROB= 0.5592 0.1043 0.3366 WSEL= 768.64

3320 NORMAL BRIDGE,NPS= 11 MIN ELTRD= 763.80 MAX ELLC= 762.50

3470 ENCROACHMENT STATIONS= 528.1 705.2 TYPE= 4 TARGET= 0.037

12.30	10.47	768.67	0.00	768.53	768.67	0.00	0.00	0.00	758.20	
385.	216.	42.	127.	461.	58.	325.	48.	12.	758.20	
1.51	0.47	0.71	0.39	0.080	0.035	0.080	0.034	758.20	528.67	
0.000074	40.	40.	40.	0	0	0	-74.55	177.15	704.21	

FLOW DISTRIBUTION FOR SECNO= 12.30 CWSEL= 768.67

STA=	528.	558.	607.	616.	624.	634.	692.	705.
PER Q=	15.8	35.3	5.1	10.8	5.1	25.2	2.6	
AREA=	143.8	270.2	47.2	58.3	47.2	238.1	37.7	
VEL=	0.4	0.5	0.4	0.7	0.4	0.4	0.3	

*SECNO 12.400
2800 NAT Q1= 599.37 WSEL= 768.53 ENC Q1= 599.37 WSEL= 768.63 RATIO= 0.0000
NAT Q1= 618. RATIOS LOB,CH,ROB= 0.4594 0.2465 0.2940 WSEL= 768.63

3470 ENCROACHMENT STATIONS= 528.7 704.2 TYPE= 4 TARGET= 0.030

U/S FACE OF 5X7 FT. CULVERT

12.40	10.47	768.67	0.00	768.53	768.68	0.01	0.00	0.00	758.20
385.	177.	97.	111.	488.	75.	349.	48.	12.	758.20
1.31	0.36	1.29	0.32	0.080	0.035	0.080	0.034	758.20	528.66
0.000040	1.	1.	1.	0	0	0	0.00	175.52	704.18

FLOW DISTRIBUTION FOR SECNO= 12.40 CWSEL= 768.67

STA=	529.	558.	607.	616.	624.	634.	692.	704.
PER Q=	11.5	26.1	8.3	25.3	8.3	18.6	1.9	
AREA=	141.9	270.2	75.9	75.5	75.9	5.1	5.1	
VEL=	0.3	0.4	0.4	1.2	0.4	0.2	0.2	

*SECNO 13.000
2800 NAT Q1= 599.33 WSEL= 768.53 ENC Q1= 599.33 WSEL= 768.63 RATIO= 0.0000
NAT Q1= 618. RATIOS LOB,CH,ROB= 0.4595 0.2465 0.2941 WSEL= 768.63

3470 ENCROACHMENT STATIONS= 528.7 704. TYPE= 4 TARGET= 0.030

VALLEY SECT. APPROX.30 FT. U/S OF 5X7 FT. CULVERT

13.00	10.47	768.67	0.00	768.53	768.68	0.01	0.00	0.00	758.20
385.	177.	98.	111.	488.	75.	349.	49.	12.	758.20
1.32	0.36	1.29	0.32	0.080	0.035	0.080	0.034	758.20	528.75
0.000041	30.	30.	30.	0	0	0	0.00	175.27	704.02

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FLOW DISTRIBUTION FOR SECNO=      13.00          CWSEL=     768.67

STA=      529.      558.      607.      616.      624.      634.      692.      704.
  PER Q=     11.5      26.1       8.3      25.3       8.3      18.6       1.9
   AREA=    141.5     270.1      75.9      75.4      75.9     238.0      34.7
    VEL=      0.3       0.4       0.4       1.3       0.4       0.3       0.2

CCHV=   0.100 CEHV=   0.300
*SECNO 14.000
 2800 NAT Q1=    1184.14  WSEL=     768.55  ENC Q1=    1184.14  WSEL=     768.65  RATIO=  0.0000
 NAT Q1=    1214.  RATIOS LOB,CH,ROB=  0.1104  0.0903  0.7993  WSEL=     768.65
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        QLOSS     BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       VIN       ELMIN     SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IH2       ICONT     CQRAR     TOPWID    ENDST

3470 ENCROACHMENT STATIONS=      619.5      878.9  TYPE=      4  TARGET=      0.025

        VALLEY SECT. APPROX. 30 FT D/S OF HOWARD ST

    14.00     11.98    768.68      0.00    768.55    768.68      0.00      0.01      0.00    759.70
     385.       39.       36.      311.      199.       69.     1486.       59.       14.     759.70
     1.72      0.19      0.51      0.21     0.080     0.035     0.080     0.034    756.70    619.47
 0.000010      280.      340.      365.         0         0         0      0.00    255.47    873.95

FLOW DISTRIBUTION FOR SECNO=      14.00          CWSEL=     768.68

STA=      619.      649.      655.      879.
  PER Q=     10.0       9.2      80.7
   AREA=    199.4      69.3    1486.0
    VEL=      0.2       0.5       0.2

CCHV=   0.300 CEHV=   0.500
1400 NH CARD USED
*SECNO 14.500
 2800 NAT Q1=     788.42  WSEL=     768.55  ENC Q1=     788.42  WSEL=     768.65  RATIO=  0.0000
 NAT Q1=     811.  RATIOS LOB,CH,ROB=  0.1104  0.0557  0.8339  WSEL=     768.65

3470 ENCROACHMENT STATIONS=      493.9      819.9  TYPE=      4  TARGET=      0.028

        D/S FACE OF CULVERT AT HOWARD ST

    14.50     10.38    768.68      0.00    768.55    768.68      0.00      0.00      0.00    759.70
     200.       20.       11.      169.      820.       64.     1061.       60.       14.     759.70
     1.77      0.02       [illegible]      0.16     0.484     [illegible]     [illegible]     [illegible]     [illegible]
 0.000[illegible]       30.       30.       30.         0         [illegible]     [illegible]     [illegible]

FLOW DISTRIBUTION FOR SECNO=      14.50          CWSEL=     768.68

STA=      499.      548.      649.      655.      820.
  PER Q=      9.6       0.4       5.7      84.3
   AREA=    181.0     639.0      63.7    1060.6
    VEL=      0.1       0.0       0.2       0.2

*SECNO 14.600
 2800 NAT Q1=     409.06  WSEL=     768.55  ENC Q1=     409.06  WSEL=     768.65  RATIO=  0.0000
 NAT Q1=     426.  RATIOS LOB,CH,ROB=  0.2059  0.0384  0.7557  WSEL=     768.65
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3370 NORMAL BRIDGE,NRD= 11 MIN ELTRD= 764.30 MAX ELLC= 762.70

3470 ENCROACHMENT STATIONS= 497.3 818.4 TYPE= 4 TARGET= 0.041

14.60	10.38	768.68	0.00	768.55	768.68	0.00	0.00	0.00	759.70	
200.	39.	8.	154.	594.	49.	679.	60.	14.	759.70	
1.78	0.06	0.16	0.23	0.269	0.080	0.080	0.034	758.30	497.31	
0.000023	1.	1.	1.	0	1	0	-22.46	321.04	818.35	

FLOW DISTRIBUTION FOR SECNO= 14.60 CWSEL= 768.68

STA=	497.	548.	649.	655.	818.
PER Q=	18.9	0.4	3.9	76.8	
AREA=	186.9	407.1	48.8	679.1	
VEL=	0.2	0.0	0.2	0.2	

*SECNO 14.700

2800 NAT Q1= 1241.69 WSEL= 768.55 ENC Q1= 1241.69 WSEL= 768.65 RATIO= 0.0000

NAT Q1= 1275. RATIOS LOB,CH,ROB= 0.3834 0.0860 0.5306 WSEL= 768.65

3470 ENCROACHMENT STATIONS= 502.2 816.6 TYPE= 4 TARGET= 0.026

14.70	11.99	768.69	0.00	768.55	768.69	0.00	0.00	0.00	759.70	
200.	76.	18.	106.	808.	69.	1048.	68.	16.	759.70	
2.28	0.09	0.25	0.10	0.080	0.035	0.060	0.034	756.70	502.16	
0.000003	202.	202.	202.	0	0	0	0.00	314.42	816.59	

FLOW DISTRIBUTION FOR SECNO= 14.70 CWSEL= 768.69

STA=	502.	548.	649.	655.	817.
PER Q=	5.7	32.4	8.8	53.1	
AREA=	169.0	639.4	69.3	1047.9	
VEL=	0.1	0.1	0.3	0.1	

*SECNO 14.800

2800 NAT Q1= 1241.20 WSEL= 768.55 ENC Q1= 1241.20 WSEL= 768.65 RATIO= 0.0000

NAT Q1= 1275. RATIOS LOB,CH,ROB= 0.3834 0.0860 0.5306 WSEL= 768.65

3470 ENCROACHMENT STATIONS= 502.3 816.4 TYPE= 4 TARGET= 0.026

U/S FACE OF CULVERT AT HOWARD ST

14.39	11.99	768.69	0.00	768.55	768.69	0.00	0.00	0.00	759.70	
200.	76.	18.	106.	808.	69.	1047.	68.	16.	759.70	
2.28	0.09	0.25	0.10	0.080	0.035	0.060	0.034	756.70	502.31	
0.000003	1.	1.	1.	0	0	0	0.00	314.12	816.43	

FLOW DISTRIBUTION FOR SECNO= 14.80 CWSEL= 768.69

STA=	502.	548.	649.	655.	817.
PER Q=	5.7	32.4	8.8	53.1	
AREA=	168.4	639.3	69.3	1047.2	
VEL=	0.1	0.1	0.3	0.1	

*SECNO 14.900

2800 NAT Q1= 1241.28 WSEL= 768.55 ENC Q1= 1241.28 WSEL= 768.65 RATIO= 0.0000

NAT Q1= 1275. RATIOS LOB,CH,ROB= 0.3834 0.0860 0.5306 WSEL= 768.65

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

3470 ENCROACHMENT STATIONS= 502.3 816.4 TYPE= 4 TARGET= 0.026

VALLEY SECT. 50 FT U/S OF CULVERT AT HOWARD ST

15.00	11.99	768.69	0.00	768.55	768.69	0.00	0.00	0.00	759.70	
200.	76.	13.	106.	808.	69.	1047.	70.	16.	759.70	
2.40	0.09	0.25	0.10	0.080	0.035	0.080	0.034	756.70	502.31	
0.000023	50.	50.	50.	0	0	0	0.00	314.12	816.43	

FLOW DISTRIBUTION FOR SECNO= 15.00 CWSEL= 768.69

STA=	502.	548.	649.	655.	816.
PER Q=	5.7	32.4	8.8	53.1	
AREA=	168.4	639.3	69.3	1047.2	
VEL=	0.1	0.1	0.3	0.1	

CCHV= 0.100 CEHV= 0.300
*SECNO 16.000
2200 NAT Q1= 272.39 WSEL= 768.55 ENC Q1= 272.39 WSEL= 768.65 RATIO= 0.0000
NAT Q1= 286. RATIOS LOB,CH,ROB= 0.2381 0.3734 0.3885 WSEL= 768.65

3470 ENCROACHMENT STATIONS= 651.2 833.9 TYPE= 4 TARGET= 0.047

VALLEY SECT. 50 FT. D/S OF CULVERT AT MAPLE SECT. 131

16.00	9.69	768.69	0.00	768.55	768.69	0.01	0.00	0.00	762.00
200.	45.	78.	77.	153.	81.	308.	86.	19.	764.00
2.70	0.29	0.96	0.25	0.080	0.035	0.080	0.034	759.00	651.24
0.000052	580.	600.	560.	1	0	0	0.00	182.61	833.85

FLOW DISTRIBUTION FOR SECNO= 16.00 CWSEL= 768.69

STA=	651.	670.	691.	692.	700.	710.	730.	796.	830.	834.
PER Q=	4.5	9.5	0.6	8.0	58.9	12.3	16.4	9.8	1.0	
AREA=	42.0	66.0	3.7	41.5	80.9	75.9	144.8	76.3	10.9	
VEL=	0.2	0.3	0.3	0.4	1.0	0.3	0.2	0.2	0.2	

CCHV= 0.300 CEHV= 0.500
*SECNO 16.100
2200 NAT Q1= 406.21 WSEL= 768.56 ENC Q1= 406.21 WSEL= 768.66 RATIO= 0.0000
NAT Q1= 423. RATIOS LOB,CH,ROB= 0.2914 0.2769 0.4317 WSEL= 768.66

3470 ENCROACHMENT STATIONS= 653.8 832.2 TYPE= 4 TARGET= 0.039

D/S FACE OF CULVERT AT MAPLE RD.

16.11	10.19	768.69	0.00	768.56	768.69	0.00	0.00	0.00	758.70
65.	18.	19.	26.	207.	0.	396.	52.	20.	759.0
2.78	0.09	0.31	0.07	0.080	0.035	0.080	0.034	758.50	653.80
0.000003	40.	50.	30.	0	0	0	0.00	178.38	832.18

FLOW DISTRIBUTION FOR SECNO= 16.10 CWSEL= 768.69

STA=	654.	670.	697.	703.	730.	796.	830.	832.
PER Q=	2.7	25.6	28.7	25.7	11.0	5.9	0.3	
AREA=	37.0	169.7	60.0	169.7	144.3	76.1	6.3	
VEL=	0.0	0.1	0.3	0.1	0.0	0.1	0.0	

*SECNO 16.200

```
2800 NAT Q1=     153.34  WSEL=     768.56  ENC Q1=     153.34  WSEL=     768.66  RATIO=  0.0000
NAT Q1=     165.  RATIOS LOB,CH,ROB=  0.2782  0.0716  0.6503  WSEL=     768.66

3370 NORMAL BRIDGE,NRD=  7 MIN ELTRD=  765.70 MAX ELLC=  761.20


3470 ENCROACHMENT STATIONS=      649.3      835.1  TYPE=      4  TARGET=        0.071
    16.20      8.89    768.69      0.00    768.56    768.69      0.00      0.00      0.00    760.40
      65.       17.        5.       43.      121.       23.      314.       87.       20.    760.20
     2.78      0.14      0.21      0.14     0.080     0.035     0.080     0.034    759.80    649.25
 0.000017        1.        1.        1.         0         0         0   -174.14    185.85    835.10


FLOW DISTRIBUTION FOR SECNO=      16.20          CWSEL=     768.69

STA=      649.      670.      697.      703.      730.      796.      830.      835.
  PER Q=       8.7      17.5       7.7      19.1      29.0      15.5       2.5
   AREA=      45.7      75.4      23.4      79.5     144.8      76.3      13.9
    VEL=       0.1       0.2       0.2       0.2       0.1       0.1       0.1

*SECNO 16.300
 2800 NAT Q1=     153.45  WSEL=     768.56  ENC Q1=     153.45  WSEL=     768.66  RATIO=  0.0000
 NAT Q1=     165.  RATIOS LOB,CH,ROB=  0.2782  0.0715  0.6503  WSEL=     768.66

3370 NORMAL BRIDGE,NRD=  7 MIN ELTRD=  765.70 MAX ELLC=  761.20


3470 ENCROACHMENT STATIONS=      649.3      835.1  TYPE=      4  TARGET=        0.071
    16.30      8.90    768.70      0.00    768.56    768.70      0.00      0.00      0.00    760.40
      65.       17.        5.       43.      121.       23.      315.       88.       20.    760.20
     2.92      0.14      0.21      0.14     0.080     0.035     0.080     0.034    759.80    649.26
 0.000017       73.       73.       73.         0         0         0   -174.14    185.83    835.09


FLOW DISTRIBUTION FOR SECNO=      16.30          CWSEL=     768.70

STA=      649.      670.      697.      703.      730.      796.      830.      835.
  PER Q=       8.7      17.5       7.7      19.1      29.0      15.5       2.5
   AREA=      45.8      75.5      23.4      79.5     144.9      76.3      13.9
    VEL=       0.1       0.2       0.2       0.2       0.1       0.1       0.1

*SECNO 16.400
 2800 NAT Q1=     344.63  WSEL=     768.56  ENC Q1=     344.63  WSEL=     768.66  RATIO=  0.0000
 NAT Q1=     359.  RATIOS LOB,CH,ROB=  0.2825  0.2529  0.4646  WSEL=     768.66
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        CLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA      LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN      SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IH2       ICONT     CORAR     TOPWID     ENDST


3470 ENCROACHMENT STATIONS=      652.3      833.2  TYPE=      4  TARGET=        0.41

        U/S FACE OF CULVERT AT MAPLE ST.

    16.40      8.90    768.70      0.00    768.56    768.70      0.00      0.00      0.00    760.40
      65.       19.       17.       30.      187.       52.      384.        .        20.    760.20
     2.92      0.09      0.33      0.08     0.080     0.035     0.080     0.034    759.80    652.26
 0.000003        1.        1.        1.         0         0         0      0.00    180.89    833.15


FLOW DISTRIBUTION FOR SECNO=      16.40          CWSEL=     768.70

STA=      652.      670.      697.      703.      730.      796.      830.      833.
```

PER Q=	3.4	23.9	26.3	25.8	13.0	7.0	0.6
AREA=	40.1	147.0	51.8	153.8	144.9	76.3	8.9
VEL=	0.1	0.1	0.3	0.1	0.1	0.1	0.0

*SECNO 17.000
2800 NAT Q1= 311.48 WSEL= 768.56 ENC Q1= 311.48 WSEL= 768.66 RATIO= 0.0000
NAT Q1= 327. RATIOS LOB,CH,ROB= 0.1130 0.5355 0.3514 WSEL= 768.66

3470 ENCROACHMENT STATIONS= 652.5 833.0 TYPE= 4 TARGET= 0.046

VALLEY SECT. APPROX. 40 FT.D/S OF 36 INCH CONC. CULV.

17.00	7.90	768.70	0.00	768.56	768.70	0.00	0.00	0.00	766.10	
65.	6.	36.	22.	92.	129.	314.	88.	20.	765.60	
2.98	0.07	0.28	0.07	0.080	0.035	0.080	0.034	760.80	652.53	
0.000204	37.	37.	37.	0	0	0	0.00	180.45	832.99	

FLOW DISTRIBUTION FOR SECNO= 17.00 CWSEL= 768.70

STA=	553.	670.	690.	710.	730.	796.	830.	833.
PER Q=	3.7	5.8	55.9	11.8	14.4	7.7	0.7	
AREA=	39.6	51.9	128.7	79.9	144.9	76.3	8.5	
VEL=	0.1	0.1	0.3	0.1	0.1	0.1	0.0	

*SECNO 17.100
2800 NAT Q1= 149.87 WSEL= 768.56 ENC Q1= 149.87 WSEL= 768.66 RATIO= 0.0000
NAT Q1= 160. RATIOS LOB,CH,ROB= 0.3917 0.2262 0.3821 WSEL= 768.66

3470 ENCROACHMENT STATIONS= 647.5 821.8 TYPE= 4 TARGET= 0.063

D/S FACE OF 36 INCH CULVERT

17.10	9.30	768.70	0.00	768.56	768.70	0.00	0.00	0.00	760.90	
65.	25.	15.	25.	149.	27.	207.	88.	20.	760.90	
3.02	0.17	0.58	0.12	0.080	0.035	0.080	0.034	759.40	647.46	
0.000018	36.	36.	36.	0	0	0	0.00	174.38	821.84	

FLOW DISTRIBUTION FOR SECNO= 17.10 CWSEL= 768.70

STA=	647.	670.	690.	697.	699.	702.	710.	730.	796.	822.
PER Q=	9.5	11.9	10.0	7.0	23.8	11.5	4.7	15.7	5.9	
AREA=	49.0	51.0	32.5	15.2	26.7	39.5	29.9	68.7	38.6	
VEL=	0.1	0.1	0.2	0.3	0.6	0.2	0.1	0.1	0.1	

*SECNO 17.200
2800 NAT Q1= 96.35 WSEL= 768.56 ENC Q1= 96.35 WSEL= 768.66 RATIO= 0.0000
NAT Q1= 106. RATIOS LOB,CH,ROB= 0.4316 0.0946 0.4738 WSEL= 768.66

3470 ENCROACHMENT STATIONS= 646.6 822.9 TYPE= 4 TARGET= 0.088

17.20	9.30	768.70	0.00	768.56	768.70	0.00	0.00	0.00	760.90	
65.	27.	7.	31.	128.	17.	190.	88.	20.	760.90	
3.02	0.22	0.39	0.16	0.080	0.035	0.080	0.034	759.40	646.62	
0.000043	1.	1.	1.	0	0	0	-49.61	176.30	822.92	

FLOW DISTRIBUTION FOR SECNO= 17.20 CWSEL= 768.70

STA=	647.	670.	690.	697.	699.	702.	710.	730.	796.	823.
PER Q=	15.0	18.4	6.2	2.7	10.2	6.5	7.3	24.2	9.5	

AREA=	50.4	51.9	18.9	6.6	17.1	21.6	29.9	98.7	40.2
VEL=	0.2	0.2	0.2	0.3	0.4	0.2	0.2	0.2	0.2

*SECNO 17.300

2800 NAT Q1= 96.46 WSEL= 768.56 ENC Q1= 96.46 WSEL= 768.66 RATIO= 0.0000
NAT Q1= 106. RATIOS LOB,CH,ROB= 0.4316 0.0946 0.4739 WSEL= 768.66

3370 NORMAL BRIDGE,NRD= 0 MIN ELTRD= 765.10 MAX ELLC= 762.40

3470 ENCROACHMENT STATIONS= 646.5 823.0 TYPE= 4 TARGET= 0.088

17.30	9.30	768.70	0.00	768.56	768.70	0.00	0.00	0.00	760.90
65.	27.	7.	31.	128.	17.	191.	89.	20.	760.90
3.03	0.21	0.39	0.16	0.080	0.035	0.080	0.034	759.40	646.54
0.000043	11.	11.	11.	0	0	0	-49.61	176.48	823.02

FLOW DISTRIBUTION FOR SECNO= 17.30 CWSEL= 768.70

STA=	647.	670.	690.	697.	699.	702.	710.	730.	796.	823.
PER Q=	15.1	18.3	6.2	2.7	10.2	6.5	7.3	24.2	9.5	
AREA=	50.6	51.9	18.9	6.6	17.1	21.6	29.9	98.7	40.4	
VEL=	0.2	0.2	0.2	0.3	0.4	0.2	-0.2	0.2	0.2	

*SECNO 17.400

2800 NAT Q1= 149.99 WSEL= 768.56 ENC Q1= 149.99 WSEL= 768.66 RATIO= 0.0000
NAT Q1= 160. RATIOS LOB,CH,ROB= 0.3917 0.2261 0.3823 WSEL= 768.66

SECNO	DEPTH	CWSEL	CPIWS	WSELK	EG	HV	EL	FLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	IOPWID	ENDST

3470 ENCROACHMENT STATIONS= 647.4 821.9 TYPE= 4 TARGET= 0.063

U/S FACE OF 36 INCH CULVERT

17.40	9.30	768.70	0.00	768.56	768.70	0.00	0.00	0.00	760.90
65.	25.	15.	25.	149.	27.	207.	89.	20.	760.90
3.03	0.17	0.58	0.12	0.080	0.035	0.080	0.034	759.40	647.44
0.000018	1.	1.	1.	0	0	0	0.00	174.41	821.86

FLOW DISTRIBUTION FOR SECNO= 17.40 CWSEL= 768.70

STA=	647.	670.	690.	697.	699.	702.	710.	730.	796.	822.
PER Q=	9.5	11.9	10.0	7.0	23.8	11.5	4.7	15.7	5.9	
AREA=	49.0	51.9	32.5	15.2	26.7	39.5	29.9	98.8	38.7	
VEL=	0.1	0.1	0.2	0.3	0.4	0.2	0.1	0.1	0.1	

*SECNO 17.40

2800 NAT Q1= 102.48 WSEL= 768.56 ENC Q1= 102.48 WSEL= 768.66 RATIO= 0.0000
NAT Q1= 110. RATIOS LOB,CH,ROB= 0.4761 0.0978 0.4261 WSEL= 768.66

3470 ENCROACHMENT STATIONS= 593.5 707.2 TYPE= 4 TARGET= 0.072

D/S FACE OF 24 INCH CULVERT

18.10	6.20	768.70	0.00	768.56	768.70	0.00	0.00	0.00	763.90
65.	31.	7.	27.	140.	11.	129.	89.	20.	763.90
3.09	0.22	0.61	0.21	0.080	0.035	0.080	0.034	762.50	593.52
0.000038	50.	50.	50.	0	0	0	0.00	113.80	707.32

FLOW DISTRIBUTION FOR SECNO= 18.10 CWSEL= 768.70

STA=	594.	634.	638.	647.	649.	651.	653.	662.	707.
PER Q=	22.3	3.3	16.6	5.3	10.4	5.3	16.4	20.5	
AREA=	81.1	10.0	37.8	10.7	11.2	11.0	37.8	80.5	
VEL=	0.2	0.2	0.3	0.3	0.6	0.3	0.3	0.2	

*SECNO 18.200
2800 NAT Q1= 56.96 WSEL= 768.56 ENC Q1= 50.90 WSEL= 768.66 RATIO= 0.0000
NAT Q1= 57. RATIOS LOB,CH,ROB= 0.5212 0.0163 0.4625 WSEL= 768.66

3370 NORMAL BRIDGE,NRD= 9 MIN ELTRD= 766.20 MAX ELLC= 764.90

3470 ENCROACHMENT STATIONS= 590.9 710.5 TYPE= 4 TARGET= 0.107

18.20	6.20	768.70	0.00	768.56	768.70	0.00	0.00	0.00	763.90	
65.	34.	1.	30.	100.	3.	95.	89.	20.	763.90	
3.09	0.34	0.38	0.32	0.080	0.035	0.080	0.034	762.50	590.88	
0.000152	1.	1.	1.	0	0	0	-90.83	116.61	710.50	

FLOW DISTRIBUTION FOR SECNO= 18.20 CWSEL= 768.70

STA=	591.	634.	638.	647.	651.	662.	710.
PER Q=	46.0	4.4	1.8	1.8	3.5	42.5	
AREA=	85.0	8.0	6.7	3.0	9.9	84.7	
VEL=	0.4	0.4	0.2	0.4	0.2	0.3	

*SECNO 18.300
2800 NAT Q1= 51.60 WSEL= 768.58 ENC Q1= 51.60 WSEL= 768.68 RATIO= 0.0000
NAT Q1= 52. RATIOS LOB,CH,ROB= 0.5208 0.0159 0.4633 WSEL= 768.68

3370 NORMAL BRIDGE,NRD= 9 MIN ELTRD= 766.20 MAX ELLC= 764.90

3470 ENCROACHMENT STATIONS= 591.1 710.3 TYPE= 4 TARGET= 0.114

18.30	6.21	768.71	0.00	768.58	768.72	0.00	0.02	0.00	763.90	
65.	34.	1.	30.	100.	3.	95.	89.	21.	763.90	
3.19	0.34	0.37	0.31	0.080	0.035	0.080	0.034	762.50	591.10	
0.000148	115.	115.	115.	0	0	0	-91.07	119.20	710.30	

FLOW DISTRIBUTION FOR SECNO= 18.30 CWSEL= 768.71

STA=	591.	634.	638.	647.	651.	662.	710.
PER Q=	46.0	4.4	1.9	1.7	3.5	42.5	
AREA=	85.4	8.0	6.8	3.0	10.0	85.2	
VEL=	0.3	0.4	0.2	0.4	0.2	0.3	

*SECNO 18.400
2800 NAT Q1= 113.45 WSEL= 768.58 ENC Q1= 113.95 WSEL= 768.68 RATIO= 0.0000
NAT Q1= 112. RATIOS LOB,CH,ROB= 0.4762 0.0970 0.4268 WSEL= 768.68

3470 ENCROACHMENT STATIONS= 593.1 707.9 TYPE= 4 TARGET= 0.072

U/S FACE OF 24 INCH CULVERT SECT. 132

18.40	6.22	768.72	0.00	768.58	768.72	0.00	0.00	0.00	763.90	
65.	31.	7.	27.	141.	11.	131.	89.	21.	763.90	
3.19	0.22	0.60	0.21	0.080	0.035	0.080	0.034	762.50	593.06	
0.000037	1.	1.	1.	0	0	0	0.00	114.87	707.93	

FLOW DISTRIBUTION FOR SECNO= 18.40 CWSEL= 768.72

STA=	593.	634.	638.	647.	649.	651.	653.	662.	708.
PER Q=	22.4	3.2	16.5	5.3	10.3	5.3	16.3	20.7	
AREA=	82.5	10.1	37.9	10.7	11.2	11.0	37.9	82.1	
VEL=	0.2	0.2	0.3	0.3	0.6	0.3	0.3	0.2	

*SECNO 19.500
2800 NAT Q1= 171.71 WSEL= 768.58 ENC Q1= 171.71 WSEL= 768.68 RATIO= 0.0000
NAT Q1= 132. RATIOS LOB,CH,ROB= 0.1787 0.1279 0.6934 WSEL= 768.68

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV	
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT	
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA	
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IP2	ICONT	CORAR	TOPWID	ENDST	

3470 ENCROACHMENT STATIONS= 598.8 734.2 TYPE= 4 TARGET= 0.056

VALLEY SECTION APPROX. 50 FT. D/S OF 24 INCH CULVERT

18.50	4.42	768.72	0.00	768.58	768.72	0.00	0.00	0.00	764.60
65.	11.	9.	46.	99.	21.	287.	90.	21.	764.30
3.26	0.11	0.41	0.16	0.080	0.035	0.080	0.034	764.30	598.82
0.000014	50.	50.	50.	0	0	0	0.00	135.34	734.16

FLOW DISTRIBUTION FOR SECNO= 18.30 CWSEL= 768.72

STA=	599.	634.	642.	648.	653.	730.	734.
PER Q=	12.1	1.9	2.3	13.5	68.7	1.5	
AREA=	72.5	12.9	13.3	21.2	276.4	10.4	
VEL=	0.1	0.1	0.1	0.4	0.2	0.1	

CCHV= 0.100 CEHV= 0.300
*SECNO 19.000
2800 NAT Q1= 12.35 WSEL= 768.58 ENC Q1= 12.35 WSEL= 768.68 RATIO= 0.0000
NAT Q1= 16. RATIOS LOB,CH,ROB= 0.3611 0.2911 0.3478 WSEL= 768.68

3470 ENCROACHMENT STATIONS= 474.1 575.5 TYPE= 4 TARGET= 0.238

VALLEY SECT. APPROX.350 FT. U/S OF 24 INCH CULVERT SECT. 133

19.00	1.61	768.71	0.00	768.58	768.74	0.03	0.01	0.01	768.00
65.	21.	24.	20.	29.	11.	31.	1.	22.	768.00
3.32	0.71	2.19	0.65	0.080	0.035	0.080	0.04	767.10	474.15
0.002388	230.	280.	300.	2	0	0	0.00	101.36	575.50

FLOW DISTRIBUTION FOR SECNO= 19.[illegible] CWSEL= 768.71

STA=	474.	[illegible]0.	515.	[illegible]5.	[illegible]74.
PER Q=	12.2	19.8	37.3	30.7	
AREA=	11.3	17.8	11.1	30.8	
VEL=	0.7	0.7	2.2	0.6	



1) COUNTY: KALAMAZOO

2) STUDY NAME: CITY OF KALAMAZOO

3) WATERCOURSE: ~~KALAMAZOO RIVER~~ AXTELL CREEK

4) DOCUMENT TYPE: 100-YR INPUT



| | | |

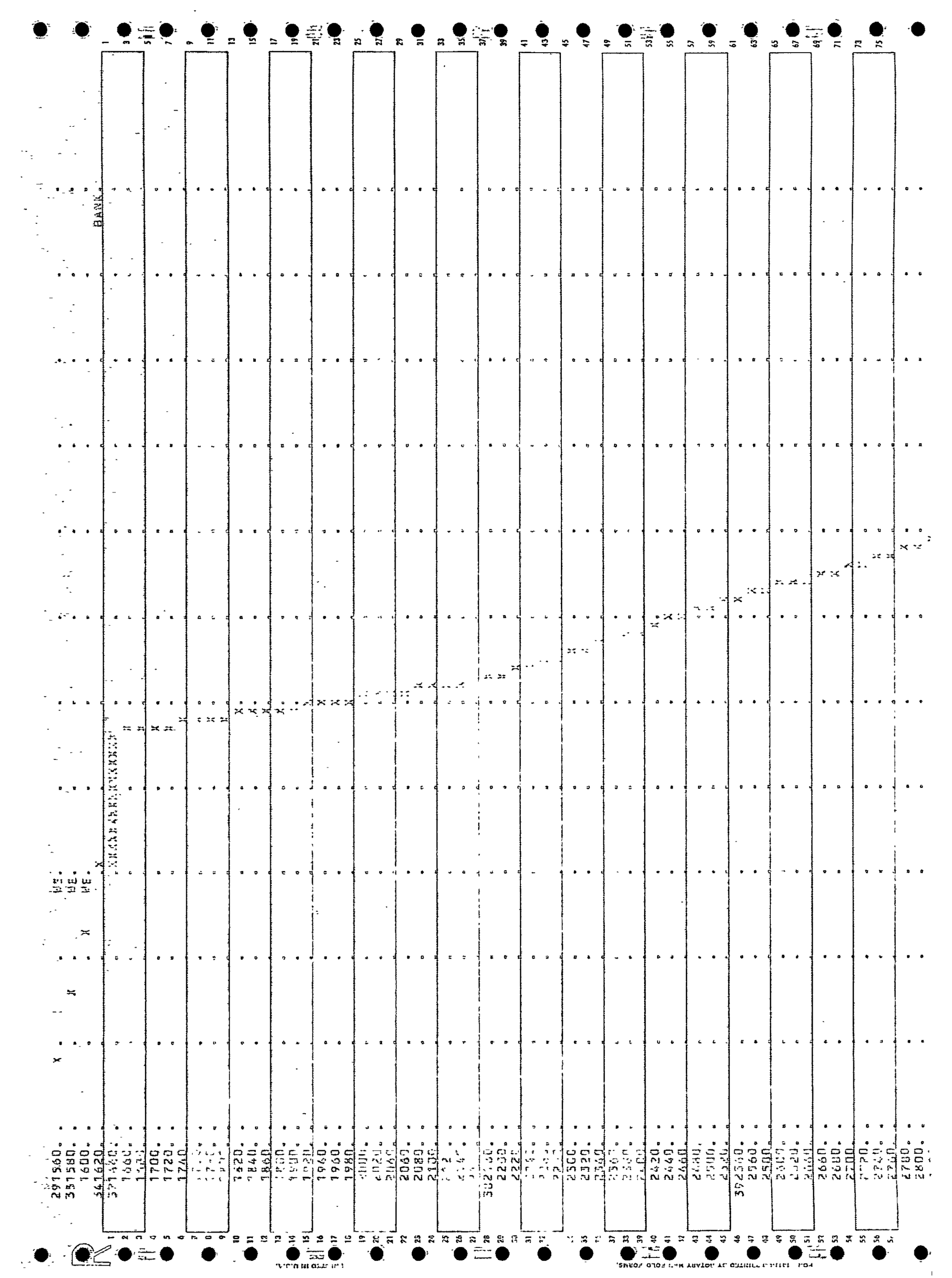
CROSS SECTION 30.00
STREAM KALAMAZOO RIVER
DISCHARGE= 6770.

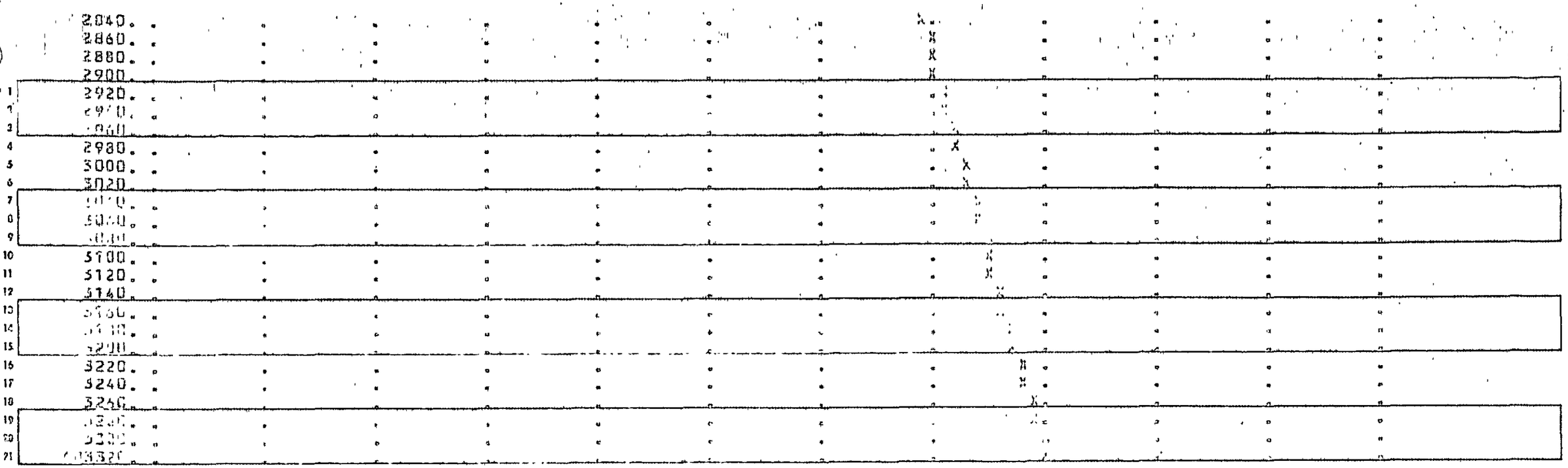
PLOTTED POINTS [illegible]

ELEV 755. 760. 765. 770. 775. 780. 785. 790. 795. 800. 805.

STA-FLOW

2 540.						X							
560.						X							
3 580.						X							
600.						X							
620.						X							
640.						X							
660.						X							
680.						X							
700.						X							
720.						X							
740.						X							
760.						X							
780.						X							
800.						X							
820.						X							
4 [illegible]													
860.						X							
[illegible]													
5 900.						X							
920.						X							
940.						X							
[illegible]													
980.						X							
1000.						X							
1020.						X							
1040.						X							
1060.						X							
1080.						X							
1100.						X							
1120.						X							
1140.						X							
1160.						X							
1180.						X							
1200.						X							
1220.						X							
1240.						X							
1260.						X							
1280.						X							
1300.						X							
1320.						X							
91340.					XXXXXXXXXXXXXXXXX								DAM.
1360.				X									
1380.			X		WE.								
131400.			X		WE.								
141420.		X			WE.								
151440.		X			WE.								
191460.		X			WE.								
211480.		X			WE.								
231500.		X			WE.								
241520.		X			WE.								
251540.		X			WE.								





NTD= 0 ELLC= 9999999.00 ELTRD= 9999997.00

777.40	[illegible]	[illegible]	[illegible]	777.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
777.50	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
762.40	1400.40	762.40	1400.50	759.00	1419.50	758.50	1433.50	758.50	1438.60
758.50	1447.40	758.50	1447.50	758.10	1465.50	758.30	1483.50	758.30	1485.60
758.30	1494.40	758.30	1494.50	758.60	1513.50	758.80	1532.50	[illegible]	1532.60
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		

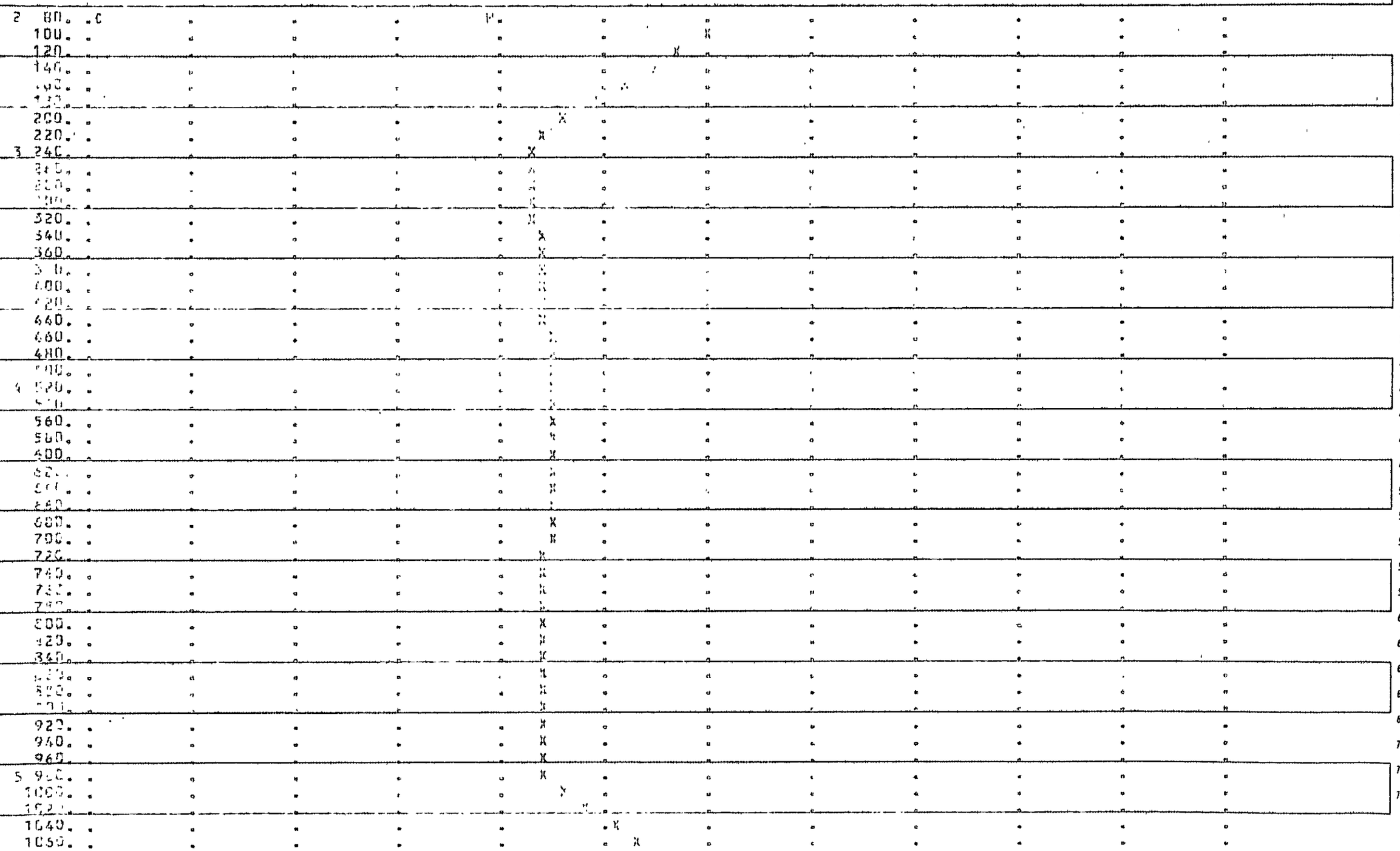
FORM 1411-GB-PRINTED BY ROTARY MANI-OLD FORMS.

CROSS SECTION 32.00
STREAM KALAMAZOO RIVER
DISCHARGE= 6770.

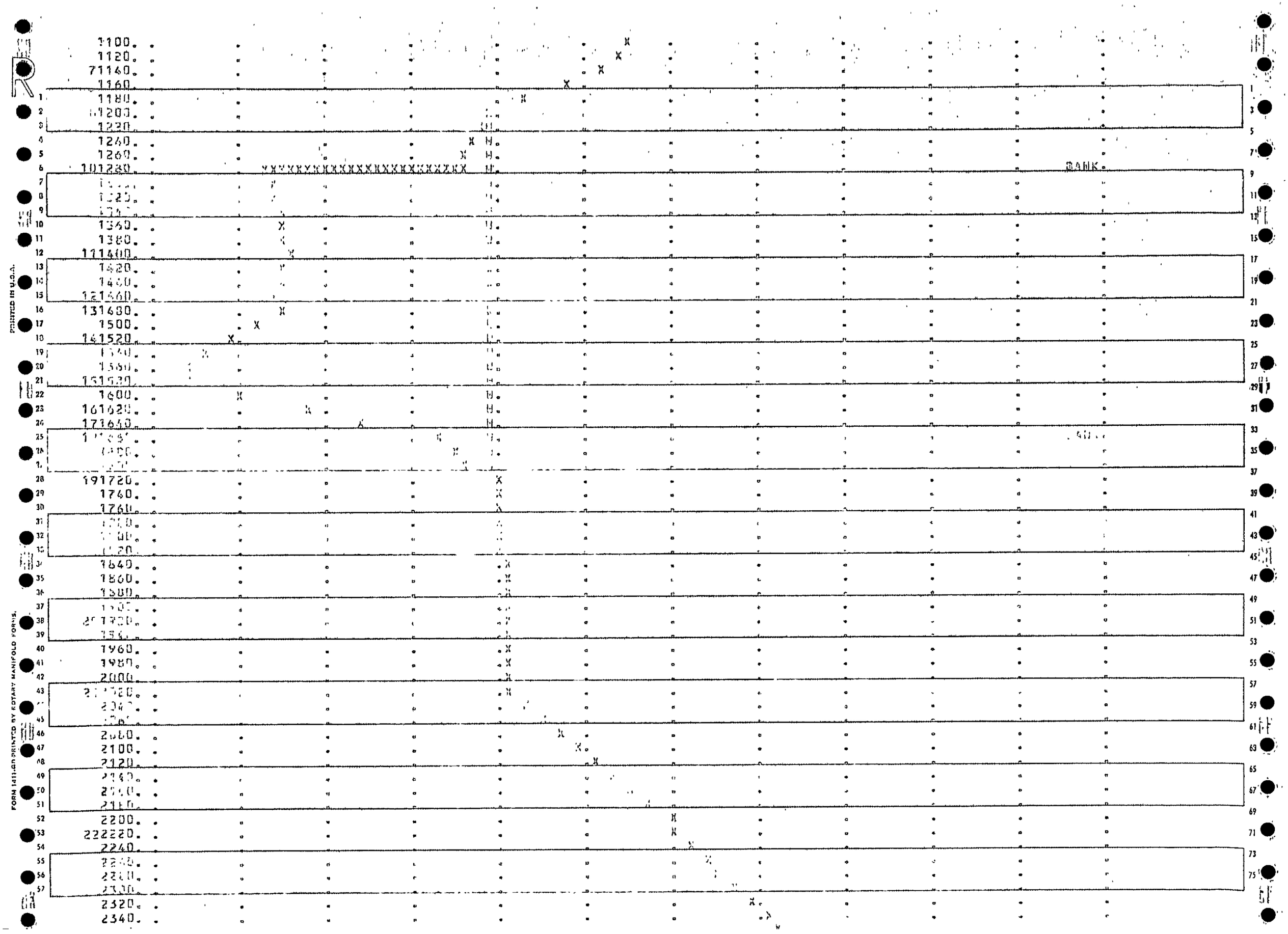
[illegible]

SLEV 750. 755. 760. 765. 770. 775. 780. 785. 790. 795. 800.

STA-FEET



FORM 1411-00 PRINTED BY ROTARY MANIFOLD FORMS



FORM 1411-GD PRINTED BY ROTARY MANIFOLD FORMS.
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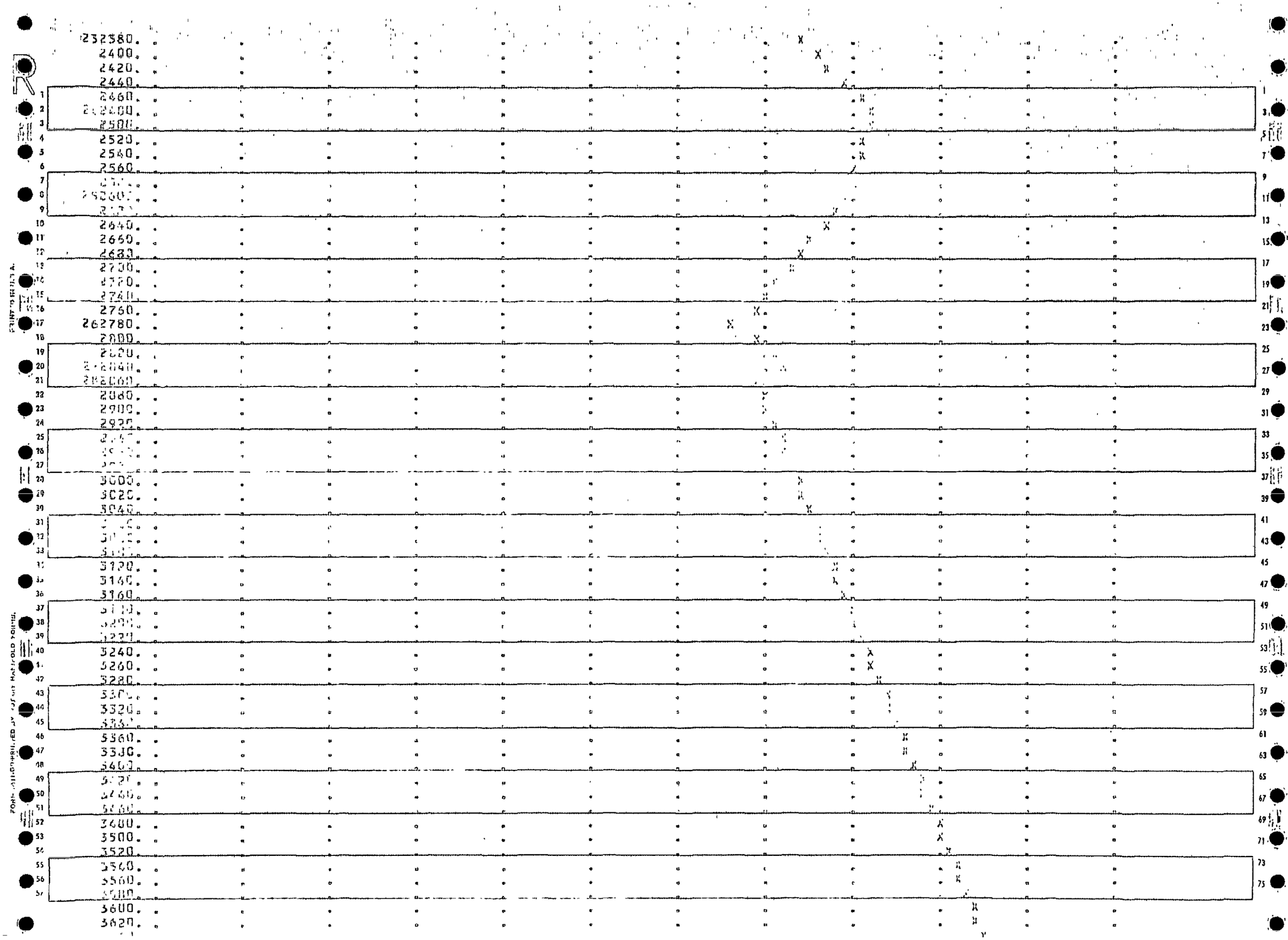
232380.
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2420.
2440.
2460.
2500.
2520.
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2640.
2660.
2680.
2700.
2740.
2760.
262780.
2800.
2820.
2840.
2860.
2880.
2900.
2920.
3000.
3020.
3040.
3120.
3140.
3160.
3240.
3260.
3280.
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3480.
3500.
3520.
3560.
3600.
3620.

3660. . . . . X . .
293680. . . . . X . .

NRD= 0 ELLC= 9999999.00 ELTRD= 9999999.00

ELC[illegible]STA[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
776.00	1143.00	769.40	1203.00	763.10	1271.00	756.70	1272.00	756.00	1396.00
756.80	1451.00	757.50	1486.00	754.30	1526.00	751.90	1571.00	759.10	1621.00
761.90	1636.00	766.40	1651.00	769.50	1730.00	770.60	1918.00	770.60	2024.00
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				

CROSS SECTION 33.00
STREAM KALAMAZOO RIVER
DISCHARGE= 6770.

PLOTTED POINTS (IF PLOTTED) ARE INTERPOLATED DISTANCES FROM LEFT BANK

ELEV 754. 756. 758. 760. 762. 764. 766. 768. 770. 772. 774.

STATION

2	0.								X			
3	2.	X										BANK.
	4.	X										
	6.											
	8.											
	10.											
	12.	X										
	14.	X										
	16.	X										
	18.											
	20.											
	22.											
	24.	X										
	26.	X										
	28.											
	30.											
	32.											
	34.											
	36.	X										
	38.	X										
	40.	X										
	42.											
	44.											
	46.											
	48.	X										
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	52.	X										
	54.											
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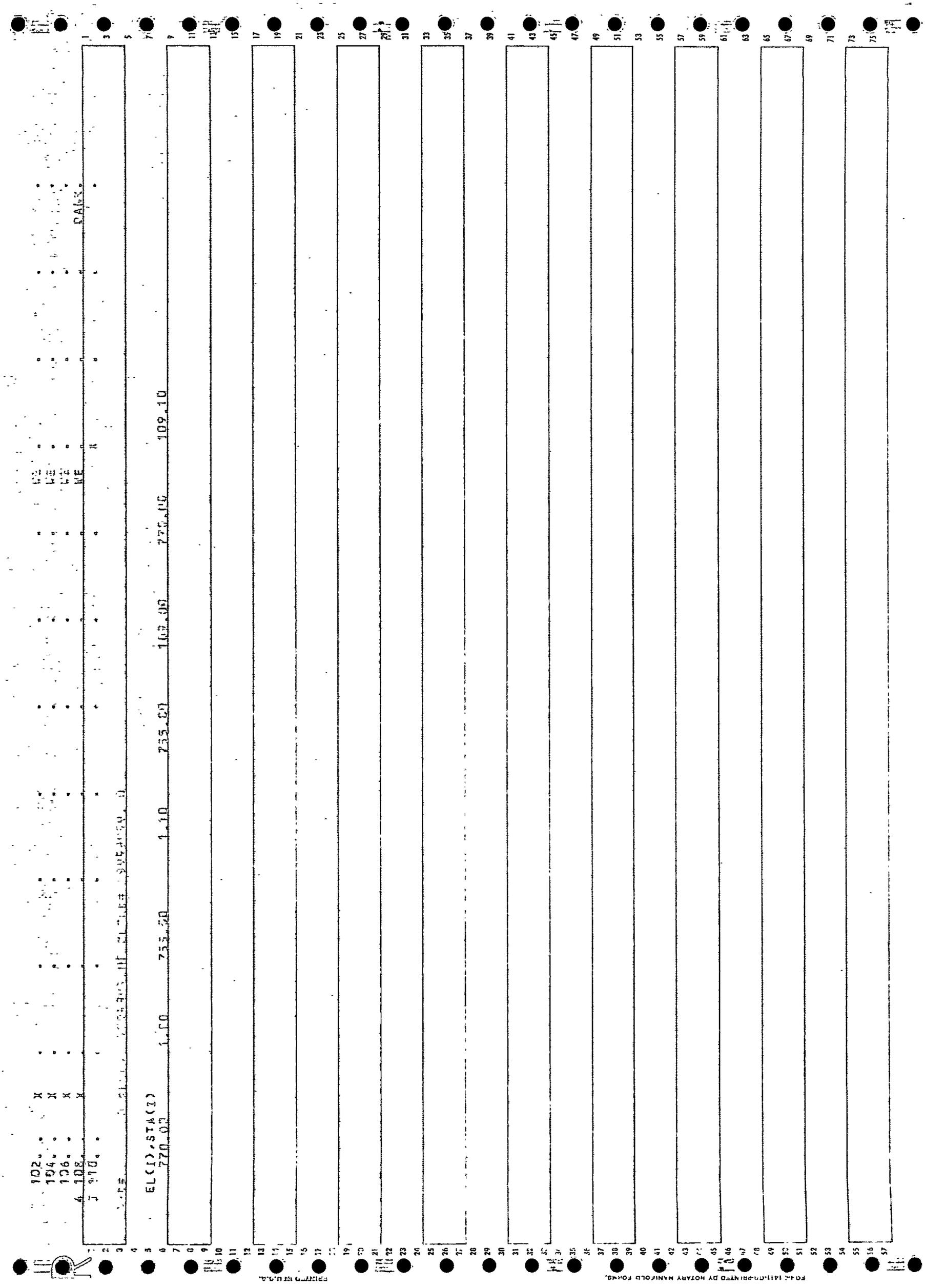
	72.	X										
	74.	X										
	76.	X										
	78.											
	80.											
	82.											
	84.	X										
	86.	X										
	88.	X										
	90.											
	92.											
	94.											
	96.	X										
	98.	X										

FORM 1411-C1 PRINTED BY ROTARY MANIFOLD FORMS.



```
   102.  .    X    .    .    .    .    .    .    .    WE   .    .    .    .
   104.  .    X    .    .    .    .    .    .    .    WE   .    .    .    .
   106.  .    X    .    .    .    .    .    .    .    WE   .    .    .    .
 4 108.  .    X    .    .    .    .    .    .    .    WE   .    .    .    DANK.
 J 110.  .    .    .    .    .    .    .    .    .    X    .    .    .    .

[illegible]

EL(I),STA(I)
   770.00      1.00      755.00      1.10      755.00      109.00      770.00      109.10
```

PRINTED IN U.S.A.
FORM 1411-CO-PRINTED BY ROTARY MANIFOLD FORMS.

00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: CITY OF KALAMAZOO

3) WATERCOURSE: AXTELL CREEK

4) DOCUMENT TYPE: 100-YR NATURAL RUN

00BREAK00

*PROF 1

CCHV= 0.100 CEHV= 0.300

*SECNO 1.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	CLOSS	RANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST
1.00	3.85	760.15	0.00	760.15	760.56	0.41	0.01	0.00	761.50
385.	0.	385.	0.	0.	75.	0.	0.	0.	761.50
0.00	0.00	5.15	0.00	0.080	0.035	0.080	0.000	756.30	1493.06
0.004857	0.	0.	0.	0	0	0	0.00	31.36	1524.42

VALLEY SECT. APPROX. 90 FT. U/S OF CONFLUENCE W/PORTAGE CREEK SECT. 114.

FLOW DISTRIBUTION FOR SECNO= 1.00 CWSEL= 760.15

STA= 1493. 1528.
PER Q= 100.0
AREA= 74.7
VEL= 5.2

*SECNO 2.000

VALLEY SECT. APPROX. 30 FT. D/S OF ENCLOSURE SECT. 115.

2.00	6.64	761.14	0.00	0.00	761.32	0.17	0.73	0.02	759.20
385.	6.	379.	0.	11.	112.	0.	1.	0.	761.00
0.03	0.59	3.38	0.10	0.080	0.035	0.080	0.033	754.50	596.17
0.000990	380.	390.	400.	3	0	0	0.00	37.56	633.73

FLOW DISTRIBUTION FOR SECNO= 2.00 CWSEL= 761.14

STA= 596. 627. 632. 634.
PER Q= 1.6 98.4 0.0
AREA= 10.4 112.1 0.1
VEL= 0.6 3.4 0.1

*SECNO 2.500

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	CLOSS	RANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

3685 PC TRIALS ATTEMPTED ASEL>CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

OVERLAND FLOW, APPROX. 10 FT U/S FROM D/S OF ENCLOSURE

2.50	0.86	762.86	762.86	0.00	763.29	0.43	0.07	0.08	762.00
294.	23.	246.	25.	16.	43.	17.	1.	0.	762.00
0.03	1.43	5.74	1.43	0.080	0.020	0.080	0.033	742.00	0.89
0.007310	40.	40.	40.	20	17	0	0.00	89.21	90.11

FLOW DISTRIBUTION FOR SECNO= 2.50 CWSEL= 762.86

```
STA=        1.       20.       70.       90.       90.
  PER Q=      7.9      83.7       8.4       0.0
   AREA=     16.3      42.9      17.2       0.0
    VEL=      1.4       5.7       1.4       0.0

*SECNO 3.000

        OVERLAND FLOW;APPROX.24 FT U/S FROM D/S OF ENCLOSURE

     3.00      1.55    763.55      0.00      0.00    763.60      0.05      0.27      0.04    762.00
     294.       16.      202.       76.       30.       94.      141.        2.        1.    762.00
     0.07      0.54      2.16      0.54     0.080     0.020     0.080     0.029    762.00      0.80
 0.000467      230.      230.      230.         3         0         0      0.00    169.39    170.20

FLOW DISTRIBUTION FOR SECNO=       3.00          CWSEL=     763.55

STA=        1.       20.       80.      170.      170.
  PER Q=      5.4      68.8      23.8       0.0
   AREA=     29.8      93.6     140.4       0.2
    VEL=      0.5       2.2       0.5       0.1

*SECNO 4.000
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        DLOSS     BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IHZ       ICONT     CORAR     TOPWID    ENDST

        OVERLAND FLOW;APPROX.590FT U/S FROM D/S OF ENCLOSURE

     4.00      1.47    763.87      0.00      0.00    763.94      0.07      0.33      0.01    763.20
     294.        5.      125.      165.        6.       40.      155.        4.        3.    763.20
     0.12      0.77      3.11      1.06     0.080     0.020     0.080     0.026    762.40      0.90
 0.002981      360.      350.      340.         3         0         0      0.00    214.29    215.19

FLOW DISTRIBUTION FOR SECNO=       4.00          CWSEL=     763.87

STA=        1.       10.       70.      215.      215.
  PER Q=      1.6      42.4      56.0       0.0
   AREA=      6.1      40.2     155.1       0.1
    VEL=      0.8       3.1       1.1       0.2

*SECNO 5.000

        OVERLAND FLOW;APPROX.1065FT U/S FROM D/S OF ENCLOSURE

     5.00      2.40    764.20      0.00      0.00    764.[illegible]      0.07      0.34      0.00    761.80
     294.       20.      253.       21.       34.      108.       36.        6.        4.    761.80
     0.19      0.58      2.34      0.58     0.080     0.020     0.080     0.024    761.80      0.71
 0.000308      475.      475.      475.         3         0         0      0.00     74.59     75.29

FLOW DISTRIBUTION FOR SECNO=       5.00          CWSEL=     764.20

STA=        1.        1.       15.       60.       75.       75.
  PER Q=      0.0       6.7      86.1       7.2       0.0
   AREA=      0.4      33.6     108.1      36.0       0.4
    VEL=      0.1       0.6       2.3       0.6       0.1

*SECNO 5.010
```

VALLEY SECT.APPROX. 10FT U/S OF ENCLOSURE

	5.01	9.06	764.26	0.00	0.00	764.30	0.04	0.02	0.00	755.20
1	385.	26.	312.	47.	63.	181.	123.	7.	4.	755.20
2	0.22	0.41	1.72	0.38	0.080	0.035	0.080	0.025	755.20	1103.29
3	0.000087	155.	160.	165.	2	0	0	0.00	76.14	1179.43

FLOW DISTRIBUTION FOR SECNO= 5.01 CWSEL= 764.26

STA=	1103.	1104.	1152.	1120.	1140.	1146.	1158.	1164.	1178.	1179.
PER Q=	0.0	1.2	5.5	81.1	5.0	3.7	1.2	2.3	0.0	
AREA=	0.6	16.5	45.7	181.5	38.8	38.0	14.	30.3	1.3	
VEL=	0.1	0.3	0.5	1.7	0.5	0.4	0.3	0.3	0.1	

*SECNO 5.020

5.02	11.61	764.31	0.00	0.00	764.31	0.00	0.01	0.00	755.50
385.	145.	92.	148.	595.	122.	608.	12.	5.	755.50
0.41	0.24	0.75	0.24	0.080	0.035	0.080	0.026	752.70	661.66
0.000016	255.	260.	265.	0	0	0	0.00	246.72	908.36

FLOW DISTRIBUTION FOR SECNO= 5.02 CWSEL= 764.31

STA=	662.	700.	778.	790.	870.	909.
PER Q=	2.7	34.9	23.9	35.8	2.7	
AREA=	82.8	512.1	122.3	525.3	82.8	
VEL=	0.1	0.3	0.8	0.3	0.1	

CCHV= 0.300 CEHV= 0.500

*SECNO 5.100

D/S FACE OF ROSE ST. BRIDGE SECT. 11°.

5.10	11.61	764.31	0.00	0.00	764.31	0.00	0.00	0.00	755.50
385.	145.	92.	148.	595.	122.	608.	13.	6.	755.50
0.45	0.24	0.75	0.24	0.080	0.035	0.080	0.027	752.70	661.66
0.000016	50.	50.	50.	0	0	0	0.00	246.69	908.34

FLOW DISTRIBUTION FOR SECNO= 5.10 CWSEL= 764.31

STA=	662.	700.	778.	790.	870.	909.
PER Q=	2.7	34.9	23.9	35.8	2.7	
AREA=	82.7	512.0	122.3	525.1	82.7	
VEL=	0.1	0.3	0.8	0.3	0.1	

*SECNO 5.200

SECNO	DEPTH	CWSEL	CRIWS	ASELK	EG	HV		CLOSS	PAPR ELEV
Q	GLC	ACH	QBOH	SLOB	ACH	XNTH	XNL	TOP WIDTH	RT/WEIGHT
TIME	VLC	ACH	VLOB	XNL	XSCH	XNR	XTR	CELIA	SIL
SLOPE	XLOPL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

3570 NORMAL BRIDGE,NRD= X MIN ELTRD= 762.00 MAX ELLC= 759.50

5.20	11.61	764.31	0.00	0.00	764.32	0.01	0.00	0.01	755.50
385.	125.	132.	128.	225.	92.	229.	13.	6.	755.50
0.45	0.56	1.44	0.56	0.080	0.035	0.080	0.027	752.70	661.67
0.000343	1.	1.	1.	0	0	0	-778.55	246.65	908.33

FLOW DISTRIBUTION FOR SECNO= 5.20 CWSEL= 764.31

STA=	662.	700.	778.	790.	870.	908.
PER Q=	4.3	28.1	34.3	28.8	4.3	
AREA=	44.3	180.3	91.9	184.9	44.3	
VEL=	0.4	0.6	1.4	0.6	0.4	

*SECNO 5.300

3370 NORMAL BRIDGE,NRD= 8 MIN ELTRD= 762.00 MAX ELLC= 759.50

5.30	11.63	764.33	0.00	0.00	764.34	0.01	0.02	0.00	755.50	
385.	125.	132.	128.	226.	92.	230.	14.	6.	755.50	
0.47	0.55	1.43	0.56	0.080	0.035	0.080	0.027	752.70	661.57	
0.000332	64.	64.	64.	1	0	0	-778.76	246.86	908.43	

FLOW DISTRIBUTION FOR SECNO= 5.30 CWSEL= 764.33

STA=	662.	700.	778.	790.	870.	908.
PER Q=	4.4	28.2	34.2	28.9	4.4	
AREA=	44.6	181.2	92.0	185.9	44.6	
VEL=	0.4	0.6	1.4	0.6	0.4	

*SECNO 5.400

U/S FACE OF ROSE ST. BRIDGE SECT. 119.

5.40	11.64	764.34	0.00	0.00	764.35	0.00	0.00	0.00	755.50	
385.	145.	92.	148.	597.	123.	610.	14.	6.	755.50	
0.47	0.24	0.75	0.24	0.080	0.035	0.080	0.027	752.70	661.46	
0.000016	1.	1.	1.	1	0	0	0.00	247.08	908.54	

FLOW DISTRIBUTION FOR SECNO= 5.40 CWSEL= 764.34

STA=	661.	700.	778.	790.	870.	909.
PER Q=	2.7	34.9	23.9	35.8	2.7	
AREA=	83.6	513.7	122.6	526.9	83.6	
VEL=	0.1	0.3	0.8	0.3	0.1	

*SECNO 5.500

5.50	11.64	764.34	0.00	0.00	764.35	0.00	0.00	0.00	755.50	
385.	145.	92.	148.	599.	123.	612.	14.	6.	755.50	
0.51	0.24	0.75	0.24	0.080	0.035	0.080	0.027	752.70	661.32	
0.000016	50.	50.	50.	0	0	0	0.00	247.37	908.68	

FLOW DISTRIBUTION FOR SECNO= 5.50 CWSEL= 764.34

STA=	661.	700.	778.	790.	870.	909.
PER Q=	2.7	34.9	23.9	35.8	2.7	
AREA=	84.2	514.9	122.7	528.1	84.2	
VEL=	0.1	0.3	0.7	0.3	0.1	

CCHV= 0.100 CEHV= 0.300

*SECNO 5.600

5.60	7.94	764.34	0.00	0.00	764.35	0.01	0.01	0.00	757.20	
385.	128.	129.	128.	336.	98.	339.	21.	7.	757.20	
0.60	0.38	1.31	0.38	0.080	0.035	0.080	0.028	756.40	716.61	
0.000066	225.	210.	195.	0	0	0	0.00	229.22	945.83	

FLOW DISTRIBUTION FOR SECNO= 5.60 CWSEL= 764.34

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STA= 717. 760. 824. 837. 900. 946.
PER Q= 1.8 31.5 33.5 31.5 1.9
AREA= 44.4 291.9 98.0 291.9 46.9
VEL= 0.2 0.4 1.3 0.4 0.2

CCHV= 0.300 CEHV= 0.500

*SECNO 6.100

SECNO	DEPTH	CWSEL	CRIWS	WSELK	FQ	HV	HL	QLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

D/S FACE OF STOCKBRIDGE AVE. BRIDGE SECT. 120.

6.10	7.95	764.35	0.00	0.00	764.36	0.01	0.00	0.00	757.20
385.	128.	129.	128.	336.	98.	339.	22.	8.	757.20
0.62	0.38	1.32	0.38	0.080	0.035	0.050	0.02-	756.40	716.65
0.000066	50.	50.	50.	0	0	0	0.00	229.18	945.81

FLOW DISTRIBUTION FOR SECNO= 6.10 CWSEL= 764.35

STA= 717. 760. 824. 837. 900. 946.
PER Q= 1.8 31.5 33.5 31.5 1.9
AREA= 44.4 291.9 98.0 291.9 46.9
VEL= 0.2 0.4 1.3 0.4 0.2

*SECNO 6.200

3370 NORMAL BRIDGE,NRD= * MIN ELTRD= 762.30 MAX ELLC= 761.26

6.20	7.94	764.34	0.00	0.00	764.36	0.02	0.00	0.01	757.20
385.	118.	147.	119.	174.	83.	177.	22.	8.	757.20
0.62	0.68	1.77	0.68	0.080	0.035	0.050	0.028	756.40	716.61
0.000627	1.	1.	1.	0	0	0	-338.56	229.23	945.84

FLOW DISTRIBUTION FOR SECNO= 6.20 CWSEL= 764.34

STA= 717. 760. 824. 837. 900. 946.
PER Q= 5.4 25.3 38.2 25.3 5.8
AREA= 44.4 130.0 83.3 130.0 46.9
VEL= 0.5 0.7 1.8 0.7 0.5

*SECNO 6.300

3370 NORMAL BRIDGE,NRD= * MIN ELTRD= 762.30 MAX ELLC= 761.26

6.30	7.92	764.38	0.00	0.00	764.40	0.02	0.04	0.01	757.20
385.	119.	146.	120.	177.	84.	180.	22.	8.	757.20
0.63	0.67	1.74	0.67	0.080	0.035	0.080	0.028	756.40	716.08
0.000607	64.	64.	64.	1	0	0	-338.56	230.33	946.40

FLOW DISTRIBUTION FOR SECNO= 6.30 CWSEL= 764.38

STA= 716. 760. 824. 837. 900. 946.
PER Q= 5.5 25.4 37.9 25.4 5.8
AREA= 45.5 131.6 83.7 131.6 48.1
VEL= 0.5 0.7 1.7 0.7 0.5

*SECNO 6.400

U/S FACE OF STOCKBRIDGE AVE. CULVERT ON FOREST STREET

6.40	8.00	764.40	0.00	0.00	764.41	0.01	0.00	0.00	757.20	
385.	128.	128.	129.	341.	99.	344.	22.	8.	757.20	
0.63	0.38	1.30	0.37	0.080	0.035	0.080	0.028	756.40	715.70	
0.000164	1.	1.	1.	1	0	0	0.00	231.09	946.79	

FLOW DISTRIBUTION FOR SECNO= 6.40 CWSEL= 764.40

STA=	716.	760.	824.	837.	900.	947.
PER Q=	1.8	31.5	33.3	31.5	1.9	
AREA=	46.3	294.6	98.6	294.6	48.9	
VEL=	0.2	0.4	1.3	0.4	0.2	

*SECNO 6.500

6.50	8.00	764.40	0.00	0.00	764.41	0.01	0.00	0.00	757.20	
385.	128.	128.	129.	343.	99.	345.	23.	8.	757.20	
0.63	0.37	1.29	0.37	0.080	0.035	0.080	0.029	756.40	715.33	
0.000163	50.	50.	50.	1	0	0	0.00	231.86	947.19	

FLOW DISTRIBUTION FOR SECNO= 6.50 CWSEL= 764.40

STA=	715.	760.	824.	837.	900.	947.
PER Q=	1.9	31.5	33.2	31.5	2.0	
AREA=	47.1	295.8	98.8	295.8	49.7	
VEL=	0.2	0.4	1.3	0.4	0.2	

CCHV= 0.100 CEHV= 0.300

*SECNO 6.600

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST
6.60	7.74	764.44	0.00	0.00	764.47	0.03	0.03	0.01	757.50	
385.	102.	184.	99.	177.	92.	180.	31.	11.	756.70	
0.78	0.58	1.99	0.55	0.080	0.035	0.080	0.029	756.70	896.85	
0.000152	550.	570.	590.	0	0	0	0.00	136.04	1032.88	

FLOW DISTRIBUTION FOR SECNO= 6.60 CWSEL= 764.44

STA=	897.	920.	952.	964.	990.	1033.
PER Q=	1.9	24.7	47.7	22.4	3.3	
AREA=	29.2	149.0	92.3	130.0	50.1	
VEL=	0.3	0.6	2.0	0.7	0.3	

CCHV= 0.300 CEHV= 0.500

*SECNO 7.000

D/S FACE OF PARK AVE. BRIDGE SECT. 121

7.00	7.75	764.45	0.00	0.00	764.48	0.03	0.01	0.00	757.50	
385.	102.	184.	99.	178.	92.	181.	32.	11.	756.70	
0.79	0.58	1.99	0.55	0.080	0.035	0.080	0.029	756.70	896.78	
0.000151	50.	50.	50.	0	0	0	0.00	136.23	1033.01	

FLOW DISTRIBUTION FOR SECNO= 7.00 CWSEL= 764.45

STA=	897.	920.	952.	964.	990.	1033.
PER Q=	1.9	24.7	47.7	22.4	3.3	
AREA=	28.4	149.3	92.4	130.1	50.4	
VEL=	0.3	0.6	2.0	0.7	0.3	

*SECNO 7.100

3370 NORMAL BRIDGE,NRD= 10 MIN ELTRD= 762.00 MAX ELLC= 761.10

7.10	8.52	764.42	0.00	0.00	764.50	0.08	0.00	0.02	756.70
385.	96.	183.	106.	82.	62.	96.	32.	11.	757.00
0.79	1.18	2.96	1.10	0.080	0.035	0.080	0.029	755.90	896.96
0.002316	1.	1.	1.	2	0	0	-127.82	139.93	1036.50

FLOW DISTRIBUTION FOR SECNO= 7.10 CWSEL= 764.42

STA=	897.	920.	950.	951.	952.	964.	966.	967.	990.	1036.
PER Q=	7.3	17.2	0.1	0.3	47.6	0.3	0.1	13.1	13.9	
AREA=	27.9	51.2	1.0	1.5	61.8	1.5	1.0	39.8	54.0	
VEL=	1.0	1.3	0.4	0.9	3.0	0.9	0.3	1.3	1.9	

*SECNO 7.200

3370 NORMAL BRIDGE,NRD= 10 MIN ELTRD= 762.00 MAX ELLC= 761.10

7.20	8.72	764.62	0.00	0.00	764.68	0.06	0.17	0.01	756.70
385.	101.	171.	113.	93.	64.	111.	32.	11.	757.00
0.81	1.10	2.66	1.02	0.080	0.035	0.080	0.030	755.90	895.12
0.001777	85.	85.	85.	2	0	0	-127.82	145.25	1040.37

FLOW DISTRIBUTION FOR SECNO= 7.20 CWSEL= 764.62

STA=	895.	920.	950.	951.	952.	964.	966.	967.	990.	1040.
PER Q=	7.9	17.9	0.1	0.4	44.3	0.4	0.1	13.8	15.0	
AREA=	32.6	56.9	1.2	1.8	64.1	1.5	1.2	44.4	65.4	
VEL=	0.9	1.2	0.4	0.9	2.7	0.9	0.3	1.2	0.9	

*SECNO 7.300

U/S FACE OF PARK AVE. BRIDGE

7.30	8.72	764.62	0.00	0.00	764.68	0.06	0.00	0.00	756.70
385.	85.	235.	66.	152.	98.	146.	62.	11.	757.00
0.81	0.56	2.40	0.45	0.080	0.035	0.080	0.030	755.90	895.10
0.000195	1.	1.	1.	0	0	0	0.00	145.31	1040.41

FLOW DISTRIBUTION FOR SECNO= 7.30 CWSEL= 764.62

STA=	895.	920.	950.	951.	952.	964.	966.	967.	990.	1040.
PER Q=	2.6	15.4	0.6	3.4	60.9	3.0	0.4	8.7	5.0	
AREA=	32.6	100.9	6.1	12.7	97.7	12.0	5.2	65.1	63.5	
VEL=	0.3	0.6	0.4	1.0	2.4	1.0	0.2	0.5	0.	

*SECNO 8.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

VALLEY SECT. APPROX. 65 FT. U/S OF PARK ST. BRIDGE SECT. 122.

8.00	8.18	764.68	0.00	0.00	764.70	0.02	0.01	0.01	758.70	
385.	44.	277.	64.	126.	223.	239.	33.	11.	759.20	
0.83	0.35	1.24	0.27	0.080	0.035	0.080	0.030	756.50	797.73	
0.000060	65.	65.	85.	1	0	0	0.00	170.86	968.59	

FLOW DISTRIBUTION FOR SECNO= 8.00 CWSEL= 764.68

STA=	798.	824.	835.	864.	877.	969.
PER Q=	4.4	7.0	71.9	6.3	10.3	
AREA=	65.5	60.3	225.0	60.9	177.6	
VEL=	0.3	0.4	1.2	0.4	0.2	

CCHV= 0.100 CEHV= 0.300
*SECNO 9.000

VALLEY SECT. APPROX. 50 FT. D/S OF 60 INCH PIPE

9.00	7.68	764.68	0.00	0.00	764.71	0.02	0.01	0.00	759.20	
385.	42.	288.	56.	108.	209.	190.	35.	12.	759.70	
0.86	0.39	1.38	0.29	0.080	0.035	0.080	0.030	757.00	800.34	
0.000081	50.	135.	100.	0	0	0	0.00	156.59	956.93	

FLOW DISTRIBUTION FOR SECNO= 9.00 CWSEL= 764.68

STA=	800.	824.	835.	864.	877.	957.
PER Q=	3.9	6.9	74.7	6.1	8.3	
AREA=	53.1	54.9	208.6	54.5	175.5	
VEL=	0.3	0.5	1.4	0.4	0.2	

CCHV= 0.300 CEHV= 0.500
*SECNO 9.100

D/S FACE OF 60 INCH CMPS SECT. 123

9.10	7.68	764.68	0.00	0.00	764.72	0.04	0.01	0.01	757.40	
385.	115.	182.	89.	191.	79.	146.	35.	12.	757.00	
0.87	0.60	2.31	0.61	0.080	0.035	0.080	0.030	757.00	629.62	
0.000210	50.	50.	50.	0	0	0	0.00	150.66	780.27	

FLOW DISTRIBUTION FOR SECNO= 9.10 CWSEL= 764.68

STA=	630.	680.	695.	696.	705.	715.	718.	724.	725.	728.	780.
PER Q=	6.9	10.0	1.0	12.0	47.2	6.1	8.2	1.0	1.7	6.0	
AREA=	75.2	59.5	4.8	57.1	78.6	22.3	76.5	1.0	11.5	70.2	
VEL=	0.4	0.7	0.1	0.9	2.4	1.1	0.5	0.5	0.6	0.3	

*SECNO 9.200

3370 NORMAL BRIDGE,NRD= 18 MIN ELTRD= 759.70 MAX ELLC= 760.00

9.20	7.69	764.69	0.00	0.00	764.73	0.03	0.00	0.00	757.40	
385.	205.	74.	106.	153.	36.	102.	35.	12.	757.00	
0.87	1.34	2.03	1.04	0.080	0.035	0.080	0.030	757.00	629.62	
0.001631	1.	1.	1.	1	0	0	-124.48	150.65	780.27	

FLOW DISTRIBUTION FOR SECNO= 9.20 CWSEL= 764.69

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STA=	630.	680.	695.	696.	705.	715.	718.	724.	725.	728.	780.
PER Q=	19.1	27.9	1.5	4.8	19.1	1.6	3.0	1.5	4.7	16.6	
AREA=	75.2	58.3	3.3	16.6	36.3	5.5	10.9	3.4	11.5	70.2	
VEL=	1.0	1.8	1.7	1.1	2.0	1.1	1.1	1.7	1.6	0.9	

*SECNO 9.300

3370 NORMAL BRIDGE,NPD= 12 MIN ELTRD= 759.70 MAX ELLC= 760.00

9.30	7.72	764.72	0.00	0.00	764.75	0.03	0.02	0.00	757.40	
385.	205.	73.	107.	155.	37.	103.	35.	12.	757.00	
0.87	1.32	2.00	1.03	0.080	0.035	0.080	0.030	757.00	629.17	
0.001574	15.	15.	15.	1	0	0	-124.48	151.62	780.79	

FLOW DISTRIBUTION FOR SECNO= 9.30 CWSEL= 764.72

STA=	629.	680.	695.	696.	705.	715.	718.	724.	725.	728.	781.
PER Q=	19.2	27.8	1.4	4.8	19.0	1.6	3.1	1.5	4.7	16.8	
AREA=	76.6	59.7	3.4	16.8	36.6	5.5	11.1	3.5	11.6	71.	
VEL=	1.0	1.8	1.7	1.1	2.0	1.1	1.1	1.7	1.6	0.9	

*SECNO 9.400

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LFET/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	ANR	WTD	ELMIN	SSTA
SLOPE	XLOBL	YLCH	XLOBR	ITRIAL	IM2	ICONT	CORAR	TOPWID	E.DST

U/S FACE 60 INCH CMPS

9.40	7.71	764.71	0.00	0.00	764.76	0.04	0.00	0.01	757.40	
385.	115.	181.	89.	194.	79.	148.	36.	12.	757.00	
0.87	0.59	2.29	0.60	0.080	0.035	0.080	0.030	757.00	629.05	
0.000205	1.	1.	1.	0	0	0	0.00	151.88	780.93	

FLOW DISTRIBUTION FOR SECNO= 9.40 CWSEL= 764.71

STA=	629.	680.	695.	696.	705.	715.	718.	724.	725.	728.	781.
PER Q=	7.0	10.1	1.0	12.0	47.0	6.0	8.2	1.0	1.7	6.1	
AREA=	77.0	58.8	4.8	53.4	79.0	22.4	37.0	5.0	11.6	72.0	
VEL=	0.3	0.7	0.8	0.9	2.3	1.0	0.9	0.7	0.6	0.3	

*SECNO 9.500

9.50	7.72	764.72	0.00	0.00	764.77	0.04	0.01	0.00	757.40	
385.	115.	181.	89.	194.	79.	148.	36.	12.	757.00	
0.88	0.59	2.29	0.60	0.080	0.035	0.080	0.030	757.00	628.99	
0.000205	50.	50.	50.	2	1	1	0.00	152.02	781.1	

FLOW DISTRIBUTION FOR SECNO= 9.50 CWSEL= 764.72

STA=	629.	680.	695.	696.	705.	715.	718.	724.	725.	728.	781.
PER Q=	7.0	10.1	1.0	12.0	46.9	6.0	8.2	1.0	1.7	6.1	
AREA=	77.1	58.9	4.8	53.5	79.0	22.4	37.0	5.0	11.6	72.0	
VEL=	0.3	0.7	0.8	0.9	2.3	1.0	0.9	0.7	0.6	0.3	

CCHV= 0.100 CEHV= 0.300

*SECNO 10.000

VALLEY SECT. APPROX.10FT D/S OF ENCLOSURE

	10.00	6.07	764.77	0.00	0.00	764.78	0.01	0.01	0.00	758.70
	385.	148.	113.	124.	378.	121.	335.	37.	13.	758.70
	0.92	0.39	0.93	0.37	0.080	0.035	0.080	0.030	758.70	533.89
	0.000043	80.	80.	80.	2	0	0	0.00	150.08	683.98

FLOW DISTRIBUTION FOR SECNO= 10.00 CWSEL= 764.77

STA=	534.	535.	540.	544.	568.	600.	621.	680.	684.
PER Q=	0.0	1.4	2.0	14.9	20.2	29.3	31.9	0.4	
AREA=	1.5	18.9	21.5	143.3	192.6	121.4	325.2	9.5	
VEL=	0.1	0.3	0.4	0.4	0.4	0.9	0.4	0.2	

*SECNO 10.100

OVERLAND FLOW 10 FT U/S OF ENCLOSURE

	10.10	1.54	764.74	0.00	0.00	764.79	0.05	0.00	0.01	763.20
	215.	54.	90.	71.	42.	43.	48.	37.	13.	763.20
	0.92	1.30	2.07	1.49	0.080	0.080	0.080	1.031	763.20	547.35
	0.006969	20.	20.	20.	2		0	0.00	143.81	691.77

FLOW DISTRIBUTION FOR SECNO= 10.10 CWSEL= 764.74

STA=	542.	602.	630.	662.	692.
PER Q=	25.3	41.7	28.9	4.1	
AREA=	41.7	43.2	36.6	11.1	
VEL=	1.3	2.1	1.7	0.8	

*SECNO 10.200

	10.20	1.29	765.78	0.00	0.00	765.35	0.07	0.56	0.01	764.00
	215.	43.	127.	45.	27.	51.	29.	37.	13.	764.00
	0.93	1.57	2.49	1.57	0.080	0.080	0.080	1.041	764.00	557.36
	0.012927	60.	60.	60.	2	0	0	0.00	127.42	684.78

FLOW DISTRIBUTION FOR SECNO= 10.20 CWSEL= 765.78

STA=	557.	600.	640.	695.
PER Q=	19.9	59.2	20.9	
AREA=	27.3	51.2	28.6	
VEL=	1.6	2.5	1.6	

*SECNO 10.300

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	FL	QLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

	10.30	1.15	766.15	0.00	0.00	766.23	0.12	0.52	0.00	765.00
	215.	41.	136.	38.	25.	52.	23.	37.	13.	765.00
	0.94	1.65	2.62	1.65	0.080	0.080	0.080	0.032	765.00	551.36
	0.016568	60.	60.	60.	3	0	0	0.00	128.84	680.20

FLOW DISTRIBUTION FOR SECNO= 10.30 CWSEL= 766.15

STA=	551.	595.	640.	680.
PER Q=	19.2	63.0	17.7	
AREA=	25.1	51.7	23.1	
VEL=	1.7	2.6	1.7	

```
*SECNO 10.400
    10.40      1.01    767.21      0.00      0.00    767.30      0.08      1.06      0.00    766.20
     215.       42.      144.       30.       26.       56.       18.       37.       13.    766.20
     0.95      1.63      2.58      1.63     0.080     0.080     0.080     0.033    766.20    539.42
 0.019050       60.       60.       60.         3         0         0      0.00    141.53    680.94

FLOW DISTRIBUTION FOR SECNO=      10.40          CWSEL=     767.21

STA=      539.      590.      645.      681.
  PER Q=      19.4      66.9      13.8
   AREA=      25.6      55.6      18.2
    VEL=       1.6       2.6       1.6

*SECNO 10.500

        OVERLAND FLOW AT WESTNEDGE AVENUE

    10.50      0.78    768.38      0.00      0.00    768.48      0.10      1.18      0.00    767.60
     215.       73.      131.       11.       33.       48.        6.       38.       13.    767.60
     0.95      2.19      2.71      1.71     0.080     0.080     0.080     0.033    767.60    435.26
 0.029740       50.       50.       50.         3         0         0      0.00    139.29    574.55

FLOW DISTRIBUTION FOR SECNO=      10.50          CWSEL=     768.38

STA=      435.      440.      496.      558.      575.
  PER Q=       0.4      33.5      60.9       5.1
   AREA=       0.9      32.4      48.3       6.4
    VEL=       1.1       2.2       2.7       1.7

*SECNO 11.000

        VALLEY SECT. APPROX. 10 FT D/S OF ENCLOSURE

    11.00      9.46    768.46      0.00      0.00    768.49      0.03      0.01      0.01    759.00
     385.       26.      312.       47.       71.      208.      162.       38.       13.    759.00
     0.97      0.37      1.50      0.29     0.080     0.035     0.080     0.033    759.00    735.05
 0.000062       70.       70.       70.         2                   0      0.00     99.49    834.54

FLOW DISTRIBUTION FOR SECNO=      11.00          CWSEL=     768.46

STA=      735.      750.      772.      778.      835.
  PER Q=       6.8      81.0       4.7       7.6
   AREA=      70.7     208.2      41.2     120.6
    VEL=       0.4       1.5       0.4       0.2

*SECNO 12.000

        VALLEY SECT. 50 FT. D/S OF 5X7 FT CMP CULVERT    SECT. 12

    12.00     10.32    768.52      0.00      0.00    768.53      0.01      0.04      0.00    758.20
     385.      177.       96.      112.      529.       74.      381.       50.       16.    758.20
     1.32      0.33      1.30      0.29     0.080     0.035     0.080     0.034    758.20    495.48
 0.020042      750.      725.      700.         3         0         0      0.00    245.74    741.23

FLOW DISTRIBUTION FOR SECNO=      12.00          CWSEL=     768.52

STA=      495.      558.      607.      616.      624.      634.      692.      741.
  PER Q=      12.5      25.2       8.1      25.1       8.1      17.8       3.2
   AREA=     191.4     263.1      74.5      74.3      74.5     229.6      76.9
    VEL=       0.3       0.4       0.4       1.3       0.4       0.3       0.2
```

CCHV= 0.300 CEHV= 0.500
*SECNO 12.100

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	CLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IN2	ICONT	CORAR	TOPWID	ENDST

D/S FACE OF 5x7 FT. CMP CULVERT

12.10	10.33	768.53	0.00	0.00	768.53	0.01	0.00	0.00	758.20
385.	177.	96.	112.	529.	74.	381.	51.	17.	758.20
1.35	0.33	1.30	0.29	0.080	0.035	0.080	0.034	752.20	495.46
0.000041	50.	50.	50.	0		0	0.00	245.81	741.26

FLOW DISTRIBUTION FOR SECNO= 12.10 CWSEL= 768.53

STA=	495.	558.	607.	616.	624.	634.	692.	741.
PER Q=	12.5	25.3	8.1	25.0	8.1	17.8	3.2	
AREA=	191.6	263.2	74.5	74.4	74.5	229.7	77.0	
VEL=	0.3	0.4	0.4	1.3	0.4	0.3	0.2	

*SECNO 12.200

3370 NORMAL BRIDGE,NRD= 11 MIN ELTRD= 763.80 MAX ELLC= 762.50

12.20	10.33	768.53	0.00	0.00	768.54	0.00	0.00	0.00	758.20
385.	216.	41.	128.	500.	57.	352.	51.	17.	758.20
1.35	0.43	0.71	0.36	0.080	0.035	0.080	0.034	758.20	495.46
0.000076	1.	1.	1.	0	0	0	-74.55	245.79	741.25

FLOW DISTRIBUTION FOR SECNO= 12.20 CWSEL= 768.53

STA=	495.	558.	607.	616.	624.	634.	692.	741.
PER Q=	17.0	34.2	4.9	10.6	4.9	24.1	4.4	
AREA=	191.5	263.2	45.8	57.2	45.8	229.7	77.0	
VEL=	0.3	0.5	0.4	0.7	0.4	0.4	0.2	

*SECNO 12.300

3370 NORMAL BRIDGE,NRD= 11 MIN ELTRD= 763.80 MAX ELLC= 762.50

12.30	10.33	768.53	0.00	0.00	768.54	0.00	0.00	0.00	758.20
385.	216.	41.	128.	502.	57.	353.	52.	17.	758.20
1.38	0.43	0.71	0.36	0.080	0.035	0.080	0.034	758.20	495.38
0.000076	40.	40.	40.	0	0	0	-74.55	245.71	741.39

FLOW DISTRIBUTION FOR SECNO= 12.30 CWSEL= 768.53

STA=	495.	558.	607.	616.	624.	634.	692.	741.
PER Q=	17.0	34.2	4.9	10.6	4.9	24.1	4.4	
AREA=	192.1	263.6	45.9	57.3	45.9	230.2	77.4	
VEL=	0.3	0.5	0.4	0.7	0.4	0.4	0.2	

*SECNO 12.400

U/S FACE OF 5X7 FT. CULVERT

12.40	10.33	768.53	0.00	0.00	768.54	0.01	0.00	0.00	758.20

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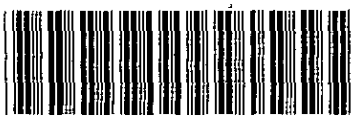

1) COUNITY: KALAMAZOO

2) STUDY NAME: CITY OF KALAMAZOO

3) WATERCOURSE: AXTELL CREEK

4) DOCUMENT TYPE: 100-YR SUMMARY



****
HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
ERROR CORR - 01
MODIFICATION - 50,51,52
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

AXTELL CREEK KALAMAZOO

SUMMARY PRINTOUT TABLE 110

	SECNO	CWSEL	DIFKWS	EG	TOPWID	QLOB	QCH	QROB	PERENC	STENCL	STCHL	STCHR	STENCR
	1.000	760.15	0.00	760.56	31.36	0.00	385.00	0.00	0.00	0.00	1489.00	1528.00	0.00
	1.000	760.15	0.00	760.56	31.36	0.00	385.00	0.00	0.00	1489.00	1489.00	1528.00	1528.00
	2.000	761.14	0.00	761.32	37.56	6.22	378.77	0.01	0.00	0.00	607.00	632.00	0.00
	2.000	761.19	0.05	761.37	25.00	0.00	385.00	0.00	0.02	607.00	607.00	632.00	632.00
*	2.500	762.86	0.00	763.29	89.21	23.37	246.02	24.60	0.00	0.00	20.00	70.00	0.00
*	2.500	762.86	0.00	763.30	89.00	22.80	247.17	24.03	0.00	1.00	20.00	70.00	90.00
	3.000	763.55	0.00	763.60	169.39	16.02	202.16	75.82	0.00	0.00	20.00	80.00	0.00
	3.000	763.58	0.03	763.64	139.22	2.76	222.30	68.94	0.09	16.24	20.00	80.00	155.47
	4.000	763.87	0.00	763.94	214.29	4.68	124.76	164.56	0.00	0.00	10.00	70.00	0.00
	4.000	763.94	0.07	764.04	177.49	0.00	154.65	139.35	0.17	10.00	10.00	70.00	187.49
	5.000	764.20	0.00	764.28	74.59	19.72	253.15	21.13	0.00	0.00	15.00	60.00	0.00
	5.000	764.31	0.11	764.39	63.26	10.92	270.64	12.44	0.07	6.39	15.00	60.00	69.65
	5.010	764.26	0.00	764.30	76.14	25.88	312.05	47.07	0.00	0.00	1120.00	1140.00	0.00
	5.010	764.39	0.11	764.42	61.26	22.22	317.76	45.02	0.02	1110.95	1120.00	1140.00	1172.21
	5.020	764.31	0.00	764.31	246.72	144.71	92.12	148.16	0.00	0.00	778.00	790.00	0.00
	5.020	764.43	0.11	764.43	190.14	143.90	93.66	147.44	0.02	689.93	778.00	790.00	880.07
	5.100	764.31	0.00	764.31	246.69	144.70	92.14	148.16	0.00	0.00	778.00	790.00	0.00
	5.100	764.43	0.11	764.43	189.63	143.86	93.73	147.41	0.02	690.18	778.00	790.00	879.82
	5.200	764.31	0.00	764.32	246.65	124.99	132.23	127.77	0.00	0.00	778.00	790.00	0.00
	5.200	764.42	0.11	764.44	183.44	123.30	135.40	126.31	0.05	693.28	778.00	790.00	876.72
	[illegible]	[illegible]	[illegible]	764.34	[illegible]	[illegible]	[illegible]	[illegible]	0.00	0.00	778.00	790.00	0.00
	[illegible]	[illegible]	0.11	764.46	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	5.400	764.34	0.00	764.35	247.08	144.79	91.96	148.25	0.00	0.00	778.00	790.00	0.00
	5.400	764.46	0.12	764.46	188.37	143.85	93.75	147.40	0.03	690.81	778.00	790.00	879.19
	5.500	764.34	0.00	764.35	247.37	144.86	[illegible]	[illegible]	0.00	0.00	778.00	790.00	0.00
	5.500	764.46	0.12	764.46	191.23	144.0	93.29	147.62	0.02	689.38	778.00	790.00	880.62

SECNO	CWSEL	DIFKWS	EG	TOPWID	QLOB	QCH	QROB	PERENC	STENCL	STCHL	STCHR	STENCR
5.600	764.34	0.00	764.35	229.22	127.86	128.90	128.24	0.00	0.00	823.50	836.50	0.00
5.600	**764.46**	**0.11**	**764.47**	**145.62**	**126.48**	**131.60**	**126.92**	**0.03**	**757.68**	**823.50**	**836.50**	**903.30**
6.100	764.35	0.00	764.36	229.18	127.85	128.91	128.23	0.00	0.00	823.50	836.50	0.00
6.100	764.47	0.11	764.47	144.46	126.3[illegible]	131.83	126.80	0.03	758.25	823.50	836.50	902.71
6.200	764.34	0.00	764.36	229.23	116.28	147.20	119.46	0.00	0.00	823.50	836.50	0.00
6.200	**764.46**	**0.11**	**764.48**	**159.18**	**116.73**	**150.12**	**118.15**	**0.06**	**750.97**	**823.50**	**836.50**	**910.15**
6.300	764.38	0.00	764.40	230.33	119.00	145.80	120.20	0.00	0.00	823.50	836.50	0.00
6.300	764.50	0.11	764.52	156.83	116.85	149.[illegible]	118.32	0.07	752.14	823.50	836.50	908.97
6.400	764.40	0.00	764.41	231.09	128.21	128.19	128.60	0.00	0.00	823.50	836.50	0.00
6.400	**764.51**	**0.11**	**764.52**	**144.33**	**126.61**	**131.36**	**127.04**	**0.04**	**758.33**	**823.50**	**836.50**	**902.66**
6.500	764.40	0.00	764.41	231.86	128.35	127.90	128.75	0.00	0.00	823.50	836.50	0.00
6.500	764.52	0.11	764.53	148.70	126.95	130.56	127.47	0.03	756.16	823.50	836.50	904.87
6.600	764.44	0.00	764.47	136.04	102.30	183.79	98.92	0.00	0.00	951.80	964.20	0.00
6.600	**764.55**	**0.11**	**764.59**	**82.23**	**99.88**	**188.17**	**96.95**	**0.03**	**918.01**	**951.80**	**964.20**	**1000.24**
7.000	764.45	0.00	764.48	136.23	102.36	183.66	98.99	0.00	0.00	951.80	964.20	0.00
7.000	764.56	0.11	764.59	82.22	99.92	188.05	97.00	0.03	917.03	951.80	964.20	1000.25
7.100	764.42	0.00	764.50	139.53	96.06	183.34	105.63	0.00	0.00	952.10	963.90	0.00
7.100	**764.54**	**0.11**	**764.62**	**93.19**	**91.68**	**189.14**	**104.10**	**0.07**	**914.04**	**952.10**	**963.90**	**1007.23**
7.200	764.62	0.00	764.68	145.25	101.45	170.61	112.94	0.00	0.00	952.10	963.90	0.00
7.200	764.73	0.11	764.79	96.65	97.40	175.77	111.83	0.04	912.90	952.10	963.90	1009.55
7.300	764.62	0.00	764.68	145.31	94.67	234.60	65.73	0.00	0.00	952.10	963.90	0.00
7.300	**764.74**	**0.12**	**764.80**	**89.90**	**81.83**	**239.61**	**63.55**	**0.03**	**915.84**	**952.10**	**963.90**	**1005.74**
8.000	764.68	0.00	764.70	170.86	44.01	276.80	64.19	0.00	0.00	835.00	864.00	0.00
8.000	764.80	0.12	764.81	102.68	39.85	282.50	62.64	0.03	914.44	835.00	864.00	917.12
9.000	764.68	0.00	764.71	156.59	41.71	287.64	55.65	0.00	0.00	835.00	864.00	0.00
9.000	**764.80**	**0.12**	**764.82**	**93.63**	**37.27**	**294.00**	**53.73**	**0.03**	**816.26**	**835.00**	**864.00**	**909.89**
9.100	764.68	0.00	764.72	150.66	114.92	181.54	88.54	0.00	0.00	704.80	715.30	0.00
9.100	764.80	0.12	764.84	95.46	113.88	185.03	86.10	0.03	661.04	704.80	715.30	746.50
9.200	764.69	0.00	764.73	150.65	205.36	73.56	106.08	0.00	0.00	704.80	715.30	0.00
9.200	**764.80**	**0.11**	**764.84**	**89.37**	**205.59**	**77.38**	**102.03**	**0.07**	**659.19**	**704.80**	**715.30**	**748.57**
9.300	764.72	0.00	764.75	151.62	205.20	73.20	106.60	0.00	0.00	704.80	715.30	0.00
9.300	764.83	0.11	764.87	90.10	205.41	76.91	102.79	0.07	658.57	704.80	715.30	748.96
9.400	764.71	0.00	764.76	151.64	115.[illegible]	179.79	[illegible]	[illegible]	0.00	704.80	715.30	0.00
9.400	**764.83**	**0.11**	**764.87**	**86.17**	**114.27**	**184.35**	**96.39**	**0.03**	**660.71**	**704.80**	**715.30**	**746.88**
9.500	764.72	0.00	764.77	152.02	115.44	180.68	88.89	0.00	0.00	704.80	715.30	0.00
9.500	764.84	0.11	764.88	95.24	114.1[illegible]	184.61	[illegible].21	0.03	661.19	704.80	715.30	746.39
10.000	764.77	0.00	764.79	150.[illegible]	145.49	112.62	124.90	[illegible].00	0.00	600.00	620.00	0.00
10.000	**764.88**	**0.11**	**764.89**	**141.34**	**145.34**	**114.34**	**125.32**	**0.03**	**539.95**	**600.00**	**620.00**	**681.29**

SECNO	CWSEL	DIFKWS	FG	TOPWID	QLOP	QCH	QROD	PERENC	STENCL	STCHL	STCHP	STENCR
10.100	764.74	0.00	764.79	143.81	54.44	89.58	70.98	0.00	0.00	602.00	630.00	0.00
10.100	**764.85**	**0.10**	**764.91**	**77.05**	**48.36**	**99.13**	**67.50**	**0.13**	**582.79**	**602.00**	**630.00**	**659.83**
10.200	765.28	0.00	765.35	127.42	42.75	127.36	44.89	0.00	0.00	600.00	640.00	0.00
10.200	765.37	0.09	765.47	66.38	33.92	144.46	36.62	0.15	587.34	600.00	640.00	653.72
10.300	766.15	0.00	766.23	128.84	41.32	135.50	35.11	0.00	0.00	595.00	640.00	0.00
10.300	**766.25**	**0.10**	**766.36**	**67.64**	**31.83**	**155.56**	**27.61**	**0.16**	**582.84**	**595.00**	**640.00**	**650.47**
10.400	767.21	0.00	767.30	141.53	41.64	143.77	29.58	0.00	0.00	590.00	645.00	0.00
10.400	767.31	0.10	767.42	74.35	31.34	168.57	15.09	0.19	576.85	590.00	645.00	651.20
10.500	768.32	0.00	768.48	139.29	73.07	130.93	11.00	0.00	0.00	496.00	558.00	0.00
10.500	**768.48**	**0.10**	**768.61**	**88.02**	**55.27**	**159.73**	**0.00**	**0.21**	**469.98**	**496.00**	**558.00**	**558.00**
11.000	768.46	0.00	768.49	99.49	26.07	311.68	47.25	0.00	0.00	750.00	772.00	0.00
11.000	768.60	0.14	768.63	99.00	24.06	310.29	50.65	99.00	740.00	750.00	772.00	830.90
12.000	768.52	0.00	768.53	245.74	176.59	96.45	111.95	0.00	0.00	616.40	623.60	0.00
12.000	**768.66**	**0.14**	**768.67**	**175.04**	**176.52**	**97.69**	**110.79**	**0.03**	**528.83**	**616.40**	**623.60**	**703.87**
12.100	768.53	0.00	768.53	245.81	176.60	96.42	111.98	0.00	0.00	616.40	623.60	0.00
12.100	768.66	0.14	768.67	175.13	176.52	97.65	110.79	0.03	528.80	616.40	623.60	703.93
12.200	768.53	0.00	768.54	245.79	215.67	40.86	128.27	0.00	0.00	616.40	623.60	0.00
12.200	**768.67**	**0.14**	**768.67**	**176.16**	**216.20**	**41.67**	**127.13**	**0.04**	**528.43**	**616.40**	**623.60**	**704.58**
12.300	768.53	0.00	768.54	246.01	215.82	40.80	128.37	0.00	0.00	616.40	623.60	0.00
12.300	768.67	0.14	768.67	177.15	216.19	41.52	127.38	0.04	528.07	616.40	623.60	705.22
12.400	768.53	0.00	768.54	246.03	176.63	96.30	112.04	0.00	0.00	616.40	623.60	0.00
12.400	**768.67**	**0.14**	**768.68**	**175.52**	**176.55**	**97.48**	**110.97**	**0.03**	**528.66**	**616.40**	**623.60**	**704.18**
13.000	768.53	0.00	768.54	246.02	176.62	96.30	112.08	0.00	0.00	616.40	623.60	0.00
13.000	768.67	0.14	768.68	175.27	176.54	97.54	110.92	0.03	528.75	616.40	623.60	704.02
14.000	768.55	0.00	768.55	292.63	42.30	35.12	307.50	0.00	0.00	648.90	655.10	0.00
14.000	**768.68**	**0.14**	**768.68**	**259.47**	**38.66**	**35.56**	**310.78**	**0.02**	**619.47**	**648.90**	**655.10**	**878.95**
14.500	768.55	0.00	768.55	330.16	21.68	11.27	167.05	0.00	0.00	648.90	655.10	0.00
14.500	768.69	0.14	768.69	321.09	20.02	11.41	168.57	0.03	498.86	648.90	655.10	819.95
14.600	768.55	0.00	768.55	330.16	40.97	7.83	151.19	0.00	0.00	648.90	655.10	0.00
14.600	**768.68**	**0.14**	**768.68**	**321.04**	**38.52**	**7.89**	**153.59**	**0.04**	**497.31**	**648.90**	**655.10**	**818.35**
14.700	768.55	0.00	768.55	330.17	76.43	17.41	106.16	0.00	0.00	648.90	655.10	0.00
14.700	768.69	0.14	768.69	314.62	76.15	17.60	106.25	0.03	502.16	648.90	655.10	816.58
14.800	768.55	0.00	768.55	330.16	76.41	17.41	106.17	0.00	0.00	648.90	655.10	0.00
14.800	**768.69**	**0.14**	**768.69**	**314.12**	**76.15**	**17.60**	**106.25**	**0.03**	**502.31**	**648.90**	**655.10**	**816.43**
15.000	768.55	0.00	768.55	330.17	76.42	17.41	106.17	0.00	0.00	648.90	655.10	0.00
15.000	768.69	0.14	768.69	314.12	76.15	17.60	106.25	0.03	502.31	648.90	655.10	816.43
16.000	768.55	0.00	768.56	253.02	47.05	76.79	76.15	0.00	0.00	700.00	710.00	0.00
16.000	**768.69**	**0.14**	**768.69**	**182.61**	**45.22**	**77.77**	**77.01**	**0.05**	**651.24**	**700.00**	**710.00**	**833.85**

PRINTED IN U.S.A.
FORM 1411-28 PRINTED BY ROTARY MANIFOLD FORMS

SECNO	CWSEL	DIFKWS	EG	TOPWID	QLOB	QCH	QROB	PERENC	STENCL	STCHL	STCHR	STENCR
16.100	768.56	0.00	768.56	253.02	18.91	18.39	27.70	0.00	0.00	697.00	703.00	0.00
16.100	768.69	0.14	768.69	178.38	18.40	18.67	27.93	0.04	653.80	697.00	703.00	832.18
16.200	768.56	0.00	768.56	253.25	17.97	4.79	42.24	0.00	0.00	697.00	703.00	0.00
16.200	768.69	0.14	768.69	185.85	17.03	4.98	42.99	0.07	649.25	697.00	703.00	835.10
16.300	768.56	0.00	768.56	253.29	17.97	4.79	42.24	0.00	0.00	697.00	703.00	0.00
16.300	768.70	0.14	768.70	185.83	17.03	4.98	42.99	0.07	649.26	697.00	703.00	835.09
16.400	768.56	0.00	768.56	253.31	18.31	16.82	29.87	0.00	0.00	697.00	703.00	0.00
16.400	768.70	0.14	768.70	180.89	17.77	17.07	30.16	0.04	652.26	697.00	703.00	833.15
17.000	768.56	0.00	768.56	253.32	7.06	35.55	22.38	0.00	0.00	690.00	710.00	0.00
17.000	768.70	0.14	768.70	180.45	6.19	36.36	22.46	0.05	652.53	690.00	710.00	832.98
17.100	768.56	0.00	768.56	241.18	25.52	15.40	24.08	0.00	0.00	698.50	701.50	0.00
17.100	768.70	0.14	768.70	174.38	24.94	15.46	24.60	0.06	647.46	698.50	701.50	821.84
17.200	768.56	0.00	768.56	241.17	28.35	6.54	30.10	0.00	0.00	698.50	701.50	0.00
17.200	768.70	0.14	768.70	176.30	27.50	6.62	30.89	0.09	646.62	698.50	701.50	822.92
17.300	768.56	0.00	768.56	241.22	28.35	6.54	30.11	0.00	0.00	698.50	701.50	0.00
17.300	768.70	0.14	768.70	176.48	27.49	6.61	30.90	0.09	646.54	698.50	701.50	823.02
17.400	768.56	0.00	768.56	241.23	25.52	15.32	24.03	0.00	0.00	698.50	701.50	0.00
17.400	768.70	0.14	768.70	174.41	24.94	15.46	24.61	0.06	647.44	698.50	701.50	821.86
18.100	768.56	0.00	768.56	235.59	30.90	6.64	27.46	0.00	0.00	649.00	651.00	0.00
18.100	768.70	0.14	768.70	113.80	30.84	6.74	27.40	0.07	593.52	649.00	651.00	707.32
18.200	768.56	0.00	768.56	235.61	34.03	1.15	29.78	0.00	0.00	649.00	651.00	0.00
18.200	768.70	0.13	768.70	119.61	33.99	1.14	29.87	0.11	590.88	649.00	651.00	710.50
18.300	768.58	0.00	768.58	236.72	34.01	1.17	29.82	0.00	0.00	649.00	651.00	0.00
18.300	768.71	0.13	768.72	119.20	33.97	1.13	29.90	0.11	591.10	649.00	651.00	710.30
18.400	768.58	0.00	768.58	237.39	30.91	6.59	27.50	0.00	0.00	649.00	651.00	0.00
18.400	768.72	0.13	768.72	114.87	30.85	6.70	27.45	0.07	593.06	649.00	651.00	707.96
18.500	768.58	0.00	768.58	213.73	11.12	8.47	45.42	0.00	0.00	647.50	652.50	0.00
18.500	768.72	0.13	768.72	135.34	10.58	8.78	45.64	0.06	598.82	647.50	652.50	734.16
19.000	768.58	0.00	768.61	197.66	23.99	21.34	19.67	0.00	0.00	515.00	525.00	0.00
19.000	768.71	0.13	768.74	101.36	20.76	24.26	19.98	0.24	474.15	515.00	525.00	575.50

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FORM [illegible] PRINTED BY ROTARY MANIFOLD FORM

AXTELL CREEK KALAMAZOO

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
	1.000	0.00	0.00	0.00	756.30	385.00	760.1[illegible]	0.00	760.56	48.57	5.15	74.75	55.24
	1.000	0.00	0.00	0.00	756.30	385.00	760.1[illegible]	0.00	760.56	48.57	5.15	74.75	55.24
	2.000	**390.00**	**0.00**	**0.00**	**754.50**	**385.00**	**761.14**	**0.00**	**761.32**	**9.90**	**3.38**	**122.74**	**122.36**
	2.000	**390.00**	**0.00**	**0.00**	**754.50**	**385.00**	**761.19**	**0.00**	**761.37**	**11.01**	**3.40**	**113.34**	**116.05**
*	2.500	40.00	0.00	0.00	762.00	294.00	762.86	762.86	763.29	73.10	5.74	76.45	34.39
*	2.500	40.00	0.00	0.00	762.00	294.00	762.86	762.86	763.30	73.36	5.75	76.48	34.33
	3.000	**230.00**	**0.00**	**0.00**	**762.00**	**294.00**	**763.55**	**0.00**	**763.60**	**4.67**	**2.16**	**263.95**	**136.05**
	3.000	**230.00**	**0.00**	**0.00**	**762.00**	**294.00**	**763.58**	**0.00**	**763.64**	**5.48**	**2.35**	**219.13**	**125.57**
	4.000	350.00	0.00	0.00	762.40	294.00	763.87	0.00	763.94	29.41	3.11	201.49	53.85
	4.000	350.00	0.00	0.00	762.40	294.00	763.94	0.00	764.04	34.19	3.51	168.55	50.28
	5.000	**475.00**	**0.00**	**0.00**	**761.80**	**294.00**	**764.20**	**0.00**	**764.28**	**3.08**	**2.34**	**178.53**	**167.42**
	5.000	**475.00**	**0.00**	**0.00**	**761.80**	**294.00**	**764.31**	**0.00**	**764.39**	**3.05**	**2.40**	**158.73**	**168.27**
	5.010	160.00	0.00	0.00	755.20	385.00	764.2[illegible]	0.00	764.30	0.87	1.72	367.33	412.87
	5.010	160.00	0.00	0.00	755.20	385.00	764.38	0.00	764.42	0.86	1.73	346.79	414.01
	5.020	**260.00**	**0.00**	**0.00**	**752.70**	**385.00**	**764.31**	**0.00**	**764.31**	**0.16**	**0.75**	**1325.24**	**954.49**
	5.020	**260.00**	**0.00**	**0.00**	**752.70**	**385.00**	**764.43**	**0.00**	**764.43**	**0.16**	**0.76**	**1256.22**	**955.88**
	5.100	50.00	0.00	0.00	752.70	385.00	764.31	0.00	764.31	0.16	0.75	1324.76	954.02
	5.100	50.00	0.00	0.00	752.70	385.00	764.43	0.00	764.43	0.16	0.76	1254.64	955.27
	5.200	**1.00**	**762.00**	**759.50**	**752.70**	**385.00**	**764.31**	**0.00**	**764.32**	**3.43**	**1.44**	**545.72**	**207.98**
	5.200	**1.00**	**762.00**	**759.50**	**752.70**	**385.00**	**764.42**	**0.00**	**764.44**	**3.42**	**1.45**	**505.18**	**208.26**
	5.300	64.00	762.00	759.50	752.70	385.00	764.33	0.00	764.34	3.38	1.43	548.35	209.34
	5.300	64.00	762.00	759.50	752.70	385.00	764.44	0.00	764.46	3.40	1.45	504.31	208.81
	5.400	**1.00**	**0.00**	**0.00**	**752.70**	**385.00**	**764.34**	**0.00**	**764.35**	**0.16**	**0.75**	**1330.24**	**959.36**
	5.400	**1.00**	**0.00**	**0.00**	**752.70**	**385.00**	**764.46**	**0.00**	**764.46**	**0.16**	**0.76**	**1254.86**	**958.66**
	5.500	50.00	0.00	0.00	752.70	385.00	764.34	0.00	764.35	0.16	0.75	1334.17	963.19
	5.500	50.00	0.00	0.00	752.70	385.00	764.46	0.00	764.46	0.16	0.75	1266.05	964.72
	5.600	**210.00**	**0.00**	**0.00**	**756.40**	**385.00**	**764.34**	**0.00**	**764.35**	**0.66**	**1.31**	**773.19**	**475.68**
	5.600	**210.00**	**0.00**	**0.00**	**756.40**	**385.00**	**764.46**	**0.00**	**764.47**	**0.65**	**1.32**	**710.46**	**478.33**
	5.700	50.00	0.00	0.00	756.40	385.00	764.35	0.00	764.36	0.66	1.32	772.97	475.52
	5.700	50.00	0.00	0.00	756.40	385.00	764.47	0.00	764.47	0.65	1.33	707.42	477.02
	6.200	**1.00**	**762.30**	**761.20**	**756.40**	**385.00**	**764.34**	**0.00**	**764.36**	**6.27**	**1.77**	**434.69**	**153.73**
	6.200	**1.00**	**762.30**	**761.20**	**756.40**	**385.00**	**764.46**	**0.00**	**764.48**	**6.14**	**1.77**	**396.73**	**155.35**
	6.300	64.00	762.30	761.20	756.40	385.00	764.36	0.00	764.40	6.07	1.74	440.47	156.28
	6.300	64.00	762.30	761.20	756.40	385.00	764.50	0.00	764.52	6.03	1.76	397.30	156.84
	6.400	**1.00**	**0.00**	**0.00**	**756.40**	**385.00**	**764.40**	**0.00**	**764.41**	**0.64**	**1.30**	**783.08**	**482.86**
	6.400	**1.00**	**0.00**	**0.00**	**756.40**	**385.00**	**764.51**	**0.00**	**764.52**	**0.64**	**1.31**	**713.14**	**483.06**

FORM 1412 68 PRINTED BY ROTARY MANIFOLD FORMS
PRINTED IN U.S.A.

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
6.500	50.00	0.00	0.00	756.40	385.00	764.40	0.00	764.41	0.63	1.29	787.15	485.81
6.500	50.00	0.00	0.00	756.40	385.00	764.52	0.00	764.53	0.62	1.30	723.86	487.31
6.600	570.00	0.00	0.00	756.70	385.00	764.44	0.00	764.47	1.52	1.99	449.60	312.32
6.600	570.00	0.00	0.00	756.70	385.00	764.58	0.00	764.59	1.51	2.01	406.50	312.98
7.000	50.00	0.00	0.00	756.70	385.00	764.45	0.00	764.48	1.51	1.99	450.53	313.02
7.000	50.00	0.00	0.00	756.70	385.00	764.56	0.00	764.59	1.51	2.01	407.07	313.63
7.100	1.00	762.00	761.10	755.90	385.00	764.42	0.00	764.50	23.16	2.96	239.98	80.01
7.100	1.00	762.00	761.10	755.90	385.00	764.54	0.00	764.62	22.97	2.99	213.65	80.33
7.200	85.00	762.00	761.10	755.90	385.00	764.67	0.00	764.68	17.77	2.66	267.58	91.34
7.200	85.00	762.00	761.10	755.90	385.00	764.73	0.00	764.79	17.62	2.69	238.01	91.72
7.300	1.00	0.00	0.00	755.90	385.00	764.62	0.00	764.68	1.95	2.40	395.69	275.69
7.300	1.00	0.00	0.00	755.90	385.00	764.74	0.00	764.80	1.95	2.42	352.98	275.97
8.000	65.00	0.00	0.00	756.50	385.00	764.68	0.00	764.70	0.60	1.24	587.65	497.54
8.000	65.00	0.00	0.00	756.50	385.00	764.80	0.00	764.81	0.59	1.25	516.31	499.24
9.000	135.00	0.00	0.00	757.00	385.00	764.68	0.00	764.71	0.81	1.38	506.67	428.37
9.000	135.00	0.00	0.00	757.00	385.00	764.80	0.00	764.82	0.80	1.39	446.13	430.21
9.100	50.00	0.00	0.00	757.00	385.00	764.69	0.00	764.72	2.10	2.31	415.86	265.67
9.100	50.00	0.00	0.00	757.00	385.00	764.80	0.00	764.84	2.07	2.32	367.14	267.48
9.200	1.00	759.70	760.00	757.00	385.00	764.69	0.00	764.73	16.31	2.03	291.34	95.34
9.200	1.00	759.70	760.00	757.00	385.00	764.80	0.00	764.84	16.24	2.07	249.49	95.53
9.300	15.00	759.70	760.00	757.00	385.00	764.72	0.00	764.75	15.74	2.00	295.36	97.05
9.300	15.00	759.70	760.00	757.00	385.00	764.83	0.00	764.87	15.64	2.04	253.25	97.35
9.400	1.00	0.00	0.00	757.00	385.00	764.71	0.00	764.76	2.05	2.29	420.96	268.82
9.400	1.00	0.00	0.00	757.00	385.00	764.83	0.00	764.87	2.03	2.30	370.76	269.94
9.500	50.00	0.00	0.00	757.00	385.00	764.72	0.00	764.77	2.05	2.29	421.51	269.17
9.500	50.00	0.00	0.00	757.00	385.00	764.84	0.00	764.88	2.03	2.30	369.57	269.98
10.000	80.00	0.00	0.00	758.70	385.00	764.77	0.00	764.78	0.43	0.93	833.87	586.39
10.000	80.00	0.00	0.00	758.70	385.00	764.88	0.00	764.89	0.42	0.92	825.57	595.80
10.100	20.00	0.00	0.00	763.20	215.00	764.74	0.00	764.79	69.69	2.07	132.65	25.75
10.100	20.00	0.00	0.00	763.20	215.00	764.85	0.00	764.91	68.72	2.15	110.57	25.94
10.200	60.00	0.00	0.00	764.00	215.00	765.28	0.00	765.35	129.27	2.49	107.09	18.91
10.200	60.00	0.00	0.00	764.00	215.00	765.39	0.00	765.47	159.61	2.47	99.22	18.91
10.300	60.00	0.00	0.00	765.00	215.00	766.15	0.00	766.22	165.48	2.73	99.82	16.70
10.300	60.00	0.00	0.00	765.00	215.00	766.25	0.00	766.36	166.01	2.77	80.82	16.69
10.400	60.00	0.00	0.00	766.20	215.00	767.21	0.00	767.30	190.50	2.58	99.41	15.58
10.400	60.00	0.00	0.00	766.20	215.00	767.31	0.00	767.40	191.03	2.76	80.43	15.56
10.500	50.00	0.00	0.00	767.60	215.00	768.48	0.00	768.48	297.40	2.71	88.05	12.47
10.500	50.00	0.00	0.00	767.60	215.00	768.48	0.00	768.61	299.83	2.92	75.11	12.42

SECNO	XLCH	ELTRD	FLLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	APFA	.01K
11.000	70.00	0.00	0.00	759.00	385.00	768.46	0.00	768.49	0.62	1.50	440.74	488.71
11.000	**70.00**	**0.00**	**0.00**	**759.00**	**385.00**	**768.60**	**0.00**	**768.63**	**0.59**	**1.47**	**444.72**	**502.96**
12.000	725.00	0.00	0.00	758.20	385.00	768.52	0.00	768.53	0.42	1.30	984.23	597.33
12.000	725.00	0.00	0.00	758.20	385.00	768.66	0.00	768.67	0.41	1.30	909.26	602.76
12.100	50.00	0.00	0.00	758.20	385.00	768.53	0.00	768.53	0.41	1.30	984.83	597.78
12.100	**50.00**	**0.00**	**0.00**	**758.20**	**385.00**	**768.66**	**0.00**	**768.67**	**0.41**	**1.30**	**909.79**	**603.14**
12.200	1.00	763.80	762.50	758.20	385.00	768.53	0.00	768.54	0.76	0.71	910.16	440.94
12.200	1.00	763.80	762.50	758.20	385.00	768.67	0.00	768.67	0.75	0.72	835.14	444.78
12.300	40.00	763.80	762.50	758.20	385.00	768.53	0.00	768.54	0.76	0.71	912.27	442.36
12.300	**40.00**	**763.80**	**762.50**	**758.20**	**385.00**	**768.67**	**0.00**	**768.67**	**0.74**	**0.71**	**842.44**	**447.15**
12.400	1.00	0.00	0.00	758.20	385.00	768.53	0.00	768.54	0.41	1.29	986.94	599.37
12.400	1.00	0.00	0.00	758.20	385.00	768.67	0.00	768.68	0.40	1.29	912.44	605.06
13.000	30.00	0.00	0.00	758.20	385.00	768.53	0.00	768.54	0.41	1.29	986.88	599.33
13.000	**30.00**	**0.00**	**0.00**	**758.20**	**385.00**	**768.67**	**0.00**	**768.68**	**0.41**	**1.29**	**911.58**	**604.62**
14.000	340.00	0.00	0.00	756.70	385.00	768.55	0.00	768.55	0.11	0.51	1796.49	1184.14
14.000	340.00	0.00	0.00	756.70	385.00	768.68	0.00	768.68	0.10	0.51	1754.75	1192.51
14.500	30.00	0.00	0.00	758.30	200.00	768.55	0.00	768.55	0.06	0.18	1924.29	788.42
14.500	**30.00**	**0.00**	**0.00**	**758.30**	**200.00**	**768.68**	**0.00**	**768.68**	**0.06**	**0.18**	**1944.37**	**795.96**
14.600	1.00	764.30	762.70	758.30	200.00	768.55	0.00	768.55	0.24	0.16	1298.20	409.06
14.600	1.00	764.30	762.70	758.30	200.00	768.68	0.00	768.68	0.23	0.16	1321.69	418.04
14.700	202.00	0.00	0.00	756.70	200.00	768.55	0.00	768.55	0.03	0.25	1931.06	1241.69
14.700	**202.00**	**0.00**	**0.00**	**756.70**	**200.00**	**768.69**	**0.00**	**768.69**	**0.03**	**0.25**	**1925.59**	**1253.86**
14.800	1.00	0.00	0.00	756.70	200.00	768.55	0.00	768.55	0.03	0.25	1930.58	1241.20
14.800	1.00	0.00	0.00	756.70	200.00	768.69	0.00	768.69	0.03	0.25	1924.22	1253.14
15.000	50.00	0.00	0.00	756.70	200.00	768.55	0.00	768.55	0.03	0.25	1930.66	1241.28
15.000	**50.00**	**0.00**	**0.00**	**756.70**	**200.00**	**768.69**	**0.00**	**768.69**	**0.03**	**0.25**	**1924.31**	**1253.23**
16.000	600.00	0.00	0.00	759.00	200.00	768.55	0.00	768.56	0.54	0.97	586.04	272.39
16.000	600.00	0.00	0.00	759.00	200.00	768.69	0.00	768.69	0.52	0.96	541.89	276.97
16.100	50.00	0.00	0.00	758.50	65.00	768.56	0.00	768.56	0.03	0.31	717.81	406.21
16.100	**50.00**	**0.00**	**0.00**	**758.50**	**65.00**	**768.69**	**0.00**	**768.69**	**0.03**	**0.31**	**663.11**	**409.35**
16.200	1.00	765.70	761.20	759.80	65.00	768.56	0.00	768.56	0.18	0.21	497.91	153.34
16.200	1.00	765.70	761.20	759.80	65.00	768.69	0.00	768.69	0.17	0.21	459.18	156.45
16.300	73.00	765.70	761.20	759.80	65.00	768.56	0.00	768.56	0.1	0.21	497.18	153.45
16.300	**73.00**	**765.70**	**761.20**	**759.80**	**65.00**	**768.70**	**0.00**	**768.70**	**0.17**	**0.21**	**459.33**	**156.59**
16.400	1.00	0.00	0.00	759.80	65.00	768.56	0.00	768.56	0.04	0.33	672.42	344.63
16.400	1.00	0.00	0.00	759.80	65.00	768.70	0.00	768.70	0.03	0.33	622.96	349.63
17.000	37.00	0.00	0.00	760.80	65.00	768.56	0.00	768.56	0.04	0.28	590.45	311.48
17.000	**37.00**	**0.00**	**0.00**	**760.80**	**65.00**	**768.70**	**0.00**	**768.70**	**0.04**	**0.28**	**529.85**	**315.59**

FORM 1411-4 ● PRINTED BY ROTARY MANIFOLD FORMS

SECNO	XLCH	ELTRD	FLLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
17.100	36.00	0.00	0.00	759.40	65.00	768.56	0.00	768.56	0.19	0.59	414.74	149.87
17.100	**36.00**	**0.00**	**0.00**	**759.40**	**65.00**	**768.70**	**0.00**	**768.70**	**0.18**	**0.58**	**381.96**	**153.09**
17.200	1.00	765.10	762.40	759.40	65.00	768.56	0.00	768.56	0.46	0.39	365.07	96.35
17.200	1.00	765.10	762.40	759.40	65.00	768.70	0.00	768.70	0.43	0.39	335.33	99.19
17.300	11.00	765.10	762.40	759.40	65.00	768.56	0.00	768.56	0.45	0.39	365.36	96.46
17.300	**11.00**	**765.10**	**762.40**	**759.40**	**65.00**	**768.70**	**0.00**	**768.70**	**0.43**	**0.39**	**335.88**	**99.38**
17.400	1.00	0.00	0.00	759.40	65.00	768.56	0.00	768.56	0.19	0.59	415.03	149.99
17.400	1.00	0.00	0.00	759.40	65.00	768.70	0.00	768.70	0.18	0.58	382.19	153.19
18.100	50.00	0.00	0.00	762.50	65.00	768.56	0.00	768.56	0.40	0.61	343.22	102.48
18.100	**50.00**	**0.00**	**0.00**	**762.50**	**65.00**	**768.70**	**0.00**	**768.70**	**0.38**	**0.61**	**279.98**	**104.98**
18.200	1.00	766.20	764.90	762.50	65.00	768.56	0.00	768.56	1.63	0.39	254.47	50.90
18.200	1.00	766.20	764.90	762.50	65.00	768.70	0.00	768.70	1.52	0.38	197.28	52.78
18.300	115.00	766.20	764.90	762.50	65.00	768.58	0.00	768.58	1.59	0.38	257.06	51.60
18.300	**115.00**	**766.20**	**764.90**	**762.50**	**65.00**	**768.71**	**0.00**	**768.72**	**1.48**	**0.37**	**198.34**	**53.37**
18.400	1.00	0.00	0.00	762.50	65.00	768.58	0.00	768.58	0.39	0.60	347.73	103.95
18.400	1.00	0.00	0.00	762.50	65.00	768.72	0.00	768.72	0.37	0.60	293.49	106.40
18.500	50.00	0.00	0.00	764.30	65.00	768.58	0.00	768.58	0.14	0.41	454.37	171.71
18.500	**50.00**	**0.00**	**0.00**	**764.30**	**65.00**	**768.72**	**0.00**	**768.72**	**0.14**	**0.41**	**406.77**	**174.48**
19.000	280.00	0.00	0.00	767.10	65.00	768.58	0.00	768.61	27.71	2.18	87.06	12.35
19.000	280.00	0.00	0.00	767.10	65.00	768.71	0.00	768.74	23.89	2.19	70.91	13.30

PRINTED IN U.S.A.

AXTELL CREEK KALAMAZOO

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	1.000	385.00	760.15	0.00	0.00	0.00	31.36	0.00
	1.000	385.00	760.15	0.00	0.00	0.00	31.36	0.00
	2.000	385.00	761.14	0.00	0.99	0.00	37.56	390.00
	2.000	385.00	761.19	0.00	1.04	0.05	25.00	390.00
*	2.500	294.00	762.86	0.00	1.71	0.00	39.21	40.00
*	2.500	294.00	762.86	0.00	1.67	0.00	39.00	40.00
	3.000	294.00	763.55	0.00	0.69	0.00	169.39	230.00
	3.000	294.00	763.58	0.00	0.72	0.03	139.22	230.00
	4.000	294.00	763.87	0.00	0.32	0.00	214.29	350.00
	4.000	294.00	763.94	0.00	0.36	0.07	177.49	350.00
	5.000	294.00	764.20	0.00	0.34	0.00	74.59	475.00
	5.000	294.00	764.31	0.00	0.37	0.11	63.26	475.00
	5.010	385.00	764.26	0.00	0.06	0.00	76.14	160.00
	5.010	385.00	764.38	0.00	0.07	0.11	61.26	160.00
	5.020	385.00	764.31	0.00	0.05	0.00	246.72	260.00
	5.020	385.00	764.43	0.00	0.05	0.11	190.14	260.00
	5.100	385.00	764.31	0.00	0.00	0.00	246.69	50.00
	5.100	385.00	764.43	0.00	0.00	0.11	189.63	50.00
	5.200	385.00	764.31	0.00	-0.01	0.00	246.65	1.00
	5.200	385.00	764.42	0.00	-0.01	0.11	183.44	1.00
	5.300	385.00	764.33	0.00	0.02	0.00	246.86	64.00
	5.300	385.00	764.44	0.00	0.02	0.11	181.58	64.00
	5.400	385.00	764.34	0.00	0.01	0.00	247.08	1.00
	5.400	385.00	764.46	0.00	0.02	0.12	188.37	1.00
	5.500	385.00	764.34	0.00	0.00	0.00	247.37	50.00
	5.500	385.00	764.46	0.00	0.00	0.12	191.23	50.00
	5.600	385.00	764.34	0.00	0.00	0.00	229.22	210.00
	5.600	385.00	764.46	0.00	0.00	0.11	145.62	210.00
	6.100	385.00	764.35	0.00	0.00	0.00	229.1[illegible]	50.00
	6.100	385.00	764.46	0.00	0.00	0.11	144.45	50.00
	6.200	385.00	764.34	0.00	-0.01	0.00	229.23	1.00
	6.200	385.00	764.46	0.00	-0.01	0.11	159.18	1.00
	6.300	385.00	764.38	0.00	0.04	0.00	230.33	64.00
	6.300	385.00	764.50	0.00	0.04	0.11	156.83	64.00
	6.400	385.00	764.40	0.00	0.02	0.00	231.09	1.00
	6.400	385.00	764.51	0.00	0.02	0.11	144.33	1.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
6.500	385.00	764.40	0.00	0.00	0.00	231.86	50.00
6.500	385.00	764.52	0.00	0.00	0.11	148.70	50.00
6.600	385.00	764.44	0.00	0.04	0.00	136.04	570.00
6.600	385.00	764.55	0.00	0.04	0.11	82.23	570.00
7.000	385.00	764.45	0.00	0.01	0.00	136.23	50.00
7.000	385.00	764.56	0.00	0.01	0.11	82.22	50.00
7.100	385.00	764.42	0.00	-0.02	0.00	139.53	1.00
7.100	385.00	764.54	0.00	-0.02	0.11	93.19	1.00
7.200	385.00	764.62	0.00	0.19	0.00	145.25	85.00
7.200	385.00	764.73	0.00	0.19	0.11	96.65	85.00
7.300	385.00	764.62	0.00	0.00	0.00	145.31	1.00
7.300	385.00	764.74	0.00	0.01	0.12	89.90	1.00
8.000	385.00	764.68	0.00	0.06	0.00	170.86	65.00
8.000	385.00	764.80	0.00	0.06	0.12	102.68	65.00
9.000	385.00	764.68	0.00	0.00	0.00	156.59	135.00
9.000	385.00	764.80	0.00	0.00	0.12	93.63	135.00
9.100	385.00	764.68	0.00	-0.00	0.00	150.66	50.00
9.100	385.00	764.80	0.00	-0.00	0.12	85.46	50.00
9.200	385.00	764.69	0.00	0.01	0.00	150.65	1.00
9.200	385.00	764.80	0.00	0.01	0.11	89.37	1.00
9.300	385.00	764.72	0.00	0.03	0.00	151.62	15.00
9.300	385.00	764.83	0.00	0.03	0.11	90.10	15.00
9.400	385.00	764.71	0.00	-0.00	0.00	151.88	1.00
9.400	385.00	764.83	0.00	-0.00	0.11	86.17	1.00
9.500	385.00	764.72	0.00	0.01	0.00	152.02	50.00
9.500	385.00	764.84	0.00	0.01	0.11	85.24	50.00
10.000	385.00	764.77	0.00	0.05	0.00	150.08	80.00
10.000	385.00	764.89	0.00	0.05	0.11	141.34	80.00
10.100	215.00	764.74	0.00	-0.03	0.00	143.81	20.00
10.100	215.00	764.85	0.00	-0.04	0.10	77.05	20.00
10.200	215.00	765.28	0.00	0.54	0.00	127.42	60.00
10.200	215.00	765.39	0.00	[illegible]	0.00	[illegible]	60.00
10.300	215.00	766.1[illegible]	0.00	0.87	0.00	[illegible]	60.00
10.300	215.00	766.25	0.00	0.87	0.10	67.64	60.00
10.400	215.00	767.21	0.00	1.06	0.00	141.53	60.00
10.400	215.00	767.31	0.00	1.07	0.10	74.3[illegible]	60.00
10.500	215.00	768.38	0.00	1.17	0.00	139.2[illegible]	50.00
10.500	215.00	768.48	0.00	1.17	0.10	88.02	50.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
11.000	385.00	768.46	0.00	0.09	0.00	99.49	70.00
11.000	**385.00**	**768.60**	**0.00**	**0.12**	**0.14**	**90.00**	**70.00**
12.000	**385.00**	**768.52**	**0.00**	**0.06**	**0.00**	**245.74**	**725.00**
12.000	385.00	768.66	0.00	0.06	0.14	175.04	725.00
12.100	385.00	768.53	0.00	0.00	0.00	245.81	50.00
12.100	**385.00**	**768.66**	**0.00**	**0.00**	**0.14**	**175.13**	**50.00**
12.200	**385.00**	**768.53**	**0.00**	**0.01**	**0.00**	**245.79**	**1.00**
12.200	385.00	768.67	0.00	0.01	0.14	176.16	1.00
12.300	385.00	768.53	0.00	0.00	0.00	246.01	40.00
12.300	**385.00**	**768.67**	**0.00**	**0.00**	**0.14**	**177.15**	**40.00**
12.400	**385.00**	**768.53**	**0.00**	**-0.00**	**0.00**	**246.03**	**1.00**
12.400	385.00	768.67	0.00	-0.00	0.14	175.52	1.00
13.000	385.00	768.53	0.00	0.00	0.00	246.02	30.00
13.000	**385.00**	**768.67**	**0.00**	**0.00**	**0.14**	**175.27**	**30.00**
14.000	**385.00**	**768.55**	**0.00**	**0.01**	**0.00**	**292.63**	**340.00**
14.000	385.00	768.68	0.00	0.01	0.14	259.47	340.00
14.500	200.00	768.55	0.00	0.00	0.00	330.16	50.00
14.500	**200.00**	**768.68**	**0.00**	**0.00**	**0.14**	**321.09**	**30.00**
14.600	**200.00**	**768.55**	**0.00**	**-0.00**	**0.00**	**330.16**	**1.00**
14.600	200.00	768.68	0.00	-0.00	0.14	321.04	1.00
14.700	200.00	768.55	0.00	0.00	0.00	330.17	202.00
14.700	**200.00**	**768.69**	**0.00**	**0.00**	**0.14**	**314.42**	**202.00**
14.800	**200.00**	**768.55**	**0.00**	**0.00**	**0.00**	**330.16**	**1.00**
14.800	200.00	768.69	0.00	0.00	0.14	314.12	1.00
15.000	200.00	768.55	0.00	0.00	0.00	330.17	50.00
15.000	**200.00**	**768.69**	**0.00**	**0.00**	**0.14**	**314.12**	**50.00**
16.000	**200.00**	**768.55**	**0.00**	**0.00**	**0.00**	**253.02**	**600.00**
16.000	200.00	768.69	0.00	-0.00	0.14	182.61	600.00
16.100	65.00	768.56	0.00	0.01	0.00	253.02	50.00
16.100	**65.00**	**768.69**	**0.00**	**0.01**	**0.14**	**178.38**	**50.00**
16.200	**65.00**	**768.56**	**0.00**	**0.00**	**0.00**	**253.25**	**1.00**
16.200	65.00	768.69	0.00	0.00	0.14	185.87	1.00
16.300	65.00	768.57	0.00	0.00	0.00	253.29	73.00
16.300	**65.00**	**768.70**	**0.00**	**0.00**	**0.14**	**185.83**	**73.00**
16.400	**65.00**	**768.56**	**0.00**	**-0.00**	**0.00**	**253.31**	**1.00**
16.400	65.00	768.70	0.00	-0.00	0.14	184.78	1.00
17.000	65.00	768.56	0.00	0.00	0.00	253.32	37.00
17.000	**65.00**	**768.70**	**0.00**	**0.00**	**0.14**	**180.45**	**37.00**

FORM 1611-88-PRINTED BY ROTAFLO MANIFOLD FORMS

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
17.100	65.00	768.56	0.00	0.00	0.00	241.18	36.00
17.100	65.00	768.70	0.00	0.00	0.14	174.38	36.00
17.200	65.00	768.56	0.00	0.00	0.00	241.17	1.00
17.200	65.00	768.70	0.00	0.00	0.14	176.30	1.00
17.300	65.00	768.56	0.00	0.00	0.00	241.22	11.00
17.300	65.00	768.70	0.00	0.00	0.14	176.48	11.00
17.400	65.00	768.56	0.00	-0.00	0.00	241.23	1.00
17.400	65.00	768.70	0.00	-0.00	0.14	174.41	1.00
18.100	65.00	768.56	0.00	0.00	0.00	235.59	50.00
18.100	65.00	768.70	0.00	0.00	0.14	113.80	50.00
18.200	65.00	768.56	0.00	0.00	0.00	235.61	1.00
18.200	65.00	768.70	0.00	-0.00	0.13	119.61	1.00
18.300	65.00	768.58	0.00	0.02	0.00	236.72	115.00
18.300	65.00	768.71	0.00	0.02	0.13	119.20	115.00
18.400	65.00	768.58	0.00	0.00	0.00	237.39	1.00
18.400	65.00	768.72	0.00	0.00	0.13	114.87	1.00
18.500	65.00	768.58	0.00	0.00	0.00	213.73	50.00
18.500	65.00	768.72	0.00	0.00	0.13	135.34	50.00
19.000	65.00	768.58	0.00	-0.01	0.00	197.66	280.00
19.000	65.00	768.71	0.00	-0.01	0.13	101.36	280.00

SUMMARY OF ERRORS

CAUTION SECNO= 2.500 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 2.500 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 2.500 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO= 2.500 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 2.500 PROFILE= 2 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 2.500 PROFILE= 2 20 TRIALS ATTEMPTED TO BALANCE WSEL

FLOODWAY DATA, AXTELL CREEK KALAMAZOO
PROFILE NO. 2

STATION	FLOODWAY WIDTH (FT)	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WITHOUT FLOODWAY	DIFFERENCE
1.000	31.	75.	5.2	760.1	760.1	0.0
2.000	25.	113.	3.4	761.2	761.1	0.1
2.500	89.	76.	3.8	762.9	762.9	0.0
3.000	139.	219.	1.3	763.6	763.6	0.0
4.000	177.	169.	1.7	764.0	763.9	0.1
5.000	63.	159.	1.9	764.3	764.2	0.1
5.010	61.	347.	1.1	764.4	764.3	0.1
5.020	190.	1256.	0.3	764.4	764.3	0.1
5.100	190.	1255.	0.3	764.4	764.3	0.1
5.200	183.	505.	0.8	764.4	764.3	0.1
5.300	182.	504.	0.8	764.4	764.3	0.1
5.400	188.	1255.	0.3	764.4	764.3	0.1
5.500	191.	1266.	0.3	764.4	764.3	0.1
5.600	146.	710.	0.5	764.4	764.3	0.1
6.100	144.	707.	0.5	764.4	764.3	0.1
6.200	159.	397.	1.0	764.4	764.3	0.1
6.300	157.	397.	1.0	764.5	764.4	0.1
6.400	144.	713.	0.5	764.5	764.4	0.1
6.500	149.	724.	0.5	764.5	764.4	0.1
6.600	82.	406.	0.9	764.5	764.4	0.1
7.000	82.	407.	0.9	764.5	764.4	0.1
7.100	93.	214.	1.8	764.5	764.4	0.1
7.200	97.	238.	1.6	764.7	764.6	0.1
7.300	90.	353.	1.1	764.7	764.6	0.1
8.000	103.	516.	0.7	764.8	764.7	0.1
9.000	94.	446.	0.9	764.8	764.7	0.1
9.100	85.	367.	1.0	764.8	764.7	0.1
9.200	89.	249.	1.5	764.8	764.7	0.1
9.300	90.	253.	1.5	764.8	764.7	0.1
9.400	86.	371.	1.0	764.8	764.7	0.1
9.500	85.	370.	1.0	764.8	764.7	0.1
10.000	141.	826.	0.5	764.9	764.8	0.1
10.100	77.	111.	1.9	764.8	764.7	0.1
10.200	66.	86.	2.5	765.4	765.3	0.1
10.300	68.	81.	2.7	766.2	766.1	0.1
10.400	74.	80.	2.7	767.3	767.2	0.1
10.500	88.	75.	2.9	768.5	768.4	0.1
11.000	90.	445.	0.9	768.6	768.5	0.1
12.000	175.	909.	0.4	768.6	768.5	0.1
12.100	175.	910.	0.4	768.6	768.5	0.1
12.200	176.	432.	0.9	768.6	768.5	0.1
12.300	177.	942.	0.4	768.7	768.5	0.1
12.400	176.	912.	0.4	768.6	768.5	0.1
13.000	175.	912.	0.4	768.6	768.5	0.1
14.000	259.	1755.	0.2	768.6	768.5	0.1
14.500	321.	1944.	0.1	768.7	768.5	0.1
14.600	321.	1322.	0.2	768.6	768.5	0.1
14.700	314.	1926.	0.1	768.7	768.6	0.1
14.800	314.	1924.	0.1	768.7	768.6	0.1
15.000	314.	1924.	0.1	768.7	768.6	0.1

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FLOODWAY DATA, AXTELL CREEK KALAMAZOO
PROFILE NO. 2

STATION	FLOODWAY WIDTH (FT)	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WITHOUT FLOODWAY	DIFFERENCE
16.000	183.	542.	0.4	768.7	768.6	0.1
16.100	178.	663.	0.1	768.7	768.6	0.1
16.200	186.	459.	0.1	768.7	768.6	0.1
16.300	186.	459.	0.1	768.7	768.6	0.1
16.400	181.	523.	0.1	768.7	768.6	0.1
17.000	180.	530.	0.1	768.7	768.6	0.1
17.100	174.	382.	0.2	768.7	768.6	0.1
17.200	176.	335.	0.2	768.7	768.6	0.1
17.300	176.	336.	0.2	768.7	768.6	0.1
17.400	174.	382.	0.2	768.7	768.6	0.1
18.100	114.	280.	0.2	768.7	768.6	0.1
18.200	120.	197.	0.3	768.7	768.6	0.1
18.300	119.	198.	0.3	768.7	768.6	0.1
18.400	115.	283.	0.2	768.7	768.6	0.1
18.500	135.	407.	0.2	768.7	768.6	0.1
19.000	161.	71.	0.9	768.7	768.6	0.1

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1) COUNTY: KALAMAZOO

2) STUDY NAME: CITY OF KALAMAZOO

3) WATERCOURSE: AXTELL CREEK

4) DOCUMENT TYPE: CROSS SECTION PLOTS



CROSS SECTION 1.00
STREAM AXTELL CREEK KALAMAZOO
DISCHARGE= 385.

PLOTTED POINTS (BY PRIORITY)-U=BOTTOM BRIDGE,T=TOP BRIDGE,X=GROUND,W= STEP SUR,E=ENERGY GRADIENT,C=CRITICAL WSEL

ELEV	756.	757.	758.	759.	760.	761.	762.	763.	764.	765.	766.
314-FEET											
21358.							X				
1360.							X				
1362.							X				
1364.											
1366.											
1368.											
1370.							X				
1372.							X				
1374.							X				
1376.											
1378.											
1380.											
31382.							X				
1384.							X				
1386.							X				
1388.							X				
1390.											
1392.											
1394.							X				
1396.							X				
1398.							X				
41400.							X				
1402.							X				
1404.							X				
1406.							X				
1408.							X				
1410.							X				
1412.							X				
1414.							X				
1416.							X				
1418.							X				
1420.							X				
1422.							X				
1424.							X				
1426.							X				
1428.							X				
1430.							X				
1432.							X				
1434.							X				
1436.							X				
1438.							X				
1440.											
1442.							X				
1444.							X				
1446.							X				
1448.							X				
1450.							X				
1452.							X				
1454.							X				
1456.							X				
1458.							X				

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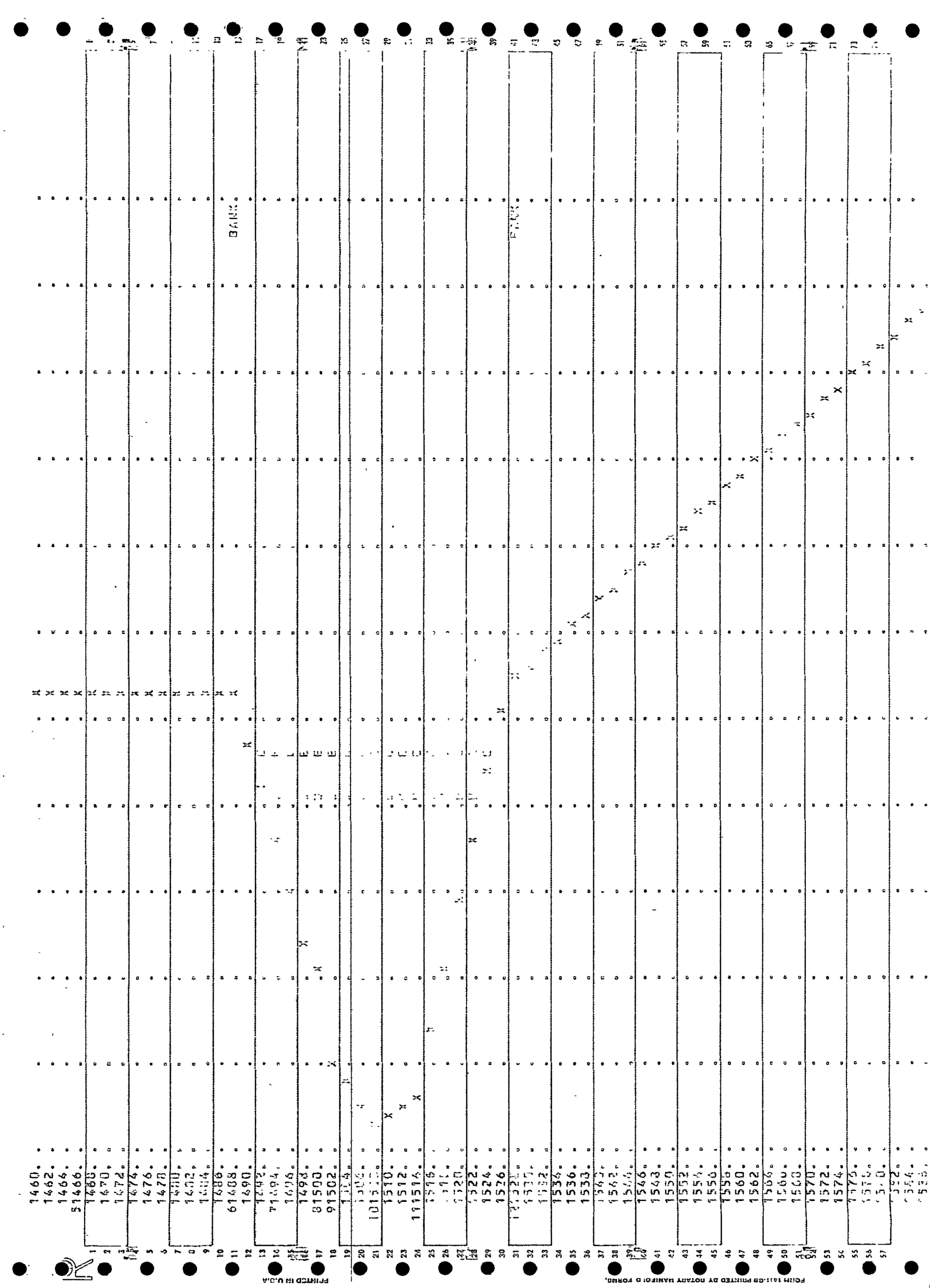
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```
   1588.
 131590.
   1592.
   1594.
   1596.
   1598.
 141600.
   1602.
   1604.
   1606.
   1608.
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   1650.
   1652.
   1654.
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   1662.
   1664.
   1666.
   1668.
   1670.
   1672.
   1674.
   1676.
 151678.

NND=        0 ELLO=  9999999.00 ILTID=  9999999.00

  EL(I),STA(I)
     762.20     1353.00     762.20     1382.00     761.60     1400.00     761.30     1466.00     761.30     1489.00
     759.60     1495.00     758.10     1500.00     757.00     1503.00     756.30     1509.00     756.60     1515.00
     761.50     1520.00     766.00     1590.00     765.00     1600.00     766.00     1676.00
```

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CROSS SECTION 2.00
STREAM AXTELL CREEK KALAMAZOO
DISCHARGE= 365.

PLOTTED POINTS (BY PRIORITY)=B=BOTTOM W=EDGE/TOE L=BRIDGE,R=RIGHT,L=LEFT S=WATER SURFACE,E=ENERGY G=BANK,T=C=CRITICAL HEEL

	SLEV	754.	755.	756.	757.	758.	759.	760.	761.	762.	763.	764.
	STA=FLET											
2	530.									X		
	532.									X		
	534.									X		
	536.											
	538.									X		
	540.									X		
	542.									X		
	544.									X		
	546.									X		
	548.											
	550.											
	552.											
	554.									X		
	556.									X		
	558.									X		
	560.											
	562.											
	564.											
	566.									X		
	568.									X		
	570.									X		
	572.									X		
	574.									X		
	576.									X		
	578.									X		
	580.									X		
	582.									X		
	584.									X		
	586.									X		
3	588.									X		
	590.									X		
	592.								X			
	594.									X		
4	596.								F			
	598.							X	E			
	600.						X		F			
	602.								E			
	604.					X			E			
5	606.						X		F			BANK
	608.					X			E			
	610.				X				E			
6	612.			X					E			
	614.			X					E			
	616.		X						E			
	618.	X							E			
7	620.	X							E			
	622.	X							E			
	624.			X					E			
8	626.				X				E			
	628.					X			E			
	630.											

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```
 9 632.                                                                                                                  BANK.
   634.                                                                                                                  .
   636.                                                                                                                  .
10 638.                                                                                                                  .
   640.                                                                                                                  .
   642.                                                                                                                  .
   644.                                                                                                                  .
12 646.                                                                                                                  .
   648.                                                                                                                  .
   650.                                                                                                                  .
   652.                                                                                                                  .
   654.                                                                                                                  .
   656.                                                                                                                  .
   658.                                                                                                                  .
   660.                                                                                                                  .
   662.                                                                                                                  .
   664.                                                                                                                  .
   666.                                                                                                                  .
   668.                                                                                                                  .
   670.                                                                                                                  .
   672.                                                                                                                  .
   674.                                                                                                                  .
   676.                                                                                                                  .
   678.                                                                                                                  .
   680.                                                                                                                  .
   682.                                                                                                                  .
   684.                                                                                                                  .
   686.                                                                                                                  .
   688.                                                                                                                  .
   690.                                                                                                                  .
   692.                                                                                                                  .
   694.                                                                                                                  .
   696.                                                                                                                  .
   698.                                                                                                                  .
   700.                                                                                                                  .
   702.                                                                                                                  .
   704.                                                                                                                  .
   706.                                                                                                                  .
   708.                                                                                                                  .
   710.                                                                                                                  .
   712.                                                                                                                  .
13 714.                                                                                                                  .

NRD=        0 ELLC=  9999999.00 ELYRD=  9999999.00

 CL(I),STA(I)
     762.50      530.00      762.40      589.00      761.00      597.00      759.20      607.00      756.20      613.00
     754.50      620.00      756.50      627.00      761.00      632.00      761.50      633.00      761.50      642.00
     762.00      647.00      762.50      715.00
```

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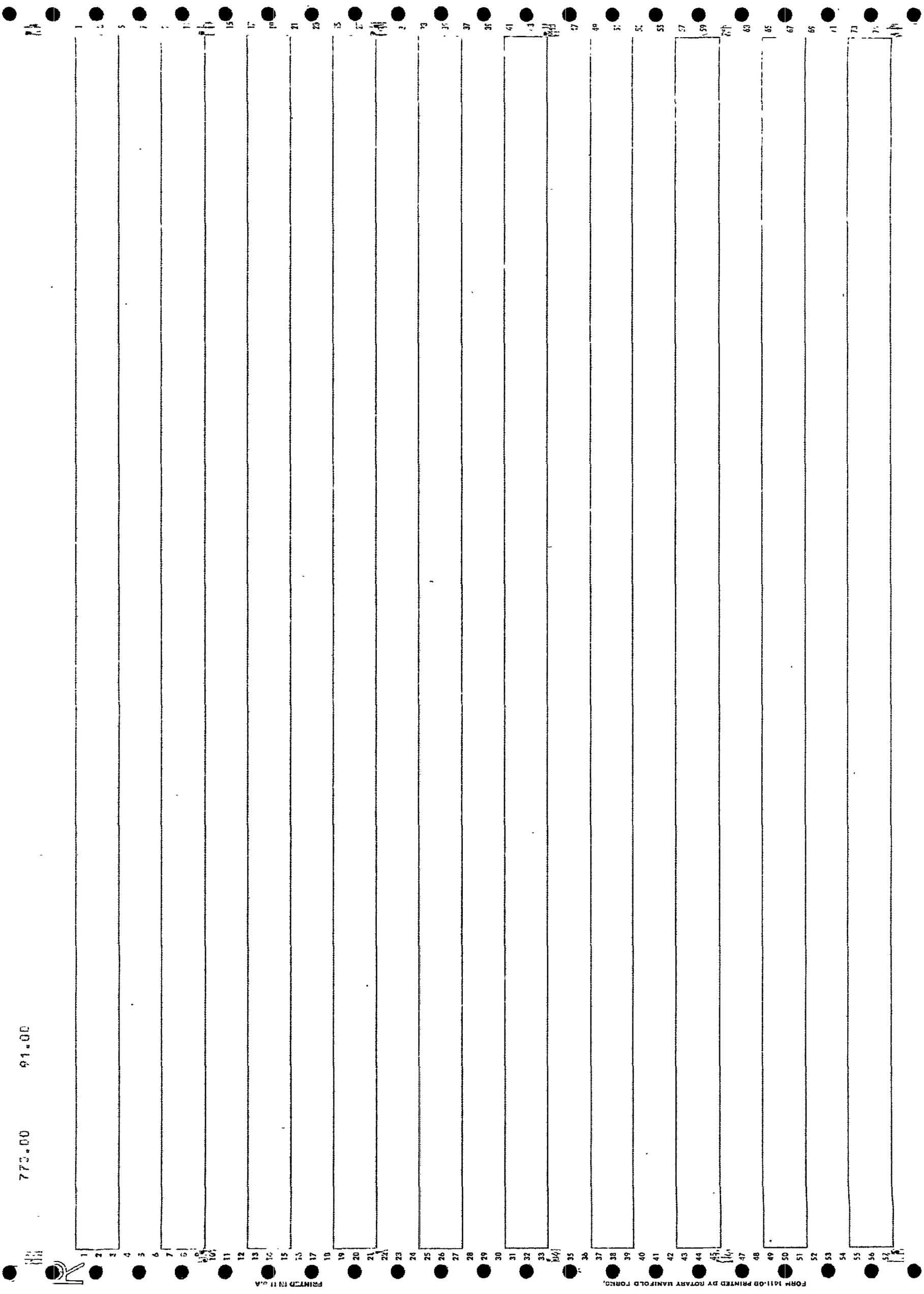
CROSS SECTION 2.50
STREAM AXTELL CREEK KALAMAZOO
DISCHARGE= 294.

PLOTTED POINTS (LOW PRIORITY)=Y=BOTTOM RIDGE,T=TOP BRIDGE,K=GROUND,H=WATER SURFACE,E=ENERGY GRADIENT,C=CRITICAL H&L

ELEV	762.	763.	764.	765.	766.	767.	768.	769.	770.	771.	772.	
STA-FEET												
3	0.	X	H.	E								
	2.	X	H.	E								
	4.	X	H.	E								
	6.	X	H.	E								
	8.	X	H.	E								
	10.	X	H.	E								
	12.	X	H.	E								
	14.	X	H.	E								
	16.	X	H.	E								
	18.	X	H.	E								
4	20.	X	H.	E								
	22.	X	H.	E								
	24.	X	H.	E								
	26.	X	H.	E								
	28.	X	H.	E								
	30.	X	H.	E								
	32.	X	H.	E								
	34.	X	H.	E								
	36.	X	H.	E								
	38.	X	H.	E								
	40.	X	H.	E								
	42.	X	H.	E								
	44.	X	H.	E								
	46.	X	H.	E								
	48.	X	H.	E								
	50.	X	H.	E								
	52.	X	H.	E								
	54.	X	H.	E								
	56.	X	H.	E								
	58.	X	H.	E								
	60.	X	H.	E								
	62.	X	H.	E								
	64.	X	H.	E								
	66.	X	H.	E								
	68.	X	H.	E								
5	70.	X	H.	E								
	72.	X	H.	E								
	74.	X	H.	E								
	76.	X	H.	E								
	78.	X	H.	E								
	80.	X	H.	E								
	82.	X	H.	E								
	84.	X	H.	E								
	86.	X	H.	E								
	88.	X	H.	E								
7	90.	XXXX


773.00
91.00
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CROSS SECTION 5.01
STREAM AXTELL CREEK KALAMAZOO
DISCHARGE= 385.

PLOTTED POINTS (BY PRIORITY)-W=BOTTOM BRIDGE,T=TOP BRIDGE,X=GROUND,W=WATER SURF,E=ENERGY GRADIENT,C=CRITICAL WSEL

ELEV 755. 756. 757. 758. 759. 760. 761. 762. 763. 764. 765.

STA-FEET

21102.										X	
31104.								X			
1106.								X			
1108.											
1110.								X			
61112.								X			
1114.						X					
1116.				X							
1118.			X								
51120.											BANK.
1122.	X										
1124.	X										
1126.	X										
1128.	X										
1130.	X										
1132.	X										
1134.	X										
1136.	X										
61140.	X										BANK.
1142.			X								
1144.				X							
71146.						X					
1148.							X				
1150.							X				
1152.							X				
1154.							X				
1156.											
81158.								X			
1160.								X			
1162.								X			
71164.								X			
1166.								X			
1168.											
1170.								X			
1172.								X			
1174.								X			
1176.								X			
101178.								X			
1180.										X	

NUM= 0 FLOW= 9999999.00 FLTRD= 9999999.00

FL(I),STA(I)

765.00	1103.00	762.50	1104.00	761.90	1112.00	755.20	1120.00	755.20	1140.00
760.40	1146.00	761.00	1158.00	761.30	1164.00	762.40	1178.00	765.00	1180.00

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CROSS SECTION 10.00
STREAM AXTELL CREEK KALAMAZOO
DISCHARGE= 385.

PLOTTED POINTS (BY PRIORITY)=-=BOTTOM OF BRIDGE,X=CALCULATED WATER SURFACE,E=ENERGY GRADIENT,C=CRITICAL DEPTH

ELEV	758.	760.	762.	764.	766.	768.	770.	772.	774.	776.	778.	
STA-FEET												
2	465.	.C										
	470.	.					X					
	475.	.					X					
	480.	.					X					
	485.	.					X					
	490.	.					X					
	495.	.					X					
	500.	.					X					
	505.	.					X					
	510.	.					X					
	515.	.					X					
	520.	.					X					
	525.	.					X					
3	530.	.					X					
4	535.	.										
5	540.	.	X									
6	545.	.	X									
	550.	.	X									
	555.	.	X									
	560.	.	X									
	565.	.	X									
7	570.	.	X									
	575.	.	X									
	580.	.	X									
	585.	.	X									
	590.	.	X									
	593.	.	X									
	600.	.	X									BANK.
	605.	.	X									
	610.	.	X									
	615.	.	X									
9	620.	.	X									BANK.
	625.	.	X									
	630.	.	X									
	635.	.	X									
	640.	.	X									
	645.	.	X									
	650.	.	X									
	655.	.	X									
	660.	.	X									
	665.	.	X									
	670.	.	X									
	675.	.	X									
10	680.	.	X									
11	685.	.					X					
	690.	.					X					
	695.	.					X					
	700.	.					X					
	705.	.					X					
	710.	.					X					
	715.						X					

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720.
725.
730.
735.
740.
745.
750.
755.
760.
765.
770.
775.
780.
785.
790.
795.
800.
805.
810.
815.
820.
825.
830.
835.
840.
845.
850.
855.
860.
865.
870.
875.
12 885.

SL(I),STA(I)

770.20	768.00	769.50	532.00	762.00	535.01	760.00	540.00	758.00	544.00
750.80	564.00	758.70	600.00	758.70	620.00	760.00	630.70	766.00	685.00
769.20	770.00								

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CROSS SECTION 10.50
STREAM AXTELL CREEK KALAMAZOO
DISCHARGE= 215.

PLOTTED POINTS (BY PRIORITY)-O=BOTTOM LEDGES,T=TOP BRIDGE,X=GROUND,W=WATER SUR,F=ENERGY GRADIENT,C=CRITICAL WSEL

ELEV 767. 768. 769. 770. 771. 772. 773. 774. 775. 776. 777.

STA-ELEV

2 160.
180.
3 200.
220.
240.
4 260.
280.
300.
5 320.
340.
360.
380.
400.
420.
7 440.
460.
480.
500.
520.
540.
9 560.
10 580.
600.
620.
640.
660.
680.
700.
720.
740.
11 760.
780.
12 800.

BANK.

BRD= 0 ELEV= 9999997.00 ELTRD= 9999999.00

EL(I),STA(I)

773.60	166.00	771.90	210.00	770.20	270.00	769.30	326.00	768.40	435.00
768.00	440.00	767.60	496.00	767.60	550.00	768.40	575.00	772.20	754.00
773.00	804.00								

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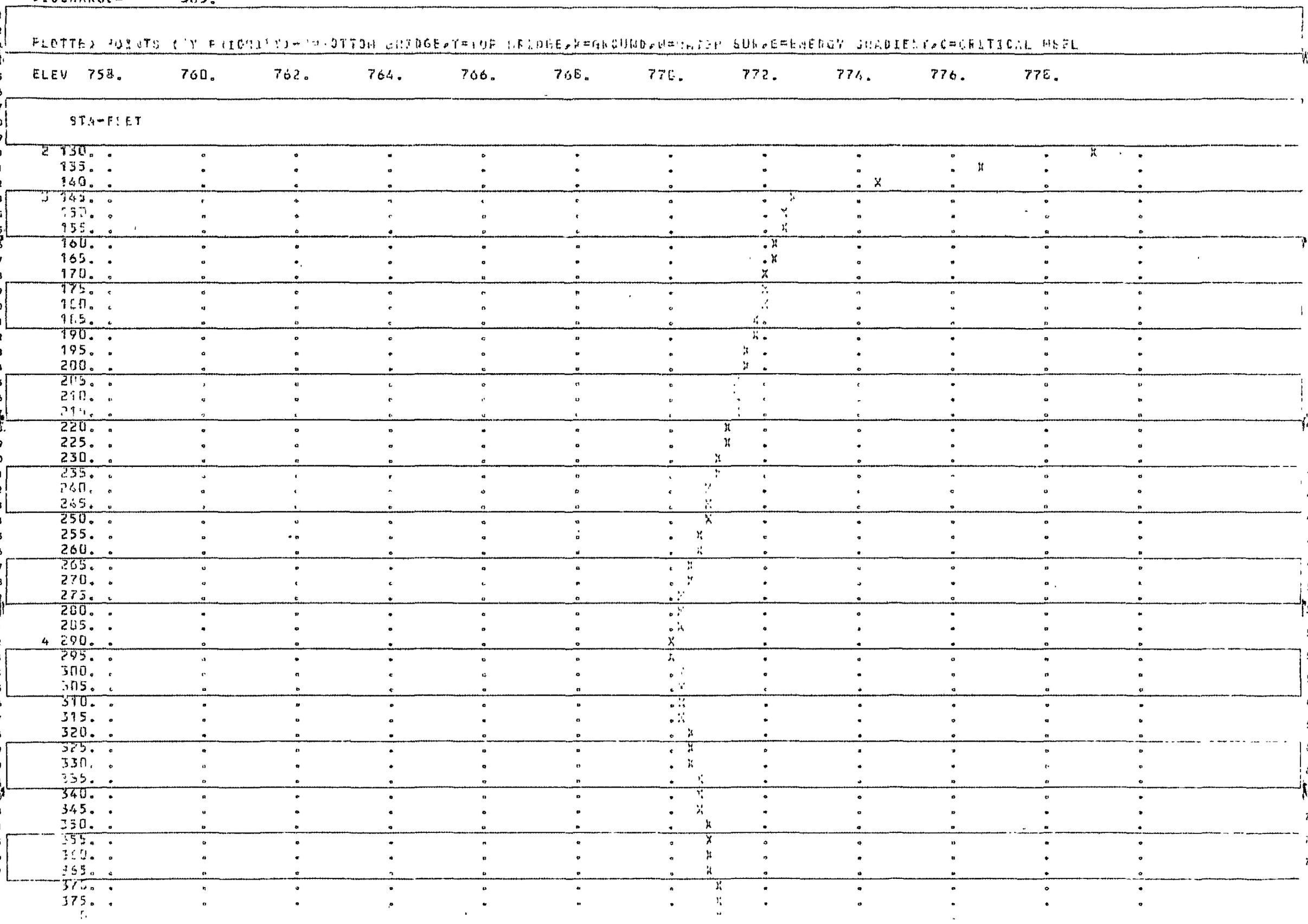
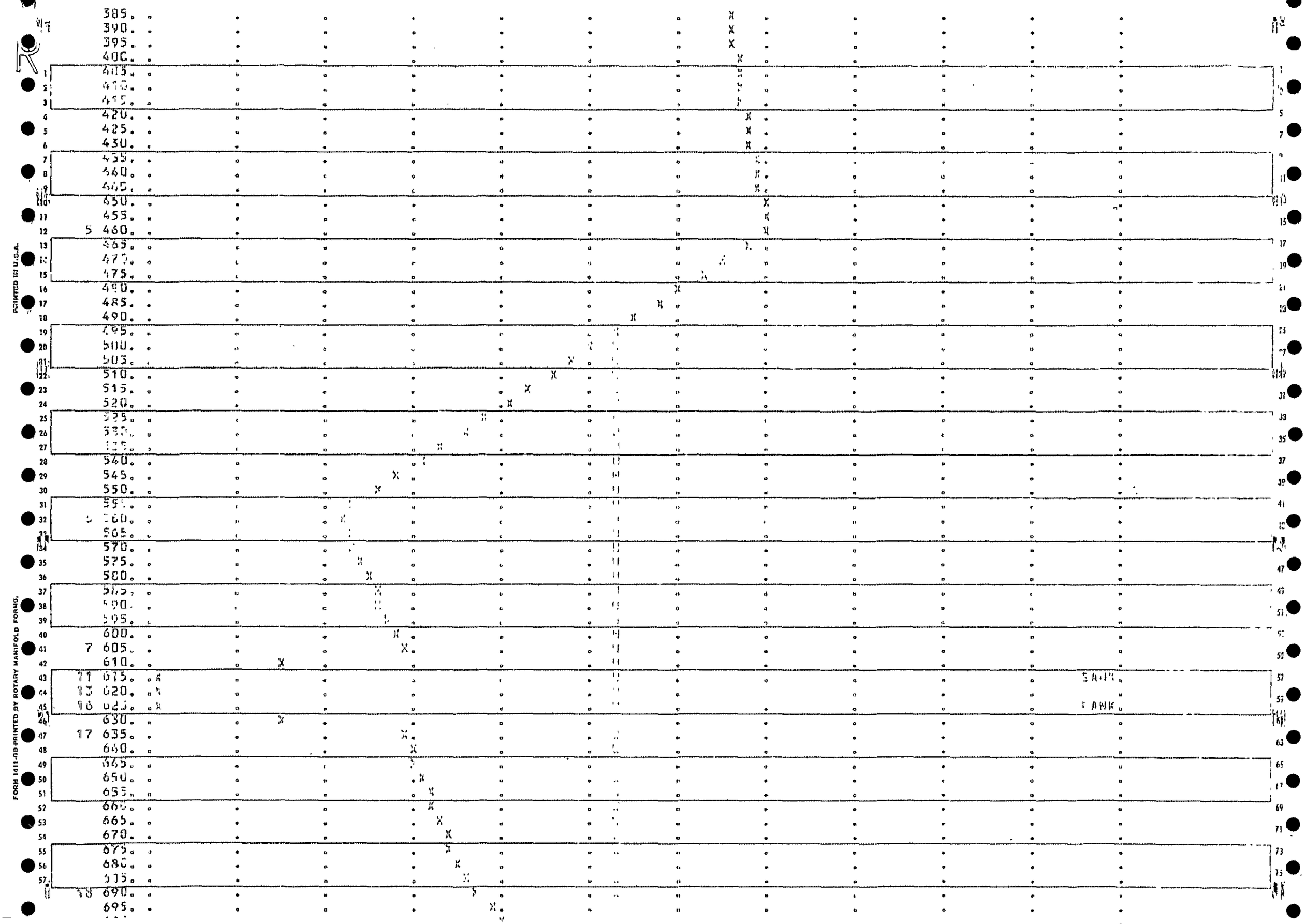
CROSS SECTION 12.00
STREAM AXTELL CREEK KALAMAZOO
DISCHARGE= 385.

PLOTTED POINTS (BY PRIORITY)-W=BOTTOM BRIDGE,T=TOP BRIDGE,X=GROUND,W=WATER SUR,E=ENERGY GRADIENT,C=CRITICAL WSEL





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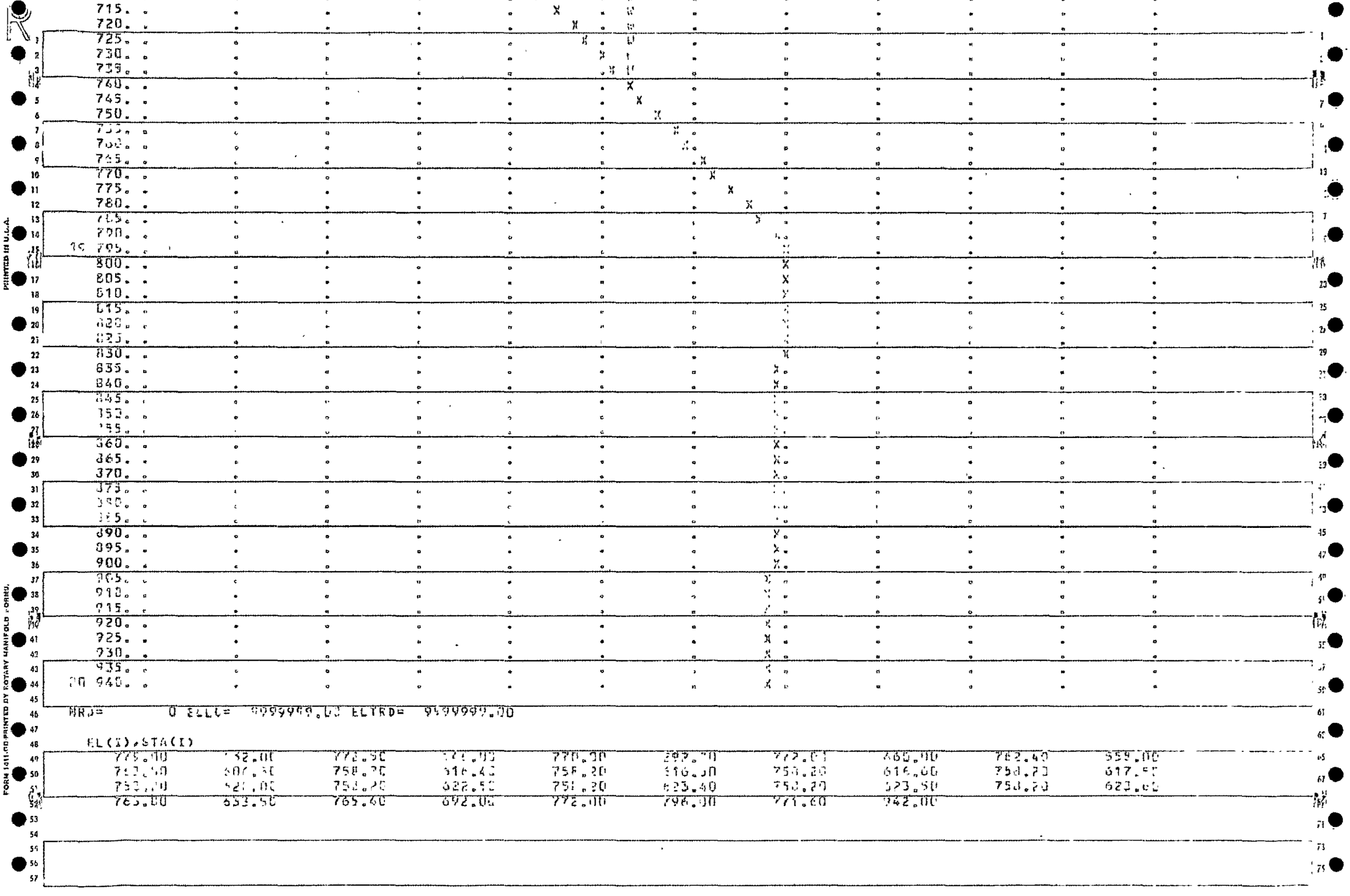

FORM 1411-00-PRINTED BY ROTARY MANIFOLD FORMS. PRINTED IN U.S.A.

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MRD=        0 ELLC=  9999999.00 ELTRD=  9999999.00

EL(I),STA(I)
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775.00	632.00	772.50	674.00	770.00	292.70	772.00	660.00	762.40	559.00
763.50	607.50	758.20	616.40	758.20	616.60	758.20	616.60	758.20	617.50
758.20	621.00	758.20	622.50	758.20	623.40	758.20	623.50	758.20	623.60
765.00	653.50	765.60	692.00	772.00	796.00	771.60	942.00		

	385.	177.	96.	112.	530.	74.	382.	52.	17.	759.20
	1.38	0.33	1.29	0.29	0.060	0.035	0.060	0.034	736.20	405.37
	0.000041	1.	1.	1.	0	0	0	0.00	246.03	741.40

FLO. DISTRIBUTION FOR SECNO= 12.00 ENGEL= 708.53

STA=	495.	558.	607.	616.	624.	634.	692.	741.
PER Q=	12.5	25.2	8.1	25.0	8.1	17.8	3.2	
AREA=	192.1	263.6	74.6	74.4	74.6	230.2	77.4	
VEL=	0.3	0.5	0.3	1.3	0.3	1.1	0.1	

*SECNO 13.000

VALLEY SECT. APPROX.30 FT. U/S OF 5X7 FT. CULVERT

13.00	1.15	763.53	3.05	0.05	760.54	1.01	0.30	0.0	759.91
385.	177.	96.	112.	530.	74.	382.	52.	17.	756.20
1.38	0.33	1.29	0.29	0.060	0.035	0.060	0.034	736.20	405.37
0.000041	30.	30.	30.	0	0	0	0.00	246.03	741.40

FLO DISTRIBUTION FOR SECNO= 13.00 ENGEL= 708.53

STA=	495.	558.	607.	616.	624.	634.	692.	741.
PER Q=	12.5	25.2	8.1	25.0	8.1	17.8	3.2	
AREA=	192.1	263.6	74.6	74.4	74.6	230.2	77.4	
VEL=	0.3	0.5	0.3	1.3	0.3	1.1	0.1	

CONV= 0.100 CFS= 3.100
WSEL= 13.000

SECNO	DEPTH	CWSEL	CRIWS	CVELH	EG	SF	AL	DLOSS	CH.R ELEV
Q	TTIE	WTOP	VCH	WMOC	XNL	XMOC	WLP	LOB	RTE	LEFT/RIGHT
SLOPE	KRATL	LOB	ELOB	TIME L	L/Q	TOB	ROB			SSTA

VALLEY SECT. APPROX. 30 FT U/S OF EDWARD ST

14.00	1.15	766.53	0.30	0.10	763.54	0.01	0.30	0.0	762.91
385.	177.	96.	112.	530.	74.	382.	52.	17.	759.20
1.38	0.33	1.29	0.29	0.060	0.035	0.060	0.034	736.20	405.37
0.000041	280.	340.	365.	0	0	0	0.00	292.63	382.55

FLO DISTRIBUTION FOR SECNO 14.00 ENGEL= 708.53

STA=	495.	558.	607.	616.	624.	634.	692.	741.
PER Q=	12.5	25.2	8.1	25.0	8.1	17.8	3.2	
AREA=	192.1	263.6	74.6	74.4	74.6	230.2	77.4	
VEL=	0.3	0.5	0.3	1.3	0.3	1.1	0.1	

CONV= 0.100 CFS= 3.100
WSEL= 14.000

*SECNO 14.300

U/S FACE OF CULVERT AT EDWARD ST

14.30	13.21	768.53	1.01	5.00	765.55	5.06	1.30	0.00	759.70
200.	88.	11.	57.	599.	53.	1553.	16.	11.	755.70
1.00	0.03	0.10	0.16	0.444	0.060	0.386	0.034	760.70	402.57
0.000006	30.	30.	30.	2	2	6	0.30	390.16	892.20

FLOW DISTRIBUTION FOR SECNO= 14.50 CHSEL= 768.55

STA=	492.	548.	649.	655.	820.	822.
PER Q=	10.4	1.7	5.6	33.4	0.1	
AREA=	193.3	325.1	1.0	1038.5	7.	
VEL=	0.1	0.0	0.2	0.2	0.2	

*SECNO 14.600

14.60	10.	761.2	3.02	3.03	768.55	3.02	3.02	3.00	759.01
200.	41.	8.	151.	507.	48.	604.	55.	19.	759.70
1.05	0.07	0.16	0.23	0.251	0.060	0.010	0.034	758.30	492.74
0.000026	1.	1.	1.	0	0	0	-526.25	330.26	522.21

FLOW DISTRIBUTION FOR SECNO= 14.60 CHSEL= 768.55

STA=	492.	548.	649.	655.	820.	822.
PER Q=	20.1	0.7	3.9	75.6	0.2	
AREA=	193.3	325.1	45.0	1038.5	7.	
VEL=	0.1	0.0	0.2	0.2	0.	

*SECNO 14.700

14.60	11.35	761.35	0.00	0.00	768.55	0.00	0.00	0.00	759.70
200.	76.	17.	106.	319.	69.	1061.	72.	21.	759.70
2.36	0.09	0.25	0.11	0.000	0.000	0.000	0.034	758.30	492.04
0.000026	1.	1.	1.	1	0	0	-526.25	330.26	522.21

FLOW DISTRIBUTION FOR SECNO= 14.70 CHSEL= 768.55

STA=	492.	548.	649.	655.	820.	822.
PER Q=	0.1	0.7	3.9	75.6	0.2	
AREA=	193.3	325.1	45.0	1038.5	7.	
VEL=	0.0	0.1	0.1	0.3	0.1	0.0

*SECNO 14.800

14.60	11.85	761.55	0.00	0.00	768.55	0.00	0.00	0.00	759.70
200.	76.	17.	106.	319.	69.	1061.	72.	21.	759.70
2.36	0.09	0.25	0.10	0.000	0.000	0.000	0.034	758.30	492.04
0.000026	1.	1.	1.	1	0	0	-526.25	330.26	522.21

FLOW DISTRIBUTION FOR SECNO= 14.80 CHSEL= 768.55

STA=	492.	495.	540.	649.	655.	820.	822.
PER Q=	0.	0.	0.	0.	0.	0.	
AREA=	3.3	190.2	625.4	31.5	1041.1	4.1	
VEL=	0.0	0.1	0.1	0.	0.2	0.0	

*SECNO 15.000

SECNO	DEPTH	CHSEL	CHINS	USELV	EG	HV	HL	QLOSS	BANK ELEV
Q	ELOB	TCL	CROF	AROF	TCH	ARCH	WPC	QWA	LEFT
TIPI	VLOB	WSI	WPOF	XI	YCI	XCI	PWI	ELTRD	ESTA
ELOB	WLOB	XL	XLOB	TRIALS	IHR	ICON	ERROR	TOPWID	LOB

VALLEY SECT. 50 FT U/S OF CULVERT AT HOWARD ST

15.00	11.85	768.55	0.00	0.00	768.55	0.00	0.00	0.00	759.70
200.	76.	17.	106.	919.	68.	1063.	74.	21.	759.70
2.44	0.09	0.25	0.17	0.000	0.035	0.000	0.034	756.70	692.04
0.000003	30.	30.	30.	1	[illegible]	0	0.00	220.17	822.21

FLOW DISTRIBUTION FOR SECNO= 15.00 CWSEL= 768.55

STA=	405.	405.	515.	527.	657.	692.
PER C=	0.1	[illegible]	31.0	[illegible]	13.0	[illegible]
AREA=	[illegible]	[illegible]	325.6	68.[illegible]	2036.0	[illegible]
VEL=	0.0	0.1	0.1	0.3	0.1	0.0

CCHV= 0.100 CEHV= 0.300
*SECNO 15.000

VALLEY SECT. 50 FT. U/S OF CULVERT AT [illegible] STA [illegible]

16.00	9.55	768.55	0.00	0.00	768.36	0.01	0.00	0.00	762.00
200.	47.	77.	76.	187.	80.	319.	91.	25.	764.00
2.79	0.[illegible]	0.[illegible]	0.27	0.000	[illegible]	[illegible]	[illegible]	75[illegible]	[illegible]
0.000[illegible]	[illegible]	[illegible]	[illegible]	1	0	[illegible]	[illegible]	[illegible]	[illegible]

FLOW DISTRIBUTION FOR SECNO= 16.00 CWSEL= 768.55

STA=	600.	670.	697.	692.	700.	730.	[illegible]	[illegible]	[illegible]
PER C=	[illegible]	[illegible]	0.4	7.1	[illegible]	[illegible]	1[illegible]	0	[illegible]
AREA=	[illegible]	[illegible]	[illegible]	40.[illegible]	79.5	[illegible]	[illegible]	[illegible]	[illegible]
VEL=	0.2	0.3	0.3	0.4	1.[illegible]	0.[illegible]	0.2	0.2	0.2

CCHV= 0.300 CEHV= 0.500
*SECNO 16.[illegible]

U/S FACE OF CULVERT AT [illegible]

16.10	10.06	768.36	0.00	0.00	768.36	0.00	0.00	0.00	758.70
65.	19.	18.	23.	246.	39.	412.	91.	25.	759.00
[illegible]	[illegible]	0.[illegible]	0.[illegible]	0.[illegible]	0.[illegible]	[illegible]	[illegible]	75[illegible]	[illegible]
0.000[illegible]	40.	50.	30.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

FLOW DISTRIBUTION FOR SECNO= 16.10 CWSEL= 768.56

STA=	605.	670.	697.	703.	737.	796.	80.	1[illegible].
PER C=	[illegible]	24.9	[illegible]	25.0	1[illegible]	[illegible]	2.[illegible]
AREA=	[illegible]	6[illegible]	59.2	[illegible]	1[illegible]	71.[illegible]	[illegible]
VEL=	0.0	0.1	0.3	0.1	0.0	0.0	0.0

*SECNO 16.200

[illegible] ELTIC= 768.[illegible] [illegible] 7[illegible]

16.20	8.73	768.56	0.00	0.00	768.56	0.00	0.00	0.00	760.40
65.	15.	5.	42.	157.	23.	323.	91.	25.	760.20
2.07	0.12	0.21	0.13	0.000	0.035	0.000	0.034	759.30	604.65
0.000012	1.	1.	1.	0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

FLOW DISTRIBUTION FOR SECNO= 16.20 CWSEL= 768.56

STA=	604	670	697	703	730	79[illegible]	83[illegible]	1[illegible]

PER Q=	1[illegible].2	16.6	7.4	18.0	26.6	14.3	6.1
AREA=	60.6	71.0	22.6	75.3	[illegible]35.9	71.7	39.6
VEL=	0.1	0.1	0.2	0.2	0.1	0.1	0.1

*SECNO 15.300

3370 [illegible]RIAL D.[illegible]DGE,NRD= 7 [illegible]M SLOPE= 3[illegible].10 FOR FLOW= 761.20

16.30	0.76	768.56	0.00	0.00	768.56	0.07	0.07	0.00	760.40
65.	18.	5.	62.	152.	23.	323.	92.	26.	760.20
[illegible].02	0.[illegible]	[illegible].21	7.[illegible]	[illegible].[illegible]3	[illegible].[illegible]1	[illegible].[illegible]	0.[illegible]4	[illegible].[illegible]5	[illegible].[illegible]
0.000018	53.	72.	73.	1	1	2	[illegible]0.14	832.[illegible]	837.[illegible]

FLOW DISTRIBUTION FOR SECNO= 16.30 CHSEL= 760.51

STA=	[illegible].	670.	697.	703.	727.	796.	850.	870.
PER Q=	11.4	16.[illegible]	[illegible].[illegible]	18.0	[illegible].[illegible]	[illegible].[illegible]	[illegible]	
AREA=	[illegible].6	71.0	26.0	75.3	[illegible]35.9	71.7	[illegible]39.6	
VEL=	0.1	0.1	0.2	0.2	0.1	0.1	0.[illegible]	

*SECNO 16.400

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
SLOPE	XLOCL	XLOR	XLOFR	ITRIAL	I42	ICONT	CDTOT	TOPWID	[illegible]

[illegible]/S [illegible] OF SOLVEST [illegible] TABLE S".

16.40	0.76	768.56	0.00	0.00	768.56	0.00	0.00	0.00	760.40
65.	18.	17.	80.	224.	51.	392.	12.	26.	760.20
3.02	0.08	0.33	0.09	0.060	0.033	0.[illegible]3	0.[illegible]6	799.30	606.[illegible]
[illegible].000007	[illegible]	[illegible]	[illegible]	1.	[illegible]	[illegible]	[illegible]	[illegible].[illegible]	[illegible].[illegible]

FLOW DISTRIBUTION FOR SECNO= 16.40 CHSEL= 768.56

STA=	604.	670.	697.	703.	727.	796.	850.	870.
PER Q=	[illegible]	[illegible]	23.[illegible]	[illegible].0	[illegible]	[illegible]	[illegible]	
AREA=	[illegible].[illegible]	1[illegible].[illegible]	[illegible].0	1[illegible].[illegible]	135.[illegible]	[illegible].[illegible]	[illegible]	
VEL=	0.[illegible]	[illegible].[illegible]	[illegible]	[illegible].0	[illegible].[illegible]	[illegible].[illegible]	[illegible].0	

*SECNO 17.000

[illegible]ALLOW [illegible]FLT. [illegible]SPEED. 50 FT.[illegible] OF 50 E.[illegible]N 50[illegible]. COLV.

17.00	2.76	3[illegible].50	[illegible].00	0.00	7[illegible].50	[illegible].[illegible]	[illegible].[illegible]	[illegible].[illegible]	[illegible].[illegible]
65.	7.	56.	22.	130.	[illegible]26.	325.	[illegible].	27.	763.60
3.08	0.35	1.[illegible]	0.07	0.000	0.055	0.0[illegible]	0.[illegible]4	730.[illegible]	636.40
0.000004	[illegible]7.	[illegible]3.	[illegible]2.	0	0	0	0.00	[illegible]3.32	657.[illegible]

[illegible] DIST[illegible] [illegible] FOR [illegible]=[illegible] 17.00 [illegible].[illegible] [illegible].[illegible]

STA=	[illegible]4.	670.	690.	710.	730.	796.	850.	858.
PER Q=	[illegible].[illegible]	[illegible].[illegible]	[illegible].[illegible]	[illegible].[illegible]	[illegible].[illegible]	[illegible].[illegible]	7.0	[illegible].0
AREA=	[illegible]0.[illegible]	[illegible].[illegible]	[illegible].[illegible]	[illegible].[illegible]	[illegible]	[illegible]	[illegible]	[illegible].[illegible]
VEL=	[illegible].[illegible]	[illegible].	[illegible]	[illegible].[illegible]	[illegible].[illegible]	[illegible].[illegible]	[illegible]	[illegible]

*SECNO 17.[illegible]

	17.10	9.96	768.56	0.00	0.00	768.56	0.00	0.00	0.00	760.90
	65.	26.	15.	24.	176.	26.	212.	93.	26.	760.90
	3.12	0.16	0.59	0.15	0.080	0.035	0.060	0.034	759.40	604.61
	0.000015	17.	11.	58.	0	0	2	0.00	241.15	765.10

FLOW DISTRIBUTION FOR SECNO= 17.10 CHSEL= 768.56

STA=	604.	670.	690.	697.	699.	702.	710.	730.	796.	830.	846.
PER Q=	2.9	17.1	5.9	2.6	10.1	6.1	6.4	21.2	10.9	1.6	
AREA=	12.4	49.2	18.0	6.2	15.7	20.5	42.2	69.8	46.4	10.4	
VEL=	2.1	1.2	2.1	2.2	1.8	2.2	1.2	2.1	2.1	1.7	

*SECNO 17.200

3370 NODAL BRIDGE,IRD= 1 CHL ELTRD= 765.10 ,BR CLOF= 772.67

	17.20	3.16	768.56	0.00	0.00	768.56	0.00	0.00	0.00	760.90
	65.	29.	7.	30.	154.	17.	194.	93.	26.	760.90
	3.12	0.19	0.39	0.15	0.080	0.035	0.060	0.034	759.40	604.61
	0.000042	1.	1.	1.	0	0	3	-49.41	241.17	765.10

FLOW DISTRIBUTION FOR Q CHL= 17.20 CHSEL= 768.56

STA=	604.	670.	690.	697.	699.	702.	710.	730.	796.	830.	846.
PER Q=	2.9	17.1	5.9	2.6	10.1	6.1	6.4	21.2	10.9	1.6	
AREA=	12.4	49.2	18.0	6.2	15.7	20.5	42.2	69.8	46.4	10.4	
VEL=	2.1	1.2	2.1	2.2	1.8	2.2	1.2	2.1	2.1	1.7	

*SECNO 17.370

3370 NODAL BRIDGE,IRD= 1 CHL ELTRD= 765.10 ,BR CLOF= 772.67

	17.36	3.16	768.56	0.00	0.00	768.56	0.00	0.00	0.00	760.90
	65.	29.	7.	30.	154.	17.	194.	93.	26.	760.90
	3.16	0.19	0.39	0.15	0.080	0.035	0.060	0.034	759.40	604.61
	0.000043	11.	11.	11.	0	0	0	-49.41	241.22	765.10

FLOW DISTRIBUTION FOR Q CHL= 17.30 CHSEL= 768.56

STA=	604.	670.	690.	697.	699.	702.	710.	730.	796.	830.	846.
PER Q=	17.0	17.3	5.9	2.6	10.1	6.1	6.4	21.2	10.9	1.6	
AREA=	52.7	49.2	18.0	6.2	15.7	20.5	42.2	69.8	46.4	10.4	
VEL=	2.1	1.2	2.1	2.2	1.8	2.2	1.2	2.1	2.1	1.7	

*SECNO 17.430

SECNO	DEPTH	CHSEL	CRIMS	HSELR	ES	RV	HL	CLASS	TARK ELEV
0	QLOB	QCH	QROB	XTL	YVCH	XR	HT	CLETR	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XTL	YVCH	XR	HT	CLETR	SSTA
SLOPE	NLOB	NCH	NROB	CHORD	CL	ZROT	CT	PCWTD	ELTRD

U/S FACE OF 36 I CH CULVERT

	17.43	3.16	768.56	0.00	0.00	768.56	0.00	0.00	0.00	760.90
	65.	26.	15.	24.	176.	26.	212.	93.	26.	760.90
	3.16	0.16	0.59	0.15	0.080	0.035	0.060	0.034	759.40	604.61
	0.000015	1.	1.	1.	0	0	1	0.00	241.23	765.10

FLOW DISTRIBUTION FOR SECNO= 17.40 CHSEL= 768.58

STA=	604.	670.	690.	697.	699.	702.	710.	730.	756.	833.	846.
PER Q=	11.5	11.1	9.7	7.0	23.7	11.2	6.1	10.7	7.0	1.0	
AREA=	17.5	45.2	31.6	14.9	26.3	51.3	37.1	69.9	45.3	17.6	
VEL=	0.1	0.1	0.2	0.3	0.6	0.3	0.1	0.1	0.1	0.1	

*SECNO 18.100

D/S FACE OF 24 INCH CULVERT

18.10	6.06	759.67	0.00	1.00	761.06	1.00	1.00	1.00	760.20	760.06
51.	57.	2.	5.	71.	11.	100.	1.	35.	765.06	
3.20	0.13	0.01	0.17	0.060	0.035	0.000	0.034	762.50	537.09	
0.000240	50.	50.	50.	0	1	1	0.00	234.59	772.79	

FLOW DISTRIBUTION FOR SECNO= 18.20 CHSEL= 771.13

STA=	537.	634.	638.	647.	649.	651.	653.	662.	773.
PER Q=	23.2	3.0	10.1	5.2	10.2	5.2	13.9	21.1	
AREA=	114.6	5.5	36.6	10.5	10.9	10.7	36.5	114.2	
VEL=	0.1	0.1	0.3	0.1	0.3	0.1	0.1	0.1	

*SECNO 18.205

3370 NORMAL BRIDGE, IRD= 9 UPW ELTRD= 766.20 DAY ELLC= 764.90

15.30	6.06	769.53	0.00	0.00	768.53	0.00	0.00	0.30	760.20
65.	56.	1.	30.	100.	2.	100.	1.	35.	765.06
3.35	0.13	0.01	0.17	0.060	0.035	0.000	0.034	762.50	537.09
0.000139	15.	515.	115.	0	1	0	-66.81	234.31	772.90

FLOW DISTRIBUTION FOR SECNO= 18.30 CHSEL= 768.58

STA=	537.	634.	638.	647.	649.	651.	653.	662.	773.
PER Q=	42.6	4.1	1.6	1.0	3.5	42.6			
AREA=	114.6	7.4	4.1	3.0	9.5	114.3			
VEL=	0.3	0.4	0.2	0.4	0.2	0.2			

*SECNO 18.30

D/S FACE OF 24 INCH CULVERT SECT

18.40	6.06	768.58	0.00	0.00	768.38	0.00	0.30	0.30	763.13

3.33	0.18	0.60	0.97	0.020	0.035	0.040	0.014	762.50	536.41
0.000035	1.	1.	1.	0	0	3	0.05	857.39	775.51

FLOW DISTRIBUTION FOR SECTION= 10.40 CFLOW= 765.50

STA=	556.	634.	610.	657.	649.	65[illegible].	[illegible].	682.	77[illegible].
PER C=	23.3	3.3	15.0	5.2	10.1	5.2	15.0	21.4	
AREA=	116.2	9.5	36.7	10.5	10.9	10.6	36.7	116.4	
VEL=	0.1	0.2	0.3	0.3	0.6	[illegible]	0.3	0.1	

SEC C 10.50'

SECTO	DEPTH	WID	CFSME	WETPER	A	W	L	F DES	F IS FLOW
C	ALOD	ACH	AROB	ALOD	ACH	AROB	VOL	Y.A	LEFT/RIGHT
TIME	VLOD	VCH	VROB	XNL	XNCH	XNR	LTM	LCHS	SSTA
SLOPE	XLSOL	XLCH	XLSOR	ITRIAL	IN2	ICC.T	CORN.1	ICRHTO	ENDST

VALLEY SECTION APPROX. 50 FT. U/S OF 24 INCH CULVERT

10.50	6.26	766.38	0.00	0.00	760.50	0.01	0.20	0.00	766.60	
63.	11.		43.	134.	3	35.		2	2	
3.4	0.01	1.7	0.19	0.2 [illegible]	[illegible]	[illegible]	[illegible]	5[illegible]	2[illegible]	
0.00004	50.	30.	50.	0	0	0	0.01	[illegible]	[illegible]	

FLOW DISTRIBUTION FOR SECTION= 10.50 CFLOW= 766.0[illegible]

STA=	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
PER C=	[illegible]	1.5	3.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
AREA=	109.6	11.9	12.[illegible]	40.3	2[illegible].3	39.4		
VEL=	0.[illegible]	0.[illegible]	0.[illegible]	0.4	0.2	0.1		

[illegible] 10.[illegible]

SEC C 10.00'

VALLEY SECT. APPROX. 550 FT. U/S OF 24 INCH CULVERT SECT. 135

19.00	1.48	766.50	0.00	0.00	760.01	0.5[illegible]	1.01	0.01	766.00
53.	4.	2[illegible]	21.	1.	1[illegible]	[illegible]	[illegible]	20	[illegible]
3.[illegible]	0.53	2.1	0.47	[illegible]	[illegible]	[illegible]	[illegible]	76[illegible]	[illegible]
0.002771	231.	250.	173.	1	1	1	1.[illegible]	167.[illegible]	[illegible]

FLOW DISTRIBUTION FOR SECTION= 10.50 CFLOW= 766.0[illegible]

STA=	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
PER C=	0.7	[illegible]	12.4	12.4	[illegible]	30.1	[illegible]	
AREA=	1.0	5.5	14.6	14.6	0.8	41.9	0.5	
VEL=	0.6	0.7	0.7	0.7	0.4	0.5	0.2	

00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: CITY of KALAMAZOO

3) WATERCOURSE: AXTELL CREEK

4) DOCUMENT TYPE: MULTI-PROFILE INPUT

00BREAK00

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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
  ERROR CORR -  01
  MODIFICATION -  50,51,52
*****************************************************

C
T110 YEAR PROFILE
T2STARTING WATER SURFACE PROTAGE CREEK MEAN WATER SURFACE ELEVATION
T3       AXTELL CREEK KALAMAZOO

J1  ICHECK    INQ       NINV      IDIS      STRT      METRIC    HVINS     Q         WSEL      FQ

      0.        2.        0.        0.  0.000000      0.00       0.0        0.   760.150     0.000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IPI       CHNIM     ITRACE

    1.000     0.000    -1.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

   150.000   201.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

J5  LPRNT     NUMSEC                  ********REQUESTED SECTION NUMBERS********

   -10.000   -10.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
ET      0.000     0.000     0.000     0.000     1.410     0.000     0.000     0.000     0.000     0.000
QT      5.000   210.000   325.000   385.000   385.000   510.000     0.000     0.000     0.000     0.000
NC      0.080     0.080     0.035     0.100     0.300     0.000     0.000     0.000     0.000     0.000

      VALLEY SECT. APPROX. 90 FT. U/S OF CONFLUENCE W/PORTAGE CREEK SECT. 114.

X1      1.000    14.000  1489.000  1528.000     0.000     0.000     0.000     0.000     0.000     0.000
GR    762.200  1358.000   762.200  1382.000   761.600  1400.000   761.300  1466.000   761.300  1489.000
GR    759.600  1495.000   758.100  1500.000   757.000  1503.000   756.300  1509.000   756.600  1515.000
GR    761.500  1528.000   766.000  1590.000   766.000  1600.000   766.000  1678.000     0.000     0.000

      VALLEY SECT. APPROX. 30 FT. D/S OF ENCLOSURE          SECT. 115.

X1      2.000    12.000   607.000   632.000   380.000   400.000   390.000     0.000     0.000     0.000
GR    762.500   530.000   762.400   589.000   761.000   597.000   759.200   607.000   756.200   613.000
GR    754.500   620.000   756.600   627.000   761.000   632.000   761.500   638.000   761.500   642.000
GR    762.000   647.000   762.500   715.000     0.000     0.000     0.000     0.000     0.000     0.000
QT      5.000   120.000   234.000   294.000   294.000   420.000     0.000     0.000     0.000     0.000
NC      0.000     0.000     0.020     0.000     0.000     0.000     0.000     0.000     0.000     0.000
ET      0.000     0.000     0.000     0.000     [illegible]     0.000     0.000     0.000     0.000     [illegible]

      OVERLAND FLOW, APPROX. 10 FT U/S FROM D/S OF ENCLOSURE

X1      2.500     6.000    20.000    70.000    40.000    [illegible]     0.000     0.000     0.000     0.000
GR    770.000     0.000   762.000     1.000   762.000    20.000   762.000    70.000   762.000    90.000
GR    770.000    91.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
ET      0.000     0.000     0.000     0.000     1.410     0.000     0.000     0.000     0.000     0.000

      OVERLAND FLOW;APPROX.240FT U/S FROM D/S OF ENCLOSURE
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**********************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
  ERROR CORR -  01
  MODIFICATION -  50,51,52
**********************************************************

C
T1100 YEAR PROFILE
T2STARTING WATER SURFACE PROTAGE CREEK MEAN WATER SURFACE ELEVATION
T3       AXTELL CREEK KALAMAZOO

J1  ICHECK     INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ
         0.       4.       0.        0.  0.000000      0.00      0.0       0.     760.150     0.000

J2  NPROF      IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE
        1.000     0.000    -1.000     0.000     0.000     0.000     0.000     0.000     0.000    15.000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT
      110.000   150.000   200.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

    ET      0.000     0.000     0.000     0.000     1.410     0.000     0.000     0.000     0.000     0.000
    QT      5.000   210.000   325.000   385.000   385.000   510.000     0.000     0.000     0.000     0.000
    NC      0.080     0.080     0.035     0.100     0.300     0.000     0.000     0.000     0.000     0.000

    VALLEY SECT. APPROX. 90 FT. U/S OF CONFLUENCE W/PORTAGE CREEK SECT. 114.

    X1      1.000    14.000  1489.000  1528.000     0.000     0.000     0.000     0.000     0.000     0.000
    GR    762.200  1358.000   762.200  1382.000   761.600  1400.000   761.300  1466.000   761.300  1489.000
    GR    759.600  1495.000   758.100  1500.000   757.000  1503.000   756.300  1509.000   756.600  1515.000
    GR    761.500  1521.000   766.000  1590.000   766.000  1610.000   744.000  1678.000     0.000     0.000

    VALLEY SECT. APPROX. 30 FT. D/S OF ENCLOSURE          SECT. 115.

    X1      2.000    12.000   607.000   632.000   380.000   400.000   390.000     0.000     0.000     0.000
    GR    762.500   530.000   762.400   589.000   761.000   597.000   759.200   607.000   756.200   613.000
    GR    754.500   620.000   756.600   627.000   761.000   632.000   761.500   638.000   761.500   642.000
    GR    764.000   642.000   762.500   715.000     0.000     0.000     0.000     0.000     0.000     0.000
    QT      5.000   120.000   234.000   294.000   294.000   420.000     0.000     0.000     0.000     0.000
    NC      0.000     0.000     0.020     0.000     0.000     0.000     0.000     0.000     0.000     0.000
    ET      0.000     0.000     0.000     0.000     9.100     0.000     0.000     0.000     1.000    90.000

    OVERLAND FLOW; APPROX. 10 FT U/S FROM D/S OF ENCLOSURE

    X1      2.500     6.000    20.000    70.000    40.000    40.000    40.000     0.000     0.000     0.000
    GR    770.000     0.000   762.000     1.000   762.000    20.000   762.000    70.000   762.000    90.000
    GR    770.000    91.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
    ET      0.000     0.000     0.000     0.000     1.410     0.000     0.000     0.000     0.000     0.000

    OVERLAND FLOW; APPROX. 240FT U/S FROM D/S OF ENCLOSURE

    X1      3.000     6.000    20.000    80.000   230.000   230.000   230.000     0.000     0.000     0.000
    GR    770.000     0.000   762.000     1.000   762.000    20.000   762.000    80.000   762.000   170.000
    GR    770.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
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OVERLAND FLOW;APPROX.590FT U/S FROM D/S OF ENCLOSURE

X1	4.000	6.000	10.000	70.000	360.000	340.000	350.000	0.000	0.000	0.000
GR	770.000	0.000	763.200	1.000	763.200	10.000	763.200	70.000	762.400	215.000
GR	770.000	216.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

OVERLAND FLOW;APPROX.1065FT U/S FROM D/S OF ENCLOSURE

X1	5.000	6.000	15.000	60.000	475.000	475.000	475.000	0.000	0.000	0.000
GR	770.000	0.000	761.800	1.000	761.800	15.000	761.800	60.000	761.800	75.000
GR	770.000	76.800	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000
QT	5.000	210.000	325.000	385.000	385.000	515.000	0.000	0.000	0.000	0.000

VALLEY SECT.APPROX. 10FT U/S OF ENCLOSURE

X1	5.010	10.000	1120.000	1140.000	155.000	161.000	160.000	0.000	0.000	0.000
GR	765.300	1103.600	762.500	1104.000	761.900	1112.000	755.200	1120.000	755.200	1141.000
GR	760.400	1146.000	761.800	1158.000	761.800	1164.000	762.400	1178.000	765.000	1180.000

X1	5.020	15.000	778.000	790.000	255.000	265.000	260.000	0.000	0.000	0.000
GR	776.270	154.000	770.000	244.000	770.000	370.000	770.000	430.000	770.800	604.000
GR	760.000	700.500	755.500	778.000	755.500	778.100	750.700	784.000	755.500	789.900
GR	755.500	790.000	760.000	870.000	770.800	966.000	770.000	984.000	770.000	1050.000
NC	0.000	0.000	0.000	0.300	0.500	0.000	0.000	0.000	0.000	0.000

D/S FACE OF ROSE ST. BRIDGE SECT. 119.

X1	5.100	0.000	0.000	0.000	50.000	50.000	50.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	759.500	759.500	0.000

X1	5.200	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	759.500	759.500	0.000
BT	8.000	604.000	770.800	0.000	700.000	762.000	0.000	778.000	762.000	0.000
BT	778.100	762.000	759.500	789.900	762.000	759.500	790.000	762.000	0.000	870.000
BT	762.000	0.000	966.000	770.800	0.000	0.000	0.000	0.000	0.000	0.000

X1	5.300	0.000	0.000	0.000	64.000	64.000	64.000	0.000	0.000	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	761.800	762.000	0.000

U/S FACE OF ROSE ST. BRIDGE SECT. 119.

X1	5.400	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	761.800	762.000	0.000

X1	5.500	0.000	0.000	0.000	50.000	50.000	50.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.100	0.300	0.000	0.000	0.000	0.000	0.000

X1	5.600	12.000	823.500	836.500	225.000	195.000	210.000	0.000	0.000	0.000
GR	777.200	366.000	772.000	428.000	769.200	472.000	769.000	618.000	762.300	760.000
	757.100	8 [illegible].500	757.200	823.600	756.400	830.000	757.200	836.400	757.200	836.500
			000	1050.000	0.000	0.000	0.000	0.000	0.000	0.000

NC	0.000	0.000	0.000	0.300	0.500	0.000	0.000	0.000	0.000	0.000

D/S FACE OF STOCKBRIDGE AVE. BRIDGE SECT. 120.

X1	6.100	0.000	0.000	0.000	50.000	50.000	50.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	760.900	760.900	0.000
X1	6.200	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	760.900	760.900	0.000
BT	8.000	618.000	769.000	0.000	760.000	762.300	0.000	823.500	762.300	0.000
BT	823.600	762.300	761.200	836.400	762.300	761.200	836.500	762.300	0.000	900.000
BT	762.300	0.000	1050.000	769.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	6.300	0.000	0.000	0.000	64.000	64.000	64.000	0.000	0.000	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	761.800	762.300	0.000

D/S FACE OF STOCKBRIDGE AVE. CULVERT ON FOREST STREET

X1	6.400	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	761.800	762.300	0.000
X1	6.500	0.000	0.000	0.000	50.000	50.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.100	0.300	0.000	0.000	0.000	0.000	0.000
X1	6.600	15.000	951.300	964.200	550.000	590.000	570.000	0.000	0.000	0.000
G	771.200	588.000	770.000	602.000	770.000	622.000	770.000	626.000	770.000	844.000
GR	762.000	920.000	757.500	951.800	757.500	951.900	757.400	953.000	756.900	958.000
GR	756.700	963.000	756.700	964.100	756.700	964.200	762.100	990.000	771.800	1168.000
NC	0.000	0.000	0.000	0.300	0.500	0.000	0.000	0.000	0.000	0.000

D/S FACE OF PARK AVE. BRIDGE SECT. 121

X1	7.000	0.000	0.000	0.000	50.000	50.000	50.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	761.500	761.400	0.000
X1	7.100	21.000	952.100	963.900	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	761.500	761.400	0.000
BT	10.000	920.000	762.000	0.000	952.100	763.500	0.000	952.200	763.500	759.700
BT	953.800	763.500	759.700	953.900	763.500	761.100	962.100	763.500	761.100	962.200
BT	763.500	759.700	963.800	763.500	759.700	963.900	763.500	0.000	990.000	762.100
X1	7.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
G	771.200	588.000	770.000	602.000	770.000	622.000	770.000	626.000	770.000	844.000
GR	762.000	920.000	760.400	940.500	756.700	951.800	756.700	953.000	756.700	952.200
GR	756.300	953.800	756.300	953.900	755.900	958.000	756.700	962.100	756.700	962.200
GR	757.000	963.800	757.000	963.900	757.300	965.500	761.600	966.500	762.100	990.000
GR	771.000	1168.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	7.200	0.000	0.000	0.000	35.000	55.000	55.000	0.000	0.000	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	762.000	763.500	0.000

U/S FACE OF PARK AVE. BRIDGE

X1	7.300	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	762.000	763.500	0.000

VALLEY SECT. APPROX. 65 FT. U/S OF PARK ST. BRIDGE SECT. 122.

X1	8.000	15.000	835.000	864.000	65.000	85.000	65.000	0.000	0.000	0.000
GR	786.000	244.000	780.600	418.000	770.400	452.000	770.000	564.000	770.000	590.000
GR	769.000	775.000	759.700	824.000	758.700	839.000	756.700	847.000	756.500	849.000
GR	757.400	861.000	759.200	864.000	760.800	877.000	765.000	876.000	780.000	1066.000
NC	0.000	0.000	0.000	0.100	0.300	0.000	0.000	0.000	0.000	0.000

VALLEY SECT. APPROX. 50 FT. D/S OF 60 INCH PIPE

X1	9.000	0.000	1.000	0.000	50.000	100.000	125.000	0.000	0.500	0.000
NC	0.000	0.000	0.000	0.300	0.500	0.000	0.000	0.000	0.000	0.000

D/S FACE OF 60 INCH CMPS S CT. 123

X1	9.100	27.000	704.800	715.300	50.000	0.000	50.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	759.700	759.700	0.000
GR	773.900	408.000	770.000	464.000	770.000	496.000	770.000	540.000	761.700	680.000
GR	759.900	695.000	759.900	696.000	757.400	704.800	757.400	704.900	757.400	706.100
GR	757.400	707.300	757.400	708.500	757.400	709.300	757.400	709.900	757.400	710.000
GR	757.000	710.100	757.000	710.200	757.000	711.400	757.000	712.700	757.000	714.000
GR	757.000	715.200	757.000	715.300	757.000	718.200	759.700	724.000	759.700	725.000
GR	762.000	728.000	773.000	942.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	9.200	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	759.700	759.700	0.000
BT	18.000	695.000	759.900	0.000	696.000	762.800	0.000	704.800	762.800	0.000
BT	704.900	762.800	757.400	706.100	762.800	759.000	707.300	762.800	759.900	708.500
BT	762.800	759.000	709.800	762.800	757.400	709.900	762.800	0.000	710.100	762.800
BT	0.000	710.200	762.800	757.500	711.400	762.800	759.000	712.700	762.800	760.000
BT	714.000	762.800	759.000	715.200	762.800	757.500	715.300	762.800	0.000	724.000
BT	762.800	0.000	725.000	759.700	0.000	0.000	0.000	0.000	0.000	0.000

X1	9.300	0.000	0.000	0.000	15.000	15.000	15.000	0.000	0.000	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	759.900	759.700	0.000

U/S FACE 60 INCH CMPS

X1	9.400	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	759.900	759.700	0.000

X1	9.500	0.000	0.000	0.000	50.000	50.000	50.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.100	0.300	0.000	0.000	0.000	0.000	0.000

VALLEY SECT. APPROX.10FT D/S OF ENCLOSURE

X1	10.000	11.000	600.000	620.000	80.000	80.000	80.000	0.000	0.000	0.000
GR	770.200	468.000	769.500	532.000	762.000	559.000	760.000	540.000	758.800	544.000
GR	758.800	568.000	758.700	600.000	758.700	620.000	760.000	680.000	766.000	685.000
GR	769.200	884.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.080	0.000	0.000	0.000	0.000	0.000	0.000	0.000
QT	5.000	33.000	152.000	215.000	215.000	345.000	0.000	0.000	0.000	0.000

OVERLAND FLOW 10 FT U/S OF ENCLOSURE

X1	10.100	7.000	602.000	630.000	20.000	20.000	20.000	0.000	0.000	0.000
GR	769.500	492.000	766.000	504.000	763.200	602.000	763.200	630.000	764.000	662.000
GR	766.800	774.000	770.000	800.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	10.200	4.000	600.000	640.000	60.000	60.000	60.000	0.000	0.000	0.000
GR	767.000	500.000	764.000	600.000	764.000	640.000	768.000	780.000	0.000	0.000
X1	10.300	4.000	595.000	640.000	60.000	60.000	60.000	0.000	0.000	0.000
GR	767.500	500.000	765.000	595.000	765.000	640.000	768.000	780.000	0.000	0.000
X1	10.400	4.000	590.000	645.000	60.000	60.000	60.000	0.000	0.000	0.000
GR	768.000	500.000	766.200	590.000	766.200	645.000	770.000	780.000	0.000	0.000

OVERLAND FLOW AT WESTNEDGE AVENUE

X1	10.500	11.000	496.000	558.000	50.000	50.000	50.000	0.000	0.000	0.000
GR	773.600	166.000	771.900	210.000	770.200	270.000	769.000	326.000	768.400	435.000
GR	768.000	440.000	767.600	496.000	767.600	558.000	768.400	575.000	772.200	754.000
GR	773.000	504.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000
QT	5.000	210.000	325.000	385.000	385.000	510.000	0.000	0.000	0.000	0.000
ET	0.000	0.000	0.000	0.000	9.100	0.000	0.000	0.000	749.000	830.000

VALLEY SECT. APPROX. 10 FT U/S OF ENCLOSURE

X1	11.000	11.000	750.000	772.000	70.000	70.000	70.000	0.000	0.000	0.000
GR	774.500	508.000	773.000	524.000	771.600	552.000	770.000	718.000	768.500	735.000
GR	759.000	750.000	759.000	772.000	764.200	778.000	768.500	835.000	769.000	995.000
GR	775.300	1174.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ET	0.000	0.000	0.000	0.000	1.410	0.000	0.000	0.000	0.000	0.000

VALLEY SECT. 50 FT. D/S OF 5X7 FT CMP CULVERT SECT. 127

X1	12.000	19.000	616.400	623.600	750.000	700.000	725.000	0.000	0.000	0.000
GR	779.000	132.000	772.500	146.000	770.000	242.000	772.000	460.000	762.400	558.000
GR	767.800	606.500	758.200	616.400	758.200	616.500	758.200	616.600	758.200	617.500
GR	758.200	620.000	758.200	622.500	758.200	623.400	758.200	623.500	758.200	623.600
GR	763.800	633.500	765.400	692.000	772.000	796.000	771.600	942.000	0.000	0.000
NC	0.000	0.000	0.000	0.300	0.500	0.000	0.000	0.000	0.000	0.000

D/S FACE 5X7 FT. CMP CULVERT

X1	12.100	0.000	0.000	0.000	50.000	50.000	50.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	762.500	762.500	0.000
X1	12.200	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	762.500	762.500	0.000
BT	11.000	606.500	763.800	0.000	616.400	764.000	0.000	616.500	764.000	759.300
BT	616.600	764.000	760.300	617.500	764.000	761.600	620.000	764.000	762.500	622.500
BT	764.000	761.600	623.400	764.000	760.300	623.500	764.000	759.300	623.600	764.000
BT	0.000	633.500	763.800	0.000	0.000	0.000	0.000	0.000	0.000	0.000

PRINTED IN U.S.A.

X1	12.300	0.000	0.000	0.000	40.000	40.000	40.000	0.000	0.000	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	763.800	763.800	0.000

U/S FACE OF 5X7 FT. CULVERT

X1	12.400	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	763.800	763.800	0.000

VALLEY SECT. APPROX.30 FT. U/S OF 5X7 FT. CULVERT

X1	13.000	0.000	0.000	0.000	30.000	30.000	30.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.100	0.300	0.000	0.000	0.000	0.000	0.000

VALLEY SECT. APPROX. 30 FT D/S OF HOWARD ST

X1	14.000	15.000	648.900	655.100	280.000	365.300	345.000	0.000	0.000	0.000
GR	777.200	130.000	771.000	354.000	770.000	374.000	770.000	540.000	759.700	648.900
GR	**759.700**	**649.000**	**758.300**	**649.300**	**757.100**	**650.500**	**756.700**	**652.000**	**757.100**	**653.500**
GR	**758.300**	**654.700**	**759.700**	**655.000**	**759.700**	**655.100**	**764.400**	**880.000**	**775.000**	**886.000**
NC	0.000	0.000	0.000	0.300	0.500	0.000	0.000	0.000	0.000	0.000
NH	3.000	0.080	549.000	10.000	648.900	0.050	884.000	0.000	0.000	0.000
QT	5.000	119.000	170.000	200.000	290.000	270.000	0.000	0.000	0.000	0.000

D/S FACE OF CULVERT AT HOWARD ST

X1	14.500	15.000	648.900	655.100	30.000	30.000	30.000	0.000	0.000	0.000
X3	10.000	758.300	0.000	0.000	0.000	0.000	0.000	764.000	764.000	0.000
GR	777.200	130.000	771.000	490.000	765.000	495.000	765.000	548.000	759.700	648.900
GR	**759.700**	**649.000**	**758.300**	**649.300**	**757.100**	**650.500**	**756.700**	**652.000**	**757.100**	**653.500**
GR	**758.300**	**654.700**	**759.700**	**655.000**	**759.700**	**655.100**	**764.800**	**820.000**	**775.000**	**826.000**

X1	14.600	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	764.000	764.000	0.000
BT	**11.000**	**548.000**	**765.000**	**0.000**	**648.900**	**764.300**	**0.000**	**649.000**	**764.300**	**759.700**
BT	**649.300**	**764.300**	**761.100**	**650.500**	**764.300**	**762.300**	**652.000**	**764.300**	**762.700**	**653.500**
BT	**764.300**	**762.300**	**654.700**	**764.300**	**761.100**	**655.000**	**764.300**	**759.700**	**655.100**	**764.300**
BT	0.000	820.000	764.400	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.080	0.080	0.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	14.700	15.000	648.900	655.100	202.000	202.000	202.000	0.000	0.000	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	764.000	764.000	0.000
GR	777.200	130.000	771.000	490.000	765.000	495.000	765.000	548.000	759.700	648.900
GR	759.700	649.000	758.300	649.300	757.100	650.500	756.700	652.000	757.100	653.500
GR	**758.300**	**654.700**	**759.700**	**655.000**	**759.700**	**655.100**	**764.800**	**820.000**	**775.000**	**826.000**

U/S FACE OF CULVERT AT HOWARD ST

X1	14.800	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	764.000	764.000	0.000

VALLEY SECT. 50 FT U/S OF CULVERT AT HOWARD ST

X1	15.000	0.000	0.000	0.000	50.000	50.000	50.000	0.000	0.000	0.000

NC	0.000	0.000	0.000	0.100	0.300	0.000	0.000	0.000	0.000	0.000

VALLEY SECT. 50 FT. D/S OF CULVERT AT MAPLE SECT. 131

X1	16.000	12.000	700.000	710.000	580.000	560.000	600.000	0.000	0.000	0.000
GR	784.000	416.000	768.800	598.000	766.100	670.000	765.000	691.000	765.000	692.000
GR	762.000	700.000	759.000	709.000	764.000	710.000	765.800	730.000	767.200	796.000
GR	765.700	830.000	775.400	924.000	0.000	0.000	0.000	0.000	0.000	0.000
QT	5.000	35.000	55.000	65.000	65.000	90.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.300	0.500	0.000	0.000	0.000	0.000	0.000

D/S FACE OF CULVERT AT MAPLE RD.

X1	16.100	12.000	697.000	703.000	40.000	30.000	50.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	761.200	761.200	0.000
GR	784.000	416.000	768.800	598.000	766.100	670.000	758.700	697.000	758.700	697.200
GR	758.500	700.000	759.000	702.800	759.000	703.000	765.800	730.000	767.200	796.000
GR	765.700	830.000	775.400	924.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	16.200	12.000	697.000	703.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	761.200	761.200	0.000
BT	7.000	670.000	766.100	0.000	697.000	765.700	0.000	697.200	765.700	761.200
BT	700.100	765.700	761.000	702.800	765.700	766.800	703.000	765.700	0.000	730.000
BT	765.800	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	784.000	416.000	768.300	598.000	766.100	670.300	760.400	697.000	760.400	697.200
GR	759.800	700.000	760.200	702.800	760.200	703.000	765.800	730.000	767.200	796.000
GR	765.700	830.000	775.400	924.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	16.300	0.000	0.000	0.000	73.000	73.000	73.000	0.000	0.000	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	765.700	765.700	0.000

D/S FACE OF CULVERT AT MAPLE ST.

X1	16.400	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	765.700	765.700	0.000

VALLEY SECT. APPROX. 40 FT. D/S OF 36 INCH CONC. CULV.

X1	17.000	12.000	690.000	710.000	37.000	37.000	37.000	0.000	0.000	0.000
GR	784.000	416.000	768.800	598.000	766.100	670.000	766.100	690.000	761.300	696.500
GR	760.900	700.000	760.800	703.500	763.600	710.000	765.800	730.000	767.200	796.000
GR	765.700	830.000	775.400	924.000	0.000	0.000	0.000	0.000	0.000	0.000

D/S FACE OF 36 INCH CULVERT

X1	17.100	17.000	698.500	701.500	36.000	36.000	36.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	762.400	762.400	0.000
GR	784.000	416.000	768.800	598.000	766.100	670.000	766.100	690.000	761.300	696.500
GR	760.900	698.500	760.300	698.600	759.800	699.000	765.400	700.000	768.900	701.000
GR	760.300	701.400	760.900	701.500	767.200	710.000	767.200	730.000	767.200	796.000
GR	767.200	830.000	775.400	924.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	17.200	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	762.400	762.400	0.000
BT	9.000	690.000	766.100	0.000	698.500	765.300	760.900	698.600	765.300	761.500

BT	699.000	765.300	762.000	700.000	765.200	762.400	701.000	765.100	762.000	701.400
BT	765.100	761.500	701.500	765.100	760.900	710.000	767.200	0.000	0.000	0.000
X1	17.300	0.000	0.000	0.000	11.000	11.000	11.000	0.000	0.000	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	765.300	765.100	0.000

U/S FACE OF 36 INCH CULVERT

X1	17.400	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	765.300	765.100	0.000

D/S FACE OF 24 INCH CULVERT

X1	18.100	17.000	649.000	651.000	50.000	50.000	50.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	764.900	764.900	0.000
GR	780.100	470.000	770.200	470.100	766.200	634.000	766.200	638.000	7 2.800	647.000
GR	763.900	649.000	763.200	649.200	763.000	649.500	762.900	650.000	763.000	650.500
GR	763.200	650.800	763.900	651.000	762.500	653.000	766.500	652.000	770.000	850.000
GR	780.000	896.000	780.000	990.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	19.200	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	764.900	764.900	0.000
BT	9.000	634.000	766.200	0.000	649.000	770.000	763.900	649.200	770.000	764.400
BT	649.500	770.000	764.800	650.000	770.000	764.900	650.500	770.000	764.800	650.800
BT	770.000	764.400	651.000	770.000	763.900	662.000	766.500	0.000	0.000	0.000
X1	18.300	0.000	0.000	0.000	115.000	115.000	115.000	0.000	0.000	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	765.300	765.300	0.000

U/S FACE OF 24 INCH CULVERT SECT. 132

X1	18.400	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	765.300	765.300	0.000

VALLEY SECTION APPROX. 50 FT. U/S OF 24 INCH CULVERT

X1	18.500	9.000	647.500	652.500	50.000	50.000	50.000	0.000	0.000	0.000
GR	780.400	470.000	770.200	480.000	766.200	634.000	768.000	642.000	764.600	647.500
GR	764.500	650.000	764.300	652.500	766.000	730.000	775.000	820.000	0.000	0.000
NC	0.000	0.000	0.000	0.100	0.300	0.000	0.000	0.000	0.000	0.000

VALLEY SECT. APPROX.350 FT. U/S OF 24 INCH CULVERT SECT. 133

X1	19.000	16.000	515.000	525.000	230.000	300.000	280.000	0.000	0.000	0.000
GR	791.200	378.000	777.400	400.000	768.000	456.000	768.000	465.000	768.000	490.000
GR	768.000	515.000	767.700	517.000	767.100	520.000	767.800	523.000	768.000	525.000
GR	768.500	650.000	770.800	655.000	773.200	664.000	779.200	682.000	780.400	716.000
GR	792.600	840.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
EJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: CITY OF KALAMAZOO

3) WATERCOURSE: AXTELL CREEK

4) DOCUMENT TYPE: MULTI-PROFILE RUN

CROSSTOWN PARKWAY
CROSSING BURDICK STREET

ENCLOSURE NO. 1

00BREAK00

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*****************************************************
  HEC2 RELEASE DATED NOV 75 UPDATED FEB 1977
  ERROR CORR -  5
  MODIFICATION -  50,51,52
*****************************************************

C
T1COMPUTATIONS FOR ENCLOSURE ALONG CROSSTOWN PARKWAY CROSSING BURDICK ST
T2STARTING WATER SURFACE TAKEN FROM A D/S RUN
T3      AXTELL CREEK KALAMAZOO

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ
       0.       2.       1.       0.  0.000000     0.00     1.0      3.   730.500    0.000

J2  NPROF    IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE
     1.000    0.000   -1.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT
    150.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000

J3  LPRNT    NUMSEC                  ********REQUESTED SECTION NUMBERS********
    -10.000  -10.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000
NT      5.000    20.000    91.000    91.000    91.000    0.000    0.000    0.000    0.000    0.000
NC      0.100     0.100     0.035     0.300     0.500     0.000     0.000     0.000     0.000     0.000

        VALLEY SECT. APPROX. 10 FT. U/S OF ENCLOSURE

X1      2.000    12.000   607.000   632.000     0.000     0.000     0.000     0.000     0.000     0.000
X3     10.000     0.000     0.000     0.000     0.000     0.000     0.000   900.000   900.000     0.000
GR    770.000   530.000   762.400   539.000   761.300   597.000   759.200   607.000   756.200   613.000
GR    754.500   620.000   756.600   627.000   761.000   632.000   761.500   638.000   761.500   642.000
GR    770.000   714.000   770.000   715.000     0.000     0.000     0.000     0.000     0.000     0.000
SE      0.000    26.300     0.600     0.000     7.000     0.000    31.600     0.000   755.200   754.500

        VALLEY SECT. APPROX. 10 FT. U/S OF ENCLOSURE

X1      5.010    10.000   1160.000  1160.000  1275.000   825.000  1275.000     0.000     0.000     0.000
X2      0.000     0.000     1.000   759.000   900.000     0.000     0.000     0.000     0.000     0.000
X3     10.000     0.000     0.000     0.000     0.000     0.000     0.000   900.000   900.000     0.000
GR    770.000  1103.000   762.500  1104.000   761.900  1112.000   755.200  1120.000   755.200  1140.000
GR    760.400  1146.000   761.000  1150.000   761.800  1164.000   762.400  1170.000   770.000  1180.000
EJ      0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
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****
HEC2 RELEASE DATE NOV 76 [illegible] FEB 1977
ERROR CORR - [illegible]
MODIFICATION - 50,51,52
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

AXTELL CREEK KALAMAZOO

SUMMARY PRINTOUT TABLE 150

SECNO	KLOW	ELYRD	ELLC	ELMIN	[illegible]	[illegible]	CRIMS	[illegible]	[illegible]	VOL	[illegible]	[illegible]
2.000	0.00	0.00	0.00	754.50	90.00	760.51	0.00	760.52	0.92	0.93	96.39	93.71
2.000	0.00	0.00	0.00	754.50	91.00	760.91	0.00	760.92	0.71	0.86	106.25	108.06
2.000	0.00	0.00	0.00	754.50	[illegible]	[illegible]	0.00	[illegible]	0.40	0.31	12.00	17.20
2.000	0.00	0.00	0.00	754.50	[illegible]	[illegible]	0.00	[illegible]	0.42	0.72	135.00	139.65
5.010	1275.00	900.00	759.00	755.20	90.00	763.57	0.00	763.57	0.11	0.54	167.42	277.71
5.010	1275.00	900.00	759.00	755.20	91.00	764.03	0.00	764.04	0.09	0.51	176.78	302.36
5.010	1275.00	900.00	759.00	755.20	91.00	764.27	0.00	764.27	0.03	0.50	181.38	316.69
5.010	1275.00	[illegible]	759.00	[illegible]	[illegible]	[illegible]	[illegible]	764.72	0.07	0.47	190.42	339.2[illegible]

AXTELL CREEK KALAMAZOO

SUMMARY PRINTOUT TABLE 150

SECNO	Q	CUSEL	DIFWSP	DIFMSN	DIFKMS	TOPWID	%CH
2.000	90.00	760.51	0.00	0.00	0.00	24.44	0.00
2.000	91.00	760.91	0.00	0.00	0.00	24.92	0.00
2.000	91.00	761.14	0.00	0.00	0.00	25.00	0.00
2.000	90.00	761.66	0.00	0.00	0.00	25.00	0.00
5.010	90.00	763.57	0.00	3.06	0.00	20.00	1275.00
5.010	91.00	764.03	0.00	3.13	0.00	20.00	1275.00
5.010	91.00	764.27	0.00	3.13	0.00	20.00	1275.00
5.010	90.00	764.72	0.00	3.06	0.00	20.00	1275.00

SUMMARY OF ERRORS

00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: CITY OF KALAMAZOO

3) WATERCOURSE: AXTELL CREEK

4) DOCUMENT TYPE: MULTI-PROFILE RUN UNDER WESTNEDGE AVE

ENCLOSURE NO. 2

00BREAK00

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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
  ERROR CORR -  01
  MODIFICATION -  50,51,52
*****************************************************

C
T1COMPUTATIONS FOR ENCLOSURE UNDER WESTHEDGE AVE
T2STARTING WATER SURFACE ELEVATION TAKEN FROM A D/S RUN
T3       AXTELL CREEK KALAMAZOO

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    RVINS     Q         WSEL      FQ

      0.        2.        0.        0.  0.000000      0.00       0.0        0.   763.570     0.000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     1.000     0.000    -1.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    150.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

J5  LPRNT    NUMSEC                  ********REQUESTED SECTION NUMBERS********

    -10.000   -10.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
QT      5.000    77.000   173.200   173.000   173.000   [illegible]   0.000     0.000     0.000     0.000
NC      0.100     0.100     0.035     0.300     0.500     0.000     0.000     0.000     0.000     0.000

        VALLEY SECT. APPROX. 10 FT. U/S OF ENCLOSURE

X1     10.000    11.000   620.000   620.000     0.000     0.000     0.000     0.000     0.000     0.000
X3     10.000     0.000     0.000     0.000     0.000     0.000     0.000   900.000   900.000     0.000
GR    770.200   468.000   769.300   492.000   762.000   304.000   760.000   520.000   758.300   544.000
GR    758.800   568.000   758.700   600.000   758.700   620.000   760.000   728.000   764.400   734.000
GR    769.200   [illegible]     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
SB      0.000     5.130     2.500     0.000     5.000     0.000    [illegible]     0.000   [illegible]   [illegible]

        VALLEY SECT. APPROX. 10 FT. U/S OF ENCLOSURE

X1     11.000    11.000   750.000   772.000   [illegible]   320.000   620.000     0.000     0.000     0.000
X2      0.000     0.000     1.000   762.900   900.000     0.000     0.000     0.000     0.000     0.000
X3     10.000     0.000     0.000     0.000     0.000     0.000     0.000   900.000   900.000     0.000
GR    774.500   508.000   773.000   524.000   771.600   532.000   769.400   678.000   767.000   738.000
GR    759.000   750.000   759.200   772.000   764.200   778.000   766.300   946.000   768.100  1064.000
GR    775.300  1174.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
SB      0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
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HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
ERROR CORR - 01
MODIFICATION - 50,51,52
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES [illegible] IN SUMMARY OF ERRORS LIST

AXTELL CREEK KALAMAZOO

SUMMARY PRINTOUT TABLE 153

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	QUSEL	CHINS	HS	TOKMS	VCH	AREA	.01*
10.000	0.00	0.00	0.00	758.70	177.00	763.97	0.00	764.01	1.78	1.68	105.40	132.53
10.000	0.00	0.00	0.00	758.70	173.00	764.53	0.00	764.56	1.23	1.48	116.60	156.07
10.000	0.00	0.00	0.00	758.70	170.00	[illegible]	0.00	[illegible]	[illegible]	[illegible]	121.40	[illegible]
10.000	0.00	0.00	0.00	758.70	[illegible]	[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
11.000	320.00	900.00	762.90	759.00	177.00	767.92	0.00	767.93	0.27	0.90	196.35	340.94
11.000	320.00	900.00	762.90	759.00	173.00	768.30	0.00	768.31	0.23	0.84	204.79	364.24
11.000	320.00	900.00	762.90	759.00	170.00	768.61	0.00	768.62	0.21	0.82	207.22	371.00
11.000	320.00	[illegible]	762.90	[illegible]	[illegible]	[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

AXTELL CREEK KALAMAZOO

SUMMARY PRINTOUT TABLE 150

SECNO	S	CHSE	DIFMSP	DIFLSX	DIFCHS	TOPWID	XLOCH
10.000	177.00	765.97	0.00	0.00	0.00	20.00	0.00
10.000	173.00	764.53	0.30	0.00	0.00	20.00	0.00
10.000	170.00	764.77	0.30	0.00	0.00	20.00	0.00
10.000	165.00	765.23	0.00	0.00	0.00	20.00	0.00
11.000	177.00	767.92	0.00	3.95	0.00	22.00	320.00
11.000	173.00	768.30	0.00	3.77	0.00	22.00	320.00
11.000	170.00	768.49	0.00	3.64	0.00	22.00	320.00
11.000	165.00	767.66	0.00	3.45	0.00	22.00	320.00

SUMMARY OF ERRORS

00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: CITY OF KALAMAZOO

3) WATERCOURSE: AXTELL CREEK

4) DOCUMENT TYPE: MULTI-PROFILES SUMMARY

00BREAK00

****
HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
ERROR CORR - 01
MODIFICATION - 50,51,52
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

AXTELL CREEK KALAMAZOO

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
	1.000	0.00	0.00	0.00	756.30	210.00	760.15	0.00	760.27	14.45	2.91	74.75	55.24
	1.000	0.00	0.00	0.00	756.30	325.00	760.15	0.00	760.44	34.01	4.35	74.75	55.24
	1.000	**0.00**	**0.00**	**0.00**	**756.30**	**385.00**	**760.15**	**0.00**	**760.56**	**48.57**	**5.15**	**74.75**	**55.24**
	1.000	**0.00**	**0.00**	**0.00**	**756.30**	**510.00**	**760.15**	**0.00**	**760.87**	**85.22**	**6.82**	**74.75**	**55.24**
	2.000	390.00	0.00	0.00	754.50	210.00	760.51	0.00	760.58	4.61	2.17	101.03	95.78
	2.000	390.00	0.00	0.00	754.50	325.00	760.91	0.00	761.05	8.49	3.03	114.18	111.54
	2.000	390.00	0.00	0.00	754.50	385.00	761.14	0.00	761.32	9.90	3.38	122.74	122.36
	2.000	**390.00**	**0.00**	**0.00**	**754.50**	**510.00**	**761.66**	**0.00**	**761.90**	**11.76**	**3.96**	**145.24**	**148.75**
*	**2.500**	**40.00**	**0.00**	**0.00**	**762.00**	**120.00**	**762.47**	**762.47**	**762.71**	**90.22**	**4.27**	**41.90**	**12.63**
*	2.500	40.00	0.00	0.00	762.00	234.00	762.74	762.74	763.11	77.50	5.33	65.49	26.58
*	2.500	40.00	0.00	0.00	762.00	294.00	762.86	762.86	763.29	73.10	5.74	76.45	34.39
*	2.500	40.00	0.00	0.00	762.00	420.00	763.09	763.09	763.64	67.44	6.66	97.04	51.14
	3.000	**230.00**	**0.00**	**0.00**	**762.00**	**120.00**	**762.95**	**0.00**	**762.98**	**3.88**	**1.43**	**162.89**	**60.89**
	3.000	**230.00**	**0.00**	**0.00**	**762.00**	**234.00**	**763.37**	**0.00**	**763.41**	**4.55**	**1.96**	**231.99**	**109.74**
	3.000	230.00	0.00	0.00	762.00	294.00	763.55	0.00	763.60	4.67	2.16	263.95	136.05
	3.000	230.00	0.00	0.00	762.00	420.00	763.90	0.00	763.97	4.95	2.54	321.29	188.71
	4.000	**350.00**	**0.00**	**0.00**	**762.40**	**120.00**	**763.33**	**0.00**	**763.37**	**126.44**	**2.09**	**84.92**	**10.67**
	4.000	**350.00**	**0.00**	**0.00**	**762.40**	**234.00**	**763.70**	**0.00**	**763.77**	**38.07**	**2.92**	**166.91**	**37.92**
	4.000	**350.00**	**0.00**	**0.00**	**762.40**	**294.00**	**763.87**	**0.00**	**763.94**	**29.81**	**3.11**	**201.49**	**53.85**
	4.000	350.00	0.00	0.00	762.40	420.00	764.19	0.00	764.28	26.70	3.36	270.47	92.32
	5.000	475.00	0.00	0.00	761.80	120.00	763.57	0.00	763.59	1.43	1.30	131.33	100.52
	5.000	**475.00**	**0.00**	**0.00**	**761.80**	**234.00**	**764.02**	**0.00**	**764.07**	**2.55**	**2.02**	**164.79**	**146.56**
	5.000	**475.00**	**0.00**	**0.00**	**761.80**	**294.00**	**764.20**	**0.00**	**764.28**	**3.08**	**2.34**	**178.53**	**167.42**
	5.000	**475.00**	**0.00**	**0.00**	**761.80**	**420.00**	**764.54**	**0.00**	**764.66**	**4.06**	**2.93**	**203.77**	**208.50**
	5.010	160.00	0.00	0.00	755.20	210.00	763.58	0.00	763.61	0.43	1.11	215.92	350.29
	5.010	160.00	0.00	0.00	755.20	325.00	764.01	0.00	764.09	0.69	1.51	352.00	393.67
	5.010	**160.00**	**0.00**	**0.00**	**755.20**	**385.00**	**764.26**	**0.00**	**764.30**	**0.87**	**1.72**	**367.33**	**412.87**
	5.010	**160.00**	**0.00**	**0.00**	**755.20**	**510.00**	**764.64**	**0.00**	**764.70**	**1.28**	**2.15**	**396.04**	**450.00**
	5.020	260.00	0.00	0.00	752.70	210.00	763.68	0.00	763.69	0.17	0.47	1155.30	792.61
	5.020	260.00	0.00	0.00	752.70	325.00	764.1	0.00	764.10	0.13	0.66	1273.65	904.57
	5.020	260.00	0.00	0.00	752.70	385.00	764.31	0.00	764.31	0.16	0.75	1325.24	954.49
	5.020	**260.00**	**0.00**	**0.00**	**752.70**	**510.00**	**764.71**	**0.00**	**764.72**	**0.24**	**0.93**	**1423.84**	**1051.67**

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CPIWS	EG	10K*S	VCH	AREA	.01K
5.100	50.00	0.00	0.00	752.70	210.00	763.60	0.00	763.61	0.07	0.47	1154.33	791.70
5.100	50.00	0.00	0.00	752.70	325.00	764.10	0.00	764.10	0.13	0.66	1272.70	903.66
5.100	50.00	0.00	0.00	752.70	385.00	764.31	0.00	764.31	0.16	0.75	1324.76	954.02
5.100	50.00	0.00	0.00	752.70	510.00	764.71	0.00	764.72	0.23	0.93	1425.26	1053.09
5.200	1.00	762.00	759.50	752.70	210.00	763.60	0.00	763.61	2.48	1.15	398.19	133.41
5.200	1.00	762.00	759.50	752.70	325.00	764.09	0.00	764.11	3.13	1.35	497.62	183.74
5.200	1.00	762.00	759.50	752.70	385.00	764.31	0.00	764.32	3.43	1.44	545.72	207.98
5.200	1.00	762.00	759.50	752.70	510.00	764.71	0.00	764.72	3.90	1.59	638.90	258.22
5.300	64.00	762.00	759.50	752.70	210.00	763.62	0.00	763.63	2.47	1.15	398.92	133.73
5.300	64.00	762.00	759.50	752.70	325.00	764.11	0.00	764.13	3.11	1.35	498.77	184.31
5.300	64.00	762.00	759.50	752.70	385.00	764.33	0.00	764.34	3.38	1.47	548.35	209.34
5.300	64.00	762.00	759.50	752.70	510.00	764.73	0.00	764.75	3.85	1.58	641.96	259.93
5.400	1.00	0.00	0.00	752.70	210.00	763.63	0.00	763.63	0.07	0.47	1158.27	795.38
5.400	1.00	0.00	0.00	752.70	325.00	764.13	0.00	764.13	0.13	0.66	1277.69	908.45
5.400	1.00	0.00	0.00	752.70	385.00	764.34	0.00	764.35	0.16	0.75	1331.24	959.36
5.400	1.00	0.00	0.00	752.70	510.00	764.75	0.00	764.75	0.23	0.92	1431.47	1059.28
5.500	50.00	0.00	0.00	752.70	210.00	763.63	0.00	763.63	0.07	0.47	1161.14	798.04
5.500	50.00	0.00	0.00	752.70	325.00	764.13	0.00	764.13	0.13	0.66	1281.31	911.94
5.500	50.00	0.00	0.00	752.70	385.00	764.34	0.00	764.35	0.16	0.75	1334.17	963.19
5.500	50.00	0.00	0.00	752.70	510.00	764.75	0.00	764.75	0.23	0.92	1436.00	1063.81
5.600	210.00	0.00	0.00	756.40	210.00	763.63	0.00	763.63	0.33	0.87	619.85	365.69
5.600	210.00	0.00	0.00	756.40	325.00	764.13	0.00	764.14	0.54	1.17	724.85	440.77
5.600	210.00	0.00	0.00	756.40	385.00	764.34	0.00	764.35	0.66	1.31	773.19	475.68
5.600	210.00	0.00	0.00	756.40	510.00	764.75	0.00	764.76	0.87	1.57	869.91	546.28
6.100	50.00	0.00	0.00	756.40	210.00	763.63	0.00	763.63	0.33	0.87	619.80	365.65
6.100	50.00	0.00	0.00	756.40	325.00	764.13	0.00	764.14	0.54	1.18	724.74	440.69
6.100	50.00	0.00	0.00	756.40	385.00	764.35	0.00	764.36	0.66	1.32	772.97	475.52
6.100	50.00	0.00	0.00	756.40	510.00	764.75	0.00	764.77	0.87	1.57	869.67	546.10
6.200	1.00	762.30	761.20	756.40	210.00	763.62	0.00	763.64	5.26	1.50	281.39	91.53
6.200	1.00	762.30	761.20	756.40	325.00	764.13	0.00	764.15	5.98	1.69	346.40	132.94
6.200	1.00	762.30	761.20	756.40	385.00	764.34	0.00	764.36	6.27	1.77	434.69	153.73
6.200	1.00	762.30	761.20	756.40	510.00	764.75	0.00	764.77	6.62	1.89	531.53	198.18
6.300	64.00	762.30	761.20	756.40	210.00	763.65	0.00	763.68	5.11	1.48	295.02	92.87
6.300	64.00	762.30	761.20	756.40	325.00	764.16	0.00	764.19	5.79	1.66	391.51	135.10
6.300	64.00	762.30	761.20	756.40	385.00	764.38	0.00	764.40	6.07	1.74	440.47	156.28
6.300	64.00	762.30	761.20	756.40	510.00	764.79	0.00	764.82	6.40	1.87	538.55	201.53
6.400	1.00	0.00	0.00	756.40	210.00	763.68	0.00	763.68	0.32	0.86	627.17	370.90
6.400	1.00	0.00	0.00	756.40	325.00	764.18	0.00	764.19	0.52	1.16	733.95	447.83
6.400	1.00	0.00	0.00	756.40	385.00	764.40	0.00	764.41	0.64	1.30	783.18	482.96
6.400	1.00	0.00	0.00	756.40	510.00	764.81	0.00	764.82	0.84	1.55	881.17	554.56
6.500	50.00	0.00	0.00	756.40	210.00	763.68	0.00	763.68	0.32	0.86	630.54	373.29
6.500	50.00	0.00	0.00	756.40	325.00	764.18	0.00	764.19	0.52	1.16	737.80	450.10
6.500	50.00	0.00	0.00	756.40	385.00	764.40	0.00	764.41	0.63	1.30	787.15	485.81
6.500	50.00	0.00	0.00	756.40	510.00	764.81	0.00	764.82	0.84	1.55	885.49	557.74

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
6.600	570.00	0.00	0.00	756.70	210.00	763.70	0.00	763.71	0.75	1.30	356.31	242.54
6.600	570.00	0.00	0.00	756.70	325.00	764.22	0.00	764.24	1.26	1.77	419.91	290.06
6.600	570.00	0.00	0.00	756.70	385.00	764.44	0.00	764.47	1.52	1.99	449.60	312.32
6.600	570.00	0.00	0.00	756.70	510.00	764.86	0.00	764.90	2.04	2.39	509.18	357.29
7.000	50.00	0.00	0.00	756.70	210.00	763.70	0.00	763.71	0.75	1.30	356.82	242.92
7.000	50.00	0.00	0.00	756.70	325.00	764.22	0.00	764.25	1.25	1.77	420.73	290.67
7.000	**50.00**	**0.00**	**0.00**	**756.70**	**385.00**	**764.45**	**0.00**	**764.48**	**1.51**	**1.99**	**450.53**	**313.02**
7.000	**50.00**	**0.00**	**0.00**	**756.70**	**510.00**	**764.87**	**0.00**	**764.91**	**2.03**	**2.39**	**510.48**	**358.28**
7.100	1.00	762.00	761.10	755.90	210.00	763.67	0.00	763.74	21.97	2.[illegible]	143.20	44.81
7.100	1.00	762.00	761.10	755.90	325.00	764.20	0.00	764.27	22.87	2.86	219.12	67.96
7.100	1.00	762.00	761.10	755.90	385.00	764.42	0.00	764.50	23.16	2.96	239.98	60.01
7.100	**1.00**	**762.00**	**761.10**	**755.90**	**510.00**	**764.85**	**0.00**	**764.93**	**22.76**	**3.10**	**303.77**	**106.91**
7.200	85.00	762.00	761.10	755.90	210.00	763.86	0.00	763.91	16.20	2.30	165.47	52.18
7.200	85.00	762.00	761.10	755.90	325.00	764.39	0.00	764.45	17.33	2.55	235.16	78.08
7.200	85.00	762.00	761.10	755.90	385.00	764.62	0.00	764.68	17.77	2.66	267.58	91.34
7.200	85.00	762.00	761.10	755.90	510.00	765.09	0.00	765.11	18.17	2.83	332.18	119.64
7.300	**1.00**	**0.00**	**0.00**	**755.90**	**210.00**	**763.89**	**0.00**	**763.92**	**0.98**	**1.60**	**297.33**	**212.40**
7.300	**1.00**	**0.00**	**0.00**	**755.90**	**325.00**	**764.40**	**0.00**	**764.45**	**1.62**	**2.15**	**364.00**	**255.01**
7.300	1.00	0.00	0.00	755.90	385.00	764.62	0.00	764.68	1.95	2.40	395.69	275.69
7.500	1.00	0.00	0.00	755.90	510.00	765.04	0.00	765.11	2.56	2.85	460.27	318.63
8.000	65.00	0.00	0.00	756.50	210.00	763.92	0.00	763.93	0.28	0.80	465.11	393.48
8.000	65.00	0.00	0.00	756.50	325.00	764.45	0.00	764.47	0.49	1.10	548.40	464.00
8.000	65.00	0.00	0.00	756.50	385.00	764.68	0.00	764.70	0.60	1.24	587.65	497.54
8.000	65.00	0.00	0.00	756.50	510.00	765.11	0.00	765.14	0.82	1.50	663.17	563.89
9.000	135.00	0.00	0.00	757.00	210.00	763.92	0.00	763.93	0.39	0.89	395.16	334.83
9.000	135.00	0.00	0.00	757.00	325.00	764.46	0.00	764.47	0.66	1.22	471.42	398.80
9.000	135.00	0.00	0.00	757.00	385.00	764.68	0.00	764.71	0.81	1.38	506.67	428.57
9.000	135.00	0.00	0.00	757.00	510.00	765.12	0.00	765.15	1.09	1.66	577.94	489.22
9.100	50.00	0.00	0.00	757.00	210.00	763.92	0.00	763.94	1.02	1.54	311.51	201.69
9.100	50.00	0.00	0.00	757.00	325.00	764.45	0.00	764.49	1.74	2.07	382.31	245.01
9.100	**50.00**	**0.00**	**0.00**	**757.00**	**385.00**	**764.68**	**0.00**	**764.72**	**2.10**	**2.31**	**415.86**	**265.67**
9.100	**50.00**	**0.00**	**0.00**	**757.00**	**510.00**	**765.12**	**0.00**	**765.17**	**2.73**	**2.73**	**485.13**	**308.87**
9.200	1.00	759.70	760.00	757.00	210.00	763.92	0.00	763.94	15.18	1.65	186.35	53.89
9.200	1.00	759.70	760.00	757.00	325.00	764.46	0.00	764.49	16.05	1.92	256.96	81.12
9.200	1.00	759.70	760.00	757.00	385.00	764.69	0.00	764.73	16.31	2.03	291.34	95.34
9.200	**1.00**	**759.70**	**760.00**	**757.00**	**510.00**	**765.14**	**0.00**	**765.18**	**16.11**	**2.19**	**363.74**	**127.06**
9.300	15.00	759.70	760.00	757.00	210.00	763.94	0.00	763.96	14.77	1.64	188.39	54.64
9.300	15.00	759.70	760.00	757.00	325.00	764.48	0.00	764.51	15.45	1.88	260.79	82.67
9.300	15.00	759.70	760.00	757.00	385.00	764.71	0.00	764.75	15.74	2.00	295.36	97.05
9.300	15.00	759.70	760.00	757.00	510.00	765.17	0.00	765.20	15.75	2.17	366.97	122.11
9.400	1.00	0.00	0.00	757.00	210.00	763.94	0.00	763.96	1.07	1.54	313.75	203.17
9.400	1.00	0.00	0.00	757.00	325.00	764.48	0.00	764.52	1.73	2.06	386.29	247.45
9.400	1.00	0.00	0.00	757.00	385.00	764.71	0.00	764.76	2.05	2.37	420.91	268.32
9.400	1.00	0.00	0.00	757.00	510.00	765.16	0.00	765.21	2.65	2.71	491.70	313.01

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	TOKAS	VCH	AREA	.01K
9.500	50.00	0.00	0.00	757.00	210.00	763.95	0.00	763.97	1.06	1.53	314.62	203.71
9.500	50.00	0.00	0.00	757.00	325.00	764.49	0.00	764.52	1.72	2.05	386.99	247.88
9.500	50.00	0.00	0.00	757.00	385.00	764.72	0.00	764.77	2.05	2.29	421.51	269.17
9.500	50.00	0.00	0.00	757.00	510.00	765.17	0.00	765.23	2.64	2.70	493.06	313.86
10.000	80.00	0.00	0.00	758.70	210.00	763.97	0.00	763.97	0.21	0.59	713.50	455.93
10.000	80.00	0.00	0.00	758.70	325.00	764.53	0.00	764.53	0.35	0.82	757.67	545.84
10.000	80.00	0.00	0.00	758.70	385.00	764.77	0.00	764.78	0.43	0.93	833.87	586.39
10.000	80.00	0.00	0.00	758.70	510.00	765.23	0.00	765.24	0.58	1.13	903.11	666.97
10.100	20.00	0.00	0.00	763.20	35.00	763.97	0.00	763.98	14.63	0.32	44.13	5.61
10.100	20.00	0.00	0.00	763.20	152.00	764.51	0.00	764.55	73.82	1.91	100.45	17.69
10.100	20.00	0.00	0.00	763.20	215.00	764.74	0.00	764.79	69.69	2.07	132.65	25.75
10.100	20.00	0.00	0.00	763.20	345.00	765.21	0.00	765.25	54.76	2.19	207.00	46.62
10.200	60.00	0.00	0.00	764.00	33.00	764.40	764.26	764.44	275.39	1.68	21.67	1.99
10.200	60.00	0.00	0.00	764.00	152.00	765.27	0.00	765.13	133.52	2.35	82.15	13.15
10.200	60.00	0.00	0.00	764.00	215.00	765.28	0.00	765.35	129.27	2.69	107.09	17.91
10.200	60.00	0.00	0.00	764.00	345.00	765.64	0.00	765.73	116.58	2.79	157.70	31.95
10.300	60.00	0.00	0.00	765.00	33.00	765.48	0.00	765.50	122.01	1.25	29.50	2.99
10.300	60.00	0.00	0.00	765.00	152.00	765.96	0.00	766.03	168.36	2.35	77.20	11.71
10.300	60.00	0.00	0.00	765.00	215.00	766.15	0.00	766.23	165.68	2.62	99.82	16.70
10.300	60.00	0.00	0.00	765.00	345.00	766.45	0.00	766.55	161.35	3.03	142.56	27.16
10.400	60.00	0.00	0.00	766.20	33.00	766.53	0.00	766.56	280.71	1.51	23.61	1.97
10.400	60.00	0.00	0.00	766.20	152.00	767.05	0.00	767.12	194.84	2.32	76.91	10.89
10.400	60.00	0.00	0.00	766.20	215.00	767.21	0.00	767.30	190.50	2.58	99.41	15.58
10.400	60.00	0.00	0.00	766.20	345.00	767.48	0.00	767.59	187.01	3.00	141.97	25.23
10.500	50.00	0.00	0.00	767.60	33.00	767.91	0.00	767.94	268.14	1.38	26.65	2.02
10.500	50.00	0.00	0.00	767.60	152.00	768.25	0.00	768.33	307.16	2.43	69.84	8.67
10.500	50.00	0.00	0.00	767.60	215.00	768.38	0.00	768.48	297.40	2.71	88.05	12.47
10.500	50.00	0.00	0.00	767.60	345.00	768.61	0.00	768.73	281.25	3.12	124.27	20.57
11.000	70.00	0.00	0.00	759.00	210.00	767.93	0.00	767.94	0.23	0.89	389.63	433.34
11.000	70.00	0.00	0.00	759.00	325.00	768.32	0.00	768.34	0.47	1.29	426.50	473.28
11.000	70.00	0.00	0.00	759.00	385.00	768.46	0.00	768.49	0.62	1.50	440.74	488.71
11.000	70.00	0.00	0.00	759.00	510.00	768.71	0.00	768.76	0.97	1.90	473.29	518.14
12.000	725.00	0.00	0.00	758.20	210.00	767.95	0.00	767.96	0.18	0.82	846.28	495.36
12.000	725.00	0.00	0.00	758.20	325.00	768.36	0.00	768.37	0.33	1.14	945.51	568.21
12.000	725.00	0.00	0.00	758.20	385.00	768.52	0.00	768.53	0.42	1.30	984.23	597.33
12.000	725.00	0.00	0.00	758.20	510.00	768.81	0.00	768.82	0.61	1.61	1054.38	650.99
12.100	50.00	0.00	0.00	758.20	210.00	767.95	0.00	767.96	0.18	0.82	848.14	496.70
12.100	50.00	0.00	0.00	758.20	325.00	768.37	0.00	768.37	0.33	1.14	945.92	568.51
12.100	50.00	0.00	0.00	758.20	385.00	768.53	0.00	768.53	0.41	1.30	984.63	597.78
12.100	50.00	0.00	0.00	758.20	510.00	768.81	0.00	768.82	0.61	1.61	1054.77	651.25
12.200	1.00	763.80	762.50	758.20	210.00	767.96	0.00	767.96	0.36	0.46	773.64	351.56
12.200	1.00	763.80	762.50	758.20	325.00	768.37	0.00	768.37	0.61	0.63	871.31	414.96
12.200	1.00	763.80	762.50	758.20	385.00	768.5	0.00	768.5	0.72	0.71	910.16	440.94
12.200	1.00	763.80	762.50	758.20	510.00	768.82	0.00	768.82	1.00	0.87	980.63	489.12

PRINTED IN U.S.A.
FORM 1411-6B PRINTED BY ROTARY MANIFOLD FORMS

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
	12.300	40.00	763.80	762.50	758.20	210.00	767.96	0.00	767.96	0.36	0.46	774.49	352.09
1	12.300	40.00	763.80	762.50	758.20	325.00	768.37	0.00	768.38	0.61	0.63	872.96	416.05
2	12.300	40.00	763.80	762.50	758.20	385.00	768.53	0.00	768.54	0.76	0.71	912.27	442.36
3	12.300	40.00	763.80	762.50	758.20	510.00	768.82	0.00	768.83	1.08	0.87	983.78	491.30
4													
5	12.400	1.00	0.00	0.00	758.20	210.00	767.96	0.00	767.96	0.18	0.82	849.15	497.43
6	12.400	1.00	0.00	0.00	758.20	325.00	768.37	0.00	768.38	0.37	1.14	947.63	569.79
7	12.400	1.00	0.00	0.00	758.20	385.00	768.53	0.00	768.54	0.41	1.29	986.94	599.37
8	12.400	1.00	0.00	0.00	758.20	510.00	768.82	0.00	768.83	0.61	1.60	1058.58	654.24
9													
10	13.000	30.00	0.00	0.00	758.20	210.00	767.96	0.00	767.96	0.18	0.82	849.10	497.39
11	13.000	30.00	0.00	0.00	758.20	325.00	768.37	0.00	768.38	0.33	1.14	947.57	569.75
12	13.000	30.00	0.00	0.00	758.20	385.00	768.53	0.00	768.54	0.41	1.29	986.88	599.33
13	13.000	30.00	0.00	0.00	758.20	510.00	768.82	0.00	768.83	0.61	1.60	1058.33	654.05
14													
15	14.000	340.00	0.00	0.00	756.70	210.00	767.96	0.00	767.96	0.04	0.31	1626.56	1015.27
16	14.000	340.00	0.00	0.00	756.70	325.00	768.38	0.00	768.38	0.0	0.45	1748.65	1135.69
17	14.000	340.00	0.00	0.00	756.70	385.00	768.55	0.00	768.55	0.11	0.51	1796.49	1184.14
18	14.000	340.00	0.00	0.00	756.70	510.00	768.84	0.00	768.84	0.16	0.64	1882.39	1272.89
19													
20	14.500	30.00	0.00	0.00	758.30	110.00	767.96	0.00	767.96	0.03	0.11	1731.24	663.26
21	14.500	30.00	0.00	0.00	758.30	170.00	768.38	0.00	768.38	0.05	0.16	1870.22	752.46
22	14.500	30.00	0.00	0.00	758.30	200.00	768.55	0.00	768.55	0.06	0.18	1924.29	788.42
23	14.500	30.00	0.00	0.00	758.30	270.00	768.84	0.00	768.84	0.10	0.23	2021.24	854.63
24													
25	14.600	1.00	764.30	762.70	758.30	110.00	767.96	0.00	767.96	0.12	0.11	1104.99	313.35
26	14.600	1.00	764.30	762.70	758.30	170.00	768.38	0.00	768.39	0.20	0.15	1243.97	381.17
27	14.600	1.00	764.30	762.70	758.30	200.00	768.55	0.00	768.55	0.24	0.16	1298.20	409.06
28	14.600	1.00	764.30	762.70	758.30	270.00	768.84	0.00	768.84	0.34	0.20	1395.15	460.84
29													
30	14.700	202.00	0.00	0.00	756.70	110.00	767.96	0.00	767.96	0.01	0.16	1737.57	1051.45
31	14.700	202.00	0.00	0.00	756.70	170.00	768.39	0.00	768.39	0.02	0.22	1876.67	1198.96
32	14.700	202.00	0.00	0.00	756.70	200.00	768.55	0.00	768.55	0.03	0.25	1931.06	1241.69
33	14.700	202.00	0.00	0.00	756.70	270.00	768.84	0.00	768.85	0.04	0.32	2028.41	1342.16
34													
35	14.800	1.00	0.00	0.00	756.70	110.00	767.96	0.00	767.96	0.01	0.16	1737.12	1051.22
36	14.800	1.00	0.00	0.00	756.70	170.00	768.39	0.00	768.39	0.02	0.22	1876.27	1198.56
37	14.800	1.00	0.00	0.00	756.70	200.00	768.55	0.00	768.55	0.03	0.25	1930.58	1241.28
38	14.800	1.00	0.00	0.00	756.70	270.00	768.84	0.00	768.85	0.04	0.32	2027.85	1341.57
39													
40	15.000	50.00	0.00	0.00	756.70	110.00	767.96	0.00	767.96	0.01	0.16	1737.12	1051.22
41	15.000	50.00	0.00	0.00	756.70	170.00	768.39	0.00	768.39	0.02	0.22	1876.27	1198.56
42	15.000	50.00	0.00	0.00	756.70	200.00	768.55	0.00	768.55	0.03	0.25	1930.66	1241.28
43	15.000	50.00	0.00	0.00	756.70	270.00	768.85	0.00	768.85	0.04	0.32	2027.93	1341.66
44													
45	16.000	600.00	0.00	0.00	759.00	110.00	767.96	0.00	767.97	0.30	0.69	443.63	200.22
46	16.000	600.00	0.00	0.00	759.00	170.00	768.39	0.00	768.39	0.46	0.79	544.79	250.65
47	16.000	600.00	0.00	0.00	759.00	200.00	768.55	0.00	768.56	0.54	0.87	596.14	272.39
48	16.000	600.00	0.00	0.00	759.00	270.00	768.85	0.00	768.85	0.72	1.10	692.51	314.45
49													
50	16.100	50.00	0.00	0.00	758.50	35.00	767.97	0.00	767.97	0.01	0.20	575.29	324.03
51	16.100	50.00	0.00	0.00	758.50	55.00	768.39	0.00	768.39	0.02	0.28	676.43	381.66
52	16.100	50.00	0.00	0.00	758.50	65.00	768.56	0.00	768.56	0.03	0.31	717.81	406.21
53	16.100	50.00	0.00	0.00	758.50	90.00	768.86	0.00	768.86	0.04	0.39	794.06	453.05
54													
55													
56													

	SECNO	XLOC	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
	16.200	1.00	765.70	761.20	759.80	35.00	767.97	0.00	767.97	0.14	0.17	354.63	92.88
	16.200	1.00	765.70	761.20	759.80	55.00	768.39	0.00	768.39	0.17	0.20	456.31	134.83
	16.200	1.00	765.70	761.20	759.80	65.00	768.56	0.00	768.56	0.18	0.21	497.91	153.34
	16.200	1.00	765.70	761.20	759.80	90.00	768.86	0.00	768.86	0.22	0.25	574.93	189.75
	16.300	73.00	765.70	761.20	759.80	35.00	767.97	0.00	767.97	0.14	0.17	354.74	92.93
	16.300	73.00	765.70	761.20	759.80	55.00	768.39	0.00	768.39	0.17	0.20	456.55	134.93
	16.300	73.00	765.70	761.20	759.80	65.00	768.56	0.00	768.56	0.18	0.21	498.16	153.45
	16.300	73.00	765.70	761.20	759.80	90.00	768.86	0.00	768.86	0.22	0.25	575.25	189.91
	16.400	1.00	0.00	0.00	759.80	35.00	767.97	0.00	767.97	0.02	0.22	529.00	265.42
	16.400	1.00	0.00	0.00	759.80	55.00	768.39	0.00	768.39	0.03	0.30	630.81	320.90
	16.400	1.00	0.00	0.00	759.80	65.00	768.56	0.00	768.56	0.04	0.33	672.42	344.63
	16.400	1.00	0.00	0.00	759.80	90.00	768.86	0.00	768.86	0.05	0.41	749.59	390.40
	17.000	37.00	0.00	0.00	760.80	35.00	767.97	0.00	767.97	0.02	0.19	437.02	230.95
	17.000	37.00	0.00	0.00	760.80	55.00	768.39	0.00	768.39	0.04	0.25	538.78	287.24
	17.000	37.00	0.00	0.00	760.80	65.00	768.56	0.00	768.56	0.04	0.28	580.45	311.48
	17.000	37.00	0.00	0.00	760.80	90.00	768.86	0.00	768.86	0.06	0.35	657.69	358.34
	17.100	36.00	0.00	0.00	759.40	35.00	767.97	0.00	767.97	0.12	0.46	278.79	99.21
	17.100	36.00	0.00	0.00	759.40	55.00	768.39	0.00	768.39	0.17	0.55	375.17	134.06
	17.100	36.00	0.00	0.00	759.40	65.00	768.56	0.00	768.56	0.19	0.59	414.74	149.87
	17.100	36.00	0.00	0.00	759.40	90.00	768.86	0.00	768.86	0.25	0.69	488.43	181.65
	17.200	1.00	765.10	762.40	759.40	35.00	767.97	0.00	767.97	0.47	0.37	229.13	50.80
	17.200	1.00	765.10	762.40	759.40	55.00	768.39	0.00	768.40	0.45	0.38	325.50	81.96
	17.200	1.00	765.10	762.40	759.40	65.00	768.56	0.00	768.56	0.46	0.39	365.07	96.35
	17.200	1.00	765.10	762.40	759.40	90.00	768.86	0.00	768.86	0.51	0.43	438.75	125.58
	17.300	11.00	765.10	762.40	759.40	35.00	767.97	0.00	767.97	0.47	0.37	229.39	50.88
	17.300	11.00	765.10	762.40	759.40	55.00	768.40	0.00	768.40	0.45	0.38	325.84	82.08
	17.300	11.00	765.10	762.40	759.40	65.00	768.56	0.00	768.56	0.45	0.39	365.36	96.46
	17.300	11.00	765.10	762.40	759.40	90.00	768.86	0.00	768.86	0.51	0.43	439.19	125.77
	17.400	1.00	0.00	0.00	759.40	35.00	767.97	0.00	767.97	0.12	0.46	279.06	99.30
	17.400	1.00	0.00	0.00	759.40	55.00	768.39	0.00	768.40	0.17	0.55	375.51	134.19
	17.400	1.00	0.00	0.00	759.40	65.00	768.56	0.00	768.56	0.19	0.59	415.03	149.99
	17.400	1.00	0.00	0.00	759.40	90.00	768.86	0.00	768.86	0.25	0.68	488.80	181.82
	18.100	50.00	0.00	0.00	762.50	35.00	767.97	0.00	767.97	0.30	0.48	220.38	64.37
	18.100	50.00	0.00	0.00	762.50	55.00	768.40	0.00	768.40	0.37	0.57	305.31	90.27
	18.100	50.00	0.00	0.00	762.50	65.00	768.56	0.00	768.56	0.40	0.61	343.22	102.48
	18.100	50.00	0.00	0.00	762.50	90.00	768.86	0.00	768.86	0.50	0.70	417.85	127.57
	18.200	1.00	766.20	764.90	762.50	35.00	767.97	0.00	767.97	2.30	0.46	140.45	23.07
	18.200	1.00	766.20	764.90	762.50	55.00	768.40	0.00	768.40	1.74	0.40	219.05	41.66
	18.200	1.00	766.20	764.90	762.50	65.00	768.56	0.00	768.56	1.67	0.39	254.47	50.90
	18.200	1.00	766.20	764.90	762.50	90.00	768.86	0.00	768.86	1.61	0.39	324.29	73.54
	18.300	115.00	766.20	764.90	762.50	35.00	768.00	0.00	768.00	2.16	0.45	143.85	23.81
	18.300	115.00	766.20	764.90	762.50	55.00	768.42	0.00	768.42	1.69	0.40	221.56	42.30
	18.300	115.00	766.20	764.90	762.50	65.00	768.58	0.00	768.58	1.59	0.38	257.06	51.60
	18.300	115.00	766.20	764.90	762.50	90.00	768.86	0.00	768.86	1.54	0.38	327.73	71.43

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SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	TOK*S	VCH	AREA	.01K
18.400	1.00	0.00	0.00	762.50	35.00	768.00	0.00	768.00	0.28	0.48	225.06	65.74
18.400	1.00	0.00	0.00	762.50	55.00	768.42	0.00	768.42	0.36	0.57	309.78	91.69
18.400	1.00	0.00	0.00	762.50	65.00	768.58	0.00	768.58	0.39	0.60	347.73	103.95
18.400	1.00	0.00	0.00	762.50	90.00	768.88	0.00	768.88	0.48	0.69	422.96	129.33
18.500	50.00	0.00	0.00	764.30	35.00	768.00	0.00	768.00	0.09	0.29	337.96	117.96
18.500	50.00	0.00	0.00	764.30	55.00	768.42	0.00	768.42	0.13	0.38	419.76	155.26
18.500	50.00	0.00	0.00	764.30	65.00	768.58	0.00	768.58	0.14	0.41	454.37	171.71
18.500	50.00	0.00	0.00	764.30	90.00	768.88	0.00	768.88	0.19	0.50	520.52	204.12
19.000	280.00	0.00	0.00	767.10	35.00	768.22	768.22	768.34	134.64	3.52	25.38	3.02
19.000	280.00	0.00	0.00	767.10	55.00	768.39	0.00	768.45	83.44	3.23	48.35	6.02
19.000	280.00	0.00	0.00	767.10	65.00	768.52	0.00	768.61	27.71	2.19	87.06	12.35
19.000	280.00	0.00	0.00	767.10	90.00	768.89	0.00	768.90	11.30	1.67	148.16	26.77

AXTELL CREEK KALAMAZOO

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	1.000	210.00	760.15	0.00	0.00	0.00	31.36	0.00
	1.000	325.00	760.15	0.00	0.00	0.00	31.36	0.00
	1.000	**385.00**	**760.15**	**0.00**	**0.00**	**0.00**	**31.36**	**0.00**
	1.000	**510.00**	**760.15**	**0.00**	**0.00**	**0.00**	**31.36**	**0.00**
	2.000	210.00	760.51	0.00	0.36	0.00	51.09	390.00
	2.000	325.00	760.91	0.00	0.76	0.00	54.36	390.00
	2.000	385.00	761.14	0.00	0.99	0.00	37.56	390.00
	2.000	**510.00**	**761.66**	**0.00**	**1.51**	**0.00**	**50.42**	**390.00**
*	2.500	120.00	762.47	0.00	1.96	0.00	89.12	40.00
*	2.500	234.00	762.74	0.00	1.62	0.00	39.13	40.00
*	2.500	294.00	762.86	0.00	1.71	0.00	39.21	40.00
*	2.500	420.00	763.09	0.00	1.43	0.00	89.27	40.00
	3.000	120.00	762.95	0.00	0.48	0.00	169.24	230.00
	3.000	234.00	763.37	0.00	0.64	0.00	169.34	230.00
	3.000	294.00	763.55	0.00	0.69	0.00	169.39	230.00
	3.000	420.00	763.90	0.00	0.81	0.00	169.47	230.00
	4.000	120.00	763.33	0.00	0.38	0.00	214.14	350.00
	4.000	234.00	763.70	0.00	0.33	0.00	214.25	350.00
	4.000	294.00	763.87	0.00	0.32	0.00	214.29	350.00
	4.000	420.00	764.19	0.00	0.29	0.00	214.38	350.00
	5.000	120.00	763.57	0.00	0.23	0.00	74.43	475.00
	5.000	234.00	764.02	0.00	0.31	0.00	74.54	475.00
	5.000	294.00	764.20	0.00	0.34	0.00	74.59	475.00
	5.000	420.00	764.54	0.00	0.35	0.00	74.67	475.00
	5.010	210.00	763.59	0.00	0.02	0.00	75.35	160.00
	5.010	325.00	764.06	0.00	0.05	0.00	75.90	160.00
	5.010	**385.00**	**764.26**	**0.00**	**0.06**	**0.00**	**76.14**	**160.00**
	5.010	**510.00**	**764.64**	**0.00**	**0.10**	**0.00**	**76.58**	**160.00**
	5.020	210.00	763.60	0.00	0.02	0.00	234.14	260.00
	5.020	325.00	764.10	0.00	0.04	0.00	242.98	260.00
	5.020	385.00	764.31	0.00	0.05	0.00	246.72	260.00
	5.020	**510.00**	**764.71**	**0.00**	**0.07**	**0.00**	**253.73**	**260.00**
	5.100	210.00	763.60	0.00	0.00	0.00	234.08	50.00
	5.100	325.00	764.10	0.00	0.00	0.00	242.91	50.00
	5.100	385.00	764.31	0.00	0.00	0.00	246.64	50.00
	5.100	510.00	764.71	0.00	0.00	0.00	253.73	50.00
	5.200	210.00	763.60	0.00	-0.00	0.00	234.07	1.00
	5.200	325.00	764.09	0.00	-0.01	0.00	242.89	1.00
	5.200	385.00	764.31	0.00	-0.01	0.00	246.45	1.00
	5.200	510.00	764.71	0.00	-0.01	0.00	253.73	1.00
	5.300	210.00	763.62	0.00	0.02	0.00	234.13	64.00
	5.300	325.00	764.11	0.00	0.02	0.00	242.98	64.00
	5.300	385.00	764.33	0.00	0.02	0.00	246.86	64.00
	5.300	510.00	764.73	0.00	0.03	0.00	254.01	64.00

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SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
5.400	210.00	763.63	0.00	0.01	0.00	234.38	1.00
5.400	325.00	764.13	0.00	0.01	0.00	243.27	1.00
5.400	385.00	764.34	0.00	0.01	0.00	247.08	1.00
5.400	510.00	764.75	0.00	0.02	0.00	254.26	1.00
5.500	210.00	763.63	0.00	0.00	0.00	234.60	50.00
5.500	325.00	764.13	0.00	0.00	0.00	243.54	50.00
5.500	385.00	764.34	0.00	0.00	0.00	247.37	50.00
5.500	510.00	764.75	0.00	0.00	0.00	254.58	50.00
5.600	210.00	763.63	0.00	0.00	0.00	197.53	210.00
5.600	325.00	764.13	0.00	0.00	0.00	219.83	210.00
5.600	385.00	764.34	0.00	0.00	0.00	229.22	210.00
5.600	510.00	764.75	0.00	0.00	0.00	246.92	210.00
6.100	210.00	763.63	0.00	0.00	0.00	197.91	50.00
6.100	325.00	764.13	0.00	0.00	0.00	219.81	50.00
6.100	385.00	764.35	0.00	0.00	0.00	229.18	50.00
6.100	510.00	764.75	0.00	0.00	0.00	246.88	50.00
6.200	210.00	763.62	0.00	-0.01	0.00	197.95	1.00
6.200	325.00	764.13	0.00	-0.01	0.00	219.86	1.00
6.200	385.00	764.34	0.00	-0.01	0.00	229.23	1.00
6.200	510.00	764.75	0.00	-0.00	0.00	246.96	1.00
6.300	210.00	763.66	0.00	0.03	0.00	198.74	64.00
6.300	325.00	764.16	0.00	0.04	0.00	220.87	64.00
6.300	385.00	764.38	0.00	0.04	0.00	230.33	64.00
6.300	510.00	764.79	0.00	0.04	0.00	248.19	64.00
6.400	210.00	763.68	0.00	0.02	0.00	199.53	1.00
6.400	325.00	764.18	0.00	0.02	0.00	221.63	1.00
6.400	385.00	764.40	0.00	0.02	0.00	231.09	1.00
6.400	510.00	764.80	0.00	0.01	0.00	248.90	1.00
6.500	210.00	763.68	0.00	0.00	0.00	200.27	50.00
6.500	325.00	764.18	0.00	0.00	0.00	222.39	50.00
6.500	385.00	764.40	0.00	0.00	0.00	231.86	50.00
6.500	510.00	764.81	0.00	0.00	0.00	249.66	50.00
6.600	210.00	763.70	0.00	0.02	0.00	115.37	570.00
6.600	325.00	764.22	0.00	0.03	0.00	129.81	570.00
6.600	385.00	764.44	0.00	0.04	0.00	136.04	570.00
6.600	510.00	764.86	0.00	0.05	0.00	147.73	570.00
7.000	210.00	763.70	0.00	0.00	0.00	115.49	50.00
7.000	325.00	764.22	0.00	0.01	0.00	129.90	50.00
7.000	385.00	764.45	0.00	0.01	0.00	136.12	50.00
7.000	510.00	764.87	0.00	0.01	0.00	147.82	50.00
7.100	210.00	763.67	0.00	-0.03	0.00	117.30	1.00
7.100	325.00	764.20	0.00	-0.02	0.00	132.85	1.00
7.100	385.00	764.42	0.00	-0.02	0.00	139.54	1.00
7.100	510.00	764.85	0.00	-0.02	0.00	152.42	1.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
7.200	210.00	763.86	0.00	0.18	0.00	122.77	85.00
7.200	325.00	764.39	0.00	0.19	0.00	138.51	85.00
7.200	385.00	764.62	0.00	0.19	0.00	145.25	85.00
7.200	510.00	765.04	0.00	0.19	0.00	157.82	85.00
7.300	210.00	763.89	0.00	0.03	0.00	123.74	1.00
7.300	325.00	764.40	0.00	0.01	0.00	138.72	1.00
7.300	385.00	764.62	0.00	0.00	0.00	145.31	1.00
7.300	510.00	765.04	0.00	-0.01	0.00	157.87	1.00
8.000	210.00	763.92	0.00	0.03	0.00	148.74	65.00
8.000	325.00	764.45	0.00	0.05	0.00	164.11	65.00
8.000	385.00	764.68	0.00	0.06	0.00	170.86	65.00
8.000	510.00	765.11	0.00	0.07	0.00	181.20	65.00
9.000	210.00	763.92	0.00	0.00	0.00	134.50	135.00
9.000	325.00	764.46	0.00	0.00	0.00	149.96	135.00
9.000	385.00	764.68	0.00	0.00	0.00	156.59	135.00
9.000	510.00	765.12	0.00	0.01	0.00	169.21	135.00
9.100	210.00	763.92	0.00	-0.00	0.00	122.89	50.00
9.100	325.00	764.45	0.00	-0.00	0.00	142.34	50.00
9.100	385.00	764.68	0.00	-0.00	0.00	150.66	50.00
9.100	510.00	765.12	0.00	-0.00	0.00	166.52	50.00
9.200	210.00	763.92	0.00	-0.00	0.00	122.75	1.00
9.200	325.00	764.46	0.00	0.01	0.00	142.12	1.00
9.200	385.00	764.69	0.00	0.01	0.00	150.65	1.00
9.200	510.00	765.14	0.00	0.03	0.00	167.20	1.00
9.300	210.00	763.94	0.00	0.02	0.00	123.36	15.00
9.300	325.00	764.48	0.00	0.02	0.00	143.09	15.00
9.300	385.00	764.72	0.00	0.03	0.00	151.62	15.00
9.300	510.00	765.17	0.00	0.02	0.00	167.89	15.00
9.400	210.00	763.94	0.00	0.00	0.00	123.61	1.00
9.400	325.00	764.48	0.00	-0.00	0.00	143.35	1.00
9.400	385.00	764.71	0.00	-0.00	0.00	151.88	1.00
9.400	510.00	765.16	0.00	-0.01	0.00	167.95	1.00
9.500	210.00	763.95	0.00	0.01	0.00	123.87	50.00
9.500	325.00	764.49	0.00	0.01	0.00	143.53	50.00
9.500	385.00	764.72	0.00	0.01	0.00	152.02	50.00
9.500	510.00	765.17	0.00	0.01	0.00	168.24	50.00
10.000	210.00	763.97	0.00	0.02	0.00	149.09	80.00
10.000	325.00	764.53	0.00	0.04	0.00	169.79	80.00
10.000	385.00	764.77	0.00	0.05	0.00	178.30	80.00
10.000	510.00	765.22	0.00	0.06	0.00	194.61	80.00
10.100	33.00	763.97	0.00	-0.00	0.00	86.04	20.00
10.100	152.00	764.51	0.00	-0.02	0.00	125.90	20.00
10.100	215.00	764.74	0.00	-0.03	0.00	143.71	20.00
10.100	345.00	765.21	0.00	-0.03	0.00	178.42	20.00

PRINTED IN U.S.A.
FORM 1411-88 PRINTED BY ROTARY MANIFOLD FORMS

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
10.200	33.00	764.40	0.00	0.43	0.00	67.54	60.00
10.200	152.00	765.07	0.00	0.57	0.00	113.25	60.00
10.200	215.00	765.28	0.00	0.54	0.00	127.42	60.00
10.200	345.00	765.64	0.00	0.44	0.00	152.16	60.00
10.300	33.00	765.49	0.00	1.08	0.00	79.58	60.00
10.300	152.00	765.96	0.00	0.89	0.00	115.41	60.00
10.300	215.00	766.15	0.00	0.87	0.00	128.84	60.00
10.300	345.00	766.45	0.00	0.80	0.00	151.10	60.00
10.400	33.00	766.53	0.00	1.06	0.00	84.64	60.00
10.400	152.00	767.05	0.00	1.09	0.00	127.20	60.00
10.400	215.00	767.21	0.00	1.06	0.00	141.53	60.00
10.400	345.00	767.48	0.00	1.04	0.00	164.79	60.00
10.500	33.00	767.91	0.00	1.38	0.00	111.54	50.00
10.500	152.00	768.25	0.00	1.20	0.00	134.51	50.00
10.500	215.00	768.38	0.00	1.17	0.00	139.24	50.00
10.500	345.00	768.61	0.00	1.12	0.00	156.63	50.00
11.000	210.00	767.93	0.00	0.02	0.00	91.55	70.00
11.000	325.00	768.32	0.00	0.07	0.00	97.34	70.00
11.000	385.00	768.46	0.00	0.09	0.00	99.49	70.00
11.000	510.00	768.71	0.00	0.11	0.00	171.10	70.00
12.000	210.00	767.95	0.00	0.02	0.00	230.71	725.00
12.000	325.00	768.36	0.00	0.04	0.00	241.62	725.00
12.000	385.00	768.52	0.00	0.06	0.00	245.74	725.00
12.000	510.00	768.81	0.00	0.02	0.00	253.04	725.00
12.100	210.00	767.95	0.00	0.00	0.00	230.91	50.00
12.100	325.00	768.37	0.00	0.00	0.00	241.66	50.00
12.100	385.00	768.53	0.00	0.00	0.00	245.81	50.00
12.100	510.00	768.81	0.00	0.00	0.00	253.15	50.00
12.200	210.00	767.96	0.00	0.00	0.00	230.92	1.00
12.200	325.00	768.37	0.00	0.00	0.00	241.65	1.00
12.200	385.00	768.53	0.00	0.01	0.00	245.79	1.00
12.200	510.00	768.82	0.00	0.01	0.00	253.13	1.00
12.300	210.00	767.96	0.00	0.00	0.00	231.02	40.00
12.300	325.00	768.37	0.00	0.00	0.00	241.83	40.00
12.300	385.00	768.53	0.00	0.00	0.00	246.01	40.00
12.300	510.00	768.82	0.00	0.00	0.00	253.45	40.00
12.400	210.00	767.96	0.00	-0.00	0.00	231.03	1.00
12.400	325.00	768.37	0.00	-0.00	0.00	241.84	1.00
12.400	385.00	768.53	0.00	-0.00	0.00	246.03	1.00
12.400	510.00	768.82	0.00	-0.00	0.00	253.47	1.00
13.000	210.00	767.96	0.00	0.00	0.00	231.02	30.00
13.000	325.00	768.37	0.00	0.00	0.00	241.84	30.00
13.000	385.00	768.53	0.00	0.00	0.00	246.02	30.00
13.000	510.00	768.82	0.00	0.00	0.00	253.45	30.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
14.000	210.00	767.96	0.00	0.01	0.00	288.39	340.00
14.000	325.00	768.38	0.00	0.01	0.00	291.44	340.00
14.000	385.00	768.55	0.00	0.01	0.00	292.63	340.00
14.000	510.00	768.84	0.00	0.02	0.00	294.75	340.00
14.500	110.00	767.96	0.00	0.00	0.00	329.33	30.00
14.500	170.00	768.39	0.00	0.00	0.00	329.93	30.00
14.500	200.00	768.55	0.00	0.00	0.00	330.16	30.00
14.500	270.00	768.84	0.00	0.00	0.00	330.58	30.00
14.600	110.00	767.96	0.00	0.00	0.00	329.33	1.00
14.600	170.00	768.38	0.00	0.00	0.00	329.93	1.00
14.600	200.00	768.55	0.00	-0.00	0.00	330.16	1.00
14.600	270.00	768.84	0.00	-0.00	0.00	330.58	1.00
14.700	110.00	767.96	0.00	0.00	0.00	329.33	202.00
14.700	170.00	768.39	0.00	0.00	0.00	329.93	202.00
14.700	200.00	768.55	0.00	0.00	0.00	330.17	202.00
14.700	270.00	768.84	0.00	0.00	0.00	330.59	202.00
14.800	110.00	767.96	0.00	0.00	0.00	329.33	1.00
14.800	170.00	768.39	0.00	0.00	0.00	329.93	1.00
14.800	200.00	768.55	0.00	0.00	0.00	330.16	1.00
14.800	270.00	768.84	0.00	0.00	0.00	330.58	1.00
15.000	110.00	767.96	0.00	0.00	0.00	329.33	50.00
15.000	170.00	768.39	0.00	0.00	0.00	329.93	50.00
15.000	200.00	768.55	0.00	0.00	0.00	330.17	50.00
15.000	270.00	768.85	0.00	0.00	0.00	330.58	50.00
16.000	110.00	767.96	0.00	-0.00	0.00	231.66	600.00
16.000	170.00	768.39	0.00	-0.00	0.00	247.02	600.00
16.000	200.00	768.55	0.00	0.00	0.00	253.02	600.00
16.000	270.00	768.85	0.00	0.00	0.00	263.07	600.00
16.100	35.00	767.97	0.00	0.00	0.00	231.63	50.00
16.100	55.00	768.39	0.00	0.01	0.00	247.00	50.00
16.100	65.00	768.56	0.00	0.01	0.00	253.02	50.00
16.100	90.00	768.86	0.00	0.01	0.00	263.06	50.00
16.200	35.00	767.97	0.00	0.00	0.00	231.77	1.00
16.200	55.00	768.39	0.00	0.00	0.00	247.21	1.00
16.200	65.00	768.56	0.00	0.00	0.00	253.25	1.00
16.200	90.00	768.86	0.00	0.00	0.00	263.26	1.00
16.300	35.00	767.97	0.00	0.00	0.00	231.79	73.00
16.300	55.00	768.39	0.00	0.00	0.00	247.25	73.00
16.300	65.00	768.56	0.00	0.00	0.00	253.29	73.00
16.300	90.00	768.86	0.00	0.00	0.00	263.27	73.00
16.400	35.00	767.97	0.00	0.00	0.00	231.81	1.00
16.400	55.00	768.39	0.00	-0.00	0.00	247.26	1.00
16.400	65.00	768.56	0.00	-0.00	0.00	253.31	1.00
16.400	90.00	768.86	0.00	0.00	0.00	263.30	1.00

FORM 1811 GR PRINTED BY ROTARY MANIFOLD FORMS

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	17.000	35.00	767.97	0.00	0.00	0.00	231.82	37.00
	17.000	55.00	768.39	0.00	0.00	0.00	247.26	37.00
	17.000	65.00	768.56	0.00	0.00	0.00	253.32	37.00
	17.000	90.00	768.86	0.00	0.00	0.00	263.31	37.00
	17.100	35.00	767.97	0.00	-0.00	0.00	218.64	36.00
	17.100	55.00	768.39	0.00	-0.00	0.00	234.34	36.00
	17.100	65.00	768.56	0.00	0.00	0.00	241.18	36.00
	17.100	90.00	768.86	0.00	0.00	0.00	251.71	36.00
	17.200	35.00	767.97	0.00	0.00	0.00	216.63	1.00
	17.200	55.00	768.39	0.00	0.00	0.00	234.83	1.00
	17.200	65.00	768.56	0.00	0.00	0.00	241.17	1.00
	17.200	90.00	768.86	0.00	0.00	0.00	251.70	1.00
	17.300	35.00	767.97	0.00	0.00	0.00	218.67	11.00
	17.300	55.00	768.40	0.00	0.00	0.00	234.89	11.00
	17.300	65.00	768.56	0.00	0.00	0.00	241.22	11.00
	17.300	90.00	768.86	0.00	0.00	0.00	251.74	11.00
	17.400	35.00	767.97	0.00	-0.00	0.00	218.68	1.00
	17.400	55.00	768.39	0.00	-0.00	0.00	234.90	1.00
	17.400	65.00	768.56	0.00	-0.00	0.00	241.23	1.00
	17.400	90.00	768.86	0.00	-0.00	0.00	251.74	1.00
	18.100	35.00	767.97	0.00	0.00	0.00	179.55	50.00
	18.100	55.00	768.40	0.00	0.00	0.00	219.83	50.00
	18.100	65.00	768.56	0.00	0.00	0.00	235.59	50.00
	18.100	90.00	768.86	0.00	0.00	0.00	263.89	50.00
	18.200	35.00	767.97	0.00	0.00	0.00	179.55	1.00
	18.200	55.00	768.40	0.00	0.00	0.00	219.85	1.00
	18.200	65.00	768.56	0.00	0.00	0.00	235.61	1.00
	18.200	90.00	768.86	0.00	0.00	0.00	263.93	1.00
	18.300	35.00	768.00	0.00	0.03	0.00	181.50	115.00
	18.300	55.00	768.42	0.00	0.02	0.00	221.00	115.00
	18.300	65.00	768.58	0.00	0.02	0.00	236.72	115.00
	18.300	90.00	768.88	0.00	0.02	0.00	265.09	115.00
	18.400	35.00	768.00	0.00	0.00	0.00	182.00	1.00
	18.400	55.00	768.42	0.00	0.00	0.00	221.74	1.00
	18.400	65.00	768.58	0.00	0.00	0.00	237.39	1.00
	18.400	90.00	768.88	0.00	0.00	0.00	265.71	1.00
	18.500	35.00	768.00	0.00	0.00	0.00	185.44	50.00
	18.500	55.00	768.42	0.00	0.00	0.00	225.23	50.00
	18.500	65.00	768.58	0.00	0.00	0.00	243.23	50.00
	18.500	90.00	768.88	0.00	0.00	0.00	273.65	50.00
*	19.000	35.00	768.22	0.00	0.22	0.00	125.43	280.00
	19.000	55.00	768.38	0.00	-0.04	0.00	165.80	280.00
	19.000	65.00	768.58	0.00	-0.01	0.00	187.19	280.00
	19.000	90.00	768.89	0.00	0.01	0.00	220.15	280.00

SUMMARY OF ERRORS

CAUTION SECNO= 2.500 PROFILE= 1 CRITICAL DEPTH ASSUMED

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 CAUTION  SECNO=     2.500  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION  SECNO=     2.500  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
 CAUTION  SECNO=     2.500  PROFILE=  2  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO=     2.500  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION  SECNO=     2.500  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL
 CAUTION  SECNO=     2.500  PROFILE=  3  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO=     2.500  PROFILE=  3  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION  SECNO=     2.500  PROFILE=  3  20 TRIALS ATTEMPTED TO BALANCE WSEL
 CAUTION  SECNO=     2.500  PROFILE=  4  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO=     2.500  PROFILE=  4  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION  SECNO=     2.500  PROFILE=  4  20 TRIALS ATTEMPTED TO BALANCE WSEL

 CAUTION  SECNO=    19.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO=    19.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION  SECNO=    19.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
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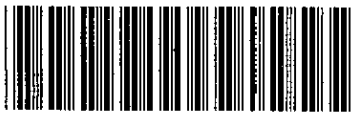
FLOOD INSURANCE ZONE DATA FOR PRTELL CREEK KALAMAZOO

FLOOD HAZARD FACTOR FOR ENTIRE REACH USING SECTIONS

SECTION NUMBER	CUMULATIVE DISTANCE	ELEVATION DIFFERENCE BETWEEN BASE FLOOD AND 10%	2%	0.2%
2.000	0.	0.0	0.0	0.2
2.050	220.	-0.0	-0.0	0.2
2.500	430.	-0.4	-0.1	0.2
3.000	650.	-0.6	-0.2	0.3
4.000	1050.	-0.5	-0.2	0.3
5.000	1455.	-0.6	-0.2	0.4
5.010	1465.	-0.7	-0.2	0.4
5.020	1475.	-0.7	-0.2	0.4
5.100	1555.	-0.7	-0.2	0.4
5.200	1656.	-0.7	-0.2	0.4
5.300	2020.	-0.7	-0.2	0.4
5.400	2071.	-1.0	-0.3	0.5
5.500	2121.	-0.9	-0.3	0.5
5.600	2234.	-0.8	-0.2	0.5
6.100	2334.	-0.7	-0.2	0.6
6.200	2352.	-0.7	-0.2	0.6
6.300	2396.	-0.7	-0.2	0.6
6.400	2446.	-0.7	-0.2	0.6
6.500	2496.	-0.7	-0.2	0.6
6.600	2546.	-0.7	-0.2	0.6
6.700	2596.	-0.7	-0.2	0.6
7.000	2747.	-0.7	-0.2	0.6
7.100	2797.	-0.7	-0.2	0.6
7.200	2847.	-0.7	-0.2	0.6
7.300	2897.	-0.7	-0.2	0.6
7.400	2947.	-0.7	-0.2	0.6
7.500	2997.	-0.7	-0.2	0.6
7.600	3047.	-0.7	-0.2	0.6
7.700	3097.	-0.7	-0.2	0.6
7.800	3147.	-0.7	-0.2	0.6
7.900	3197.	-0.7	-0.2	0.6
8.000	3247.	-0.7	-0.2	0.6
8.100	3297.	-0.7	-0.2	0.6
8.200	3347.	-0.7	-0.2	0.6
8.300	3397.	-0.7	-0.2	0.6
8.400	3447.	-0.7	-0.2	0.6
8.500	3497.	-0.7	-0.2	0.6
8.600	3547.	-0.7	-0.2	0.6
8.700	3597.	-0.7	-0.2	0.6
8.800	3647.	-0.7	-0.2	0.6
8.900	3697.	-0.7	-0.2	0.6
9.000	3747.	-0.7	-0.2	0.6
9.100	3804.	-0.7	-0.2	0.6
9.200	3855.	-0.7	-0.2	0.6
9.300	3920.	-0.7	-0.2	0.6
9.400	3971.	-0.7	-0.2	0.6
9.500	4021.	-0.7	-0.2	0.6
10.000	4501.	-0.7	-0.2	0.6
10.100	4571.	-0.8	-0.2	0.5
10.200	4631.	-0.8	-0.2	0.5
10.300	4691.	-0.8	-0.2	0.5
10.400	4751.	-0.8	-0.2	0.5
10.500	4801.	-0.8	-0.1	0.5
11.000	5271.	-0.8	-0.1	0.5
12.000	6596.	-0.8	-0.2	0.5
12.100	6646.	-0.8	-0.2	0.5
12.200	6697.	-0.8	-0.2	0.5
12.300	6747.	-0.8	-0.2	0.5
12.400	6797.	-0.8	-0.2	0.5
13.000	7371.	-0.8	-0.2	0.5
14.000	8058.	-0.8	-0.2	0.5
14.900	8078.	-0.8	-0.2	0.5
16.000	8189.	-0.8	-0.2	0.5
16.200	8341.	-0.8	-0.2	0.5
16.300	8392.	-0.8	-0.2	0.5
16.400	8442.	-0.8	-0.2	0.5
16.500	8492.	-0.8	-0.2	0.5
16.600	8542.	-0.8	-0.2	0.5
16.700	8592.	-0.8	-0.2	0.5
16.800	8642.	-0.8	-0.2	0.5
16.900	8692.	-0.8	-0.2	0.5
17.000	8742.	-0.8	-0.2	0.5
17.100	8792.	-0.8	-0.2	0.5
17.200	8842.	-0.8	-0.2	0.5
17.300	8892.	-0.8	-0.2	0.5
17.400	8942.	-0.8	-0.2	0.5
17.500	8992.	-0.8	-0.2	0.5

16.300	6066.	-0.6	-0.2	0.3
16.400	6067.	-0.6	-0.2	0.3
17.000	6104.	-0.6	-0.2	0.3
17.100	6140.	-0.6	-0.2	0.3
17.200	614[illegible].	-0.6	-0.2	0.3
17.300	6[illegible].	-0.6	-0.2	0.3
17.400	6157.	-0.6	-0.2	0.3
18.100	6203.	-0.6	-0.2	0.3
18.200	6204.	-0.6	-0.2	0.3
18.300	6319.	-0.6	-0.2	0.3
18.400	[illegible]	-0.6	-0.2	0.3
18.500	6370.	-0.6	-0.2	0.3
18.600	[illegible]	-0.6	-0.2	0.3
WEIGHTED AVG FOR BEACH		-0.6	-0.2	0.3

PDF FOR THE BEACH = [illegible] OF THE BEACH [illegible]
ZONE FOR THE BEACH [illegible]



1) COUNTY: KALAMAZOO

2) STUDY NAME: CITY OF KALAMAZOO

3) WATERCOURSE: AXTELL CREEK

4) DOCUMENT TYPE: REPORT



HYDRAULIC REPORT

AXTELL CREEK

CITY OF KALAMAZOO, MICHIGAN

HUD 2027-07

February, 1981

Prepared By:

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Taylor, Michigan 48180

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LIST OF EXHIBITS

EXHIBIT NO.	DESCRIPTION
1	Field Cross Section Location and 100-Year Flood Plain - Floodway Map
2	Computer Printouts HEC-2 Backwater Analysis with Cross Section Plots
3	Water Surface Profiles
4	Bridge Notes and Sketches
5	Enclosure Computations
6	Time of Concentration and Runoff Curve Number Computations

I INTRODUCTION

This report summarizes the hydraulic studies undertaken to support detailed studies on 1.5 miles of the Axtell Creek in the City of Kalamazoo, Michigan. The creek has a drainage area of approximately 1.0 square mile and is a part of the Portage Creek Basin. William Weaver served as Project Manager for this study.

As shown in Exhibit 1, the Axtell Creek is partially enclosed at two locations. The first enclosure is approximately 1,250 feet long beginning about 500 feet upstream from the confluence of Axtell Creek and Portage Creek. The second enclosure is located under Westnedge Avenue and is approximately 300 feet long. The two enclosures, along with nine culvert cross sections and six valley sections, were field surveyed by Wade, Trim and Associates, Inc., in November, 1979. These cross sections were supplemented by Abrams aerial elevation information, 2-foot contour maps and a U.S.G.S. Quadrangle Map which consists of 10-foot contour intervals (References 1 and 2).

Cross section locations are shown on Exhibit 1. Table 1 cross references section designations by showing the computer section number which corresponds to each cross section letter shown in Exhibit 1. Table 2 lists discharges which have been approved by the Michigan Department of Natural Resources (M.D.N.R.) for this creek.

TABLE 1

AXTELL CREEK

CITY OF KALAMAZOO

CROSS REFERENCE INDEX

X-SECTION	ABRAMS/ WTA NO.	COMPUTER NO.	DESCRIPTION
A	114	1.0	Valley Section
B	115	2.0	Valley Section
C	116	2.5	Overland Section
D	-	3.0	Overland Section
E	118	5.01	Valley Section
F	119	5.1	D/S Face Rose Street
G	119	5.4	U/S Face Rose Street
H	120	6.1	D/S Face Stockbridge Avenue
I	120	6.4	U/S Face Stockbridge Avenue
J	121	7.0	D/S Face Park Avenue
K	121	7.3	U/S Face Park Avenue
L	123	9.1	D/S Face 60-Inch CMPs
M	124	10.0	Valley Section
N	125	10.5	Overland Section
O	126	11.0	Valley Section
P	127	12.0	Valley Section
Q	129	14.5	D/S Face Howard Street
R	130	14.8	U/S Face Howard Street
S	131	16.1	D/S Face Maple Road
T	131	16.4	U/S Face Maple Road

TABLE 2

AXTELL CREEK

CITY OF KALAMAZOO

FLOOD FLOW FREQUENCY DATA

LOCATION	10-YEAR CFS	50-YEAR CFS	100-YEAR CFS	500-YEAR CFS
U/S of Howard Road	110	170	200	270
D/S of Howard Road to Confluence with Portage Creek	210	325	385	510

II METHOD OF ANALYSIS

The HEC-2 backwater computer program was used in developing water surface profiles (Reference 3). Table 3 presents water surface elevations at selected locations for the four storms (10, 50, 100 and 500-year) analyzed in this report. HEC-2 printouts including computer cross section plots are presented as Exhibit 2. (Exhibit 2 is contained in the 11" x 15" folder enclosed with this report.) Water surface profiles resulting from the backwater analyses are presented as Exhibit 3.

TABLE 3

AXTELL CREEK

CITY OF KALAMAZOO

FLOOD ELEVATIONS*

LOCATION	FREQUENCY 10-YEAR	50-YEAR	100-YEAR	500-YEAR
Confluence of Axtell Creek and Portage Creek	763.3	764.5	764.9	765.5
Westnedge Avenue	767.9	768.2	768.4	768.6
U/S of Howard Street	768.0	768.4	768.6	768.8
U/S of Maple Road	768.0	768.4	768.6	768.9

*All elevations are based upon National Geodetic Vertical Datum.

III VARIABLES AND COEFFICIENTS

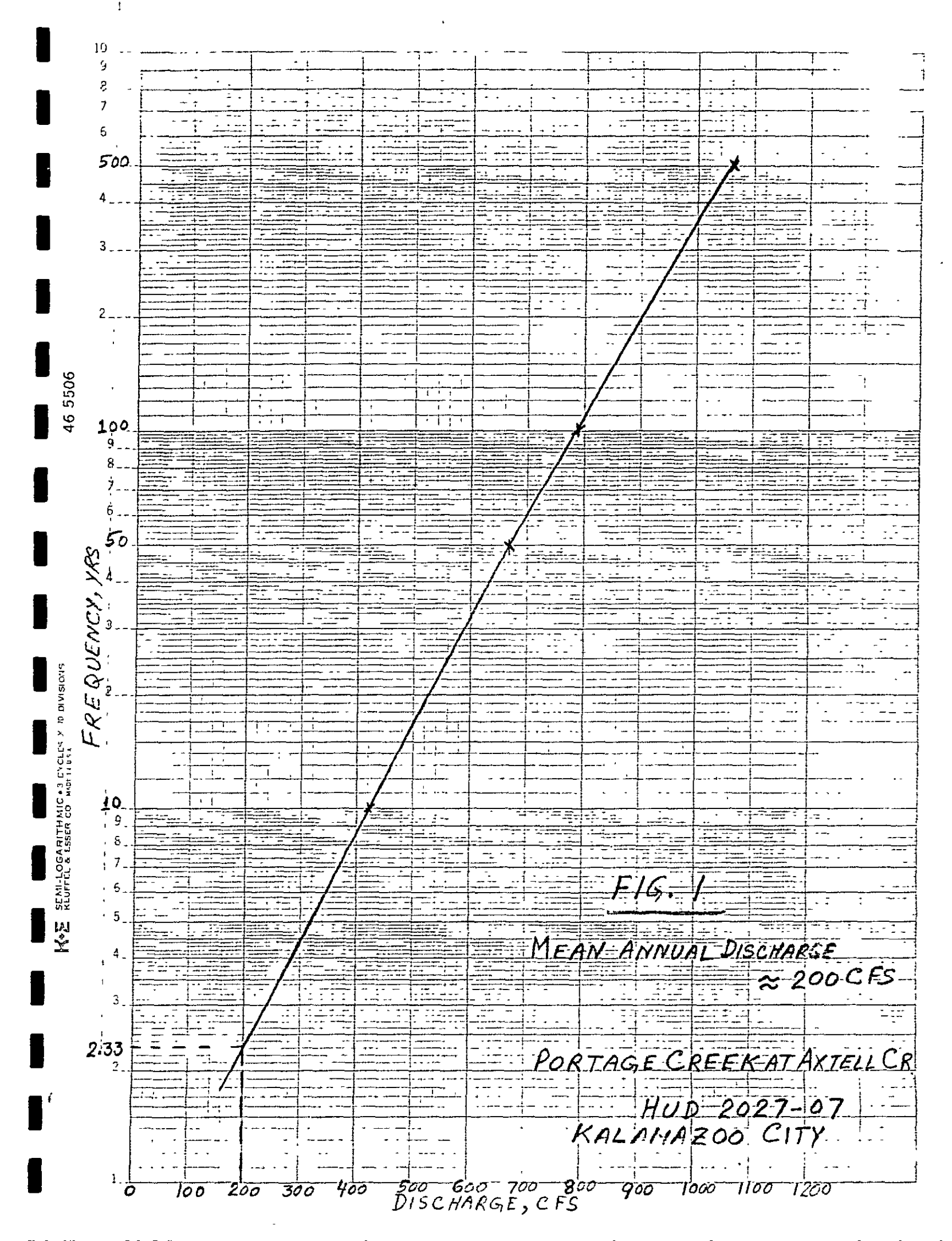
Roughness coefficients (Mannings "n") were estimated from field inspections, quad maps, and photographs. Typical roughness values for the main channel and overbank areas of Axtell Creek are .035 and .08, respectively, for all floods. These values are indicative of summer month conditions and are consistent with values recommended and used in engineering practice (Reference 4). Contraction and expansion coefficients were selected as 0.3 and 0.5, respectively, at bridge sections and 0.1 and 0.3, respectively, for gradual channel transitions. Bridge notes and sketches are included in Exhibit 4.

IV HIGH WATER MARKS

There are no documented high water marks for the Axtell Creek.

V STARTING CONDITIONS

The mean annual flood elevation of Portage Creek (Reference 5), located at its confluence with Axtell Creek, was utilized for the starting water surface elevation for the 10, 50, 100 and 500-year storms. As shown in Figure 1, the mean annual flood discharge of the Portage Creek at its confluence with Axtell Creek is approximately 200 cfs, corresponding to a frequency of 2.33 years. This results in the mean flood elevation of 760.15, as shown in Figure 2. However, backwater elevations from Portage Creek were plotted on the stream profiles of Axtell Creek, where these elevations exceeded Axtell Creek elevations, to reflect flood conditions from both streams.


FREQUENCY, YRS
DISCHARGE, CFS
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
500
100
50
10
2.33
FIG. 1
MEAN ANNUAL DISCHARGE
≈ 200 CFS
PORTAGE CREEK AT AXTELL CR
HUD 2027-07
KALAMAZOO CITY
46 5506
SEMI-LOGARITHMIC • 3 CYCLES X 10 DIVISIONS
KEUFFEL & ESSER CO MADE IN U.S.A.

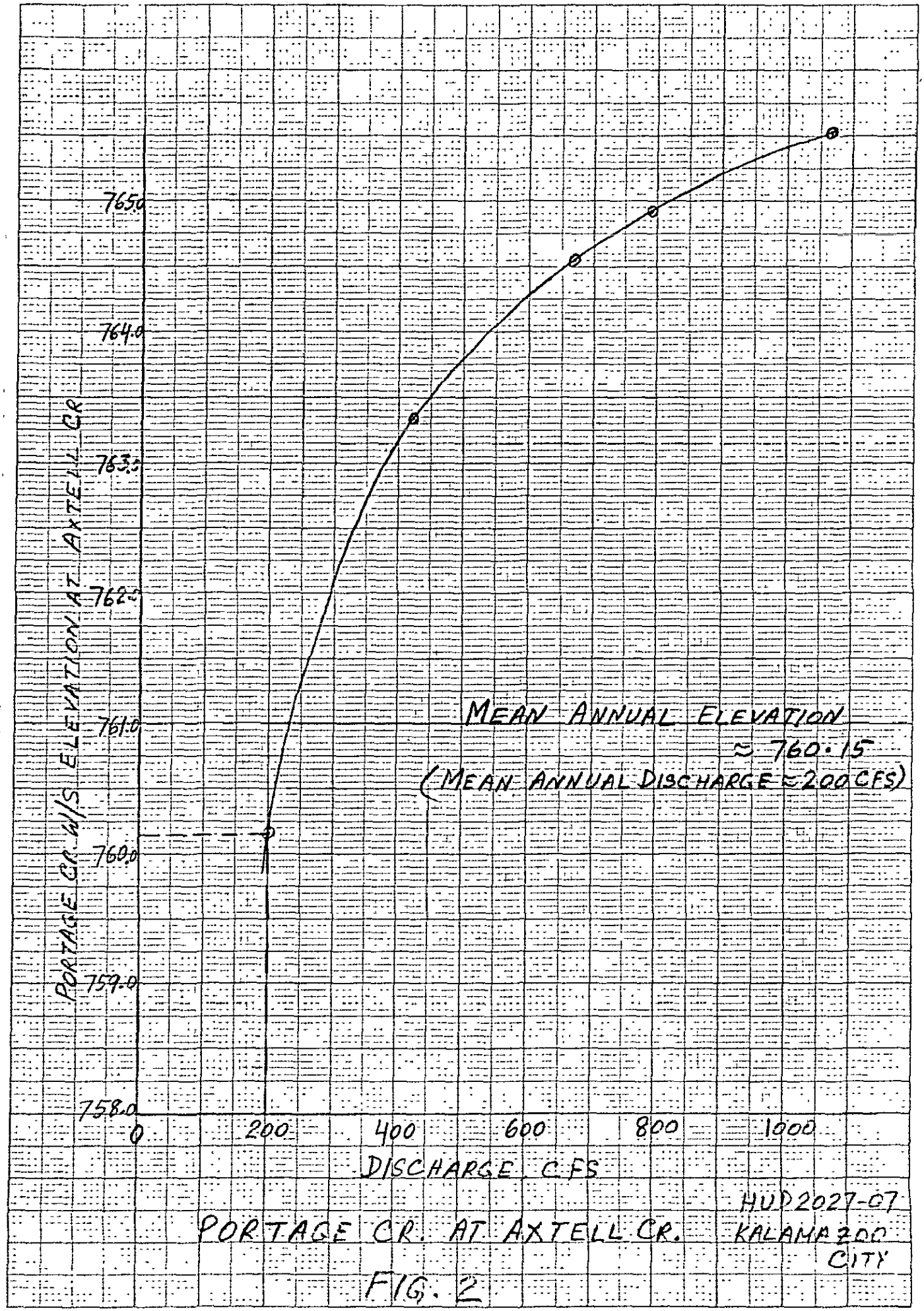


FIG. 2

46 1320

KEUFFEL & ESSER CO MADE IN USA

VI SPECIAL PROBLEMS

A. ENCLOSURES

The two enclosures on the Axtell Creek required detailed analyses. For each of the enclosures, two types of flow would occur during a flood: pressure flow and overland flow. The total flow for each flood was distributed between pressure flow and overland flow as follows:

1. The HEC-2 special bridge routine was utilized for the computation of pressure flow through the enclosures. Loss coefficient values, XKOR, were computed for each segment of the enclosure. These values were utilized in the computation of average values of XKOR and area of flow, BAREA. The roadway elevation was kept high enough so as to discount the possibility of any weir flow.

2. For overland flow, cross sections were located at intervals over each of the enclosures. These sections were taken perpendicular to the anticipated flow lines and were extended across the entire flood plain.

For each enclosure, computer runs both for overland flow and pressure flow were started at the same water surface elevation on the downstream side. The discharges for both types of flows were adjusted so as to obtain the same water surface elevation on the upstream side. Detailed computations for the two enclosures are presented as Exhibit 5. Table 4 lists the subdivision of total discharge into pressure flow and overland flow for each enclosure.

TABLE 4

AXTELL CREEK

CITY OF KALAMAZOO

FLOOD FLOW DISTRIBUTION

LOCATION	FREQUENCY 10-YEAR CFS	50-YEAR CFS	100-YEAR CFS	500-YEAR CFS
Enclosure along Crosstown Parkway in the D/S Reach				
Flow through the Enclosure	90	91	91	90
Overland Flow	120	234	294	420
Enclosure under Westnedge Avenue				
Flow through the Enclosure	177	173	170	165
Overland Flow	33	152	215	345

B. HYDROLOGY

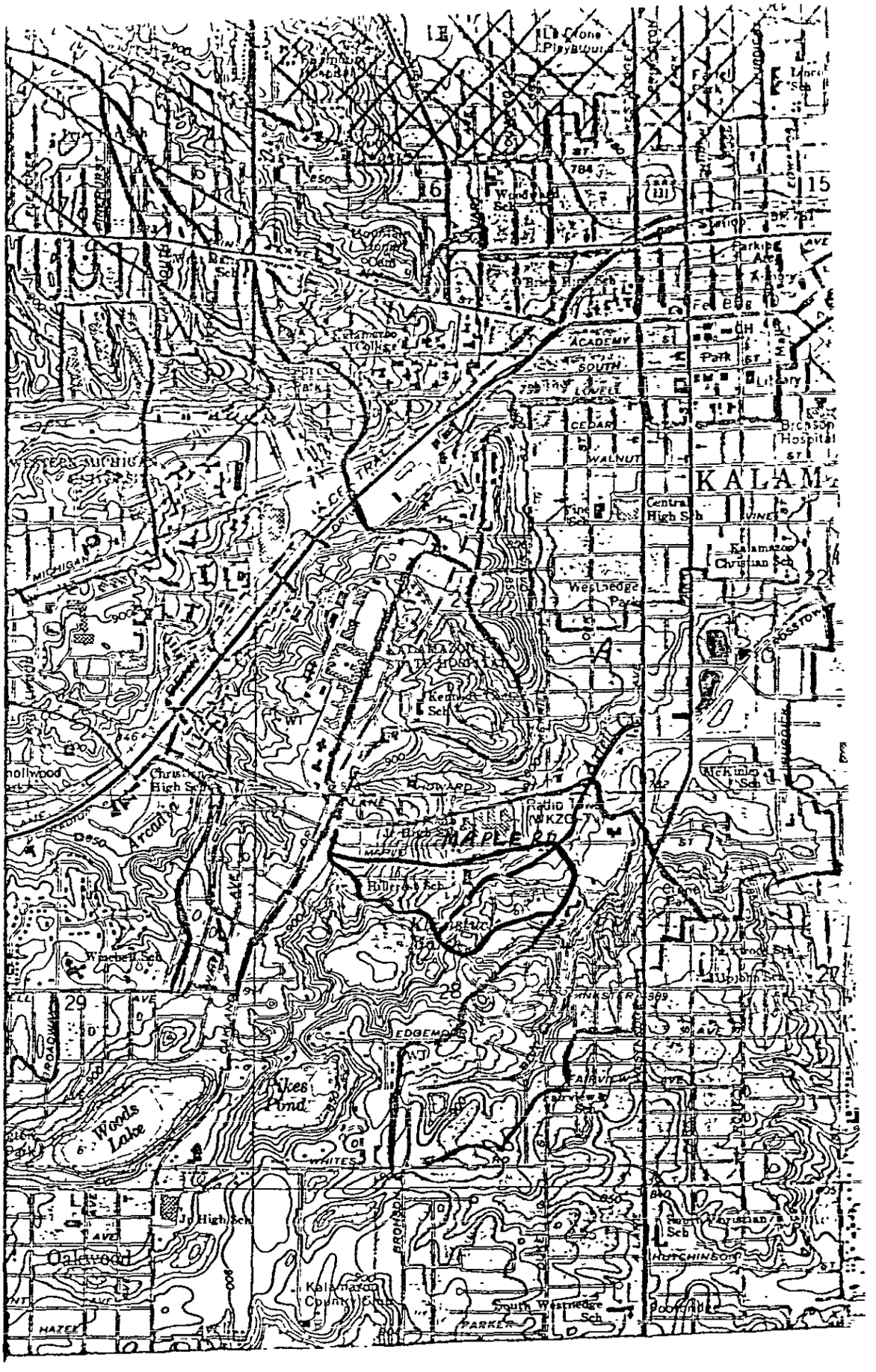
As shown in Figure 3, the drainage area tributary to the Axtell Creek upstream of Maple Road is approximately 0.1 square mile in size. This area is small compared to the area of 0.44 square miles which is tributary to the stream upstream of Howard Road. Therefore, a further subdivision was required in the hydrologic model (Reference 6) of the Axtell Creek.

A TR-20 computer model (Reference 7) was set up for the basin upstream of Maple Road and 10, 50, 100 and 500-year flow rates were developed as listed in Table 5. Computations for Runoff Curve Number and Time of Concentration are presented as Exhibit 6.

TABLE 5
AXTELL CREEK
CITY OF KALAMAZOO

FLOOD FLOW FREQUENCY DATA

		FREQUENCY			
LOCATION	TECHNIQUE	10-YEAR CFS	50-YEAR CFS	100-YEAR CFS	500-YEAR CFS
U/S of Maple Road	TR-20	35	55	65	90



HUD 2027-07

FIG. 3 AXTELL CREEK

DRAINAGE AREA U/S OF MAPLE RD

VII GENERAL

Computed water surface elevations were developed to an accuracy of 0.5 feet for floods of the selected recurrence intervals.

All elevations are referenced to the U.S. Geological Survey (U.S.G.S.) Datum. This datum is equivalent to the National Geodetic Vertical Datum (N.G.V.D.).

The hydraulic analyses for this study were based upon the effects of flow unobstructed by ice or debris. The flood elevations are considered valid only if hydraulic structures, in general, remain unobstructed and do not fail.

REFERENCES

1. Abrams Aerial Survey Corporation, Sections of Axtell Creek in Kalamazoo Township, 1979.

2. U. S. Geological Survey Topographical Maps - Kalamazoo Quadrangle, Kalamazoo County, 7.5 Minute Series - Photo Revised, 1973.

3. U. S. Army, Corps of Engineers, HEC-2 Water Surface Profile - Users Manual - 1976.

4. Chow, Ven Te, Open Channel Hydraulics, McGraw Hill, Inc., 1959.

5. Wade, Trim and Associates, Inc., Taylor, Michigan, Hydraulic Analysis of the Portage Creek Basin, for the City of Kalamazoo and the City of Portage; February, 1981.

6. Wade, Trim and Associates, Inc., Taylor, Michigan, Hydrologic Analysis of the Portage Creek Basin, for the City of Kalamazoo and the City of Portage; Revised October, 1980.

7. Corcoran, R. H., TR-20 Computer Program Parts I - IV, Soil Conservation Service, 1978.

AXTELL CREEK

CITY OF KALAMAZOO, MICHIGAN

EXHIBIT 1

FIELD CROSS SECTION LOCATION AND

100-YEAR FLOOD PLAIN - FLOODWAY MAP

AXTELL CREEK

CITY OF KALAMAZOO, MICHIGAN

EXHIBIT 2

COMPUTER PRINTOUTS

HEC-2 BACKWATER ANALYSIS WITH

CROSS SECTION PLOTS

(See Separate Folder)

AXTELL CREEK

CITY OF KALAMAZOO, MICHIGAN

EXHIBIT 3

WATER SURFACE PROFILES

AXTELL CREEK

CITY OF KALAMAZOO, MICHIGAN

EXHIBIT 4

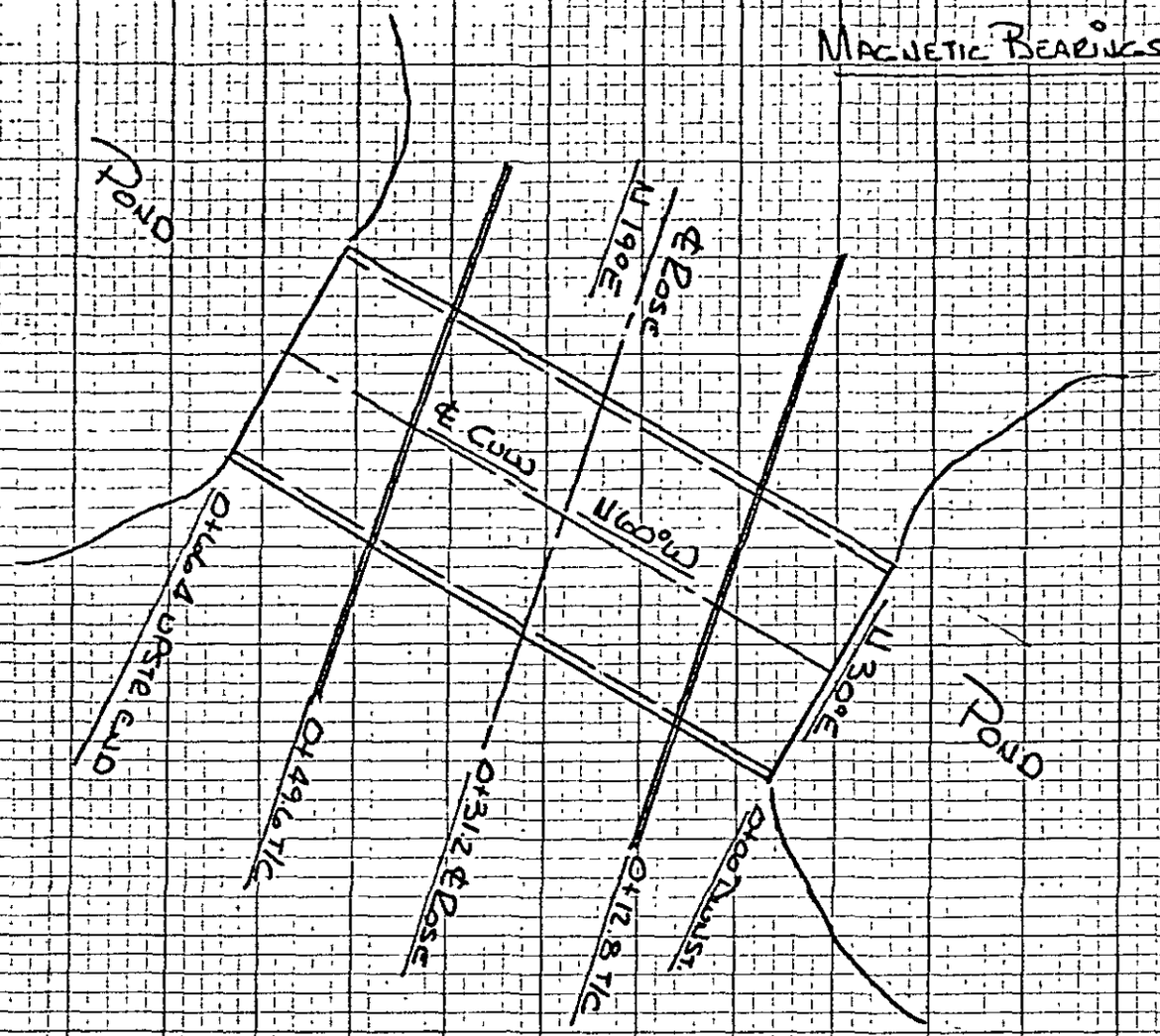
BRIDGE NOTES AND SKETCHES

HUD 20[illegible]-05

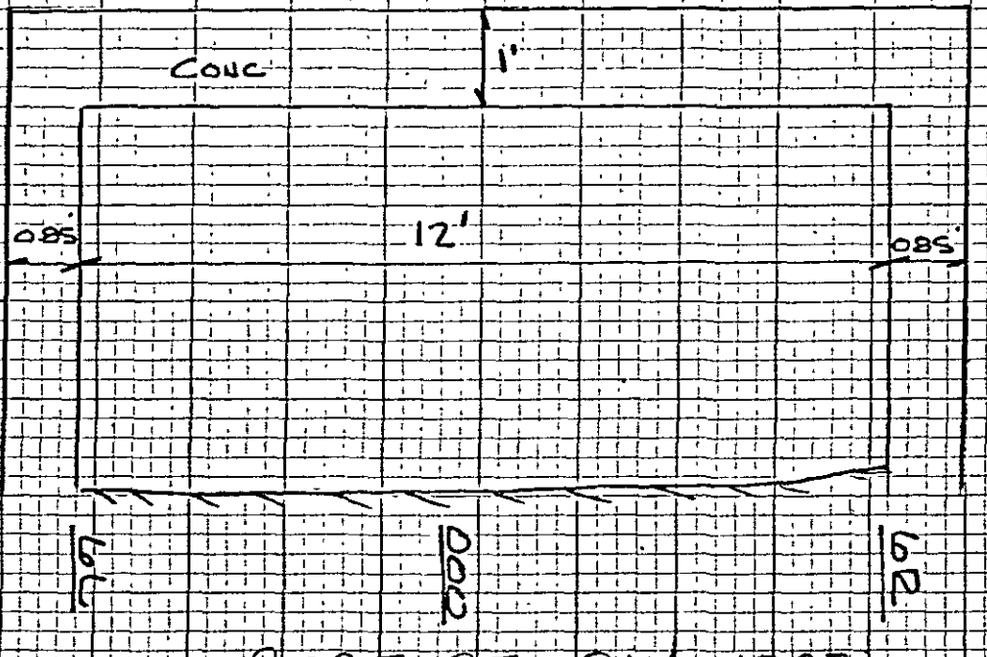
Book 4

Cross-Section #119 Axtell Creek

Magnetic Bearings



Downstr. End Facing Upstream

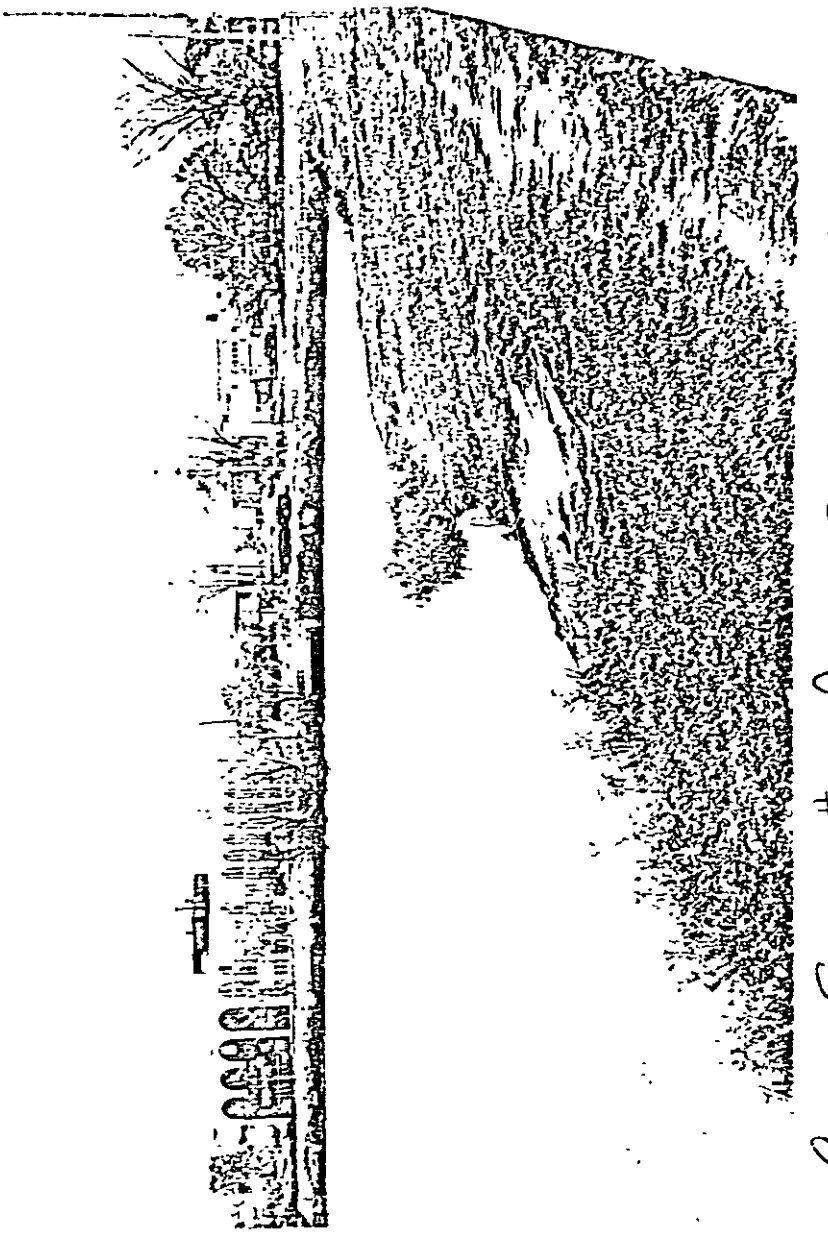


ROSE ST. CULVERT

AXTELL CREEK
KALAMAZOO

Sheet 1/2[illegible]

HUD [illegible]



Cross-Section #119 Axtell Creek (upstr)

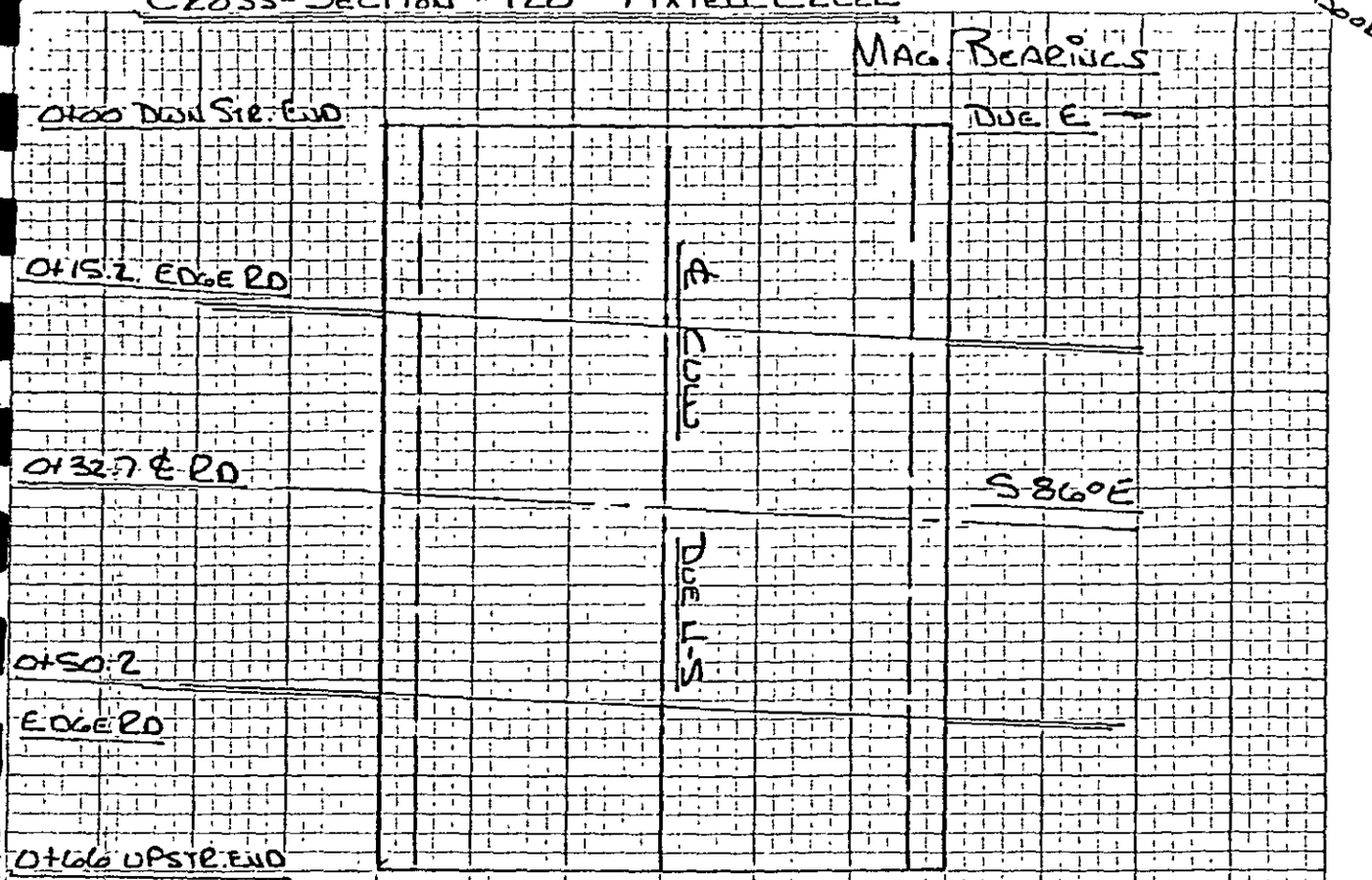
U/S FACE ROSE ST. CULVERT

AXTELL CREEK
KALAMAZOO

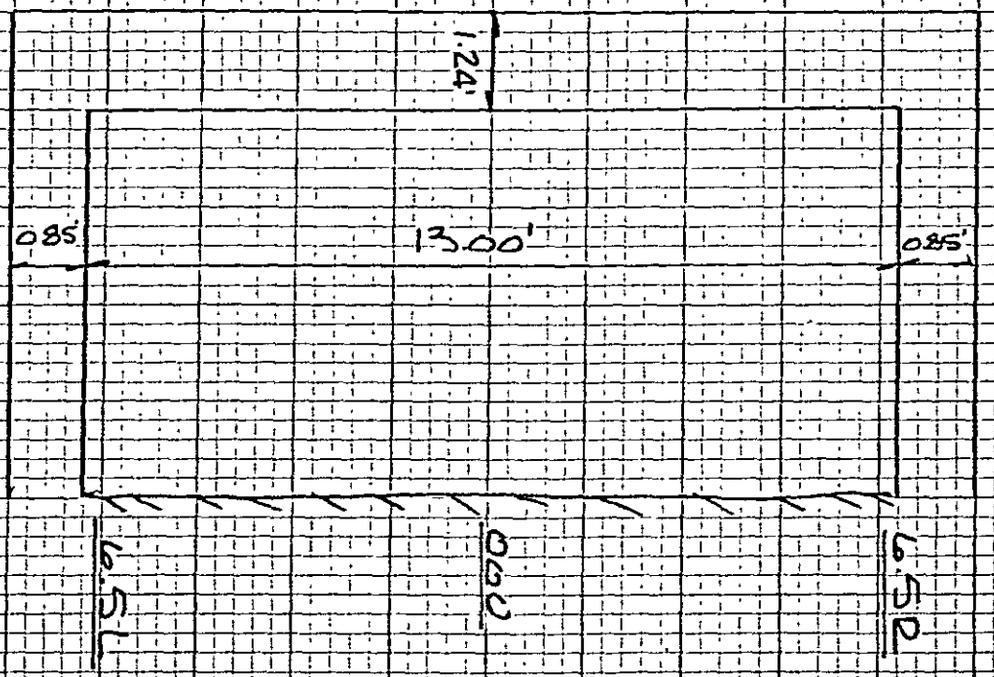
Sheet 2/20

HUD 2027-07

Cross-Section #120 Axtell Creek



DOWNSTREAM FACING UPSTREAM

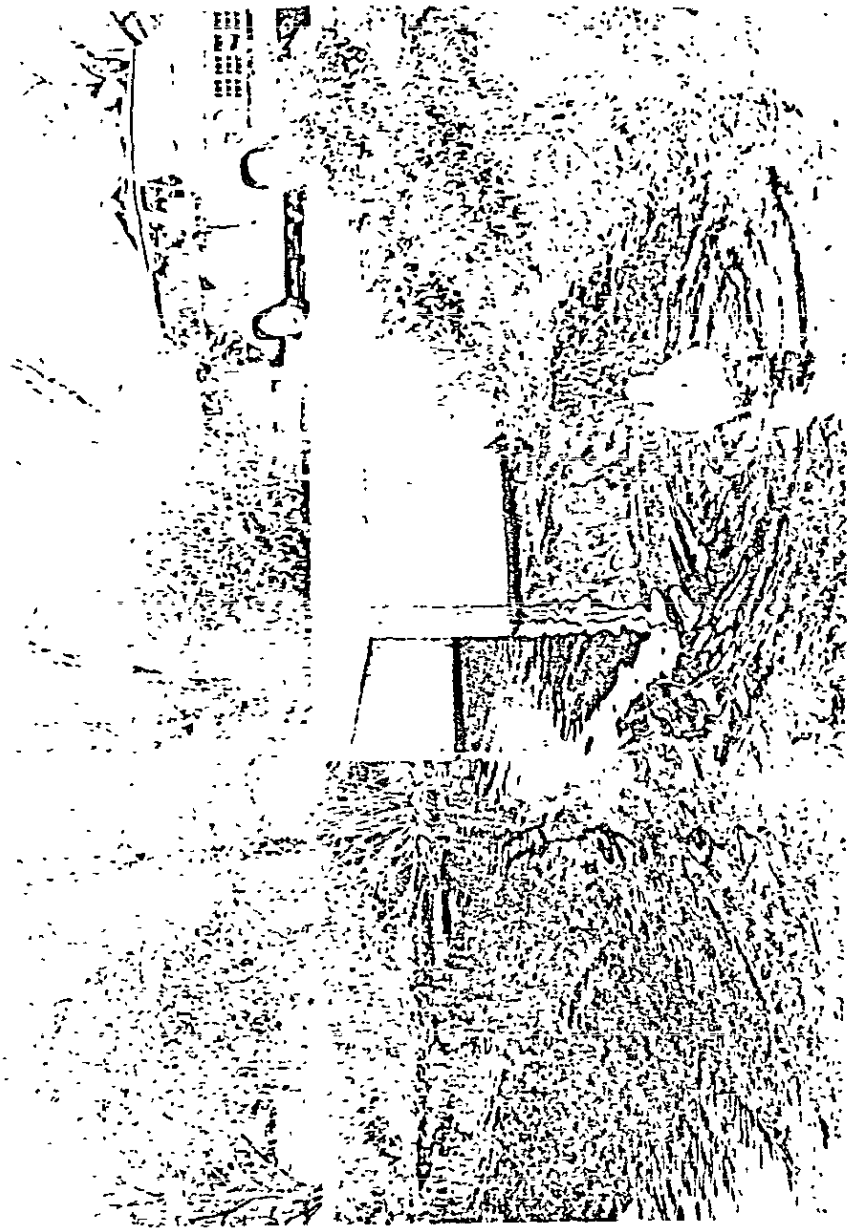


STOCKBRIDGE AVE. CULVERT

AXTELL CREEK, KALAMAZOO

Sheet 3/20

HUD2007-07



CROSS-SECTION #120 AXTELL CREEK (UP.STR)

U/S FACE STOCKBRIDGE AVE CULVERT

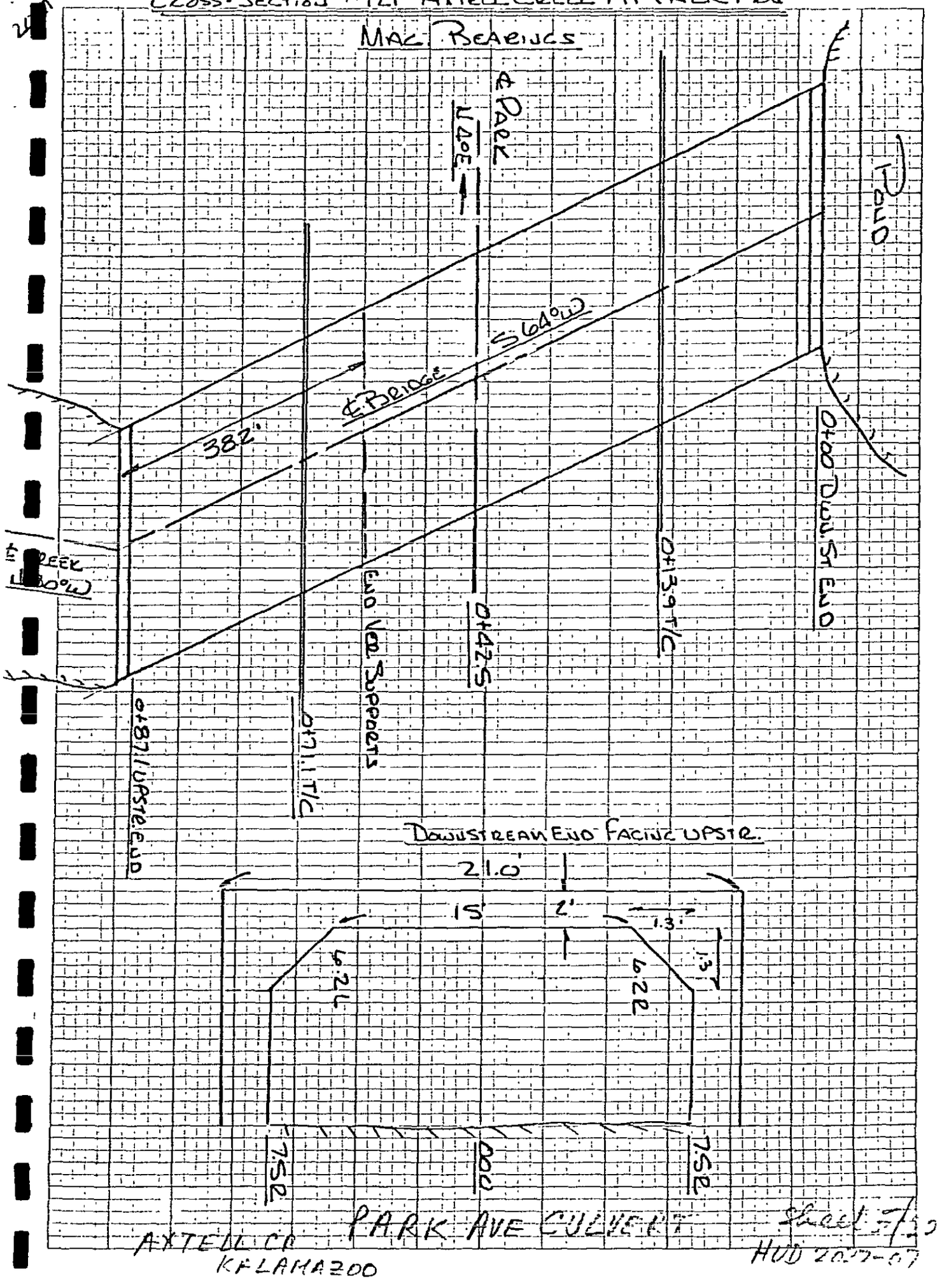
AXTELL CREEK

KALAMA 200

Sheet 4/20

HUD 2000-07

Cross-Section #121 Axtell Creek At Park Ave

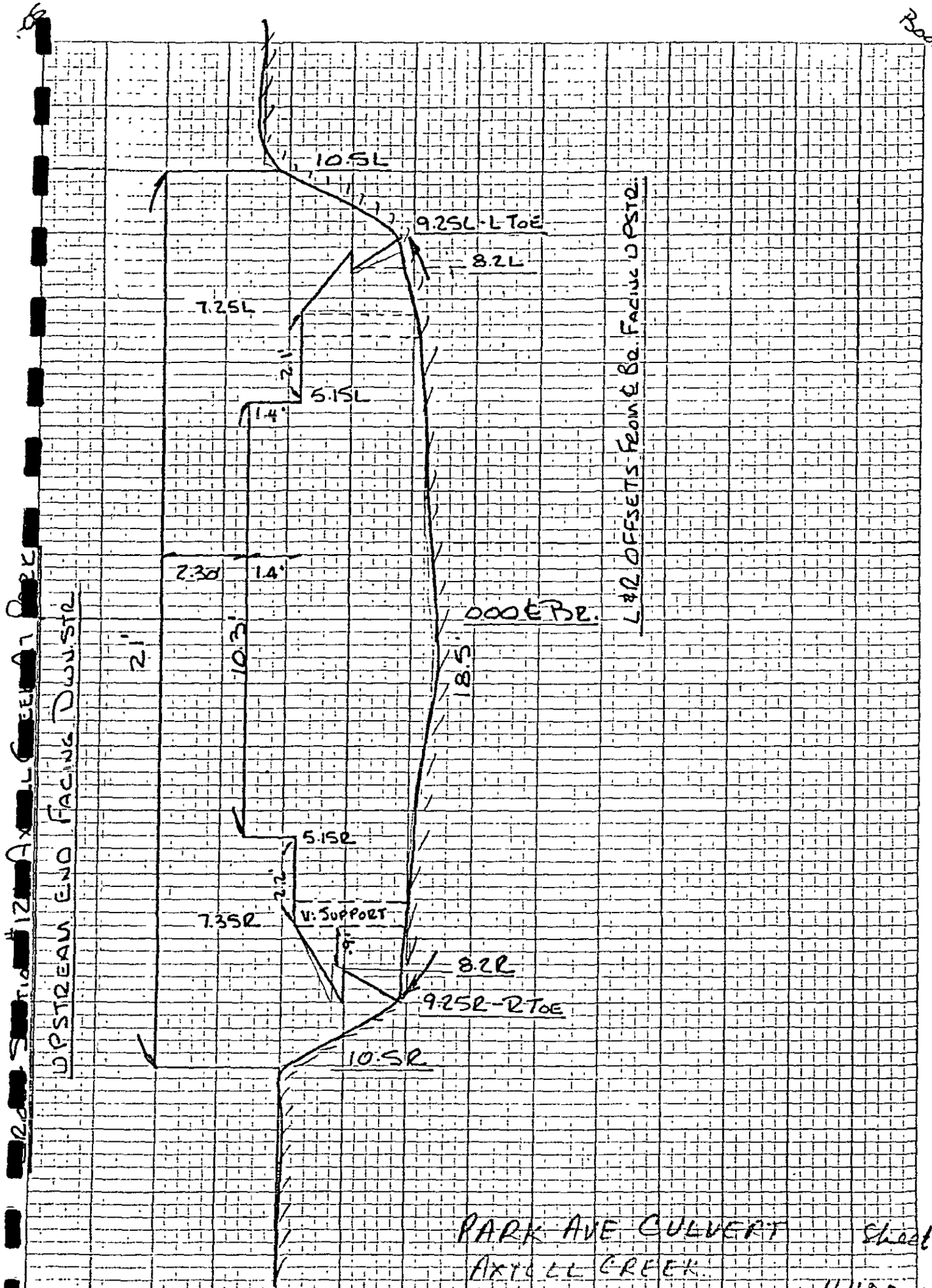


PARK AVE CULVERT

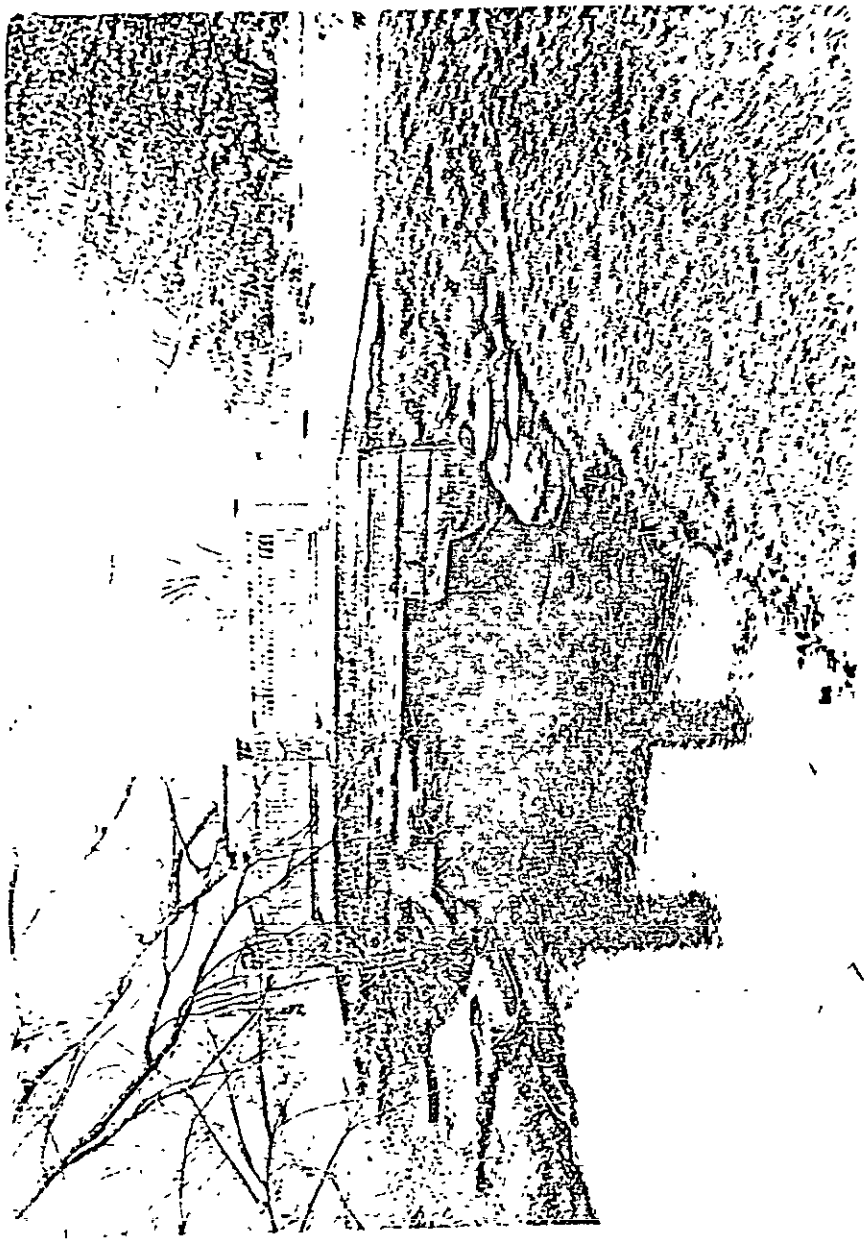
Sheet 5/20

AXTELL CR
KALAMAZOO

HUD 2017-07



PARK AVE CULVERT — Sheet 20
AXTELL CREEK
KALAMAZOO — HUD 20-1-57



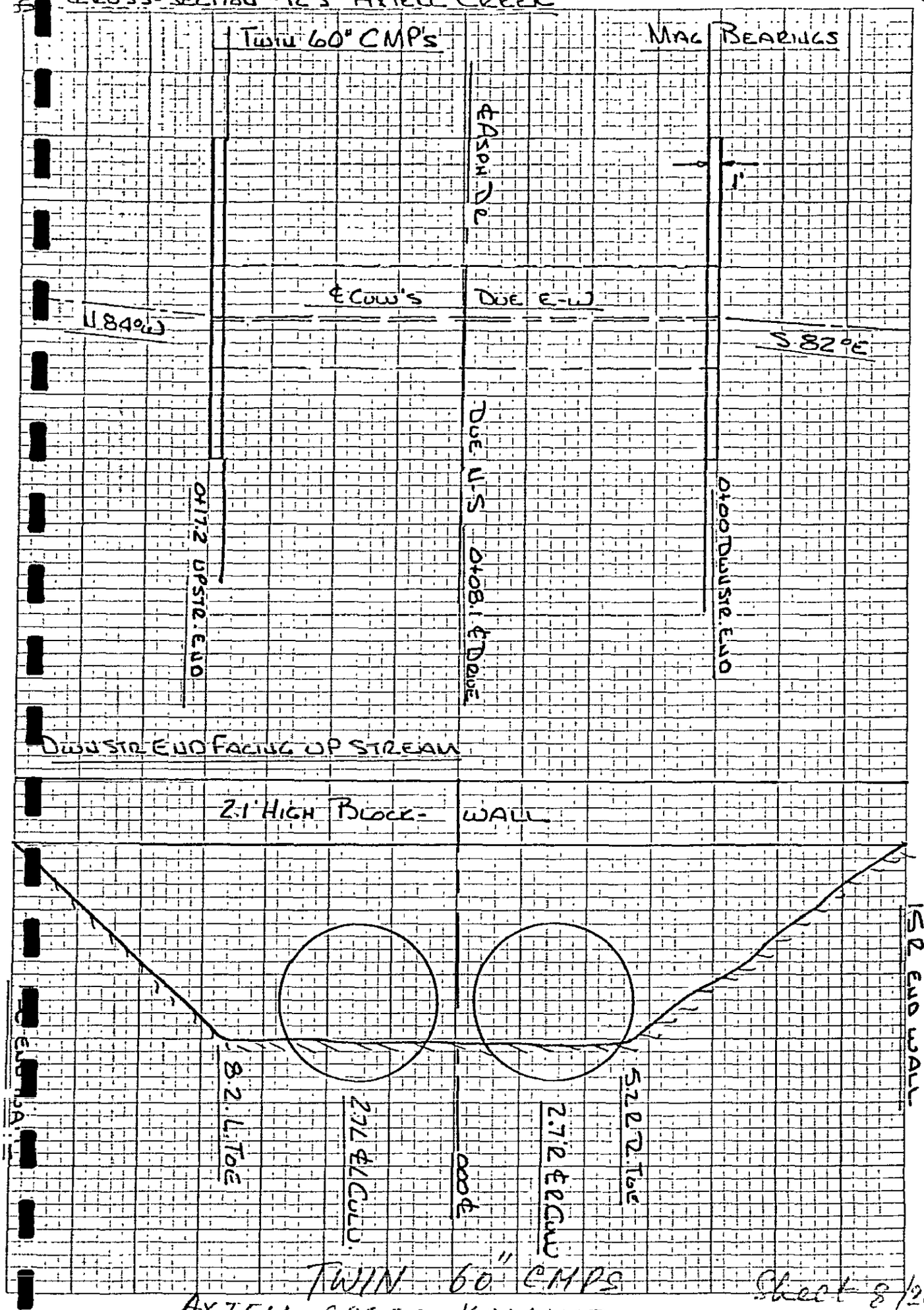
CROSS-SECTION #121 AXTELL CREEK (UPSTREAM)

U/S FACE PARK AVE CULVERT

AXTELL CREEK
KALAMAZOO

Sheet 1/2
HUD 2027-07

Cross-Section #123 Axtell Creek

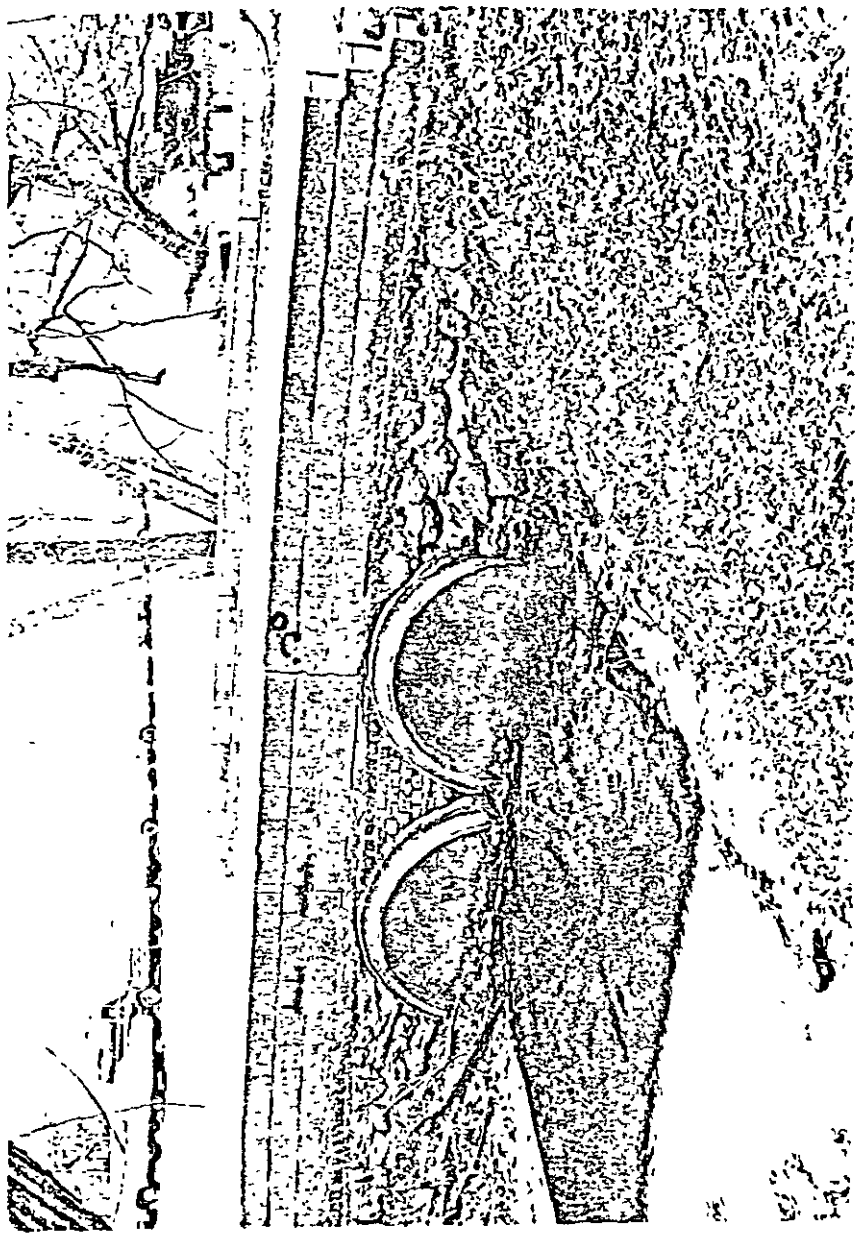


TWIN 60" CMPS

Sheet 8/20

AXTELL CREEK KALAMAZOO

HUD 2027-07



CROSS-SECTION #123 AXTELL CREEK

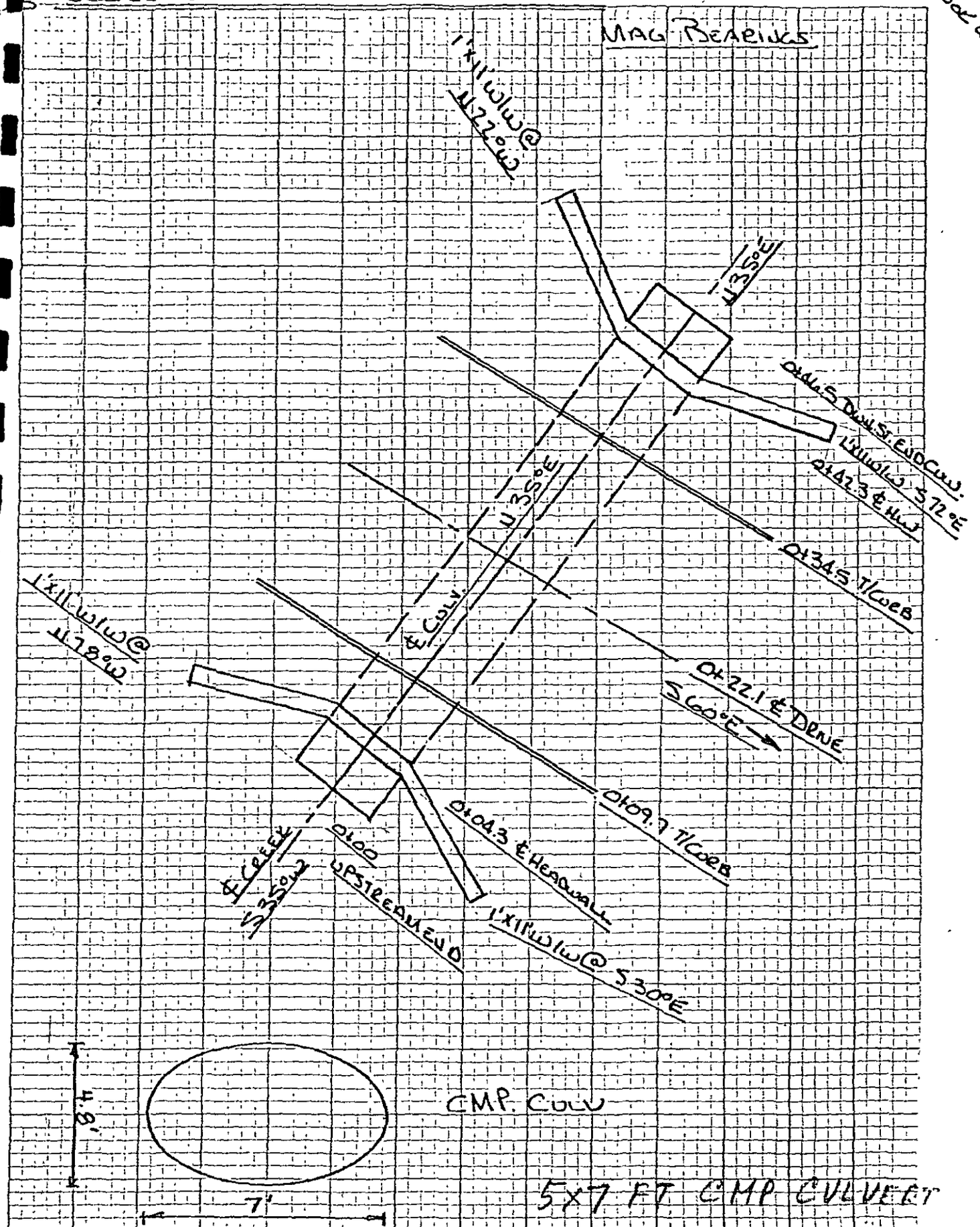
TWIN 60" CMPS

AXTELL CREEK, KALAMAZOO

Sheet 9/20

HUD 2007-C

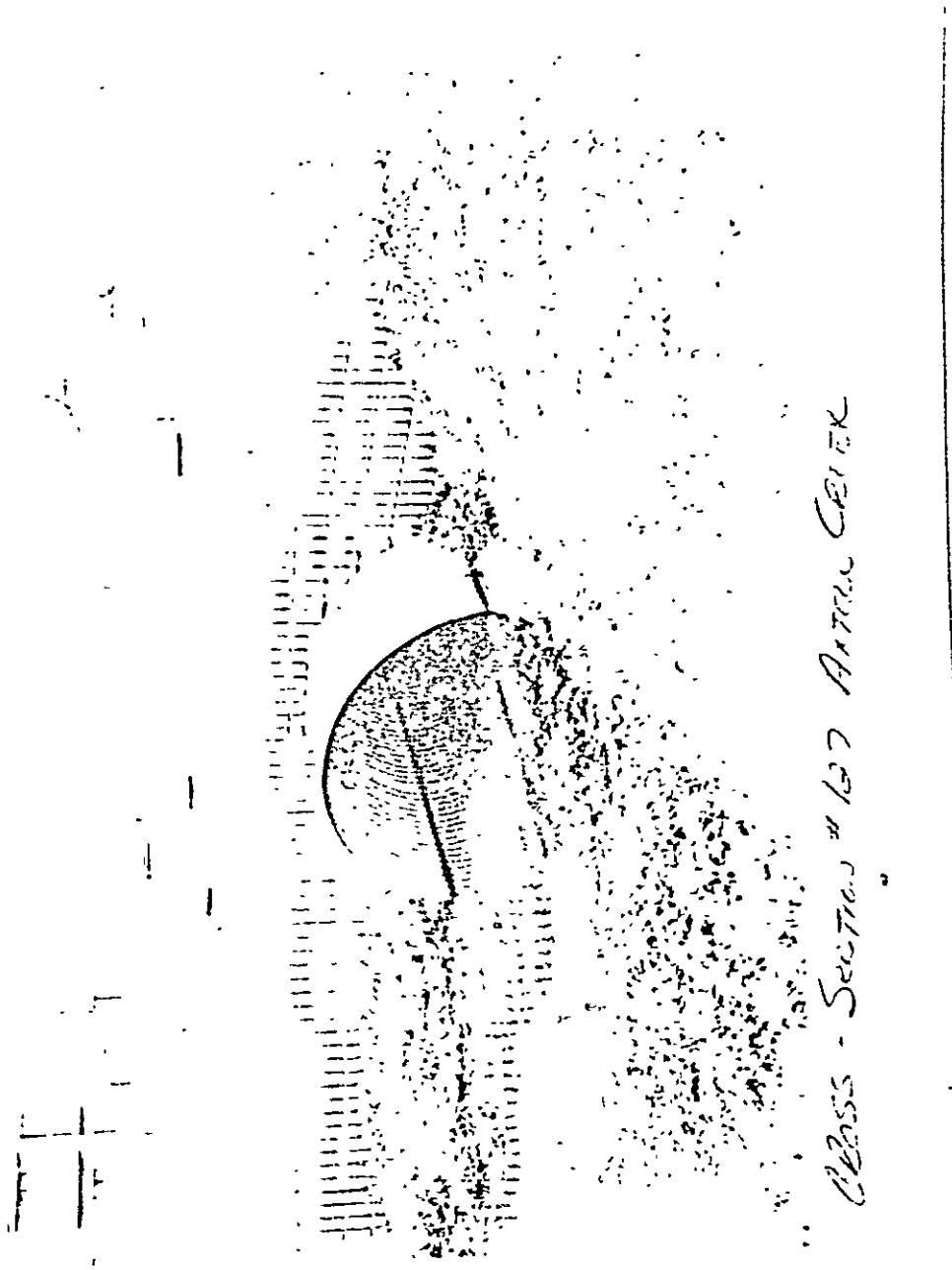
CROSS-SECTION #127 AXTELL CREEK



5x7 FT CMP CULVERT

AXTELL CREEK
KALAMAZOO

Sheet 10/20
HUD 2027-07



5 X 7 FT CMP, CULVERT

AXTELL CREEK KALAMAZOO

Sheet 1/20

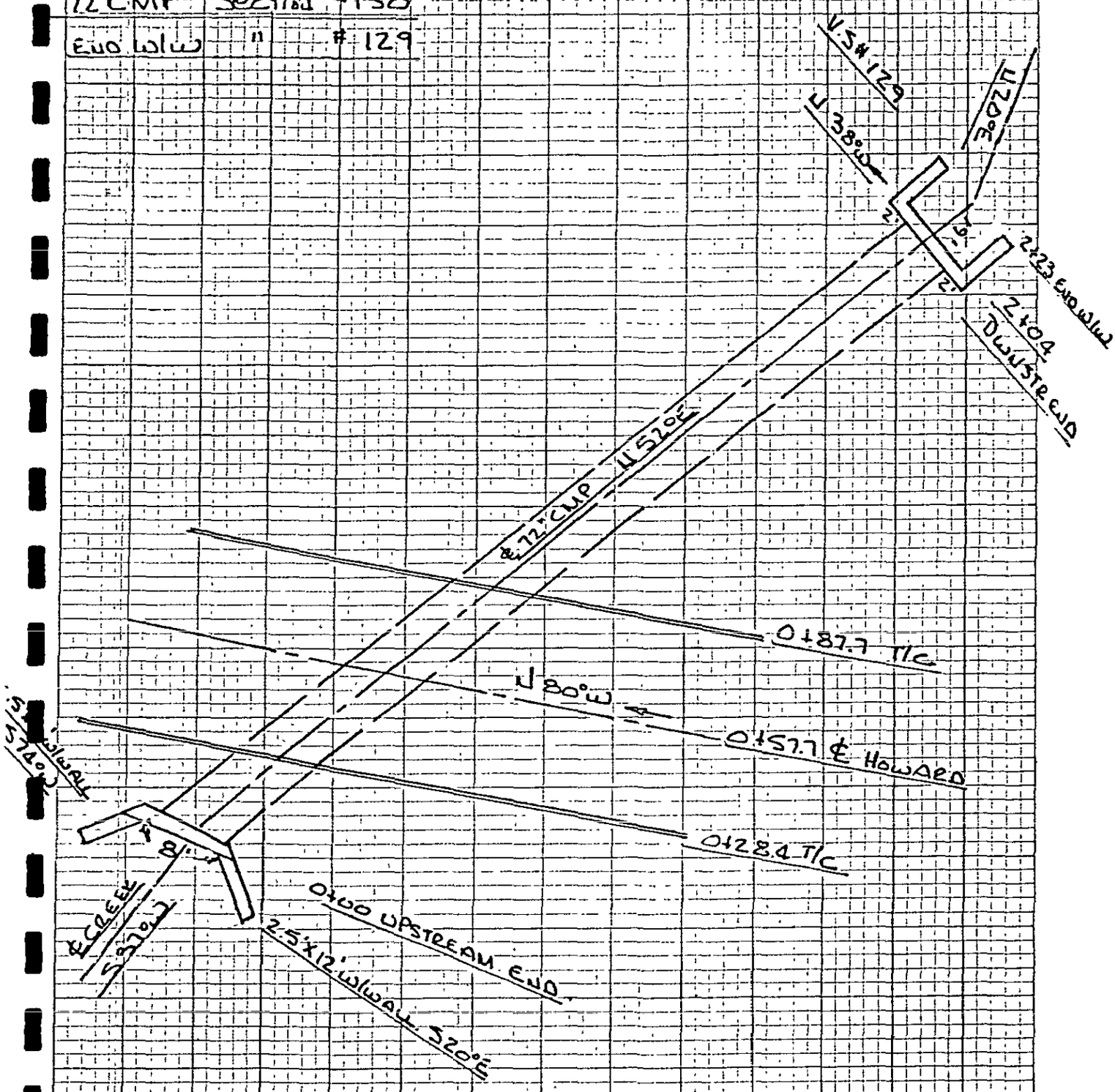
HUD 202-07

CROSS-SECTION #130-#129 AXTELL CREEK

MAG BEAR

72" CMP SECTION #130

END W/W " #129



HOWARD ST CULVERT

AXTELL CREEK

KALAMAZOO

Sheet 12/

HUD 2027-



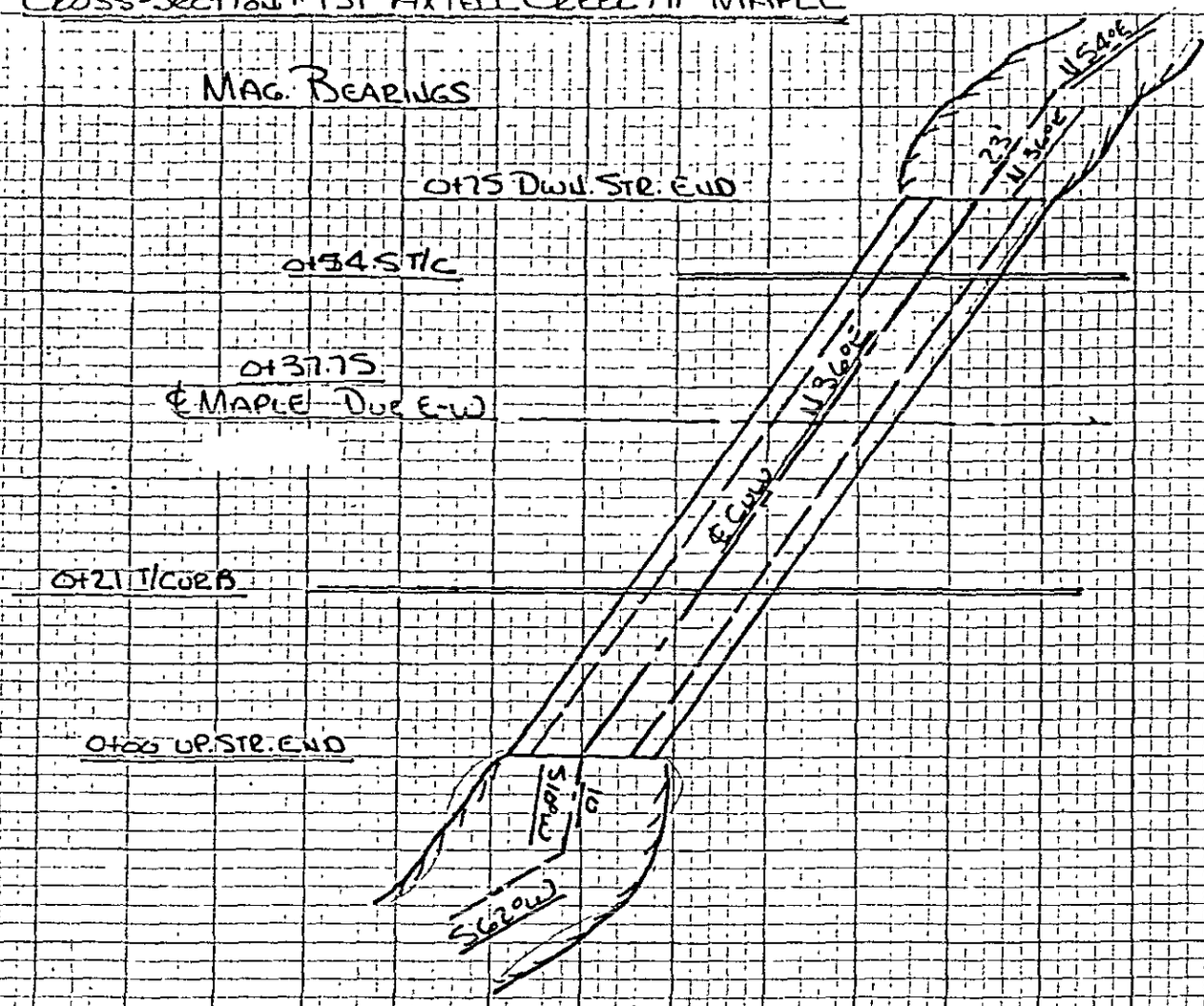
U/S END SECTION 130 AXTELL CREEK

U/S END HOWARD ST CULVERT

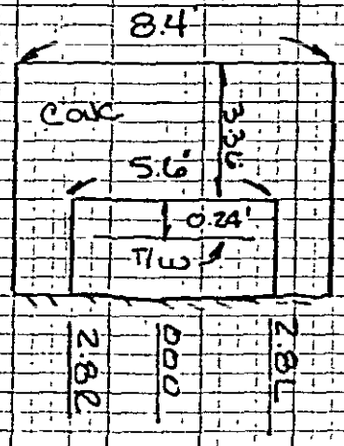
AXTELL CREEK
KALAMAZOO

Sheet 13/25
HUD 2027-C

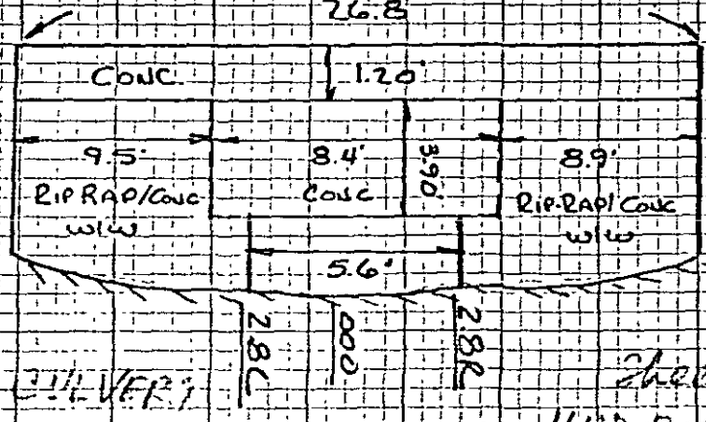
Cross-Section #131 Axtell Creek At Maple



L & R offsets from ℄ Structure facing upstr



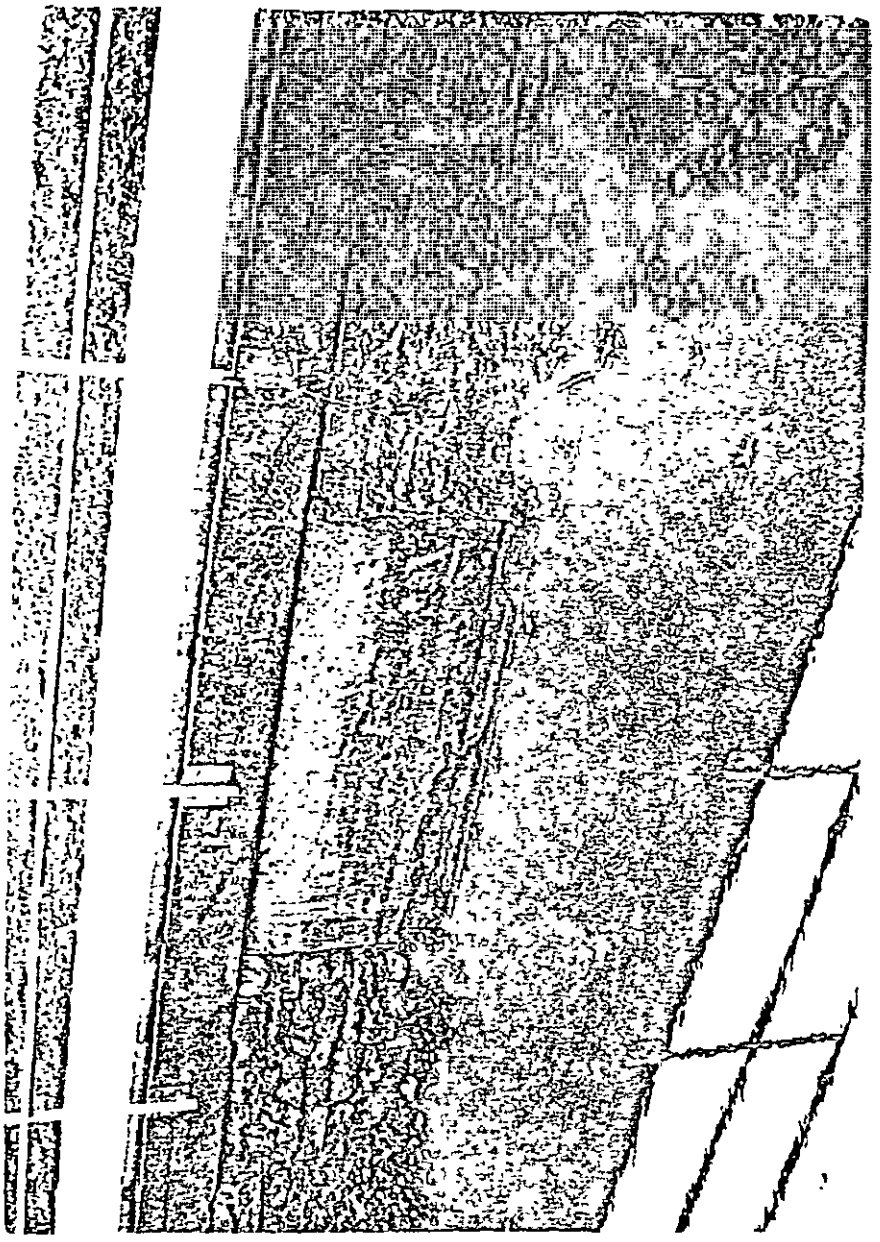
Downstr End facing upstr



Pstr End Fa. Downstr

MAPLE RD CULVERT
AXTELL CREEK, KALAMAZOO

Sheet 11/20
HUD 2027-07



DOWNSTREAM END SECTION 131 - AXTELL CREEK

D/S END MAPLE RD CULVERT

AXTELL CREEK KALAMAZOO

Sheet 1 of 20

HUD 2027-37



UPSTREAM END SEC 131 AXTELL CREEK

U/S END MAPLE RD CULVERT

AXTELL CREEK, KALAMA 200

Sheet 16 20

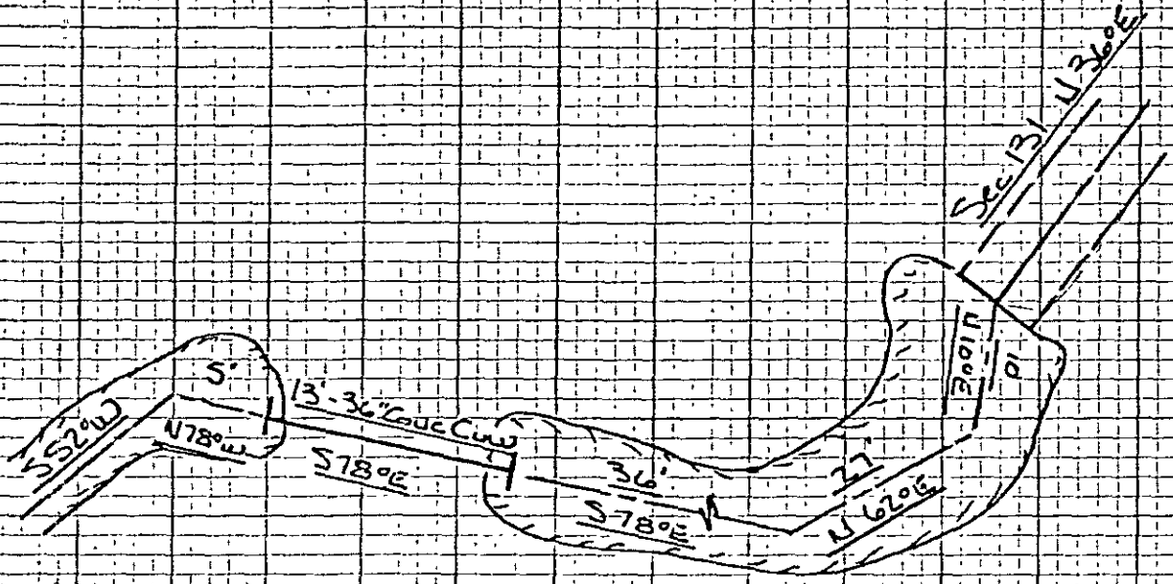
HUD 205-07

HUD 2027-05

CROSS-SECTION #131A AXTELL CREEK

MAC BEARINGS

13'-36" CONC CULV.



36" DIA. CULVERT

AXTELL CREEK

KALAMAZOO

Sheet 17/20

HUD 2027-07



DOWNSTR. END SECTION IBIA - AXTELL CREEK

36" DIA CULVERT

AXTELL CREEK
KALAMAZOO.

Sheet 18/20
HUD 2027-07

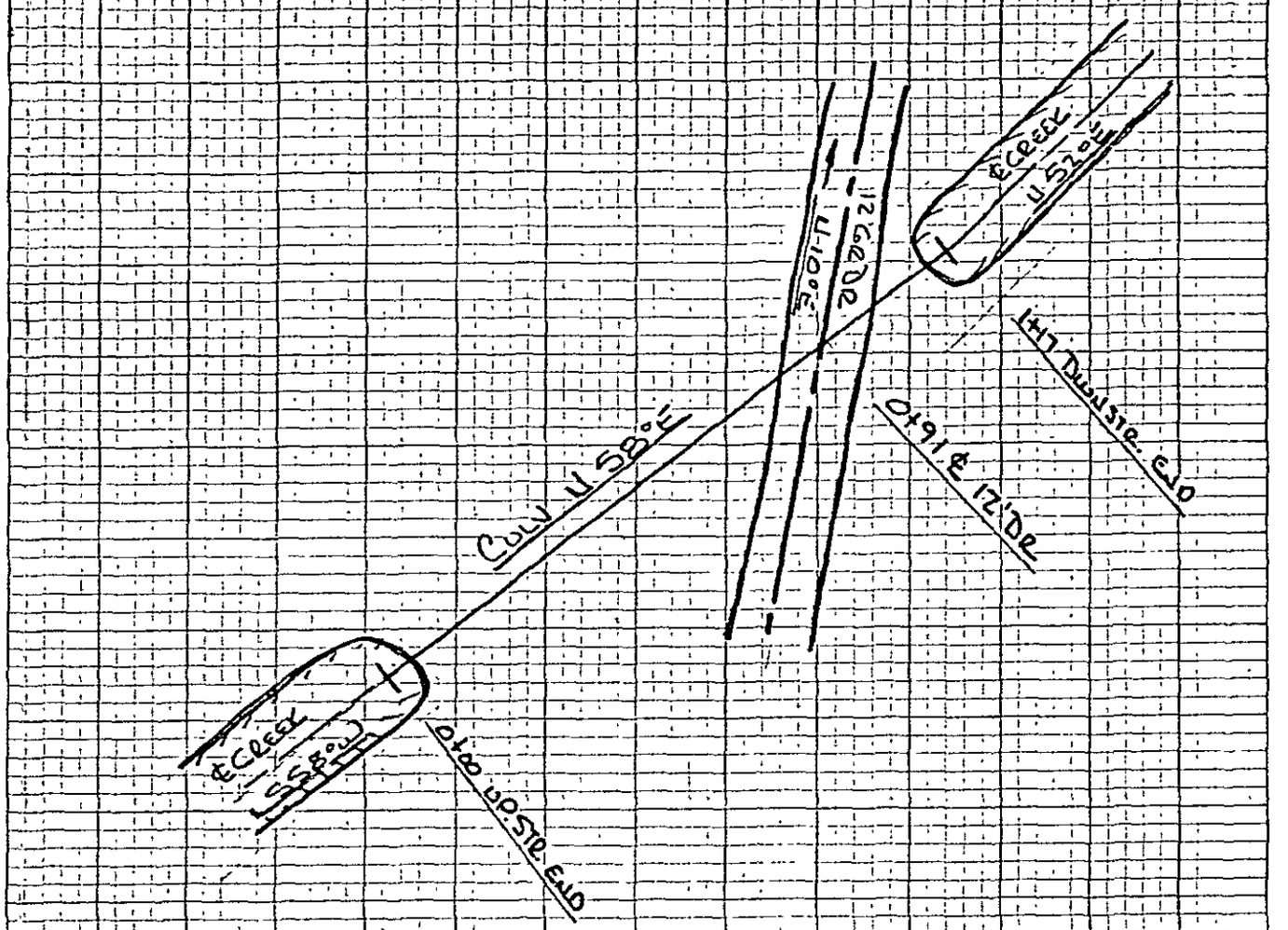
HUD 2005

CROSS SECTION #132 AXTELL CREEK

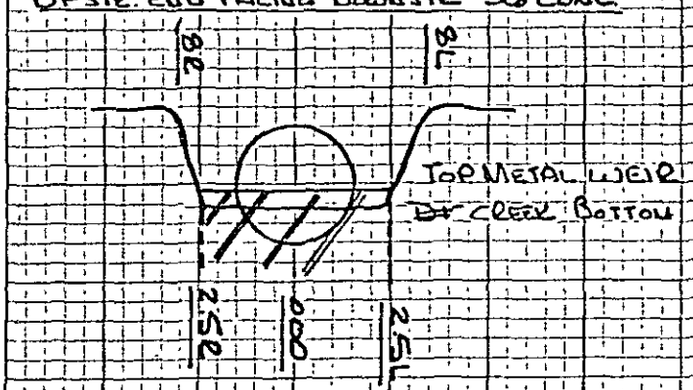
Book 4

0+00 UPSTREAM END

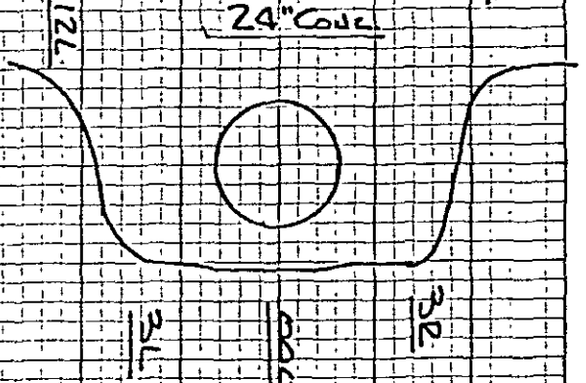
MAG BEARINGS



UPSTR. END FACING DOWNSTR 36" CONC



DOWNSTR END FAC UPSTR 24" CONC



24" DIA CULVERT

Sheet 10/20

AXTELL CREEK, KALAMAZOO

HUD 2027-0



UPSTR END SEC 132 AXTELL CREEK

24" DIA CULVERT
AXTELL CREEK, KALAMAZOO

Sheet 20/20
HUD 20-07-07

AXTELL CREEK

CITY OF KALAMAZOO, MICHIGAN

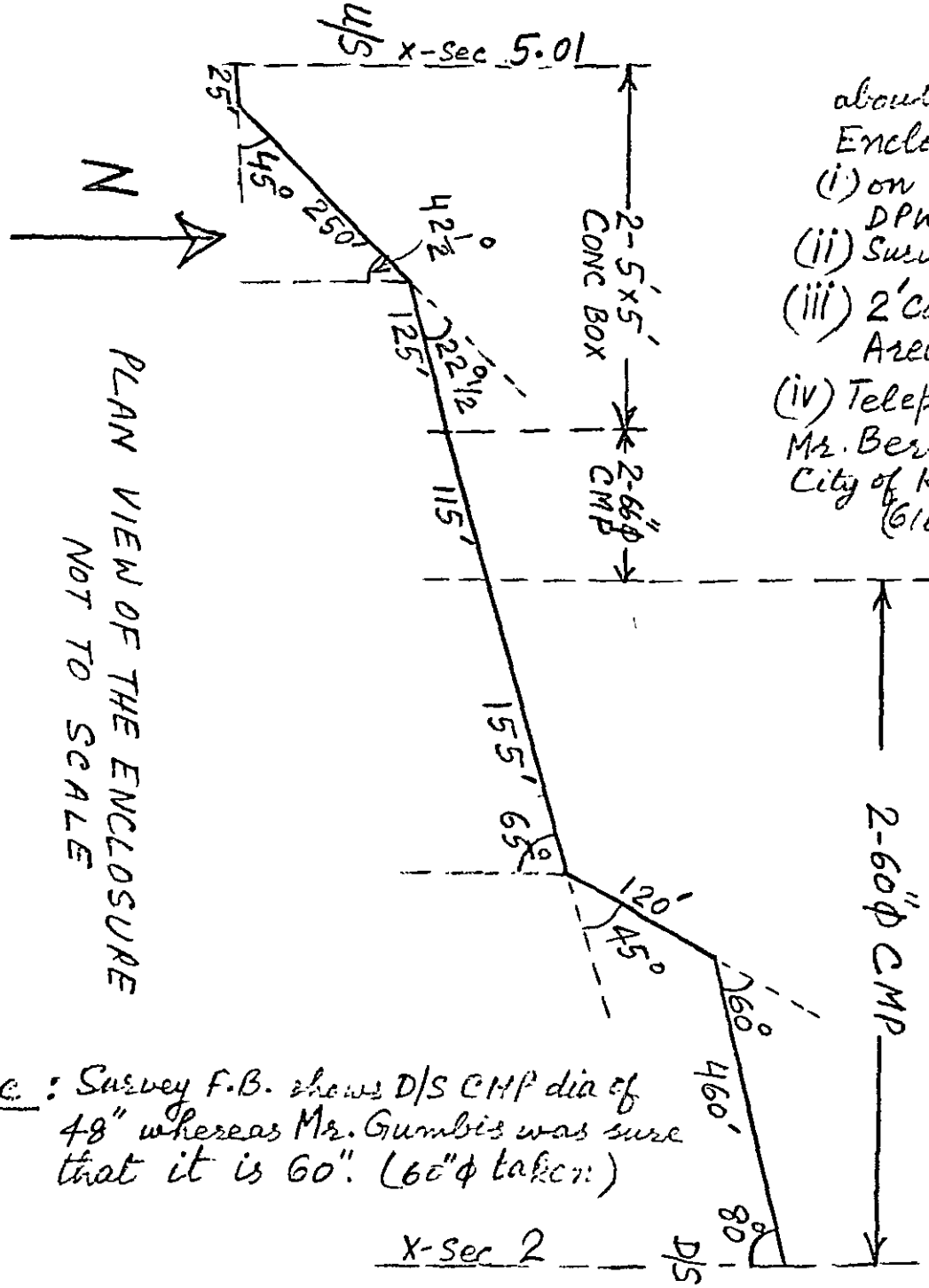
EXHIBIT 5

ENCLOSURE COMPUTATIONS

REFERENCE

Procedure Used in Pressure Flow Calculations for the Axtell Creek Enclosures

1) Enclosure along Crosstown Parkway crossing Burdick St.



Information about the layout of the Enclosure based
(i) on the Drawings from DPW
(ii) Survey F. B. #4
(iii) 2' Contour Map of the Area
(iv) Telephonic talk with Mr. Bernie Gumbis City of Kalamazoo, DPW (616) 385-8002

Note: Survey F.B. shows D/S CMP dia of 48" whereas Mr. Gumbis was sure that it is 60". (60" ϕ taken)

SUBJECT	BY	CHK.	SHEET NO.	File Code No (Job No) Owner Project Suffix
Kalamazoo – Axtell Creek	Sushil		1 OF 8	HUD 2027 • C
	DATE 3/20/80	DATE		

REFERENCE

Computations for XKOR

2-60" ϕ CMP

Bend Losses

$$h_{\ell} = K_{\ell}\, v^2/2g$$

14 $K_{\ell} = 0.7$ for 45° bend
.08 $= 0.42$ " $22\frac{1}{2}$° "
17 $= 0.83$ " 60° "
→ multiplier

King's Handbook Pg 6-23

Friction Losses

$$K_f = \frac{29.1\, n^2 L}{R^{4/3}}$$

HEC-2 Manual

Exit Loss

$$h_{exit} = K_{exit}\, v^2/2g$$

where $K_{exit} = 1.0$

Contraction Loss

$$h_c = \left(\frac{1}{C} - 1\right)^2 v_2^2/2g$$

where $C = 0.582 + \frac{0.0418}{1.1 - r}$

r being the ratio of the dias. of the two pipes

King's Handbook 6-21

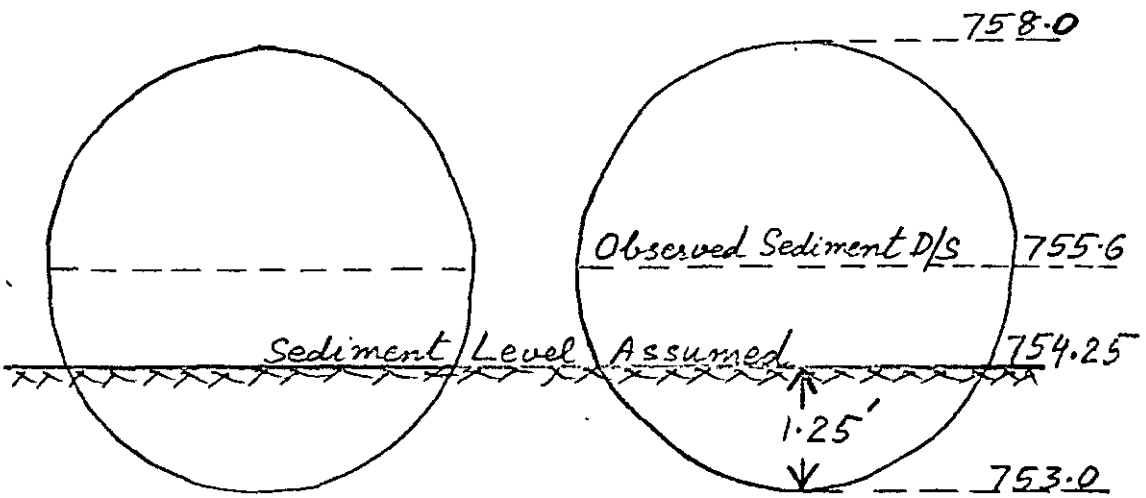
$$XKOR = K_{contraction} + K_f + K_{\ell} + K_{exit}$$

$$K_{Contraction} = \left(\frac{1}{0.582 + \frac{0.0418}{1.1 - 60/66}} - 1\right)^2 = \underline{0.06}$$

SUBJECT Kalamazoo - Axtell Creek	BY [illegible]	CHK	SHEET NO 2 OF 8	File Code No (Job No.) Owner Project Suffix HUD • 21 2 • 07
	DATE 3/20/80	DATE		

REFERENCE

K_f



Pipes are approximately half silted up on the D/S side. There was no way to check the sediment level in the pipes near the U/S side. Based on the measurements of the other Enclosure (between x-sections 124 and 125), it shall be assumed that, on an average, the depth of sediments is $\frac{1}{4}$th of the diameter of the pipes.

$$R = \frac{\text{Area}}{\text{Wetted Perimeter}} = \frac{0.804 \times \pi \times 2.5^2}{10.47 + 4.34}$$

$$= 1.07 \text{ ft}$$

Taking $n \approx 0.03$

$$K_f = \frac{29.1 (0.03)^2 \{155 + 120 + 460\}}{1.07^{4/3}}$$

$$= \underline{17.68}$$

$K_b = 0.7 + 0.83 = \underline{1.53}$

$K_{exit} = \underline{1.0}$

Therefore, $XKOR = 0.06 + 17.68 + 1.53 + 1.0 = \underline{20.3}$

SUBJECT	BY	CHK	SHEET NO	File Code No (Job No Owner Project Suffix
Kalamazoo – Axtell Creek	Sushil		3 OF 8	HUD • 2027 • 07
	DATE 3/20/80	DATE		

REFERENCE

2-66" ϕ CMP

$$XKOR \approx K_f$$

Assuming that the Pipes are $\frac{1}{4}$ th silted up,

$$R = \frac{0.804 \times \pi \times 2.75^2}{11.52 + 4.76} = 1.17 \text{ ft}$$

$$K_f = \frac{29.1 (0.03)^2 (115)}{1.17^{4/3}} = \underline{2.43}$$

Hence $XKOR = \underline{2.43}$

2- 5'x5' CONC BOX

$$XKOR = K_{entrance} + K_f + K_e$$

$K_{entrance} \approx \underline{0.4}$

Bureau of Public Roads Table in "Hydraulics of Bridge Waterways" 1963.

$$R = \frac{5 \times 5}{20} = 1.25 \text{ ft.}$$

Take $n \approx 0.02$

$$K_f = \frac{29.1 (0.02)^2 400}{1.25^{4/3}} = \underline{3.46}$$

REFERENCE

$$K_b = 0.7 + 0.42 = 1.12$$

Hence $\sum KOR = 0.4 + 3.46 + 1.12$

$\approx 6.0 \Rightarrow 4.0$

Computations for average value of $\sum KOR$ to be used in SB Card for Pressure flow

Total Head Loss through the Enclosure

$$= h_1 + h_2 + h_3$$

$$= \sum_{i=1}^{3} \frac{(\sum KOR)_i \left(\frac{Q}{a_i}\right)^2}{2g}$$

$$= \frac{4.0}{6.0}\frac{\left(\frac{Q}{2\times5\times5}\right)^2}{2g} + \frac{2.4\left(\frac{Q}{2\times.804\times\pi\times2.5^2}\right)^2}{2g}$$

$$+ \frac{20.3\left(\frac{Q}{2\times.804\times\pi\times2.5^2}\right)^2}{2g}$$

$$= \frac{0.0244\,Q^2}{2g} \quad .0236$$

The area of flow through the Enclosure

SUBJECT	BY	CHK	SHEET NO.	File Code No (Job No.) Owner Project Suffix
Kalamazoo - Axtell Creek	Sushil		5 OF 8	HUD • 2027 • 01
	DATE 3/20/81	DATE		

REFERENCE

to be used in S B card shall be taken equal to the area available on the D/S side.

Therefore, taking area of flow equal to $2 \times .804\pi \times 2.5^2$ (= 31.6 sq ft),

the above noted equation can be written as

Total Head loss through the Enclosure

$$= \frac{0.0244 (31.6)^2 \left(\frac{Q}{31.6}\right)^2}{2g}$$

$$= \frac{24.3 \left(\frac{Q}{31.6}\right)^2}{2g}$$

Hence av. value of XKOR = 24.3 (23.6 may be high)

BAREA, Area of flow = 31.6 ft^2

As per output enclosed (under a separate folder), flow through the Enclosure is given below:

10 YR	50 YR	100 YR	500 YR
90 CFS	91 CFS	91 CFS	90 CFS

SUBJECT	BY	CHK.	SHEET NO.	File Code No (Job No) Owner Project Suffix
Kalamazoo – Axtell Cr.	Cussil		6 OF 8	HUD • 2027 • 07
	DATE 3/20/20	DATE		

Cross-Section #118 Axtell Creek (upstream)

Enclosure along Crossroads Parkway
350 ft. u/s of Burdick St.

Subject: Axtell Creek
Kalamazoo

HUD 2027-07 Sheet 7/8



Valley Section #116 Axtell Creek (Dwn. Sta.)
D/S End of the Enclosure

Subject: Axtell Creek Kalamazoo IIUD 2027-07 Sheet 3/8

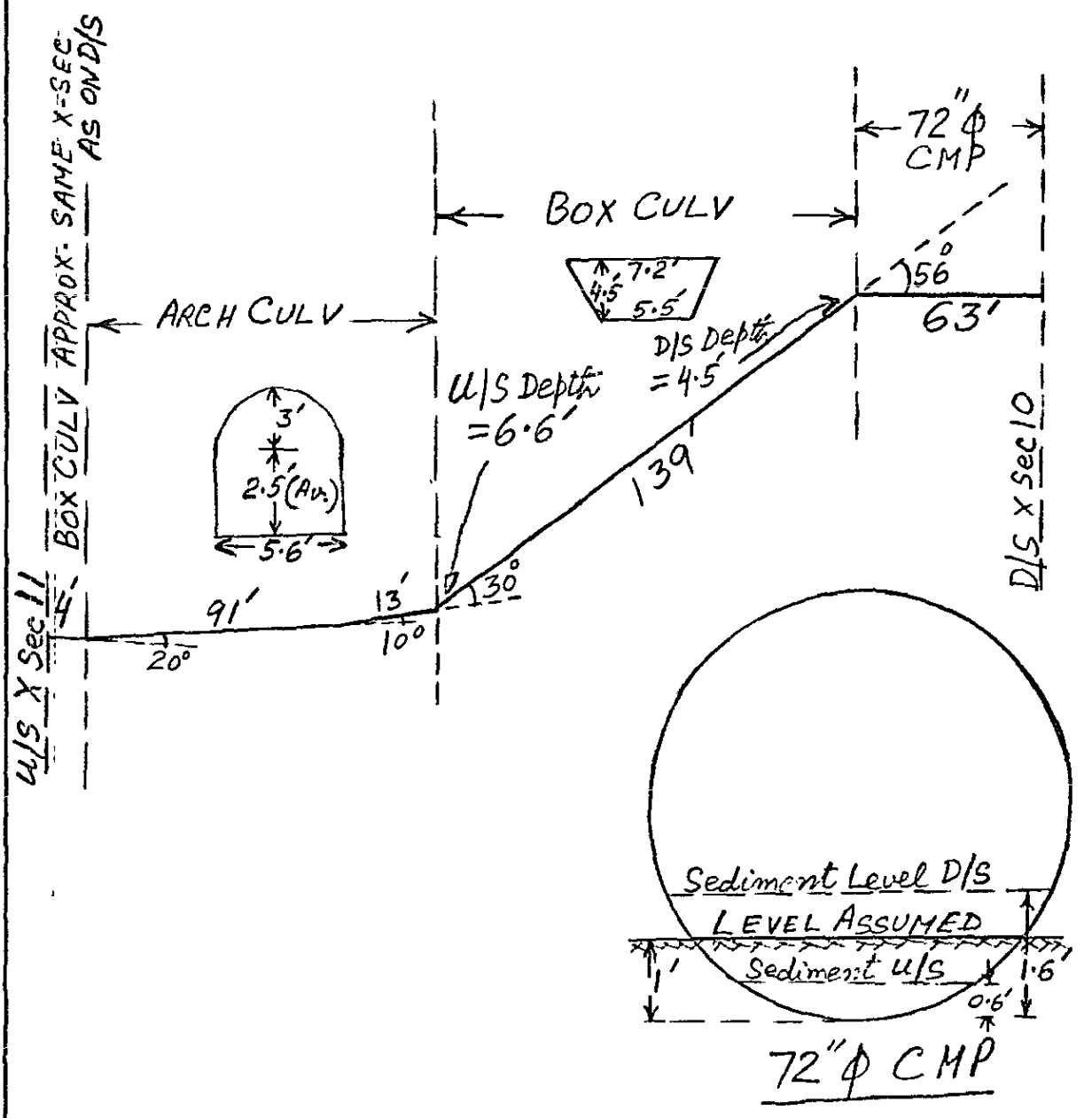
FORM 25-0
(313) 291-5400

Wade, Trim & Associates, Inc.
Civil Engineers • Land Surveyors
WORK SHEET

25185 GODDARD ROAD
TAYLOR, MICHIGAN 48180

REFERENCE

2) Enclosure under Westnedge Avenue



F.B #4
Pgs 63-64

SUBJECT Kalamazoo - Axtell Creek	BY Sustel	CHK	SHEET NO. 1 OF 6	File Code No. (Job No.) Owner Project Suffix
	DATE 3/21/80	DATE		HDD • 2027 • 07

FORM 25-0
(313) 291-5400

Wade, Trim & Associates, Inc.
Civil Engineers • Land Surveyors
WORK SHEET

25185 GODDARD ROAD
TAYLOR, MICHIGAN 48180

REFERENCE

Computations for XKOR

72" ϕ CMP

$$R = \frac{\text{Area}}{\text{Wetted Perimeter}} = \frac{0.887\pi 3^2}{0.73\pi 6 + 4.48}$$

$$= \frac{25.1}{18.24} = 1.37 \text{ ft}$$

$$K_f = \frac{29.1\, n^2 L}{R^{4/3}} = \frac{29.1(.035)^2\, 63}{1.37^{4/3}}$$

$$= \underline{1.48}$$

.45

Take Junction and 56° Bend Loss ≈ $\underline{0.80}$

$582 + \frac{0416}{11 - \frac{251}{352}} = 69$ .45 ≈.2 ≈.67

$$K_{exit} = \underline{1.0}$$

Therefore, $XKOR = 1.48 + 0.8 + 1.0$

$$= \underline{3.3}$$ close ✓

Box Culvert

v=2.55

$$\text{Average Depth} = \frac{6.6 + 4.5}{2} = 5.55 \text{ ft}$$

$$R = \frac{\text{Area}}{\text{Wetted Perimeter}} = \frac{\frac{5.55}{2}(12.7)}{2 \times 5.6 + 12.7}$$

$$= \frac{35.24}{23.9} = \underline{1.47 \text{ ft}}$$

REFERENCE

$$K_f = \frac{29.1\, n^2 L}{R^{4/3}} = \frac{29.1\,(0.02)^2\,143}{1.47^{4/3}}$$

$$= 1.0$$

Take Junction and 30° bend loss

$$\approx 0.5$$

Therefore, $\Sigma KOR = 1.0 + 0.5 = \underline{1.5}$

Arch Culvert

$$R = \frac{5.6 \times 2.7 + \pi 2.8^2/2}{5.6 + 2 \times 2.7 + \pi 2.8} = \frac{27.44}{19.80}$$

$$= \underline{1.39 \text{ ft}}$$

$$K_f = \frac{29.1\, n^2 L}{R^{4/3}} = \frac{29.1\,(0.02)^2\,104}{1.39^{4/3}}$$

$$= 0.78$$

Take entrance loss ≈ 0.5

$$\Sigma KOR = 0.78 + 0.5 = \underline{1.28}$$

SUBJECT	BY	CHK	SHEET NO.	File Code No (Job No) Owner	Project	Suffix
Kalamazoo - Axtell Creek	Sushil P		3 OF 6	HUD	2027	07
	DATE 3/21/80	DATE				

REFERENCE

Computations for average value of XKOR to be used in SB Card for Pressure Flow

Total Head Loss through the Enclosure

$$= \frac{3.2}{3.3}\frac{3.3\left(\frac{Q}{25.1}\right)^2}{2g} + \frac{1.2}{1.5}\frac{1.5\left(\frac{Q}{35.24}\right)^2}{2g} + \frac{1.28\left(\frac{Q}{27.44}\right)^2}{2g}$$

$$= \frac{0.0081\,Q^2}{2g}$$

The area of flow through the Enclosure to be used in SB card shall be taken equal to the area available on the D/S side

Therefore, taking area of flow equal to $25.1\ ft^2$, the above noted equation can be written as

$$\text{Total Head Loss} = \frac{0.0081(25.1)^2\left(\frac{Q}{25.1}\right)^2}{2g}$$

$$= \frac{5.13\left(\frac{Q}{25.1}\right)^2}{2g}$$

Hence av. value of XKOR = $\frac{4.88}{5.13}$

BAREA, Av. area of flow = $25.1\ ft^2$

As per output enclosed (under a separate folder), flow through the Enclosure is given below:

10 YR	50 YR	100 YR	500 YR
177 CFS	173 CFS	170 CFS	165 CFS

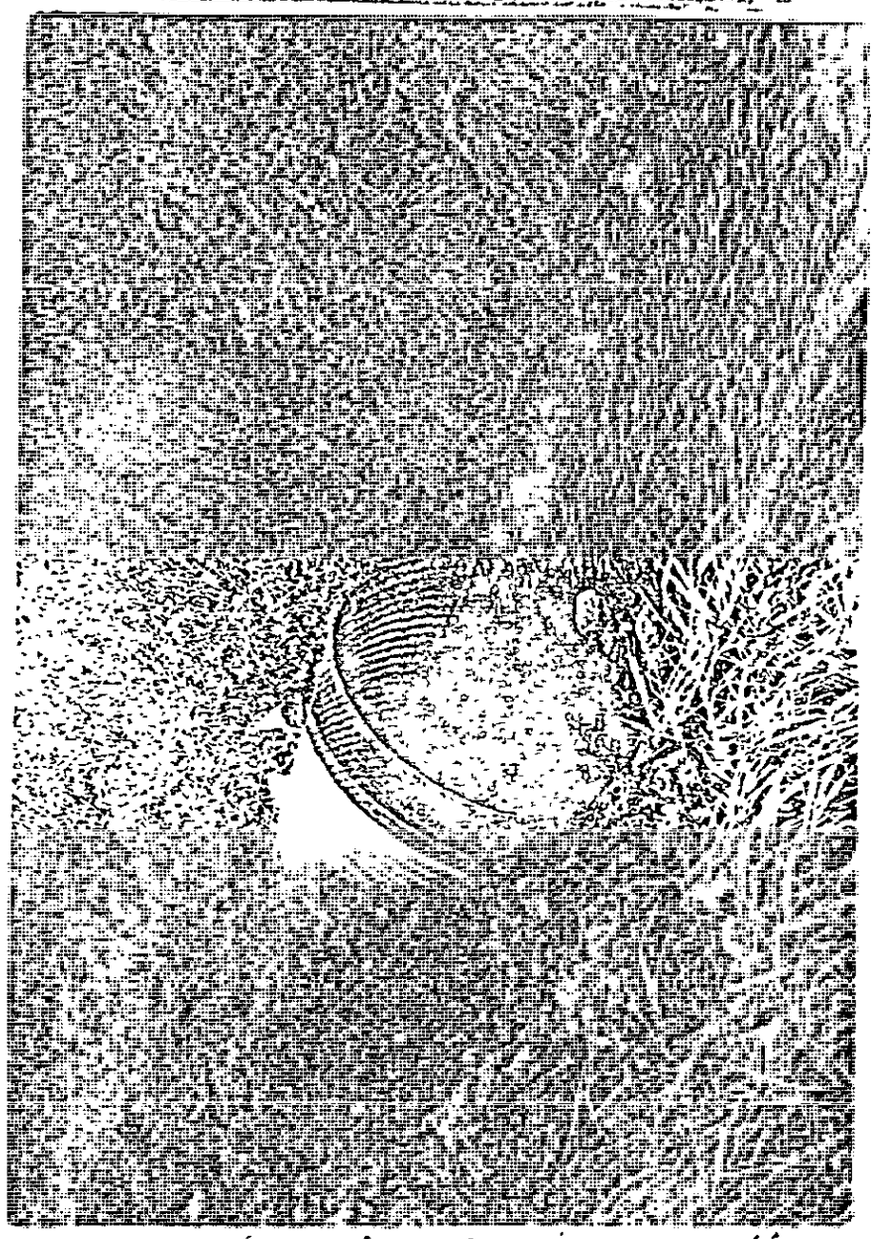
SUBJECT	BY	CHK.	SHEET NO	File Code No (Job No.) Owner Project Suffix
Kalamazoo - Axtell Cr.	DATE 3/20/80	DATE	4 OF 6	HUD • 2027 • 07



Cross Section #175 Axtell Creek
(Upstr. End Enclosure)

ENCLOSURE UNDER WESTNEDGE AVE
U/S END

AXTELL CREEK
KALAMAZOO



CROSS SECTION #124 AXTELL CREEK
(DOWNSTR. END ENCLOSED)

ENCLOSURE UNDER WESTNEDGE AVE
D/S END

AXTELL CREEK
KALAMAZOO

Sheet 6/6
HUD 2027-07

AXTELL CREEK

CITY OF KALAMAZOO, MICHIGAN

EXHIBIT 6

TIME OF CONCENTRATION AND

RUNOFF CURVE NUMBER COMPUTATIONS

Wade Trim & Associates, Inc.
Civil Engineers • Land Surveyors
WORK SHEET

25185 GODDARD ROAD
TAYLOR, MICHIGAN 48180

REFERENCE

Subject: Axtell Creek Drainage Area;
Upstream of Maple Rd;
Computations for Time of Concentration

1700 ft of sheet flow

$$V = .48\sqrt{S}$$

$$= .48\left(\frac{900-800}{17}\right)^{\frac{1}{2}}$$

$= 1.2$ ft/sec $T = 0.41$ hrs

1200 ft of tributary flow

$$V = 2.1\sqrt{S}$$

$$= 2.1\left(\frac{800-768}{12}\right)^{\frac{1}{2}}$$

$= 3.43$ ft/sec $T = 0.10$ hrs

$T_C \approx \underline{0.5 \text{ hrs}}$

SUBJECT	BY	CHK.	SHEET NO.	File Code No (Job No Owner Project Suffix
Portage and Axtell Cr. City of Kalamazoo	Susbur		1 OF 1	HUD 2027 07
	DATE 2/2/81	DATE		

LAND USE

(Present) or Future

Watershed Axtell Creek Drainage Area upstream of Maple Road Site — D.A. 0.10 mi.²

Computed by Sartal Date 2/2/81 Checked by — Date —

Cover	Practice	Condition or Rotation	% Per Practice	Curve Numbers Moisture Condition II: % A Soils	% B Soils	% C Soils	100% D Soils	wt. ave.	Product
Fallow	Straight Row	--		77	86	91	94		
Row Crops	Straight Row	Poor		72	81	88	91		
	Straight Row	Good		67	78	85	89		
	**Contoured	Poor		70	79	84	88		
	**Contoured	Good		65	75	82	86		
	*C and T	Poor		66	74	80	82		
	*C and T	Good		62	71	78	81		
Small Grain	Straight Row	Poor		65	76	84	88		
	Straight Row	Good		63	75	83	87		
	**Contoured	Poor		63	74	82	85		
	**Contoured	Good		61	73	81	84		
	*C and T	Poor		61	72	79	82		
	*C and T	Good		59	70	78	81		
Legumes or Rotation Meadow	Straight Row	Poor		66	77	85	89		
	Straight Row	Good		58	72	81	85		
	**Contoured	Poor		64	75	83	85		
	**Contoured	Good		55	69	78	83		
	*C and T	Poor		63	73	80	83		
	*C and T	Good		51	67	76	80		
Pasture		Poor	40%	68	(79)	86	89		31.6
		Fair		49	69	79	84		
		Good		39	61	74	80		
Meadow (Permanent)		Good		30	58	71	78		
Woods (Farm)		Poor	30%	45	(66)	77	83		19.8
		Fair		36	60	73	79		
		Good		25	55	70	77		
Farmsteads		--		59	74	82	86		
Impervious Surfaces		--		100	100	100	100		
Water Surfaces (lakes, ponds)		--		100	100	100	100		
Commercial and business areas (85% impervious)				89	92	94	95		
Industrial districts (72% impervious)				81	88	91	93		
Residential: Average % Impery. Average lot size									
1/8 acre or less 65				77	85	90	92		
1/4 acre 38			30%	72	(83)	88	91		24.9
1/3 acre 30				61	75	83	87		
1/2 acre 25				57	72	81	86		
1 acre 20				54	70	80	85		
				51	68	79	84		
Paved parking lots, roofs				98	98	98	98		

Total = 76.3

USE 77

00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: COMSTOCK TWP. CITY OF KALAMAZOO

3) WATERCOURSE: KALAMAZOO RIVER

4) DOCUMENT TYPE: REPORT

00BREAK00

Wade, Trim & Associates, Inc.
Civil Engineers • Land Surveyors • Community Planners
Taylor, Michigan

April 7, 1980

Michigan Department of Natural Resources
Flood Insurance & Flood Plain Delineation Unit
Water Management Division
Stevens T. Mason Building
Lansing, Michigan 48909

Attention: Mr. Dan Morgan

Re: Engineering Contract H-4802
Comstock Township/City of Kalamazoo
Flood Insurance Studies

Gentlemen:

Enclosed is a report which describes the hydraulic studies for the Kalamazoo River associated with the City of Kalamazoo/Comstock Township - Michigan Flood Insurance Administration Studies performed by our office. Your review and approval of this report are requested.

Please contact William J. Weaver of this office if you have any questions regarding this report.

Very truly yours,

WADE, TRIM & ASSOCIATES, INC.

Glen A. Roberts

GAR:WJW:asw
HUD 2024-07
HUD 2027-07
Enclosure
cc: Mr. Wallace Weaver, Federal Emergency Management Agency
Mr. Martin Gunn, Federal Emergency Management Agency

KALAMAZOO RIVER

INDEX OF EXHIBITS

EXHIBIT 1	Field Cross Section Location and 100 Year Flood Plain - Floodway Map, City of Kalamazoo, 2 Sheets.
EXHIBIT 2	Computer Printouts, HEC-2 Backwater Analysis with Cross Section Plots (in separate folder) City of Kalamazoo.
EXHIBIT 3	Stream Profile, City of Kalamazoo, 2 Sheets.
EXHIBIT 4	Bridge Notes and Sketches, City of Kalamazoo, 13 Sheets
EXHIBIT 5	Field Cross Section Location and 100 Year Flood Plain - Floodway Map, Comstock Township, 3 Sheets.
EXHIBIT 6	Computer Printouts, HEC-2 Backwater Analysis with Cross Section Plots (in separate folder) Comstock Township.
EXHIBIT 7	Stream Profile, Comstock Township, 4 Sheets.
EXHIBIT 8	Bridge Notes and Sketches, Comstock Township, 4 Sheets.
EXHIBIT 9	Analysis at Oxbow, Comstock Creek, 6 Sheets.
EXHIBIT 10	Morrow Lake Dam Spillway Analysis, 7 Sheets.
EXHIBIT 11	Cross Section Plots, Morrow Lake Dam to Comstock Corporate Boundary, by Gilbert/Commonwealth Associates.
EXHIBIT 12	Computer Printouts, HEC-2 Backwater Analysis, by Gilbert/Commonwealth Associates, 35th Street Bridge to Comstock Township/Charleston Corporate Boundary.

KALAMAZOO RIVER BASIN
HYDRAULIC ANALYSIS
FOR
CITY OF KALAMAZOO
AND
COMSTOCK TOWNSHIP
FLOOD INSURANCE STUDIES

HUD 2024-07
HUD 2027-07

March 20, 1980

Prepared By:

Wade, Trim & Associates, Inc.
25185 Goddard Road
Taylor, Michigan 48180

HYDRAULICS REPORT
KALAMAZOO RIVER
CITY OF KALAMAZOO, MICHIGAN
COMSTOCK TOWNSHIP, MICHIGAN

I INTRODUCTION

This report summarizes the hydraulic studies undertaken to support detailed studies on 7.0 miles of the Kalamazoo River.

This hydraulic analysis was coordinated with the analysis performed by Gilbert/Commonwealth, Associates, in order to insure continuity between the City of Kalamazoo, Kalamazoo Township, Comstock Township and Galesburg Flood Insurance Studies. One of the agreements made between Wade, Trim & Associates, Inc. and Commonwealth was to trade hydraulic analyses on certain segments of the Kalamazoo River. As a result of this trade, the hydraulic analysis between the Morrow Lake dam and the upstream limit of Comstock Township, which is part of the Comstock Township Flood Insurance Study, was performed by Gilbert/Commonwealth Associates and included as part of this study. Glen Roberts served as Project Manager for this study.

HUD 2024-07
HUD 2027-07
March 20, 1980

II KALAMAZOO RIVER (DETAILED) CITY OF KALAMAZOO

Detailed studies were performed on the Kalamazoo River from the City of Kalamazoo/Kalamazoo Township corporate boundary (between Mosel Avenue and Patterson Road) to City of Kalamazoo/Kalamazoo Township corporate boundary (between Railroad Bridge and King Highway), a distance of approximately 2 miles. A total of 6 bridge cross sections and 11 valley sections were field surveyed by Wade, Trim & Associates, Inc. in October, 1979. Cross section locations are shown on Exhibit 1 and were supplemented by Abrams aerial elevation information, 2 feet contour maps and U.S.G.S. Quad Maps of the study area which consist of 10 feet contour intervals (Reference 1, 2 and 3, respectively).

Table 1 cross references section designations by showing the computer section number which corresponds to the cross section letter shown in Exhibit 1. Table 2 lists discharges which have been approved by the Michigan Department of Natural Resources (M.D.N.R.).

A. METHOD OF ANALYSIS

The HEC-2 backwater computer program was used in developing water surface profiles (Reference 4). HEC-2 printouts including computer cross section plots are presented as Exhibit 2. (Exhibit 2 is contained in the 11" x 15" folder enclosed with this report.) Water surface profiles resulting from the backwater analyses are presented as Exhibit 3.

B. VARIABLES AND COEFFICIENTS

Roughness coefficients (Mannings "n") were estimated by field inspection, quad map information, and survey photographs. Typical roughness values for the main channel of the Kalamazoo River range from .03 to .035; roughness values for the overbank areas range from .05 to .12 for all floods. These values are indicative of summer month conditions and are consistent with values recommended and used in engineering practice (Reference 5). Contraction and expansion coefficients were selected as 0.3 and 0.5, respectively, at bridge sections and 0.1 and 0.3, respectively, for gradual channel transitions. Bridge loss coefficient computations are included in Exhibit 4.

C. HIGH WATER MARKS

No documented high water marks exist on the Kalamazoo River in this study area.

D. STARTING CONDITIONS

Starting water surface elevations for the 10, 50, 100 and 500 year storms in the City of Kalamazoo were obtained from the Kalamazoo Township Flood Insurance Study (Reference 6).

F. GENERAL

Computed water surface elevations were developed to an accuracy of 0.5 feet for floods of the selected recurrence intervals.

All elevations are referenced to the U.S. Geological Survey (U.S.G.S.) Datum. This datum is equivalent to the National Geodetic Vertical Datum (N.G.V.D.).

The hydraulic analyses for this study were based only on the effects of flow unobstructed by ice or debris. The flood elevations are considered valid only if hydraulic structures, in general, remain unobstructed and do not fail.

TABLE 1

CITY OF KALAMAZOO

KALAMAZOO RIVER

CROSS REFERENCE INDEX

X-SECT.	COMPUTER NO.	DESCRIPTION
A	6.2	Section @ Corporate Boundary/Mosel Rd.
B	7.0	Valley Section
C above STP	8.0	Valley Section ± 1600 Ft. U/S of City/Township Boundary
D	9.2	D/S Face Patterson Rd.
E	9.5	U/S Face Patterson Rd.
F	10.0	Valley Section ± 900 Ft. U/S of Patterson Rd.
G	11.2	D/S Face Gull St.
H	11.5	U/S Face Gull St.
I	11.7	Valley Section ± 500 Ft. U/S of Gull St.
J	12.1	D/S Face R.R. Bridge
K	12.4	U/S Face R.R. Bridge
L	13.2	D/S Face Michigan Ave.
M	13.5	U/S Face Michigan Ave.
N	14.2	D/S Face Mill St.
O	14.5	U/S Face Mill St.
P	15.0	Valley Section ± 1450 Ft. U/S of Mill St.
Q	16.2	D/S Face of R.R. Bridge
R	16.4	U/S Face of R.R. Bridge
S	17.0	Valley Section at City/Township Corporate Boundary

TABLE 2

CITY OF KALAMAZOO

KALAMAZOO RIVER FLOOD ELEVATIONS

LOCATION	Selected Frequencies 10 YEAR	50 YEAR	100 YEAR	500 YEAR
	Q= 4940 cfs	Q= 6640 cfs	Q= 7390 cfs	Q= 9180 cfs
D/S City of Kalamazoo/ Kalamazoo Township Boundary	756.9	758.1	758.5	759.5
Michigan Avenue	760.3	761.9	762.7	764.3
	Q= 4620 cfs	Q= 6210 cfs	Q= 6910 cfs	Q= 8580 cfs
U/S City of Kalamazoo/ Kalamazoo Township Boundary	761.1	762.8	763.6	765.6
	Q = 4620	6210	6900	8570

III KALAMAZOO RIVER (DETAILED) COMSTOCK TOWNSHIP

Detailed studies were performed on the Kalamazoo River for a distance of approximately 5 miles from the Kalamazoo Township/Comstock Township corporate boundary at Sprinkle Road to the Comstock Township/Charleston Township corporate boundary at 35th Street. A total of 6 bridge cross sections and 11 valley sections were field surveyed by Wade, Trim & Associates, Inc. in August, 1979. Cross section locations are shown on Exhibit 5 and were supplemented by Abrams aerial elevation information, 2 feet contour maps and U.S.G.S. Quad Maps of the study area which consists of 10 feet contour intervals (References 1, 2, 3, and 7, respectively).

Table 3 cross references section designations by showing the computer section number which corresponds to the cross section letter shown in Exhibit 5. Table 4 lists discharges which have been approved by the MDNR.

A. METHOD OF ANALYSIS

The HEC-2 backwater computer program was used in developing water surface profiles (Reference 4). HEC-2 printouts including computer cross section plots are presented as Exhibits 6 and 11. (Exhibit 6 is contained in the 11" x 15" folder enclosed with this report.) Water surface profiles resulting from the backwater analyses are presented as Exhibit 7.

B. VARIABLES AND COEFFICIENTS

Roughness coefficients (Mannings "n") were estimated by field inspection, quad map information and survey photographs. Roughness values for the main channel of the Kalamazoo River are .03; roughness values for the overbank areas vary between .06 and .12 for all floods. These values are indicative of summer month conditions and are consistent with values recommended and used in engineering practice (Reference 5). Contraction and expansion coefficients were selected as 0.3 and 0.5 at bridge sections and 0.1 and 0.3 for gradual channel transitions. Bridge loss coefficient computations are included in Exhibit 8.

C. HIGH WATER MARKS

The gaging station located at the downstream side of the River Street Bridge (Section No. 23) recorded a peak elevation of 767.06 for a discharge of 6910 cfs during the 1947 flood which was equivalent to a 100 year storm. Therefore, the HEC-2 computer model was calibrated with this historic data and the high water mark was matched with the 100 year flood profile developed for this Flood Insurance Study.

D. STARTING CONDITIONS

The cross sections used to describe Sprinkle Road were the same as used in the Kalamazoo Township FIS (Reference 6). The starting water surface elevations for the 10, 50, 100 and 500 year floods were taken from the Kalamazoo Township FIS.

TABLE 3

COMSTOCK TOWNSHIP

KALAMAZOO RIVER

CROSS REFERENCE INDEX

X-SECT.	COMPUTER NO.	DESCRIPTION
A	12.9	D/S Face of Sprinkle Rd.
B	13.2	U/S Face of Sprinkle Rd.
C	15.0	Valley Sect. ± 1030 Ft. U/S of Sprinkle Rd.
D	16.0	Valley Sect. ± 2325 Ft. D/S of River St.
E	17.0	Valley Sect. ± 1700 Ft. D/S of River St.
F	18.0	Valley Sect. ± 1100 Ft. D/S of River St.
G	21.0	Valley Sect. ± 553 Ft. D/S of River St.
H	23.0	D/S Face of River Rd.
I	24.0	U/S Face of River Rd.
J	26.0	Valley Sect. Approx. 1015 Ft. U/S of River Rd.
K	27.0	Valley Sect. Approx. 1470 Ft. D/S of Consumer Power Bridge
L	29.0	D/S Face of Consumer Power Bridge
M	30.0	U/S Face of Consumer Power Bridge
N	32.0	Valley Sect. ± 400 Ft. D/S of Morrow Dam
O	33.0	D/S of Morrow Dam
P	70.0	Morrow Dam
Q	71.0	2900 Ft. U/S of Morrow Dam
R	72.0	10400 Ft. U/S of Morrow Dam
S	80.0	5000 Ft. D/S of 35th St. Bridge
T	80.1	3600 Ft. D/S of 35th St. Bridge
U	80.2	U/S Face of 35th St. Bridge
V	81.0	D/S Face of 35th St. Bridge
W	81.2	U/S Face of 35th St. Bridge
X	83.0	3850 Ft. D/S of Corporate Boundary
Y	84.8	650 Ft. U/S of Corporate Boundary

E. SPECIAL PROBLEMS

There is an oxbow in the river between Sprinkle Road and River Street. A rating curve was developed for the oxbow and the main river (Exhibit 9). Results of this analysis indicate that only 1% of the 100 year flow would go through the oxbow. This reduction of the flow in the main branch of the river would only reduce the 100 year flood elevation approximately 0.02 feet from the full flow elevation. Therefore, the oxbow has no effect on flood stages and was not part of the analysis.

The Morrow Lake dam was analyzed by hand computations (Exhibit 10) and the resulting elevations were input to the computer model.

F. GENERAL

Computed water surface elevations were developed to an accuracy of 0.5 feet for floods of the selected recurrence intervals.

All elevations are referenced to the U.S. Geological Survey (U.S.G.S.) Datum. This datum is equivalent to the National Geodetic Vertical Datum (NGVD).

The hydraulic analyses for this study were based only on the effects of flow unobstructed by ice or debris. The flood elevations are considered valid only if hydraulic structures, in general, remain unobstructed and do not fail.

TABLE 4

COMSTOCK TOWNSHIP

KALAMAZOO RIVER FLOOD ELEVATIONS

LOCATION	Selected Frequencies 10 YEAR	50 YEAR	100 YEAR	500 YEAR
	Q= 4520 cfs	Q= 6210 cfs	Q= 6900 cfs	Q= 8570 cfs
U/S Face Sprinkle Rd. Bridge	763.10	764.71	765.54	767.50
U/S Face River St. Bridge	765.01	766.42	767.09	768.70
D/S of Morrow Lake Dam	767.52	768.63	769.13	770.13
	Q= 4500 cfs	Q= 6070 cfs	Q= 6750 cfs	Q= 8420 cfs
U/S of Morrow Lake Dam	778.03	779.25	779.75	780.90
U/S of 35th St. Bridge	778.67	778.84	780.31	781.39
Comstock Township/Charleston Corporate Boundary	783.08	784.16	784.58	785.48

REFERENCES

1. Abrams Aerial Survey, Kalamazoo River in City of Kalamazoo and Comstock Township, 1979.

2. Two feet contour maps along the Kalamazoo River in the City of Kalamazoo and Comstock Township.

3. U.S. Geological Survey Topographical Maps - Kalamazoo Quadrangle, Kalamazoo County, 7.5 Minute Series - Photo Revised, 1973.

4. HEC-2 Water Surface Profile - Users Manual - U.S. Army Corps of Engineers - 1976.

5. Open Channel Hydraulics, Chow, Ven Te, McGraw Hill, Inc., 1959.

6. Kalamazoo Township Flood Insurance Study, being prepared by Gilbert/Commonwealth Associates, Jackson, Michigan, January, 1980.

7. U.S. Geological Survey Topographical Maps - Galesburg Quadrangle, Kalamazoo County, 7.5 Minute Series - Photo Revised, 1972.

8. United States Department of the Interior, Water Resources Data for Michigan - Part 1, Surface Water Records, 1974.

not submitted to DNR April 29, 1980

KALAMAZOO RIVER

CITY OF KALAMAZOO

EXHIBIT 1

Field Cross Section Location and

100 Year Flood Plain - Floodway Map

KALAMAZOO RIVER

CITY OF KALAMAZOO

EXHIBIT 2

Computer Printouts

HEC-2 Backwater Analysis with

Cross Section Plots (See Separate Folder)

KALAMAZOO RIVER

CITY OF KALAMAZOO

EXHIBIT 3

Stream Profile

KALAMAZOO RIVER

CITY OF KALAMAZOO

EXHIBIT 4

Bridge Notes and Sketches

Wade Trim & Associates Inc.
Civil Engineers • Land Surveyors
25185 GODDARD ROAD
TAYLOR, MICHIGAN 48180
(313) 291-5400

FORM 25-0

WORK SHEET

Bridge Location : R.R. CROSSING S/END SUTHERLAND PARK (Sect. 16)

Bridge Losses - SB Card

REFERENCE

1. XK (Pier Shape Coefficient) 1.25 — HEC-2 Manual

XKOR (Loss Coefficient) = 1.0 + Σk , Σk = $k_f + k_e + k_p$

where k_f = friction loss coefficient
k_e = entrance loss coefficient
k_p = loss from intermediate piers

Description of Bridge :

$K_f = 29.1\, n^2 L / R^{4/3}$ for English units

Area = ____ Wp = ____

$R = A/wp$ $R^{4/3}$ = ____ L = 10.5

n (composite) = ____

See attached

$K_f = 29.1 \times (\quad)^2 \times \quad / \quad = 0$

$K_e = 0.5$ — Hydraulic Charts for the Selection of Highway Culverts Circular No. 5 Dec. 1965 pg. 49

$k_p = 0$ if bridge has no intermediate piers

$K_p = 0.05$ if bridge has intermediate piers — HEC-2 manual

2. XKOR = 1 + 0 + 0.5 + 0.05 = 1.55
3. COFQ - Coefficient of discharge = 2.8 — HEC-2 manual
4. RDLEN = Length of weir = 0 (0 if read off BT cards)
5. BWC = bottom width of bridge opening (inc. piers) = 141
6. BWP = total width of obstruction = 37.4 — field data
7. BAREA = bridge opening inc. piers = 2075
8. SS = side slope = 0
(horizontal per 1 vertical unit)
9. ELCHU = Elevation of channel invert U/S side = 743.5
(0 if equal to minimum elevation in previous X-sect.)
10. ELCHD = Elevation of channel invert D/S side = 742.8
(0 if equal to minimum elevation in previous X-sect.)

SUBJECT	BY	CHK.	SHEET NO.	File Code No (Job No) Owner Project Suffix
KALAMAZOO RIVER CITY OF KALAMAZOO	AM DATE 7/8/80	DATE	___ OF ___	HUD • 2027 • 07

FORM 25-0
(313) 291-5400

Wade, Trim & Associates, Inc.
Civil Engineers • Land Surveyors
WORK SHEET

25185 GODDARD ROAD
TAYLOR, MICHIGAN 48180

Bridge Location: R.R. CROSSING S/END SUTHERLAND PARK (Sect 16)

Bridge Losses - SB Card

REFERENCE

1. XK (Pier Shape Coefficient) 1.25 — HEC-2 manual

XKOR (Loss Coefficient) = 1.0 + Σk, $\Sigma k = k_f + k_e + k_p$

where k_f = friction loss coefficient
k_e = entrance loss coefficient
k_p = loss from intermediate piers

Description of Bridge:

$k_f = 29.1\, n^2 L / R^{4/3}$ for English units

Area = ____ = ____ W_p =

$R = A/W_p$ $R^{4/3}$ = L = 10.5

n (composite) =

See attached

$k_f = 29.1 \times (\quad)^2 \times \quad / \quad = 0$

k_e = 0.5 — Hydraulic Charts for the Selection of Highway Culverts Circular No. 5 Dec. 1965 pg. 49

k_p = 0 if bridge has no intermediate piers

k_p = 0.05 if bridge has intermediate piers — HEC-2 manual

2. XKOR = 1 + 0 + 0.5 + 0.05 = 1.55

3. COFQ = Coefficient of discharge = 2.8 — HEC-2 manual

4. RDLEN = Length of weir = 0 (0 if read off BT cards)

5. BWC = bottom width of bridge opening (inc. piers) = 141

6. BWP = total width of obstruction = 37.4 — field data

7. BAREA = bridge opening inc. piers = 2075

8. SS = side slope = 0
(horizontal per 1 vertical unit)

9. ELCHU = Elevation of channel invert U/S side = 743.5
(0 if equal to minimum elevation in previous x-sect.)

10. ELCHD = Elevation of channel invert D/S side = 742.8
(0 if equal to minimum elevation in previous x-sect.)

SUBJECT	BY	CHK.	SHEET NO.	File Code No. (Job No.) Owner	Project	Suffix
KALAMAZOO RIVER CITY OF KALAMAZOO	AM			HUD	2027	07
	DATE 1/8/80	DATE	___ OF ___			

R.R. CROSSING S/END SUTHERLAND PARK

K_e calculation

$$K_{equiv.} = \frac{A_T^2}{\left[\sum_{i=1}^{n} \sqrt{\frac{A_i^2}{K_i}}\right]^2}$$

A_T = TOTAL AREA
A_i = Area of individual culvert
K_i = Coefficient for individual culvert
n = number of culverts

(1) Area = $(6.3 \times 12') = 75.6$
$W_p = (6.3)2 + 12(2) = 36.6$
$R = 75.6/36.6 = (2.1)\ R^{4/3} = 2.63$
$n_{composite} = 24(0.015) + 6.3(0.018) + 6.3(0.03)/36.6 = 0.018$
$K_f = 29.1 \times (0.018)^2 \times 10.5 \ / 2.63 = 0.038$

(4) Area = $11.6 \times 16 = 185.6$
$W_p = (11.6)2 + 16(2) = 55.2$
$R = 185.6/55.2 = 3.36 \quad R^{4/3} = 5.0$
$n_{composite} = 32(0.015) + 11.6(0.018) + 11.6(0.03)/55.2 = 0.019$
$K_f = 29.1 \times (0.019)^2 \times 10.5 \ / 5. = 0.022$

(3) Area = $11.5 \times 17.1 = 196.6$
$W_p = 2(11.5) + 2(17.1) = 57.2$
$R = 196.6/57.2 = 3.4 \quad R^{4/3} = 5.2$
$n_{composite} = 34.2(0.015) + 11.5(0.018) + 11.5(0.03)/57.2 = 0.019$
$K_f = 29.1 \times (0.019)^2 \times 10.5 / 5.2 = 0.021$

(11) Area = $25.3 \times 18.5 = 468.$
$W_p = 2(25.3) + 2(18.5) = 87.6$
$R = 468/87.6 = 5.34 \quad R^{4/3} = 9.3$
$n_{composite} = 37(0.015) + 25.3(0.018) + 25.3(0.03)/87.6 = 0.02$
$K_f = 29.1 \times (0.02)^2 \times 10.5 / 9.3 = 0.013$

(5) Area = $29.1 \times 20.1 = 585$
$W_p = 2(29.1) \times 2(20.1) = 98.4$
$R = 585/98.4 = 5.95 \quad R^{4/3} = 10.76$
$n_{composite} = 40.2(0.015) + 29.1(0.018) + 29.1(0.018)/98.4 = 0.017$
$K_f = 29.1 \times (0.017)^2 \times 10.5 / 10.76 = 0.008$

R.R. CROSSING S/END SUTHERLAND PARK (CONT.)

⑥ Area = 28.3 x 13.7 = 387.7

$W_p = 2(28.3) + 2(13.7) = 84$

$R = 387.7/84 = 4.6 \quad R^{4/3} = 7.68$

$n_{composite} = 27.4(0.015) + 28.3(0.018) + 28.3(0.03)/84 = 0.021$

$K_f = 29.1 \times (0.021)^2 \times 10.5 / 7.68 = 0.018$

⑦ Area = 27.6 x 6.4 = 176.6

$W_p = 2(27.6) + 2(6.4) = 68$

$R = 176.6/68 = 2.6 \quad R^{4/3} = 3.6$

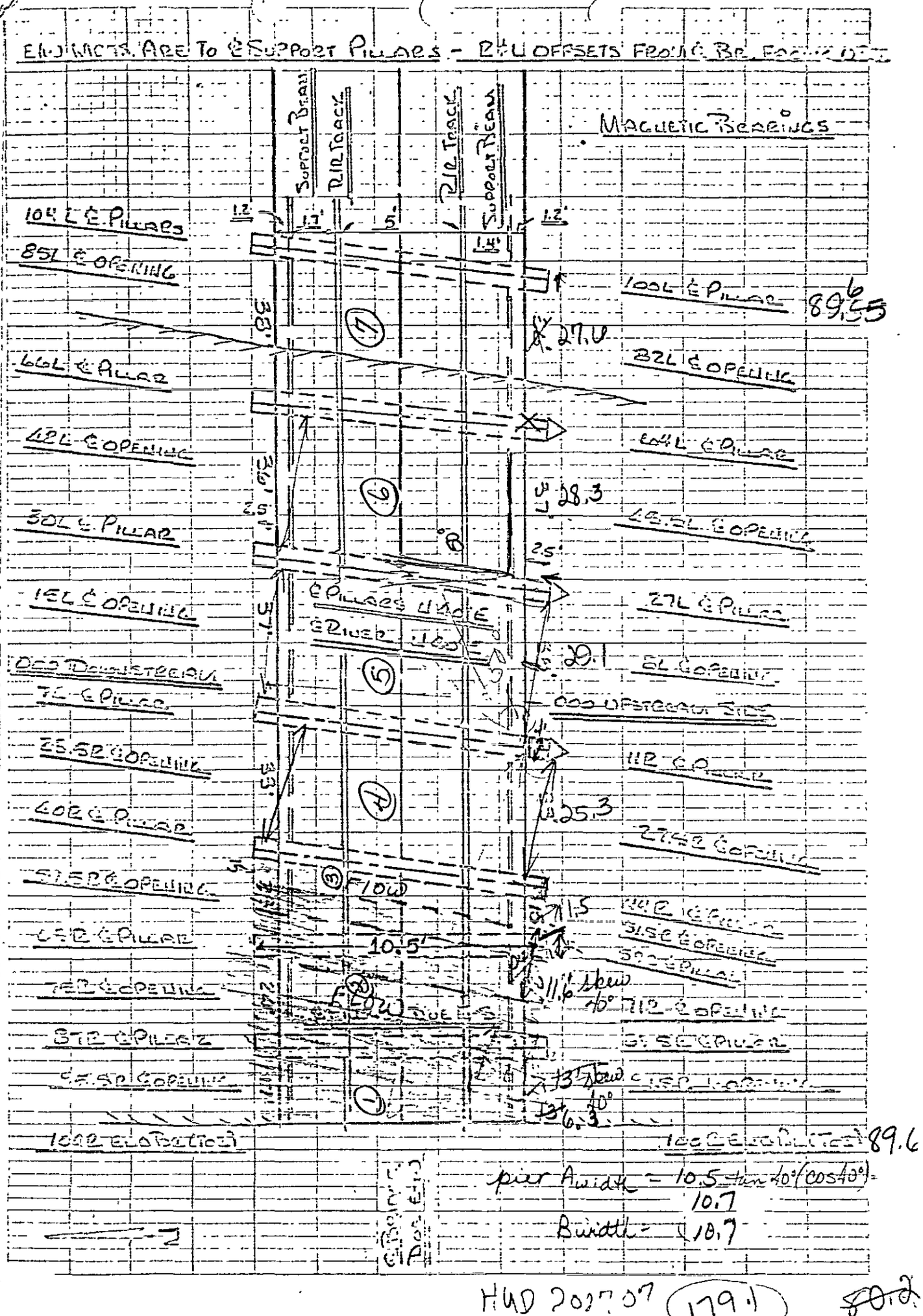
$n_{composite} = 12.8(0.015) + 27.6(0.018) + 27.6(0.03)/68 = 0.022$

$K_f = 29.1 \times (0.022)^2 \times 10.5 / 3.6 = 0.041$

$$K_{equiv.} = \frac{(2075.1)^2}{\left[\sqrt{\frac{(75.6)^2}{0.038}} + \sqrt{\frac{(185.6)^2}{0.022}} + \sqrt{\frac{(196.6)^2}{0.021}} + \sqrt{\frac{(468)^2}{0.013}} + \sqrt{\frac{(585)^2}{0.008}} + \sqrt{\frac{(387.7)^2}{0.018}} + \sqrt{\frac{(176.6)^2}{0.041}}\right]^2}$$

$A_T = 2075.1$ SQ. FT.

$K_{equiv.} = 0.014$


ENDWICTS ARE TO ℄ SUPPORT PILLARS - R+L OFFSETS FROM ℄ BR FACE OUT
MAGNETIC BEARINGS
SUPPORT BEAM
RR TRACK
RR TRACK
SUPPORT BEAM
104 L ℄ PILLARS
85L ℄ OPENING
100L ℄ PILLAR
89.6
38.1'
27.0'
66L ℄ PILLAR
82L ℄ OPENING
42L ℄ OPENING
64L ℄ PILLAR
30.1'
28.3'
30L ℄ PILLAR
46.8L ℄ OPENING
IEL ℄ OPENING
℄ PILLARS MADE
27L ℄ PILLAR
37.1'
20.1'
000 DOWNSTREAM
7L ℄ PILLAR
2L ℄ OPENING
000 UPSTREAM SIDE
25.5R ℄ OPENING
33.1'
11R ℄ PILLAR
40R ℄ PILLAR
25.3'
27.5R ℄ OPENING
51.5R ℄ OPENING
FLOW
1.5'
10.5'
64R ℄ PILLAR
81.5R ℄ OPENING
11.6' skew
76R ℄ OPENING
87R ℄ PILLAR
FLOW
13' skew
93R ℄ OPENING
136.3'
100R ELEVATION
89.6
pier Awidth = 10.5 + tan 40°(cos 40°) = 10.7
Bwidth = 10.7
CENTER LINE PIER
HUD 2017-07
179.1
80.2
Kanawha River at RR Bridge S. of Mines St.
Gage: St. Albans, WV
U.S. 2017-07

Bridge Location: PATERSON RD. (Sec. 9)

Bridge Losses - SB Card

REFERENCE

1. XK (Pier Shape Coefficient) 0.95 — HEC-2 Manual

XKOR (Loss Coefficient) = 1.0 + Σk, $\Sigma k = k_f + k_e + k_p$

where k_f = friction loss coefficient
k_e = entrance loss coefficient
k_p = loss from intermediate piers

Description of Bridge:

$K_f = 29.1 n^2 L / R^{4/3}$ for English units

Area = 4230 = _____ WP = 420'

$R = A/wp = 10.1$ $R^{4/3} = 21.7$ $L = 44'$

n (composite) = 0.05

$K_f = 29.1 \times (0.05)^2 \times 44 / 21.7 = 0.05$

$K_e = 0.2$ — Hydraulic Charts for the Selection of Highway Culverts Circular No. 5 Dec. 1965 pg. 41

$K_p = 0$ if bridge has no intermediate piers

$K_p = 0.05$ if bridge has intermediate piers — HEC-2 manual

2. XKOR = 1 + 0.2 + 0.05 + 0.1 = 1.35 inc 1.5

3. COFQ = Coefficient of discharge = 2.6 — HEC-2 manual

4. RDLEN = Length of weir = 0 (0 if read off BT cards)

5. BWC = bottom width of bridge opening (inc. piers) = 173.

6. BWP = total width of obstruction = 7.5 — field data

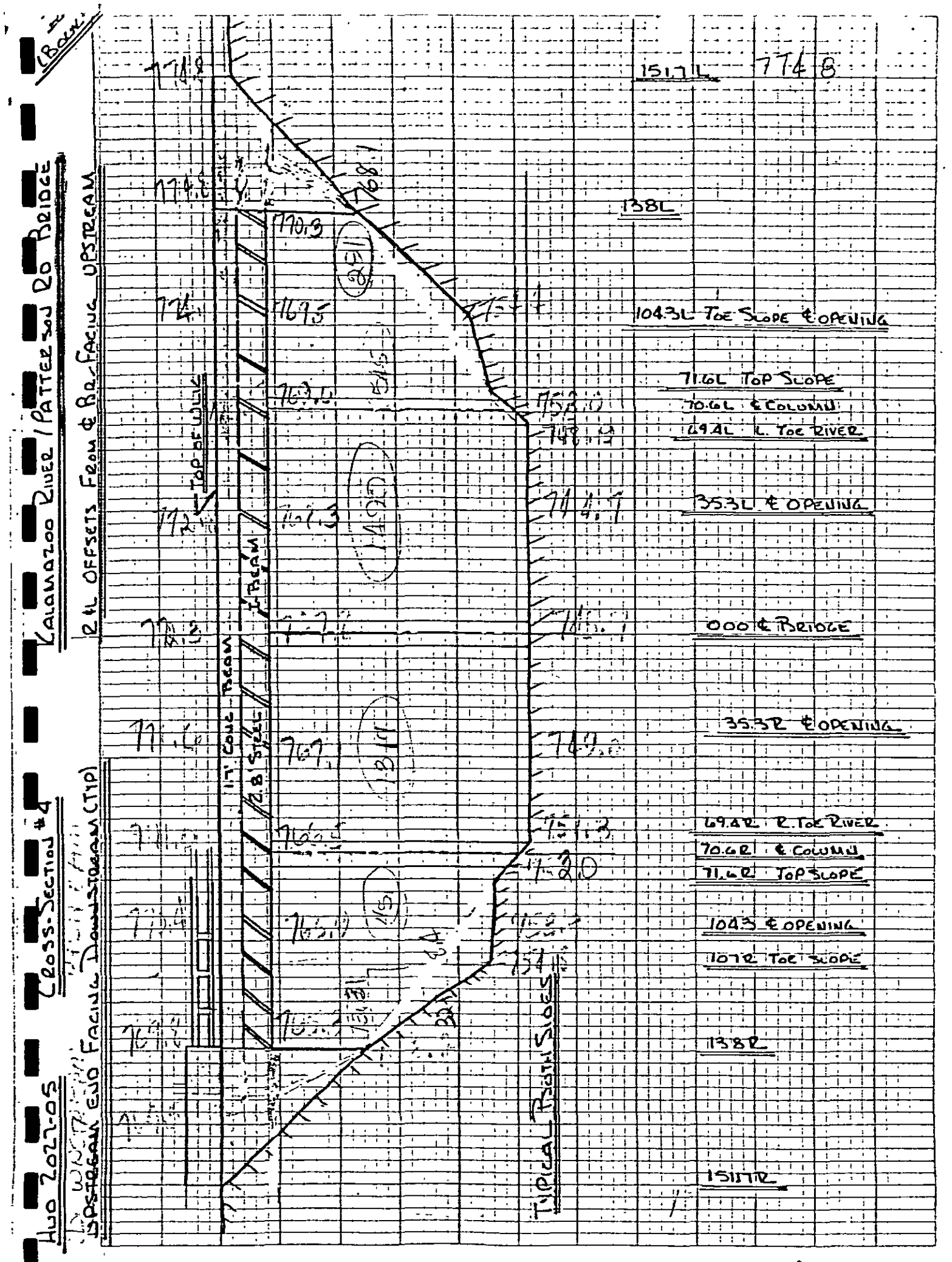
7. BAREA = bridge opening inc. piers = 4250

8. SS = side slope = 0 (horizontal per 1 vertical unit)

9. ELCHU = Elevation of channel invert U/S side = _____ (0 if equal to minimum elevation in previous X-sect.)

10. ELCHD = Elevation of channel invert D/S side = _____ (0 if equal to minimum elevation in previous X-sect.)

SUBJECT	BY	CHK.	SHEET NO	File Code No (Job No) Owner Project Suffix
PATERSON ST. KALAMAZOO RIVER	AM		___ OF ___	HWD-2027 07
	DATE 11/28/79	DATE		



HUD 2027-05
CROSS-SECTION #4
KALAMAZOO RIVER / PATTERSON RD BRIDGE
R&L OFFSETS FROM ℄ BR. FACING UPSTREAM
UPSTREAM END FACING DOWNSTREAM (TYP)
TOP OF WALK
I-BEAM
1.7' CONC BEAM
2.8' STEEL
TYPICAL BOTH SIDES
151.7L
774.8
138L
104.3L TOE SLOPE ℄ OPENING
71.6L TOP SLOPE
70.6L ℄ COLUMN
69.4L L. TOE RIVER
35.3L ℄ OPENING
000 ℄ BRIDGE
35.3R ℄ OPENING
69.4R R. TOE RIVER
70.6R ℄ COLUMN
71.6R TOP SLOPE
104.3 ℄ OPENING
107R TOE SLOPE
138R
151.7R

HUD 2027

FORM 25-0
(313) 291-5400
Wade Trim & Associat , Inc.
Civil Engineers • Land Surveyors
WORK SHEET
25185 GODDARD ROAD
TAYLOR, MICHIGAN 48180

Bridge Location: R.R. BRIDGE NORTH OF MICH. AVE. (Sect. 12

REFERENCE

Bridge Losses - SB Card

1. XK (Pier Shape Coefficient) 1.05 — HEC-2 manual

XKOR (Loss Coefficient) = 1.0 + Σk, $\Sigma k = k_f + k_e + k_p$

where k_f = friction loss coefficient
k_e = entrance loss coefficient
k_p = loss from intermediate piers

Description of Bridge:

$K_f = 29.1\, n^2 L / R^{4/3}$ for English units

Area = 1715 = 1715 S.F. Wp ≈ 400'

$R = A/wp = 4.3$ $R^{4/3} = 6.96$ $L = 28$

n (composite) =

$K_f = 29.1 \times (0.03)^2 \times 28 / 6.90 = 0.11$

K_e = 0.2 — Hydraulic Charts for the Selection of Highway Culverts Circular No. 5 Dec. 1965 pg. 4

K_p = 0 if bridge has no intermediate piers

(Kp = 0.05) if bridge has intermediate piers — HEC-2 manual

2. XKOR = 1 + 0.11 + 0.2 + 0.05 = ~~1.36~~ use 1.5
3. COFQ = Coefficient of discharge = 2.0 — HEC-2 manual
4. RDLEN = Length of weir = 0 (0 if read off BT cards)
5. BWC = bottom width of bridge opening (inc. piers) = 180
6. BWP = total width of obstruction = 21. — field data
7. BAREA = bridge opening [redacted] = 1715
8. SS = side slope = _____ (horizontal per 1 vertical unit)
9. ELCHU = Elevation of channel invert U/S side = 751.3 (0 if equal to minimum elevation in previous X-sect.)
10. ELCHD = Elevation of channel invert D/S side = 744.1 (0 if equal to minimum elevation in previous X-sect.)

SUBJECT	BY	CHK	SHEET NO.	File Code No. (Job No.) Owner Project Suffix
KALAMAZOO RIVER CITY OF KALAMAZOO	AM			HUD • 2027 • 07
	DATE 12/12/79	DATE	___ OF ___	

pers 87' 33' d.

Hade, Trim & Associates, Inc.
Civil Engineers • Land Surveyors
WORK SHEET
FORM 25-0
(313) 291-5400
25185 GODDARD ROAD
TAYLOR, MICHIGAN 48180

Bridge Location : MICHIGAN AVE. (Sect. 13.5)
Bridge Losses - SB Card

REFERENCE

1. XK (Pier Shape Coefficient): 0.95 — HEC-2 Manual

XKOR (Loss Coefficient) = 1.0 + Σk , $\Sigma k = k_f + k_e + k_p$

where k_f = friction loss coefficient
k_e = entrance loss coefficient
k_p = loss from intermediate piers

Description of Bridge :

$K_f = 29.1\, n^2 L / R^{4/3}$ for English units.

Area = = ____ Wp =

R = A/wp $R^{4/3}$ = L =

n (composite) =

$K_f = 29.1 \times (\quad)^2 \times \quad / \quad = 0.2$

(see attached)

Hydraulic Charts for the Selection of Highway Culverts Circular No. 5 Dec. 1965 pg. 43

K_e = 0.5

K_p = 0 if bridge has no intermediate piers

K_p = 0.05 if bridge has no intermediate piers — HEC-2 manual

2. XKOR = 1 + 0.2 + 0.5 + 0.05 = 1.75
3. COFQ = Coefficient of discharge = 2.6 — HEC-2 manual
4. RDLEN = Length of weir = 0 (0 if read off BT cards)
5. BWC = bottom width of bridge opening (inc. piers) = 145.
6. BWP = total width of obstruction = 64. — field data
7. BAREA = bridge opening ~~inc. piers~~ = 1185.
8. SS = side slope = 0
(horizontal per 1 vertical unit)
9. ELCHU = Elevation of channel invert U/S side = 748.7
(0 if equal to minimum elevation in previous x-sect.)
10. ELCHD = Elevation of channel invert D/S side = 748.9
(0 if equal to minimum elevation in previous x-sect.)

SUBJECT	BY	CHK.	SHEET NO	File Code No (Job No) Owner Project Suffix
MICHIGAN AVE. KALAMAZOO RIVER, KALAMAZOO	AM			HUD • 2027 • 07
	DATE 1/7/80	DATE	___ OF ___	

Wade Trim & Associates, Inc.
Civil Engineers • Land Surveyors
25185 GODDARD ROAD
TAYLOR, MICHIGAN 48180

WORK SHEET

REFERENCE

R opening =

Area = 616.4 sq. ft. × cos 40° = 472 (333)

W_p = 166.4

R = 2.84 $R^{4/3}$ = 4.0

L = 50

$n_{composite}$ = 180 (0.03) + 5.6(0.013) + 80.8(0.025)/166.4 = 0.027

K_f = 29.1 n^2 L/$R^{4/3}$ = 0.27

Center opening:

Area = 787.9 sq.ft. × cos 40° = 603.6 sq. ft. (432)

W_p = 167.1

R = 3.61 $R^{4/3}$ = 5.54

L = 50

$n_{comp.}$ = 76.5(0.03) + 13(0.013) + 77.6(0.025)/167.1 = 0.026

K_f = 0.18

Left opening

Area = 771.4 sq. ft. × cos 40° = ~~590.9~~ sq. ft. (417.)

W_p = 173

R = 3.42 $R^{4/3}$ = 5.14

L = 50

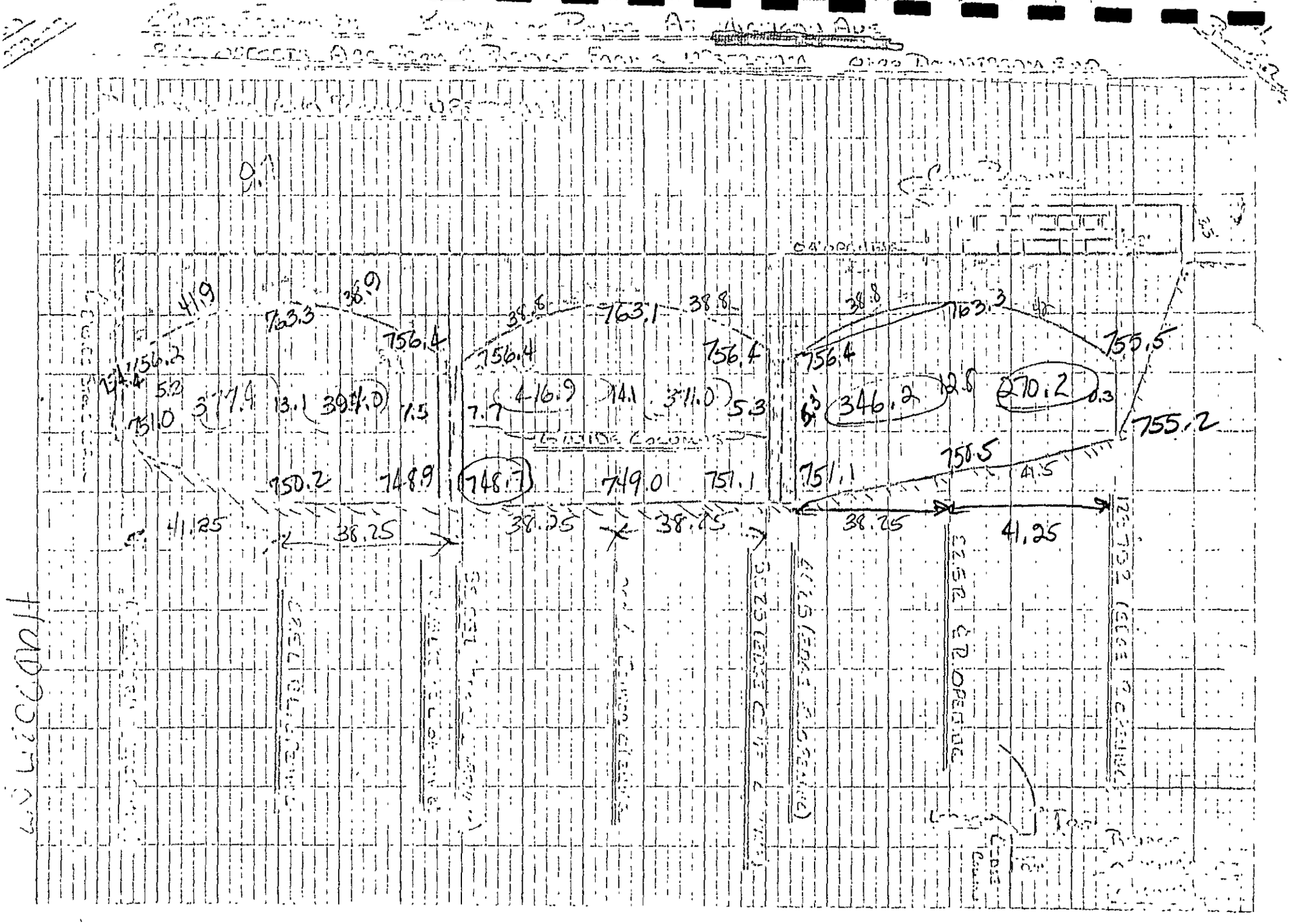
n_{comp} = 79.5(0.030) + 12.7(0.013) + 80.8(0.025)/173 = 0.026

K_f = 0.19

$$K_{equiv.} = \frac{AT^2}{\left[\sum_{i=1}^{n} \sqrt{\frac{A_i^2}{K_i}}\right]^2} = \frac{(1666.5)^2}{\left[\frac{472^2}{0.27} + \frac{603.6^2}{0.18} + \frac{590.9^2}{0.19}\right]^2}$$

K_{equiv} = 0.20

SUBJECT	BY	CHK	SHEET NO	File Code No (Job No.) Owner Project Suffix
K_f calculations for Michigan Ave. Kalamazoo	Am		____ OF ____	HUD • 2027 • 07
	DATE 1/7/80	DATE		



41.9
763.3
38.9
756.4
38.8
763.1
38.8
756.4
38.8
763.3
755.5
756.2
5.2
751.0
13.1
7.5
7.7
416.9
14.1
371.0
5.3
346.2
12.8
270.2
0.3
755.2
750.2
748.9
748.7
749.0
751.1
751.1
758.5
41.5
41.25
38.25
38.25
38.25
38.25
41.25

Bridge Location: MILL STREET BRIDGE (Sect. 14)
Bridge Losses - SB Card.

REFERENCE

1. XK (Pier Shape Coefficient) 1.05 — HEC-2 manual

XKOR (Loss Coefficient) = 1.0 + Σk, Σk = $k_f + k_e + k_p$

where k_f = friction loss coefficient
k_e = entrance loss coefficient
k_p = loss from intermediate piers

Description of Bridge:

$K_f = 29.1\, n^2 L / R^{4/3}$ for English units

Area ≈ 530 SQ. FT. = _____ Wp = 117.0 ft

$R = A/wp = 4.53$ $R^{4/3} = 8.7$ $L = 34'$

n (composite) = 53(0.03) + (0.015)(64)/117 = 0.022

$K_f = 29.1 \times (0.022)^2 \times 34 / 8.7 = 0.06$

$K_e = 0.2$ — Hydraulic Charts for the Selection of Highway Culverts Circular No. 5 Dec. 1965 pg. 46

$K_p = 0$ if bridge has no intermediate piers

(Kp = 0.05) if bridge has intermediate piers — HEC-2 manual

2. XKOR = 1 + 0.1 + 0.2 + 0.05 = ~~1.35~~ use 1.5
3. COFQ = Coefficient of discharge = 2.6 — HEC-2 manual
4. RDLEN = Length of weir = 0 (0 if read off BT cards)
5. BWC = bottom width of bridge opening (inc. piers) = 119.
6. BWP = total width of obstruction = 14 — field data
7. BAREA = bridge opening ~~inc. piers~~ = 1590.
8. SS = side slope = _____ (horizontal per 1 vertical unit)
9. ELCHU = Elevation of channel invert U/S side = 749.8 (0 if equal to minimum elevation in previous X-sect.)
10. ELCHD = Elevation of channel invert D/S side = 748.8 (0 if equal to minimum elevation in previous X-sect.)

SUBJECT	BY	CHK	SHEET NO.	File Code No (Job No) Owner Project Suffix
KALAMAZOO RIVER CITY OF KALAMAZOO	AM			HUD • 2027 • 07
	DATE 12/12/79	DATE	OF	

Bridge Location : GULL STREET - KALAMAZOO RIVER (Abrams #1)

Bridge Losses - SB Card

1. XK (Pier Shape Coefficient) 1.05 — HEC-2 manual

XKOR (Loss Coefficient) = 1.0 + Σk, $\Sigma k = k_f + k_e + k_p$

where k_f = friction loss coefficient
k_e = entrance loss coefficient
k_p = loss from intermediate piers

Description of Bridge :

$K_f = 29.1\, n^2 L / R^{4/3}$ for English units

Area = 1955' = ____ WP = 384'

$R = A/wp = \frac{1955}{384} = 5.1$ $R^{4/3} = 8.71$ $L = 42$

n (composite) = 0.03

$K_f = 29.1 \times (0.03)^2 \times 42 \;/\; 8.71 = 0.13$

K_e = 0.2 — Hydraulic Charts for the Selection of Highway Culvert Circular No. 5 Dec. 1965 pg. 4

K_p = 0 if bridge has no intermediate piers

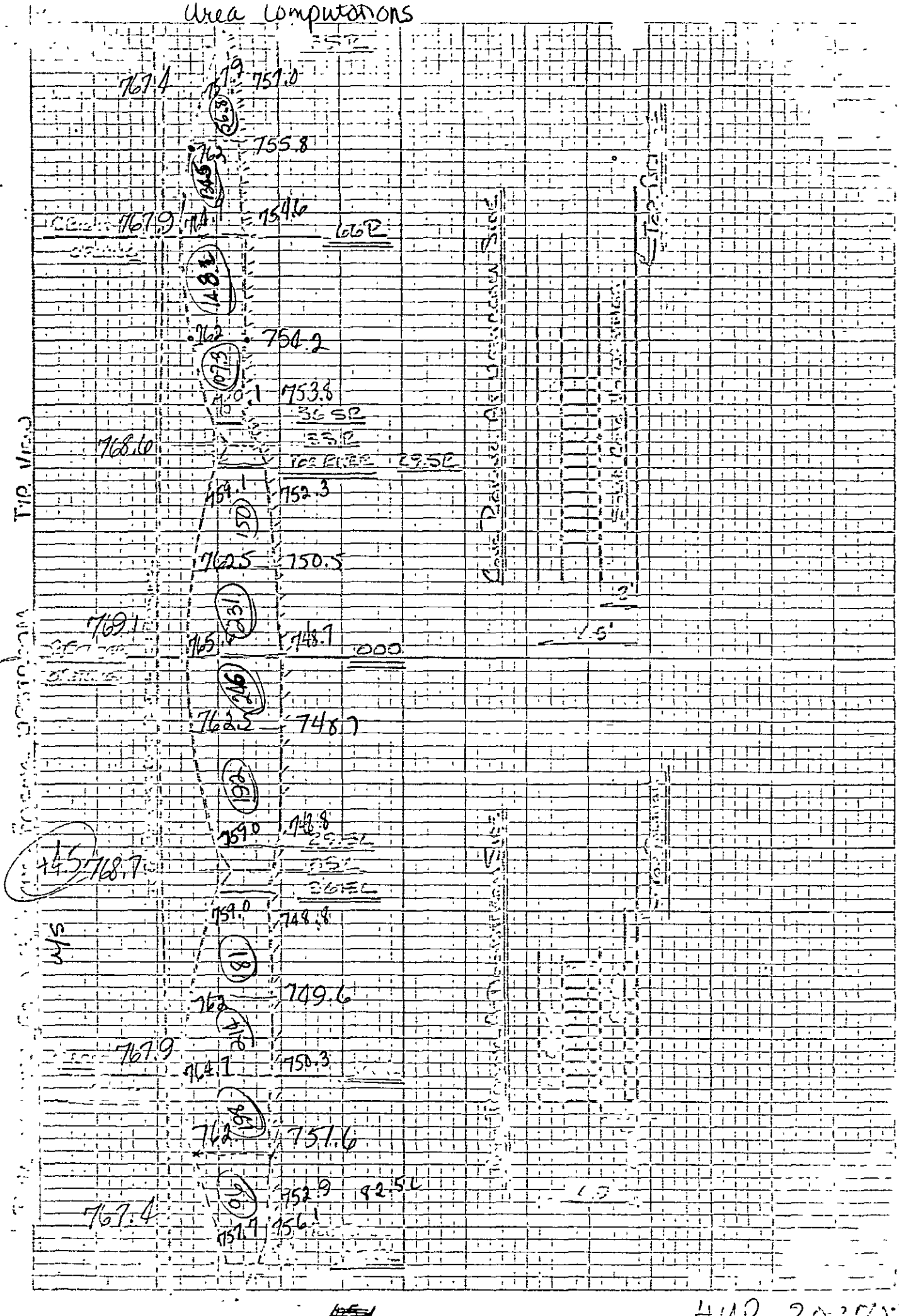
K_p = 0.05 if bridge has intermediate piers — HEC-2 manual

use 1.5

2. XKOR = 1 + .13 + 0.2 + 0.05 = ~~1.38~~
3. COFQ = Coefficient of discharge = 2.6 — HEC-2 manu
4. RDLEN = Length of weir = 0 (0 if read off BT cards)
5. BWC = bottom width of bridge opening (inc. piers) = 128.
6. BWP = total width of obstruction = 12.0 — field date
7. BAREA = bridge opening inc. piers = 1955.
8. SS = side slope = 0 (horizontal per 1 vertical unit)
9. ELCHU = Elevation of channel invert U/S side = 748.7 (0 if equal to minimum elevation in previous x-sect.)
10. ELCHD = Elevation of channel invert D/S side = 749.5 (0 if equal to minimum elevation in previous x-sect.)

SUBJECT KALAMAZOO RIVER	BY AM	CHK.	SHEET NO.	File Code No (Job No) Owner Project Suffix
CITY OF KALAMAZOO	DATE 12/11/79	DATE	___ OF ___	HUD • 2027 • 07

Area Computations



HUD 2-0-2707

KALAMAZOO RIVER

COMSTOCK TOWNSHIP

EXHIBIT 5

Field Cross Section Location and

100 Year Flood Plain - Floodway Map

KALAMAZOO RIVER

COMSTOCK TOWNSHIP

EXHIBIT 6

Computer Printouts

HEC-2 Backwater Analysis with

Cross Section Plots (See Separate Folder)

KALAMAZOO RIVER

COMSTOCK TOWNSHIP

EXHIBIT 7

Stream Profile

KALAMAZOO RIVER

COMSTOCK TOWNSHIP

EXHIBIT 8

Bridge Notes and Sketches

Bridge Location: KING HWY. (EASTERLY BRIDGE AT BYPASS WITHIN COMSTOCK TWP.)
Bridge Losses - SB Calc

REFERENCE

1. XK (Pier Shape Coefficient) No Pier = 0 — HEC-2 manual
XKOR (Loss Coefficient) = 1.0 + Σk, $\Sigma k = k_f + k_e + k_p$
where k_f = friction loss coefficient
k_e = entrance loss coefficient
k_p = loss from intermediate piers
Description of Bridge: CONCRETE BOX CULVERT
$K_f = 29.1\, n^2 L / R^{4/3}$ for English units
Area = 6 × 5.25 = 31.5 Wp = (6)2 + 5.25(2) = 22.5
$R = A/wp = 31.5/22.5 = 1.4$ $R^{4/3} = 1.57$ $L = 77'$
n (composite) = 0.013
$K_f = 29.1 \times (0.013)^2 \times 77 / 1.57 = 0.24$

$K_e = 0.5$ — Hydraulic Charts for the Selection of Highway Culverts Circular No. 5 Dec. 1965 pg.

$K_p = 0$ if bridge has no intermediate piers

$K_p = 0.05$ if bridge has intermediate piers — HEC-2 manual

2. XKOR = 1 + 0.24 + 0.5 + 0 = 1.74
3. COFQ = Coefficient of discharge = 3.0 — HEC-2 manu
4. RDLEN = Length of weir = _____ (0 if read off BT cards)
5. BWC = bottom width of bridge opening (inc. piers): 6
6. BWP = total width of obstruction = 0 — field data
7. BAREA = bridge opening inc. piers = 31.5
8. SS = side slope = 0
(horizontal per 1 vertical unit)
9. ELCHU = Elevation of channel invert U/S side = 757.10
(0 if equal to minimum elevation in previous x-sect.)
10. ELCHD = Elevation of channel invert D/S side = 757.0
(0 if equal to minimum elevation in previous x-sect.)

SUBJECT	BY	CHK	SHEET NO.	File Code No (Job No) Owner Project Suffix
KALAMAZOO RIVER BYPASS CHANNEL WITHIN COMSTOCK TOWNSHIP	AM			HUD • 2024 • 07
	DATE 1/10/80	DATE	OF	

Bridge Location: KING. HWY. (WESTERLY BRIDGE AT BYPASS WITHIN COMSTOCK TOWNSHIP)
Bridge Losses - SB. Card

REFERENCE

1. XK (Pier Shape Coefficient) 1.25 — HEC-2 Manual

XKOR (Loss Coefficient) = 1.0 + Σk, $\Sigma k = k_f + k_e + k_p$

where k_f = friction loss coefficient
k_e = entrance loss coefficient
k_p = loss from intermediate piers

Description of Bridge:

$K_f = 29.1\, n^2 L / R^{4/3}$ for English units

Area = ____ = ____ Wp = ____
$R = A/wp$ $R^{4/3}$ = ____ L = 81'
n (composite) = 0.019

K_f = 29.1 × ( )^2 × / = 0.6

K_e = 0.5 — Hydraulic Charts for the Selection of Highway Culverts Circular No. 5 Dec. 1965 pg. 4

K_p = 0 if bridge has no intermediate piers

K_p = 0.05 if bridge has intermediate piers — HEC-2 manual

2. XKOR = 1 + 0.6 + 0.5 + 0.05 = 2.15
3. COFQ = Coefficient of discharge = 2.6 — HEC-2 manual
4. RDLEN = Length of weir = ____ (0 if read off BT cards)
5. BWC = bottom width of bridge opening (inc. piers) = 10.8
6. BWP = total width of obstruction = 0.8 — field data
7. BAREA = bridge opening inc. piers = 57.6
8. SS = side slope = 0
(horizontal per 1 vertical unit)
9. ELCHU = Elevation of channel invert U/S side = 755.9
(0 if equal to minimum elevation in previous X-sect.)
10. ELCHD = Elevation of channel invert D/S side = 755.5
(0 if equal to minimum elevation in previous X-sect.)

SUBJECT	BY	CHK	SHEET NO.	File Code No (Job No) Owner • Project • Suffix
KALAMAZOO RIVER BYPASS CHANNEL WITHIN COMSTOCK TOWNSHIP	AM		____ OF ____	HUD • 2024 • 07
	DATE 7/10/80	DATE		

King Hwy @ Kalamazoo River in Comstock Township

Twin Box Conc. Culverts

L side

D/S TOP 761.62 / INV. 756.17 } 5.45'

U/S TOP 761.71 / INV. 756.98 } 4.83'

6' across

Left side area = 4.83 x 6

area = 29 SQ. FT.

W_p = 4.83+4.83+6+6 = 21.9'

R = 1.324 $R^{4/3}$ = 1.454

n(composite) = 6(0.03)+15.66(0.015)/21.9 = 0.019

K = 0.585

R side

D/S TOP 761.59 / INV. 756.17 } 5.42'

U/S TOP 761.73 / INV. 755.93 } 5.8'

right culv = 5.4 x 6 =

area = 32.4 SQ. FT.

W_p = 2(5.4) + 2(6) = 22.8'

R = 1.332 $R^{4/3}$ = 1.4

n(composite) (6)(0.03)+16.8(0.015)/22.8 = 0.01

K = 0.58

use K = 0.6

for mult. culverts

Bridge Location : E.R BRIDGE NR MICHIGAN AVE.
Bridge Losses - SB Cart

REFERENCE

1. XK (Pier Shape Coefficient) No Piers 0 — HEC-2 Manual
XKOR (Loss Coefficient) = 1.0 + Σk , Σk = $k_f + k_e + k_p$
where k_f = friction loss coefficient
k_e = entrance loss coefficient
k_p = loss from intermediate piers
Description of Bridge :
$K_f = 29.1\, n^2 L / R^{4/3}$ for English units
Area = ____ = ____ Wp = ____
$R = A/wp$ $R^{4/3}$ = ____ L = 29
n (composite) =
K_f = 29.1 x ( )^2 x / =

K_c = 0.4 — Hydraulic Charts for the Selection of Highway Culverts Circular No. 5 Dec. 1965 pg. 49

(K_p = 0) if bridge has no intermediate piers

K_p = 0.05 if bridge has intermediate piers — HEC-2 manual

2. XKOR = 1 + 0.1 + 0. + 0. = 1.5
3. COFQ - Coefficient of discharge = 2.0 — HEC-2 manual
4. RDLEN = Length of weir = 0 (0 if read off BT cards)
5. BWC = bottom width of bridge opening (inc. piers) = 35.0
6. BWP - total width of obstruction = 0 — field data
7. BAREA = bridge opening inc. piers = 325
8. SS = side slope = 0
(horizontal per 1 vertical unit)
9. ELCHU = Elevation of channel invert U/S side = 774.9
(0 if equal to minimum elevation in previous x-sect.)
10. ELCHD = Elevation of channel invert D/S side = 774.9
(0 if equal to minimum elevation in previous x-sect.)

SUBJECT	BY	CHK.	SHEET NO	File Code No (Job No) Owner Project Suffix
Comstock Creek Comstock Township	AM		___ OF ___	HUD • 9024 • 01
	DATE	DATE		

KALAMAZOO RIVER

COMSTOCK TOWNSHIP

EXHIBIT 9

Analysis at Oxbow

Form 39-24

291-5400

WADE, TRIM & ASSOCIATES, INC.
CONSULTING ENGINEERS

INTER OFFICE COMMUNICATION

25185 Goddard Road
Taylor, Michigan 48180

TO	NAME	ACK. DATE
	L. BAUMAN	
	R. GEHL	
	H. LAMKIN	
	M. MANORE	
	G. ORR	
	G. ROBERTS	
	F. SLAVIERO	
	J. STRAUB	
	D. TRIM	
	R. WADE	
	D. WATSON	
	V. WILSON	
	W. ZBIKOWSKI	
	D. ZDYRSKI	
	OPERATIONS	
	GRAPHICS	
	STENO	
	CUSTODIAN	
	DESTROY	
	FILE	

MEMORANDUM
RE: OXBOW ON KALAMAZOO RIVER IN COMSTOCK TWP.

JOB NO. HUD 2024-07 DATE 2/21/80

The 100 yr. flow going thru the oxbow was determined to be 95 cfs with 6685 cfs staying in the main channel. The 95 cfs would make no difference in elevation in the flood elev. of the Kalamazoo River as shown in the attached computer runs.

flow	elev.
6685 cfs	767.57
6780 cfs	

Therefore it is assumed that the oxbow has no effect on flood stages and will be ignored in this study.

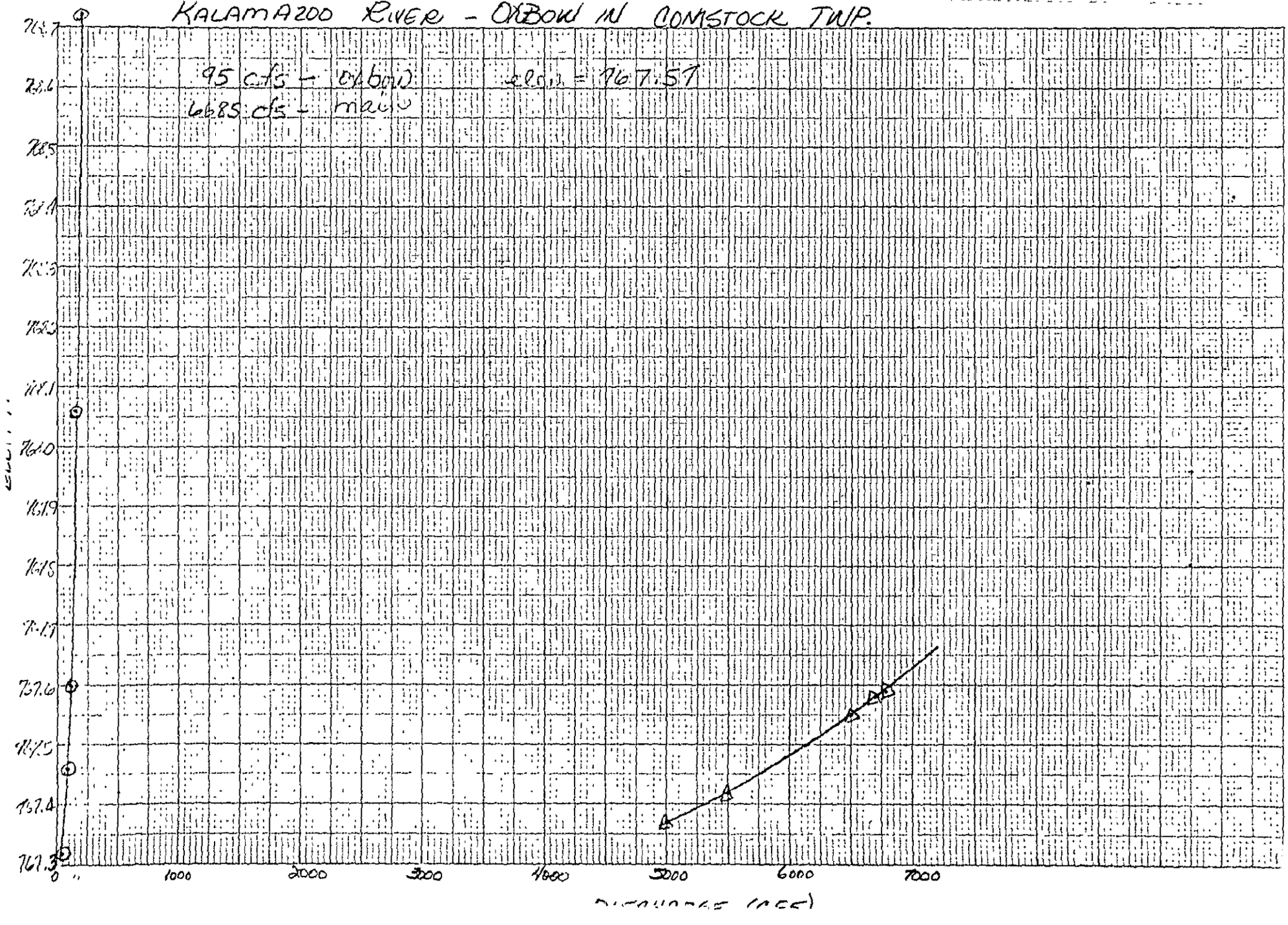
VERBAL INSTRUCTIONS DO NOT COUNT

By: [illegible]

K+E 10 X 10 TO ½ INCH 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.
46 1320

RATING CURVE = 100 YEAR

KALAMAZOO RIVER - OXBOW IN COMSTOCK TWP.



KALAMAZOO RIVER

COMSTOCK TOWNSHIP

EXHIBIT 10

Morrow Lake Dam

Spillway Analysis

FORM 25-0
(313) 291-5400

Wade, Trim & Associates, inc.
Civil Engineers • Land Surveyors
WORK SHEET

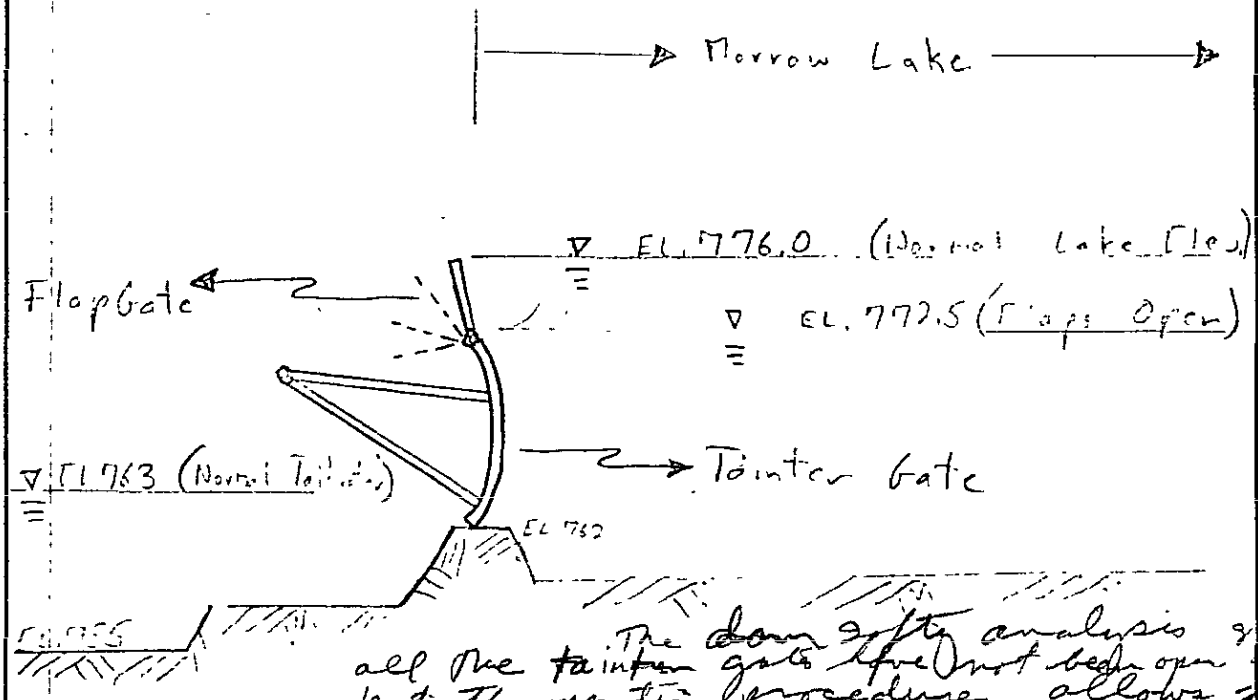
25185 GODDARD ROAD
TAYLOR, MICHIGAN 48180

REFERENCE

Normal lake April-October = 776.
Remainder of time 775.

Morrow Lake Rating Curve

The Morrow Lake Dam control structure consists of 4 - 24' x 14' High Tainter gates with approximately 4' high flap gates placed on top of the tainter gates:



The dam safety analysis shows that all the tainter gates have not been open at once but the operating procedures allows for it.

The flap gates are normally adjusted during storms in such a way that the normal lake elevation remains at elevation 776.0. During a major storm, the Tainter gates remain closed while the flap gates are fully open.

Per conversation operator at Dam (David Long).

Therefore, 10, 50, 100 + 500 yr storms will occur with the flap gates open to elevation 772.5 and the tainter gates will be closed.

Exhibit ~~#1~~ #10

SUBJECT	BY	CHK	SHEET NO.	File Code No. (Job No.) Owner Project Suffix
Morrow Lake Control Structure	WJ Weiss		1 OF 4	HUD • 2027 • 07
	DATE 8/3/79	DATE		

FORM 25-0
(313) 291-5400

Wade, Trim & Associates, Inc.
Civil Engineers • Land Surveyors
WORK SHEET

25185 GODDARD ROAD
TAYLOR, MICHIGAN 48180

REFERENCE

(cont'd) Morrow Lake

The following rating table was obtained from David Long who is the Spillway engineer/operator. "C" values were calculated using the weir flow equation. This rating table applies to the flop gates:

Feet of Water over Gates	Flow (cfs)	"C" Value $C = \frac{Q}{L H^{3/2}}$
.1	16	5.27
.15	28	5.02
.2	40	4.66
.25	52	4.33
.3	64	4.06
.4	88	3.62
.5	120	3.54
.75	220	3.53
1.0	328	3.42
1.25	468	3.49
1.5	608	3.45
1.75	772	3.47
2.0	944	3.48
2.25	1136	3.51
2.5	1336	3.52
2.75	1548	3.54
3.0	1768	3.54
3.25	2000	3.56
3.5	2248	3.58
3.75	2508	3.6
4.0	2776	3.6

Flowrates for the Comstock Flood Insurance Study range from 4500 to 8420; therefore, a "C" value of 3.6 will be used in all cases.

Exhibit ~~#1~~ #10

REFERENCE

Morrow Lake Rating Curve

Note: Tailwater Submergence of the flap gates appears highly unlikely; however, this must be verified.

$C = 3.6$ $L = 96'$

Head on Flap Gate (ft.)	Elevation	$Q = CLH^{3/2}$
4.5	777.0	3299
5.0	777.5	3864
5.5	778.0	4458
6.0	778.5	5079
6.5	779.0	5727
7.0	779.5	6400
7.5	780.0	7099
8.0	780.5	7820
* 8.5	781.0	8565

*The embankment of the dam is overtopped at elevation 781.0

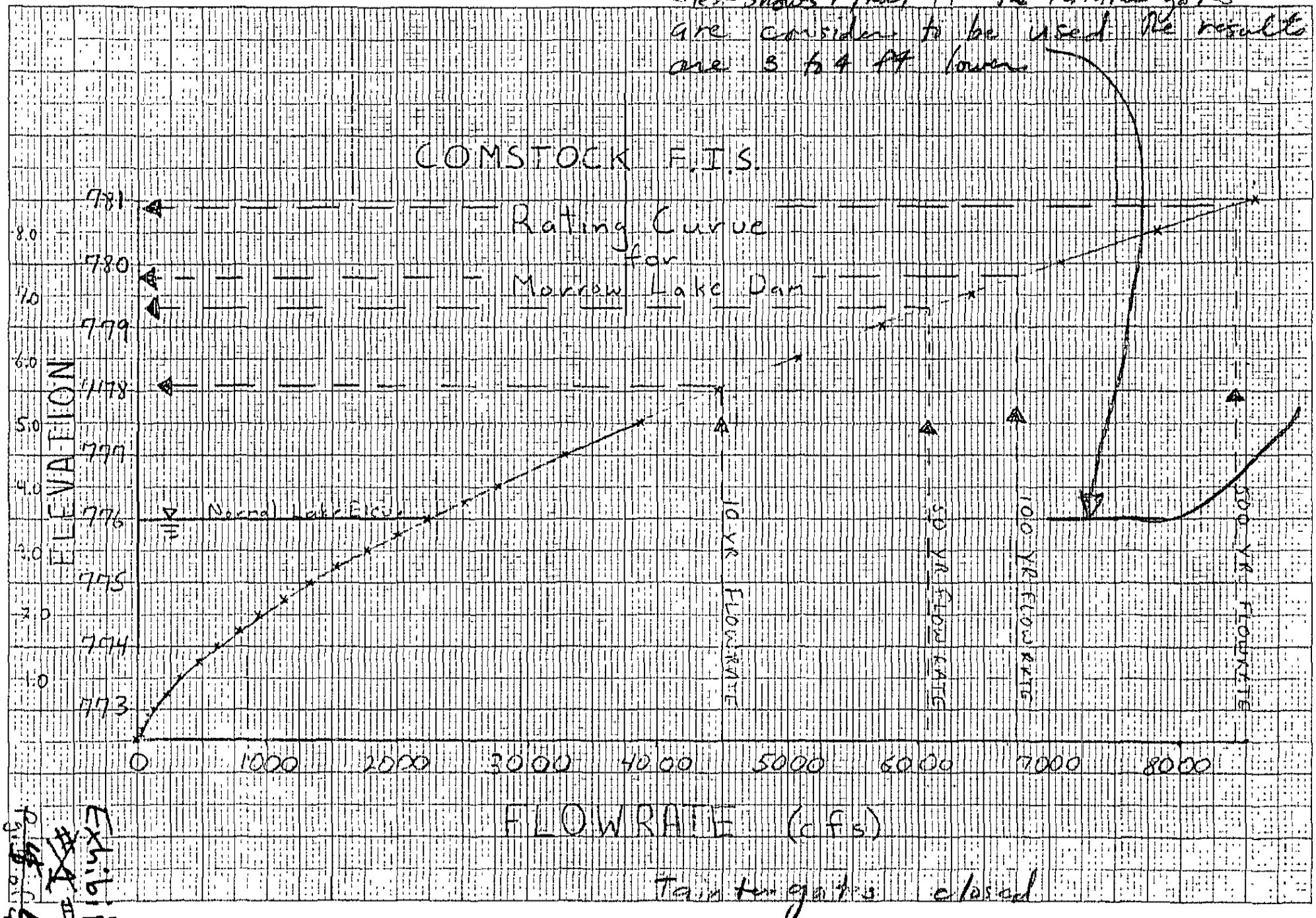
The Morrow Lake Rating Curve is presented as exhibit 1. The plans for the Dam are presented as exhibit 2.

Exhibit #10

SUBJECT	BY	CHK	SHEET NO	File Code No. (Job No.) Owner Project Suffix
Morrow Lake Control Structure	DATE 8/3/94	DATE	3 OF 4	HUD • 2327 • 01

K+E 10 X 10 TO ½ INCH 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A. 46 1320

Dam safety Analysis by CEWA
~~He~~ shows that if the tainter gates are considered to be used the results are 3 to 4 ft lower



Tainter gates closed

Exhibit #10

HUD 2027-07 Pg 4 of 7

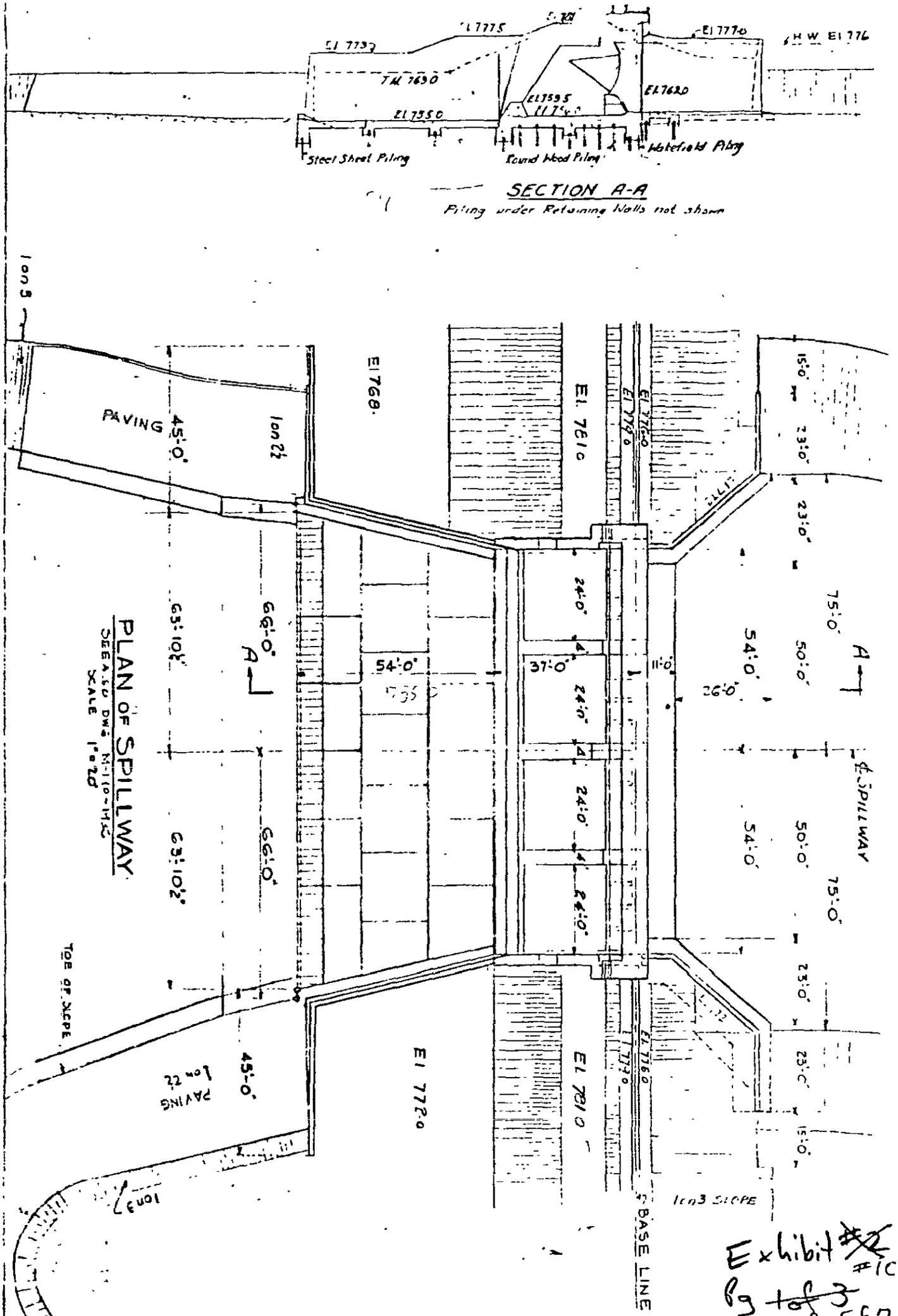
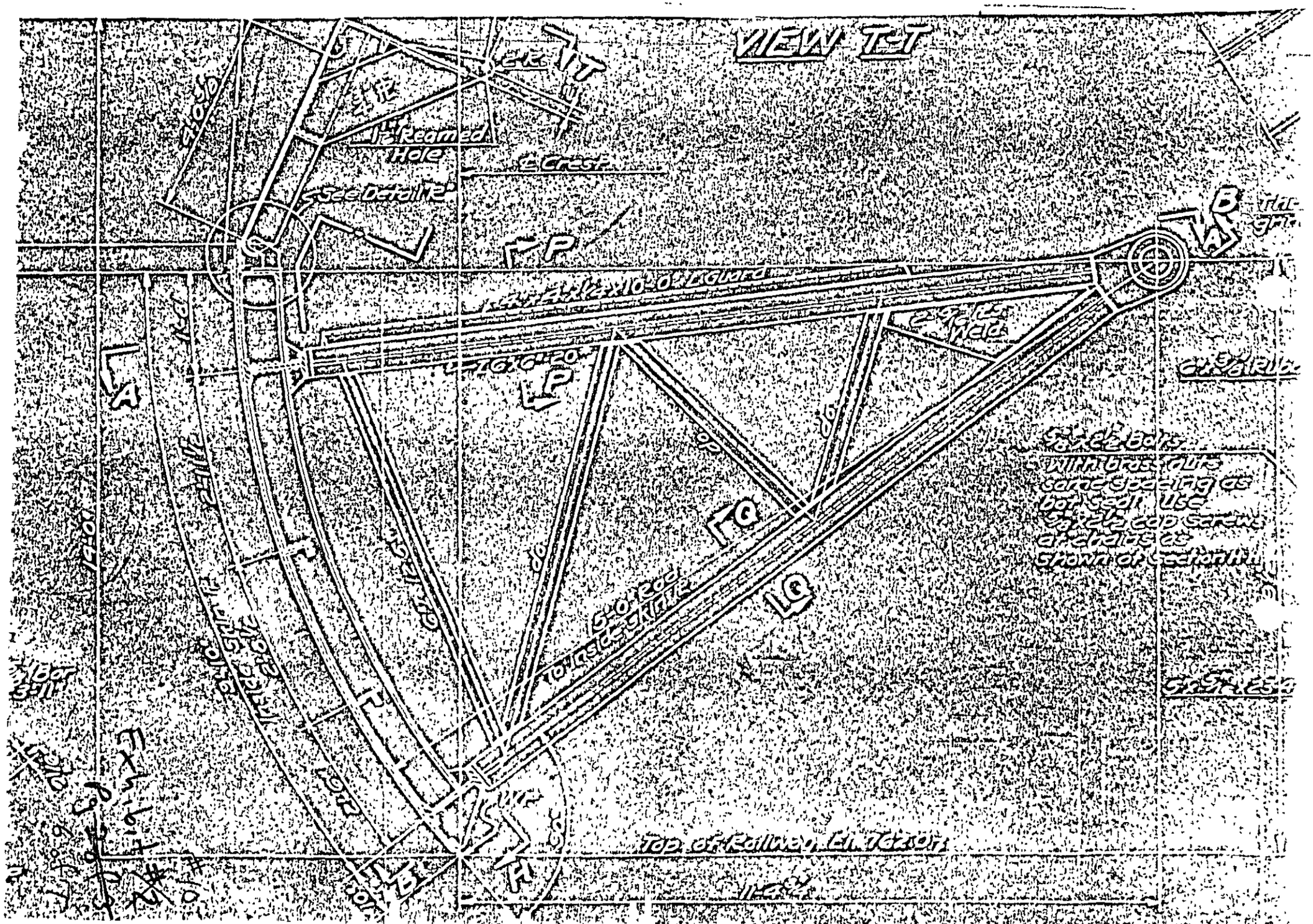
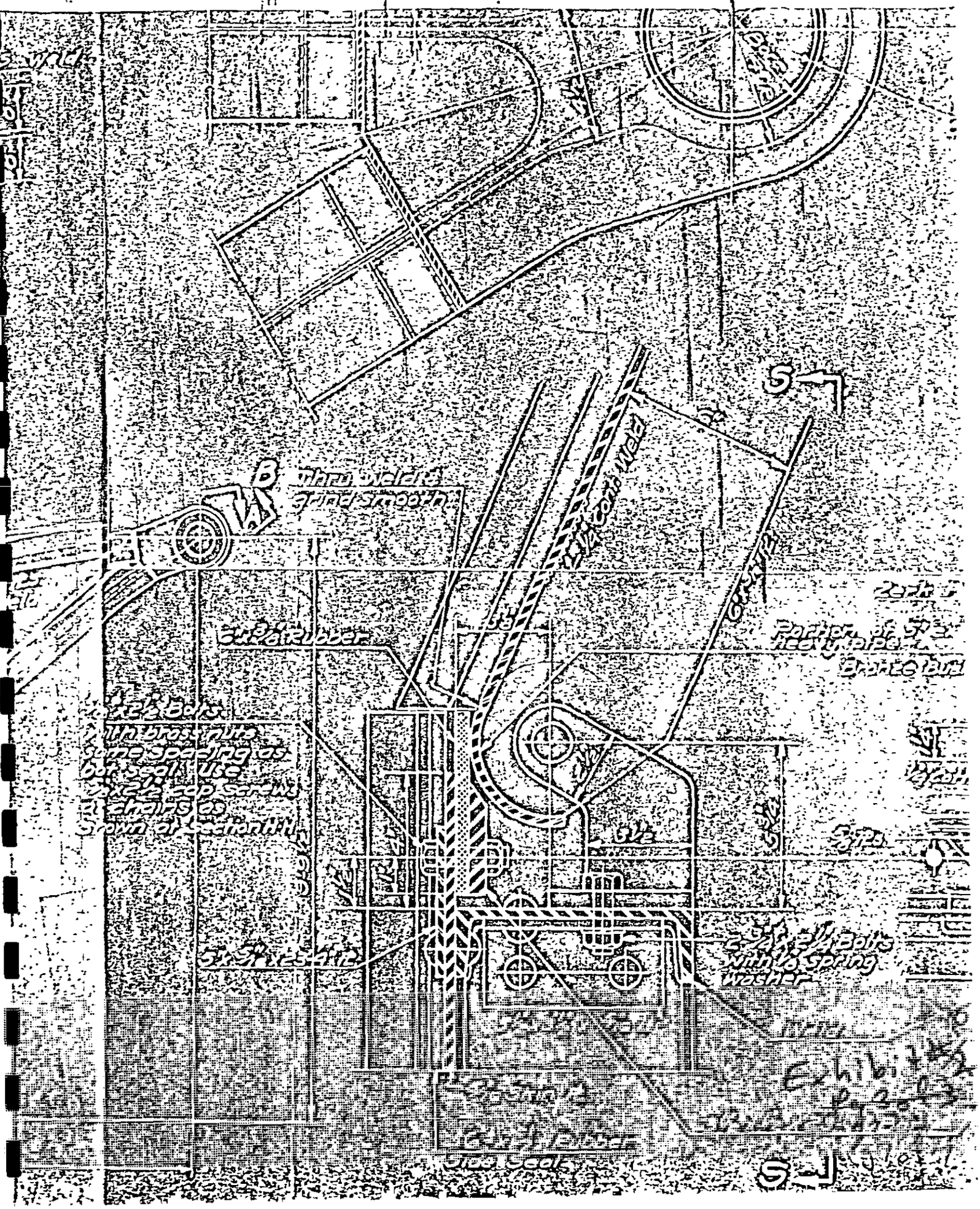


Exhibit #C
Pg 1 of 3
Pg. 5 of 7


VIEW T-T
Reamed Hole
See Detail "R"
Weld
Top of Railway El. 762.07
Exhibit #2
Pg 2 of 7



KALAMAZOO RIVER

CITY OF KALAMAZOO

EXHIBIT 11

CROSS SECTION PLOTS

Morrow Lake Dam to Comstock Corporate Boundary

by Gilbert/Commonwealth Associates

KALAMAZOO RIVER
CITY OF KALAMAZOO

EXHIBIT 12

Computer Printouts, HEC-2 Backwater Analysis
by Gilbert/Commonwealth Associates
35th Street Bridge to Corporate Boundary

00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: CITY OF KALAMAZOO

3) WATERCOURSE: KALAMAZOO RIVER

4) DOCUMENT TYPE: CROSS SECTION PLOTS

00BREAK00

CROSS SECTION 7.00
STREAM KALAMAZOO R. KALAMAZOO
DISCHARGE= 7390.

PLOTTED POINTS (BY PRIORITY)-B=BOTTOM BRIDGE,T=TOP BRIDGE,X=GROUND,W=WATER SUR,E=ENERGY GRADIENT,C=CRITICAL WSEL

ELEV	746.	748.	750.	752.	754.	756.	758.	760.	762.	764.	766.
2105U.										X	
1060.									X		
31100.							XE				
1110.							XE				
1120.							XE				
1160.							XWE				
1170.							XWE				
1180.							XWE				
1220.							XWE				
1230.							XWE				
1240.							XWE				
1280.							XWE				
1290.							XWE				
1300.							XWE				
1340.							XWE				
1350.							XWE				
1360.							XWE				
1400.							XWE				
1410.							XWE				
1420.							XWE				
1460.							XWE				
1470.							XWE				
1480.							XWE				
1520.							XWE				
1530.							XWE				
1540.							XWE				
1550.							XWE				

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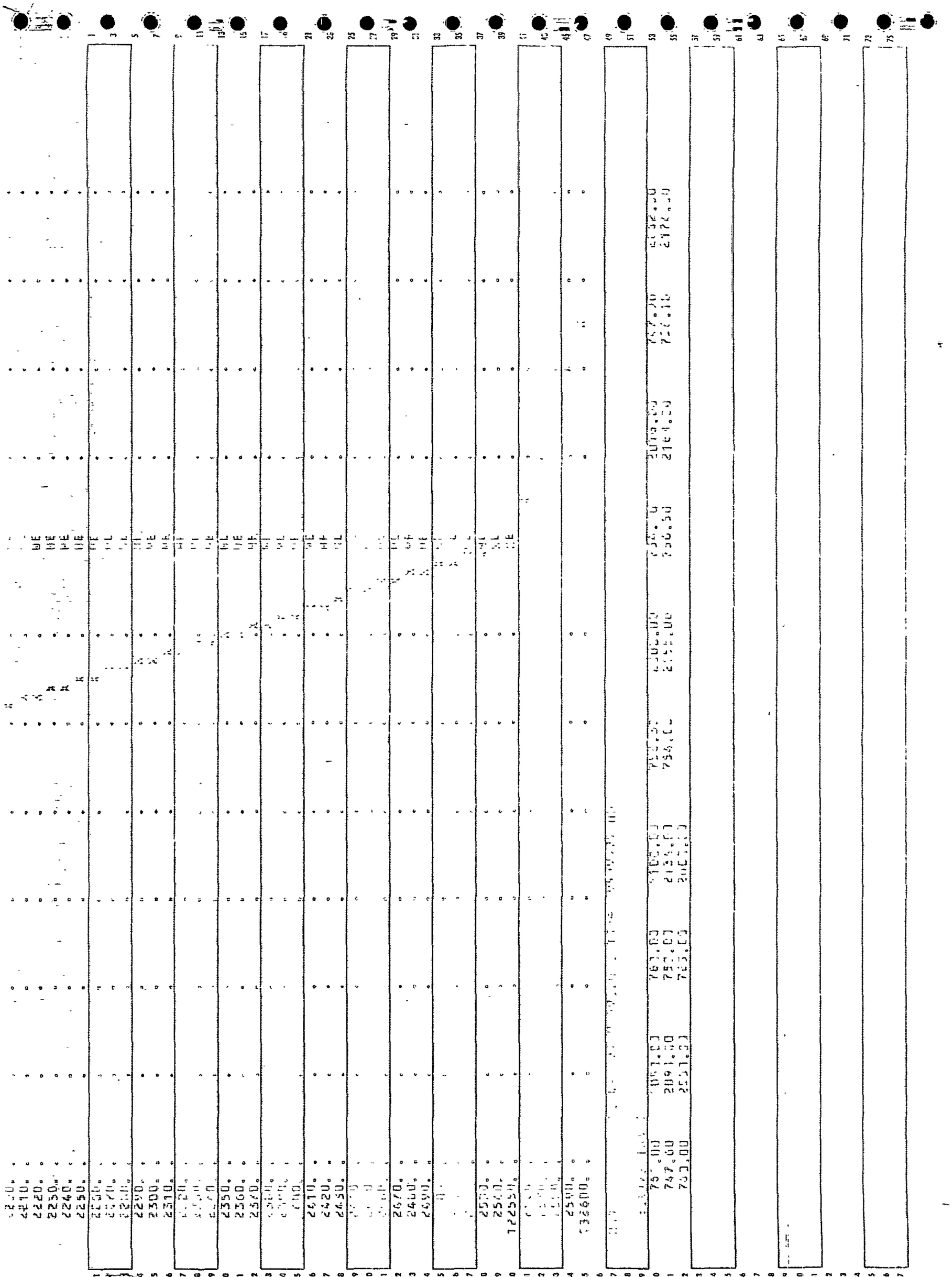
| | | |



	2200.										
	2210.										
	2220.							WE			
	2230.							WE			
	2240.							WE			
	2250.							WE			
	2260.							WE			
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	122550.							WE			
	2520.										
	2530.										
	2540.										
	2590.										
	132600.										
	[illegible]										
	[illegible]										
	757.00	2051.00	761.00	2100.00	752.50	2100.00	754.00	2016.00	747.70	2032.00	
	747.00	2091.00	750.00	2135.00	754.00	2155.00	756.50	2164.00	756.10	2174.00	
	760.00	2551.00	765.00	2007.00							

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CROSS SECTION 8.00
STREAM KALAMAZOO R. KALAMAZOO
DISCHARGE= 7390.

PLOTTED POINTS (BY PRIORITY)-1=BOTTOM BRIDGE,T=TOP BRIDGE,X=[illegible] =WATER SURFACE-[illegible]

BELOW	740.	745.	750.	755.	760.	765.	770.	775.	780.	785.	790.
STA-FEET											
340.											
350.											
360.											
3 370.											
380.											
[illegible]											
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4 420.											
430.											
440.											
[illegible]											
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480.											
490.											
500.											
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540.											
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600.											
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620.											
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660.											
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680.											
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720.											
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740.											
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780.											
790.											
800.											
[illegible]											
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840.											

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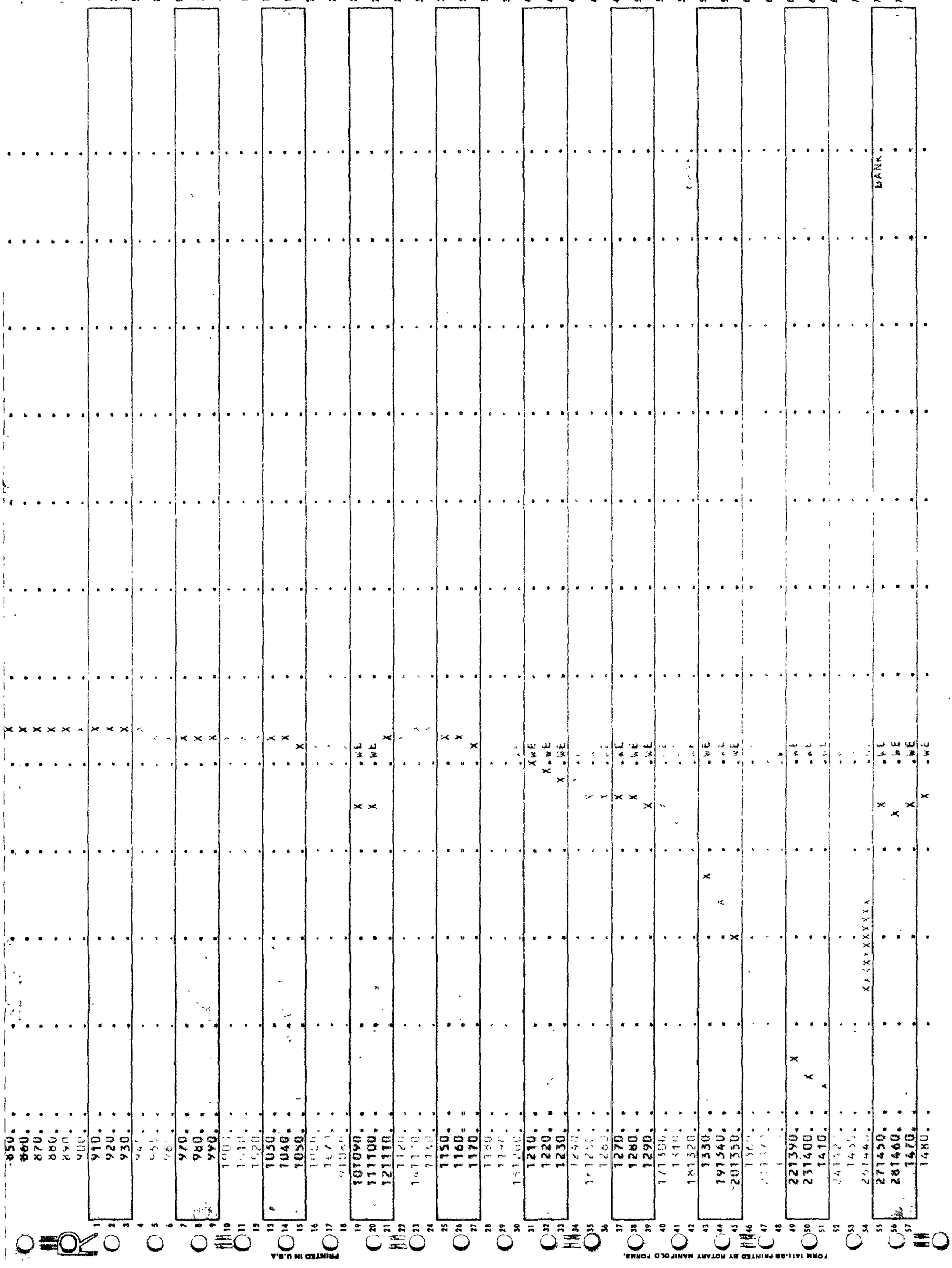
FORM 1311-GB PRINTED BY ROTARY MANIFOLD FORMS.


BANK
850.
860.
870.
880.
910.
920.
930.
970.
980.
990.
1050.
1040.
1030.
1070.
1110.
1210.
1220.
1230.
1270.
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 297500.
  1510.
  1520.
  1530.
  1540.
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  1570.
  1580.
  1590.
  1600.
  1610.
  1620.
  1630.
  1640.
  1650.
  1660.
  1670.
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  1680.
  1700.
  1710.
  1720.
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 [illegible]
 [illegible]
 [illegible]
 [illegible]   1490.00     [illegible]   [illegible]   [illegible]   1420.00     [illegible]   [illegible]   [illegible]   1445.00
 757.[illegible]   1455.00     757.00     [illegible]   755.00     1496.00     [illegible]   [illegible]   762.27     1729.00
 100000.[illegible]   1729.[illegible]   100000.00     [illegible]
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CROSS SECTION 9.30
STREAM KALAMAZOO R. KALAMAZOO
DISCHARGE= 7590.

STA-FEET												
[illegible]												
460.												
470.												
480.												
[illegible]												
[illegible]												
[illegible]												
520.												
530.												
540.												
[illegible]												
[illegible]												
[illegible]												
580.												
590.												
600.												
[illegible]												
[illegible]												
[illegible]												
640.												
650.												
660.												
[illegible]												
[illegible]												
[illegible]												
700.												
710.												
720.												
[illegible]												
[illegible]												
[illegible]												
760.												
770.												
780.												
[illegible]												
[illegible]												
[illegible]												
820.												
830.												
840.												
[illegible]												
[illegible]												
[illegible]												
880.												
890.												
900.												
910.												
[illegible]												
[illegible]												
940.												

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FORM 1411-OB PRINTED BY ROTARY MANIFOLD FORMS.

FORM 1511 GB PRINTED BY ROTARY MANIFOLD FORMS.

PRINTED IN U.S.A.

```
 8560 XSEC POINT-B      EL,ST-      0.00
 8560 XSEC POINT-A      EL,ST-
  81590. .                  .          .          .          .          T.         .          .          .          .          .
 8560 XSEC POINT-B      EL,ST-      0.00
 8560 XSEC POINT-A      EL,ST-
 101600. .                  .          .          .          X          .          I          .          .          .          .    BANK.
 111610. .C                 .          .          .          W          .B         T          .          .          .          .
   1620. .                  .          .          X          .          .B         T          .          .          .          .
   1630. .                  .          .          X          .          W          .B         .I         .          .          .          .
   1640. .                  .          .          .          .          .          .          .I         .          .          .          .
   1650. .                  .          .          .          .          .          .          .          .          .          .          .
   1661. .                  .          .          .          .          .          .          .I         .          .          .          .
 151670. .                  .          .          XXXX       .          W          .          .T         .          .          .          .
 8560 XSEC POINT-B      EL,ST-      0.00
 8560 XSEC POINT-A      EL,ST-
 161690. .C                 .          .          .          .          W          .          .T         .          .          .          .
 171700. .C                 .          .          .          .          W          .          .T         .          .          .          .
   1710. .                  .          .          .          .          W          .          .          T          .          .          .
   1720. .                  .          .          .          .          .          .          .          I          .          .          .
   1730. .                  .          .          .          .          .          .          .          I          .          .          .
   1741. .                  .          .          .          .          .          .          .          .          .          .          .
 8560 XSEC POINT-B      EL,ST-      0.00
 8560 XSEC POINT-A      EL,ST-
 201750. .C                 .          .          .          .          W          .          .          T          .          .          .
 8560 XSEC POINT-B      EL,ST-      0.00
 8560 XSEC POINT-A      EL,ST-
 211761. .                  .          .          .          .          .          .          .          I          .          .          .
 221770. .C                 .          .          .          .          W          .          .B         .          T          .          .
   1780. .                  .          .          .          .          .          X          .          .B         .          T          .
   1790. .                  .          .          .          .          .          .          .          .          .          .          X
   1800. .                  .          .          .          .          .          .          .          .          .          .          .
 241810. .                  .          .          .          .          .          .          .          .          .          .          .
 8560 XSEC POINT-B      EL,ST-      0.00
 8560 XSEC POINT-A      EL,ST-
 251820. .C                 .          .          .          .          W          .          .          T          .          .          .
 8560 XSEC POINT-B      EL,ST-      0.00
 8560 XSEC POINT-A      EL,ST-
 261830. .                  .          .          .          .          .          .          .          I          .          .          .
 271841. .                  .          .          .          .          .          .          .          I          .          .          .
   1850. .                  .          .          .          .          .          .          .          .          X          T          .
   1860. .                  .          .          .          .          .          .          .          .          .          .          X
   1870. .                  .          .          .          .          .          .          .          .          .          .          .
 281870. .C                 .          .          .          .          W          .          .          .          .          .          .
 8560 XSEC POINT-B      EL,ST-      0.00
 8560 XSEC POINT-A      EL,ST-
 291890. .C                 .          .          .          .          W          .          .          T          .          .          .

 NRD=       20 ELLC=       770.30 ELTRD=       769.50

  1670.70    766.50     771.00     1738.30    767.80     773.30     1738.90      0.00     772.30
  1741.10      0.00     772.30     1741.20    767.80     772.50     1809.40    769.00     773.50
  1809.50      0.00     773.50     1811.70      0.00     773.50     1811.80    769.00     773.50

 ELLC,STA,ELEV
    769.40    1552.00    769.50    1589.00    763.20    1602.00    763.20    1602.10    754.80    1633.00
    753.00    1668.20    753.00    1668.30    751.30    1670.60    751.30    1670.70    745.70    1738.80
    745.70    1738.90    745.70    1741.10    745.70    1741.20    744.70    1775.00    748.90    1809.40
    748.90    1809.50    752.00    1811.70    752.00    1811.80    754.40    1844.30    768.10    1877.90
```

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FORM 1511-GB PRINTED BY ROTARY MANIFOLD FORMS.

CROSS SECTION 10.00
STREAM KALAMAZOO R. KALAMAZOO
DISCHARGE= 7390.

PLOTTED POINTS (BY PRIORITY)-B=BOTTOM BRIDGE,T=TOP BRIDGE,X=GROUND,W=WATER SUR,E=ENERGY GRADIENT,C=CRITICAL WSEL

ELEV 740. 745. 750. 755. 760. 765. 770. 775. 780. 785. 790.

STA-FEET

2	100.											X
	120.											X
3	140.											X
	160.											
	180.											X
	200.											X
	220.											X
	240.											X
	260.											X
	280.											X
	300.											X
	320.											X
	340.											X
4	360.											X
	380.											X
	400.											X
5	420.											X
	440.											X
	460.											X
	480.											X
	500.											X
6	520.											X
	540.											X
	560.											X
	580.											X
	600.											X
	620.											X
	640.											X
7	660.											X
	680.											X
	700.											X
	720.											X
	740.											X
8	760.											X
	780.											X
	800.											X
9	820.											X
	840.											X
	860.											X
11	880.											X
	900.											X
	920.											X
12	940.											X
	960.											X
14	980.											X
	1000.											
	1020.					X						
	1040.					X						
15	1060.					XW						
	1080.					X W						
	1100.					X W						

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161120.					X						
1140.					X						
171160.					X						
181180.				X							
191200.				X							DANK.
211220.		XXXXXXXXXXXX									
221240.											
231260.											
251280.											
261300.		X									
271320.		X									
291340.			XXXXXXXXX								
[illegible]											
[illegible]											[illegible]
[illegible]				X							
1420.				X							
1440.				X							
1460.				X							
[illegible]											
[illegible]											
[illegible]											
1540.											
341560.											
1560.											
[illegible]											
[illegible]											
[illegible]											
1660.											
1680.											
1700.											
[illegible]											
[illegible]											
[illegible]											
351760.											
1800.											
1820.											
[illegible]											
[illegible]											
[illegible]											
[illegible]											
1920.											
1940.											
[illegible]											
[illegible]											
[illegible]											

NRD= 0 [illegible] 9999995.30 [illegible] 9999999.0[illegible]

[illegible]									
100000.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
100000.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
100000.00	950.00	100000.00	971.00	761.95	[illegible]	761.20	[illegible]	[illegible]	1124.00
760.70	1170.00	750.10	1179.00	754.30	1209.00	752.50	1214.00	747.00	1229.00
746.[illegible]	1249.00	747.70	1269.00	747.10	1279.00	748.60	1309.00	745.[illegible]	1309.00
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				

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FORM 1411-GB PRINTED BY ROTARY MANIFOLD FORMS

CROSS SECTION 11.90
STREAM: KALAMAZOO R. KALAMAZOO
DISCHARGE= 7890.

PLOTTED PULSE CAT PRODUCT(*)=BOTTOM ELEVATION CROSS SECTION(-)=WATER SURFACE ELEVATION CAT FILL=CHANNEL SIDE

ST.=FEET

5 160.
240.
260.
280.
360.
420.
5 420.
520.
600.
720.
740.
760.
820.
860.
880.
900.
7 900.
980.
1000.
1020.
1040.
1060.
1080.
1100.
1120.
1140.
1160.
1180.
1200.
1220.
1240.
1260.
1280.
1300.
1320.
1340.
1360.
1380.
1400.
1420.
1440.
1460.
1480.
1500.
1520.
1540.
1560.
1580.
1600.
1620.
1640.
1660.
1680.
1700.
1720.
1740.
1760.

```
 1100.
 1120.
 1140.
 1160.
8560 XSEC POINT-B      EL,ST-      0.30
8560 XSEC POINT-D      EL,ST-
 1180.
8560 XSEC POINT-B      EL,ST-      0.30
8560 XSEC POINT-D      EL,ST-
111200.
8560 XSEC POINT-T      EL,ST-    771.90
8560 XSEC POINT-D      EL,ST-
[illegible]
[illegible]
[illegible]
141240.
8560 XSEC POINT-T      EL,ST-    772.40
8560 XSEC POINT-D      EL,ST-
[illegible]
[illegible]
[illegible]
191260.
8560 XSEC POINT-T      EL,ST-    773.10
8560 XSEC POINT-D      EL,ST-
[illegible]
[illegible]
[illegible]
8560 XSEC POINT-D      EL,ST-      0.00
8560 XSEC POINT-D      EL,ST-
251320.
[illegible]
[illegible]
[illegible]
8560 XSEC POINT-D      EL,ST-
261360.
8560 XSEC POINT-T      EL,ST-    773.10
[illegible]
[illegible]
[illegible]
8560 XSEC POINT-D      EL,ST-
[illegible]
8560 XSEC POINT-T      EL,ST-    773.[illegible]
[illegible]
[illegible]
[illegible]
8560 XSEC POINT-T      EL,ST-
[illegible]
8560 XSEC POINT-T      EL,ST-    773.[illegible]
[illegible]
[illegible]
[illegible]
NRD=      25 ELEC=      753.50 ELTOP=      76[illegible]

 1186.50      0.00    757.20   1196.50      0.00    757.40   1195.[illegible]    757.40    771.90
[illegible]
[illegible]
[illegible]
 1300.00    762.50    773.40   1321.50    759.00    773.10   1321.50      0.00    773.20
 1326.50      0.00    773.20   1326.50    759.00    773.10   1341.00    762.00    772.80
 1350.00    764.70    772.40   1374.00    762.00    772.70   1367.40    757.70    771.90
[illegible]
[illegible]
   765.[illegible]    952.70    756.40   1186.30    757.20   1195.[illegible]    757.[illegible]   1196.[illegible]    757.50   1196.50
```

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
751.40	1262.40	751.20	1262.80	751.60	1275.00	749.50	1292.00	749.20	1358.00
749.90	1321.50	749.90	1321.60	751.40	1320.40	751.40	1328.50	751.20	1341.00
751.00	1358.00	751.70	1374.00	752.40	1387.40	754.70	1367.50	766.80	1390.00
762.40	1315.00	765.40	1952.00	767.30	2414.00				

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FORM 1411-OB-PRINTED BY ROTARY MANIFOLD FORMS.

FORM 1411-GB PRINTED BY ROTARY MANIFOLD FORMS.

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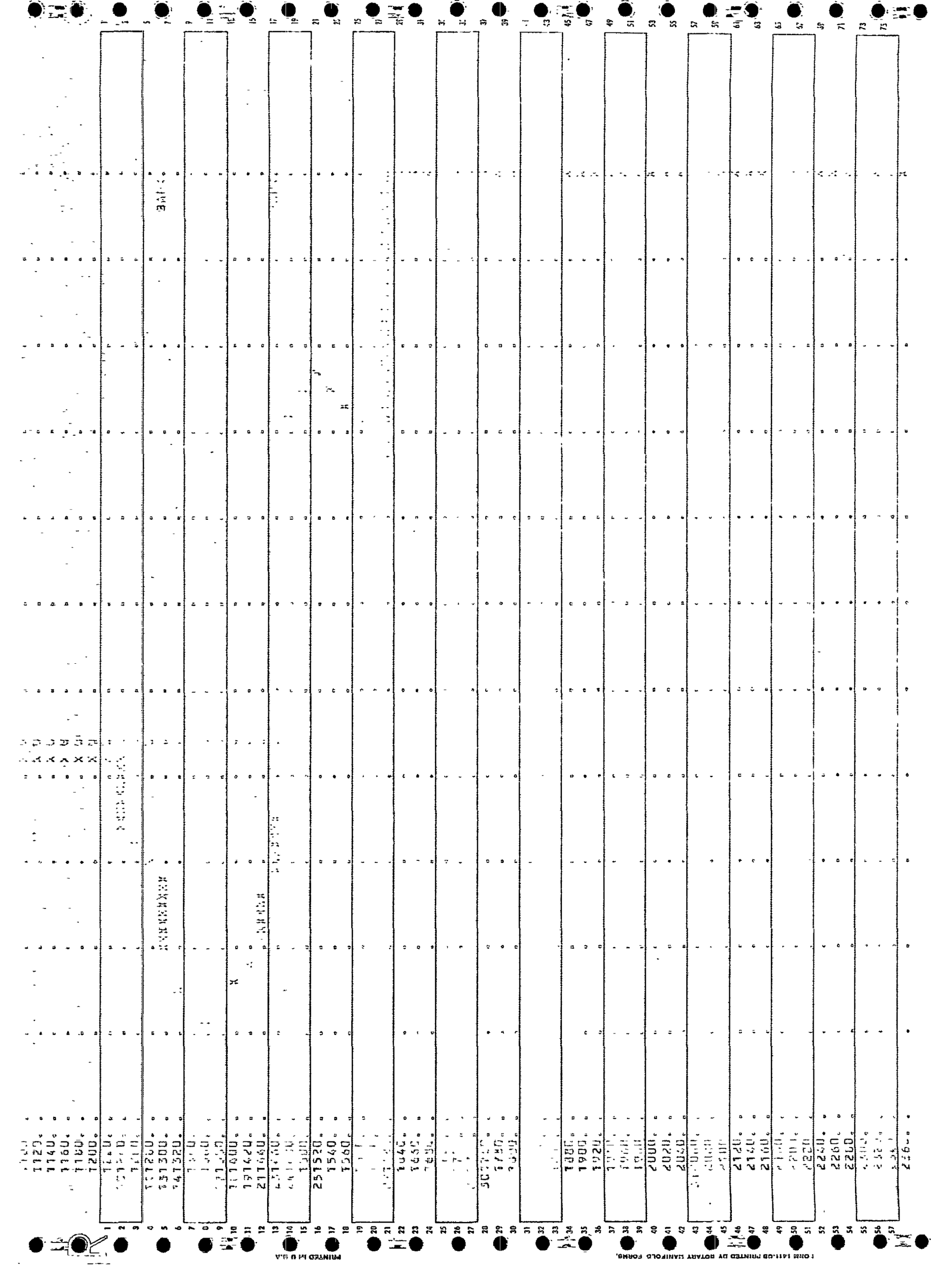
CROSS SECTION 11+70
STREAM [illegible] 3+ KALAMAZOO
DISCHARGE= 7990.

[illegible] TO GET DISCHARGE FACTOR [illegible]

STA-FEET

| | | |



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2340.  .  .  .
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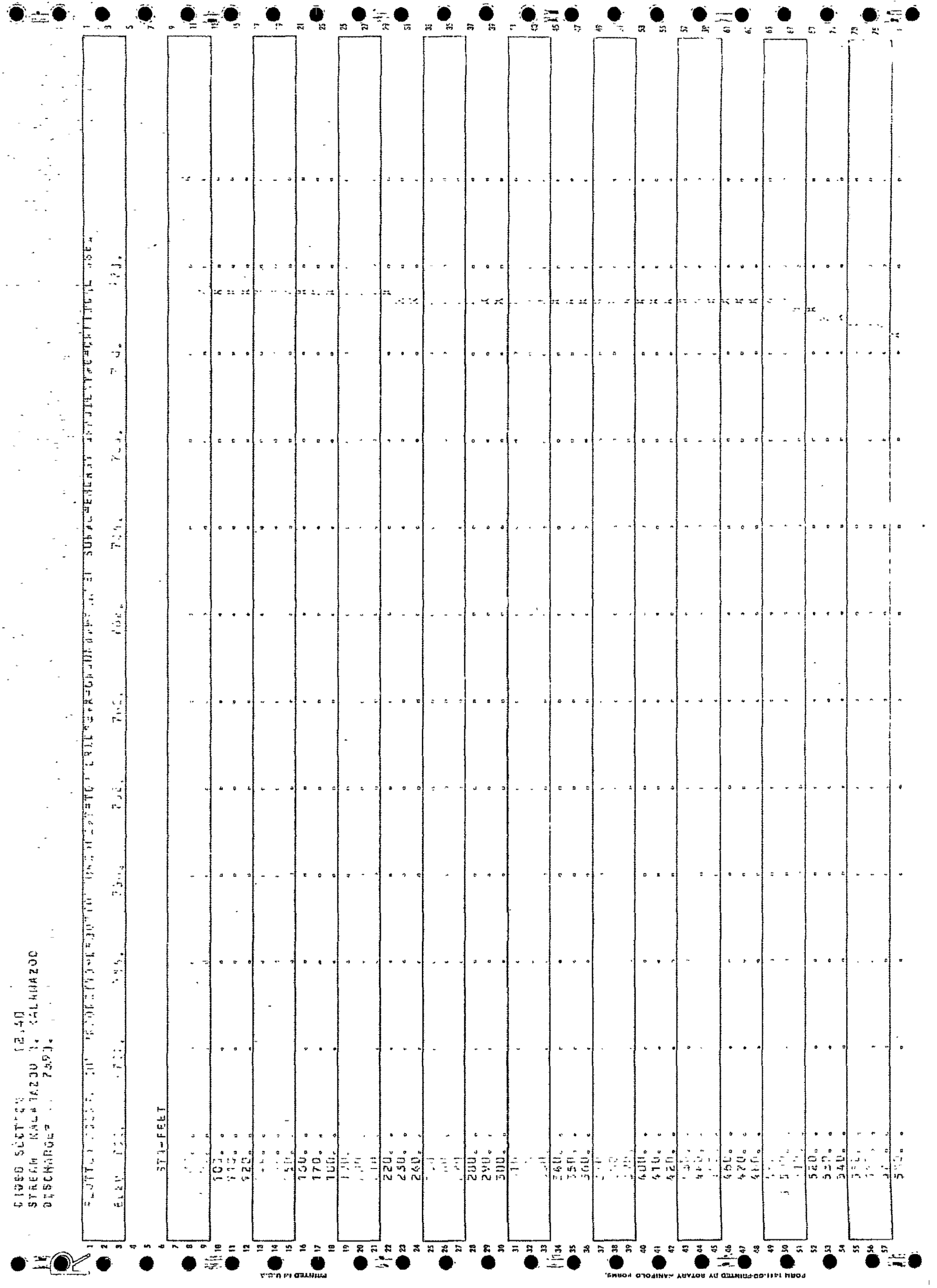
STA-FELT
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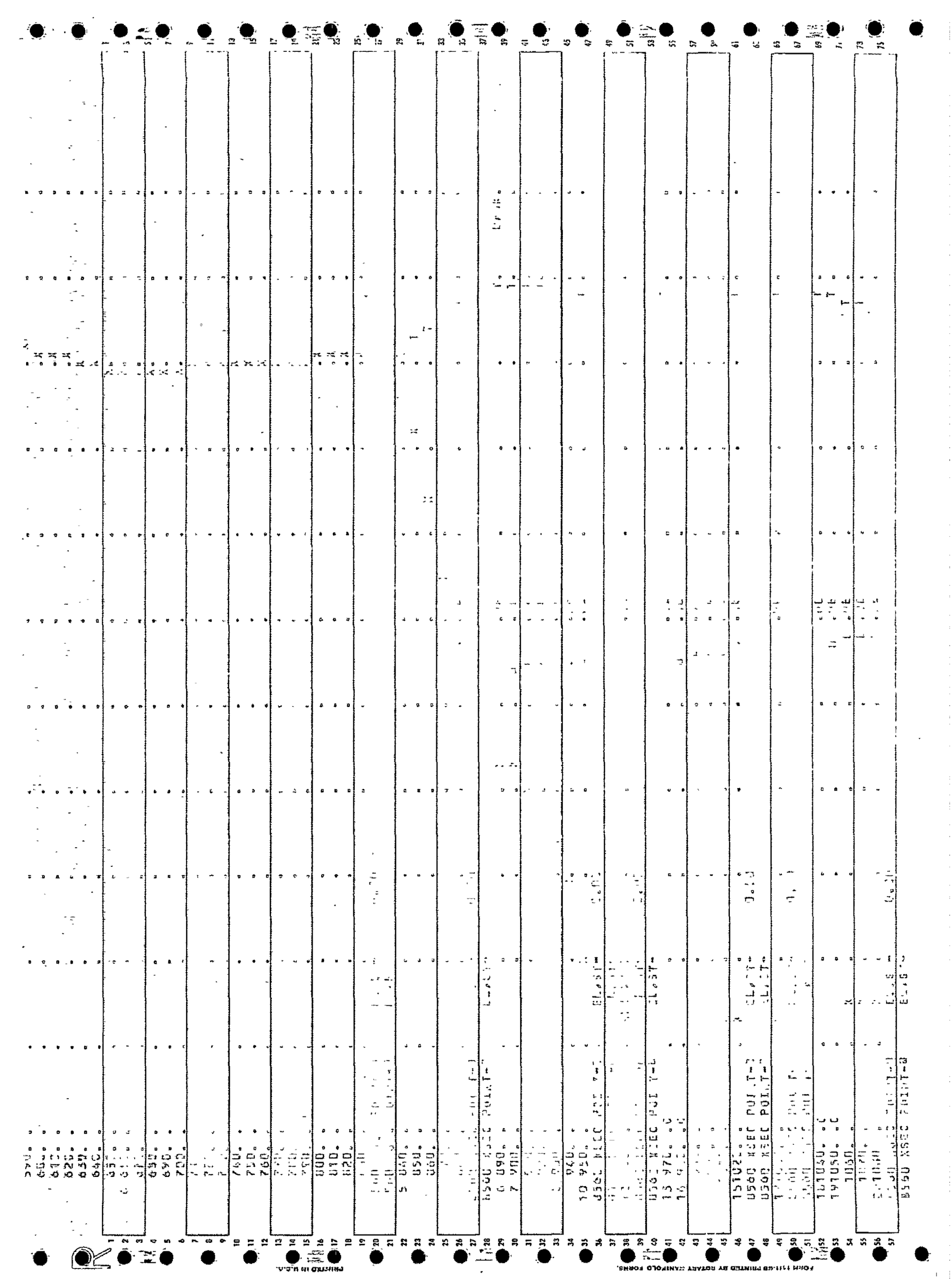
FORM 1411-CO-PRINTED BY ROTARY MANIFOLD FORMS.



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```

CROSS SECTION 13.32
STREAM KALAMAZOO R. KALAMAZOO
DISCHARGE= 7390.

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

STA-FEET

[illegible]													
[illegible]													
695.											X		
700.											X		
705.											X		
[illegible]													
[illegible]													
[illegible]											X		
725.											X		
730.											X		
735.											X		
[illegible]													
[illegible]													
[illegible]													
6560 XSEC POINT-1		EL,ST=	1.20										
0560 XSEC POINT-2		EL,ST=											
5 765.													DRAW.
[illegible]													
[illegible]													
[illegible]													
765.													
7 770.													
775.													
[illegible]													
[illegible]													
[illegible]													
6560 XSEC POINT-0		EL,ST=											
10 790.													
795.													
[illegible]													
[illegible]													
[illegible]													
12 805.													
810.													
[illegible]													
[illegible]													
15 [illegible]													
[illegible]													
835.													
840.													
845.													
[illegible]													
[illegible]													
[illegible]													
15 855.													
860.													
6560 XSEC POINT-0		EL,ST=	0.01										
[illegible]													
[illegible]													
[illegible]													
15 875.													

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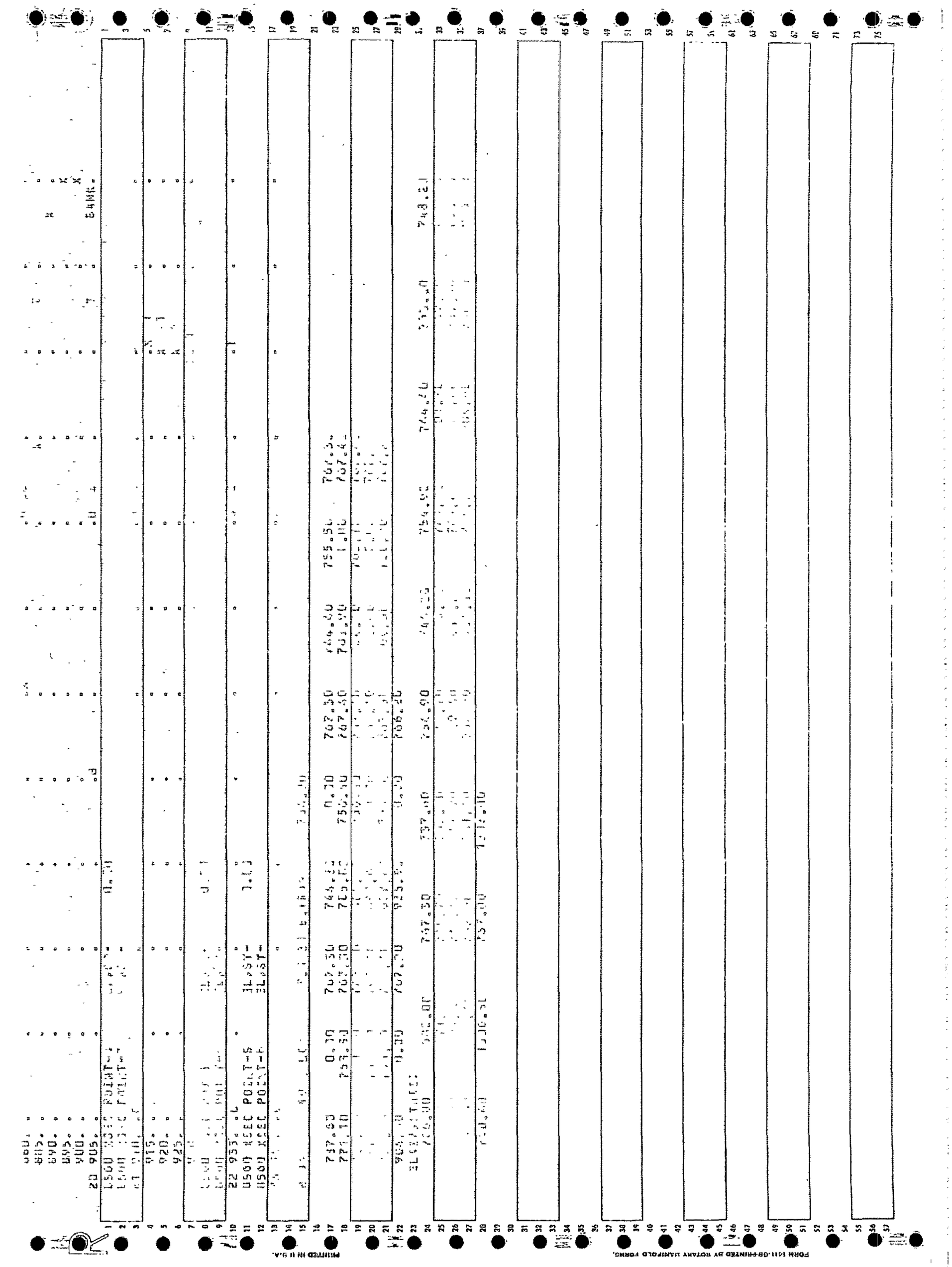
FORM 1311-00 PRINTED BY ROTARY MANIFOLD FORMS.



```
    880.
    885.
    890.
    895.
    900.
20 905.                                                                                                  BANK.
0500 XSEC POINT-4          [illegible]        0.00
0500 XSEC POINT-7          [illegible]
[illegible]
    915.
    920.
    925.
    [illegible]
0500 [illegible]           [illegible]        0.00
0500 [illegible]           [illegible]
22 933.
0500 XSEC POINT-5          ELAST-        0.00
0500 XSEC POINT-6          ELAST-
[illegible]

[illegible]                                  [illegible]

    737.60       0.00     767.30     744.[illegible]       0.00     767.30     744.60     755.50     767.3[illegible]
    771.10     753.50     767.30     765.[illegible]     756.40     767.40     761.90       1.00     767.4[illegible]
[illegible]
    904.[illegible]       0.00     767.30     925.[illegible]       0.00     766.20
ELAST/STRESS
    766.90     [illegible]     767.30     737.60     756.90     744.[illegible]     754.90     744.40     755.[illegible]     748.2[illegible]
[illegible]
    [illegible]     1[illegible]     757.00     1[illegible]
```

FORM 1411-08-PRINTED BY ROTARY MANIFOLD FORMS.

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CROSS SECTION [illegible] 14.40
STREAM KALAMAZOO R. KALAMAZOO
DISCHARGE= 5910.

FLOTTED POINTS [illegible] PRIOR [illegible] BOTTOM [illegible] BOTTOM [illegible] FOREST [illegible] CRITICAL [illegible]

ELEV	755.	750.	755.	[illegible]	[illegible]	770.	775.	[illegible]	[illegible]	[illegible]	[illegible]
STA-FEET											
350.											
360.											
370.					X						
380.					X						
390.					X						
400.					X						
410.					X						
420.					X						
430.					X						
440.					X						
450.					X						
[illegible]					X						
[illegible]					X						
[illegible]					X						
3 490.					X						
500.					X						
510.					X						
[illegible]					X						
[illegible]					X						
[illegible]					X						
550.					X						
560.					X						
570.					X						
[illegible]					X						
[illegible]					X						
[illegible]					X						
510.					X						
520.					X						
630.					X						
[illegible]					X						
[illegible]					X						
[illegible]					X						
570.					X						
510.					X						
690.					X						
[illegible]					X						
[illegible]					X						
[illegible]					X						
730.					X						
740.					X						
750.					X						
[illegible]					X						
[illegible]					X						
[illegible]					X						
790.					X						
800.					X						
810.					X						
[illegible]					X						
[illegible]					X						
[illegible]					X						
850.					X						

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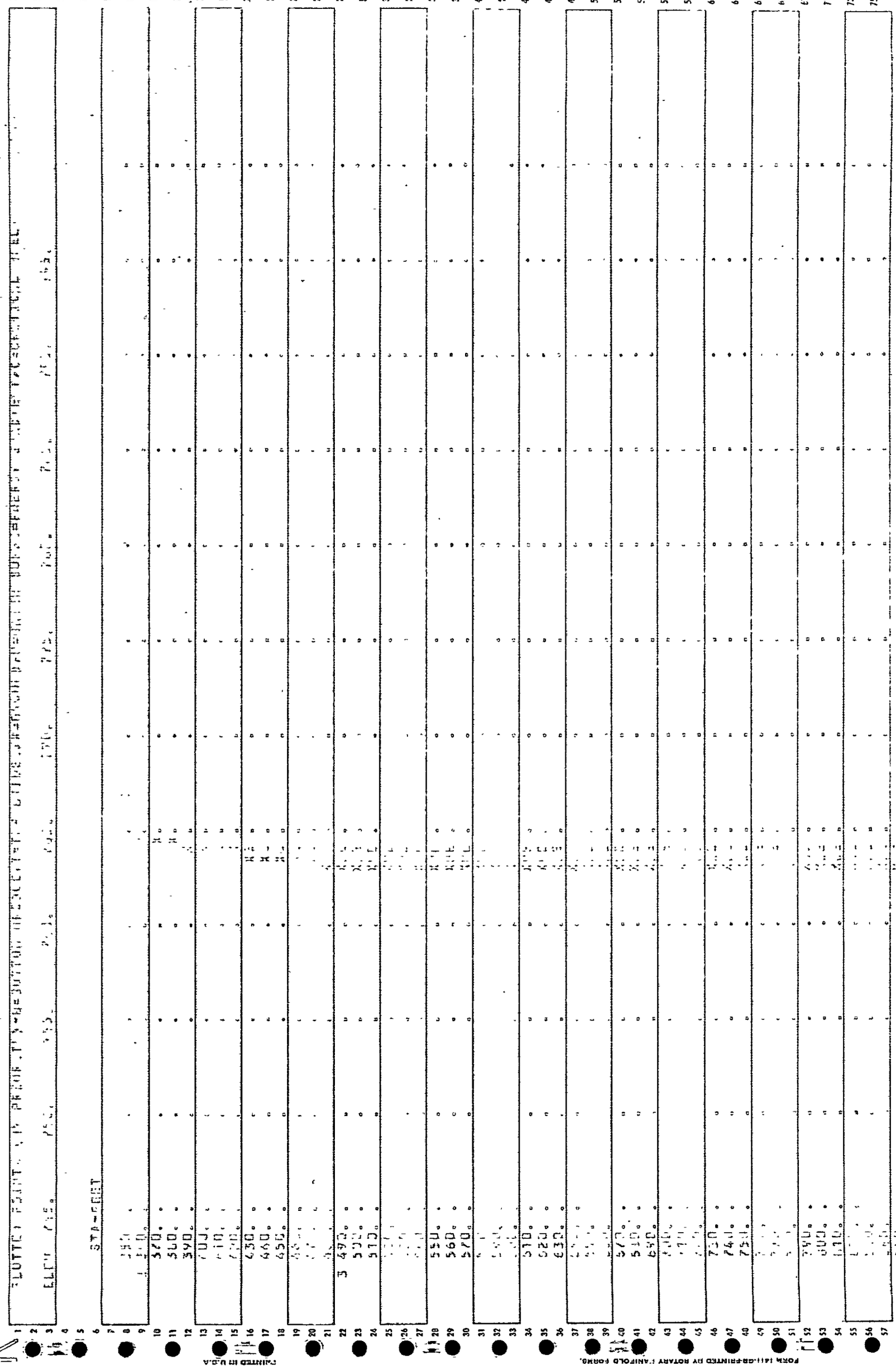
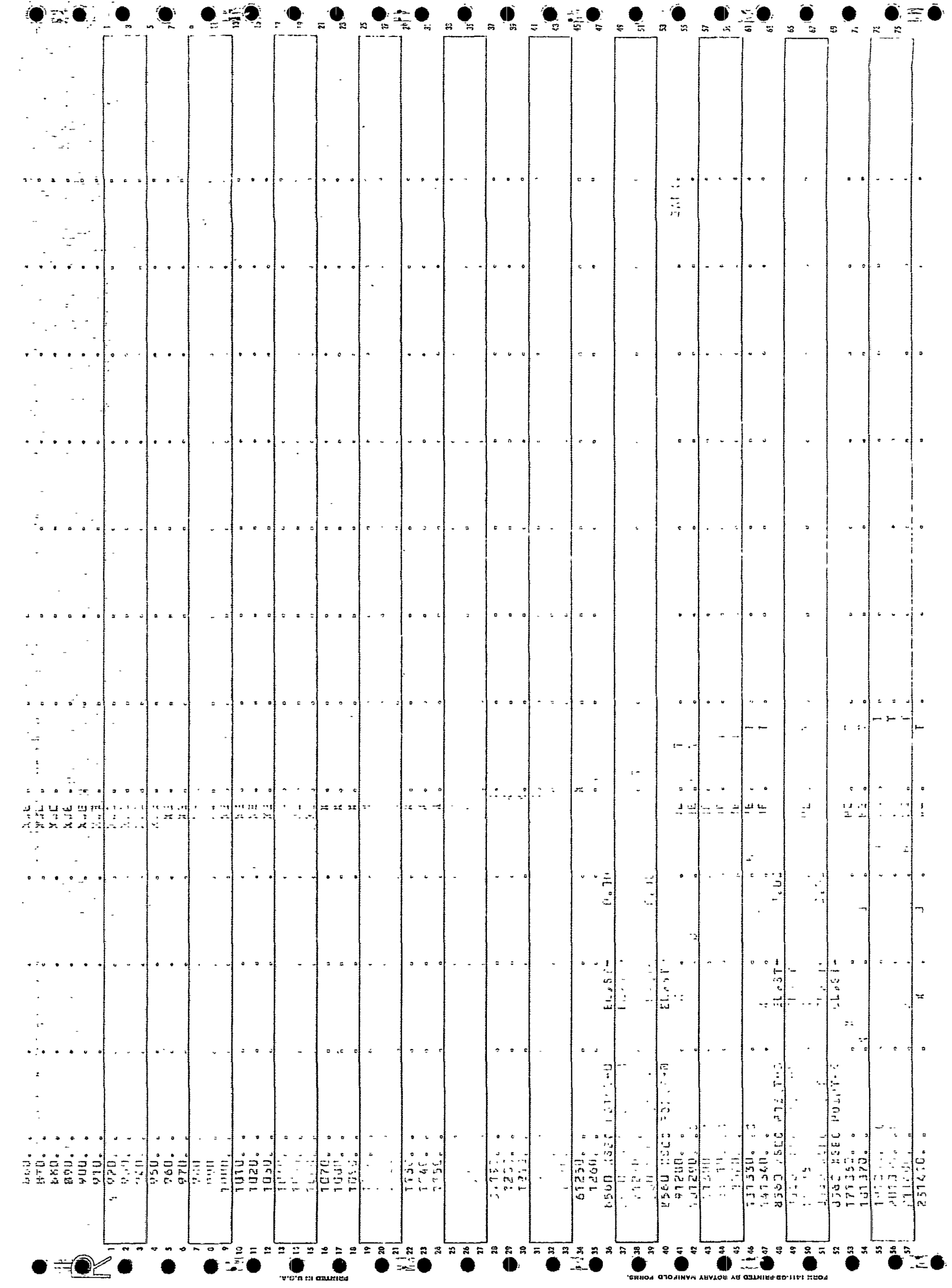
FORM 1411-GR-PRINTED BY ROTARY MANIFOLD FORMS.





FORM 141-GB-PRINTED BY ROTARY MANIFOLD PORMS.

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```
8560 XSEC POINT-B        EL,ST-        0.00
8560 XSEC POINT-C        EL,ST-
241420. .                 .          WE .
8560 XSEC POINT-B        EL,ST-        1.00
8560 XSEC POINT-C        EL,ST-
251430. .C                .          WE .
[illegible]
[illegible]
[illegible]
291470. .                 .          .
301400. .                 .          .
8560 XSEC POINT-D        EL,ST-        0.00
[illegible]
[illegible]
[illegible]
8560 XSEC POINT-D        EL,ST-
321500. .C                .          WE .
8560 XSEC POINT-D        EL,ST-        0.00
[illegible]
[illegible]
[illegible]
8560 XSEC POINT-C        EL,ST-
341520. .C                .          WE .

[illegible]

[illegible]
1298.00   [illegible]   767.70   1312.[illegible]   765.50   767.90   1320.00   761.00   [illegible]
1340.50   [illegible]   767.60   1341.[illegible]   0.00   768.60   1347.50   0.00   [illegible]
1347.50   [illegible]   768.60   1360.[illegible]   781.50   768.90   1374.10   764.90   769.10
[illegible]
[illegible]
[illegible]
1464.00   [illegible]   757.50   1472.[illegible]   [illegible]   [illegible]
EL(I),STA(A)
764.[illegible]   56.00   [illegible]   480.00   [illegible]   [illegible]   [illegible]   1190.00   [illegible]   [illegible]
[illegible]
[illegible]
[illegible]
753.00   1407.40   [illegible]   1437.50   [illegible]   [illegible]   [illegible]   1436.00   [illegible]   1450.[illegible]
757.60   1443.90   [illegible]   1464.00   766.40   [illegible]   [illegible]   1462.00   [illegible]   1670.[illegible]
762.70   1995.00   [illegible]   2[illegible].00   770.40   2054.[illegible]
```

CROSS SECTION 15.[illegible]
STREAM KALAMAZOO R. KALAMAZOO
DISCHARGE= 6912.

PLOTTED POINTS [illegible]

ELEV [illegible] 770. [illegible] 765. [illegible]

STA-FEET

1100.
1105.
1110.
1115.
1120.
1125.
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1175.
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1185.
1190.
1195.
1200.
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FORM 1411-GB PRINTED BY ROTARY MANIFOLD FORMS.

FORM 1111-GB PRINTED BY ROTARY MANIFOLD FORMS

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FORM 1011-GR-PRINTED BY ROTARY MANIFOLD FORMS.
PRINTED IN U.S.A.

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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY1979
  ERROR CORR =  01,02,03
  MODIFICATION =  50,51,52,53
**************************************************


T1 GALESBURG,CITY
T2 100 YEAR
T3 -KALAMAZOO-RIVER-
```

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ		
	0.	0.	0.	0.	0.000504	0.00	0.0	6750.	779.330	0.000		
NC	0.100	0.100	0.014	0.300	0.500	0.000	0.000	0.000	0.000	0.000		
X1	81.200	20.000	2000.000	2178.000	0.000	0.000	0.000	0.000	0.000	0.000		
GR	785.700	2000.000	780.300	2000.000	774.700	2023.000	774.300	2039.000	773.700	2052.000		
GR	773.200	2058.000	773.200	2058.100	773.900	2060.000	773.000	2060.100	771.500	2076.000		
GR	770.800	2088.000	771.400	2118.000	771.400	2118.100	771.400	2120.000	771.400	2120.000		
GR	770.300	2130.000	771.100	2146.000	776.500	2162.000	782.200	2178.000	787.900	2178.000		
NC	0.000	0.000	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
X1	82.500	28.000	3082.000	3269.000	75.000	75.000	75.000	0.000	-1.660	0.000		
X3	0.000	0.000	0.000	3082.000	783.000	3269.000	783.000	0.000	0.000	0.000		
GR	787.500	3066.000	780.800	3082.000	778.400	3093.000	775.100	3118.000	773.500	3143.000		
GR	772.000	3168.000	773.700	3193.000	774.400	3224.000	777.900	3266.000	779.800	3269.000		
GR	779.400	3316.000	778.300	3316.000	775.200	3338.000	776.800	3354.000	779.600	3362.000		
GR	779.900	3480.000	779.200	3574.000	780.200	3708.000	778.800	3806.000	778.900	3900.000		
GR	781.600	3980.000	781.700	4074.000	783.600	4218.000	782.000	4326.000	780.800	4422.000		
GR	780.400	4498.000	782.800	4592.000	783.000	4654.000	0.000	0.000	0.000	0.000		
X1	82.550	0.000	0.000	0.000	100.000	100.000	100.000	0.000	0.050	0.000		
X1	82.600	0.000	0.000	0.000	900.000	900.000	900.000	0.000	0.450	0.000		
X1	82.700	0.000	0.000	0.000	1000.000	1000.000	1000.000	0.000	0.500	0.000		
X1	83.000	0.000	0.000	0.000	1275.000	1025.000	1300.000	0.000	0.660	0.000		
EJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		

*PROF 1

CCHV= 0.300 CEHV= 0.500

*SECNO 81.200

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	NXR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
81.20	8.24	778.54	0.00	779.33	779.40	0.86	0.00	0.00	785.70
6750.	0.	6750.	0.	0.	906.	0.	0.	0.	787.90
0.00	0.00	7.45	0.00	0.100	0.014	0.100	0.000	770.30	2007.22
0.000503	0.	0.	0.	0	0	4	0.00	160.51	2167.73

*SECNO 82.500

3470 ENCROACHMENT STATIONS= 3082.0 3269.0 TYPE= 1 TARGET= 187.000

ELENCL= 783.00 ELENCR= 783.00

82.50	8.55	778.89	0.00	0.00	779.55	0.65	0.08	0.06	779.14
6750.	0.	6750.	0.	0.	1043.	0.	2.	0.	781.34
0.00	0.00	6.47	0.00	0.100	0.040	0.100	0.039	770.34	3083.10
0.003093	75.	75.	75.	2	0	0	0.00	185.90	3269.00

*SECNO 82.550

3265 DIVIDED FLOW

82.55	9.17	779.56	0.00	0.00	779.86	0.30	0.21	0.11	779.19
6750.	0.	5570.	1180.	0.	1156.	1312.	6.	2.	778.19
0.01	0.18	4.82	0.90	0.100	0.040	0.100	0.040	770.39	3081.12
0.001496	100.	100.	100.	3	0	0	0.00	1021.68	4528.10

*SECNO 82.600

3265 DIVIDED FLOW

82.60	9.88	780.72	0.00	0.00	780.92	0.19	1.03	0.03	779.64
6750.	0.	5171.	1578.	1.	1288.	1959.	65.	25.	778.64
0.09	0.28	4.01	0.81	0.100	0.040	0.100	0.040	770.84	3079.43
0.000899	900.	900.	900.	2	0	0	0.00	1227.57	4555.76

*SECNO 82.700

3265 DIVIDED FLOW

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	NXR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
82.70	10.22	781.56	0.00	0.00	781.72	0.16	0.79	0.01	780.14
6750.	1.	4979.	1770.	2.	1354.	2333.	144.	54.	779.14
0.18	0.30	3.68	0.76	0.100	0.040	0.100	0.040	771.34	3078.60
0.000707	1000.	1000.	1000.	2	0	0	0.00	1293.75	4569.46

*SECNO 83.000

3265 DIVIDED FLOW

83.00	10.40	782.40	0.00	0.00	782.54	0.14	0.82	0.00	780.80
6750.	1.	4886.	1863.	3.	1387.	2531.	243.	86.	779.80
0.31	0.30	3.52	0.74	0.100	0.040	0.100	0.041	772.00	3078.18
0.000628	1275.	1300.	1025.	2	0	0	0.00	1326.33	4576.36

PROFILE FOR STREAM AZOO RIVER

PLOTTED POINTS (BY PRIORITY)-E-ENERGY,W-WATER SURFACE,I-INVERT,C-CRITICAL W.S.,L-LEFT BANK,R-RIGHT BANK,M-LOWER END STA

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ELEVATION-FT   770.      772.      774.      776.      778.      780.      782.      784.      786.      788.
    SECNO   CUMDIS-FT

    81.20      0.  CI         .         .         .         .  W   E  .         .         .         L.        R.         .
    82.50    100.  C I        .         .         .         .   W L E .       R .     M   .         .         .         .
    82.55    200.  C I        .         .         .         .R    L WE.         .     M   .         .         .         .
             300.  C I        .         .         .         .R    L W E         .     M   .         .         .         .
             400.  C I        .         .         .         .R    L  WE         .      M  .         .         .         .
             500.  C  I       .         .         .         . R    L  WE        .      M  .         .         .         .
             600.  C  I       .         .         .         . R    L  W E       .      M  .         .         .         .
             700.  C  I       .         .         .         . R    L  .WE       .      M  .         .         .         .
             800.  C  I       .         .         .         . R    L  . WE      .       M .         .         .         .
             900.  C   I      .         .         .         .  R    L . WE      .       M .         .         .         .
            1000.  C   I      .         .         .         .  R    L .  WE     .       M .         .         .         .
    82.60   1100.  C   I      .         .         .         .  R    L .   WE    .        M .         .         .         .
            1200.  C   I      .         .         .         .  R    L .   WE    .        M .         .         .         .
            1300.  C    I     .         .         .         .   R    L.   WE    .        M .         .         .         .
            1400.  C    I     .         .         .         .   R    L.    WE   .        M .         .         .         .
            1500.  C    I     .         .         .         .   R    L.    WE   .         M.         .         .         .
            1600.  C    I     .         .         .         .   R    L.     WE  .         M.         .         .         .
            1700.  C     I    .         .         .         .    R    L     WE  .         M.         .         .         .
            1800.  C     I    .         .         .         .    R    L      E  .         M.         .         .         .
            1900.  C     I    .         .         .         .    R    L      WE .         M.         .         .         .
            2000.  C     I    .         .         .         .    R    L      WE .          M         .         .         .
    82.70   2100.  C      I   .         .         .         .     R   .L      WE.          M         .         .         .
            2200.  C      I   .         .         .         .     R   .L      WE.          M         .         .         .
            2300.  C      I   .         .         .         .     R   .L      WE.          .M        .         .         .
            2400.  C      I   .         .         .         .     R   .L       WE          .M        .         .         .
            2500.  C       I  .         .         .         .      R  . L      WE          .M        .         .         .
            2600.  C       I  .         .         .         .      R  . L      WE          .M        .         .         .
            2700.  C       I  .         .         .         .      R  . L       E          . M       .         .         .
            2800.  C       I  .         .         .         .      R  . L       WE         . M       .         .         .
            2900.  C        I.         .         .         .       R . L       WE         . M       .         .         .
            3000.  C        I.         .         .         .       R . L       .E         . M       .         .         .
            3100.  C        I.         .         .         .       R . L       .WE        .  M      .         .         .
            3200.  C        I.         .         .         .       R . L       .WE        .  M      .         .         .
            3300.  C         I         .         .         .        R.   L     . E        .  M      .         .         .
    83.00   3400.  C         I         .         .         .        R.   L     . WE       .  M      .         .         .
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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
**************************************************

T1 GALESBURG,CITY
T2 100 YEAR
T3 KALAMAZOO RIVER
```

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ		
	0.	0.	0.	0.	0.000000	0.00	0.0	6750.	779.330	0.000		
NC	0.100	0.100	0.014	0.300	0.500	0.000	0.000	0.000	0.000	0.000		
X1	81.200	20.000	2000.000	2178.000	0.000	0.000	0.000	0.000	0.000	0.000		
GR	785.700	2000.000	780.300	2000.000	774.700	2023.000	774.300	2039.000	773.700	2052.000		
GR	773.200	2058.000	773.200	2058.100	773.900	2060.000	773.000	2060.100	771.500	2076.000		
GR	770.800	2088.000	771.400	2118.000	771.400	2118.100	771.400	2120.000	771.400	2120.000		
GR	770.300	2130.000	771.100	2146.000	776.500	2162.000	782.200	2178.000	787.900	2178.000		
NC	0.000	0.000	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
X1	82.500	28.000	3082.000	3269.000	75.000	75.000	75.000	0.000	-1.660	0.000		
X3	0.000	0.000	0.000	3082.000	783.000	3269.000	783.000	0.000	0.000	0.000		
GR	787.500	3066.000	780.800	3082.000	778.400	3093.000	775.100	3118.000	773.500	3143.000		
GR	772.000	3168.000	773.700	3193.000	774.400	3224.000	777.900	3266.000	779.800	3269.000		
GR	779.400	3316.000	778.300	3316.000	775.200	3338.000	776.800	3354.000	779.600	3362.000		
GR	779.900	3480.000	779.200	3574.000	780.200	3708.000	778.800	3806.000	778.900	3900.000		
GR	781.600	3980.000	781.700	4074.000	783.600	4218.000	782.000	4326.000	780.800	4422.000		
GR	780.400	4498.000	782.800	4592.000	783.000	4654.000	0.000	0.000	0.000	0.000		
X1	82.550	0.000	0.000	0.000	100.000	100.000	100.000	0.000	0.050	0.000		
X1	82.600	0.000	0.000	0.000	900.000	900.000	900.000	0.000	0.450	0.000		
X1	82.700	0.000	0.000	0.000	1000.000	1000.000	1000.000	0.000	0.500	0.000		
X1	83.000	0.000	0.000	0.000	1275.000	1025.000	1300.000	0.000	0.660	0.000		
EJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		

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*PROF 1

CCHV=   0.300 CEHV=   0.500
*SECNO 81.200
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA     LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      NXR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

    81.20      9.03    779.33      0.00    779.33    779.99      0.66      0.00      0.00    785.70
     6750.        0.     6750.        0.        0.     1034.        0.        0.        0.    787.90
     0.00      0.00      6.53      0.00      0.100     0.014     0.100     0.000   770.30   2003.98
 0.000338        0.        0.        0.          0         0         0      0.00   165.96   2169.94

*SECNO 82.500

3470 ENCROACHMENT STATIONS=    3082.0    3269.0  TYPE=      1  TARGET=     187.000
 ELENCL=    783.00  ELENCR=    783.00
    82.50      9.23    779.57      0.00      0.00    780.09      0.52      0.05      0.04    779.14
     6750.        0.     6750.        0.        0.     1168.        0.        2.        0.    781.34
     0.00      0.00      5.78      0.00      0.100     0.040     0.100     0.039   770.34   3082.00
 0.002154        75.       75.       75.         2         0         0      0.00   187.00   3269.00

*SECNO 82.550

3265 DIVIDED FLOW

    82.55      9.72    780.11      0.00      0.00    780.32      0.21      0.14      0.09    779.19
     6750.        0.     5257.     1493.        1.     1260.     1803.        7.        2.    778.19
     0.01      0.27      4.17      0.83      0.100     0.040     0.100     0.040   770.39   3079.80
 0.001001       100.      100.      100.         2         0         0      0.00  1197.47   4549.79

*SECNO 82.600

3265 DIVIDED FLOW

    82.60     10.11    780.95      0.00      0.00    781.12      0.17      0.78      0.01    779.64
     6750.        1.     5043.     1707.        2.     1332.     2205.       75.       27.    778.64
     0.09      0.29      3.79      0.77      0.100     0.040     0.100     0.040   770.84   3078.88
 0.000765       900.      900.      900.         2         0         0      0.00  1272.13   4564.87

*SECNO 82.700

3265 DIVIDED FLOW

   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA     LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      NXR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

    82.70     10.34    781.68      0.00      0.00    781.83      0.15      0.71      0.01    780.14
     6750.        1.     4916.     1833.        3.     1376.     2465.      160.       57.    779.14
     0.19      0.30      3.57      0.74      0.100     0.040     0.100     0.040   771.34   3078.32
 0.000653      1000.     1000.     1000.         2         0         0      0.00  1315.56   4574.08

*SECNO 83.000

3265 DIVIDED FLOW
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83,00	10.46	782,46	0,00	0,00	782,60	0,14	0,77	0,00	780,80
6750.	1.	4853.	1896.	3.	1398.	2601.	261.	90.	779,80
0,32	0,31	3,47	0,73	0,100	0,040	0,100	0,041	772,00	3078,03
0,000603	1275.	1300.	1025.	2.	0	0	0,00	1337,79	4578,79

782.98
782.4
.58

.58
.53
.45

PROFILE FOR STREAM AZOO RIVER

PLOTTED POINTS (BY PRIORITY)-E-ENERGY,W-WATER SURFACE,I-INVERT,C-CRITICAL W.S.,L-LEFT BANK,R-RIGHT BANK,M-LOWER END STA

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ELEVATION-FT   770.      772.      774.      776.      778.      780.      782.      784.      786.      788.
    SECNO   CUMDIS-FT
                                                                 W  E                          L.        R.
   81.20       0.  CI
   82.50     100.  C I                                          L  W  E          R          M
   82.55     200.  C I                                        .R    L    .WE        .  M
             300.  C I                                        .R    L    .WE        .  M
             400.  C I                                        .R    L    .WE        .   M
             500.  C  I                                       . R    L   . WE        .  M
             600.  C  I                                       . R    L   . WE        .  M
             700.  C  I                                       . R    L   .  WE       .  M
             800.  C  I                                       . R    L   .  WE       .   M
             900.  C   I                                      .  R    L  .   WE       .  M
            1000.  C   I                                      .  R    L  .   WE       .  M
   82.60    1100.  C   I                                      .  R    L  .    WE      .   M
            1200.  C   I                                      .  R    L  .    WE      .   M
            1300.  C    I                                     .   R    L.    WE      .   M
            1400.  C    I                                     .   R    L.     WE     .   M
            1500.  C    I                                     .   R    L.     WE     .    M.
            1600.  C    I                                     .   R    L.      E     .    M.
            1700.  C     I                                    .    R    L      WE    .    M.
            1800.  C     I                                    .    R    L      WE    .    M.
            1900.  C     I                                    .    R    L       E    .    M.
            2000.  C     I                                    .    R    L       WE   .     M
   82.70    2100.  C      I                                   .     R   .L      WE   .     M
            2200.  C     I                                    .     R   .L      E.   .     M
            2300.  C     I                                    .     R   .L      WE   .    .M
            2400.  C     I                                    .     R   .L      WE   .    .M
            2500.  C      I                                   .      R  . L      E    .    .M
            2600.  C      I                                   .      R  . L      WE   .    .M
            2700.  C      I                                   .      R  . L      WE   .    . M
            2800.  C      I                                   .      R  . L      .E   .    . M
            2900.  C       I                                  .       R . .  L    .WE   .    . M
            3000.  C       I                                  .       R . .  L    .WE   .    . M
            3100.  C       I                                  .       R . .  L    .WE   .    .  M
            3200.  C       I                                  .       R . .  L    . E   .    .  M
            3300.  C        I                                 .        R.  .   L   . WE   .    .  M
   83.00    3400.  C        I                                 .        R.  .   L   . WE   .    .  M
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  HEC2 RELEASE DATED NOV 76 UPDATED JULY1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
**************************************************

T1 GALESBURG,CITY
T2 100 YEAR
T3 KALAMAZOO RIVER

J1   ICHECK     INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

       0.        0.        0.        0.  0.000000      0.00      0.0    6750.   779.330     0.000

NC      0.100     0.100     0.014     0.300     0.500     0.000     0.000     0.000     0.000     0.000

X1     81.200    20.000  2000.000  2178.000     0.000     0.000     0.000     0.000     0.000     0.000
GR    785.700  2000.000   780.300  2000.000   774.700  2023.000   774.300  2039.000   773.700  2052.000
GR    773.200  2058.000   773.200  2058.100   773.900  2060.000   773.000  2060.100   771.500  2076.000
GR    770.800  2088.000   771.400  2118.000   771.400  2118.100   771.400  2120.000   771.400  2120.000
GR    770.300  2130.000   771.100  2146.000   776.500  2162.000   782.200  2178.000   787.900  2178.000
NC      0.000     0.000     0.040     0.000     0.000     0.000     0.000     0.000     0.000     0.000

X1     82.500    28.000  3082.000  3269.000    75.000    75.000    75.000     0.000    -1.660     0.000
X3      0.000     0.000     0.000  3082.000   783.000  3269.000   783.000     0.000     0.000     0.000
GR    787.500  3066.000   780.800  3082.000   778.400  3093.000   775.100  3118.000   773.500  3143.000
GR    772.000  3168.000   773.700  3193.000   774.400  3224.000   777.900  3266.000   779.800  3269.000
GR    779.400  3316.000   778.300  3316.000   775.200  3338.000   776.800  3354.000   779.600  3362.000
GR    779.900  3480.000   779.200  3574.000   780.200  3708.000   778.800  3806.000   778.900  3900.000
GR    781.600  3980.000   781.700  4074.000   783.600  4218.000   782.000  4326.000   780.800  4422.000
GR    780.400  4498.000   782.800  4592.000   783.000  4654.000     0.000     0.000     0.000     0.000

X1     82.600     0.000     0.000     0.000  1000.000  1000.000  1000.000     0.000     0.500     0.000

X1     82.700     0.000     0.000     0.000  1000.000  1000.000  1000.000     0.000     0.500     0.000

X1     83.000     0.000     0.000     0.000  1275.000  1025.000  1300.000     0.000     0.660     0.000
EJ      0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
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*PROF 1

CCHV= 0.300 CEHV= 0.500
*SECNO 81.200

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	NXR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
81.20	9.03	779.33	0.00	779.33	779.99	0.66	0.00	0.00	785.70
6750.	0.	6750.	0.	0.	1034.	0.	0.	0.	787.90
0.00	0.00	6.53	0.00	0.100	0.014	0.100	0.000	770.30	2003.98
0.000338	0.	0.	0.	0	0	0	0.00	165.96	2169.94

*SECNO 82.500

3470 ENCROACHMENT STATIONS= 3082.0 3269.0 TYPE= 1 TARGET= 187.000
ELENCL= 783.00 ELENCR= 783.00

82.50	9.23	779.57	0.00	0.00	780.09	0.52	0.05	0.04	779.14
6750.	0.	6750.	0.	0.	1168.	0.	2.	0.	781.34
0.00	0.00	5.78	0.00	0.100	0.040	0.100	0.039	770.34	3082.00
0.002154	75.	75.	75.	2	0	0	0.00	187.00	3269.00

*SECNO 82.600

3265 DIVIDED FLOW

82.60	10.31	781.15	0.00	0.00	781.30	0.15	1.10	0.11	779.64
6750.	1.	4935.	1815.	3.	1369.	2426.	59.	17.	778.64
0.10	0.30	3.60	0.75	0.100	0.040	0.100	0.040	770.84	3078.40
0.000668	1000.	1000.	1000.	2	0	0	0.00	1309.15	4572.72

*SECNO 82.700

3265 DIVIDED FLOW

82.70	10.46	781.80	0.00	0.00	781.94	0.14	0.63	0.00	780.14
6750.	1.	4854.	1894.	3.	1398.	2599.	148.	48.	779.14
0.20	0.31	3.47	0.73	0.100	0.040	0.100	0.040	771.34	3078.03
0.000604	1000.	1000.	1000.	2	0	0	0.00	1337.36	4578.70

*SECNO 83.000

3265 DIVIDED FLOW

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	NXR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
83.00	10.53	782.53	0.00	0.00	782.66	0.13	0.72	0.00	780.80
6750.	1.	4819.	1930.	4.	1411.	2678.	252.	81.	779.80
0.33	0.31	3.42	0.72	0.100	0.040	0.100	0.041	772.00	3077.87
0.000577	1275.	1300.	1025.	2	0	0	0.00	1350.03	4581.38

PROFILE FOR STREAM AZOO RIVER

PLOTTED POINTS (BY PRIORITY)-E-ENERGY,W-WATER SURFACE,I-INVERT,C-CRITICAL W.S.,L-LEFT BANK,R-RIGHT BANK,M-LOWER END STA.

ELEVATION-FT		770.	772.	774.	776.	778.	780.	782.	784.	786.	788.
SECNO	CUMDIS-FT										
81.20	0.	CI	.	.	.	.	W E	.	.	L.	R.
82.50	100.	C I	.	.	.	.	L W E	R .	M	.	.
	200.	C I	.	.	.	.	L W.E	R .	M	.	.
	300.	C I	.	.	.	.	L W. E R	.	M	.	.
	400.	C I	.	.	.	.	L W ER	.	M	.	.
	500.	C I	.	.	.	.	L .W E	.	M	.	.
	600.	C I	.	.	.	.	L R WE	.	M	.	.
	700.	C I	.	.	.	.	L R. WE	.	M	.	.
	800.	C I	.	.	.	.	L . W E	.	M	.	.
	900.	C I	.	.	.	.	R L . WE	.	M	.	.
	1000.	C I	.	.	.	.	R L . WE	.	M	.	.
82.60	1100.	C I	.	.	.	.	R L . E	.	M	.	.
	1200.	C I	.	.	.	.	R L . WE	.	M	.	.
	1300.	C I	.	.	.	.	R L. WE	.	M	.	.
	1400.	C I	.	.	.	.	R L. E	.	M	.	.
	1500.	C I	.	.	.	.	R L. WE	.	M.	.	.
	1600.	C I	.	.	.	.	R L. WE	.	M.	.	.
	1700.	C I	.	.	.	.	R L E	.	M.	.	.
	1800.	C I	.	.	.	.	R L WE.		M.	.	.
	1900.	C I	.	.	.	.	R L WE.		M.	.	.
	2000.	C I	.	.	.	.	R L E.		M	.	.
82.70	2100.	C I	.	.	.	.	R .L WE		M	.	.
	2200.	C I	.	.	.	.	R .L WE		M	.	.
	2300.	C I	.	.	.	.	R .L E		.M	.	.
	2400.	C I	.	.	.	.	R .L WE		.M	.	.
	2500.	C I	.	.	.	.	R . L WE		.M	.	.
	2600.	C I	.	.	.	.	R . L WE		.M	.	.
	2700.	C I	.	.	.	.	R . L .E		. M	.	.
	2800.	C I	.	.	.	.	R . L .WE		. M	.	.
	2900.	C I	.	.	.	.	R . L .WE		. M	.	.
	3000.	C I	.	.	.	.	R . L . E		. M	.	.
	3100.	C I	.	.	.	.	R . L . E		. M	.	.
	3200.	C I	.	.	.	.	R . L . WE		. M	.	.
	3300.	C I	.	.	.	.	R. L . WE		. M	.	.
83.00	3400.	C I	.	.	.	.	R. L . E		. M	.	.

1) COUNTY: KALAMAZOO

2) STUDY NAME: COMSTOCK TWP

3) WATERCOURSE: COMSTOCK CREEK

4) DOCUMENT TYPE: 100 YR ENCROACHEED RUN

*PROF 2

CCHV= 0.100 CEHV= 0.300

*SECNO 100.000

SECNO	DEPTH	CWSEL	CRWS	WSELK	EG	HV	HL	CLOSS	BANK ELEV
Q	XLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IHZ	ICONT	CORAR	TOPWID	ENDST

100' U/S OF MOUTH AT KALAMAZOO RIVER-75' D/S OF DAM

100.00	3.80	764.00	0.00	764.00	764.12	0.12	0.00	0.00	763.40
250.	7.	263.	0.	24.	85.	0.	0.	0.	764.00
0.00	0.27	2.64	0.00	0.100	0.040	0.100	0.000	760.20	820.00
0.001532	0.	0.	0.	0	0	0	0.30	135.00	955.00

*SECNO 140.000

140' U/S OF MOUTH-35' D/S OF DA

140.00	3.59	764.03	0.00	0.00	764.14	0.09	0.33	0.00	762.60
250.	16.	232.	2.	46.	95.	11.	0.	0.	763.40
0.00	0.34	2.45	0.23	0.100	0.040	0.100	0.039	760.20	830.10
0.000951	60.	60.	40.	2	0	0	0.00	155.53	985.63

*SECNO 175.000

D/S FACE OF DAM

175.00	3.93	764.13	0.00	0.00	764.21	0.08	0.00	0.00	762.60
250.	17.	230.	3.	50.	96.	12.	0.	0.	763.40
0.01	0.34	2.40	0.23	0.100	0.042	0.100	0.039	760.20	830.10
0.000897	35.	35.	35.	0	0	0	0.00	157.45	987.55

*SECNO 180.000

SECNO	DEPTH	CWSEL	CRWS	WSELK	EG	HV	HL	CLOSS	BANK ELEV
Q	XLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IHZ	ICONT	CORAR	TOPWID	ENDST

3685 20 TRIALS ATTEMPTED WSEL>CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

CENTER OF DAM

180.00	1.35	764.15	764.15	0.00	764.69	0.54	0.01	0.08	762.80
250.	68.	172.	11.	56.	31.	12.	3.	0.	763.40
0.01	1.26	5.63	0.85	0.100	0.030	0.100	0.038	762.80	830.10
0.012054	5.	5.	5.	20	23	0	0.00	158.12	988.22

*SECNO 185.000

SECNO	DEPTH	CWSEL	CRWS	WSELK	EG	HV	HL	CLOSS	BANK ELEV
Q	XLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IHZ	ICONT	CORAR	TOPWID	ENDST

U/S FACE OF DAM

185.00	4.27	764.47	0.00	0.00	764.53	0.06	0.01	0.03	762.80
250.	29.	213.	6.	03.	106.	29.	0.	0.	763.40
0.01	0.34	2.03	0.26	0.100	0.040	0.100	0.036	760.20	830.09
0.000565	5.	5.	5.	2	0	0	0.00	165.23	995.32

*SECNO 225.000

45' U/S OF DAM

225.00	4.30	764.50	0.00	0.00	764.55	0.05	0.02	0.00	762.80
250.	29.	214.	7.	05.	107.	26.	0.	0.	763.40
0.02	0.34	2.01	0.26	0.100	0.040	0.100	0.036	760.20	830.09
0.000547	40.	40.	40.	2	1	0	0.00	165.26	995.37

*SECNO 395.000

395.00	3.11	764.61	0.00	0.00	764.72	0.11	0.16	0.02	763.00
250.	17.	211.	22.	25.	72.	33.	1.	1.	763.30
0.03	3.64	3.92	0.68	0.100	0.040	0.100	0.039	761.50	924.49
0.001848	160.	170.	160.	2	0	0	0.00	91.66	986.15

*SECNO 563.000

3301 NW CHANGED MORE THAN MINS

565.00	2.49	764.99	0.00	0.00	765.61	0.62	0.73	0.15	765.00
250.	0.	250.	0.	0.	39.	0.	1.	1.	765.00
0.06	0.00	6.34	3.00	0.100	0.040	0.100	0.39	752.50	927.11
0.019559	160.	170.	160.	3	0	0	0.30	20.01	955.52

*SECNO 752.000

100' D/S OF KING HIGHWAY

752.00	3.19	756.39	0.00	0.00	766.80	0.21	1.25	1.04	756.00
250.	1.	249.	0.	2.	67.	0.	2.	1.	766.20
0.06	0.42	3.70	0.32	0.100	0.040	0.100	0.040	763.50	921.18
0.003326	180.	187.	180.	2	0	0	0.00	36.19	957.38

CCHV= 0.300 CEHV= 0.500

*SECNO 802.000

SECNO	DEPTH	CHSEL	CRIWS	WSELK	EG	KV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTM	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	XTRIAL	IM?	ICONT	CORIR	TOPWID	ENDST

3470 ENCROACHMENT STATIONS= 922.0 959.5 TYPE= 1 TARGET= 37.500

35' D/S OF KING HIGHWAY

802.00	2.85	766.85	0.00	0.00	767.15	0.31	0.21	0.05	756.20
250.	1.	249.	0.	1.	56.	0.	2.	1.	767.00
0.06	2.52	4.43	3.03	0.100	0.040	0.100	0.040	764.00	926.36

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0.005333	50.	50.	50.	2	0	0	0.00	29.30	953.76

*SECNO 827.000

827.00	2.75	765.95	0.00	0.00	767.38	0.43	0.17	0.06	767.60
250.	0.	250.	0.	0.	46.	0.	2.	1.	767.50
0.06	0.00	5.24	0.00	0.100	0.060	0.100	0.042	764.20	1195.30
0.008958	25.	25.	25.	0	0	0	0.00	25.08	1220.64

*SECNO 852.000

3301 HV CHANGED MORE THAN HVINS

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 772.10 ELREA= 772.10

D/S FACE KING HIGHWAY

852.00	2.55	766.95	0.00	0.00	768.03	1.08	0.32	0.33	764.70
250.	0.	250.	0.	0.	30.	0.	2.	1.	764.80
0.06	0.00	8.33	0.00	0.100	0.040	0.100	0.039	764.40	1201.70
0.019871	25.	25.	25.	2	0	2	0.00	12.60	1214.30

*SECNO 853.000

3370 NORMAL BRIDGE,NRB= 9 MIN ELTRD= 777.50 MAX ELLC= 772.12

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 777.50 ELREA= 777.50

1 FT. INSIDE D/S END OF KING HWY. BRIDGE

853.00	2.37	766.97	0.00	0.20	768.25	1.08	0.01	0.00	764.70
250.	0.	250.	0.	0.	30.	0.	2.	1.	764.60
0.06	0.00	8.33	0.00	0.100	0.030	0.100	0.039	764.40	1201.70
0.011099	1.	1.	1.	0	0	0	-6.26	12.60	1214.30

*SECNO 922.000

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE,NRB= 9 MIN ELTRD= 777.50 MAX ELLC= 772.20

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 777.50 ELREA= 777.50

1 FT. INSIDE U/S END OF KING HWY. BRIDGE

922.00	3.60	768.10	0.00	0.00	768.62	0.52	0.41	0.17	764.80
250.	0.	250.	0.	0.	43.	0.	2.	1.	764.90
0.06	0.00	5.81	0.00	0.100	0.030	0.100	0.039	764.50	1201.70
0.003681	69.	69.	69.	2	0	0	-13.52	12.60	1214.30

*SECNO 923.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	EL	QLOSS	BANK ELEV
									LEFT/RIGHT

TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	MTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IN2	ICONT	CORAR	TOPWID	ENDST

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 777.10 ELREA= 777.30

U/S FACE KING HIGHWAY

923.30	3.61	760.11	0.00	0.00	768.63	3.52	0.00	0.00	764.01
250.	0.	250.	0.	0.	43.	0.	2.	1.	766.50
0.06	0.00	5.79	0.00	0.100	0.040	0.100	0.039	764.50	1201.70
0.006426	1.	1.	1.	0	0	0	0.00	12.60	1214.30

CONV= 0.100 CEFV= 0.300
*SECNO 1025.000

VALLEY SECT. BASED ON ABRAMS #22 APPROX. 100 FT. U/S OF KING HIGHWAY

1025.00	3.36	768.96	0.00	0.00	769.12	0.15	0.45	0.04	765.70
250.	0.	246.	4.	1.	77.	6.	2.	1.	767.60
0.07	0.34	5.10	0.60	0.100	0.040	0.100	0.039	765.60	1184.48
0.003263	102.	102.	102.	2	0	0	0.00	33.06	1230.36

*SECNO 1100.000

1100.00	2.76	769.24	0.00	0.00	769.51	0.27	0.37	0.03	769.00
250.	0.	250.	0.	0.	82.	0.	2.	2.	769.20
0.02	0.01	4.03	0.01	0.100	0.040	0.100	0.039	766.50	1182.74
0.008117	75.	75.	75.	2	0	0	0.00	47.88	1230.62

*SECNO 1175.000

APPROX. 250' U/S OF KING HIGHWAY

1175.00	2.61	770.01	0.00	0.00	770.41	0.40	0.85	0.04	770.00
250.	0.	250.	0.	0.	49.	0.	2.	2.	770.00
0.03	0.02	5.09	0.02	0.100	0.040	0.100	0.039	767.40	965.09
0.016074	70.	75.	70.	4	0	0	0.00	44.06	1010.04

*SECNO 1325.000

APPROX. 400' U/S OF KING HIGHWAY

1325.00	2.56	771.76	0.00	0.00	772.13	0.43	1.78	0.04	772.02
250.	0.	245.	5.	0.	46.	7.	2.	2.	771.00
0.09	0.00	5.33	0.73	0.100	0.040	0.100	0.039	769.20	965.51
0.008790	145.	150.	145.	2	0	0	0.00	41.03	1006.54

*SECNO 1603.000

SECNO	DEPTH	CHSEL	CRIWS	HSELK	EG	HV	HL	QLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	MTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IN2	ICONT	CORAR	TOPWID	ENDST

VALLEY SECT. BASED ON ABRAMS #23 83' D/S OF MICHIGAN AVE.

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1485.00	2.27	773.47	773.37	0.00	774.12	0.64	1.36	0.06	774.40
250.	0.	245.	5.	0.	38.	5.	3.	2.	772.73
0.10	0.00	6.50	0.99	0.100	0.040	0.100	0.039	771.20	967.21
0.016046	155.	160.	155.	4	15	0	0.00	34.60	1001.81

*SECNO 1512.000

1512.00	2.06	774.06	0.00	0.00	774.48	0.42	0.34	0.02	774.50
250.	0.	247.	3.	0.	47.	3.	3.	2.	773.00
0.10	0.00	5.25	0.97	0.100	0.040	0.100	0.039	772.00	966.78
0.010281	27.	27.	27.	3	3	0	0.00	34.09	1000.86

*SECNO 1538.000

SECNO	DEPTH	CHSEL	CRIWS	HSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	HTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IN2	ICONT	CORAR	TOPWID	ENDST

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1538.00	1.65	774.75	774.75	0.00	775.41	0.66	0.39	0.07	775.60
250.	0.	250.	0.	0.	31.	0.	3.	2.	775.00
0.10	0.00	6.50	0.00	0.100	0.040	0.100	0.039	773.10	966.73
0.021966	26.	26.	26.	20	15	0	0.00	29.50	996.22

CCHV= 0.300 CEHV= 0.500
*SECNO 1568.000

SECNO	DEPTH	CWSEL	CRIWS	HSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	HTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IN2	ICONT	CORAR	TOPWID	ENDST

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 787.70 ELREA= 787.70

D/S FACE OF MICHIGAN AVE. BRIDGE

1568.00	1.54	775.84	775.84	0.00	776.48	0.64	0.66	0.01	776.60
250.	0.	250.	0.	0.	39.	0.	3.	2.	776.70
0.10	0.00	6.40	0.00	0.100	0.040	0.100	0.039	774.30	697.29
0.022208	30.	30.	30.	2	11	0	0.00	31.04	728.33

*SECNO 1569.000

3370 NORMAL BRIDGE,NRD= 6 MIN ELTRD= 787.70 MAX ELLC= 783.90

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 787.70 ELREA= 787.70

1 FT. INSIDE D/S END OF MICHIGAN AVE. BRIDGE

1569.00	1.85	776.15	0.00	0.00	776.56	0.41	0.01	0.07	776.60
250.	0.	250.	0.	0.	49.	0.	3.	2.	776.70
0.10	0.00	5.12	0.00	0.100	0.030	0.100	0.039	774.30	695.76

0.006539	1.	1.	1.	6	0	0	0.00	33.30	729.06

*SECNO 1621.000

SECNO	DEPTH	CHSEL	CRIWS	WSELK	EG	FV	HL	DLOSS	BANK ELEV
Q	SLOB	OCH	ORCB	ALOB	ACH	AROB	VOL	TOP	LEFT/RIGHT
TIME	WLOB	VCH	VROB	WNL	WMCH	WNR	WTH	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

3370 NORMAL BRIDGE,NRD= 6 MIN ELTRD= 787.70 MAX ELLC= 796.40

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 787.70 ELREA= 787.70

1 FT. INSIDE U/S END OF MICHIGAN AVE. BRIDGE

1621.00	1.70	776.50	0.00	0.00	777.00	0.50	0.39	0.05	777.10
250.	0.	250.	0.	0.	44.	0.	3.	2.	777.20
0.10	0.00	5.66	0.00	0.100	0.030	0.100	0.039	774.80	696.48
0.005779	52.	52.	52.	3	0	3	0.00	32.25	728.72

*SECNO 1622.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 787.70 ELREA= 787.70

U/S FACE OF MICHIGAN AVE. BRIDGE

1622.00	1.71	776.51	0.00	0.00	777.01	0.50	0.01	0.00	777.10
250.	0.	250.	0.	0.	66.	0.	3.	2.	777.20
0.10	0.00	5.65	0.00	0.100	0.040	0.100	0.039	774.50	695.47
0.015519	1.	1.	1.	0	2	0	0.00	32.25	728.72

*SECNO 1631.000

SECNO	DEPTH	CHSEL	CRIWS	WSELK	EG	HV	HL	CLOSS	BANK ELEV
Q	SLOB	OCH	ORCB	ALOB	ACH	AROB	VOL	TOP	LEFT/RIGHT
TIME	WLOB	VCH	VROB	WNL	WMCH	WNR	WTH	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3695 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 790.00 ELREA= 789.90

D/S FACE OF R.R. BRIDGE

1631.00	1.34	776.64	776.64	0.00	777.28	0.64	0.17	0.07	777.40
250.	0.	250.	0.	0.	39.	0.	3.	2.	777.50
0.11	0.00	6.41	0.00	0.100	0.040	0.100	0.039	775.10	697.30
0.022389	9.	9.	9.	2	11	0	0.00	31.03	728.32

*SECNO 1632.000

3370 NORMAL BRIDGE,NRD= 6 MIN ELTRD= 789.90 MAX ELLC= 793.90

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3695 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      790.00 ELREA=      789.90

        1 FT. INSIDE D/S END OF R.R. BRIDGE

  1632.00     1.85   776.95     0.00     0.00   777.36     0.41     0.01     0.07   777.40
     250.       0.     250.       0.       0.      49.       0.       3.       2.    777.50
     0.11     0.00     5.12     0.00    0.100    0.030    0.100    0.039   775.10   695.77
 0.006567       1.       1.       1.        6        0        0     0.00    33.29   729.36

*SECNO 1659.000

3370 NORMAL BRIDGE,NRD=  6 MIN ELTRD=  789.90 MAX ELLC=  784.30

3695 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      790.00 ELREA=      789.90

        1 FT. INSIDE U/S END OF R.R. BRIDGE

  1659.00     1.59   777.09     0.00     0.00   777.67     0.58     0.23     0.09   777.80
     250.       0.     250.       0.       0.      41.       0.       3.       2.    777.90
     0.11     0.00     6.13     0.00    0.100    0.030    0.100    0.038   775.50   697.01
 0.011046      27.      27.      27.        2        0        0     0.00    31.45   728.46

*SECNO 1660.000
   SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
   Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      THA     LEFT/RIGHT
   TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
   SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IH2      ICONT    CORAR    TOPWID     ENDST

3695 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      790.00 ELREA=      789.90

        U/S FACE OF R.R. BRIDGE

  1660.00     1.60   777.19     0.00     0.00   777.69     0.58     0.01     0.00   777.60
     250.       0.     250.       0.       0.      41.       0.       3.       2.    777.90
     0.11     0.00     6.13     0.00    0.100    0.040    0.100    0.038   775.50   697.01
 0.019605       1.       1.       1.        0        0        0     0.00    31.46   728.46

*SECNO 1690.000
   SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
   Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      THA     LEFT/RIGHT
   TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
   SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IH2      ICONT    CORAR    TOPWID     ENDST

7103 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  1690.00     1.55   777.75   777.75     0.00   778.38     0.63     0.62     0.02   778.50
     250.       0.     250.       0.       0.      39.       0.       3.       2.    778.60
     0.11     0.00     6.37     0.00    0.100    0.040    0.100    0.038   776.20   697.26
 0.022000      30.      30.      30.        2        6        0     0.00    31.08   728.34

CCHV=   0.100 CEHV=   0.300
*SECNO 1720.000
   SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
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Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IHZ	ICONT	CORAR	TOPWID	ENDST
7185 MINIMUM SPECIFIC ENERGY									
3720 CRITICAL DEPTH ASSUMED									
1720.00	1.54	778.44	778.44	0.00	779.08	0.64	0.67	0.00	779.20
250.	0.	250.	0.	0.	39.	0.	3.	2.	779.30
0.11	0.00	6.41	0.00	0.100	0.040	0.100	0.038	776.90	697.30
0.022377	30.	30.	30.	0	5	5	0.00	31.05	726.32

*SECNO 1750.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	QLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IHZ	ICONT	CORAR	TOPWID	ENDST
7185 MINIMUM SPECIFIC ENERGY									
3720 CRITICAL DEPTH ASSUMED									
VALLEY SECTION D/S OF DAM									
1750.00	1.54	779.14	779.14	0.00	779.78	0.63	0.67	0.00	779.90
250.	0.	250.	0.	0.	39.	0.	3.	2.	780.00
0.11	0.00	6.39	0.00	0.100	0.040	0.100	0.038	777.60	697.28
0.022200	30.	30.	30.	0	5	0	0.00	31.05	728.33

SPECIAL BRIDGE

SS	XK	NCOR	COPS	BOLEN	B.C	B.P	SAREA	SS	ELCHO	ELCHD
	0.00	1.50	2.63	0.00	0.10	1.00	0.10	0.10	737.50	777.80

CCHV= 0.300 CEHV= 0.500

*SECNO 1794.000

3301 HV CHANGED MORE THAN XVINS

PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
146353.60	790.09	0.00	240.	2.	0.	0.	739.20	739.20

U/S OF DAM

1796.00	3.91	791.97	0.00	0.00	791.94	0.02	12.16	0.00	793.00
250.	66.	124.	60.	126.	74.	112.	3.	2.	780.00
0.12	0.53	1.68	0.53	0.100	0.040	0.100	0.038	788.00	0.00
0.000330	44.	44.	44.	2	0	10	0.00	100.00	100.00

*SECNO 1894.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	VV	HL	QLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IHZ	ICONT	CORAR	TOPWID	ENDST

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        100FT U/S OF DAM

  1894.00     4.34   791.54     0.00     0.00   791.95     0.01     0.01     0.00   791.00
     250.       0.     250.       0.       1.     332.       1.       4.       2.   791.60
     0.16     0.02     0.71     0.04    0.100    0.035    0.080    0.038   787.60   863.71
 0.000047     100.     100.     100.        2        0        0     0.00   111.18   974.89

CCHV=   0.100 CEHV=   0.300
*SECNO 2300.000
  2300.00     2.66   791.96     0.00     0.00   792.01     0.05     0.05     0.01   792.00
     250.       0.     250.       0.       0.     143.       0.       6.       3.   792.00
     0.23     0.00     1.75     0.00    0.100    0.035    0.080    0.038   789.30   893.22
 0.000627     390.     406.     390.        2        0        0     0.00    87.60   960.03

*SECNO 2784.000

        VALLEY SECT. BASED ON ABRAMS #26 80' D/S OF DRAN RD. CULVERT

  2784.00     1.40   792.48     0.00     0.00   792.90     0.62     0.70     0.11   791.20
     250.       2.     236.      11.       2.      44.       0.       7.       4.   791.20
     0.25     1.07     5.35     1.40    0.100    0.035    0.080    0.037   791.00  1535.64
 0.010366     470.     484.     470.        4        0        0     0.00    48.15  1583.79

*SECNO 2824.000
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IH2       ICONT     CORAR     TOPWID      ENDST

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  2824.00     2.17   793.77   793.77     0.00   794.59     0.82     0.49     0.12   793.00
     250.       1.     248.       1.       1.      34.       1.       7.       4.   793.00
     0.25     0.93     7.31     1.17    0.100    0.035    0.080    0.037   791.60  1544.44
 0.014960      40.      40.      40.       20       14        0     0.00    25.13  1569.56

CCHV=   0.300 CEHV=   0.500
*SECNO 2864.000

3301 HV CHANGED MORE THAN HVINS

   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IH2       ICONT     CORAR     TOPWID      ENDST

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=       797.00 ELREA=       797.00

        D/S FACE OF DRAN RD. CULVERT
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  2864.00     3.40   795.30   795.30     0.00   796.88     1.57     0.70     0.38   793.90
     250.       0.     250.       0.       0.      25.       0.       7.       4.   793.90
     0.25     0.00    10.07     0.00    0.100    0.035    0.080    0.037   791.90   758.00
 0.020994      40.      40.      40.       20       14        0     0.00     8.00   766.00

*SECNO 2865.000
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        CLOSS   BANK ELEV
   Q         QLOB      QCH       QROB      ALOB'     ACH       AROB      VOL       THA     LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       LTM       ELMIN      SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IN2       ICONT     CORAR     TOPWID     ENDST

3370 NORMAL BRIDGE,NRD= 11 MIN ELTRD=  801.00 MAX ELLC=  797.80

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      797.00 ELREA=      797.00

  2865.00     3.41   795.31   795.28     0.00   796.91     1.60     0.02     0.01   793.90
     250.       0.     250.       0.       0.      25.       0.       7.       4.   793.90
     0.25     0.00    10.15     0.00    0.100    0.030    0.080    0.037   791.90   758.00
 0.016796       1.       1.       1.        2       12        0    -5.84     8.00   766.00

*SECNO 2901.000

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE,NRD= 11 MIN ELTRD=  801.00 MAX ELLC=  797.80

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      799.00 ELREA=      799.00

  2901.00     4.76   796.66     0.00     0.00   797.52     0.86     0.39     0.22   793.90
     250.       0.     250.       0.       0.      34.       0.       7.       4.   793.90
     0.26     0.00     7.44     0.00    0.100    0.030    0.080    0.037   791.90   758.00
 0.007649      36.      36.      36.        3        0        0   -15.26     8.00   766.00

CCHV=   0.300 CEHV=   0.500
*SECNO 2902.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      801.00 ELREA=      801.00

        U/S FACE OF DRAW RD. CULVERT

  2902.00     5.00   796.90     0.00     0.00   797.58     0.69     0.01     0.05   793.90
     250.       0.     250.       0.       0.      38.       0.       7.       4.   793.90
     0.26     0.00     6.64     0.00    0.100    0.035    0.080    0.037   791.90   758.00
 0.006219       1.       1.       1.        2        0        0     0.00     8.00   766.00

*SECNO 2922.000

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS=      701.0      823.0  TYPE=      1  TARGET=      122.000

        VALLEY SECT. D/S OF DAM
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2922.00	4.55	797.75	0.00	0.00	797.79	0.04	0.02	0.19	797.80
250.	0.	250.	0.	0.	154.	0.	7.	4.	797.80
0.26	0.00	1.62	0.00	0.100	0.035	0.080	0.037	793.20	743.06
0.000276	20.	20.	20.	2	0	0	0.00	41.83	784.90

SPECIAL BRIDGE

SB	XK	XKOR	COEF	BDLEN	BWC	ELP	BAREA	SS	ELCHD	ELCHD
	0.00	1.50	2.63	0.30	0.10	0.00	0.10	0.10	803.90	792.20

*SECNO 2957.000

PRESSURE AND WEIR FLOW

EGPRS	EGLWC	WS	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
146372.20	810.49	0.00	249.	2.	0.	0.	805.90	805.90

JUST U/S OF DAM

2957.00	5.77	809.77	0.00	0.00	809.81	0.05	12.02	0.00	808.00
250.	46.	160.	43.	100.	73.	75.	8.	4.	808.00
0.26	0.47	2.20	0.58	0.100	0.035	0.080	0.037	804.00	0.00
0.000479	35.	35.	35.	2	0	11	0.00	112.00	112.00

*SECNO 3200.000

2800 NAT Q1= 261.00 WSEL= 809.87 ENC Q1= 261.00 WSEL= 809.97 RATIO= 0.0000

NAT Q1= 276. RATIOS LOB,CH,ROB= 0.3543 0.6312 0.0145 WSEL= 809.97

SECNO	DEPTH	CWSEL	CWPS	WSELR	EG	FW	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	A_OB	ACH	AROB	VOL	THR	LEFT/RIGHT
TIME	VLOB	VCH	VROB	KNL	KNCH	KNR	MTA	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IN2	ICONT	CORAR	TOPWID	ENDST

3470 ENCROACHMENT STATIONS= 734.7 930.3 TYPE= 6 TARGET= 0.056

VALLEY SECTION U/S OF DAM

3280.00	5.68	809.88	0.00	809.87	809.89	0.01	0.06	0.01	809.70
250.	31.	169.	0.	333.	139.	0.	10.	5.	809.60
0.36	0.24	1.06	0.00	0.100	0.035	0.080	0.037	804.20	734.71
0.000102	323.	323.	323.	1	0	0	0.00	203.79	938.50

CCHV= 0.100 CEHV= 0.300

*SECNO 4280.000

2800 NAT Q1= 159.66 WSEL= 810.05 ENC Q1= 170.35 WSEL= 810.15 RATIO= -3.0682

NAT Q1= 172. RATIOS LOB,CH,ROB= 0.0027 0.9914 0.0059 WSEL= 810.15

3470 ENCROACHMENT STATIONS= 906.0 1004.0 TYPE= 6 TARGET= 0.009

VALLEY SECT. BASED ON ABRAMS #29

4280.00	2.83	810.07	0.00	810.05	810.09	0.02	0.20	0.00	809.13
250.	0.	250.	0.	0.	221.	0.	21.	10.	808.30
0.70	0.00	1.13	0.00	0.100	0.035	0.080	0.036	807.20	906.00
0.000251	1500.	1500.	1500.	2	0	0	0.00	98.00	1034.00

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*SECNO 4598.000
 2800 NAT Q1=      36.56  WSEL=     810.17  ENC Q1=      41.80  WSEL=     810.27  RATIO= -0.1455
 NAT Q1=      42.  RATIOS LOB,CH,ROB=  0.0025  0.9973  0.0000  WSEL=     810.27

3470 ENCROACHMENT STATIONS=      915.0     1000.0  TYPE=      4  TARGET=        0.003
  4598.00      1.70   810.20      0.00   810.17   810.33      0.13      0.21      0.03   809.50
     250.        0.     250.        0.       0.      85.        0.       22.       10.   810.50
     0.73      0.00     2.94      0.00    0.100    0.035     0.080     0.036   808.50   915.00
 0.004449      300.     318.      300.        3        0         0      0.00    79.71   994.71

*SECNO 4916.000
 2800 NAT Q1=      40.35  WSEL=     811.50  ENC Q1=      44.65  WSEL=     811.60  RATIO= -0.1066
 NAT Q1=      45.  RATIOS LOB,CH,ROB=  0.0088  0.9822  0.0090  WSEL=     811.60

3470 ENCROACHMENT STATIONS=      930.0     985.0  TYPE=      4  TARGET=        0.018
  4916.00      1.01   811.51      0.00   811.50   811.60      0.15      1.34      0.01   810.50
     250.        0.     250.        0.       0.      77.        0.       23.       11.   810.60
     0.75      0.00     3.26      0.00    0.100    0.035     0.080     0.036   809.70   930.00
 0.003975      300.     318.      300.        2        0         0      0.00    55.00   985.00

*SECNO 5234.000
 2800 NAT Q1=      28.41  WSEL=     813.08  ENC Q1=      30.71  WSEL=     813.18  RATIO= -0.0809
 NAT Q1=      32.  RATIOS LOB,CH,ROB=  0.0149  0.9654  0.0197  WSEL=     813.18

3470 ENCROACHMENT STATIONS=      935.0     975.0  TYPE=      4  TARGET=        0.035
  5234.00      1.64   813.14      0.00   813.08   813.45      0.32      1.75      0.05   812.00
     250.        0.     250.        0.       0.      55.        0.       23.       11.   812.00
     0.77      0.00     4.51      0.00    0.100    0.035     0.080     0.036   811.50   935.00
 0.007892      300.     318.      300.        2        0         0      0.00    40.00   975.00

*SECNO 5552.000
 2800 NAT Q1=      35.65  WSEL=     815.04  ENC Q1=      36.77  WSEL=     815.14  RATIO= -0.0314
 NAT Q1=      39.  RATIOS LOB,CH,ROB=  0.0316  0.9369  0.0315  WSEL=     815.14
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        DLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN      ESTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IF2       ICONT     CORAR     TOPWID     ENDET

3470 ENCROACHMENT STATIONS=      940.0     970.0  TYPE=      4  TARGET=        0.063
  5552.00      2.16   815.16      0.00   815.04   815.46      0.29      2.00      0.00   813.50
     250.        0.     250.        0.       0.      57.        0.       23.       11.   813.50
     0.79      0.00     4.36      0.00    0.100    0.035     0.080     0.036   813.00   940.00
 0.005147      300.     318.      300.        3        0         0      0.00    30.00   970.00

*SECNO 5872.000

3470 ENCROACHMENT STATIONS=      182.0    1392.0  TYPE=      1  TARGET=     1210.000

        VALLEY SECT. BASED ON ABRAMS #30

  5872.00      2.30   816.60      0.00   816.52   816.94      0.34      1.47      0.01   815.00
     250.        9.     220.       21.       11.      44.       20.       24.       12.   814.70
     0.81      0.82     4.95      1.07    0.100    0.035     0.080     0.036   813.80   802.06
 0.004151      300.     320.      300.        3        0         0      0.00    76.72   879.58
```

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*SECNO 6292.000
  6292.00     2.44   818.44     0.00   818.49   818.79     0.34     1.84     0.00   817.00
     250.       7.     242.       1.       9.      51.       1.      25.      12.   818.00
     0.84     0.83     4.78     0.47    0.100    0.035    0.080    0.036   816.00  1057.73
 0.004816     370.     420.     300.        2        0        0     0.00    42.49  1100.22

*SECNO 6712.000
  6712.00     2.50   820.50     0.00   820.48   820.84     0.34     2.05     0.00   819.50
     250.       3.     246.       1.       5.      52.       1.      25.      13.   820.00
     0.86     0.66     4.72     0.52    0.100    0.035    0.080    0.036   818.00  1060.32
 0.004993     370.     420.     300.        3        0        0     0.00    40.85  1101.17

*SECNO 7132.000

        VALLEY SECT. BASED ON ABRAMS #31

  7132.00     2.96   822.86     0.00   822.86   823.29     0.44     2.42     0.03   822.50
     250.       0.     250.       0.       0.      47.       0.      26.      13.   824.50
     0.88     0.37     5.34     0.00    0.100    0.035    0.080    0.036   819.90  1067.46
 0.006715     360.     420.     300.        3        0        0     0.00    25.29  1092.75

*SECNO 7332.000
    SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       DLOSS   BANK ELEV
    Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
    SLOPE    XLOBL    XLCH     XLOBR    XTRIAL   IHP      XCONT    CCRAR    TOPWID     ENDST

  7332.00     3.88   823.78     0.00   823.78   823.97     0.19     0.66     0.02   822.50
     250.       2.     248.       0.       4.      70.       0.      26.      13.   824.50
     0.90     0.48     3.54     0.00    0.100    0.035    0.080    0.036   819.90  1063.26
 0.001935     200.     200.     200.        2        0        0     0.00    31.89  1095.15

*SECNO 7532.000
  7532.00     4.25   824.15     0.00   824.15   824.30     0.15     0.32     0.00   822.50
     250.       3.     247.       0.       6.      80.       0.      26.      13.   824.50
     0.92     0.47     3.09     0.00    0.100    0.035    0.080    0.036   819.90  1061.57
 0.001315     225.     200.     180.        2        0        0     0.00    36.53  1096.11

*SECNO 7800.000

3670 ENCROACHMENT STATIONS=     615.0     825.0  TYPE=     1  TARGET=     210.000

        VALLEY SECT. BASED ON ABRAMS #32

  7800.00     4.59   824.39     0.00   824.39   824.41     0.02     0.10     0.01   822.40
     250.      35.     214.       2.     163.     169.       8.      28.      14.   823.20
     0.99     0.21     1.27     0.21    0.100    0.035    0.080    0.036   819.80   615.00
 0.000171     268.     268.     268.        2        0        0     0.00   210.00   825.00

*SECNO 7990.000

        D/S FACE OF MAIN ST.

  7990.00     4.76   824.46     0.00   824.43   824.45     0.01     0.04     0.00   820.40
     250.      79.      49.     122.     172.      29.     249.      29.      15.   820.50
     1.06     0.46     1.68     0.49    0.100    0.035    0.080    0.036   819.70   818.21
 0.000266     190.     190.     190.        2        0        0     0.00   208.82  1027.03
```

SPECIAL BRIDGE

SB	XK	XKOR	COFC	RDLEN	B.C	BUP	BAREA	SS	ELCFO	ELCHD
	0.00	4.20	3.00	0.00	3.90	0.00	7.00	0.00	820.10	819.70

*SECNO 8034.000
PRESSURE AND WEIR FLOW

EGPRS	EGLEC	HB	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
907.62	824.85	0.00	218.	32.	7.	7.	821.90	824.60

U/S FACE OF MAIN ST. CULVERTS

8034.00	6.14	825.84	0.00	825.84	825.84	0.00	1.39	0.00	820.40
250.	76.	36.	138.	272.	37.	435.	30.	15.	820.50
1.09	0.28	0.96	0.32	0.100	0.035	0.080	0.036	819.70	816.45
0.000038	46.	44.	46.	0	0	0	0.00	211.59	1028.03

*SECNO 8084.000

SECNO	DEPTH	CHSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOE	QCH	QROE	ALOE	ACH	AROE	VCL	THA	LEFT/RIGHT
TIME	VLOE	VCH	VROE	XNL	XNCH	XNR	HYX	ELMIN	SSTA
SLOPE	XLOEL	XLCH	XLOER	ITRIAL	THR	ICONT	CORAR	TOPWID	ENDST

VALLEY SECT. APPROX. 50 FT. U/S OF MAIN ST.

8034.00	6.14	825.84	0.00	825.84	825.84	0.00	0.00	0.00	820.40
250.	76.	36.	138.	272.	37.	436.	31.	15.	820.50
1.12	0.28	0.96	0.32	0.100	0.035	0.080	0.036	819.70	816.44
0.000057	50.	50.	50.	0	0	0	0.00	211.59	1028.03

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FORM 1411-00 PRINTED BY ROTARY MANIFOLD FORMS

00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: COMSTOCK TWP

3) WATERCOURSE: COMSTOCK CREEK

4) DOCUMENT TYPE: 100 yr NATURAL RUN

00BREAK00

*PROF 1

CCHV= 0.100 CEHV= 0.300

*SECNO 100.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	QLOSS	BANK ELEV
Q	SLOP	QCH	QROB	QLOB	ACH	AROB	WOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	STN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IN2	ICONT	CORAR	TOPWID	ENDST

100' U/S OF MOUTH AT KALAMAZOO RIVER-75' D/S OF DAM

100.00	3.80	764.00	0.00	764.00	764.12	0.12	0.00	0.00	763.40
250.	7.	243.	0.	24.	85.	0.	0.	0.	764.00
0.00	0.27	2.63	0.00	0.100	0.040	0.100	0.039	760.20	830.10
0.001552	0.	0.	0.	0	0	0	0.00	155.00	955.00

FLOW DISTRIBUTION FOR SECNO= 100.00 CHSEL= 764.00

STA=	820.	880.	926.	955.
PER Q=	0.3	2.3	97.4	
AREA=	6.0	18.4	35.0	
VEL=	0.1	0.3	2.9	

*SECNO 140.000

140' U/S OF MOUTH-35' D/S OF DAM

140.00	3.89	764.09	0.00	0.00	764.18	0.09	0.05	0.00	762.80
250.	16.	232.	2.	46.	95.	11.	0.	0.	763.40
0.00	0.34	2.65	0.23	0.100	0.040	0.100	0.039	760.20	830.10
0.000951	40.	40.	40.	2	0	0	0.00	155.53	985.63

FLOW DISTRIBUTION FOR SECNO= 140.00 CHSEL= 764.09

STA=	830.	880.	926.	955.	986.
PER Q=	0.6	5.7	92.3	1.0	
AREA=	9.4	36.3	94.3	10.6	
VEL=	0.2	2.4	2.6	0.2	

*SECNO 175.000

D/S FACE OF DAM

175.00	3.93	764.13	0.00	0.00	764.21	0.08	0.03	0.00	762.80
250.	17.	230.	3.	50.	96.	12.	0.	0.	763.40
0.01	0.34	2.40	0.23	0.100	0.040	0.100	0.039	760.20	830.10
0.000897	35.	35.	35.	0	0	0	0.00	157.45	987.55

FLOW DISTRIBUTION FOR SECNO= 175.00 CHSEL= 764.13

STA=	830.	880.	926.	955.	988.
PER Q=	0.0	6.0	92.1	1.1	
AREA=	11.6	33.3	93.1	11.9	
VEL=	0.2	0.4	2.4	0.2	

*SECNO 180.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	QLOSS	BANK ELEV
Q	SLOP	QCH	QROB	QLOB	ACH	AROB	WOL	TWA	LEFT/RIGHT

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TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

CENTER OF DAM

180.00	1.36	764.15	764.15	0.00	764.49	0.34	0.01	0.08	762.80
250.	68.	172.	11.	54.	31.	12.	0.	0.	763.40
0.01	1.26	5.63	0.83	0.100	0.030	0.100	0.030	762.80	830.12
0.012054	5.	5.	5.	20	23	0	0.00	158.12	988.22

FLOW DISTRIBUTION FOR SECNO= 180.00 CWSEL= 764.15

STA=	830.	880.	926.	955.	988.
PER Q=	4.3	22.8	68.7	4.2	
AREA=	14.8	39.0	30.5	12.4	
VEL=	0.7	1.5	5.6	0.8	

*SECNO 185.000

SECNO	DEPTH	CWSEL	CRWS	WSELK	EG	HV	EL	CLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

U/S FACE OF DAM

185.00	4.27	764.47	0.00	0.00	764.53	0.06	0.01	0.03	762.80
230.	28.	215.	6.	89.	100.	25.	2.	0.	763.40
0.01	0.34	2.03	0.26	0.100	0.040	0.100	0.030	762.80	830.09
0.000565	5.	5.	5.	2	0	0	0.00	165.23	995.32

FLOW DISTRIBUTION FOR SECNO= 185.00 CWSEL= 764.47

STA=	830.	880.	926.	955.	995.
PER Q=	2.0	8.5	86.1	3.4	
AREA=	28.7	54.1	106.0	25.0	
VEL=	0.2	0.4	2.0	0.3	

*SECNO 225.000

45' U/S OF DAM

225.00	4.30	764.50	0.00	0.00	764.55	0.05	0.02	0.00	762.80
250.	29.	214.	7.	85.	107.	26.	0.	0.	763.40
0.02	0.34	2.01	0.26	0.100	0.040	0.100	0.030	762.80	830.09
0.000567	40.	40.	40.	2	2	0	0.00	165.28	995.37

FLOW DISTRIBUTION FOR SECNO= 225.00 CWSEL= 764.50

STA=	830.	880.	926.	955.	995.
PER Q=	2.9	8.8	85.7	2.7	
AREA=	29.9	55.9	106.7	25.9	
VEL=	0.2	0.4	2.0	0.3	

*SECNO 395.000

395.00	3.1[illegible]	764.61	0.00	0.00	764.72	0.11	0.15	0.02	763.00
250.	17.	21[illegible].	22.	25.	72.	33.	1.	1.	763.00
0.03	0.68	2.92	0.68	0.100	0.040	0.100	0.039	761.50	904.49
0.001848	160.	170.	160.	2	0	0	0.00	81.66	986.15

FLOW DISTRIBUTION FOR SECNO= 395.00 CHSEL= 764.61

STA=	904.	905.	927.	956.	985.	986.
PER Q=	0.0	6.7	84.4	8.8	0.0	
AREA=	0.2	24.5	72.2	32.2	2.4	
VEL=	0.2	0.7	2.9	0.7	0.3	

*SECNO 565.000

3301 HV CHANGED MORE THAN HVINS

565.00	2.49	764.99	0.00	0.00	765.61	0.62	0.73	0.15	765.00
250.	0.	250.	0.	0.	39.	0.	1.	1.	765.00
0.04	0.00	6.34	0.00	0.100	0.040	0.100	0.039	762.50	927.11
0.019559	160.	170.	160.	3	0	0	0.00	28.81	955.92

FLOW DISTRIBUTION FOR SECNO= 565.00 CHSEL= 764.99

STA=	927.	956.
PER Q=	100.0	
AREA=	39.6	
VEL=	6.3	

*SECNO 752.000

100' D/S OF KING HIGHWAY

752.00	3.19	766.65	0.00	0.00	766.90	0.25	1.25	0.04	766.00
250.	1.	249.	0.	2.	37.	0.	2.	1.	766.20
0.06	0.42	3.70	0.32	0.100	0.040	0.100	0.040	763.50	921.13
0.003326	180.	187.	180.	2	0	0	0.00	36.19	957.38

FLOW DISTRIBUTION FOR SECNO= 752.00 CHSEL= 766.65

STA=	921.	927.	956.	957.
PER Q=	0.3	99.6	0.0	
AREA=	2.0	67.3	0.3	
VEL=	0.4	3.7	0.3	

CCHV= 0.300 CEHV= 0.500

*SECNO 802.000

SECNO	DEPTH	CHSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	NTN	ELMIN	SSTA
SLOPE	XLCBL	XLCH	XLCBR	ITRIAL	IN2	ICONT	CORAT	TOPWID	CHOST

3470 ENCROACHMENT STATIONS= 922.0 959.5 TYPE= 1 TARGET= 37.500

50' D/S OF KING HIGHWAY

802.00	2.[illegible]	766.85	0.[illegible]	0.00	767.15	0.3[illegible]	0.21	0.05	766.20
250.	1.	249.	0.	1.	56.	0.	2.	1.	767.00
0.06	0.5[illegible]	4.45	0.00	0.100	0.040	0.100	0.040	764.00	926.[illegible]6
0.005333	50.	50.	50.	2	0	0	0.00	29.30	955.76

FLOW DISTRIBUTION FOR SECNO= 802.00 CWSEL= 766.85

STA=	924.	928.	954.						
PER Q=	0.2	99.8							
AREA=	1.2	56.1							
VEL=	0.5	4.4							

*SECNO 827.000

827.00	2.75	766.93	0.00	0.00	767.38	0.53	0.17	0.06	767.60
250.	0.	250.	0.	0.	40.	0.	2.	1.	767.50
0.06	0.00	5.26	0.00	0.100	0.340	0.100	1.040	764.20	1195.56
0.008958	25.	25.	25.	0	0	0	0.00	25.08	1220.64

FLOW DISTRIBUTION FOR SECNO= 827.00 CWSEL= 766.93

STA=	1196.	1222.	
PER Q=	100.0		
AREA=	47.5		
VEL=	5.3		

*SECNO 352.000

3301 HV CHANGED MORE THAN HVINS

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 772.10 ELREA= 772.10

D/S FACE KING HIGHWAY

852.00	2.55	766.95	0.00	0.00	768.03	1.08	0.32	0.33	764.70
250.	0.	250.	0.	0.	30.	0.	2.	1.	764.80
0.06	0.00	8.35	0.00	0.100	0.040	0.100	0.359	764.60	1201.70
0.019271	25.	25.	25.	2	0	1	0.00	12.60	1214.30

FLOW DISTRIBUTION FOR SECNO= 852.00 CWSEL= 766.95

STA=	1202.	1214.	
PER Q=	100.0		
AREA=	29.9		
VEL=	8.3		

*SECNO 853.000

3370 NORMAL BRIDGE,NRC= 9 MIN ELTRD= 777.50 MAX ELLC= 772.10

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 777.50 ELREA= 777.50

1 FT. INSIDE D/S END OF KING HWY. BRIDGE

853.00	2.57	766.97	0.00	0.30	768.05	1.08	0.01	0.00	764.70
250.	0.	250.	0.	0.	30.	0.	2.	1.	764.80
0.06	0.00	8.33	0.30	0.100	0.030	0.100	0.039	764.40	1201.70
0.011099	1.	1.	1.	0	0	0	-0.26	12.60	1214.30

FLOW DISTRIBUTION FOR SECNO= 853.00 CWSEL= 766.97

STA= 1202. 1214.
PER Q= 100.0
AREA= 30.0
VEL= 8.3

*SECNO 922.000

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE,NRD= 9 MIN ELTRD= 777.50 MAX ELLC= 772.20

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 777.50 ELREA= 777.50

1 FT. INSIDE U/S END OF KING HWY. BRIDGE

922.00	3.60	768.10	0.00	0.00	768.02	0.52	0.41	0.17	764.50
250.	0.	250.	0.	0.	43.	0.	2.	1.	764.90
0.06	0.00	5.81	0.00	0.100	0.030	0.100	0.039	764.50	1201.70
0.003661	69.	69.	69.	2	0	0	-13.52	12.60	1214.30

FLOW DISTRIBUTION FOR SECNO= 922.00 CWSEL= 768.10

STA= 1202. 1214.
PER Q= 100.0
AREA= 43.2
VEL= 5.8

*SECNO 923.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	XTF	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IBS	ICONT	CORAR	TOPWID	ENDST

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 777.50 ELREA= 777.50

U/S FACE KING HIGHWAY

923.00	3.61	768.11	0.00	0.00	768.63	0.52	0.00	0.00	764.80
250.	0.	250.	0.	0.	43.	0.	2.	1.	764.90
0.06	0.00	5.79	0.00	0.100	0.040	0.100	0.039	764.50	1201.70
0.006426	1.	1.	1.	0	0	0	0.00	12.60	1214.30

FLOW DISTRIBUTION FOR SECNO= 923.00 CWSEL= 768.11

STA= 1202. 1214.
PER Q= 100.0
AREA= 43.2
VEL= 5.8

CCHV= 0.100 CEHV= 0.300

*SECNO 1025.000

VALLEY SECT. BASED ON XSECS #22 APPROX. 700 FT. U/S OF KING HIGHWAY

1025.00	3.36	768.96	0.00	0.00	769.12	0.15	0.43	0.04	765.70
250	0	245	4	1	77	6	2	1	767.80

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     0.07      0.34      3.18      0.60     0.100     0.040     0.100     0.039    765.60   1184.40
 0.003263      102.      102.      102.         2         0         0      0.00     53.86   1230.34

FLOW DISTRIBUTION FOR SECNO=    1023.00          CWSEL=     768.96

STA=     1184.     1185.     1227.     1237.     1238.
  PER Q=       0.1      98.4       1.5       0.0
   AREA=       0.8      77.4       6.1       0.0
    VEL=       0.3       3.2       0.6       0.0

*SECNO 1100.000
  1100.00      2.76    769.26      0.00      0.00    769.51      0.25      0.37      0.03    769.00
     250.        0.      250.        0.        0.       62.        0.        2.        2.    769.20
     0.08      0.01      4.03      0.01     0.100     0.040     0.100     0.039    766.50   1182.74
 0.008117       75.       75.       75.         2         0         0      0.00     47.88   1230.62

FLOW DISTRIBUTION FOR SECNO=    1100.00          CWSEL=     769.26

STA=     1183.     1183.     1229.     1231.
  PER Q=       0.0     100.0       0.0
   AREA=       0.0      62.0       0.0
    VEL=       0.0       4.0       0.0

*SECNO 1175.000

        APPROX. 250' U/S OF KING HIGHWAY

  1175.00      2.61    770.01      0.00      0.00    770.41      0.40      0.85      0.04    770.00
     250.        0.      250.        0.        0.       49.        0.        2.        2.    770.00
     0.08      0.02      5.08      0.02     0.100     0.040     0.100     0.039    767.40    965.99
 0.016874       70.       75.       70.         4         0         0      0.00     44.06   1010.04

FLOW DISTRIBUTION FOR SECNO     1175.00          CWSEL=     770.01

STA=      966.     1010.
  PER Q=     100.0
   AREA=      49.2
    VEL=       5.1

*SECNO 1325.000

        APPROX. 400' U/S OF KING HIGHWAY

  1325.00      2.56    771.76      0.00      0.00    772.19      0.43      1.78      0.01    772.00
     250.        0.      245.        5.        0.       46.        7.        2.        2.    771.00
     0.09      0.00      5.33      0.73     0.100     0.040     0.100     0.039    769.20    965.51
 0.008790      145.      150.      145.         2         0         0      0.00     41.03   1006.54

FLOW DISTRIBUTION FOR SECNO=    1325.00          CWSEL=     771.76

STA=      966.      989.     1007.
  PER Q=      98.0       2.0
   AREA=      46.0       6.7
    VEL=       5.3       0.7

*SECNO 1485.000
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        CLOSS    BANK ELEV
   Q         QLCB      QCH       QROB      ALCB      ACH       ARCB      VOL       THA    LEFT/RIGHT
   TIME      VLCB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLCBL     XLCH      XLCBR     ITRIAL    IHP       TCONT     CORAR     TOPLID      ENDST
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VALLEY SECT. BASED ON ABRAMS #23 83' D/S OF MICHIGAN AVE.

1485.00	2.27	773.47	773.37	0.00	774.12	0.64	1.38	0.36	774.48
250.	0.	245.	5.	0.	35.	5.	3.	2.	772.70
0.10	0.00	6.50	0.99	0.100	0.040	0.100	0.039	771.20	967.21
0.016046	155.	160.	155.	4	15	0	0.00	34.60	1001.81

FLOW DISTRIBUTION FOR SECNO= 1485.00 CHSEL= 773.47

STA= 967. 990. 1002.
PER Q= 98.2 1.8
AREA= 37.8 4.5
VEL= 6.5 1.0

*SECNO 1512.000

1512.00	2.06	774.06	0.00	0.00	774.48	0.42	0.34	0.02	774.50
250.	0.	247.	3.	0.	47.	3.	3.	2.	773.00
0.10	0.00	5.25	0.97	0.100	0.040	0.100	0.039	772.00	966.76
0.010201	27.	27.	27.	3	0	1	0.00	34.06	1000.86

FLOW DISTRIBUTION FOR SECNO= 1512.00 CHSEL= 774.06

STA= 967. 995. 1001.
PER Q= 89.8 10.2
AREA= 47.0 3.1
VEL= 5.3 3.0

*SECNO 1538.000

SECNO	DEPTH	CHSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	CLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	MTH	ELMIN	SSTA
SLOPE	KLOBL	KLCH	KLOBR	ITRIAL	IK2	ICONT	CORAR	TOPWID	ENDST

3685 20 TRIALS ATTEMPTED WSEL,CHSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1538.00	1.46	776.75	776.75	0.00	775.41	0.66	0.98	0.07	775.30
250.	0.	250.	0.	0.	38.	0.	3.	2.	775.00
0.10	0.00	6.50	0.00	0.100	0.040	0.100	0.039	773.10	966.73
0.021966	26.	26.	26.	20	15	0	0.00	29.50	996.22

FLOW DISTRIBUTION FOR SECNO= 1538.00 CHSEL= 776.75

STA= 967. 997.
PER Q= 100.0
AREA= 30.4
VEL= 6.5

CCHV= 0.300 CEXV= 0.500

*SECNO 1568.000

SECNO	DEPTH	CHSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	CLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	MTH	ELMIN	SSTA
SLOPE	KLOBL	KLCH	KLOBR	ITRIAL	IK2	ICONT	CORAR	TOPWID	ENDST

7485 MINIMUM SPECIFIC ENERGY

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3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 787.70 ELREA= 787.70

D/S FACE OF MICHIGAN AVE. BRIDGE

1568.00	1.54	775.84	775.84	0.00	776.48	0.64	0.66	0.01	776.60
250.	0.	250.	0.	0.	39.	0.	3.	2.	776.70
0.10	0.00	6.60	0.00	0.100	0.040	0.100	0.039	774.30	697.29
0.022288	30.	30.	30.	2	11	0	0.00	31.04	728.33

FLOW DISTRIBUTION FOR SECNO= 1568.00 CWSEL= 775.84

STA= 697. 731.
PER Q= 100.0
AREA= 39.1
VEL= 6.6

*SECNO 1569.000

3370 NORMAL BRIDGE,NRD= 6 MIN ELTRD= 787.70 MAX ELLC= 784.90

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 787.70 ELREA= 787.70

1 FT. INSIDE D/S END OF MICHIGAN AVE. BRIDGE

1569.00	1.85	776.15	0.00	0.00	776.36	0.41	0.01	0.07	776.60
250.	0.	250.	0.	0.	49.	0.	3.	2.	776.70
0.10	0.00	5.12	0.00	0.100	0.030	0.100	0.039	774.30	695.76
0.006539	1.	1.	1.	6	0	0	0.00	33.30	729.06

FLOW DISTRIBUTION FOR SECNO= 1569.00 CWSEL= 776.15

STA= 696. 731.
PER Q= 100.0
AREA= 40.9
VEL= 5.9

*SECNO 1621.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	KV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTX	ELTRD	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IHZ	ICONT	CORAR	YOFWIC	ENDSTA

3370 NORMAL BRIDGE,NRD= 6 MIN ELTRD= 787.70 MAX ELLC= 784.40

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 787.70 ELREA= 787.70

1 FT. INSIDE U/S END OF MICHIGAN AVE. BRIDGE

1621.00	1.70	776.50	0.00	0.00	777.00	0.50	0.39	0.05	777.10
250.	0.	250.	0.	0.	44.	0.	3.	2.	777.20
0.10	0.00	5.66	0.00	0.100	0.030	0.100	0.039	774.80	696.48
0.008779	52.	52.	52.	3	0	0	0.00	32.23	728.72

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FLOW DISTRIBUTION FOR SECNO=    1621.00          CWSEL=     776.50

STA=      696.      731.
  PER Q=     100.0
   AREA=      44.1
    VEL=       5.7

*SECNO 1622.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=       787.70 ELREA=       787.70

        U/S FACE OF MICHIGAN AVE. BRIDGE

  1622.00      1.71    776.51      0.00      0.00    777.01      0.50      0.01      0.00    777.10
     250.        0.      250.        0.        0.       46.        0.        3.        2.    777.20
     0.10      0.00      5.65      0.00     0.100     0.040     0.100     0.039    774.10    696.47
 0.015519        1.        1.        1.         0         0         0      0.00     32.25    728.72

FLOW DISTRIBUTION FOR SECNO=    1622.00          CWSEL=     776.51

STA=      696.      731.
  PER Q=     100.0
   AREA=      44.2
    VEL=       5.7

*SECNO 1631.000
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VCL       TWA      LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN      SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IH2       ICONT     CORAR     TOPWID     ENDST

7105 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=       790.00 ELREA=       789.90

        D/S FACE OF R.R. BRIDGE

  1631.00      1.54    776.64    776.64      0.00    777.28      0.64      0.17      0.07    777.40
     250.        0.      250.        0.        0.       39.        0.        3.        2.    777.50
     0.11      0.00      6.41      0.00     0.100     0.040     0.100     0.039    775.10    697.30
 0.022309        9.        9.        9.         2        11         0      0.00     31.03    728.32

FLOW DISTRIBUTION FOR SECNO=    1631.00          CWSEL=     776.64

STA=      697.      731.
  PER Q=     100.0
   AREA=      39.0
    VEL=       6.4

*SECNO 1632.000

3370 NORMAL BRIDGE,NRD=  6 MIN ELTRD=  789.90 MAX ELLC=  783.90

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=       790.00 ELREA=       789.90
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        1 FT. INSIDE D/S END OF R.R. BRIDGE

  1632.00     1.85   776.95     0.00     0.00   777.36     0.41     0.01     0.07   777.40
     250.       0.     250.       0.       0.      49.       0.       3.       2.    777.50
     0.11     0.00     5.12     0.00    0.100    0.030    0.100    0.039   773.10   695.77
 0.006367       1.       1.       1.        6        0        0     0.00    33.29   729.06

FLOW DISTRIBUTION FOR SECNO=   1632.00          CWSEL=    776.95

STA=      696.      731.
  PER Q=     100.0
   AREA=      40.8
    VEL=       5.1

*SECNO 1659.000

3370 NORMAL BRIDGE,NRD=  6 MIN ELTRD=  789.90 MAX ELLC=  784.30

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      790.00 ELREA=      789.90

        1 FT. INSIDE U/S END OF R.R. BRIDGE

  1659.00     1.59   777.09     0.00     0.00   777.67     0.58     0.23     0.09   777.80
     250.       0.     250.       0.       0.      41.       0.       3.       2.    777.90
     0.11     0.00     6.13     0.00    0.100    0.030    0.100    0.038   775.50   697.01
 0.011046      27.      27.      27.        2        0        0     0.00    31.45   728.46

FLOW DISTRIBUTION FOR SECNO=   1659.00          CWSEL=    777.09

STA=      697.      731.
  PER Q=     100.0
   AREA=      40.8
    VEL=       6.1

*SECNO 1660.000
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS   BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA     LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XML       XMCH      XMR       XTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     XTRIAL    IN2       XCONT     CORAR     TOPWID      ENDST

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      790.00 ELREA=      789.90

        U/S FACE OF R.R. BRIDGE

  1660.00     1.60   777.11     0.00     0.00   777.69     0.58     0.01     0.00   777.80
     250.       0.     250.       0.       0.      41.       0.       3.       2.    777.90
     0.11     0.00     6.13     0.00    0.100    0.040    0.100    0.038   775.50   697.01
 0.019605       1.       1.       1.        0        0        0     0.00    31.46   728.46

FLOW DISTRIBUTION FOR SECNO=   1660.00          CWSEL=    777.11

STA=      697.      731.
  PER Q=     100.0
   AREA=      40.8
    VEL=       6.1
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*SECNO 1690.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IN2	ICONT	CORAR	TOPWID	ENDST
1690.00	1.55	777.75	777.75	0.00	778.38	0.63	0.62	0.02	778.50
250.	0.	250.	0.	0.	39.	0.	3.	2.	778.60
0.11	0.00	6.37	0.00	0.100	0.040	0.100	0.036	776.20	697.26
0.022000	30.	30.	30.	2	3	2	0.00	31.00	728.36

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

FLOW DISTRIBUTION FOR SECNO= 1690.00 CWSEL= 777.75

STA= 697. 731.
PER Q= 100.0
AREA= 39.2
VEL= 6.4

CCHV= 0.100 CEHV= 0.300

*SECNO 1720.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IN2	ICONT	CORAR	TOPWID	ENDST
1720.00	1.54	778.46	778.44	0.00	779.08	0.64	0.67	0.00	779.20
250.	0.	250.	0.	0.	39.	0.	3.	2.	779.30
0.11	0.00	6.41	0.00	0.100	0.040	0.100	0.036	776.20	697.33
0.022377	30.	30.	30.	0	5	0	0.00	31.03	728.32

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

FLOW DISTRIBUTION FOR SECNO= 1720.00 CWSEL= 778.44

STA= 697. 731.
PER Q= 100.0
AREA= 39.0
VEL= 6.4

*SECNO 1750.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IN2	ICONT	CORAR	TOPWID	ENDST

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

VALLEY SECTION D/S OF DAM

1750.00	1.54	779.14	779.14	0.00	779.78	0.63	0.67	0.00	779.90
250.	0.	250.	0.	0.	39.	0.	3.	2.	780.00
0.11	0.00	6.39	0.00	0.100	0.040	0.100	0.036	777.60	697.26
0.022200	30.	30.	30.	0	5	0	0.00	31.03	728.33

FLOW DISTRIBUTION FOR SECNO= 1750.00 CWSEL= 779.14

STA= 697. 731.
PER Q= 100.0
AREA= 39.1
VEL= 6.4

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.50	2.63	0.00	3.10	0.20	0.13	3.10	787.62	777.50

CCHV= 0.300 CEHV= 0.500
*SECNO 1794.000

3301 HV CHANGED MORE THAN HVINS

PRESSURE AND WEIR FLOW

EGPRS	EGLHC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
146353.60	793.39	0.00	240.	2.	1.	0.	789.22	789.80

U/S OF DAM

1794.00	5.91	791.91	0.00	0.00	791.96	0.02	12.16	0.00	785.00
250.	66.	124.	60.	124.	74.	112.	3.	2.	786.00
0.12	0.33	1.68	0.35	0.100	0.050	2.100	0.038	786.00	0.20
0.000330	44.	46.	44.	2	0	10	0.00	100.00	100.00

FLOW DISTRIBUTION FOR SECNO= 1794.00 CWSEL= 791.91

STA=	0.	43.	61.	100.
PER Q=	26.5	49.6	24.0	
AREA=	123.8	73.9	112.4	
VEL=	0.5	1.7	0.5	

*SECNO 1894.000

SECNO	DEPTH	CWSEL	CRIWS	WSELS	ES	AW	AL	FLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IN2	ICONT	CORAR	TOPWID	ENDST

100FT U/S OF DAM

1894.00	4.34	791.94	0.00	0.00	791.95	0.01	0.01	0.00	791.80
250.	0.	250.	0.	1.	352.	1.	4.	2.	791.60
0.10	0.02	0.71	0.04	0.100	0.095	0.080	0.038	787.60	863.71
0.000047	100.	100.	100.	2	0	0	0.00	111.10	974.09

FLOW DISTRIBUTION FOR SECNO= 1894.00 CWSEL= 791.94

STA=	864.	884.	969.	975.
PER Q=	0.0	100.0	0.0	
AREA=	1.5	352.2	1.0	
VEL=	0.0	0.7	0.0	

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CCHV=   0.100 CEHV=   0.300
*SECNO 2300.000
  2300.00     2.66   791.96     0.00     0.00   792.01     0.05     0.05     0.01   792.00
     250.       0.     250.       0.       0.     143.       0.       6.       3.   792.00
     0.23     0.00     1.75     0.00    0.100    0.035    0.080    0.038   789.30   893.22
 0.000627     390.     406.     390.        2        0        0     0.00    67.61   960.83

FLOW DISTRIBUTION FOR SECNO=   2300.00          CWSEL=    791.96

STA=      393.      961.
  PER Q=     100.0
   AREA=     143.3
    VEL=       1.7

*SECNO 2784.000

        VALLEY SECT. BASED ON ABRAMS #26 80' D/S OF DRAN RD. CULVERT

  2784.00     1.48   792.48     0.00     0.00   792.90     0.42     0.78     0.11   791.20
     250.       2.     236.      11.       2.      44.       8.       7.       4.   791.20
     0.25     1.07     5.35     1.40    0.100    0.035    0.080    0.037   791.00  1535.64
 0.010366     470.     484.     470.        4        0        0     0.00    40.15  1593.79

FLOW DISTRIBUTION FOR SECNO=   2784.00          CWSEL=    792.48

STA=     1536.     1539.     1571.     1584.
  PER Q=       0.9      94.5       4.6
   AREA=       2.2      44.1       8.2
    VEL=       1.1       5.4       1.4

*SECNO 2824.000
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        QLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IH2       ICONT     CORAR     TOPWID      ENDST

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  2824.00     2.17   793.77   793.77     0.00   794.54     0.82     0.49     0.12   793.00
     250.       1.     248.       1.       1.      34.       1.       7.       4.   793.00
     0.25     0.93     7.31     1.17    0.100    0.035    0.080    0.037   791.60  1544.44
 0.014960      40.      40.      40.       20       14        0     0.00    25.13  1569.56

FLOW DISTRIBUTION FOR SECNO=   2824.00          CWSEL=    793.77

STA=     1544.     1547.     1567.     1570.
  PER Q=       0.4      99.2       0.5
   AREA=       1.0      33.9       1.0
    VEL=       0.9       7.3       1.2

CCHV=   0.300 CEHV=   0.500
*SECNO 2864.000

3301 HV CHANGED MORE THAN HVINS

   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        QLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IH2       ICONT     CORAR     TOPWID      ENDST
```

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3695 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 797.00 ELREA= 797.00

D/S FACE OF DRAN RD. CULVERT

2864.00	3.40	795.30	795.30	0.00	796.00	1.57	0.70	0.38	793.90
250.	0.	250.	0.	0.	25.	0.	7.	4.	793.90
0.25	0.00	10.07	0.00	0.100	0.035	0.080	0.037	791.90	758.00
0.020994	40.	40.	40.	20	14	0	0.00	8.00	766.00

FLOW DISTRIBUTION FOR SECNO= 2864.00 CWSEL= 795.30

STA= 758. 766.
PER Q= 100.0
AREA= 24.8
VEL= 10.1

*SECNO 2865.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IHZ	ICOUNT	CCHR	TOPWID	ESTA

3370 NORMAL BRIDGE,NRD= 11 MIN ELTRD= 801.00 MAX ELLC= 797.80

3695 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 797.00 ELREA= 797.00

2865.00	3.41	795.31	795.28	0.00	796.91	1.60	0.02	0.01	793.90
250.	0.	250.	0.	0.	25.	0.	7.	4.	793.90
0.25	0.00	10.15	0.00	0.100	0.030	0.080	0.037	791.90	758.00
0.016796	1.	1.	1.	2	10	0	-5.64	8.00	766.00

FLOW DISTRIBUTION FOR SECNO= 2865.00 CWSEL= 795.31

STA= 758. 766.
PER Q= 100.0
AREA= 24.6
VEL= 10.2

*SECNO 2901.000

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE,NRD= 11 MIN ELTRD= 801.00 MAX ELLC= 797.80

3695 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 799.00 ELREA= 799.00

2901.00	4.76	796.66	0.00	0.00	797.32	0.96	1.39	0.22	793.90
250.	0.	250.	0.	0.	34.	0.	7.	4.	793.90
0.26	0.00	7.64	0.00	0.100	0.030	0.080	0.037	791.90	758.00
0.007440	34.	34.	34.	3	0	0	-15.54	8.00	766.00

FLOW DISTRIBUTION FOR SECNO= 2901.00 CHSEL= 796.66

STA= 758. 766.
PER Q= 100.0
AREA= 37.6
VEL= 7.6

CCHV= 0.300 CEHV= 0.500
*SECNO 2902.000

3493 OVERBANK AREA ASSUMED NON-EFFECTIVE.ELLEA= 801.00 ELREA= 801.00

U/S FACE OF DRAN RD. CULVERT

2902.00	3.00	796.90	0.00	0.00	797.50	0.69	0.01	0.03	793.90
250.	0.	250.	0.	0.	36.	0.	7.	4.	793.90
0.26	0.00	6.64	0.00	0.100	0.035	0.000	0.037	791.90	758.00
0.006219	1.	1.	1.	2	0	0	0.00	8.00	766.00

FLOW DISTRIBUTION FOR SECNO= 2902.00 CHSEL= 796.66

STA= 758. 766.
PER Q= 100.0
AREA= 37.6
VEL= 6.6

*SECNO 2922.000

3301 HV CHANGED MORE THAN HVINS

3670 ENCROACHMENT STATIONS= 701.0 823.0 TYPE= 1 TARGET= 922.000

VALLEY SECT. D/S OF DAM

2922.00	4.35	797.75	0.00	0.00	797.79	0.06	0.02	0.19	797.80
250.	0.	250.	0.	0.	156.	0.	7.	4.	797.82
0.26	0.00	1.62	0.00	0.100	0.035	0.000	0.037	793.20	763.06
0.000275	20.	20.	20.	2	0	0	0.00	41.63	784.90

FLOW DISTRIBUTION FOR SECNO= 2922.00 CHSEL= 797.75

STA= 743. 765.
PER Q= 100.0
AREA= 154.4
VEL= 1.6

SPECIAL BRIDGE

SB	XK	XKOR	COFB	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.50	2.63	0.00	0.10	0.00	0.10	0.10	805.90	792.20

*SECNO 2957.000
PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD

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146372.20	810.49	0.00	249.	2.	0.	0.	805.90	805.90	

JUST U/S OF DAM

2957.00	5.77	809.77	0.20	0.00	809.61	0.05	12.32	0.03	808.00
250.	46.	160.	43.	100.	73.	75.	8.	4.	808.00
0.26	0.47	2.20	0.58	0.100	0.035	0.080	0.037	804.00	0.00
0.000479	35.	35.	35.	2	0	11	0.00	112.00	112.00

FLOW DISTRIBUTION FOR SECNO= 2957.00 CWSEL= 809.77

STA=	0.	57.	70.	112.
PER Q=	18.6	64.1	17.3	
AREA=	99.7	72.9	75.0	
VEL=	0.5	2.2	0.6	

*SECNO 3280.000

SECNO	DEPTH	CWSEL	CRWS	USELK	EG	HV	HL	CLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	THA	LEFT/RIGHT
TIME	VLOB	WCH	VROB	XNL	XMCH	XNR	WTR	ELMIN	SECN
SLOPE	XLOBL	XLOB	XLOBR	ITRIAL	ZR2	ICONT	ICONAR	TOPWID	ENDST

VALLEY SECTION U/S OF DAM

3280.00	3.67	809.87	0.00	0.00	809.83	0.01	0.00	0.01	809.70
250.	86.	162.	2.	242.	160.	31.	1.	6.	809.40
0.39	0.19	1.01	0.08	0.100	0.035	0.080	0.037	804.20	557.58
0.000092	323.	323.	323.	1	0	0	0.00	496.02	1053.60

FLOW DISTRIBUTION FOR SECNO= 3280.00 CWSEL= 809.87

STA=	558.	804.	850.	906.	939.	1048.	1054.
PER Q=	10.5	14.0	9.9	64.7	0.9	0.0	
AREA=	207.0	125.6	109.9	159.7	30.7	0.8	
VEL=	0.1	0.3	0.2	1.0	0.1	0.0	

CCHV= 0.100 CEHV= 0.300

*SECNO 4280.000

VALLEY SECT. BASED ON ABRAMS #29

4280.00	2.85	810.05	0.00	0.00	810.07	0.02	0.10	0.00	809.10
250.	1.	268.	1.	4.	219.	6.	24.	16.	808.50
0.71	0.14	1.13	0.24	0.100	0.035	0.080	0.036	807.20	897.69
0.000245	1300.	1300.	1500.	2	0	0	0.00	113.47	1011.15

FLOW DISTRIBUTION FOR SECNO= 4280.00 CWSEL= 810.05

STA=	898.	906.	1004.	1011.
PER Q=	0.2	99.2	0.5	
AREA=	3.9	218.9	5.5	
VEL=	0.1	1.1	0.2	

*SECNO 4598.000

4598.00	1.67	810.17	0.00	0.00	810.31	0.14	0.21	0.04	809.50
250.	1.	249.	0.	1.	83.	0.	25.	16.	810.50
0.74	2.49	3.30	3.03	0.100	0.035	0.080	0.036	808.50	911.93

```
 0.004676     300.     318.     300.        2        0        0     0.00    82.37   994.33

FLOW DISTRIBUTION FOR SECNO=   4598.00          CWSEL=    810.17

STA=      912.      915.     1000.
  PER Q=       0.2      99.8
   AREA=       1.0      83.2
    VEL=       0.5       3.0

*SECNO 4916.000
  4916.00     1.30   811.50     0.00     0.00   811.65     0.16     1.34     0.21   813.50
     250.       2.     245.       2.       3.      76.       3.      25.      17.   810.60
     0.77     0.58     3.25     0.67    0.100    0.035    0.080    0.036   809.70   923.33
 0.003839     300.     318.     300.        3        0        0     0.00    68.01   991.34

FLOW DISTRIBUTION FOR SECNO=   4916.00          CWSEL=    811.50

STA=      923.      930.      985.      991.
  PER Q=       0.8      98.5       0.8
   AREA=       3.3      75.7       2.9
    VEL=       0.6       3.3       0.7

*SECNO 5234.000
  5234.00     1.58   813.08     0.00     0.00   813.39     0.31     1.63     0.04   812.00
     250.       3.     242.       4.       4.      53.       4.      26.      17.   812.00
     0.79     0.86     4.53     1.08    0.100    0.035    0.080    0.036   811.50   927.83
 0.007742     300.     318.     300.        2        0        0     0.00    54.77   982.60

FLOW DISTRIBUTION FOR SECNO=   5234.00          CWSEL=    813.08

STA=      928.      935.      975.      983.
  PER Q=       1.5      96.9       1.8
   AREA=       3.9      53.4       4.1
    VEL=       0.9       4.5       1.1

*SECNO 5552.000
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS   BANK ELEV
   Q         QLOS      QCH       QROB      ALOB      ACH       AROB      VCL       TWA     LEFT/RIGHT
   TIME      VLOS      VCH       VROB      XNL       XNCH      XNR       WTA       ELTIN     SSTA
   SLOPE     XLOAL     XLCH      XLOER     XTRIAL    XH2       XCONT     CDBAR     TOPWID    ENDST

  5552.00     2.04   815.04     0.00     0.00   815.32     0.28     1.93     0.00   813.50
     250.       7.     235.       7.       3.      54.       7.      26.      18.   813.50
     0.81     0.87     4.39     1.08    0.100    0.035    0.080    0.036   813.00   929.01
 0.004918     300.     318.     300.        3        0        0     0.00    49.78   970.79

FLOW DISTRIBUTION FOR SECNO=   5552.00          CWSEL=    815.04

STA=      929.      940.      970.      979.
  PER Q=       2.9      94.1       2.9
   AREA=       8.5      53.7       6.8
    VEL=       0.9       4.4       1.1

*SECNO 5872.000

        VALLEY SECT. BASED ON ABRAMS [3]

  5872.00     2.72   816.52     0.00     0.00   816.90     0.38     1.55     0.03   815.00
     250.       9.     [illegible]
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     0.83      0.85      5.22      1.18     0.100     0.035     0.080     0.036    813.80    803.64
 0.004814     300.      320.      300.         2         0         0      0.00     73.73    877.37

FLOW DISTRIBUTION FOR SECNO=    5872.00          CWSEL=     816.52

STA=      804.      817.      855.      852.      877.
  PER Q=       3.5      89.0       7.5       0.0
   AREA=      10.1      42.8      15.5       0.4
    VEL=       0.9       5.2       1.2       0.1

*SECNO 6292.000
  6292.00      2.69    818.49      0.00      0.00    818.81      0.33      1.91      0.01    817.30
     250.        8.      241.        1.        9.       52.        2.       20.       19.    818.00
     0.85      0.81      4.66      0.49     0.100     0.035     0.080     0.036    816.00   1057.31
 0.004439     370.      420.      300.         2         0         0      0.00     43.60   1100.91

FLOW DISTRIBUTION FOR SECNO=    6292.00          CWSEL=     818.49

STA=     1057.     1070.     1094.     1101.
  PER Q=       3.1      96.6       0.3
   AREA=       9.5      51.3       1.7
    VEL=       0.8       4.7       0.5

*SECNO 6712.000
  6712.00      2.48    820.48      0.00      0.00    820.83      0.35      2.00      0.01    819.50
     250.        3.      246.        1.        5.       52.        1.       26.       19.    820.00
     0.88      0.36      4.77      0.51     0.100     0.035     0.080     0.036    816.00   1060.52
 0.003177     370.      420.      300.         3         0         0      0.00     40.43   1100.95

FLOW DISTRIBUTION FOR SECNO=    6712.00          CWSEL=     820.48

STA=     1061.     1070.     1096.     1101.
  PER Q=       1.2      98.5       0.3
   AREA=       6.6      51.5       1.2
    VEL=       0.7       4.8       0.5

*SECNO 7132.000

        VALLEY SECT. BASED ON ABRAMS #31

  7132.00      2.96    822.86      0.00      0.00    823.29      0.44      2.44      0.03    822.50
     250.        0.      250.        0.        0.       47.        0.       29.       19.    824.50
     0.90      0.37      5.31      0.00     0.100     0.035     0.080     0.036    819.90   1067.41
 0.006507     360.      420.      300.         3         0         0      0.00     25.37   1092.78

FLOW DISTRIBUTION FOR SECNO=    7132.00          CWSEL=     822.86

STA=     1067.     1069.     1097.
  PER Q=       0.0     100.0
   AREA=       0.3      47.1
    VEL=       0.4       3.3

*SECNO 7332.000
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      PLOB      ACH       AROH      VOL       THA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    XH2       ICONT     CORAR     TOPWIC      ENDST

  7332.00      3.88    823.78      0.30      0.00    823.97      0.19      3.66      0.02    822.50
```

	250.	2.	248.	0.	4.	70.	0.	29.	19.	824.50
	0.91	0.48	3.54	0.00	0.100	0.035	0.080	0.036	819.90	1063.25
	0.001962	200.	200.	200.	2	0	0	0.00	31.90	1095.15

FLOW DISTRIBUTION FOR SECNO= 7332.00 CHSEL= 823.78

STA= 1063. 1069. 1097.

PER Q=	0.7	99.3	
AREA=	3.7	70.2	
VEL=	0.5	3.5	

*SECNO 7532.000

7532.00	4.25	824.15	0.00	0.00	824.30	0.15	0.32	0.00	822.50
250.	3.	247.	0.	6.	80.	0.	29.	20.	824.50
0.93	0.67	3.08	0.00	0.100	0.035	0.080	0.036	819.90	1061.56
0.001512	225.	200.	180.	2	0	0	0.00	34.35	1096.11

FLOW DISTRIBUTION FOR SECNO= 7532.00 CHSEL= 824.15

STA= 1062. 1069. 1097.

PER Q=	1.1	98.9	
AREA=	6.1	80.1	
VEL=	0.3	3.1	

*SECNO 7800.000

3470 ENCROACHMENT STATIONS= 570.0 870.0 TYPE= 1 TARGET= 300.300

VALLEY SECT. BASED ON ABRAMS #32

7800.00	4.59	824.39	0.00	0.00	824.41	0.02	0.10	0.01	822.40
250.	37.	210.	3.	184.	169.	21.	31.	21.	823.20
1.02	0.20	1.25	0.14	0.100	0.035	0.080	0.036	819.82	370.00
0.000165	223.	200.	200.	2	0	0	0.00	302.09	370.00

FLOW DISTRIBUTION FOR SECNO= 7800.00 CHSEL= 824.39

STA=	570.	650.	765.	815.	829.	870.
PER Q=	1.8	12.8	84.2	1.7	3.5	
AREA=	38.6	145.7	168.6	8.6	12.5	
VEL=	0.1	0.2	1.2	0.2	0.1	

*SECNO 7990.000

D/S FACE OF MAIN ST.

7990.00	4.73	824.43	0.00	0.00	824.45	0.01	0.04	0.00	820.40
250.	79.	49.	122.	171.	29.	249.	32.	22.	820.50
1.08	0.46	1.68	0.49	0.100	0.035	0.080	0.036	819.70	818.21
0.003267	190.	150.	190.	2	0	0	0.00	208.82	1027.02

FLOW DISTRIBUTION FOR SECNO= 7990.00 CHSEL= 824.43

STA=	818.	820.	860.	889.	895.	946.	1026.	1027.
PER Q=	0.1	11.7	19.7	19.8	30.6	18.2	0.0	
AREA=	1.3	77.4	92.8	29.4	130.7	117.6	0.7	
VEL=	0.2	0.3	0.3	1.7	0.6	0.4	0.2	

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	4.20	3.00	0.00	3.90	0.00	7.00	0.00	820.10	819.70

*SECNO 8034.000
PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	CWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
907.62	824.85	0.00	213.	32.	7.	7.	821.90	824.60

U/S FACE OF MAIN ST. CULVERTS

8034.00	6.14	825.84	0.00	0.00	825.84	0.00	1.39	0.00	820.40
250.	76.	36.	138.	272.	37.	435.	33.	22.	820.50
1.11	0.28	0.96	0.32	0.150	0.035	0.062	0.036	819.70	816.45
0.000058	44.	44.	44.	0	0	8	0.00	211.58	1028.03

FLOW DISTRIBUTION FOR SECNO= 8034.00 CHSEL= 825.84

STA=	816.	820.	860.	889.	895.	944.	1026.	1036.
PER Q=	0.2	13.5	16.7	14.3	28.7	26.4	0.1	
AREA=	5.0	133.6	133.2	37.3	199.2	232.8	2.9	
VEL=	0.1	0.3	0.3	1.0	0.4	0.3	0.1	

*SECNO 8084.000

SECNO	DEPTH	CHSEL	CRWS	WSELK	EG	HV	EL	OLOSS	MAIN ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

VALLEY SECT. APPROX. 50 FT. U/S OF MAIN ST.

8084.00	6.14	825.84	0.00	0.00	825.84	0.00	0.00	0.00	820.40
250.	76.	36.	138.	272.	37.	436.	33.	22.	820.50
1.14	0.28	0.96	0.32	0.160	0.035	0.060	0.036	819.70	816.45
0.000057	52.	52.	52.	0	0	0	0.00	211.59	1028.03

FLOW DISTRIBUTION FOR SECNO= 8084.00 CHSEL= 825.84

STA=	816.	820.	860.	889.	895.	944.	1026.	1036.
PER Q=	0.2	13.5	16.7	14.3	28.7	26.4	0.1	
AREA=	5.1	133.8	133.3	37.4	199.4	233.2	2.9	
VEL=	0.1	0.3	0.3	1.0	0.4	0.3	0.1	

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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
  ERROR CORR -  01
  MODIFICATION -  50,51,52
*****************************************************

T1ENCROACHMENT RUN
T2STARTING WATER SURFACE KALAMZOO RIVER MEAN WATER SURFACE ELEVATION
T3       COMSTOCK CREEK

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

       0.        5.        0.        0.  0.000000      0.00       0.0       0.   764.000     0.000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IDP       CHNIM     ITMAGE

     15.000     0.000    -1.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
```

00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: COMSTOCK TWP.

3) WATERCOURSE: COMSTOCK CREEK

4) DOCUMENT TYPE: CROSS-SECTIONS PLOTS

00BREAK00

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**********************************************************
  FEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
  ERROR CODE -  01
  MODIFICATION -  30,31,52
**********************************************************


C
T1100 YEAR PROFILE
T2STARTING WATER SURFACE ELEVATION FOR MEAN WATER SURFACE ELEVATION
T3       COMSTOCK CREEK-COMSTOCK

J1  ICHECK     INQ        NINV       IDIF       STRT       METRIC     HVINS      Q          NSEL       FQ
          0.         4.         0.         1.  3.000E30       0.00       1.0         0.    764.300      0.000

J2  NPROF      IPLOT      PRFVS      XSECV      XSECH      FN         ALLOC      IBC        CHNIM      ITRACE
      1.000      0.000     -1.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000

J5  LPRNT      IL, SEC                                  ********** RELEASED SECTION PLOTTED **********
     -10.000    -10.000      0.050      0.000      0.000      0.000      0.000      0.000      0.000      0.000
QT     5.000    140.000    210.000    250.000    250.000    400.000      0.000      0.000      0.000      0.000
NC     0.100      0.100      0.040      0.100      0.300      0.000      0.000      0.000      0.000      0.000


          400' U/S OF SOUTH AT ELEV 770, ELEV=755' U/S OF DAM

X1   100.000      9.000    926.000    955.000      0.000      0.000      0.000      0.000      0.000      1.000
GR   770.000    750.000    764.000    820.000    763.800    820.000    763.400    926.000    761.100    931.000
GR   760.200    941.000    760.600    951.000    764.000    955.000    764.300   1046.000      0.000      0.000


          140' U/S OF SOUTH-35' D/S OF DAM

X1   140.000     10.000    926.000    955.000     40.000     40.000     40.000      0.000      0.000      0.000
GR   770.000    830.000    764.000    850.100    763.800    830.000    762.800    926.000    760.500    931.000
GR   760.200    941.000    760.600    951.000    763.400    955.000    764.300    995.000    767.000   1050.000


          D/S FACE OF DAM

X1   175.000      0.000      0.000      0.000     35.000     35.000     35.000      0.000      0.000      0.000
NC     0.000      0.000      0.030      0.010      0.000      0.000      0.300      0.000      0.000      0.000


          CENTER OF DAM

X1   180.000      0.000    926.000    955.000      5.000      5.000      5.000      0.000      0.000      0.000
GR   770.000    830.000    763.900    850.100    763.870    830.000    762.800    926.000    763.100    931.000
GR   763.400    955.000    764.300    995.000    767.300   1050.000      0.000      0.000      0.000      0.000
NC     0.000      0.000      0.040      0.000      0.000      0.000      0.000      0.000      0.000      0.000


          U/S FACE OF DAM

X1   185.000     10.000    926.000    955.000      5.000      5.000      5.000      0.000      0.000      0.000
GR   770.000    830.000    764.000    850.100    763.800    830.000    762.800    926.000    760.500    931.000
GR   760.200    941.000    760.600    951.000    763.400    955.000    764.300    995.000    767.000   1050.000
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45' U/S OF DAM

X1	225.000	0.000	0.000	0.000	40.000	40.000	40.000	0.000	0.000	0.000
X1	395.000	1.000	927.300	956.300	160.300	160.000	170.000	0.000	0.000	0.000
GR	770.000	900.000	766.000	905.000	763.000	927.000	761.500	941.000	761.900	950.000
GR	763.000	956.000	764.000	985.000	772.000	1000.000	0.000	0.000	0.000	0.000
X1	565.000	0.000	927.000	955.000	160.000	160.000	170.000	0.000	0.000	0.000
GR	770.000	900.000	765.500	910.000	763.000	927.000	762.500	941.000	763.500	950.000
GR	765.000	956.000	769.000	970.000	772.000	1000.000	0.000	0.000	0.000	0.000

100' D/S OF KING HIGHWAY

X1	752.000	0.000	927.000	956.000	160.000	160.000	170.000	0.000	0.000	0.000
GR	760.200	905.000	766.000	910.000	766.000	927.000	764.000	950.000	763.500	941.000
GR	764.200	949.500	766.200	956.000	772.300	972.500	772.200	1000.300	0.000	0.000
NC	0.000	0.000	0.000	0.300	0.500	0.000	0.000	0.000	0.000	0.000

50' D/S OF KING HIGHWAY

X1	802.000	0.000	928.000	954.000	50.000	50.000	50.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	922.000	0.000	954.500	0.000	0.000	0.000	0.000
GR	769.500	910.000	765.200	925.000	764.500	943.000	764.300	942.000	762.500	930.000
GR	767.000	954.000	771.000	954.000	774.000	1206.000	0.000	0.000	0.000	0.000
X1	327.000	9.000	1194.000	1222.000	25.000	25.000	25.000	0.000	0.000	0.000
GR	800.000	1189.000	767.900	1196.000	767.600	1194.000	764.700	1201.000	764.200	1208.000
GR	766.700	1215.000	767.500	1222.000	771.000	1233.000	770.000	1234.000	0.000	0.000

D/S FACE KING HIGHWAY

X1	852.000	18.000	1201.700	1214.300	25.000	25.000	25.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	772.100	772.100	0.000
GR	776.500	0.000	777.600	44.000	779.000	252.000	779.000	748.000	776.600	642.000
GR	772.000	926.000	777.500	954.000	777.500	1185.000	767.800	1194.000	764.700	1201.700
GR	764.700	1201.750	764.400	1208.000	764.000	1214.250	764.800	1214.300	767.700	1222.000
GR	777.500	1233.000	777.600	1320.000	777.900	1404.300	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.030	0.000	0.000	0.000	0.000	0.000	0.000	0.000

1 FT. INSIDE D/S END OF KING HWY. BRIDGE

X1	353.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	777.500	777.500	0.000
BT	9.000	984.000	777.500	0.000	1193.000	777.500	0.000	1194.000	777.500	0.000
BT	1201.700	777.500	0.000	1201.750	777.500	772.100	1214.250	777.500	772.100	1214.300
BT	777.500	0.000	1222.000	777.500	0.000	1233.000	777.500	0.000	0.000	0.000

1 FT. INSIDE U/S END OF KING HWY. BRIDGE

X1	922.000	0.000	0.000	0.000	49.000	49.000	49.000	0.000	0.100	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.500	0.000	777.500	777.500	0.000
NC	0.000	0.000	0.040	0.000	0.000	0.500	0.000	0.000	0.000	0.000

CRN 1311-03 PRINTED IN U.S.A. MOORE BUSINESS FORMS, INC. OLD FORM

U/S FACE KING HIGHWAY

X1	923.000	0.000	3.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	3.000	0.000	1.000	0.000	0.300	777.500	777.500	0.000
NC	0.000	0.000	3.000	0.100	1.300	0.000	0.200	0.050	0.000	0.000

VALLEY SECT. BASED ON ABRAMS #22 APPROX. 100 FT. U/S OF KING HIGHWAY

X1	1025.000	9.000	1105.000	1227.000	102.000	122.000	102.000	0.000	0.000	0.000
GR	772.000	1164.000	765.700	1135.000	764.600	1159.000	765.600	1195.000	767.400	1198.000
GR	767.000	1227.000	756.900	1257.000	775.000	1332.000	775.900	1350.000	0.000	0.000

X1	1100.000	7.000	1133.000	1229.000	75.000	75.000	75.000	0.000	0.000	0.000
GR	772.000	1160.000	759.300	1132.000	756.500	1157.500	765.500	1196.300	765.500	1204.000
GR	769.200	1229.000	772.500	1254.000	0.000	0.000	0.000	0.000	0.000	0.000

APPROX. 250' U/S OF KING HIGHWAY

X1	1175.000	7.000	966.500	1011.000	75.000	75.000	75.000	0.000	0.000	0.000
GR	773.000	957.000	771.000	964.000	767.500	964.000	767.500	977.000	765.000	972.000
GR	775.000	1010.000	774.000	1047.000	0.000	0.000	0.000	0.000	0.000	0.000

APPROX. 400' U/S OF KING HIGHWAY

X1	1325.000	7.000	955.000	996.000	125.000	150.000	150.000	0.000	0.000	0.000
GR	774.000	957.000	772.000	969.000	769.200	971.500	769.200	981.000	771.000	979.000
GR	772.000	1012.000	780.000	1050.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SECT. BASED ON ABRAMS 723 1ST U/S OF MICHIGAN AVE.

X1	1445.000	13.000	964.000	995.000	155.000	155.000	155.000	0.000	0.000	0.000
GR	784.600	950.000	754.400	897.000	773.900	953.000	774.400	964.000	771.500	974.000
GR	771.200	979.000	771.200	964.000	772.700	990.000	774.200	1013.000	783.100	1050.000

X1	1512.000	6.000	965.000	995.000	27.000	27.000	27.000	0.000	0.000	0.000
GR	775.500	945.000	774.500	965.000	772.000	975.000	772.500	990.000	773.000	995.000
GR	777.500	1026.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	1536.000	6.000	963.000	997.000	25.000	26.000	26.000	0.000	0.000	0.000
GR	782.000	941.000	775.600	963.000	773.100	974.000	774.100	991.000	775.000	997.000
GR	752.000	1021.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.300	0.500	0.000	0.000	0.000	0.000	0.000

D/S FACE OF MICHIGAN AVE. BRIDGE

X1	1565.000	11.000	993.400	757.500	30.000	30.000	40.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	787.700	787.700	0.000
GR	790.000	662.000	787.500	675.000	776.600	693.600	776.600	693.500	774.300	705.000
GR	774.300	712.000	774.300	724.600	776.700	730.400	776.700	730.500	787.700	754.900
GR	739.900	735.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

1 FT. INSIDE D/S END OF MICHIGAN AVE. BRIDGE

X1	1569.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	787.700	787.700	0.000
BT	6.000	662.000	790.000	0.000	693.400	787.700	776.600	693.500	787.700	783.900
BT	730.400	787.700	783.900	730.500	787.700	776.700	786.000	789.900	0.000	0.000

1 FT. INSIDE U/S END OF MICHIGAN AVE. BRIDGE

X1	1621.000	0.000	0.000	0.000	52.000	52.000	52.000	0.000	0.000	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	1.000	0.000	0.000	0.000	0.000	787.700	787.700	0.000
NC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

U/S FACE OF MICHIGAN AVE. BRIDGE

X1	1622.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	787.700	787.700	0.000

D/S FACE OF R.R. BRIDGE

X1	1631.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	787.700	787.700	0.000
NC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

1 FT. INSIDE D/S END OF R.R. BRIDGE

X1	1652.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	787.700	787.700	0.000
BT	6.000	662.000	790.000	0.000	693.400	791.300	0.000	693.500	791.300	783.900
BT	730.400	791.300	783.900	730.500	791.300	0.000	786.000	789.900	0.000	0.000

1 FT. INSIDE U/S END OF R.R. BRIDGE

X1	1659.000	0.000	0.000	0.000	27.000	27.000	27.000	0.000	0.400	0.000
X2	0.000	0.000	0.000	0.000	0.500	0.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	790.000	789.900	0.000
NC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

U/S FACE OF R.R. BRIDGE

X1	1660.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	790.000	789.900	0.000

X1	1690.000	0.000	0.000	0.000	30.000	30.000	30.000	0.000	0.700	0.000
NC	0.000	0.000	0.000	0.100	0.300	0.000	0.000	0.000	0.000	0.000

X1	1720.000	0.000	0.000	0.000	30.000	30.000	30.000	0.000	0.700	0.000

VALLEY SECTION D/S OF DAM

X1	1750.000	0.000	0.000	0.000	30.000	30.000	30.000	0.000	0.700	0.000
SO	0.000	1.500	2.630	0.000	0.100	0.000	0.100	0.100	787.600	777.600
NC	0.000	0.000	0.000	0.300	0.300	0.000	0.000	0.000	0.000	0.000

U/S OF DA

X1	1796.000	8.000	42.500	61.400	44.000	44.000	44.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	789.200	789.200	0.000	0.000	0.000	0.000	0.000
BT	6.000	0.000	791.700	0.000	42.500	791.700	0.000	42.600	789.200	0.000
BT	61.300	789.200	0.000	61.400	791.700	0.300	100.000	791.700	0.300	0.000
GR	795.300	0.100	791.000	0.000	788.000	42.500	788.000	42.600	786.000	61.300
GR	733.300	61.400	792.000	100.000	795.000	100.300	0.000	0.000	0.300	0.000
NC	0.100	0.000	0.035	0.000	0.000	0.000	0.000	0.000	0.300	0.000

10FT U/S OF DAM

X1	1894.000	0.000	536.100	540.200	100.300	100.000	100.000	0.000	0.000	0.000
GR	602.100	524.000	793.600	628.000	791.300	884.100	786.000	884.200	787.600	909.200
GR	788.000	969.100	791.600	969.200	601.000	1125.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.100	0.300	0.000	0.000	0.000	0.000	0.000

X1	2300.000	0.000	533.000	541.000	300.000	101.000	436.000	0.000	0.000	0.000
GR	796.000	870.000	792.000	893.000	789.300	909.000	789.300	949.000	792.000	961.000
GR	794.000	980.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SECT. BASED ON ARMCO [illegible] U/S OF D/M. 80. CULVERT

X1	2784.000	37.000	1539.000	1571.000	470.000	470.000	404.000	0.000	0.000	1.000
GR	885.000	74.000	872.400	90.000	469.600	130.000	858.200	172.000	854.800	258.000
GR	850.000	310.000	869.400	342.000	870.300	384.000	877.600	338.000	877.000	424.000
GR	877.000	760.000	870.000	936.000	877.300	845.000	872.500	890.300	871.200	776.000
GR	866.200	844.000	843.300	936.000	825.300	1214.000	811.100	1432.300	806.700	1506.000
GR	796.700	1519.000	795.400	1524.000	794.200	1534.000	794.000	1551.000	791.200	1571.000
GR	792.000	1587.000	797.100	1628.000	799.200	1672.000	802.600	1686.000	805.200	1732.000
GR	808.600	1790.000	809.400	1842.000	812.000	1852.000	815.300	1890.000	816.800	1932.000
GR	826.400	1946.000	827.300	1972.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	2624.000	0.000	1547.000	1557.000	40.000	40.000	40.000	0.000	0.000	0.000
GR	796.000	1557.000	793.000	1547.000	791.600	1551.500	791.600	1556.000	793.000	1567.000
GR	796.000	1577.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.300	0.500	0.000	0.000	0.000	0.000	0.000

U/S FACE OF DRAW RD. CULVERT

X1	2864.000	27.000	756.000	766.000	40.000	40.000	40.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	797.000	797.000	0.000
GR	820.600	0.000	836.400	76.100	111.000	284.000	809.900	834.000	803.000	642.000
GR	801.700	696.000	800.700	742.000	785.500	792.500	793.900	758.000	793.900	758.100
GR	792.300	758.500	792.900	759.300	791.800	792.000	792.100	794.700	792.300	765.500
GR	793.900	765.900	795.900	766.000	794.800	771.700	801.000	796.000	807.800	842.000
GR	804.200	866.000	810.400	952.000	810.800	1004.000	813.200	1010.000	815.200	1052.000
GR	821.100	1102.000	822.800	1142.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	2665.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	797.000	797.000	0.000
BT	11.000	696.000	801.700	0.000	758.000	801.000	0.000	758.100	801.000	794.800
BT	758.500	801.000	795.300	759.300	801.300	796.000	762.000	801.000	797.000	754.700
BT	801.300	796.000	795.300	801.300	795.200	795.500	801.000	794.300	796.000	801.000
BT	0.000	796.000	801.000	0.300	0.000	0.000	0.000	0.000	0.000	0.000

X2	0.000	0.100	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	799.000	799.000	0.000
NC	0.000	0.000	0.035	0.300	0.500	0.000	0.000	0.000	0.000	0.000

U/S FACE OF DRAW TO. CULVERT

X1	2902.000	0.000	0.000	0.000	1.300	1.300	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.300	0.300	0.000	0.000	801.000	801.000	0.000

VALLEY SECT. D/S OF DAM

X1	2922.000	15.000	743.000	785.000	20.000	20.000	20.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	781.300	0.300	823.000	0.000	0.300	0.000	0.000
GR	820.600	0.000	816.400	76.000	811.000	224.000	805.900	594.000	803.800	642.000
GR	801.700	696.000	800.700	742.200	797.800	743.000	793.200	749.200	795.200	771.000
GR	797.800	785.000	801.200	796.000	811.100	842.000	804.200	840.300	810.400	852.000
SB	0.000	1.300	2.650	3.000	1.100	2.000	0.100	0.100	805.970	792.200

JUST U/S OF DAM

X1	2957.000	0.000	50.500	85.500	15.000	55.000	35.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	805.970	805.200	1.000	0.000	0.000	0.000	0.000
ET	0.000	0.000	810.000	0.000	56.500	809.700	0.000	57.000	805.900	0.000
ET	69.000	806.000	0.000	69.500	809.700	0.000	112.000	809.900	0.000	0.000
GR	815.000	0.000	808.000	0.000	808.000	56.500	804.000	57.000	804.000	69.000
GR	809.000	69.500	805.000	112.000	805.700	117.000	0.000	0.000	0.000	0.000
ET	0.000	0.000	0.000	0.000	1.410	0.000	0.000	0.000	0.000	0.000

VALLEY SECTION U/S OF DAM

X1	3200.000	73.000	905.000	951.000	525.000	575.000	525.000	0.000	0.000	0.000
GR	819.000	152.000	810.000	540.000	808.200	804.200	806.100	850.000	809.700	905.300
GR	815.500	905.600	806.200	922.000	806.200	851.200	819.600	955.900	809.600	1540.200
GR	811.800	1092.000	813.400	1124.000	815.200	1140.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.100	0.300	0.000	0.000	0.000	0.000	0.000

VALLEY SECT. BASED ON ADRAGS 125

X1	4200.000	29.000	906.000	1004.000	1300.000	1500.000	1300.000	0.000	0.000	1.000
GR	865.400	82.000	865.000	108.000	862.600	132.000	856.900	190.000	861.300	236.000
GR	850.000	340.000	852.000	422.000	833.000	656.000	834.200	710.000	829.200	760.000
GR	829.000	726.000	827.400	841.000	820.200	826.000	821.000	870.000	810.200	892.000
GR	809.100	906.000	802.000	901.000	804.100	922.000	807.800	954.000	807.200	968.000
GR	808.000	1000.300	808.500	1004.000	811.100	1016.000	819.400	1002.000	823.000	1124.000
GR	829.000	1140.000	835.000	1262.000	840.000	1364.000	840.400	1422.000	0.000	0.000

X1	4598.000	5.000	915.000	1000.000	300.000	300.000	510.000	0.000	0.000	0.000
GR	815.000	890.000	809.500	915.000	809.500	965.000	810.500	1020.000	813.000	1030.000

X1	4916.000	5.000	930.000	985.000	300.000	300.000	518.000	0.000	0.000	0.000
GR	815.000	900.000	810.500	930.000	809.700	957.000	810.600	985.000	817.000	1030.000

X1	5234.000	5.000	935.000	973.000	300.000	300.000	518.000	0.000	0.000	0.000
GR	817.000	902.000	812.000	935.000	811.500	955.000	812.000	975.000	817.000	1019.000

X1	5552.000	5.000	960.000	970.000	350.000	300.000	310.000	0.000	0.000	0.000
GR	817.000	915.000	813.500	940.000	845.000	955.000	812.500	970.000	817.000	990.000

VALLEY SECT. BASED ON ABRAMS #30

X1	5672.000	27.000	817.000	845.000	300.000	301.000	320.000	0.000	0.000	1.000
GR	697.800	80.000	690.000	132.000	860.000	414.000	242.000	436.000	843.300	542.000
GR	840.600	702.000	828.200	727.000	822.000	752.000	819.100	777.000	816.700	802.000
GR	815.000	817.000	814.200	821.000	813.600	827.000	816.000	833.000	816.700	835.000
GR	816.900	852.000	816.500	877.000	817.500	902.000	817.900	927.000	825.300	936.000
GR	837.400	1008.300	844.400	1102.000	844.000	1148.000	847.000	1152.000	855.600	1316.000
GR	859.600	1592.100	862.300	1434.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	6292.000	6.000	1070.000	1094.000	370.000	320.300	420.000	0.000	0.000	0.000
GR	721.000	1024.000	817.000	1070.000	810.000	1070.000	815.000	1390.000	818.000	1094.000
GR	820.000	1122.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	6712.000	6.000	1070.000	1096.000	370.000	300.000	420.000	0.000	0.000	0.000
GR	823.000	1036.000	819.500	1070.000	810.000	1075.000	818.000	1087.000	820.000	1096.000
GR	822.300	1122.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SECT. BASED ON ABRAMS #31

X1	7132.000	31.000	1069.000	1097.000	360.000	306.000	420.000	0.000	0.000	0.000
GR	856.000	0.000	855.500	911.000	850.100	1[illegible]8.000	854.000	234.500	854.000	296.000
GR	852.800	306.000	859.100	870.000	840.900	816.000	836.500	692.000	859.600	810.000
GR	847.000	902.000	844.300	871.000	835.600	926.000	838.500	970.000	836.000	1036.000
GR	820.000	1048.000	824.500	1060.000	822.500	1069.000	820.300	1073.000	819.900	1080.000
GR	820.600	1087.000	824.500	1097.000	825.100	1119.000	831.200	1142.000	831.500	1174.000
GR	834.000	1179.000	839.600	1202.000	843.000	1236.000	840.900	1300.000	841.400	1326.000
GR	845.600	1397.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	7352.000	0.000	0.000	0.000	200.000	200.000	200.000	0.000	0.000	0.000

X1	7532.000	0.000	0.000	0.000	225.000	100.000	200.000	0.000	0.000	0.000

VALLEY SECT. BASED ON ABRAMS #32

X1	7800.000	41.000	768.000	816.000	263.000	268.000	266.000	0.000	0.000	1.000
GR	647.300	0.000	640.000	90.000	835.000	194.000	120.300	254.000	329.000	308.000
GR	829.000	330.000	826.300	856.000	827.000	451.000	825.300	476.000	823.900	546.000
GR	823.900	650.000	822.400	768.000	819.000	774.000	820.000	789.000	821.300	804.000
GR	823.200	816.000	824.100	828.000	824.100	870.000	825.000	900.000	825.000	1154.000
GR	828.500	1162.000	825.600	1160.000	835.200	1368.000	834.400	1374.000	837.100	1464.000
GR	844.000	1408.000	841.000	1502.000	843.000	1576.000	847.000	1600.000	849.000	1656.000
GR	849.000	1632.000	849.600	1710.000	849.500	1752.000	848.300	1780.000	845.500	1812.000
GR	845.600	1828.000	849.600	1852.000	838.000	1916.000	838.900	1940.000	838.900	1952.000
GR	837.000	1966.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

D/S FACE OF MAIN ST.

X1	7990.000	34.000	820.700	895.300	190.000	192.000	190.000	0.000	0.000	0.000
X3	10.000	816.700	0.000	0.000	0.000	0.000	0.000	822.000	822.500	0.000
GR	850.200	0.000	840.000	150.300	836.700	226.000	838.600	302.000	827.600	512.000
GR	827.000	815.000	823.300	820.300	822.000	862.000	820.400	838.700	820.400	868.750
GR	819.900	838.250	819.100	890.300	821.000	907.700	815.100	930.300	819.500	891.250

GR	820.400	891.750	820.400	891.000	820.500	892.200	820.500	892.250	820.300	892.750
GR	819.200	893.500	819.000	893.750	819.200	894.000	820.000	894.750	820.500	895.250
GR	820.500	895.300	823.000	944.000	823.000	1020.000	828.600	1030.000	830.200	1160.000
GR	831.600	1256.700	832.600	1308.000	833.200	1414.000	835.000	1558.000	0.000	0.000
SD	0.000	4.200	3.000	0.000	7.900	0.000	7.000	0.000	820.700	819.750

U/S FACE OF MAIN ST. CULVERTS

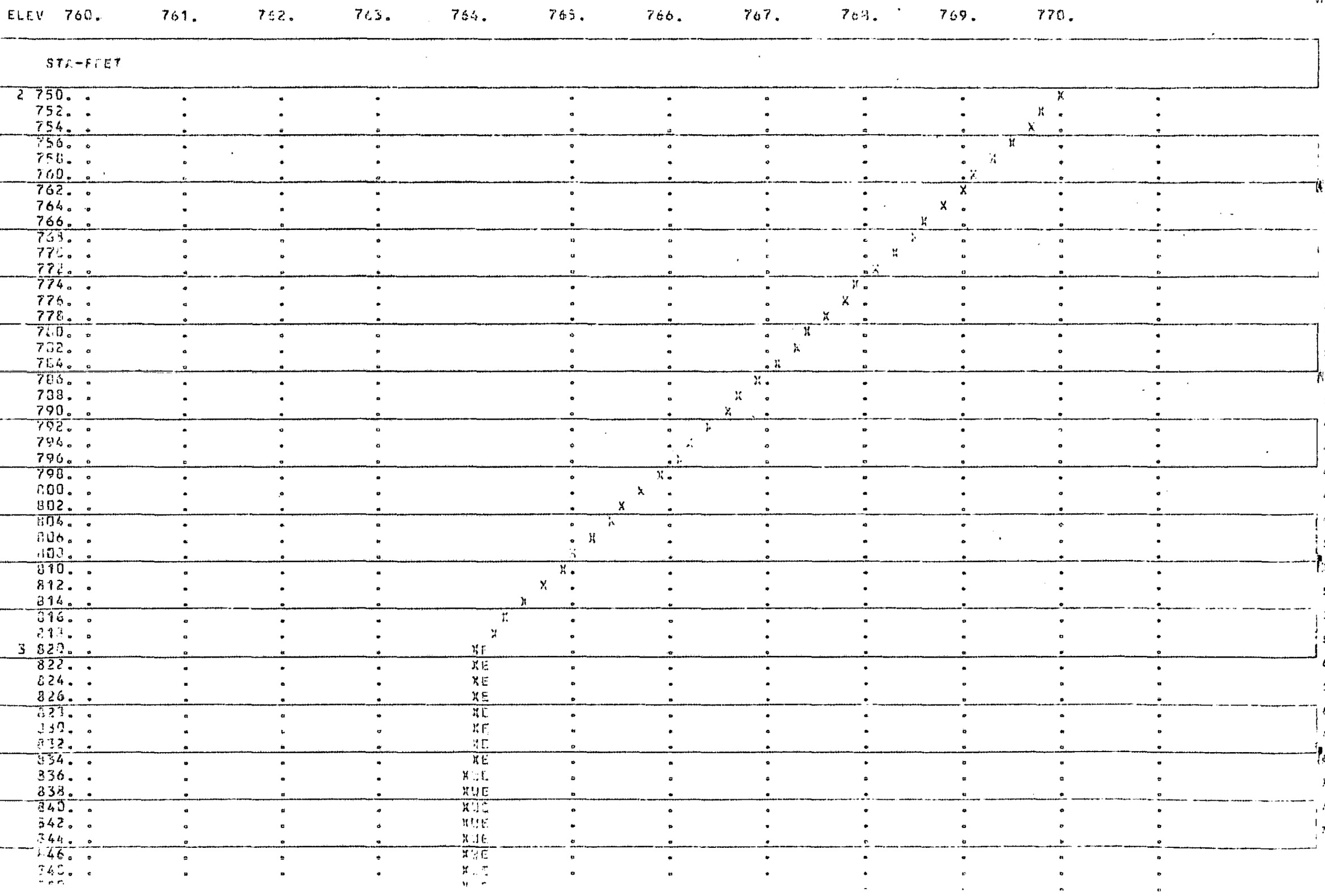
X1	8034.000	0.000	0.000	0.000	44.000	44.000	44.000	0.000	0.000	0.000
X2	0.000	1.000	1.000	821.000	824.600	0.000	0.000	0.000	0.000	0.000
X3	10.000	821.100	0.000	0.000	0.000	0.000	0.000	824.600	824.900	0.000
BT	20.000	820.000	824.600	0.000	820.700	824.900	0.000	820.750	824.900	820.600
BT	839.250	824.900	820.900	890.000	824.900	821.700	890.250	824.900	821.900	890.500
BT	824.900	821.700	891.250	824.900	820.900	891.750	824.900	820.400	891.800	824.900
BT	0.000	892.200	824.900	0.000	892.250	824.900	820.200	892.750	824.900	820.700
BT	893.500	824.900	821.300	895.750	824.900	821.750	894.000	824.900	821.500	894.750
BT	824.900	820.700	895.250	824.900	820.200	895.320	824.900	0.000	944.000	823.200
ET	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SECT. APPROX. 50 FT. U/S OF MAIN ST.

X1	8024.000	0.000	0.000	0.000	50.000	50.000	50.000	0.000	0.000	0.000
EJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

CROSS SECTION 100.00
STREAM COMSTOCK CREEK-COMSTOCK
DISCHARGE= 250.

PLOTTED POINTS (BY PRIORITY)-B=BOTTOM BRIDGE,T=TOP BRIDGE,X=GROUND,W=WATER SUR,E=ENERGY GRADIENT,C=CRITICAL USE.



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    852.                                  XWE
    854.                                  XWE
    856.                                  XWE
    858.                                  XWE
    860.                                  XWE
    862.                                  XWE
    864.                                  XWE
    866.                                 X WE
    868.                                 X WE
    870.                                 X WE
    872.                                 X WE
    874.                                 X WE
    876.                                 X WE
    878.                                 X WE
  4 880.                                 X WE
    882.                                 X WE
    884.                                 X WE
    886.                                X  WE
    888.                                X  WE
    890.                                X  WE
    892.                                X  WE
    894.                                X  WE
    896.                                X  WE
    898.                               X   WE
    900.                               X   WE
    902.                               X   WE
    904.                               X   WE
    906.                               X   WE
    908.                               X   WE
    910.                              X    WE
    912.                              X    WE
    914.                              X    WE
    916.                              X    WE
    918.                              X    WE
    920.                              X    WE
    922.                             X     WE
    924.                             X     WE
  5 926.                             X     WE                                  BANK.
    928.                       X           WE
  6 930.                     X             WE
    932.                 X                 WE
    934.               X                   WE
    936.             X                     WE
    938.           X                       WE
  7 940.         X                         WE
    942.           X                       WE
    944.           X                       WE
    946.           X                       WE
    948.             X                     WE
  8 950.               X                   WE
    952.                       X           WE
  9 954.                                   XE                                  BANK.
    956.                                   XE
    958.                                   XE
    960.                                   XE
    962.                                   XE
    964.                                   XE
    966.                                   XE
    968.                                    X
    970.                                    X
    972.                                    X
    974.                                    X
    976.                                    X
    978.                                    X
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      980.    .    .    .    .    X    .    .    .    .    .    .    .
      982.    .    .    .    .    X    .    .    .    .    .    .    .
      984.    .    .    .    .    X    .    .    .    .    .    .    .
      986.    .    .    .    .    X    .    .    .    .    .    .    .
      988.    .    .    .    .    X    .    .    .    .    .    .    .
      990.    .    .    .    .    X    .    .    .    .    .    .    .
      992.    .    .    .    .    X    .    .    .    .    .    .    .
      994.    .    .    .    .    X    .    .    .    .    .    .    .
      996.    .    .    .    .    X    .    .    .    .    .    .    .
      998.    .    .    .    .    X    .    .    .    .    .    .    .
     1000.    .    .    .    .    X    .    .    .    .    .    .    .
     1002.    .    .    .    .    X    .    .    .    .    .    .    .
     1004.    .    .    .    .    X    .    .    .    .    .    .    .
     1006.    .    .    .    .    X    .    .    .    .    .    .    .
     1008.    .    .    .    .    X    .    .    .    .    .    .    .
     1010.    .    .    .    .    X    .    .    .    .    .    .    .
     1012.    .    .    .    .    X    .    .    .    .    .    .    .
     1014.    .    .    .    .    X    .    .    .    .    .    .    .
     1016.    .    .    .    .    X    .    .    .    .    .    .    .
     1018.    .    .    .    .    X    .    .    .    .    .    .    .
     1020.    .    .    .    .    X    .    .    .    .    .    .    .
     1022.    .    .    .    .    X    .    .    .    .    .    .    .
     1024.    .    .    .    .    X    .    .    .    .    .    .    .
     1026.    .    .    .    .    X    .    .    .    .    .    .    .
     1028.    .    .    .    .    X    .    .    .    .    .    .    .
     1030.    .    .    .    .    X    .    .    .    .    .    .    .
     1032.    .    .    .    .    X    .    .    .    .    .    .    .
   101034.    .    .    .    .    X    .    .    .    .    .    .    .

   NRD=       0 ELLC=  9999999.00 ELEVC=  9999999.00

   EL(I),STA(I)
      770.00      750.00      764.00      820.00      763.80      880.00      763.40      926.00      761.10      931.00
      760.20      941.00      760.60      951.00      764.00      955.00      764.30     1034.00
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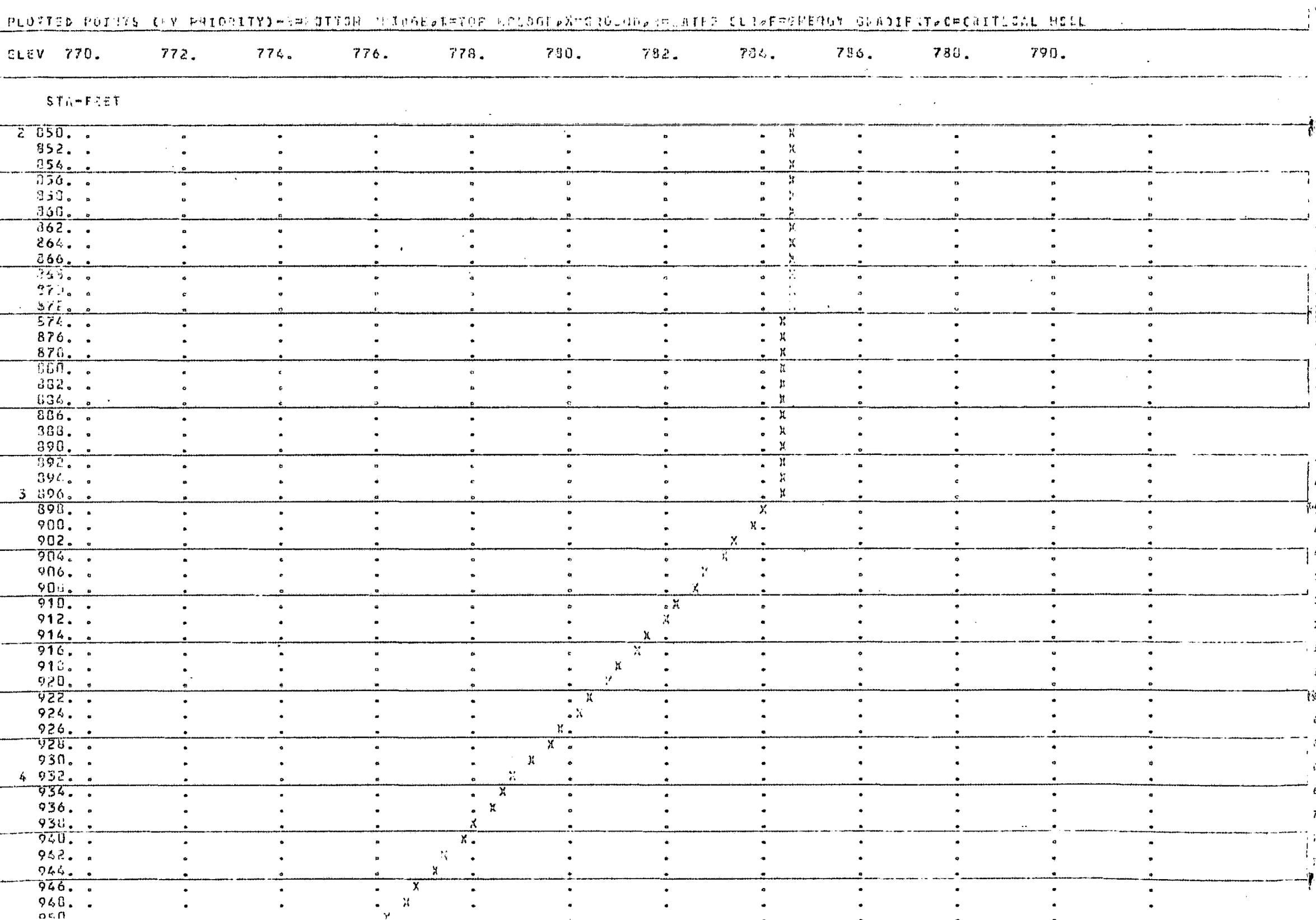
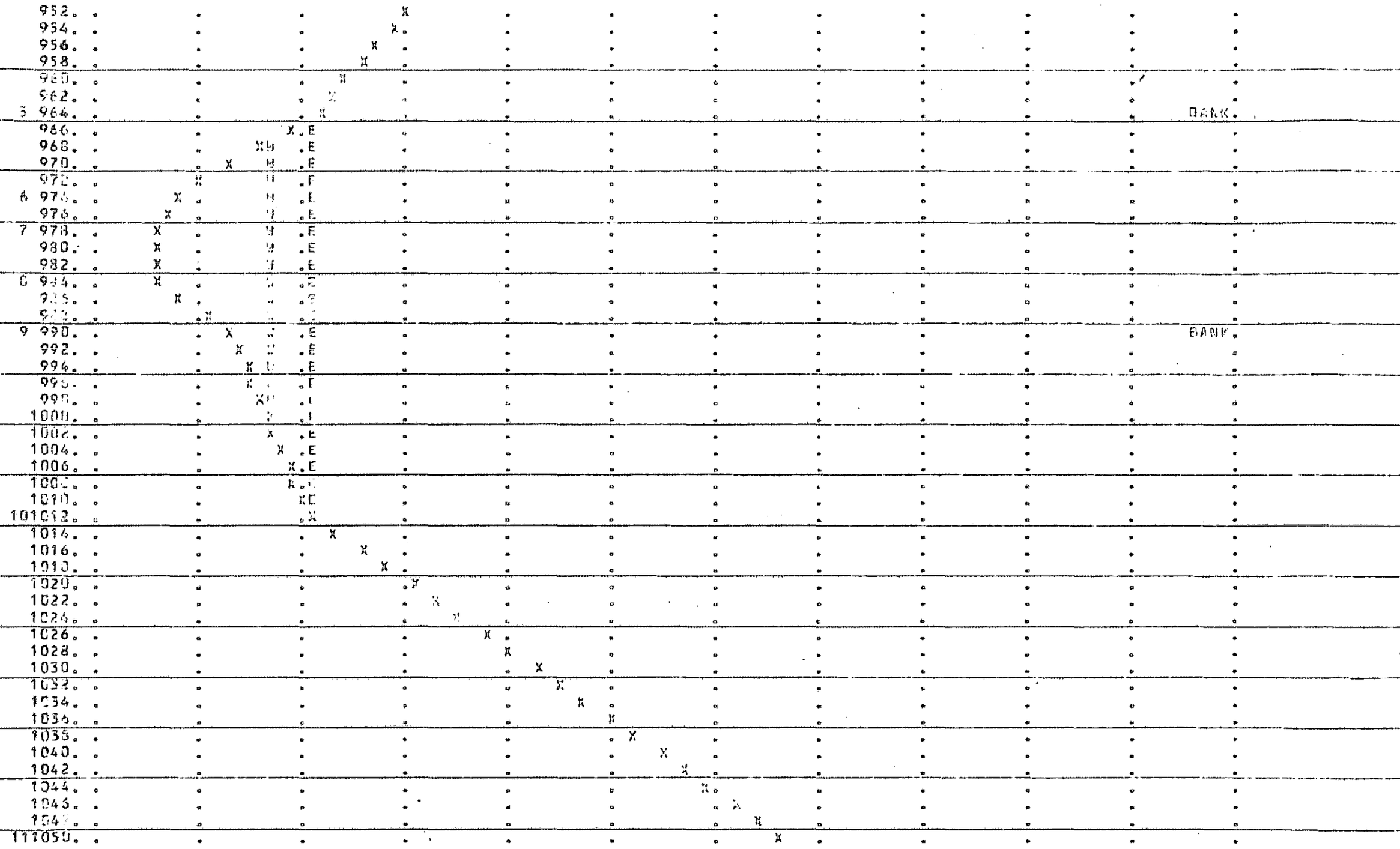
CROSS SECTION 1485.00
STREAM COMSTOCK CREEK-COMSTOCK
DISCHARGE= 250.

PLOTTED POINTS (BY PRIORITY)-B=BOTTOM BRIDGE,T=TOP BRIDGE,X=GROUND,W=WATER SLR,F=ENERGY GRADIENT,C=CRITICAL HOLE





NRD= 0 ELLC= 9999999.00 ELTRD= 9999999.00

EL(I),STA(I)

784.60	850.00	784.40	897.00	778.90	933.00	774.40	964.00	771.50	974.00
771.20	979.00	771.20	984.00	772.70	990.00	774.20	1013.00	783.10	1050.00

CROSS SECTION 2774.00
STREAM COMSTOCK CREEK-COMSTOCK
DISCHARGE= 25C.

PLOTTED POINTS (BY PRIORITY)=B=BOTTOM, E=EDGE, T=TOP, I=BRIDGE, R=GROUND, W= WATER SURFACE, E=ENERGY GRADIENT, C=CRITICAL DEPTH

ELEV 790. 800. 810. 820. 830. 840. 850. 860. 870. 880. 890.

STA-FEET

2 60. .CHE
3 80.
100.
4 120.
140.
160.
5 180.
200.
220.
240.
6 260.
280.
300.
7 320.
8 340.
9 360.
10 380.
400.
11 420.
440.
12 460.
480.
500.
520.
13 540.
560.
580.
14 600.
620.
640.
15 660.
680.
700.
720.
740.
760.
16 780.
800.
820.
17 840.
860.
880.
900.
920.
940.
18 960.
980.
1000.
1020.
1040.

```
  1080.  .                                                                                                  X
  1100.  .                                                                                                 X
  1120.  .                                                                                                X
  1140.  .                                                                                               X
  1160.  .                                                                                              X
  1180.  .                                                                                             X
  1200.  .                                                                                            X
191220.  .                                                                                           X
  1240.  .                                                                                          X
  1260.  .                                                                                         X
  1280.  .                                                                                        X
  1300.  .                                                                                       X
  1320.  .                                                                                      X
  1340.  .                                                                                     X
  1360.  .                                                                                    X
  1380.  .                                                                                   X
  1400.  .                                                                                  X
  1420.  .                                                                                 X
201440.  .                                                                                X
  1460.  .                                                                               X
  1480.  .                                                                              X
211500.  .                                                                             X
221520.  .                                                                            X
261540.  .XXX                                                                                                DATA
261560.  .XXX                                                                                                DATA
271580.  .XXX                                                                                                DATA
  1600.  .                                                                                                   X
281620.  .                                                                                                  X
  1640.  .                                                                                                  X
  1660.  .                                                                                                  X
301680.  .                                                                                                  XXXXX
  1700.  .                                                                                                  X
  1720.  .                                                                                                  X
311740.  .                                                                                                  X
  1760.  .                                                                                                  X
321780.  .                                                                                                  X
  1800.  .                                                                                                  X
  1820.  .                                                                                                  X
331840.  .                                                                                                  X
341860.  .                                                                                                  X
351880.  .                                                                                                  X
  1900.  .                                                                                                  X
  1920.  .                                                                                                  X
371940.  .                                                                                                  XXXXXXXXXX
  1960.  .                                                                                                  X
381980.  .                                                                                                  X

 NO=        0 ELLO=  9999999.00 ELTNO=  9999999.00

 EL(I),STA(I)
    825.00        74.00       872.40        90.00       859.60       130.00       856.20       172.00       854.00       258.00
    856.00       318.00       869.40       342.00       878.00       354.00       877.60       388.00       877.00       424.00
    877.00       466.00       876.00       536.00       877.00       600.00       872.30       660.00       875.20       776.00
    866.00       844.00       865.00       936.00       825.00      1294.00       811.10      1432.00       806.70      1506.00
    794.70      1519.00       795.10      1534.00       791.30      1559.00       791.00      1555.00       791.20      1571.00
    792.80      1587.00       797.10      1628.00       799.20      1672.00       802.60      1686.00       805.20      1732.00
    808.60      1790.00       809.40      1842.00       812.00      1852.00       815.80      1890.00       816.80      1932.00
    826.40      1946.00       827.30      1972.00
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CROSS SECTION 4220.30
STREAM COMSTOCK CREEK-COMSTOCK
DISCHARGE= 25.

PLOTTED POINTS (BY PRIORITY)-1= QT'S, 2=TC'S, 3=ICE, 4=W.S., 5=CRIT. SUR, 6=ENERGY GRADIENT, 7=CRITICAL MSEL

	ELEV	800.	810.	820.	830.	840.	850.	860.	870.	880.	890.	900.
	STA-FEET											
2	80.							X				
	90.							X				
	100.							X				
5	110.							X				
	120.							X				
4	130.							X				
	140.							X				
	150.							X				
	160.							X				
	170.							X				
	180.							X				
5	190.							X				
	200.							X				
	210.							X				
	220.							X				
	230.							X				
6	240.							X				
	250.							X				
	260.							X				
	270.							X				
	280.							X				
	290.							X				
	300.							X				
	310.							X				
	320.							X				
	330.							X				
7	340.							X				
	350.							X				
	360.							X				
	370.							X				
	380.							X				
	390.							X				
	400.							X				
	410.							X				
2	420.							X				
	430.							X				
	440.							X				
	450.							X				
	460.							X				
	470.							X				
	480.							X				
	490.							X				
	500.							X				
	510.							X				
	520.							X				
	530.							X				
	540.							X				
	550.							X				
	560.							X				
	570.							X				

590.
600.
610.
620.
630.
640.
650.
660.
670.
680.
9 690.
700.
10 710.
720.
730.
740.
750.
11 760.
770.
780.
12 790.
800.
810.
820.
830.
840.
13 850.
14 860.
15 870.
880.
16 890.
900.
13 910.
920.
19 930.
940.
20 950.
960.
21 970.
980.
990.
231000.
1010.
241020.
1030.
1040.
1050.
1060.
1070.
251080.
1090.
1100.
1110.
261120.
1130.
271140.
1150.
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   1230.  .                  .          .  X       .          .          .          .          .          .          .          .
   1240.  .                  .          .   X      .          .          .          .          .          .          .          .
   1250.  .                  .          .   X      .          .          .          .          .          .          .          .
 281260.  .                  .          .    X     .          .          .          .          .          .          .          .
   1270.  .                  .          .     X    .          .          .          .          .          .          .          .
   1280.  .                  .          .      X   .          .          .          .          .          .          .          .
   1290.  .                  .          .       X  .          .          .          .          .          .          .          .
   1300.  .                  .          .        X .          .          .          .          .          .          .          .
   1310.  .                  .          .        X .          .          .          .          .          .          .          .
   1320.  .                  .          .         X .          .          .          .          .          .          .          .
   1330.  .                  .          .         X .          .          .          .          .          .          .          .
   1340.  .                  .          .          X.          .          .          .          .          .          .          .
   1350.  .                  .          .          X.          .          .          .          .          .          .          .
 291360.  .                  .          .           X          .          .          .          .          .          .          .
   1370.  .                  .          .           X          .          .          .          .          .          .          .
   1380.  .                  .          .           X          .          .          .          .          .          .          .
   1390.  .                  .          .           X          .          .          .          .          .          .          .
   1400.  .                  .          .           X          .          .          .          .          .          .          .
   1410.  .                  .          .           X          .          .          .          .          .          .          .
 301420.  .                  .          .           X          .          .          .          .          .          .          .

NND=        0 ELLC=  9999995.00 ELTRD=  9999999.00

  EL(I),STA(I)
     865.60      [illegible]2.00     865.00     103.00     [illegible]2.60     [illegible]52.00     [illegible]     19[illegible].00     [illegible]61.30     236.00
     850.00     340.00     852.00     622.00     833.00     [illegible]66.00     [illegible]34.20     710.00     829.20     760.00
     829.00     786.00     820.40     846.00     820.20     856.00     821.00     868.00     810.70     892.00
     809.10     906.00     809.00     908.00     808.10     928.00     807.80     954.00     807.20     968.00
     808.00    1002.00     808.50    1004.00     811.10    1016.00     [illegible]9.40    1002.00     [illegible]23.00    1126.00
     829.00    1140.00     835.00    1[illegible]2.00     840.00    1364.00     [illegible]40.40    1422.00
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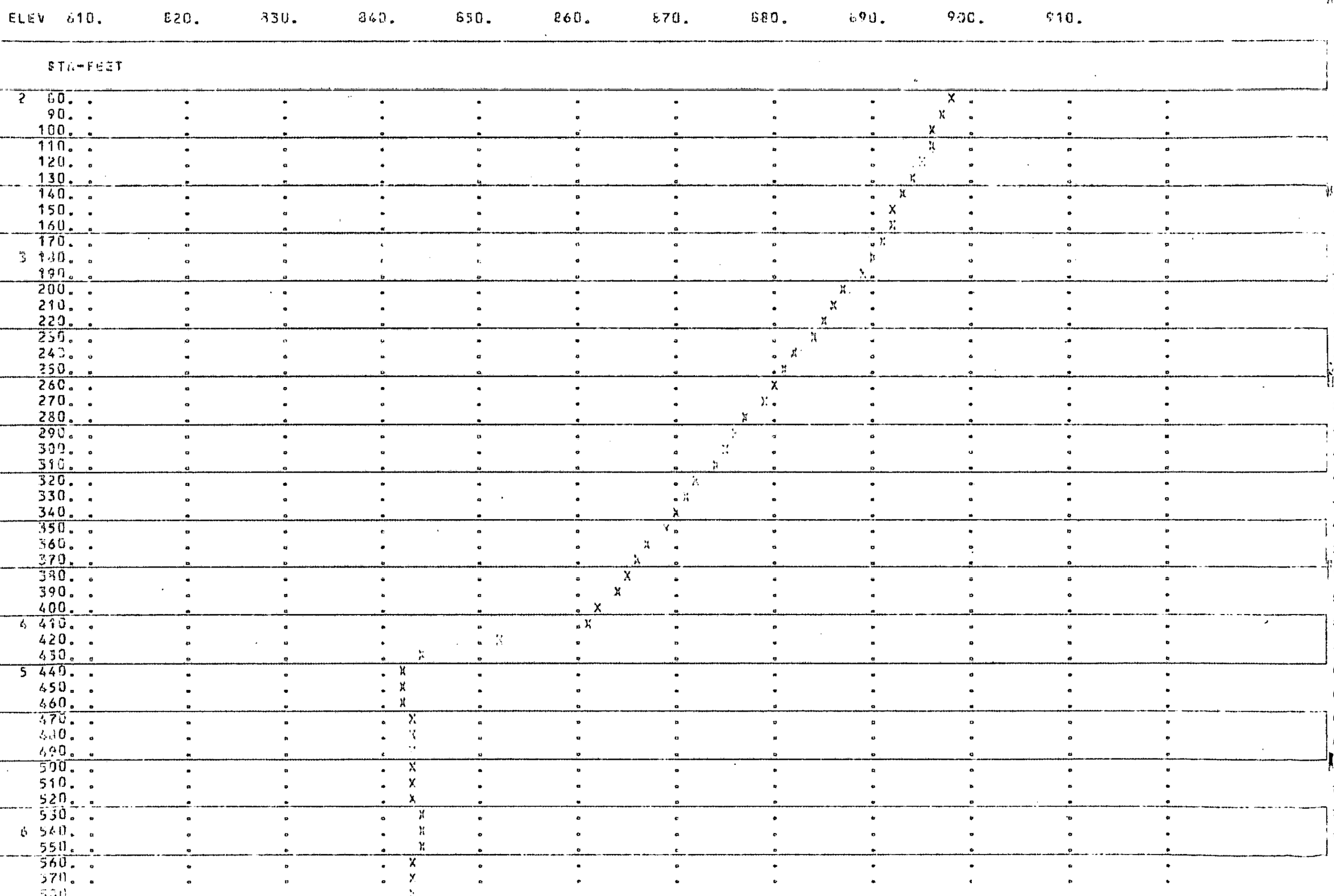
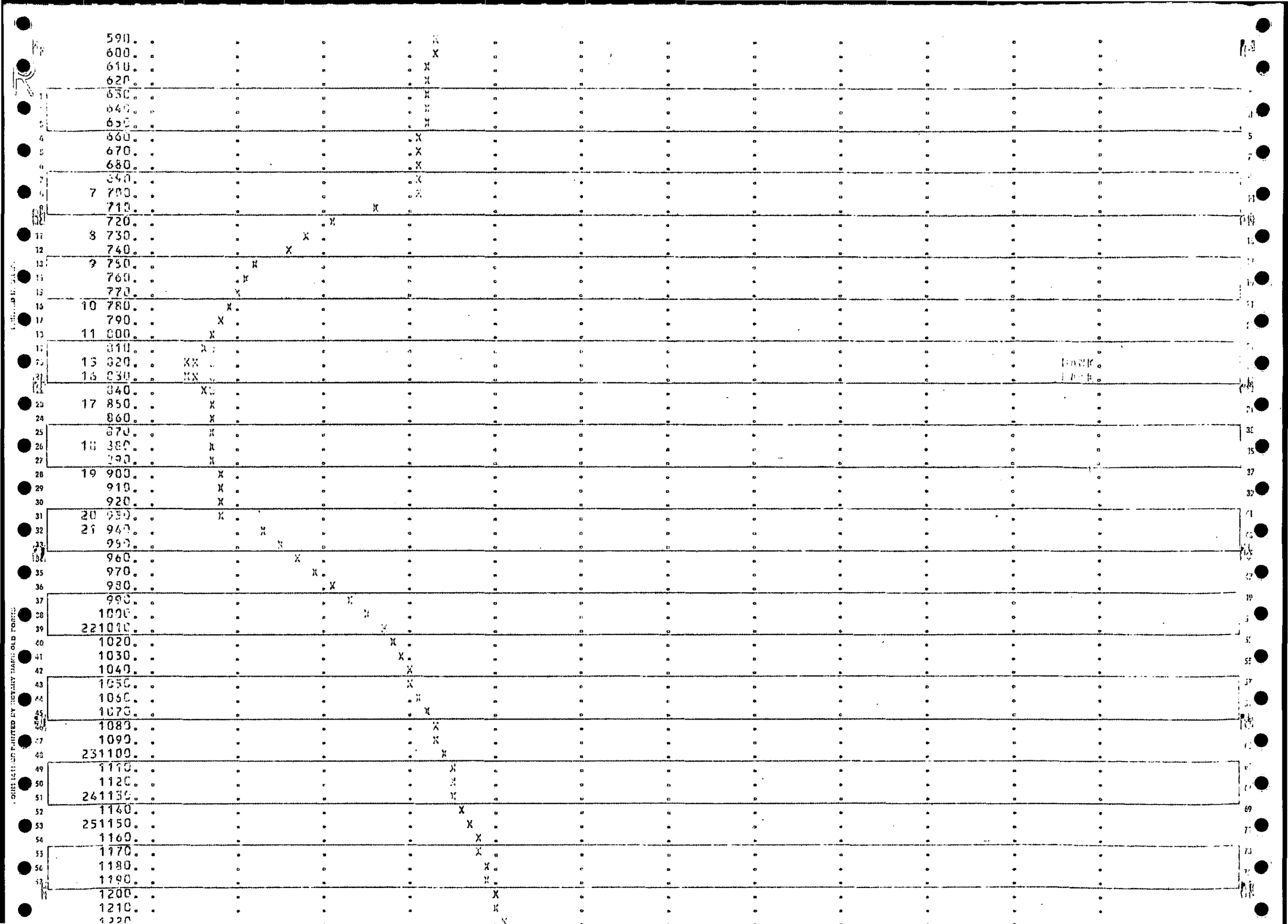
CROSS SECTION 5672.00
STREAM COMSTOCK CREEK-COMSTOCK
DISCHARGE= 250.

PLOTTED POINTS (BY PRIORITY)-I=BOTTOM BRIDGE,T=TOP BRIDGE,X=GROUND,W=WATER SUR,E=ENERGY GRADIENT,C=CRITICAL WSEL

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680.
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7 700.
710.
720.
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740.
9 750.
760.
770.
10 780.
790.
11 800.
810.
13 820.
16 830.
840.
17 850.
860.
870.
18 880.
890.
19 900.
910.
920.
20 930.
21 940.
950.
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970.
980.
990.
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221010.
1020.
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1080.
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231100.
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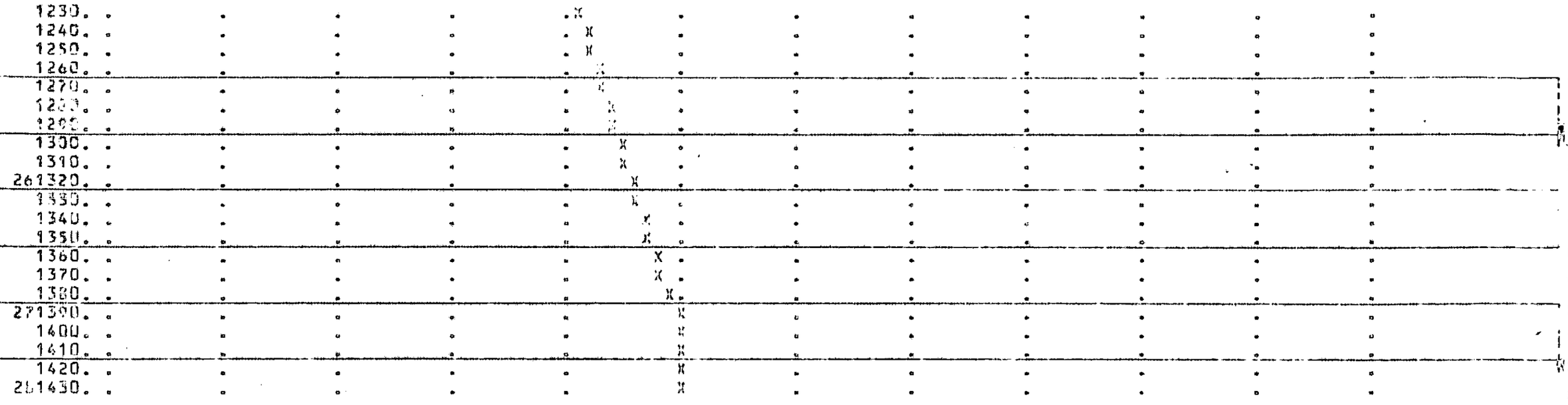


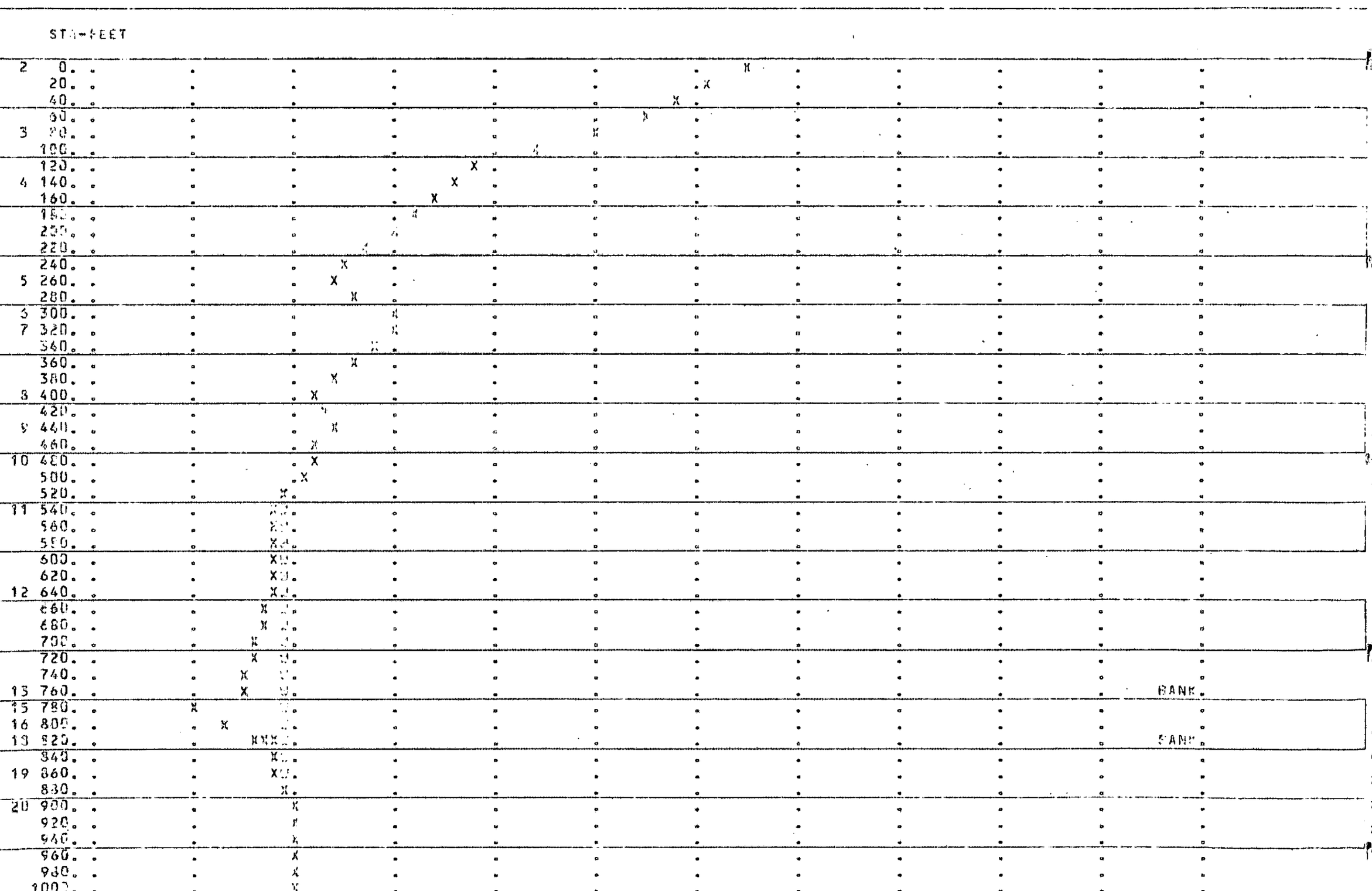
NRD= 0 ELLC= 9999999.00 ELTRD= 9999999.00

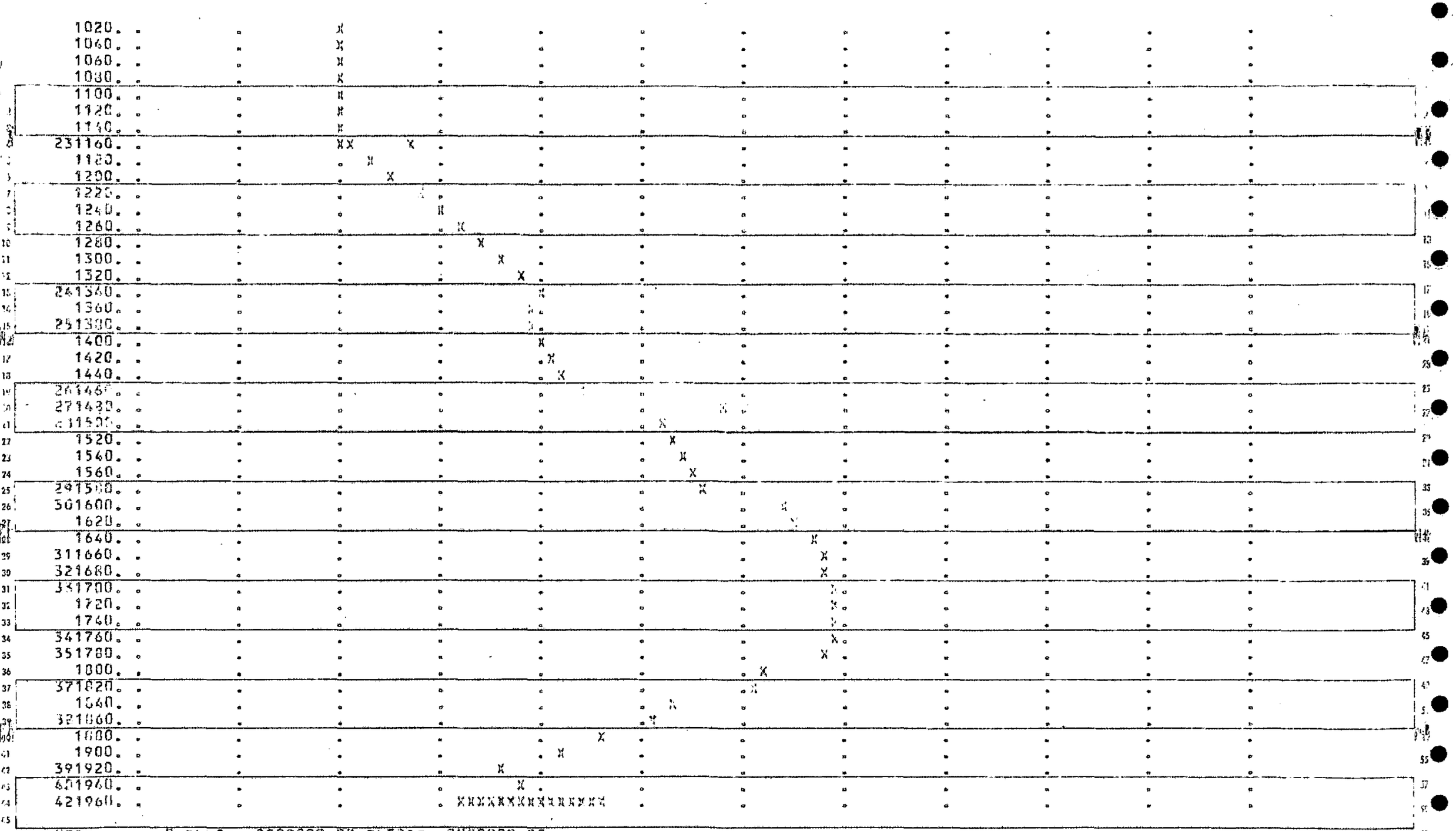
EL(I),STA(I)

897.80	80.00	890.00	182.00	862.00	414.00	842.00	436.00	843.00	942.00
840.60	702.00	828.20	727.00	822.00	732.00	819.10	777.00	816.70	802.00
815.00	817.00	814.20	821.00	813.00	827.00	814.00	833.00	814.70	835.00
816.50	852.00	816.30	877.00	817.50	902.00	817.30	927.00	823.30	936.00
837.40	1008.00	844.40	1102.00	864.00	1132.00	847.00	1152.00	855.60	1316.00
859.60	1392.00	860.30	1434.00						

CROSS SECTION 7800.00
STREAM COMSTOCK CREEK-COMSTOCK
DISCHARGE= 250.

PLOTTED POINTS (BY PRIORITY)- =BOTTOM BRIDGE,T=TOP BRIDGE,X=GROUND,W=WATER SUR,E=ENERGY GRADIENT,C=CRITICAL WSEL





NRD= 0 ELLC= 9999999.00 ELTRD= 9999999.00

EL(I),STA(I)

847.50	0.00	840.00	90.00	833.00	1[illegible].00	826.80	254.00	829.00	308.00
829.80	330.00	826.20	406.00	827.00	[illegible].00	823.[illegible]	475.00	823.90	546.00
823.90	650.00	822.40	76[illegible].00	819.80	77[illegible].00	820.00	709.00	821.30	804.00
823.20	816.00	824.10	828.00	824.10	870.00	825.00	900.00	825.00	1154.00
828.50	1162.00	825.60	1168.00	835.20	1[illegible].00	836.40	1374.00	837.10	1466.00
844.00	1488.00	841.00	1502.00	843.00	1576.00	847.00	1600.00	849.00	1656.00
849.00	1682.00	849.60	1710.00	849.50	1732.00	848.[illegible]	1785.00	845.30	1812.00
845.60	1828.00	840.60	1852.00	833.00	1918.00	833.90	1948.00	831.90	1952.00
837.80	1968.00								

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*****************************************************************
*                                                               *
*                    E R R O R   S U M M A R Y                  *
*                                                               *
*****************************************************************
*                                                               *
*   0  ERROR(S) DETECTED FOR INPUT/OUPUT STATEMENTS             *
*   1  ERROR(S) DETECTED BY THE MATHEMATICAL PACKAGE            *
*   2  ERROR(S) DETECTED BY THE USER PROCEDURE                  *
*                                                               *
*****************************************************************
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00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: COMSTOCK TWP

3) WATERCOURSE: COMSTOCK CREEK

4) DOCUMENT TYPE: INPUT DATA 100yr run

00BREAK00

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*****************************************************
  HEC2 RELEASE DATE: NOV 76 UPDATED FEB 1977
  ERROR CORR - 01
  MODIFICATION - 50,51,52
*****************************************************

C
T1100 YEAR PROFILE
T2STARTING WATER SURFACE KALMAZOO RIVER MEAN WATER SURFACE ELEVATION
T3       COMSTOCK CREEK-COMSTOCK

J1  ICHECK     INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ
       0.        4.        0.        0.  0.000000      0.00      0.0       0.   764.000     0.000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE
     1.000     0.000    -1.000     0.000     0.000     0.000     0.000     0.000     0.000    15.000

J3  VARIABLE CODES #01 SUMMARY PRINTOUT
    110.000   150.000   200.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

QT      5.000   140.000   210.000   250.000   250.000   400.000     0.000     0.000     0.000     0.000
NC      0.100     0.100     0.040     0.100     0.300     0.000     0.000     0.000     0.000     0.000

        100' U/S OF MOUTH AT KALAMAZOO RIVER-75' D/S OF DAM

X1    100.000     9.000   926.000   955.000     0.000     0.000     0.000     0.000     0.000     0.000
GR    770.000   750.000   764.000   820.000   763.300   880.000   763.600   926.000   761.100   931.000
GR    760.200   941.000   760.600   951.000   764.000   955.000   764.300  1034.000     0.000     0.000

        140' U/S OF MOUTH-35' D/S OF DAM

X1    140.000    10.000   926.000   935.000    40.000    40.000    40.000     0.000     0.000     0.000
GR    770.000   830.000   764.000   830.100   763.800   880.000   762.600   926.000   760.500   931.000
GR    760.200   941.000   760.600   951.000   763.400   955.000   764.300   995.000   767.000  1000.000

        D/S FACE OF DAM

X1    175.000     0.000     0.000     0.000    35.000    35.000    35.000     0.000     0.000     0.000
NC      0.000     0.000     0.030     0.000     0.000     0.000     0.000     0.000     0.000     0.000

        CENTER OF DAM

X1    180.000     8.000   926.000   955.000     5.000     5.000     5.000     0.000     0.000     0.000
GR    770.000   830.000   763.900   830.100   763.800   880.000   762.600   926.000   763.100   941.000
GR    763.400   955.000   764.300   995.000   767.000  1000.000     0.000     0.000     0.000     0.000
NC      0.000     0.000     0.040     0.000     0.000     0.000     0.000     0.000     0.000     0.000

        U/S FACE OF DAM

X1    185.000    10.000   926.000   955.000     5.000     5.000     5.000     0.000     0.000     0.000
GR    770.000   830.000   764.000   830.100   763.800   880.000   762.600   926.000   760.500   931.000
GR    760.200   941.000   760.600   951.000   763.400   955.000   764.300   995.000   767.000  1000.000
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45' U/S OF DAM

X1	225.000	0.000	0.000	0.000	40.000	40.000	40.000	0.000	0.000	0.000
X1	395.000	8.000	927.000	956.000	160.000	160.000	170.000	0.000	0.000	0.000
GR	770.000	900.000	764.000	905.000	763.000	927.000	761.500	941.000	761.900	950.000
GR	763.000	956.000	764.000	985.000	772.000	1000.000	0.000	0.000	0.000	0.000
X1	565.000	6.000	927.000	956.000	160.000	160.000	170.000	0.000	0.000	0.000
GR	770.000	905.000	766.500	910.000	765.000	927.000	762.500	941.000	763.500	950.000
GR	765.000	956.000	769.000	970.000	772.000	1000.000	0.000	0.000	0.000	0.000

100' D/S OF KING HIGHWAY

X1	752.000	9.000	927.000	956.000	180.000	180.000	187.000	0.000	0.000	0.000
GR	768.200	905.000	768.000	910.000	766.000	927.000	764.000	933.000	763.500	941.000
GR	764.200	949.500	766.200	956.000	772.000	972.500	772.200	1000.000	0.000	0.000
NC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

50' D/S OF KING HIGHWAY

X1	802.000	8.000	928.000	954.000	50.000	50.000	50.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	972.000	0.000	959.500	0.000	0.000	0.000	0.000
GR	769.500	910.000	766.250	923.000	764.500	943.000	764.000	962.000	766.500	950.000
GR	767.000	954.000	773.000	968.000	774.000	1030.000	0.000	0.000	0.000	0.000
X1	827.000	9.000	1194.000	1222.000	25.000	25.000	25.000	0.000	0.000	0.000
GR	800.000	1139.000	767.950	1195.000	767.000	1174.300	766.750	1209.000	766.250	1208.000
GR	764.700	1215.000	767.500	1222.000	772.000	1233.000	770.000	1234.000	0.000	0.000

D/S FACE KING HIGHWAY

X1	652.000	18.000	1201.750	1214.300	25.000	25.000	25.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	1.000	0.000	0.000	772.100	772.900	0.000
GR	778.300	0.000	777.600	46.000	778.000	296.000	776.300	748.000	778.300	842.000
GR	777.800	904.000	777.500	984.000	777.500	1183.000	767.800	1194.000	764.700	1201.750
GR	764.700	1201.750	764.400	1208.000	764.800	1214.250	764.800	1214.300	767.700	1222.000
GR	777.500	1233.000	777.600	1320.000	777.900	1404.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

1 FT. INSIDE D/S END OF KING HWY. BRIDGE

X1	853.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	777.500	777.500	0.000
GT	0.000	984.000	777.500	0.000	1183.000	777.500	0.000	1194.000	777.500	0.000
GT	1201.700	777.500	0.000	1201.750	777.500	772.100	1214.250	777.500	772.100	1214.300
BT	777.500	0.000	1222.000	777.500	0.000	1233.000	777.500	0.000	0.000	0.000

1 FT. INSIDE D/S END OF KING HWY. BRIDGE

X1	922.000	0.000	0.000	0.000	69.000	69.000	69.000	0.000	0.100	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	777.500	777.500	0.000
NC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

U/S FACE KING HIGHWAY

X1	923.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	777.500	777.500	0.000
NC	0.000	0.000	0.000	0.100	0.300	0.000	0.000	0.000	0.000	0.000

VALLEY SECT. BASED ON ABRAMS #22 APPROX. 100 FT. U/S OF KING HIGHWAY

X1	1525.000	0.000	1165.000	1227.000	102.000	102.000	102.000	0.000	0.000	0.000
GR	772.000	1184.000	765.700	1185.000	765.600	1189.000	765.000	1193.000	767.450	1198.000
GR	767.800	1227.000	768.900	1237.000	773.000	1332.000	778.900	1350.000	0.000	0.000

X1	1100.000	7.000	1185.000	1229.000	75.000	75.000	75.000	0.000	0.000	0.000
GR	772.000	1188.000	769.000	1183.000	766.500	1187.000	766.500	1194.000	768.000	1204.000
GR	769.200	1225.000	772.000	1304.000	0.000	0.000	0.000	0.000	0.000	0.000

APPROX. 250' U/S OF KING HIGHWAY

X1	1175.000	7.000	966.000	1010.000	75.000	75.000	75.000	0.000	0.000	0.000
GR	773.000	987.000	770.000	966.000	767.400	965.000	767.400	977.000	769.200	983.000
GR	770.000	1010.000	774.000	1047.000	0.000	0.000	0.000	0.000	0.000	0.000

APPROX. 400' U/S OF KING HIGHWAY

X1	1325.000	7.000	963.200	989.000	145.000	145.000	150.000	0.000	0.000	0.000
GR	774.000	957.000	772.000	965.000	769.200	971.000	769.200	981.000	771.000	989.000
GR	772.000	1012.000	780.000	1050.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SECT. BASED ON ABRAMS #23 &3' D/S OF MICHIGAN AVE.

X1	1485.000	10.000	964.000	990.000	155.000	155.000	160.000	0.000	0.000	0.000
GR	784.600	850.000	784.400	897.000	778.900	933.000	774.400	964.000	771.300	974.000
GR	771.200	979.000	771.200	984.000	772.700	990.000	774.200	1013.000	783.100	1030.000

X1	1512.000	6.000	965.000	995.000	27.000	27.000	27.000	0.000	0.000	0.000
GR	778.500	945.000	774.500	965.000	772.000	975.000	772.000	990.000	773.000	995.000
GR	777.500	1020.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	1530.000	6.000	963.000	997.000	26.000	26.000	26.000	0.000	0.000	0.000
GR	782.000	961.000	775.600	963.000	773.100	976.000	773.100	991.000	775.000	997.000
GR	782.000	1021.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.300	0.500	0.000	0.000	0.000	0.000	0.000

D/S FACE OF MICHIGAN AVE. BRIDGE

X1	1566.000	11.000	693.400	730.500	30.000	30.000	30.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	787.700	787.700	0.000
GR	790.000	662.000	787.500	675.000	776.600	693.400	776.600	693.500	774.300	705.000
GR	774.300	712.300	774.300	724.600	774.700	730.400	775.700	730.300	787.700	754.900
GR	789.900	786.200	0.000	0.000	0.000	0.200	0.000	0.300	0.000	0.000
NC	0.000	0.300	0.000	0.000	0.000	0.200	0.000	0.000	0.000	0.000

U/S FACE OF MICHIGAN AVE. BRIDGE

FORM 1411-01 PRINTED IN U.S.A. ROTARY MANIFOLD FORMS.

X1	1569.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	787.700	787.700	0.000
BT	6.000	662.000	790.000	0.000	693.400	787.700	776.600	693.500	787.700	783.900
BT	730.400	787.700	785.900	730.500	787.700	776.700	786.000	784.000	0.000	0.000

1 FT. INSIDE U/S END OF MICHIGAN AVE. BRIDGE

X1	1621.000	0.000	0.000	0.000	52.000	52.000	52.000	0.000	0.500	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	787.700	787.700	0.000
NC	0.000	0.000	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000

U/S FACE OF MICHIGAN AVE. BRIDGE

X1	1622.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	787.700	787.700	0.000

D/S FACE OF R.R. BRIDGE

X1	1631.000	0.000	0.000	0.000	9.000	9.000	9.000	0.000	0.500	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	790.000	789.900	0.000
NC	0.000	0.000	0.030	0.000	0.000	0.000	0.000	0.000	0.000	0.000

1 FT. INSIDE D/S END OF R.R. BRIDGE

X1	1632.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	790.000	789.900	0.000
BT	6.000	662.000	790.000	0.000	693.400	791.300	0.000	693.500	791.300	783.900
BT	730.600	791.300	783.900	730.500	791.300	0.000	786.000	789.900	0.000	0.000

1 FT. INSIDE U/S END OF R.R. BRIDGE

X1	1659.000	0.000	0.000	0.000	27.000	27.000	27.000	0.000	0.400	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	790.000	789.900	0.000
NC	0.000	0.000	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000

U/S FACE OF R.R. BRIDGE

X1	1660.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	790.000	789.900	0.000

X1	1690.000	0.000	0.000	0.000	30.000	30.000	30.000	0.000	0.700	0.000
NC	0.000	0.000	0.000	0.100	0.300	0.000	0.000	0.000	0.000	0.000

X1	1720.000	0.000	0.000	0.000	50.000	50.000	50.000	0.000	0.700	0.000

VALLEY SECTION D/S OF DAM

X1	1750.000	0.000	0.000	0.000	50.000	50.000	50.000	0.000	0.700	0.000
SB	0.000	1.500	2.630	0.000	0.100	0.000	0.100	0.100	787.600	777.600
NC	0.000	0.000	0.000	0.300	0.500	0.000	0.000	0.000	0.000	0.000

U/S OF DAM

X1	1794.000	8.000	42.500	61.400	44.000	44.000	44.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	789.200	789.200	0.000	0.000	0.000	0.000	0.000
BT	0.000	0.000	791.200	1.000	42.500	791.200	0.000	42.600	789.200	0.000
BT	61.500	789.200	1.000	61.400	791.200	0.000	100.000	791.200	0.000	0.000
BR	791.200	0.000	791.000	1.000	791.000	42.500	1.200	42.600	788.000	61.400
GR	788.000	61.400	790.000	100.000	795.000	100.000	0.000	0.000	0.000	0.000
NC	0.100	0.080	0.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000

100FT U/S OF DAM

X1	1894.000	8.000	884.100	969.200	100.000	100.000	100.000	0.000	0.000	0.000
GR	802.100	524.000	793.600	628.000	791.800	884.100	788.000	884.200	787.600	909.200
GR	788.000	969.100	791.600	969.200	801.000	1125.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.200	0.100	0.300	0.000	0.000	0.300	0.000	0.000

X1	2300.000	6.000	893.000	961.000	390.000	390.000	406.000	0.000	0.000	0.000
GR	798.000	870.000	792.000	893.000	789.300	909.000	789.300	949.000	792.000	961.000
GR	794.000	900.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SECT. BASED ON ABRAMS 225 60' D/S OF DRAN RD. CULVERT

X1	2784.000	37.000	1539.000	1571.000	470.000	470.000	484.000	0.000	0.000	0.000
GR	385.000	76.000	872.400	90.000	859.600	130.000	858.200	172.000	856.800	258.000
GR	356.000	516.000	865.400	542.000	872.000	534.000	872.600	869.000	872.000	826.000
GR	872.000	466.000	870.000	536.000	872.000	600.000	872.300	662.000	871.200	776.000
GR	868.200	844.000	865.000	956.000	825.000	1214.000	841.100	1532.000	806.700	1506.000
GR	794.700	1519.000	793.100	1534.000	791.200	1539.000	791.000	1555.000	791.200	1571.000
GR	792.800	1587.000	797.100	1628.000	799.200	1672.000	802.600	1688.000	805.200	1732.000
GR	808.600	1790.000	809.600	1862.000	812.000	1852.000	815.800	1890.000	816.800	1932.000
GR	820.600	1946.000	827.300	1972.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	2824.000	6.000	1547.000	1567.000	40.000	40.000	40.000	0.000	0.000	0.000
GR	796.000	1537.000	793.000	1567.000	791.600	1551.500	791.600	1558.000	793.000	1567.000
GR	796.000	1577.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.300	0.900	0.000	0.000	0.000	0.000	0.000

D/S FACE OF DRAN RD. CULVERT

X1	2864.000	27.000	758.000	766.000	40.000	40.000	40.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	797.000	797.000	0.000
GR	320.600	0.000	316.600	74.000	311.000	224.000	803.900	994.000	803.800	642.000
GR	301.700	696.000	300.700	742.000	795.500	742.300	793.900	753.000	793.900	750.100
GR	792.300	758.500	792.100	759.300	791.900	762.000	792.100	764.700	792.300	765.500
GR	793.900	765.900	793.900	766.000	794.800	771.700	801.000	796.000	801.800	842.000
GR	804.200	866.000	810.400	952.000	810.800	1006.000	813.200	1010.000	815.200	1052.000
GR	821.100	1102.000	822.000	1142.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	2865.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	797.000	797.000	0.000
BT	11.000	696.000	301.700	0.000	758.000	301.000	0.000	758.100	301.000	794.000
BT	755.500	801.000	793.600	759.300	801.000	796.000	762.000	801.000	797.800	764.700
BT	801.000	796.000	765.500	801.000	795.500	765.900	801.000	754.800	766.000	801.000
BT	0.000	796.000	301.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

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X1	2901.000	0.000	0.000	0.000	36.300	36.000	36.000	0.000	0.000	0.000
X2	0.000	0.000	0.000	0.000	0.300	0.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.300	0.000	0.000	799.000	799.000	0.000
NC	0.000	0.000	0.035	0.300	0.500	0.000	0.000	0.000	0.000	0.000

U/S FACE OF DRAM RD. CULVERT

X1	2902.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	801.000	801.000	0.000

VALLEY SECT. D/S OF DAM

X1	2922.000	15.000	743.000	785.000	20.000	20.000	20.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	701.000	0.000	823.000	0.000	0.000	0.000	0.000
GR	820.600	0.000	814.400	76.000	811.000	224.000	805.500	594.000	803.000	642.500
GR	801.700	696.300	800.700	742.000	797.800	743.200	795.200	745.000	793.200	775.200
GR	797.800	725.000	801.000	796.000	801.800	842.200	804.200	846.000	810.400	952.500
SB	0.000	1.500	2.630	0.000	0.100	0.000	0.100	0.100	805.900	792.200

JUST U/S OF DAM

X1	2957.000	0.000	56.300	69.300	55.200	35.000	55.000	0.300	0.000	0.000
X2	0.000	0.000	1.000	805.900	805.900	0.000	0.000	0.300	0.000	0.000
BT	6.000	0.000	810.000	0.000	56.500	809.700	0.000	57.300	805.900	0.000
BT	69.000	806.000	0.300	69.500	809.700	0.000	112.000	809.900	0.000	0.000
GR	815.000	0.000	806.300	0.200	808.500	56.500	806.300	57.300	804.000	69.000
GR	808.000	69.500	810.300	112.200	815.000	112.000	0.300	0.300	0.000	0.000
ET	0.000	0.000	0.300	0.200	1.400	0.000	0.300	0.300	0.000	0.000

VALLEY SECTION U/S OF DAM

X1	3280.000	13.000	905.500	936.500	325.000	325.000	325.000	0.300	0.000	0.000
GR	819.000	162.000	810.300	540.000	803.200	805.000	806.100	850.200	809.700	905.500
GR	805.500	905.600	804.200	922.000	806.200	938.400	809.600	938.500	809.600	1048.000
GR	811.800	1092.000	813.400	1124.000	815.200	1186.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.100	0.300	0.000	0.000	0.000	0.000	0.000

VALLEY SECT. BASED ON AERIAMS 629

X1	4280.000	29.000	906.000	1004.000	1300.000	1500.000	1300.000	0.000	0.000	0.000
GR	865.400	82.000	865.000	108.000	862.600	132.000	858.800	190.000	861.300	236.000
GR	850.000	360.000	852.000	422.000	833.000	686.000	834.200	710.000	829.200	760.000
GR	829.000	756.000	820.600	846.000	820.200	850.000	821.000	866.000	810.700	892.000
GR	809.100	906.000	808.000	908.000	808.100	928.000	807.800	954.000	807.200	969.000
GR	808.000	1000.000	808.500	1004.000	811.100	1016.000	819.400	1082.000	823.000	1124.000
GR	829.000	1140.000	835.000	1262.000	840.000	1364.000	860.400	1422.000	0.000	0.000

X1	4596.000	5.000	915.000	1000.000	300.000	330.300	318.000	0.000	0.000	0.000
GR	815.000	890.000	809.500	915.000	808.500	955.000	810.500	1000.000	815.000	1033.000

X1	4916.000	5.000	930.000	985.000	300.000	300.000	318.000	0.000	0.000	0.000
GR	815.000	900.000	810.500	930.000	809.700	937.300	810.600	985.000	817.300	1030.000

X1	5234.000	5.000	935.000	975.000	300.000	300.000	318.000	0.000	0.000	0.000
GR	817.000	902.000	812.000	935.000	811.500	955.000	812.000	975.000	817.300	1010.000

X1	5552.000	5.000	940.000	970.000	300.000	300.000	318.000	0.000	0.000	0.000
GR	817.000	915.000	813.500	940.000	813.000	955.000	613.500	970.000	817.000	990.000
ET	0.000	0.000	0.000	0.000	7.100	0.000	182.000	1392.000	0.000	0.000

VALLEY SECT. BASED ON ABRAMS #30

X1	5872.000	27.000	817.000	835.000	300.000	300.000	320.000	0.000	0.000	0.000
GR	897.800	80.000	890.000	182.000	860.800	414.000	842.000	436.000	843.300	542.000
GR	840.300	702.700	829.250	727.000	822.000	752.000	819.100	777.000	816.700	802.000
GR	815.000	817.000	814.200	821.000	813.800	827.000	814.000	833.000	814.700	835.000
GR	816.500	852.000	816.500	877.000	817.300	902.000	817.800	927.000	825.300	936.000
GR	837.400	1008.000	844.400	1102.000	844.000	1132.000	847.000	1152.000	855.600	1316.000
GR	859.600	1392.000	860.300	1434.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	6292.000	5.000	1070.000	1094.000	370.000	300.000	420.000	0.000	0.000	0.000
GR	821.000	1036.000	817.000	1070.000	816.200	1078.000	816.000	1090.000	818.200	1094.000
GR	820.000	1122.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	6712.000	5.000	1070.000	1096.100	370.200	300.000	420.000	0.000	0.000	0.000
GR	823.000	1036.000	819.300	1070.000	818.200	1075.000	816.000	1087.000	820.000	1096.000
GR	822.500	1122.000	0.000	0.000	0.200	0.000	0.000	0.000	0.000	0.000

VALLEY SECT. BASED ON ABRAMS #31

X1	7132.000	31.000	1069.000	1097.000	360.000	300.000	420.000	0.000	0.000	0.000
GR	856.000	0.000	838.600	48.000	850.100	166.000	854.000	830.000	854.000	296.000
GR	852.800	308.000	859.100	376.000	860.900	416.000	856.000	490.000	859.600	616.000
GR	847.000	782.000	844.800	808.000	835.400	926.000	838.600	970.000	826.000	1036.000
GR	826.000	1048.000	824.500	1060.000	822.500	1069.000	820.800	1073.000	819.900	1080.000
GR	820.600	1057.000	824.300	1077.000	823.900	1119.000	831.200	1142.000	831.500	1174.000
GR	834.000	1179.000	839.300	1232.000	845.000	1236.000	840.900	1300.000	841.400	1326.000
GR	845.600	1398.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	7332.000	0.000	0.000	0.000	200.000	200.000	200.000	0.000	0.000	0.000

X1	7532.000	0.000	0.000	0.000	225.000	190.000	200.000	0.000	0.000	0.000
ET	0.000	9.100	9.100	9.100	7.100	9.100	615.000	825.000	570.000	870.000

VALLEY SECT. BASED ON ABRAM'S #32

X1	7300.000	41.000	760.000	816.000	260.000	236.000	260.000	0.000	0.000	0.000
GR	847.300	0.000	840.000	90.000	833.000	138.000	826.800	254.000	829.800	308.000
GR	829.800	330.000	826.200	406.000	827.000	450.000	825.800	476.000	823.900	546.000
GR	823.900	650.000	822.400	768.000	819.800	774.000	820.000	789.000	821.300	804.000
GR	823.200	816.000	824.100	828.000	824.100	870.000	825.000	850.000	825.000	1154.000
GR	828.500	1162.000	825.600	1168.000	835.200	1348.000	834.400	1374.000	837.100	1444.000
GR	844.000	1400.000	841.000	1502.000	843.000	1576.000	847.000	1630.000	845.000	1456.000
GR	849.000	1682.000	849.600	1710.000	849.500	1752.000	840.800	1788.000	845.300	1812.000
GR	845.600	1828.000	840.600	1852.000	833.000	1916.000	833.900	1948.000	830.900	1952.000
GR	837.800	1968.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

D/S FACE OF MAIN ST.

X1	7990.000	34.000	800.000	823.000	190.000	190.000	190.000	0.000	0.000	0.000
X3	10.000	819.700	0.000	0.000	0.000	0.000	0.000	822.000	822.500	0.000

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GR	850.200	0.[illegible]	[illegible]	[illegible]	838.700	226.000	033.600	302.000	827.600	512.000
GR	827.000	815.000	823.000	820.000	822.000	850.000	820.450	836.700	820.400	986.750
GR	819.900	889.250	819.100	890.000	818.900	890.250	019.100	890.500	619.900	891.250
GR	820.400	891.750	820.400	891.000	820.500	892.200	820.500	892.250	820.000	892.750
GR	819.200	893.500	819.000	893.750	819.200	894.000	020.000	894.750	023.500	895.250
GR	820.500	893.300	823.000	964.000	823.000	1026.300	828.600	1030.300	030.200	1060.000
GR	831.600	1256.000	832.600	1306.000	833.200	1464.000	835.000	1538.200	0.000	0.000
SB	0.000	4.200	3.000	0.000	3.900	0.000	7.000	0.000	820.100	819.700

U/S FACE OF MAIN ST. CULVERTS

X1	8034.000	0.000	0.000	0.000	44.000	44.000	44.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	821.900	824.600	0.000	0.000	0.000	0.000	0.000
X3	10.000	820.100	0.000	0.000	0.000	0.000	0.000	824.600	824.900	0.000
BT	20.000	860.000	824.600	0.000	888.700	824.900	0.000	888.750	824.900	820.400
BT	889.250	824.900	820.900	890.000	824.900	821.700	890.250	824.900	821.900	890.500
BT	824.900	821.700	891.250	824.900	820.900	891.750	824.900	820.400	891.800	824.900
BT	0.000	892.200	824.900	0.000	892.250	824.900	820.200	892.750	824.900	820.700
BT	893.500	824.900	821.500	893.750	824.900	821.700	894.000	824.900	821.500	894.750
BT	824.900	820.700	895.250	824.900	820.200	895.300	824.900	0.000	944.000	825.200
BT	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SECT. APPROX. 50 FT. D/S OF MAIN ST.

X1	8084.000	0.000	0.000	0.000	50.000	50.000	50.000	0.000	0.000	0.000
EJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

PRINTED IN U.S.A.

PRINTED IN U.S.A. ROTARY MANIFOLD FORMS

00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: COMSTOCK TWP.

3) WATERCOURSE: COMSTOCK CREEK

4) DOCUMENT TYPE: MULTI-PROFILE INPUT AND RUN

00BREAK00

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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
  ERROR CORR -  01
  MODIFICATION -  50,51,52
*****************************************************

C
T1 [illegible] YEAR PROFILE
T2 STARTING WATER SURFACE KALAMAZOO RIVER MEAN WATER SURFACE ELEVATION
T3       COMSTOCK CREEK-COMSTOCK

J1  ICHECK     INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         HSEL      FC

       0.        2.        0.        0.  0.000000      0.00       0.0       0.   764.000     0.000

J2  NPROF     IPLOT     PRPVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     1.000     0.000    -1.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    150.000   201.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

J5  LPRNT     NUMSEC                    ********REQUESTED SECTION NUMBERS********

    -10.000   -10.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
QT      5.000   140.000   210.000   230.000   [illegible]   [illegible]     0.000     0.000     0.000     0.000
NC      0.100     0.100     0.040     0.100     0.300     0.000     0.000     0.000     0.000     0.000

        100' U/S OF MOUTH AT KALAMAZOO RIVER-75' D/S OF DAM

X1    100.000     9.000   926.000   955.000     0.000     0.000     0.000     0.000     0.000     0.000
GR    770.000   750.000   764.000   820.000   763.800   880.000   763.400   926.000   763.100   931.000
GR    760.200   941.000   760.600   951.000   764.000   955.000   764.300  1034.000     0.000     0.000

        140' U/S OF MOUTH-35' D/S OF DAM

X1    140.000    10.000   926.000   955.000    40.000    40.000    40.000     0.000     0.000     0.000
GR    770.000   830.000   764.000   830.100   763.800   880.000   762.800   926.000   760.500   931.000
GR    760.200   941.000   760.600   951.000   763.400   955.000   764.300   995.000   767.000  1000.000

        D/S FACE OF DAM

X1    175.000     0.000     0.000     0.000    35.000    35.000    35.000     0.000     0.000     0.000
NC      0.000     0.000     0.030     0.000     0.000     0.000     0.000     0.000     0.000     0.000

        CENTER OF DAM

X1    180.000     8.000   926.000   955.000     5.000     5.000     5.000     0.000     0.000     0.000
GR    770.000   830.000   763.900   830.100   763.800   880.000   762.800   926.000   763.100   941.000
GR    763.400   955.000   764.300   995.000   767.000  1000.000     0.000     0.000     0.000     0.000
NC      0.000     0.030     0.040     0.000     0.000     0.000     0.000     0.000     0.000     0.000

        U/S FACE OF DAM
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X1	155.000	10.000	926.000	955.000	5.000	5.000	5.000	0.000	0.000	0.000
GR	770.000	930.000	764.000	930.100	763.800	830.000	762.000	926.000	766.500	931.000
GR	760.200	941.000	760.600	951.000	763.400	955.000	764.300	995.000	767.000	1000.000

45' U/S OF DAM

X1	225.000	0.000	0.000	0.000	40.000	40.000	40.000	0.000	0.000	0.000

X1	595.000	0.000	927.000	956.000	960.000	960.000	175.000	0.000	0.000	0.000
GR	770.000	960.200	764.000	905.620	763.000	927.200	761.500	941.000	765.900	950.000
GR	763.000	956.500	764.000	965.000	772.000	1030.000	0.000	0.000	0.000	0.000

X1	565.000	0.000	927.000	956.000	160.000	160.000	170.000	0.000	0.000	0.000
GR	770.000	965.200	764.000	910.000	765.000	927.200	762.500	941.000	765.500	950.000
GR	765.000	956.200	764.000	972.000	772.000	1030.200	0.000	0.000	0.000	0.000

100' D/S OF KING HIGHWAY

X1	752.000	0.000	927.000	956.000	160.000	160.000	157.000	0.000	0.000	0.000
GR	765.200	965.200	764.000	910.000	760.000	927.200	764.000	930.000	764.500	941.000
GR	764.200	949.500	764.200	954.000	772.000	972.500	772.200	1030.000	0.000	0.000
NC	0.000	0.000	0.000	0.300	0.300	0.000	0.000	0.000	0.000	0.000

50' D/S OF KING HIGHWAY

X1	802.000	0.000	920.000	954.000	50.000	50.000	50.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	922.000	0.000	959.500	0.000	0.000	0.000	0.000
GR	769.500	910.000	766.200	928.000	764.500	935.000	764.000	942.000	764.500	950.000
GR	767.000	954.000	773.000	965.000	774.000	1000.000	0.000	0.000	0.000	0.000

X1	827.000	9.000	1194.000	1222.000	25.000	25.000	25.000	0.000	0.000	0.000
GR	800.000	1189.000	767.900	1196.000	767.600	1194.000	764.700	1201.000	764.200	1200.000
GR	764.700	1215.000	767.500	1222.000	773.000	1233.000	800.000	1234.000	0.000	0.000

D/S FACE KING HIGHWAY

X1	852.000	10.000	1201.700	1214.300	25.000	25.000	25.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	772.100	772.100	0.000
GR	770.300	0.000	777.600	46.000	770.000	292.000	778.000	748.000	770.600	842.000
GR	777.800	904.000	777.500	936.000	777.500	1165.000	767.300	1196.000	764.700	1201.700
GR	764.700	1201.750	764.400	1205.000	764.000	1214.250	764.000	1194.300	767.700	1222.000
GR	777.500	1233.000	777.600	1320.000	777.900	1454.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.030	0.030	0.000	0.000	0.000	0.000	0.000	0.000

1 FT. INSIDE D/S END OF KING HWY. BRIDGE

X1	853.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	777.500	777.500	0.000
BT	9.000	984.000	777.500	0.000	1183.000	777.500	0.000	1194.000	777.500	0.000
BT	1201.700	777.500	0.000	1201.750	777.500	772.100	1214.250	777.500	772.100	1214.300
ET	777.500	0.000	1222.000	777.500	0.000	1233.000	777.500	0.000	0.000	0.000

1 FT. INSIDE D/S END OF KING HWY. BRIDGE

X1	922.000	0.000	0.000	0.000	40.000	0.000	65.000	0.000	0.000	0.000

K2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
K3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	777.500	777.500	0.000
NC	0.000	0.000	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000

U/S FACE KING HIGHWAY

X1	923.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
K3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	777.500	777.500	0.000
NC	0.000	0.000	0.000	0.100	0.300	0.000	0.000	0.000	0.000	0.000

VALLEY SECT. BASED ON ABRAMS 122 APPROX. 100 FT. U/S OF KING HIGHWAY

X1	1025.000	9.000	1185.000	1227.000	102.000	102.000	102.000	0.000	0.000	0.000
GR	772.000	1184.000	765.700	1185.000	765.600	1189.000	765.800	1193.000	767.400	1198.000
GR	767.000	1227.000	768.900	1257.000	775.000	1232.500	774.950	1350.000	0.000	0.000

X1	1100.000	7.000	1193.000	1225.000	75.000	75.000	75.000	0.000	0.000	0.000
GR	772.000	1160.000	769.000	1183.000	766.500	1187.000	766.500	1194.000	768.000	1204.000
GR	769.200	1229.000	772.000	1304.000	0.000	0.500	0.000	0.000	0.000	0.000

APPROX. 250' U/S OF KING HIGHWAY

X1	1175.000	7.000	966.000	1010.000	70.000	70.000	75.000	0.000	0.000	0.000
GR	773.000	957.000	770.000	966.000	767.400	968.000	767.400	977.000	769.000	982.000
GR	770.000	1011.000	774.000	1027.000	0.200	0.500	0.000	0.000	0.000	0.000

APPROX. 400' U/S OF KING HIGHWAY

X1	1325.000	7.000	965.000	989.000	145.000	145.000	150.000	0.000	0.000	0.000
GR	774.000	957.000	772.000	965.000	769.200	971.500	769.200	981.000	771.300	989.000
GR	772.000	1012.000	780.000	1030.000	0.000	0.200	0.000	0.000	0.000	0.000

VALLEY SECT. BASED ON ABRAMS #23 83' D/S OF MICHIGAN AVE.

X1	1455.000	10.000	964.000	990.000	155.000	157.300	160.000	0.000	0.000	0.000
GR	774.600	850.000	764.600	997.000	776.900	782.000	774.400	964.000	771.500	974.000
GR	771.200	979.000	771.200	964.000	778.700	990.000	774.200	1013.000	783.100	1030.000

X1	1512.000	6.000	965.000	995.000	27.000	27.000	27.000	0.000	0.000	0.000
GR	776.500	943.000	774.500	963.000	772.000	973.000	772.000	980.000	773.000	995.000
GR	777.500	1020.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	1535.000	6.000	963.000	997.000	26.000	26.000	26.000	0.000	0.000	0.000
GR	782.000	941.000	775.600	963.000	773.100	974.000	773.100	991.000	775.000	997.000
GR	783.000	1021.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000

D/S FACE OF MICHIGAN AVE. BRIDGE

X1	1568.000	11.000	693.400	730.300	30.300	30.000	30.000	0.000	0.000	0.000
X3	10.000	5.000	0.000	0.000	0.000	0.000	0.000	787.700	787.700	0.000
GR	790.000	862.000	737.900	675.000	776.600	693.400	776.600	693.500	774.300	705.000
GR	774.300	712.000	774.300	724.600	776.700	730.400	776.700	730.500	787.700	754.900
GR	789.900	786.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

1 FT. INSIDE D/S END OF MICHIGAN AVE. BRIDGE

X1	1569.000	0.000	0.300	0.000	1.300	1.000	1.000	0.300	0.000	0.000
X3	10.300	0.000	0.300	0.000	0.300	0.000	0.000	787.700	787.700	0.000
ST	0.000	662.000	790.300	0.000	695.400	787.700	776.600	693.500	787.700	703.900
BT	730.400	787.700	783.900	730.500	787.700	776.700	780.000	789.900	0.000	0.000

1 FT. INSIDE U/S END OF MICHIGAN AVE. BRIDGE

X1	1629.000	0.000	0.000	0.000	52.000	52.000	52.300	0.000	0.500	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	787.700	787.700	0.000
NC	0.000	0.000	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000

U/S FACE OF MICHIGAN AVE. BRIDGE

X1	1622.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	787.700	787.700	0.000

D/S FACE OF R.R. BRIDGE

X1	1631.000	0.000	0.000	0.000	9.000	9.000	9.000	0.000	0.300	0.000
X3	10.000	0.000	0.000	0.000	0.300	0.000	0.000	790.000	789.900	0.000
NC	0.000	0.000	0.050	0.000	0.050	0.000	0.000	0.000	0.000	0.000

1 FT. INSIDE D/S END OF R.R. BRIDGE

X1	1632.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	790.000	789.900	0.000
BT	6.000	662.000	790.300	0.000	695.400	791.300	0.000	693.300	791.300	703.900
ST	730.400	791.300	783.900	730.500	791.900	0.000	780.000	789.900	0.000	0.000

1 FT. INSIDE U/S END OF R.R. BRIDGE

X1	1659.000	0.000	0.300	0.300	27.000	27.000	27.000	0.000	0.400	0.000
X2	0.000	0.000	0.300	0.300	0.000	0.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	790.000	789.900	0.000
NC	0.000	0.000	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000

U/S FACE OF R.R. BRIDGE

X1	1660.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	790.000	789.900	0.000

X1	1690.000	1.000	0.000	0.000	30.000	30.300	30.000	0.000	0.700	0.000
NC	0.000	0.000	0.000	0.100	0.300	0.300	0.000	0.000	0.300	0.300

X1	1720.000	0.000	0.000	0.000	30.000	30.000	30.000	0.000	0.700	0.000

VALLEY SECTION D/S OF DAM

X1	1750.000	1.000	0.300	0.000	50.000	50.300	50.000	0.000	0.700	0.300

NC	0.300	0.300	0.000	0.500	0.500	0.500	0.000	0.000	0.000	0.000

U/S OF DAM

X1	1796.000	0.000	42.500	61.400	44.000	44.000	44.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	789.200	789.200	0.000	1.000	0.000	0.000	0.000
BT	6.000	0.000	791.700	0.000	42.500	791.700	0.000	42.600	789.200	0.000
BT	61.300	789.200	0.000	61.400	791.700	0.000	103.000	791.700	0.000	0.000
GR	795.000	0.000	790.000	0.000	786.000	42.500	783.000	42.600	789.000	61.300
GR	788.000	21.400	790.000	100.000	795.000	100.000	0.000	0.000	0.000	0.000
NC	0.100	0.300	0.035	0.000	0.700	0.300	0.000	0.000	0.000	0.000

100FT U/S OF DAM

X1	1894.000	1.000	904.100	969.200	100.000	100.000	100.000	0.000	0.000	0.000
GR	802.100	524.600	795.500	838.000	791.300	644.100	788.000	804.200	757.600	909.200
GR	788.000	969.100	791.600	845.200	801.300	1138.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.100	0.300	0.000	0.000	0.000	0.000	0.000

X1	2300.000	5.000	895.100	941.000	100.000	100.000	100.000	0.000	0.000	0.000
GR	798.000	871.000	792.000	838.000	791.300	838.000	788.000	845.000	792.200	861.000
GR	794.000	958.000	0.000	0.000	0.200	0.000	0.000	0.000	0.000	0.000

VALLEY SECT. BASED ON AERIALS #26 80' D/S OF DRAN RD. CULVERT

X1	2764.000	37.000	1539.700	1571.300	470.300	470.000	484.000	0.000	0.000	0.000
GR	835.000	74.000	577.500	90.300	469.500	138.000	852.200	172.000	854.200	258.000
GR	856.000	318.000	869.400	342.000	878.800	354.000	877.600	388.000	877.000	424.000
GR	877.000	466.000	876.000	536.000	877.300	600.000	872.300	660.000	871.200	776.000
GR	866.200	844.000	843.300	956.000	825.000	1216.000	811.100	1432.000	806.700	1596.000
GR	796.700	1519.000	793.100	1554.000	791.200	1539.700	791.000	1555.000	791.200	1573.000
GR	792.300	1587.000	797.100	1625.000	792.200	1674.300	832.400	1690.000	805.200	1732.000
GR	800.600	1750.000	809.400	1862.000	812.000	1832.300	848.800	1862.000	816.000	1932.000
GR	826.400	1946.000	827.300	1972.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	2524.000	6.000	1547.000	1567.000	40.000	40.000	40.000	0.000	0.000	0.000
GR	796.000	1537.000	793.000	1547.000	791.600	1551.300	791.600	1558.000	793.000	1567.000
GR	796.000	1577.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.300	0.500	0.000	0.000	0.000	0.000	0.000

D/S FACE OF DRAN RD. CULVERT

X1	2364.000	27.000	750.000	786.300	40.000	40.000	40.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.300	0.000	0.000	797.000	797.000	0.000
GR	820.600	0.000	816.400	76.000	811.000	224.000	805.900	594.000	803.800	642.000
GR	801.700	696.000	800.700	742.000	795.500	752.300	793.900	758.000	793.900	758.100
GR	792.300	753.500	792.700	799.300	791.900	792.000	792.100	764.700	792.300	765.500
GR	793.900	765.000	793.900	766.000	794.000	771.700	809.000	794.000	801.300	842.000
GR	804.200	864.000	810.600	932.000	810.300	1010.300	813.200	1010.000	815.200	1032.000
GR	821.100	1102.000	822.000	1142.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.030	0.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	2665.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	797.000	797.000	0.000
BT	11.000	696.000	801.700	0.000	758.000	801.000	0.000	758.100	801.000	794.800
BT	758.500	801.000	795.800	759.300	801.000	796.000	762.000	801.000	797.000	764.700
BT	801.000	796.000	765.500	801.000	795.800	765.900	801.000	796.800	766.000	801.000

BT	0.000	796.000	801.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	2901.000	0.000	0.000	0.000	36.000	36.000	36.000	0.000	0.000	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.500	0.000	0.000	0.000
X3	96.000	0.000	0.000	0.000	0.000	0.000	0.000	799.000	799.000	0.000
NC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

U/S FACE OF DRAN RD. CULVERT

X1	2902.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	12.000	0.000	0.000	0.000	0.000	0.000	0.000	801.000	801.000	0.000

VALLEY SECT. D/S OF DAM

X1	2922.000	15.000	743.000	785.000	20.000	20.000	20.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	781.000	0.000	823.000	0.000	0.000	0.000	0.000
GR	820.600	0.000	815.600	76.000	811.000	224.000	805.900	594.000	803.800	642.000
GR	801.700	696.000	800.700	742.000	797.000	745.000	793.200	749.000	793.200	775.000
GR	797.800	785.000	801.000	796.000	801.000	842.300	824.200	866.000	810.400	952.000
SB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

JUST U/S OF DAM

X1	2957.000	0.000	56.500	69.500	35.000	35.000	35.000	0.000	0.000	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
BT	0.000	0.000	0.000	0.000	56.500	0.000	0.000	57.000	0.000	0.000
RT	69.000	0.000	0.000	69.500	0.000	0.000	112.000	0.000	0.000	0.000
GR	815.000	0.000	806.000	0.000	806.000	56.500	804.000	57.000	804.000	69.000
GR	806.000	69.500	806.000	112.000	815.000	112.000	0.000	0.000	0.000	0.000
ET	0.000	0.000	0.000	0.000	1.610	0.000	0.000	0.000	0.000	0.000

VALLEY SECTION U/S OF DAM

X1	3280.000	13.000	905.500	938.500	323.000	323.000	323.000	0.000	0.000	0.000
GR	819.000	192.000	810.000	540.000	808.200	804.000	806.100	850.000	809.700	905.500
GR	805.500	905.600	804.200	922.500	806.200	930.400	807.600	938.500	810.600	1068.000
GR	801.600	1092.000	813.400	1124.300	813.200	1146.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.100	0.300	0.000	0.000	0.000	0.000	0.000

VALLEY SECT. BASED ON ABRAMS #29

X1	4200.000	29.000	936.000	1304.000	1300.000	1300.000	1300.000	0.000	0.000	0.000
GR	865.400	62.000	865.000	106.000	862.600	132.300	858.500	190.000	861.300	236.000
GR	850.000	340.000	852.000	422.000	853.000	836.000	834.200	710.000	829.200	780.000
GR	829.000	756.000	820.400	346.000	820.200	856.000	821.000	868.000	810.700	892.000
GR	809.100	906.000	806.000	908.000	808.100	928.000	807.800	954.000	807.200	968.000
GR	806.000	1000.000	805.500	1004.000	811.100	1016.000	819.400	1022.000	823.000	1124.000
GR	829.000	1141.000	835.000	1262.500	842.000	1304.000	840.400	1422.000	0.000	0.000

X1	4598.000	5.000	915.000	1000.000	300.000	300.000	310.000	0.000	0.000	0.000
GR	815.000	890.000	809.500	915.000	803.500	965.000	810.500	1030.000	815.000	1030.000

X1	4916.000	3.000	930.000	985.500	320.500	302.000	314.000	0.000	0.000	0.000
GR	815.000	910.000	810.500	930.000	809.700	957.000	815.000	905.000	817.000	1030.000

X1	5234.000	5.000	935.000	975.000	300.000	300.000	340.200	0.000	0.000	0.000
GR	817.000	902.000	812.000	935.300	815.500	955.000	892.300	975.000	817.000	1010.000
X1	5532.000	5.000	940.000	970.300	300.000	300.000	340.200	0.000	0.000	0.000
GR	817.200	915.000	813.300	940.300	815.000	955.000	893.300	970.000	817.000	990.000
ET	0.000	0.000	0.000	0.000	7.100	0.000	142.000	1382.000	0.000	0.000

VALLEY SECT. BASED ON ABRAMS #30

X1	5072.000	27.000	817.000	839.000	300.000	300.000	320.000	0.000	0.000	0.000
GR	897.000	30.000	895.000	162.000	660.000	414.000	542.000	435.000	863.300	542.000
GR	840.600	762.000	828.200	727.000	822.000	752.000	679.700	777.000	816.700	802.000
GR	815.000	817.200	814.200	821.000	813.000	827.000	814.000	833.000	814.700	835.000
GR	816.500	852.300	816.500	877.000	817.300	902.000	817.800	927.000	923.300	936.000
GR	537.400	1102.100	844.400	1102.100	844.300	1102.300	847.000	1102.000	855.800	1376.000
GR	159.600	1392.300	860.300	1434.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	6292.000	0.000	1070.000	1094.000	370.000	300.000	420.000	0.000	0.000	0.000
GR	821.000	1036.300	817.000	1070.000	816.000	1075.000	818.000	1090.000	818.000	1094.000
GR	820.000	1122.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	6712.000	5.000	1070.000	1096.000	370.000	300.000	420.000	0.000	0.000	0.000
GR	823.000	1036.000	819.500	1070.000	818.000	1075.000	818.000	1087.000	820.000	1096.000
GR	822.500	1122.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SECT. BASED ON ABRAMS #31

X1	7132.000	31.000	1069.000	1097.000	360.000	300.000	420.000	0.000	0.000	0.000
GR	836.000	0.000	835.600	48.000	850.100	136.000	854.000	238.000	854.000	296.000
GR	852.000	360.000	830.100	875.000	860.900	475.300	856.000	895.000	859.600	616.000
GR	867.000	762.000	844.800	805.000	855.400	820.000	838.600	972.000	870.000	1036.000
GR	870.000	1042.000	824.500	1061.000	822.500	1065.000	820.000	1072.000	849.900	1090.000
GR	820.600	1087.000	824.500	1097.000	825.100	1119.000	831.200	1142.000	831.500	1174.000
GR	334.000	1179.000	839.000	1202.000	845.000	1256.000	840.900	1300.000	841.600	1326.000
GR	845.600	1390.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	7332.000	0.000	0.000	0.000	200.000	200.000	220.300	0.000	0.000	0.000
X1	7532.000	0.000	0.000	0.000	225.000	160.000	200.000	0.000	0.000	0.000
ET	0.000	0.000	0.000	0.000	7.100	0.000	414.000	525.000	570.000	870.000

VALLEY SECT. BASED ON ABRAMS #32

X1	7800.000	41.000	768.000	816.000	260.000	260.000	260.000	0.000	0.000	0.000
GR	847.500	0.000	840.200	90.000	853.200	137.000	820.000	254.000	829.800	308.000
GR	829.800	330.000	826.200	476.000	837.200	650.000	805.000	476.000	823.900	546.000
GR	823.900	630.000	822.400	750.000	829.200	774.000	822.000	790.000	821.300	804.000
GR	823.200	816.000	824.100	820.000	824.100	870.000	825.000	900.000	825.000	1154.000
GR	820.500	1162.000	825.600	1160.000	835.200	1340.000	834.400	1374.000	837.100	1464.000
GR	844.000	1468.000	841.000	1502.000	843.000	1576.000	847.000	1600.000	849.000	1656.000
GR	849.000	1632.000	839.600	1790.000	829.500	1752.000	842.000	1762.000	845.300	1812.000
GR	845.600	1825.000	840.600	1872.000	835.000	1910.000	833.900	1965.000	830.900	1952.000
GR	857.300	1965.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

R/S FACE OF MAIN ST.

X1	7990.000	34.000	838.700	895.300	190.000	190.000	190.000	0.000	0.000	0.000
X3	10.000	819.700	0.000	0.000	0.000	0.000	0.000	822.000	822.500	0.000
GR	850.200	0.000	840.000	160.000	836.700	226.000	833.600	302.000	827.600	512.000
GR	827.000	815.000	823.000	820.000	822.000	860.000	820.400	888.700	820.400	886.750
GR	819.900	889.250	819.100	890.000	810.900	890.250	819.100	890.500	819.900	891.250
GR	820.400	891.750	820.400	891.000	820.500	892.200	820.500	892.250	820.000	892.750
GR	819.200	893.500	819.000	893.750	819.200	894.000	820.000	894.750	820.500	895.250
GR	820.500	895.300	823.000	944.000	823.000	1026.000	828.600	1030.000	830.200	1160.000
GR	831.600	1256.000	832.600	1308.000	833.200	1414.000	835.000	1558.000	0.000	0.000
SP	0.000	4.200	0.000	0.000	3.900	0.000	7.000	0.000	820.100	819.700

U/S FACE OF MAIN ST. CULVERTS

X1	8034.000	0.000	0.000	0.000	44.000	44.000	44.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	821.900	824.600	0.000	0.000	0.000	0.000	0.000
X3	10.000	820.100	0.000	0.000	0.000	0.000	0.000	824.600	824.900	0.000
BT	20.000	860.000	824.600	0.000	836.700	824.900	0.000	838.750	824.900	820.400
BT	889.250	824.900	820.900	890.000	824.900	821.750	890.250	824.900	821.900	890.500
BT	824.900	821.700	891.250	824.900	820.900	891.750	824.900	820.400	891.800	824.900
BT	0.000	892.200	824.900	0.000	892.250	824.900	820.200	892.750	824.900	820.700
BT	893.500	824.900	821.500	893.750	824.900	821.700	894.000	824.900	821.500	894.750
BT	824.900	820.700	895.250	824.900	820.200	895.300	824.900	0.000	944.000	825.200
BT	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SECT. APPROX. 50 FT. U/S OF MAIN ST.

X1	8036.000	0.000	0.000	0.000	50.000	50.000	50.000	0.000	0.000	0.000
EJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

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*****************************************************
  HEC2 RELEASE DATED NOV 75 UPDATED FEB 1977
  ERROR CORR -  01
  MODIFICATION -  50,51,52
*****************************************************

T150 YEAR PROFILE
T2STARTING WATER SURFACE KALAMZOO RIVER MEAN WATER SURFACE ELEVATION
T3       COMSTOCK CREEK-COMSTOCK

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

       0.        3.        0.        0.  0.000000     0.00       0.0        0.   764.000     0.000

J2  NPROF     IPLOT     PRPVS     XSECV     XSECH     FN        ALLOC     IPU       CHNIM     ITRACE

     2.000     0.000    -1.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
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*****************************************************
  HECE RELEASE DATED NOV 76 UPDATED FEB 1977
  ERROR COBR -  01
  MODIFICATION -  50,51,52
*****************************************************

T1100 YEAR PROFILE
T2STARTING WATER SURFACE WALNAZOC NIVE1 MEAN WATER SURFACE ELEVATION
T3       COMSTOCK CREEK-COMSTOCK

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

       0.        4.        0.        0.  0.000000      0.00      0.0        0.   764.000     0.000

J2  NPROF     IPLOT     PRFNS     NSECV     NSECK     FN        ALLDC     IBW       CHNRN     ITRACE

     3.000     0.000    -1.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
  ERROR CORR -  31
  MODIFICATION -  50,50,52
*****************************************************

T1500 YEAR PROFILE
T2STARTING WATER SURFACE WALAMZOO RIVER MEAN WATER SURFACE ELEVATION
T3       COMSTOCK CREEK-COMSTOCK

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

       0.        0.        0.        0.  0.000000      0.00       0.0        0.   764.000     0.000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IDUM      CHNIM     ITRACE

     15.000     0.000    -1.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
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00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: COMSTOCK TWP.

3) WATERCOURSE: COMSTOCK CREEK

4) DOCUMENT TYPE: MULTI-PROFILE SUMMARY

00BREAK00

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HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
ERROR CODE - C1
MODIFICATION - 50.30.52
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

CONSTOCK CREEK-CONSTOCK

SUMMARY PRINTOUT TABLE 150

	SECNO	XLOB	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	VLOB	VCH	AREA	TOPW
	100.000	0.00	0.00	0.00	760.20	140.00	764.00	0.00	764.04	4.81	1.60	109.45	63.36
	100.000	0.00	0.00	0.00	760.20	210.00	764.00	0.00	764.09	10.81	2.40	109.45	63.36
	100.000	0.00	0.00	0.00	760.20	250.00	764.00	0.00	764.13	15.32	2.86	109.45	63.36
	100.000	0.00	0.00	0.00	760.20	400.00	764.00	0.00	764.32	35.23	4.58	109.45	63.36
	140.000	40.00	0.00	0.00	760.20	140.00	764.05	0.00	764.06	3.2	1.42	140.37	77.30
	140.000	40.00	0.00	0.00	760.20	210.00	764.06	0.00	764.12	7.06	2.09	145.34	79.03
	140.000	40.00	0.00	0.00	760.20	250.00	764.09	0.00	764.18	9.51	2.45	151.12	81.05
	140.000	40.00	0.00	0.00	760.20	400.00	764.25	0.00	764.44	19.45	3.82	177.54	90.70
	175.000	35.00	0.00	0.00	760.40	140.00	764.04	0.00	764.07	3.19	1.40	143.58	78.41
	175.000	35.00	0.00	0.00	760.20	210.00	764.09	0.00	764.15	6.68	2.05	157.56	81.22
	175.000	35.00	0.00	0.00	760.20	250.00	764.13	0.00	764.21	8.97	2.40	167.80	83.48
	175.000	35.00	0.00	0.00	760.20	400.00	764.34	0.00	764.50	17.41	3.47	191.00	95.88
	180.000	5.00	0.00	0.00	762.80	140.00	764.09	764.05	764.14	116.01	4.56	57.61	13.00
*	180.000	5.00	0.00	0.00	762.80	210.00	764.05	764.05	764.30	124.12	5.37	32.14	10.35
*	180.000	5.00	0.00	0.00	762.80	250.00	764.15	764.15	764.49	120.54	5.63	96.77	22.77
*	180.000	5.00	0.00	0.00	762.80	400.00	764.41	764.41	764.85	122.47	6.59	140.31	36.14
	185.000	5.00	0.00	0.00	762.20	140.00	764.14	0.00	764.16	2.79	1.24	150.96	82.67
	185.000	5.00	0.00	0.00	762.20	210.00	764.27	0.00	764.41	4.60	1.80	190.15	97.53
	185.000	5.00	0.00	0.00	762.20	250.00	764.47	0.00	764.53	5.65	2.08	213.35	105.22
	185.000	5.00	0.00	0.00	762.20	400.00	764.80	0.00	764.90	9.46	2.78	260.66	130.04
	225.000	40.00	0.00	0.00	760.20	140.00	764.15	0.00	764.18	2.74	1.33	160.77	84.52
	225.000	40.00	0.00	0.00	760.20	210.00	764.39	0.00	764.43	4.43	1.70	199.30	99.20
	225.000	40.00	0.00	0.00	760.20	250.00	764.50	0.00	764.55	5.47	2.01	217.60	104.55
	225.000	40.00	0.00	0.00	760.20	400.00	764.84	0.00	764.94	9.04	2.74	274.81	133.85
	395.000	170.00	0.00	0.00	761.50	140.00	764.21	0.00	764.27	11.87	2.08	96.29	40.63
	395.000	170.00	0.00	0.00	761.50	210.00	764.48	0.00	764.57	16.15	2.64	118.83	52.25
	395.000	170.00	0.00	0.00	761.50	250.00	764.61	0.00	764.72	18.56	2.92	129.61	58.15
	395.000	170.00	0.00	0.00	761.50	400.00	765.02	0.00	765.20	26.00	3.83	162.61	78.43
	565.000	170.00	0.00	0.00	762.50	140.00	764.44	0.00	764.92	205.97	5.53	25.33	9.75
	565.000	170.00	0.00	0.00	762.50	210.00	764.61	0.00	765.38	198.79	6.09	34.50	14.69
	565.000	170.00	0.00	0.00	762.50	250.00	764.99	0.00	765.61	195.59	6.34	39.44	17.50
	565.000	170.00	0.00	0.00	762.50	400.00	765.47	765.43	766.33	178.95	7.62	55.41	29.90

FR	SECNO	XLOC	ELTTD	ELLC	ELMIN	Q	CRSEL	CRIWS	EG	TOPWS	VCH	AREA	.CTR
	752.000	197.00	0.00	0.00	763.50	140.00	766.02	0.00	766.15	30.35	2.90	46.36	25.21
	752.000	197.00	0.00	0.00	763.50	210.00	766.47	0.00	766.65	32.49	3.25	62.19	36.04
	752.000	197.00	0.00	0.00	763.50	250.00	766.69	0.00	766.90	33.26	3.70	69.64	44.35
	752.000	197.00	0.00	0.00	763.50	400.00	767.35	0.00	767.57	36.20	4.56	95.88	60.46
	802.000	50.00	0.00	0.00	764.00	140.00	766.10	0.00	766.36	51.93	3.57	39.18	19.43
	802.000	50.00	0.00	0.00	764.00	210.00	766.63	0.00	766.90	52.32	4.15	51.06	29.03
	802.000	50.00	0.00	0.00	764.00	250.00	766.85	0.00	767.15	53.33	4.65	57.25	34.73
	802.000	50.00	0.00	0.00	764.00	400.00	767.54	0.00	767.83	56.00	5.40	78.10	53.45
	827.000	25.00	0.00	0.00	764.20	140.00	766.36	0.00	766.60	86.10	6.37	32.06	15.04
	827.000	25.00	0.00	0.00	764.20	210.00	766.74	0.00	767.12	88.33	6.97	42.23	22.34
	827.000	25.00	0.00	0.00	764.20	250.00	766.95	0.00	767.38	89.58	7.26	47.54	26.41
	827.000	25.00	0.00	0.00	764.20	400.00	767.62	0.00	767.88	92.53	8.12	65.36	41.58
	852.000	25.00	0.00	0.00	764.40	140.00	766.44	0.00	766.69	136.20	5.97	23.45	12.04
	852.000	25.00	0.00	0.00	764.40	210.00	766.80	0.00	767.07	175.14	7.50	27.99	15.96
	852.000	25.00	0.00	0.00	764.40	250.00	766.95	0.00	767.03	198.71	8.35	29.96	17.73
*	852.000	25.00	0.00	0.00	764.40	400.00	767.72	767.72	769.30	213.63	10.09	39.63	27.37
	853.000	1.00	777.50	772.10	764.40	140.00	766.89	0.00	767.00	74.59	5.99	23.54	14.21
	853.000	1.00	777.50	772.10	764.40	210.00	766.93	0.00	767.00	90.40	7.48	28.06	21.56
	853.000	1.00	777.50	772.10	764.40	250.00	766.97	0.00	769.05	110.99	8.33	30.01	23.73
	853.000	1.00	777.50	772.10	764.40	400.00	768.35	0.00	769.46	69.54	8.43	47.46	47.97
	922.000	69.00	777.50	772.20	764.50	140.00	767.07	0.00	767.42	34.63	4.66	30.06	25.76
	922.000	69.00	777.50	772.20	764.50	210.00	768.79	0.00	768.19	36.21	5.45	38.51	34.01
	922.000	69.00	777.50	772.20	764.50	250.00	768.10	0.00	768.62	36.67	5.91	43.00	41.32
	922.000	69.00	777.50	772.20	764.50	400.00	769.13	0.00	769.92	42.22	7.14	56.02	61.36
	923.000	1.00	5.00	0.00	764.30	140.00	767.07	0.00	767.41	60.77	4.64	30.18	17.96
	923.000	1.00	5.00	0.00	764.30	210.00	767.73	0.00	768.23	64.15	5.45	38.54	28.28
	923.000	1.00	5.00	0.00	764.30	250.00	768.11	0.00	768.63	64.26	5.90	43.17	34.19
	923.000	1.00	5.00	0.00	764.30	400.00	769.14	0.00	769.93	74.43	7.32	56.16	46.36
	1025.000	102.00	0.00	0.00	765.60	140.00	768.03	0.00	768.23	107.22	3.62	39.26	13.52
	1025.000	102.00	0.00	0.00	765.60	210.00	768.61	0.00	768.78	47.08	3.32	66.37	30.61
	1025.000	102.00	0.00	0.00	765.60	250.00	768.95	0.00	769.12	32.63	3.10	74.39	43.77
	1025.000	102.00	0.00	0.00	765.60	400.00	770.19	0.00	770.20	16.61	2.96	104.79	104.63
	1100.000	75.00	0.00	0.00	766.50	140.00	768.75	0.00	768.92	79.30	3.52	39.79	15.67
	1100.000	75.00	0.00	0.00	766.50	210.00	769.04	0.00	769.29	94.62	4.06	51.66	21.59
	1100.000	75.00	0.00	0.00	766.50	250.00	769.26	0.00	769.51	31.17	4.03	62.07	27.75
	1100.000	75.00	0.00	0.00	766.50	400.00	771.29	0.00	770.46	91.52	3.63	123.45	71.35
	1175.000	75.00	0.00	0.00	767.40	140.00	769.49	0.00	769.71	161.25	4.79	29.25	10.79
	1175.000	75.00	0.00	0.00	767.40	210.00	769.87	0.00	770.25	159.99	4.03	43.47	16.00
	1175.000	75.00	0.00	0.00	767.40	250.00	770.51	0.00	770.41	168.74	5.08	49.21	19.25
	1175.000	75.00	0.00	0.00	767.40	400.00	770.47	0.00	770.90	135.07	5.73	71.00	34.42
	1325.000	150.00	0.00	0.00	769.20	140.00	771.20	0.00	771.46	78.67	4.29	33.70	15.06
	1325.000	150.00	0.00	0.00	769.20	210.00	771.57	0.00	771.95	85.85	4.99	43.41	22.07
	1325.000	150.00	0.00	0.00	769.20	250.00	771.76	0.00	772.19	87.96	5.33	52.65	26.66
	1325.000	150.00	0.00	0.00	769.20	400.00	772.19	0.00	772.07	111.95	6.77	72.20	37.01

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRINS	EG	10K*S	VCH	AREA	.01K
	1485.000	160.00	0.00	0.00	771.20	140.00	772.68	0.00	773.37	181.16	5.59	25.29	10.40
	1485.000	160.00	0.00	0.00	771.20	210.00	773.21	773.13	773.87	164.64	6.20	36.10	16.57
	1485.000	160.00	0.00	0.00	771.20	250.00	773.47	773.37	774.12	155.66	6.50	42.32	19.74
	1485.000	160.00	0.00	0.00	771.20	400.00	774.12	773.97	774.56	134.07	7.09	68.90	34.19
	1512.000	27.00	0.00	0.00	772.00	140.00	773.46	0.00	773.78	117.85	4.51	31.52	12.90
	1512.000	27.00	0.00	0.00	772.00	210.00	773.85	0.00	774.24	107.25	5.03	43.45	20.20
	1512.000	27.00	0.00	0.00	772.00	250.00	774.06	0.00	774.43	102.89	5.25	50.12	24.66
	1512.000	27.00	0.00	0.00	772.00	400.00	774.67	0.00	775.19	102.50	6.15	70.84	39.51
*	1538.000	26.00	0.00	0.00	773.10	140.00	774.27	774.27	774.75	241.15	5.60	25.00	9.02
*	1538.000	26.00	0.00	0.00	773.10	210.00	774.59	774.59	775.19	227.59	6.24	33.65	15.92
*	1538.000	26.00	0.00	0.00	773.10	250.00	774.75	774.75	775.41	219.66	6.50	38.44	18.87
*	1538.000	26.00	0.00	0.00	773.10	400.00	775.23	775.23	776.10	204.20	7.33	54.28	27.00
*	1560.000	30.00	0.00	0.00	774.30	140.00	775.38	775.38	775.83	240.55	5.49	25.50	8.92
*	1560.000	30.00	0.00	0.00	774.30	210.00	775.69	775.69	776.27	230.23	6.12	34.30	13.86
*	1560.000	30.00	0.00	0.00	774.30	250.00	775.84	775.84	776.43	222.88	6.40	39.06	16.75
*	1560.000	30.00	0.00	0.00	774.30	400.00	776.35	776.35	777.15	203.59	7.17	55.76	26.03
	1569.000	1.00	787.70	783.90	774.50	140.00	775.81	0.00	776.31	70.99	4.32	31.94	16.62
	1569.000	1.00	787.70	783.90	774.50	210.00	776.08	0.00	776.54	65.59	4.68	43.19	25.39
	1569.000	1.00	787.70	783.90	774.50	250.00	776.15	0.00	776.58	65.39	5.12	48.87	30.92
	1569.000	1.00	787.70	783.90	774.50	400.00	776.73	0.00	777.24	60.67	5.77	69.29	51.36
	1621.000	52.00	787.70	784.40	774.80	140.00	776.02	0.00	776.36	93.61	4.51	29.90	14.47
	1621.000	52.00	787.70	784.40	774.80	210.00	776.33	0.00	776.79	89.73	5.40	38.47	22.17
	1621.000	52.00	787.70	784.40	774.80	250.00	776.50	0.00	777.00	87.79	5.86	44.14	26.68
	1621.000	52.00	787.70	784.40	774.80	400.00	777.03	0.00	777.67	83.65	6.43	62.23	45.73
	1622.000	1.00	0.00	0.00	774.80	140.00	776.02	0.00	776.38	164.42	4.79	29.21	10.92
	1622.000	1.00	0.00	0.00	774.80	210.00	776.33	0.00	776.80	150.34	5.59	38.96	16.69
	1622.000	1.00	0.00	0.00	774.80	250.00	776.51	0.00	777.01	155.19	5.95	44.22	20.07
	1622.000	1.00	0.00	0.00	774.80	400.00	777.13	0.00	777.70	134.20	6.20	64.51	34.32
*	1631.000	9.00	0.00	0.00	775.10	140.00	776.13	776.13	776.65	246.16	5.49	25.52	8.92
*	1631.000	9.00	0.00	0.00	775.10	210.00	776.49	776.49	777.07	230.23	6.12	34.30	13.84
*	1631.000	9.00	0.00	0.00	775.10	250.00	776.64	776.64	777.20	223.39	6.41	38.99	16.71
*	1631.000	9.00	0.00	0.00	775.10	400.00	777.15	777.14	777.95	205.10	7.19	55.60	27.92
	1632.000	1.00	789.90	783.90	775.10	140.00	776.42	0.00	776.71	70.43	4.37	32.03	16.66
	1632.000	1.00	789.90	783.90	775.10	210.00	776.78	0.00	777.14	65.96	4.86	43.19	25.35
	1632.000	1.00	789.90	783.90	775.10	250.00	776.95	0.00	777.36	65.67	5.12	48.79	30.85
	1632.000	1.00	789.90	783.90	775.10	400.00	777.55	0.00	778.04	60.56	5.77	69.33	51.40
	1659.000	27.00	789.90	784.30	775.50	140.00	776.39	776.38	777.06	137.92	5.46	25.55	11.92
	1659.000	27.00	789.90	784.30	775.50	210.00	776.92	0.00	777.46	116.24	5.90	35.58	19.26
	1659.000	27.00	789.90	784.30	775.50	250.00	777.09	0.00	777.67	110.46	6.13	40.79	23.79
	1659.000	27.00	789.90	784.30	775.50	400.00	777.63	0.00	778.35	97.23	6.78	59.04	40.57
	1660.000	1.00	0.00	0.00	775.50	140.00	776.03	0.00	777.12	119.75	4.31	32.51	12.39
	1660.000	1.00	0.00	0.00	775.50	210.00	776.44	0.00	777.48	105.65	5.89	35.66	14.64
	1660.000	1.00	0.00	0.00	775.50	250.00	777.11	0.00	777.69	196.05	6.13	40.81	17.86
	1660.000	1.00	0.00	0.00	775.50	400.00	777.65	0.00	778.36	173.14	6.78	59.00	30.40

	SECNO	XLCH	ELTRD	ELLC	ELMIX	Q	CLSEL	CRIMS	EG	TCK*S	VCH	AREA	.01K
*	1690.000	30.00	0.00	0.00	776.20	140.00	777.28	777.28	777.75	245.97	5.49	25.52	8.93
*	1690.000	30.00	0.00	0.00	776.20	210.00	777.59	777.59	778.77	327.57	6.10	34.43	13.92
*	1690.000	30.00	0.00	0.00	776.20	250.00	777.73	777.73	778.36	224.50	6.37	39.23	16.19
*	1690.000	30.00	0.00	0.00	776.20	400.00	778.23	778.23	779.05	206.29	7.18	55.69	27.99
	1720.000	30.00	0.00	0.00	776.90	140.00	778.02	0.00	778.45	210.03	5.27	26.57	9.45
*	1720.000	30.00	0.00	0.00	776.90	210.00	778.29	778.29	778.87	229.08	6.11	34.35	13.87
*	1720.000	30.00	0.00	0.00	776.90	250.00	778.44	778.44	779.08	225.77	6.41	39.00	15.97
*	1720.000	30.00	0.00	0.00	776.90	400.00	778.94	778.94	779.75	206.90	7.21	55.64	27.91
	1750.000	30.00	0.00	0.00	777.60	140.00	778.68	778.68	779.15	246.22	5.47	25.58	8.96
*	1750.000	30.00	0.00	0.00	777.60	210.00	778.99	778.99	779.57	230.81	6.13	34.27	13.82
*	1750.000	30.00	0.00	0.00	777.60	250.00	779.14	779.14	779.78	222.00	6.39	39.11	16.78
*	1750.000	30.00	0.00	0.00	777.60	400.00	779.64	779.64	780.45	206.90	7.21	55.46	27.84
	1796.000	44.00	789.20	789.20	783.00	140.00	791.17	0.00	791.98	2.36	1.23	230.72	91.46
	1794.000	44.00	789.20	789.20	783.00	210.00	791.74	0.00	791.78	2.69	1.40	295.95	128.10
	1794.000	44.00	789.20	789.20	783.00	250.00	791.91	0.00	791.94	3.30	1.60	310.16	137.59
	1794.000	44.00	789.20	789.20	783.00	400.00	792.33	0.00	792.38	5.73	2.56	352.10	167.08
	1894.000	100.00	0.00	0.00	787.60	140.00	791.19	0.00	791.19	0.26	0.49	266.06	203.12
	1894.000	100.00	0.00	0.00	787.60	210.00	791.79	0.00	791.79	0.3	0.62	339.07	342.31
	1894.000	100.00	0.00	0.00	787.60	250.00	791.94	0.00	791.95	0.47	0.71	354.62	369.21
	1894.000	100.00	0.00	0.00	787.60	400.00	792.39	0.00	792.41	0.85	1.02	419.97	435.13
	2300.000	406.00	0.00	0.00	769.30	140.00	791.87	0.00	791.25	6.60	1.46	94.77	54.50
	2300.000	406.00	0.00	0.00	769.30	210.00	791.63	0.00	791.94	5.53	1.59	132.67	89.12
	2300.000	406.00	0.00	0.00	769.30	250.00	791.95	0.00	792.31	6.27	1.75	143.26	99.84
	2300.000	406.00	0.00	0.00	769.30	400.00	792.42	0.00	792.50	8.37	2.29	175.73	138.28
*	2736.000	464.00	0.00	0.00	791.00	140.00	791.93	791.93	792.33	185.98	5.11	29.93	10.27
	2736.000	464.00	0.00	0.00	791.00	210.00	792.26	0.00	792.70	196.91	5.63	43.99	15.09
	2736.000	464.00	0.00	0.00	791.00	250.00	792.40	0.00	792.81	183.66	5.85	54.45	24.16
	2736.000	464.00	0.00	0.00	791.00	400.00	792.83	0.00	793.25	78.71	5.87	63.17	45.09
*	2824.000	40.00	0.00	0.00	791.60	140.00	793.23	793.23	793.80	171.03	6.05	23.30	10.71
*	2824.000	40.00	0.00	0.00	791.60	210.00	793.50	793.50	794.32	157.43	6.93	31.28	16.74
*	2824.000	40.00	0.00	0.00	791.60	250.00	793.77	793.77	794.59	149.05	7.51	35.59	20.66
*	2824.000	40.00	0.00	0.00	791.60	400.00	794.40	794.40	795.47	129.61	9.40	53.00	35.11
*	2864.000	40.00	0.00	0.00	791.90	140.00	794.32	794.32	795.38	210.15	8.26	16.96	9.66
*	2864.000	40.00	0.00	0.00	791.90	210.00	794.96	794.96	796.36	210.03	9.50	22.11	14.49
*	2864.000	40.00	0.00	0.00	791.90	250.00	795.30	795.30	796.58	209.96	10.07	24.84	17.25
*	2864.000	40.00	0.00	0.00	791.90	400.00	796.45	796.45	797.60	205.54	11.77	33.99	27.37
	2865.000	1.00	801.00	797.80	791.90	140.00	794.78	0.00	795.49	36.73	6.86	20.46	15.63
	2865.000	1.00	801.00	797.80	791.90	210.00	794.98	794.92	796.38	163.12	9.49	22.15	16.44
	2865.000	1.00	801.00	797.80	791.90	250.00	795.31	795.28	796.91	167.96	10.15	24.63	19.29
*	2865.000	1.00	801.00	797.80	791.90	400.00	796.30	796.30	797.83	236.56	12.76	31.36	25.90
	2901.000	36.00	801.00	797.80	791.90	140.00	795.09	0.00	795.30	93.67	5.72	24.47	19.11
	2901.000	36.00	801.00	797.80	791.90	210.00	795.23	0.00	796.95	68.91	6.01	30.65	25.30
	2901.000	36.00	801.00	797.80	791.90	250.00	796.66	0.00	797.52	76.49	7.44	33.60	28.59
	2901.000	36.00	801.00	797.80	791.90	400.00	798.12	0.00	798.91	241.21	10.74	37.24	25.75

FOR MATERIALS PRINTED BY LOTUS MANIFOLD FORMS

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
2902.000	1.00	0.00	0.00	791.90	140.00	795.32	0.00	795.81	64.63	5.60	24.99	17.41
2902.000	1.00	0.00	0.00	791.90	210.00	796.36	0.00	796.99	51.67	6.28	33.45	25.74
2902.000	1.00	0.00	0.00	791.90	250.00	796.90	0.00	797.50	62.19	6.64	37.63	31.70
2902.000	1.00	0.00	0.00	791.90	400.00	799.62	0.00	800.24	46.21	8.83	58.55	52.74
2922.000	20.00	0.00	0.00	793.20	140.00	795.92	0.00	795.97	5.21	1.67	83.80	61.36
2922.000	20.00	0.00	0.00	793.20	210.00	797.16	0.00	797.18	3.25	1.62	129.37	116.47
2922.000	20.00	0.00	0.00	793.20	250.00	797.75	0.00	797.79	2.76	1.62	154.39	153.97
2922.000	20.00	0.00	0.00	793.20	400.00	800.42	0.00	800.45	1.14	1.49	279.49	374.44
2957.000	35.00	805.90	805.90	804.00	140.00	806.52	0.00	806.59	6.70	2.21	106.52	53.73
2957.000	35.00	805.90	805.90	804.00	210.00	809.36	0.00	809.41	5.32	2.20	201.76	91.07
2957.000	35.00	805.90	805.90	804.00	250.00	809.77	0.00	809.81	4.79	2.20	247.67	114.24
2957.000	35.00	805.90	805.90	804.00	400.00	810.21	0.00	810.56	7.61	2.90	304.95	166.94
3280.000	325.00	0.00	0.00	806.20	140.00	808.67	0.00	808.80	1.13	0.96	250.74	131.75
3280.000	325.00	0.00	0.00	806.20	210.00	809.47	0.00	809.69	1.03	1.02	465.11	267.38
3280.000	323.00	0.00	0.00	806.20	250.00	809.87	0.00	809.88	0.92	1.01	633.62	361.00
3280.000	323.00	0.00	0.00	806.20	400.00	810.44	0.00	810.45	1.16	1.23	926.14	571.12
4280.000	1300.00	0.00	0.00	807.20	140.00	808.90	0.00	808.99	7.21	1.25	112.00	52.14
4280.000	1300.00	0.00	0.00	807.20	210.00	809.61	0.00	809.71	3.16	1.14	187.77	114.17
4280.000	1300.00	0.00	0.00	807.20	250.00	810.05	0.00	810.07	2.65	1.15	229.40	159.66
4280.000	1300.00	0.00	0.00	807.20	400.00	810.65	0.00	810.68	2.80	1.42	298.60	230.84
4594.000	314.00	0.00	0.00	808.50	140.00	809.31	809.31	809.77	224.75	4.06	34.49	9.24
4594.000	316.00	0.00	0.00	808.50	210.00	809.96	0.00	810.05	95.72	3.57	59.06	21.44
4594.000	316.00	0.00	0.00	808.50	250.00	810.17	0.00	810.31	66.76	3.82	84.28	36.55
4594.000	318.00	0.00	0.00	808.50	400.00	810.76	0.00	810.92	26.80	2.97	137.81	77.27
4916.000	316.00	0.00	0.00	809.70	140.00	811.29	0.00	811.36	21.18	2.16	67.82	30.42
4916.000	316.00	0.00	0.00	809.70	210.00	811.87	0.00	811.94	29.15	2.79	79.81	37.90
4916.000	316.00	0.00	0.00	809.70	250.00	811.96	0.00	811.66	33.39	3.25	81.96	40.35
4916.000	316.00	0.00	0.00	809.70	400.00	812.53	0.00	812.58	49.56	4.21	103.68	57.11
5234.000	318.00	0.00	0.00	811.50	140.00	812.54	0.00	812.34	144.25	6.36	33.69	11.66
5234.000	318.00	0.00	0.00	811.50	210.00	812.88	0.00	813.19	96.17	4.52	50.61	21.41
5234.000	318.00	0.00	0.00	811.50	250.00	813.17	0.00	813.39	77.42	4.33	61.47	28.71
5234.000	318.00	0.00	0.00	811.50	400.00	813.56	0.00	813.97	69.85	5.26	88.79	47.66
5552.000	318.00	0.00	0.00	813.00	140.00	814.67	0.00	814.82	54.54	3.14	51.46	25.39
5552.000	318.00	0.00	0.00	813.00	210.00	814.93	0.00	815.16	43.07	3.94	63.61	32.00
5552.000	318.00	0.00	0.00	813.00	250.00	815.06	0.00	815.32	49.10	4.39	68.67	35.65
5552.000	318.00	0.00	0.00	813.00	400.00	815.51	0.00	815.93	55.16	5.63	93.81	55.16
5872.000	320.00	0.00	0.00	813.30	140.00	815.08	0.00	816.14	47.93	4.22	41.27	20.22
5872.000	320.00	0.00	0.00	813.30	210.00	816.30	0.00	816.64	48.14	4.89	58.65	30.27
5872.000	320.00	0.00	0.00	813.30	250.00	816.52	0.00	816.90	48.14	5.20	60.30	36.03
5872.000	320.00	0.00	0.00	813.30	400.00	817.11	0.00	817.55	46.95	5.96	118.47	58.39
6292.000	420.00	0.00	0.00	816.00	140.00	817.67	0.00	818.00	49.29	3.77	39.08	23.52
6292.000	420.00	0.00	0.00	816.00	210.00	818.21	0.00	818.57	44.81	4.37	56.30	31.37
6292.000	420.00	0.00	0.00	816.00	250.00	818.49	0.00	818.87	46.39	4.66	63.02	37.52
6292.000	420.00	0.00	0.00	816.00	400.00	819.05	0.00	819.53	49.63	5.74	90.85	56.78

SECNO	XLCH	CLERD	ELLC	ELMIN	B	CMSEL	CNIUS	EG	SDR*S	VCH	AREA	.01K
6712.000	420.00	0.00	0.00	818.00	160.00	819.89	0.00	820.12	52.00	3.84	37.12	19.40
6712.000	420.00	0.00	0.00	818.00	210.00	820.29	0.00	820.59	51.72	4.46	51.09	27.20
6712.000	420.00	0.00	0.00	818.00	250.00	820.60	0.00	820.83	51.77	4.77	57.62	34.75
6712.000	420.00	0.00	0.00	818.00	400.00	821.11	0.00	821.31	52.91	5.00	87.70	57.39
7132.000	420.00	0.00	0.00	819.90	140.00	822.22	0.00	822.51	61.24	4.30	32.60	17.89
7132.000	420.00	0.00	0.00	819.90	210.00	822.65	0.00	823.03	64.58	4.97	42.34	26.13
7132.000	420.00	0.00	0.00	819.90	250.00	822.90	0.00	823.29	65.07	5.31	47.37	33.12
7132.000	420.00	0.00	0.00	819.90	400.00	823.46	0.00	823.70	72.70	6.42	64.20	46.41
7332.000	200.00	0.00	0.00	819.90	140.00	822.99	0.00	823.31	17.14	2.79	50.58	33.62
7332.000	200.00	0.00	0.00	819.90	210.00	823.52	0.00	823.69	18.77	3.29	65.79	48.47
7332.000	200.00	0.00	0.00	819.90	250.00	823.78	0.00	823.97	19.62	3.56	73.83	56.44
7332.000	200.00	0.00	0.00	819.90	400.00	824.39	0.00	824.56	21.79	4.27	102.05	86.09
7532.000	200.00	0.00	0.00	819.90	140.00	823.29	0.00	823.36	11.12	2.42	55.13	41.05
7532.000	200.00	0.00	0.00	819.90	210.00	823.87	0.00	823.90	12.50	2.87	76.77	59.59
7532.000	200.00	0.00	0.00	819.90	250.00	824.15	0.00	824.30	13.12	3.08	86.27	69.01
7532.000	200.00	0.00	0.00	819.90	400.00	825.01	0.00	825.22	14.23	3.76	123.35	106.02
7800.000	260.00	0.00	0.00	819.90	140.00	823.47	0.00	823.49	1.47	1.07	170.00	113.05
7800.000	260.00	0.00	0.00	819.90	210.00	824.09	0.00	824.11	1.76	1.21	215.09	155.25
7800.000	260.00	0.00	0.00	819.90	250.00	824.39	0.00	824.41	1.85	1.25	239.02	179.27
7800.000	260.00	0.00	0.00	819.90	400.00	825.31	0.00	825.33	1.98	1.33	669.87	340.62
7990.000	190.00	0.00	0.00	819.90	140.00	823.52	0.00	823.56	5.61	1.69	260.76	77.05
7990.000	190.00	0.00	0.00	819.90	210.00	824.14	0.00	824.15	2.07	1.67	308.46	123.01
7990.000	190.00	0.00	0.00	819.90	250.00	824.43	0.00	824.45	2.67	1.81	469.08	153.09
7990.000	190.00	0.00	0.00	819.90	400.00	825.35	0.00	825.36	2.35	1.76	641.67	261.14
8034.000	44.00	824.60	821.90	820.10	140.00	825.47	0.00	825.48	0.25	0.61	667.05	277.60
8034.000	44.00	824.61	821.90	820.10	210.00	825.71	0.00	825.72	0.46	0.86	717.92	311.23
8034.000	44.00	824.61	821.90	819.70	250.00	825.84	0.00	825.84	0.50	0.96	743.94	329.04
8034.000	44.00	824.60	821.90	819.70	400.00	826.25	0.00	826.25	1.05	1.36	830.16	396.57
8084.000	50.00	0.00	0.00	820.10	140.00	825.46	0.00	825.46	0.25	0.61	668.80	278.74
8084.000	50.00	0.00	0.00	820.10	210.00	825.72	0.00	825.72	0.45	0.84	719.16	312.07
8084.000	50.00	0.00	0.00	819.70	250.00	825.85	0.00	825.84	0.57	0.96	744.97	329.79
8084.000	50.00	0.00	0.00	819.70	400.00	826.24	0.00	826.25	1.05	1.35	832.56	391.14

REPRODUCED BY PERMISSION OF DETROIT EDISON COMPANY

COMSTOCK CREEK-COMSTOCK

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CUSEL	DIFMEP	DIFUSX	DIFMNG	TOPOIT	PLCH
	100.000	140.00	764.00	0.00	0.00	0.00	135.00	0.00
	100.000	210.00	764.00	0.00	0.00	0.00	135.00	0.00
	100.000	250.00	764.00	0.00	0.00	0.00	135.00	0.00
	100.000	400.00	764.00	0.00	0.00	0.00	135.00	0.00
	140.000	140.00	764.03	0.00	0.03	0.00	152.42	40.00
	140.000	210.00	764.06	0.00	0.06	0.00	153.87	40.00
	140.000	250.00	764.09	0.00	0.09	0.00	155.53	40.00
	140.000	400.00	764.25	0.00	0.25	0.00	162.9[illegible]	40.00
	175.000	140.00	764.04	0.00	0.01	0.00	152.36	35.00
	175.000	210.00	764.09	0.00	0.03	0.00	155.66	35.00
	175.000	250.00	764.13	0.00	0.04	0.00	157.45	35.00
	175.000	400.00	764.34	0.00	0.03	0.00	164.97	35.00
	180.000	140.00	765.[illegible]	0.00	-0.1[illegible]	0.00	161.[illegible]	5.00
*	180.000	210.00	764.[illegible]	0.00	-0.0[illegible]	0.00	1[illegible].[illegible]	5.00
*	180.000	250.00	764.15	0.00	0.02	0.00	158.12	5.00
*	180.000	400.00	764.41	0.00	0.08	0.00	165.12	5.00
	185.000	140.00	764.14	0.00	0.03	0.00	157.7[illegible]	5.00
	185.000	210.00	764.37	0.00	0.31	0.00	165.[illegible]	5.00
	185.000	250.00	764.47	0.00	0.3[illegible]	0.00	16[illegible].2[illegible]	5.00
	185.000	400.00	764.80	0.00	0.39	0.00	165.85	5.00
	225.000	140.00	764.15	0.00	0.01	0.00	158.26	40.00
	225.000	210.00	764.[illegible]	0.00	0.02	0.00	163.[illegible]	40.00
	225.000	250.00	764.5[illegible]	0.00	0.02	0.00	165.2[illegible]	40.00
	225.000	400.00	764.[illegible]	0.00	0.04	0.00	16[illegible].92	40.00
	395.000	140.00	764.21	0.00	0.06	0.00	80.55	170.00
	395.000	210.00	764.43	0.00	0.09	0.00	81.30	170.00
	395.000	250.00	764.[illegible]	0.00	0.11	0.00	81.66	170.00
	395.000	400.00	765.02	0.00	0.1[illegible]	0.00	82.70	170.00
	565.000	140.00	764.44	0.00	0.23	0.00	23.65	170.00
	565.000	210.00	764.81	0.00	0.32	0.00	27.12	170.00
	565.000	250.00	764.99	0.00	0.37	0.00	28.61	170.00
	565.000	400.00	765.47	0.00	0.4[illegible]	0.00	36.03	170.00
	752.000	140.00	766.02	0.00	1.53	0.00	28.69	187.00
	752.000	210.00	766.47	0.00	1.66	0.00	33.78	187.00
	752.000	250.00	766.69	0.00	1.70	0.00	36.19	187.00
	752.000	400.00	767.35	0.00	1.88	0.00	43.65	187.00
	802.000	140.00	766.1[illegible]	0.00	0.16	0.00	24.62	50.00
	802.000	210.00	766.63	0.00	0.16	0.00	27.77	50.00
	802.000	250.00	766.85	0.00	0.16	0.00	29.30	50.00
	802.000	400.00	767.51	0.00	0.16	0.00	33.19	50.00
	827.000	140.00	766.30	0.00	0.12	0.00	21.[illegible]	25.00
	827.000	210.00	766.74	0.00	0.11	0.00	24.[illegible]1	25.00
	827.000	250.00	766.95	0.00	0.11	0.00	25.[illegible]	25.00
	827.000	400.00	767.62	0.00	0.11	0.00	28.82	25.00

SECNO	Q	CUSEL	DIFUSP	DIFUSX	DIFUQS	TOPWID	XLCH
852.000	140.00	766.44	0.00	0.14	0.00	12.60	25.00
852.000	210.00	766.53	0.00	0.06	0.00	12.60	25.00
852.000	250.00	766.53	0.00	-0.01	0.00	12.60	25.00
852.000	400.00	767.72	0.00	0.11	0.00	12.61	25.00
853.000	140.00	766.45	0.00	0.02	0.00	12.60	1.00
853.000	210.00	766.52	0.00	0.02	0.00	12.60	1.00
853.000	250.00	766.57	0.00	0.02	0.00	12.60	1.00
853.000	400.00	766.35	0.00	0.03	0.00	12.61	1.00
922.000	140.00	767.07	0.00	0.61	0.00	12.60	69.00
922.000	210.00	767.73	0.00	0.91	0.00	12.60	69.00
922.000	250.00	768.10	0.00	1.13	0.00	12.60	69.00
922.000	400.00	769.15	0.00	0.77	0.00	12.60	69.00
923.000	140.00	767.07	0.00	0.01	0.00	12.60	1.00
923.000	210.00	767.73	0.00	0.01	0.00	12.60	1.00
923.000	250.00	768.11	0.00	0.01	0.00	12.60	1.00
923.000	400.00	769.14	0.00	0.01	0.00	12.60	1.00
1025.000	140.00	766.85	0.00	0.95	0.00	66.49	102.00
1025.000	210.00	768.61	0.00	0.60	0.00	69.31	102.00
1025.000	250.00	768.96	0.00	0.96	0.00	55.86	102.00
1025.000	400.00	770.15	0.00	1.01	0.00	81.56	102.00
1100.000	140.00	768.73	0.00	0.73	0.00	75.53	75.00
1100.000	210.00	769.36	0.00	0.42	0.00	62.46	75.00
1100.000	250.00	769.78	0.00	0.34	0.00	57.56	75.00
1100.000	400.00	770.25	0.00	0.10	0.00	75.53	75.00
1175.000	140.00	769.45	0.00	0.73	0.00	26.27	75.00
1175.000	210.00	769.97	0.00	0.53	0.00	40.32	75.00
1175.000	250.00	770.31	0.00	0.73	0.00	44.36	75.00
1175.000	400.00	770.42	0.00	0.21	0.00	69.73	75.00
1325.000	140.00	771.20	0.00	1.73	0.00	27.03	150.00
1325.000	210.00	771.57	0.00	1.70	0.00	36.33	150.00
1325.000	250.00	771.76	0.00	1.76	0.00	41.03	150.00
1325.000	400.00	772.19	0.00	1.72	0.00	66.65	150.00
1465.000	140.00	772.08	0.00	1.38	0.00	23.62	160.00
1465.000	210.00	773.20	0.00	1.71	0.00	31.05	160.00
1465.000	250.00	773.67	0.00	1.71	0.00	34.60	160.00
1465.000	400.00	774.12	0.00	1.95	0.00	45.66	160.00
1512.000	140.00	773.46	0.00	0.56	0.00	28.38	27.00
1512.000	210.00	773.85	0.00	0.58	0.00	32.15	27.00
1512.000	250.00	774.06	0.00	0.59	0.00	34.08	27.00
1512.000	400.00	774.62	0.00	0.50	0.00	39.58	27.00
* 1536.000	140.00	774.27	0.00	0.81	0.00	25.83	26.00
* 1536.000	210.00	774.53	0.00	0.73	0.00	31.34	26.00
* 1536.000	250.00	774.75	0.00	0.70	0.00	29.50	26.00
* 1536.000	400.00	775.26	0.00	0.64	0.00	33.38	26.00

	SECNO	D	CASEL	DIFUSP	DIFUSX	DIFUUS	TOPLID	XLEN
*	1568.000	140.00	775.30	0.00	1.19	0.01	27.61	30.00
*	1568.000	210.00	775.59	0.00	1.15	0.01	29.98	30.00
*	1568.000	250.00	775.96	0.00	1.01	0.01	31.04	30.00
*	1568.000	400.00	776.87	0.00	1.04	0.01	34.67	30.00
	1569.000	140.00	775.61	0.00	0.23	0.00	29.29	1.00
	1569.000	210.00	775.93	0.00	0.29	0.00	32.01	1.00
	1569.000	250.00	776.15	0.00	0.31	0.00	33.50	1.00
	1569.000	400.00	776.75	0.00	0.31	0.00	37.15	1.00
	1621.000	140.00	776.00	0.00	0.59	0.00	28.56	52.00
	1621.000	210.00	776.33	0.00	0.35	0.00	30.99	52.00
	1621.000	250.00	776.50	0.00	0.35	0.00	32.23	52.00
	1621.000	400.00	777.15	0.00	0.37	0.00	36.15	52.00
	1622.000	140.00	776.34	0.00	0.02	0.00	28.59	1.00
	1622.000	210.00	776.35	0.00	0.01	0.00	31.52	1.00
	1622.000	250.00	776.51	0.00	0.01	0.00	32.25	1.00
	1622.000	400.00	777.10	0.00	0.07	0.00	36.62	1.00
*	1631.000	140.00	776.16	0.00	1.15	0.00	27.54	9.00
*	1631.000	210.00	776.49	0.00	0.11	0.00	29.71	9.00
*	1631.000	250.00	776.64	0.00	0.13	0.00	31.13	9.00
	1631.000	400.00	777.15	0.00	0.04	0.00	34.77	9.00
	1632.000	140.00	776.42	0.00	1.23	0.00	29.41	1.00
	1632.000	210.00	776.73	0.00	0.29	0.00	32.11	1.00
	1632.000	250.00	776.93	0.00	0.31	0.00	33.49	1.00
	1632.000	400.00	777.53	0.00	0.38	0.00	37.15	1.00
	1659.000	140.00	776.59	0.00	0.17	0.00	27.63	27.00
	1659.000	210.00	776.92	0.00	0.14	0.00	30.20	27.00
	1659.000	250.00	777.08	0.00	0.14	0.00	31.44	27.00
	1659.000	400.00	777.63	0.00	0.11	0.00	35.49	27.00
	1660.000	140.00	776.83	0.00	0.24	0.00	29.44	1.00
	1660.000	210.00	776.94	0.00	0.02	0.00	30.21	1.00
	1660.000	250.00	777.11	0.00	0.02	0.00	31.47	1.00
	1660.000	400.00	777.65	0.00	0.01	0.00	35.46	1.00
*	1690.000	140.00	777.28	0.00	0.45	0.00	27.62	30.00
*	1690.000	210.00	777.59	0.00	0.65	0.00	29.92	30.00
*	1690.000	250.00	777.75	0.00	0.64	0.00	31.08	30.00
*	1690.000	400.00	778.25	0.00	0.62	0.00	34.79	30.00
	1720.000	140.00	776.32	0.00	0.73	0.00	27.90	30.00
*	1720.000	210.00	776.29	0.00	0.70	0.00	29.90	30.00
*	1720.000	250.00	776.44	0.00	0.69	0.00	31.03	30.00
*	1720.000	400.00	776.94	0.00	0.69	0.00	34.74	30.00
	1750.000	140.00	776.69	0.00	0.67	0.00	27.83	30.00
*	1750.000	210.00	776.99	0.00	0.70	0.00	29.97	30.00
*	1750.000	250.00	779.14	0.00	0.70	0.00	31.05	30.00
*	1750.000	400.00	779.64	0.00	0.70	0.00	34.74	30.00

	SECND	Q	CUSEL	DIFUSP	DIFUSX	DIFKUS	TOPWID	XLOH
	1794.000	140.00	791.17	0.00	12.49	0.00	100.00	44.00
	1794.000	210.00	791.73	0.00	12.75	0.00	100.00	44.00
	1794.000	250.00	791.99	0.00	12.77	0.00	100.00	44.00
	1794.000	400.00	792.58	0.00	12.69	0.00	100.00	44.00
	1894.000	140.00	791.19	0.00	0.02	0.00	88.07	100.00
	1894.000	210.00	791.79	0.00	0.02	0.00	88.18	100.00
	1894.000	250.00	791.94	0.00	0.03	0.00	111.15	100.00
	1894.000	400.00	792.50	0.00	0.00	0.00	161.99	100.00
	2300.000	140.00	791.20	0.00	0.01	0.00	59.71	406.00
	2300.000	210.00	791.80	0.00	0.02	0.00	65.94	406.00
	2300.000	250.00	791.96	0.00	0.02	0.00	67.61	406.00
	2300.000	400.00	792.62	0.00	0.03	0.00	73.65	406.00
*	2724.000	140.00	791.95	0.00	0.73	0.00	41.22	414.00
	2784.000	210.00	792.26	0.00	0.46	0.00	45.52	404.00
	2784.000	250.00	792.46	0.00	0.52	0.00	46.15	404.00
	2784.000	400.00	793.05	0.00	0.65	0.00	55.22	404.00
*	2824.000	140.00	793.25	0.00	1.10	0.00	41.93	40.00
*	2824.000	210.00	793.56	0.00	1.22	0.00	25.87	40.00
*	2824.000	250.00	793.77	0.00	1.27	0.00	25.13	40.00
*	2824.000	400.00	794.40	0.00	1.34	0.00	29.31	40.00
*	2864.000	140.00	794.12	0.00	1.05	0.00	0.00	40.00
*	2864.000	210.00	794.58	0.00	1.31	0.00	0.00	40.00
*	2864.000	250.00	795.32	0.00	1.54	0.00	0.00	40.00
*	2864.000	400.00	796.45	0.00	2.05	0.00	0.00	40.00
	2865.000	140.00	794.76	0.00	0.65	0.00	0.00	1.00
	2865.000	210.00	795.97	0.00	1.02	0.00	0.00	1.00
	2865.000	250.00	796.31	0.00	1.06	0.00	0.00	1.00
*	2865.000	400.00	796.70	0.00	-0.19	0.00	0.00	1.00
	2901.000	140.00	795.29	0.00	0.53	0.00	0.00	36.00
	2901.000	210.00	796.23	0.00	1.25	0.00	0.00	36.00
	2901.000	250.00	796.86	0.00	1.56	0.00	0.00	35.00
	2901.000	400.00	798.42	0.00	1.52	0.00	0.00	38.00
	2902.000	140.00	795.32	0.00	0.03	0.00	0.00	1.00
	2902.000	210.00	796.30	0.00	0.15	0.00	0.00	1.00
	2902.000	250.00	796.90	0.00	0.23	0.00	0.00	1.00
	2902.000	400.00	799.32	0.00	1.40	0.00	0.00	1.00
	2922.000	140.00	795.92	0.00	0.80	0.00	55.45	20.00
	2922.000	210.00	797.14	0.00	0.76	0.00	39.70	20.00
	2922.000	250.00	797.75	0.00	0.85	0.00	41.63	20.00
	2922.000	400.00	800.42	0.00	0.90	0.00	51.92	20.00
	2957.000	140.00	805.58	0.00	12.50	0.00	112.00	35.00
	2957.000	210.00	805.98	0.00	12.22	0.00	112.00	35.00
	2957.000	250.00	809.77	0.00	12.02	0.00	112.00	35.00
	2957.000	400.00	810.25	0.00	9.86	0.00	112.00	35.00

SECTION	Q	CHSEL	DIFUSP	DIFUSX	DIFKUS	TOPWID	XLCH
3200.000	140.00	808.67	0.00	0.15	0.00	187.46	323.00
3200.000	210.00	809.69	0.00	0.12	0.00	319.47	323.00
3200.000	250.00	809.69	0.00	0.11	0.00	496.02	323.00
3200.000	400.00	810.44	0.00	0.09	0.00	562.20	323.00
4280.000	140.00	808.96	0.00	0.29	0.00	99.87	1300.00
4280.000	210.00	809.68	0.00	0.21	0.00	100.56	1300.00
4280.000	250.00	810.15	0.00	0.17	0.00	100.97	1300.00
4280.000	400.00	810.65	0.00	0.09	0.00	101.40	1300.00
4598.000	140.00	809.51	0.00	0.55	0.00	67.74	316.00
4598.000	210.00	809.85	0.00	0.16	0.00	75.31	316.00
4598.000	250.00	810.17	0.00	0.12	0.00	82.37	316.00
4598.000	400.00	810.79	0.00	0.13	0.00	92.89	316.00
4916.000	140.00	811.28	0.00	1.78	0.00	59.12	311.00
4916.000	210.00	811.67	0.00	1.62	0.00	67.61	311.00
4916.000	250.00	811.50	0.00	1.33	0.00	68.01	318.00
4916.000	400.00	811.81	0.00	1.03	0.00	72.27	318.00
5234.000	140.00	812.54	0.00	1.62	0.00	47.37	311.00
5234.000	210.00	812.85	0.00	1.51	0.00	52.01	311.00
5234.000	250.00	813.01	0.00	1.56	0.00	54.77	312.00
5234.000	400.00	813.56	0.00	1.76	0.00	61.18	318.00
5552.000	140.00	813.67	0.00	2.13	0.00	45.06	311.00
5552.000	210.00	814.06	0.00	2.02	0.00	46.40	311.00
5552.000	250.00	814.34	0.00	1.96	0.00	49.77	312.00
5552.000	400.00	815.51	0.00	1.95	0.00	55.85	318.00
5872.000	140.00	815.88	0.00	1.21	0.00	36.86	320.00
5872.000	210.00	816.30	0.00	1.27	0.00	44.37	320.00
5872.000	250.00	816.52	0.00	1.46	0.00	73.73	320.00
5872.000	400.00	817.11	0.00	1.20	0.00	94.59	320.00
6292.000	140.00	817.87	0.00	1.99	0.00	31.05	420.00
6292.000	210.00	818.26	0.00	1.98	0.00	36.38	420.00
6292.000	250.00	818.49	0.00	1.97	0.00	42.56	420.00
6292.000	400.00	819.05	0.00	1.94	0.00	56.78	420.00
6712.000	140.00	819.89	0.00	2.03	0.00	29.27	420.00
6712.000	210.00	820.29	0.00	2.00	0.00	36.60	420.00
6712.000	250.00	820.48	0.00	1.99	0.00	40.43	420.00
6712.000	400.00	821.11	0.00	2.17	0.00	53.41	420.00
7132.000	140.00	822.22	0.00	2.33	0.00	21.69	420.00
7132.000	210.00	822.65	0.00	2.36	0.00	25.93	420.00
7132.000	250.00	822.86	0.00	2.36	0.00	28.37	420.00
7132.000	400.00	823.46	0.00	2.35	0.00	29.69	420.00
7352.000	140.00	822.99	0.00	0.77	0.00	24.85	200.00
7352.000	210.00	823.02	0.00	0.87	0.00	31.07	200.00
7352.000	250.00	823.78	0.00	0.93	0.00	34.92	200.00
7352.000	400.00	824.59	0.00	1.12	0.00	40.85	200.00

SECNO	Q	CUSEL	DIFHSP	DIFWSX	DIFKWS	TOPWID	XLOK
7532.000	140.00	823.29	0.00	0.31	0.00	28.46	200.00
7532.000	210.00	823.87	0.00	0.35	0.00	32.55	200.00
7532.000	250.00	824.15	0.00	0.37	0.00	34.55	200.00
7532.000	400.00	825.01	0.00	0.42	0.00	59.73	200.00
7800.000	140.00	823.47	0.00	0.18	0.00	136.03	268.00
7800.000	210.00	824.09	0.00	0.22	0.61	257.82	268.00
7800.000	250.00	824.39	0.00	0.23	0.91	300.00	268.00
7800.000	400.00	825.31	0.00	0.30	1.03	300.00	268.00
7990.000	140.00	823.52	0.00	0.05	0.00	207.03	190.00
7990.000	210.00	824.14	0.00	0.05	0.61	208.24	190.00
7990.000	250.00	824.43	0.00	0.05	0.91	208.82	190.00
7990.000	400.00	825.35	0.00	0.04	1.82	210.61	190.00
8034.000	140.00	825.47	0.00	1.95	0.00	210.06	44.00
8034.000	210.00	825.71	0.00	1.57	0.24	211.34	44.00
8034.000	250.00	825.84	0.00	1.40	0.36	211.53	44.00
8034.000	400.00	826.24	0.00	0.89	0.77	212.38	44.00
8084.000	140.00	825.48	0.00	0.00	0.00	210.69	50.00
8084.000	210.00	825.72	0.00	0.00	0.24	211.35	50.00
8084.000	250.00	825.84	0.00	0.00	0.36	211.59	50.00
8084.000	400.00	826.24	0.00	0.01	0.77	212.38	50.00

SUMMARY OF ERRORS

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CAUTION  SECNO=  180.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=  180.000  PROFILE= 2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=  180.000  PROFILE= 2  20 TRIALS ATTEMPTED TO BALANCE USEL
CAUTION  SECNO=  180.000  PROFILE= 3  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=  180.000  PROFILE= 3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=  180.000  PROFILE= 3  20 TRIALS ATTEMPTED TO BALANCE USEL
CAUTION  SECNO=  180.000  PROFILE= 4  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=  180.000  PROFILE= 4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=  180.000  PROFILE= 4  20 TRIALS ATTEMPTED TO BALANCE USEL

CAUTION  SECNO=  852.000  PROFILE= 4  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=  852.000  PROFILE= 4  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO= 1538.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 1538.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 1538.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE USEL
CAUTION  SECNO= 1538.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 1538.000  PROFILE= 2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 1538.000  PROFILE= 2  20 TRIALS ATTEMPTED TO BALANCE USEL
CAUTION  SECNO= 1538.000  PROFILE= 3  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 1538.000  PROFILE= 3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 1538.000  PROFILE= 3  20 TRIALS ATTEMPTED TO BALANCE USEL
CAUTION  SECNO= 1538.000  PROFILE= 4  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 1538.000  PROFILE= 4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 1538.000  PROFILE= 4  20 TRIALS ATTEMPTED TO BALANCE USEL

CAUTION  SECNO= 1568.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 1568.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 1568.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 1568.000  PROFILE= 2  MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 1568.000  PROFILE= 3  CRITICAL DEPTH ASSUMED
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 CAUTION  SECNO= 1560.000  PROFILE= 3  MINIMUM SPECIFIC ENERGY
 CAUTION  SECNO= 1560.000  PROFILE= 4  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO= 1560.000  PROFILE= 4  MINIMUM SPECIFIC ENERGY

 CAUTION  SECNO= 1631.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO= 1631.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY
 CAUTION  SECNO= 1631.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO= 1631.000  PROFILE= 2  MINIMUM SPECIFIC ENERGY
 CAUTION  SECNO= 1631.000  PROFILE= 3  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO= 1631.000  PROFILE= 3  MINIMUM SPECIFIC ENERGY

 CAUTION  SECNO= 1690.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
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 CAUTION  SECNO= 1690.000  PROFILE= 2  MINIMUM SPECIFIC ENERGY
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 CAUTION  SECNO= 1690.000  PROFILE= 3  MINIMUM SPECIFIC ENERGY
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 CAUTION  SECNO= 1690.000  PROFILE= 4  MINIMUM SPECIFIC ENERGY

 CAUTION  SECNO= 1720.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
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 CAUTION  SECNO= 1720.000  PROFILE= 3  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO= 1720.000  PROFILE= 3  MINIMUM SPECIFIC ENERGY
 CAUTION  SECNO= 1720.000  PROFILE= 4  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO= 1720.000  PROFILE= 4  MINIMUM SPECIFIC ENERGY

 CAUTION  SECNO= 1750.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
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 CAUTION  SECNO= 1750.000  PROFILE= 3  MINIMUM SPECIFIC ENERGY
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 CAUTION  SECNO= 1750.000  PROFILE= 4  MINIMUM SPECIFIC ENERGY

 CAUTION  SECNO= 2734.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO= 2734.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY

 CAUTION  SECNO= 2824.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO= 2824.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION  SECNO= 2824.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE USEL
 CAUTION  SECNO= 2824.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO= 2824.000  PROFILE= 2  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION  SECNO= 2824.000  PROFILE= 2  20 TRIALS ATTEMPTED TO BALANCE USEL
 CAUTION  SECNO= 2824.000  PROFILE= 3  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO= 2824.000  PROFILE= 3  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION  SECNO= 2824.000  PROFILE= 3  20 TRIALS ATTEMPTED TO BALANCE USEL
 CAUTION  SECNO= 2824.000  PROFILE= 4  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO= 2824.000  PROFILE= 4  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION  SECNO= 2824.000  PROFILE= 4  20 TRIALS ATTEMPTED TO BALANCE USEL

 CAUTION  SECNO= 2864.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO= 2864.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION  SECNO= 2864.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE USEL
 CAUTION  SECNO= 2864.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO= 2864.000  PROFILE= 2  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION  SECNO= 2864.000  PROFILE= 2  20 TRIALS ATTEMPTED TO BALANCE USEL
 CAUTION  SECNO= 2864.000  PROFILE= 3  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO= 2864.000  PROFILE= 3  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION  SECNO= 2864.000  PROFILE= 3  20 TRIALS ATTEMPTED TO BALANCE USEL
 CAUTION  SECNO= 2864.000  PROFILE= 4  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO= 2864.000  PROFILE= 4  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION  SECNO= 2864.000  PROFILE= 4  20 TRIALS ATTEMPTED TO BALANCE USEL

 CAUTION  SECNO= 2965.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
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CAUTION SECNO= 2865.000 PROFILE= 4 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 4596.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 4596.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

FLOOD INSURANCE ZONE DATA FOR COMSTOCK CREEK-COMSTOCK

FLOOD HAZARD FACTOR FOR ENTIRE REACH USING SECTIONS

SECTION NUMBER	CUMULATIVE DISTANCE	ELEVATION DIFFERENCE BETWEEN BASE FLOOD AND 1%	2%	0.2%
100.000	0.	0.0	0.0	0.0
140.000	40.	-0.1	-0.0	0.2
175.000	75.	-0.1	-0.0	0.2
190.000	90.	-0.3	-0.1	0.3
185.000	85.	-0.3	-0.1	0.3
225.000	125.	-0.3	-0.1	0.3
395.000	295.	-0.4	-0.1	0.4
565.000	465.	-0.5	-0.2	0.5
752.000	652.	-0.7	-0.2	0.7
802.000	702.	-0.7	-0.2	0.7
827.000	727.	-0.7	-0.2	0.7
852.000	752.	-0.8	-0.2	0.8
853.000	753.	-0.8	-0.3	1.4
922.000	822.	-1.0	-0.4	1.0
923.000	823.	-1.0	-0.4	1.0
1025.000	925.	-0.9	-0.4	1.2
1100.000	1000.	-0.5	-0.2	1.0
1175.000	1075.	-0.6	-0.2	0.5
1325.000	1225.	-0.6	-0.2	0.4
1485.000	1385.	-0.6	-0.2	0.6
1512.000	1412.	-0.6	-0.2	0.6
1538.000	1438.	-0.5	-0.2	0.5
1568.000	1468.	-0.5	-0.2	0.5
1569.000	1469.	-0.5	-0.2	0.6
1621.000	1521.	-0.5	-0.2	0.5
1622.000	1522.	-0.5	-0.2	0.6
1631.000	1531.	-0.5	-0.2	0.5
1632.000	1532.	-0.5	-0.2	0.6
1659.000	1559.	-0.5	-0.2	0.5
1660.000	1560.	-0.5	-0.2	0.5
1690.000	1590.	-0.5	-0.2	0.5
1720.000	1620.	-0.4	-0.2	0.5
1750.000	1650.	-0.5	-0.2	0.5
1794.000	1694.	-0.7	-0.2	0.6
1896.000	1796.	-0.8	-0.2	0.6
2300.000	2200.	-0.5	-0.2	0.5
2784.000	2684.	-0.6	-0.2	0.6
2824.000	2724.	-0.5	-0.2	0.6
2864.000	2764.	-1.0	-0.3	1.1
2865.000	2765.	-0.5	-0.3	1.0
2901.000	2801.	-1.4	-0.4	1.5
2902.000	2802.	-1.6	-0.5	2.4
2922.000	2822.	-1.5	-0.6	2.2
2957.000	2857.	-1.2	-0.4	0.5
3280.000	3180.	-1.2	-0.4	0.6
4200.000	4680.	-1.1	-0.4	0.6
4598.000	4798.	-0.7	-0.3	0.6
4916.000	5116.	-0.2	-0.0	0.3
5234.000	5434.	-0.3	-0.2	0.5
5552.000	5752.	-0.4	-0.1	0.5
5872.000	6072.	-0.6	-0.2	0.6
6292.000	6492.	-0.5	-0.2	0.6

7132.000	7332.	-0.6	-0.2	0.6
7332.000	7532.	-0.8	-0.5	0.8
7532.000	7732.	-0.9	-0.3	0.9
7800.000	8000.	-0.9	-0.3	0.9
7990.000	8190.	-0.9	-0.3	0.9
8034.000	8234.	-0.4	-0.1	0.4
8084.000	8284.	-0.6	-0.1	0.6
WEIGHTED AVG FOR REACH		-3.7	-0.2	0.6

PHF FOR THE REACH = [illegible] OF THE REACH WITHIN 0.5 FEET
ZOI FOR THE REACH = A 1

00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: COMSTOCK TWP

3) WATERCOURSE: COMSTOCK CREEK

4) DOCUMENT TYPE: SUMMARY 100 yr run

00BREAK00

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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
  ERROR CORR -  01
  MODIFICATION -  50.5.52
**************************************************
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

COMSTOCK CREEK-COMSTOCK

SUMMARY PRINTOUT TABLE 110

	SECNO	CWSEL	DIFKWS	FR	TOPWID	AREA	VCH	ERROR	PERENC	STENCL	STCHL	STCHR	STENCR
	100.000	764.00	0.00	764.12	135.00	6.56	243.44	0.00	0.00	0.00	926.00	955.00	0.00
	100.000	764.00	0.00	764.12	135.00	6.56	243.44	0.00	0.00	0.00	926.00	955.00	0.00
	140.000	764.09	0.00	764.16	153.53	15.44	232.00	2.33	0.00	0.00	926.00	955.00	0.00
	140.000	764.09	0.00	764.16	153.53	15.44	232.00	2.33	0.00	0.00	926.00	955.00	0.00
	175.000	764.13	0.00	764.21	157.45	17.02	230.26	2.71	0.00	0.00	926.00	955.00	0.00
	175.000	764.13	0.00	764.21	157.45	17.02	230.26	2.71	0.00	0.00	926.00	955.00	0.00
*	180.000	764.15	0.00	764.49	158.12	67.73	171.75	13.51	0.00	0.00	926.00	955.00	0.00
*	180.000	764.15	0.00	764.49	158.12	67.73	171.75	13.51	0.00	0.00	926.00	955.00	0.00
	185.000	764.47	0.00	764.53	165.23	28.27	215.28	6.46	0.00	0.00	926.00	955.00	0.00
	185.000	764.47	0.00	764.53	165.23	28.27	215.28	6.46	0.00	0.00	926.00	955.00	0.00
	225.000	764.53	0.00	764.55	165.28	29.00	214.24	6.73	0.00	0.00	926.00	955.00	0.00
	225.000	764.53	0.00	764.55	165.28	29.00	214.24	6.73	0.00	0.00	926.00	955.00	0.00
	395.000	764.61	0.00	764.72	81.66	16.78	211.05	22.17	0.00	0.00	927.00	956.00	0.00
	395.000	764.61	0.00	764.72	81.66	16.78	211.05	22.17	0.00	0.00	927.00	956.00	0.00
	565.000	764.99	0.00	765.61	28.81	0.00	250.00	0.00	0.00	0.00	927.00	956.00	0.00
	565.000	764.99	0.00	765.61	28.81	0.00	250.00	0.00	0.00	0.00	927.00	956.00	0.00
	752.000	766.69	0.00	766.90	36.19	0.83	249.06	0.11	0.00	0.00	927.00	956.00	0.00
	752.000	766.69	0.00	766.90	36.19	0.83	249.06	0.11	0.00	0.00	927.00	956.00	0.00
	802.000	766.85	0.00	767.15	29.30	0.56	249.42	0.00	37.50	922.00	928.00	954.00	959.50
	802.000	766.85	0.00	767.15	29.30	0.56	249.42	0.00	37.50	922.00	928.00	954.00	959.50
	827.000	766.95	0.00	767.38	25.08	0.00	250.00	0.00	0.00	0.00	1194.00	1222.00	0.00
	827.000	766.95	0.00	767.38	25.08	0.00	250.00	0.00	0.00	0.00	1194.00	1222.00	0.00
	852.000	766.95	0.00	768.03	12.60	0.00	250.00	0.00	0.00	0.00	1201.70	1214.30	0.00
	852.000	766.95	0.00	768.03	12.60	0.00	250.00	0.00	0.00	0.00	1201.70	1214.30	0.00
	853.000	766.97	0.00	768.05	12.60	0.00	250.00	0.00	0.00	0.00	1201.70	1214.30	0.00
	853.000	766.97	0.00	768.05	12.60	0.00	250.00	0.00	0.00	0.00	1201.70	1214.30	0.00

	SECNO	CWSEL	DIFKHS	EG	TOPWID	QLOB	QCH	QROB	PERENC	STENCL	STCHL	STCHR	STENCR
	922.000	768.10	0.00	768.62	12.60	0.00	250.00	0.00	0.00	0.00	1201.70	1214.30	0.00
	922.000	768.10	0.00	768.62	12.60	0.00	250.00	0.00	0.00	0.00	1201.70	1214.30	0.00
	923.000	768.11	0.00	768.63	12.60	0.00	250.00	0.00	0.00	0.00	1201.70	1214.30	0.00
	923.000	768.11	0.00	768.63	12.60	0.00	250.00	0.00	0.00	0.00	1201.70	1214.30	0.00
	1025.000	768.96	0.00	769.12	53.86	0.29	246.02	3.69	0.00	0.00	1185.00	1227.00	0.00
	1025.000	768.96	0.00	769.12	53.86	0.29	246.02	3.69	0.00	0.00	1185.00	1227.00	0.00
	1100.000	769.26	0.00	769.51	47.88	0.00	250.00	0.00	0.00	0.00	1183.00	1229.00	0.00
	1100.000	769.26	0.00	769.51	47.88	0.00	250.00	0.00	0.00	0.00	1183.00	1229.00	0.00
	1175.000	770.01	0.00	770.41	44.06	0.00	250.00	0.00	0.00	0.00	966.00	1010.00	0.00
	1175.000	770.01	0.00	770.41	44.06	0.00	250.00	0.00	0.00	0.00	966.00	1010.00	0.00
	1325.000	771.76	0.00	772.19	41.03	0.00	245.11	4.89	0.00	0.00	965.00	989.00	0.00
	1325.000	771.76	0.00	772.19	41.03	0.00	245.11	4.89	0.00	0.00	965.00	989.00	0.00
	1485.000	773.47	0.00	774.12	34.60	0.00	246.47	4.53	0.00	0.00	964.00	990.00	0.00
	1485.000	773.47	0.00	774.12	34.60	0.00	246.47	4.53	0.00	0.00	964.00	990.00	0.00
	1512.000	774.06	0.00	774.48	34.08	0.00	246.99	3.00	0.00	0.00	965.00	995.00	0.00
	1512.000	774.06	0.00	774.48	34.08	0.00	246.99	3.00	0.00	0.00	965.00	995.00	0.00
*	1538.000	774.75	0.00	775.41	29.50	0.00	250.00	0.00	0.00	0.00	963.00	997.00	0.00
*	1538.000	774.75	0.00	775.41	29.50	0.00	250.00	0.00	0.00	0.00	963.00	997.00	0.00
*	1568.000	775.84	0.00	776.48	31.04	0.00	250.00	0.00	0.00	0.00	693.40	730.50	0.00
*	1568.000	775.84	0.00	776.48	31.04	0.00	250.00	0.00	0.00	0.00	693.40	730.50	0.00
	1569.000	776.15	0.00	776.56	33.30	0.00	250.00	0.00	0.00	0.00	693.40	730.50	0.00
	1569.000	776.15	0.00	776.56	33.30	0.00	250.00	0.00	0.00	0.00	693.40	730.50	0.00
	1621.000	776.50	0.00	777.00	32.24	0.00	250.00	0.00	0.00	0.00	693.40	730.50	0.00
	1621.000	776.50	0.00	777.00	32.23	0.00	250.00	0.00	0.00	0.00	693.40	730.50	0.00
	1622.000	776.51	0.00	777.01	32.25	0.00	250.00	0.00	0.00	0.00	693.40	730.50	0.00
	1622.000	776.51	0.00	777.01	32.23	0.00	250.00	0.00	0.00	0.00	693.40	730.50	0.00
*	1631.000	776.64	0.00	777.28	31.03	0.00	250.00	0.00	0.00	0.00	693.40	730.50	0.00
*	1631.000	776.64	0.00	777.28	31.03	0.00	250.00	0.00	0.00	0.00	693.40	730.50	0.00
	1632.000	776.95	0.00	777.36	33.29	0.00	250.00	0.00	0.00	0.00	693.40	730.50	0.00
	1632.000	776.95	0.00	777.36	33.29	0.00	250.00	0.00	0.00	0.00	693.40	730.50	0.00
	1659.000	777.09	0.00	777.67	31.45	0.00	250.00	0.00	0.00	0.00	693.40	730.50	0.00
	1659.000	777.09	0.00	777.67	31.45	0.00	250.00	0.00	0.00	0.00	693.40	730.50	0.00
	1660.000	777.11	0.00	777.69	31.46	0.00	250.00	0.00	0.00	0.00	693.40	730.50	0.00
	1660.000	777.11	0.00	777.69	31.46	0.00	250.00	0.00	0.00	0.00	693.40	730.50	0.00
*	1690.000	777.75	0.00	778.38	31.08	0.00	250.00	0.00	0.00	0.00	693.40	730.50	0.00
*	1690.000	777.75	0.00	778.38	31.08	0.00	250.00	0.00	0.00	0.00	693.40	730.50	0.00
*	1720.000	778.44	0.00	779.08	31.03	0.00	250.00	0.00	0.00	0.00	693.40	730.50	0.00
*	1720.000	778.44	0.00	779.09	31.03	0.00	250.00	0.00	0.00	0.00	693.40	730.50	0.00

PRINTED IN U.S.A.
FORM 141-GO PRINTED BY ROTARY MANIFOLD FORMS

	SECNO	CHSEL	DIFKWS	EG	TOPWID	GLOB	GCH	GROB	PERENC	STENCL	STCHL	STCHR	STENCR
☆	1750.000	779.14	0.00	779.78	31.05	0.00	250.00	0.00	0.00	0.00	693.60	730.50	0.00
☆	1750.000	779.14	0.00	779.78	31.05	0.00	250.00	0.00	0.00	0.00	693.40	750.50	0.00
	1794.000	791.91	0.00	791.94	100.00	66.15	123.95	59.90	0.00	0.00	42.50	61.40	0.00
	1794.000	791.91	0.00	791.94	100.00	66.15	123.95	59.90	0.00	0.00	42.50	61.40	0.00
	1894.000	791.94	0.00	791.95	111.18	0.03	249.94	0.04	0.00	0.00	884.10	969.20	0.00
	1894.000	791.94	0.00	791.95	111.18	0.03	249.94	0.04	0.00	0.00	884.10	969.20	0.00
	2300.000	791.96	0.00	792.01	67.61	0.00	250.00	0.00	0.00	0.00	893.00	961.00	0.00
	2300.000	791.96	0.00	792.01	67.61	0.00	250.00	0.00	0.00	0.00	893.00	961.00	0.00
	2784.000	792.48	0.00	792.90	48.15	2.31	236.25	11.44	0.00	0.00	1539.00	1571.00	0.00
	2784.000	792.48	0.00	792.90	48.15	2.31	236.25	11.44	0.00	0.00	1539.00	1571.00	0.00
☆	2824.000	793.77	0.00	794.59	25.13	0.92	247.93	1.15	0.00	0.00	1547.00	1567.00	0.00
☆	2824.000	793.77	0.00	794.59	25.13	0.92	247.93	1.15	0.00	0.00	1547.00	1567.00	0.00
☆	2864.000	795.30	0.00	796.88	8.00	0.00	250.00	0.00	0.00	0.00	758.00	766.00	0.00
☆	2864.000	795.30	0.00	796.88	8.00	0.00	250.00	0.00	0.00	0.00	758.00	766.00	0.00
	2865.000	795.31	0.00	796.91	8.00	0.00	250.00	0.00	0.00	0.00	758.00	766.00	0.00
	2865.000	795.31	0.00	796.91	8.00	0.00	250.00	0.00	0.00	0.00	758.00	766.00	0.00
	2901.000	796.66	0.00	797.52	8.00	0.00	250.00	0.00	0.00	0.00	758.00	766.00	0.00
	2901.000	796.66	0.00	797.52	8.00	0.00	250.00	0.00	0.00	0.00	758.00	766.00	0.00
	2902.000	796.90	0.00	797.58	8.00	0.00	250.00	0.00	0.00	0.00	758.00	766.00	0.00
	2902.000	796.90	0.00	797.58	8.00	0.00	250.00	0.00	0.00	0.00	758.00	766.00	0.00
	2922.000	797.75	0.00	797.79	41.83	0.00	250.00	0.00	122.00	701.00	743.00	785.00	823.00
	2922.000	797.75	0.00	797.79	41.83	0.00	250.00	0.00	122.00	701.00	743.00	785.00	823.00
	2957.000	809.77	0.00	809.81	112.00	46.40	160.26	43.34	0.00	0.00	56.50	69.50	0.00
	2957.000	809.77	0.00	809.81	112.00	46.40	160.26	43.34	0.00	0.00	56.50	69.50	0.00
	3280.000	809.87	0.00	809.88	496.02	85.76	161.87	2.37	0.00	0.00	905.50	938.50	0.00
	3280.000	809.88	0.00	809.89	203.79	80.92	169.08	0.02	0.05	734.71	905.50	938.50	938.50
	4280.000	810.05	0.00	810.07	113.47	0.36	248.10	1.34	0.00	0.00	906.00	1004.00	0.00
	4280.000	810.07	0.02	810.09	98.00	0.00	250.00	0.00	0.01	906.00	906.00	1004.00	1004.00
	4598.000	810.17	0.00	810.31	82.37	0.50	249.50	0.00	0.00	0.00	915.00	1000.00	0.00
	4598.000	810.20	0.02	810.33	79.71	0.00	250.00	0.00	0.00	915.00	915.00	1000.00	1000.00
	4916.000	811.50	0.00	811.66	66.01	1.93	246.16	1.52	0.00	0.00	930.00	985.00	0.00
	4916.000	811.51	0.01	811.68	55.00	0.00	250.00	0.00	0.02	930.00	930.00	985.00	985.00
	5234.000	813.08	0.00	813.39	54.77	3.36	242.17	4.46	0.00	0.00	935.00	975.00	0.00
	5234.000	813.14	0.06	813.45	40.00	0.00	250.00	0.00	0.33	935.00	935.00	973.00	973.00
	5552.000	815.04	0.00	815.32	46.70	7.35	235.33	7.32	0.00	0.00	940.00	970.00	0.00
	5552.000	815.16	0.12	815.46	30.00	0.00	250.00	0.00	0.06	940.00	940.00	970.00	970.00
	5872.000	816.52	0.00	816.90	73.73	8.63	222.53	18.84	0.00	0.00	817.00	835.00	0.00
	5872.000	816.60	0.08	816.94	76.72	9.33	219.60	21.07	1210.30	782.00	817.00	835.00	1392.00

PRINTED IN U.S.A.
PERMITTED WHEN ASSEMBLED BY ADAM MANIFOLD FORMS.

SECNO	CWSEL	DIFKWS	EG	TOPWID	QLOB	QCH	QROB	PERENC	STENCL	STCHL	STCHR	STENCR
6292.000	818.49	0.00	818.81	43.60	7.69	241.48	0.83	0.00	0.00	1070.00	1094.00	0.00
6292.000	818.44	-0.05	818.79	42.49	7.32	242.03	0.65	0.00	0.00	1070.00	1094.00	0.00
6712.000	820.48	0.00	820.83	42.43	3.05	246.34	0.60	0.00	0.00	1070.00	1096.00	0.00
6712.000	820.50	0.02	820.84	40.85	3.17	246.16	0.66	0.00	0.00	1070.00	1096.00	0.00
7132.000	822.86	0.00	823.29	25.37	0.11	249.89	0.00	0.00	0.00	1069.00	1097.00	0.00
7132.000	822.84	-0.01	823.29	25.29	0.12	249.90	0.00	0.00	0.00	1069.00	1097.00	0.00
7332.000	823.78	0.00	823.97	31.90	1.77	248.23	0.00	0.00	0.00	1069.00	1097.00	0.00
7332.000	823.78	-0.00	823.97	31.89	1.76	248.24	0.00	0.00	0.00	1069.00	1097.00	0.00
7532.000	824.15	0.00	824.30	34.55	2.07	247.13	0.00	0.00	0.00	1069.00	1097.00	0.00
7532.000	824.15	-0.00	824.30	34.53	2.06	247.14	0.00	0.00	0.00	1069.00	1097.00	0.00
7800.000	824.39	0.00	824.41	300.30	36.56	210.48	2.94	300.00	570.30	768.00	816.00	825.00
7800.000	824.39	0.00	824.41	210.00	36.56	213.85	1.59	210.00	615.00	768.00	816.00	825.00
7990.000	824.43	0.00	824.45	208.82	78.57	49.40	122.03	0.00	0.00	888.70	895.30	0.00
7990.000	824.44	0.00	824.45	208.82	78.57	49.37	122.06	0.00	0.00	888.70	895.30	0.00
8034.000	825.84	0.00	825.84	211.58	76.07	35.86	138.06	0.00	0.00	888.70	895.30	0.00
8034.000	825.84	0.00	825.84	211.58	76.07	35.86	138.06	0.00	0.00	888.70	895.30	0.00
8084.000	825.84	0.00	825.84	211.59	76.07	35.86	138.10	0.00	0.00	888.70	895.30	0.00
8084.000	825.84	0.00	825.84	211.59	76.07	35.86	138.10	0.00	0.00	888.70	895.30	0.00

FORM 1011-8 PRINTED BY HOYAIY MANIFOLD FORMS

COMSTOCK CREEK-COMSTOCK

SUMMARY PRINTOUT TABLE 150

	SECNO	XLOC	ELTRD	ELLOC	ELMIN	Q	CHSEL	CRITS	EG	TOPWS	VCH	AREA	.01K
	100.000	0.00	0.00	0.00	760.20	250.00	764.00	0.00	764.12	15.32	2.86	109.45	63.86
	100.000	0.00	0.00	0.00	760.20	250.00	764.00	0.00	764.12	15.32	2.86	109.45	63.86
	140.000	40.00	0.00	0.00	760.20	250.00	764.09	0.00	764.18	9.51	2.45	151.12	81.06
	140.000	40.00	0.00	0.00	760.20	250.00	764.09	0.00	764.18	9.51	2.45	151.12	81.06
	175.000	35.00	0.00	0.00	760.20	250.00	764.13	0.00	764.21	8.97	2.40	157.88	83.48
	175.000	35.00	0.00	0.00	760.20	250.00	764.13	0.00	764.21	8.97	2.40	157.88	83.48
*	180.000	5.00	0.00	0.00	762.00	250.00	764.15	764.15	764.49	120.54	5.63	96.77	22.77
*	180.000	5.00	0.00	0.00	762.00	250.00	764.15	764.15	764.49	120.54	5.63	96.77	22.77
	185.000	5.00	0.00	0.00	760.20	250.00	764.47	0.00	764.53	5.65	2.03	213.85	105.22
	185.000	5.00	0.00	0.00	760.20	250.00	764.47	0.00	764.53	5.65	2.03	213.85	105.22
	225.000	40.00	0.00	0.00	760.20	250.00	764.50	0.00	764.55	5.47	2.01	217.68	106.85
	225.000	40.00	0.00	0.00	760.20	250.00	764.50	0.00	764.55	5.47	2.01	217.68	106.85
	395.000	170.00	0.00	0.00	761.50	250.00	764.61	0.00	764.72	18.48	2.92	129.41	58.15
	395.000	170.00	0.00	0.00	761.50	250.00	764.61	0.00	764.72	18.48	2.92	129.41	58.15
	565.000	170.00	0.00	0.00	762.50	250.00	764.99	0.00	765.61	195.59	6.34	39.44	17.88
	565.000	170.00	0.00	0.00	762.50	250.00	764.99	0.00	765.61	195.59	6.34	39.44	17.88
	752.000	187.00	0.00	0.00	763.50	250.00	766.69	0.00	766.90	33.26	3.70	69.64	43.33
	752.000	187.00	0.00	0.00	763.50	250.00	766.69	0.00	766.90	33.26	3.70	69.64	43.33
	802.000	50.00	0.00	0.00	764.00	250.00	766.85	0.00	767.15	55.33	4.45	57.25	34.23
	802.000	50.00	0.00	0.00	764.00	250.00	766.85	0.00	767.15	55.33	4.45	57.25	34.23
	827.000	25.00	0.00	0.00	764.20	250.00	766.95	0.00	767.38	89.58	5.26	47.54	26.41
	827.000	25.00	0.00	0.00	764.20	250.00	766.95	0.00	767.38	89.58	5.26	47.54	26.41
	852.000	25.00	0.00	0.00	764.40	250.00	766.95	0.00	768.03	196.71	8.35	29.94	17.73
	852.000	25.00	0.00	0.00	764.40	250.00	766.95	0.00	768.03	196.71	8.35	29.94	17.73
	853.000	1.00	777.50	772.10	764.40	250.00	766.97	0.00	768.05	110.99	8.33	30.01	23.73
	853.000	1.00	777.50	772.10	764.40	250.00	766.97	0.00	768.05	110.99	8.33	30.01	23.73
	922.000	69.00	777.50	772.20	764.50	250.00	768.10	0.00	768.62	36.61	5.81	43.00	41.32
	922.000	69.00	777.50	772.20	764.50	250.00	768.10	0.00	768.62	36.61	5.81	43.00	41.32
	923.000	1.00	0.00	0.00	764.50	250.00	768.11	0.00	768.63	64.26	5.79	43.17	31.19
	923.000	1.00	0.00	0.00	764.50	250.00	768.11	0.00	768.63	64.26	5.79	43.17	31.19
	1025.000	102.00	0.00	0.00	765.60	250.00	768.96	0.00	769.12	32.63	3.18	84.39	43.77
	1025.000	102.00	0.00	0.00	765.60	250.00	768.96	0.00	769.12	32.63	3.18	84.39	43.77
	1100.000	75.00	0.00	0.00	766.50	250.00	769.26	0.00	769.51	81.17	4.03	62.07	27.75
	1100.000	75.00	0.00	0.00	766.50	250.00	769.26	0.00	769.51	81.17	4.03	62.07	27.75
	1175.000	75.00	0.00	0.00	767.40	250.00	770.01	0.00	770.41	168.74	5.08	49.21	19.25
	1175.000	75.00	0.00	0.00	767.40	250.00	770.01	0.00	770.41	168.74	5.08	49.21	19.25

PRINTED IN U.S.A.

FORM 111-6[illegible] FILED AT LOTAVY MANIFOLD TO THIS.

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CHSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
	1325.000	150.00	0.00	0.00	769.20	250.00	771.76	0.00	772.19	87.90	5.33	52.65	26.56
	1325.000	150.00	0.00	0.00	769.20	250.00	771.76	0.00	772.19	87.90	5.33	52.65	26.66
	1485.000	160.00	0.00	0.00	771.20	250.00	773.47	773.37	774.12	160.46	6.50	42.32	19.74
	1485.000	160.00	0.00	0.00	771.20	250.00	773.47	773.37	774.12	160.46	6.50	42.32	19.74
	1512.000	27.00	0.00	0.00	772.00	250.00	774.06	0.00	774.48	102.81	5.25	50.12	24.66
	1512.000	27.00	0.00	0.00	772.00	250.00	774.06	0.00	774.48	102.81	5.25	50.12	24.66
*	1538.000	26.00	0.00	0.00	773.10	250.00	774.75	774.75	775.41	219.66	6.50	38.44	16.87
*	1538.000	26.00	0.00	0.00	773.10	250.00	774.75	774.75	775.41	219.66	6.50	38.44	16.87
*	1568.000	30.00	0.00	0.00	774.30	250.00	775.84	775.84	776.48	222.88	6.40	39.06	16.75
*	1568.000	30.00	0.00	0.00	774.30	250.00	775.84	775.84	776.48	222.88	6.40	39.06	16.75
	1569.000	1.00	787.70	783.90	774.30	250.00	776.15	0.00	776.56	65.39	5.12	48.87	30.92
	1569.000	1.00	787.70	783.90	774.30	250.00	776.15	0.00	776.56	65.39	5.12	48.87	30.92
	1621.000	52.00	787.70	784.40	774.80	250.00	776.30	0.00	777.00	87.79	5.66	44.16	26.68
	1621.000	52.00	787.70	784.40	774.80	250.00	776.30	0.00	777.00	87.79	5.66	44.16	26.66
	1622.000	1.00	0.00	0.00	774.80	250.00	776.51	0.00	777.01	155.19	5.65	44.22	20.07
	1622.000	1.00	0.00	0.00	774.80	250.00	776.51	0.00	777.01	155.19	5.65	44.22	20.07
*	1631.000	9.00	0.00	0.00	775.10	250.00	776.64	776.64	777.28	223.89	6.41	38.99	16.71
*	1631.000	9.00	0.00	0.00	775.10	250.00	776.64	776.64	777.28	223.89	6.41	38.99	16.71
	1632.000	1.00	789.90	783.90	775.10	250.00	776.95	0.00	777.36	65.67	5.12	48.79	30.85
	1632.000	1.00	789.90	783.90	775.10	250.00	776.95	0.00	777.36	65.67	5.12	48.79	30.85
	1659.000	27.00	789.90	784.30	775.50	250.00	777.09	0.00	777.67	110.46	6.13	40.79	23.79
	1659.000	27.00	789.90	784.30	775.50	250.00	777.09	0.00	777.67	110.46	6.13	40.79	23.79
	1660.000	1.00	0.00	0.00	775.50	250.00	777.19	0.00	777.69	196.05	6.13	40.81	17.86
	1660.000	1.00	0.00	0.00	775.50	250.00	777.19	0.00	777.69	196.05	6.13	40.81	17.86
*	1690.000	30.00	0.00	0.00	776.20	250.00	777.75	777.75	778.38	220.00	6.37	39.23	16.86
*	1690.000	30.00	0.00	0.00	776.20	250.00	777.75	777.75	778.38	220.00	6.37	39.23	16.86
*	1720.000	30.00	0.00	0.00	776.90	250.00	778.44	778.44	779.08	223.77	6.41	39.00	16.71
*	1720.000	30.00	0.00	0.00	776.90	250.00	778.44	778.44	779.08	223.77	6.41	39.00	16.71
*	1750.000	30.00	0.00	0.00	777.60	250.00	779.14	779.14	779.78	222.00	6.39	39.11	16.78
*	1750.000	30.00	0.00	0.00	777.60	250.00	779.14	779.14	779.78	222.00	6.39	39.11	16.78
	1794.000	44.00	789.20	789.20	788.00	250.00	791.91	0.00	791.94	3.30	1.68	310.16	137.59
	1794.000	44.00	789.20	789.20	788.00	250.00	791.91	0.00	791.94	3.30	1.68	310.16	137.59
	1894.000	100.00	0.00	0.00	787.60	250.00	791.94	0.00	791.95	0.67	0.71	354.62	365.21
	1894.000	100.00	0.00	0.00	787.60	250.00	791.94	0.00	791.95	0.67	0.71	354.62	365.21
	2300.000	406.00	0.00	0.00	789.30	250.00	791.96	0.00	792.01	6.27	1.75	143.26	99.84
	2300.000	406.00	0.00	0.00	789.30	250.00	791.96	0.00	792.01	6.27	1.75	143.26	99.84
	2784.000	484.00	0.00	0.00	791.00	250.00	792.48	0.00	792.90	103.66	5.35	54.45	24.56
	2784.000	484.00	0.00	0.00	791.00	250.00	792.48	0.00	792.90	103.66	5.35	54.45	24.56

FORM 1611-4 PRINTED BY ROTARY MANIFOLD FORMS.

	SECNO	XLCH	ELTRD	ELLC	ELWIN	Q	CUSEL	CRWS	EG	TOK*S	VCH	AREA	.01K
*	2824.000	40.00	0.00	0.00	791.60	250.00	793.77	793.77	794.59	149.60	7.31	35.89	20.44
*	2824.000	40.00	0.00	0.00	791.60	250.00	793.77	793.77	794.59	149.60	7.31	35.89	20.44
*	2864.000	40.00	0.00	0.00	791.90	250.00	795.30	795.30	796.88	209.96	10.07	24.84	17.25
*	2864.000	40.00	0.00	0.00	791.90	250.00	795.30	795.30	796.88	209.96	10.07	24.84	17.25
	2865.000	1.00	801.00	797.80	791.90	250.00	795.31	795.28	796.91	167.96	10.15	24.63	19.29
	2865.000	1.00	801.00	797.80	791.90	250.00	795.31	795.28	796.91	167.96	10.15	24.63	19.29
	2901.000	36.00	801.00	797.80	791.90	250.00	796.66	0.00	797.52	76.49	7.44	33.60	28.59
	2901.000	36.00	801.00	797.80	791.90	250.00	796.66	0.00	797.52	76.49	7.44	33.60	28.59
	2902.000	1.00	0.00	0.00	791.90	250.00	796.90	0.00	797.58	62.19	6.64	37.63	31.70
	2902.000	1.00	0.00	0.00	791.90	250.00	796.90	0.00	797.58	62.19	6.64	37.63	31.70
	2922.000	20.00	0.00	0.00	793.20	250.00	797.75	0.00	797.79	2.76	1.62	154.39	150.51
	2922.000	20.00	0.00	0.00	793.20	250.00	797.75	0.00	797.79	2.76	1.62	154.39	150.51
	2957.000	35.00	805.90	805.90	804.00	250.00	809.77	0.00	809.81	4.79	2.20	247.67	114.24
	2957.000	35.00	805.90	805.90	804.00	250.00	809.77	0.00	809.81	4.79	2.20	247.67	114.24
	3280.000	323.00	0.00	0.00	804.20	250.00	809.87	0.00	809.88	0.92	1.05	633.62	261.00
	3280.000	323.00	0.00	0.00	804.20	250.00	809.88	0.00	809.89	1.02	1.06	492.32	247.16
	4280.000	1300.00	0.00	0.00	807.20	250.00	810.05	0.00	810.07	2.45	1.13	228.40	159.66
	4280.000	1300.00	0.00	0.00	807.20	250.00	810.07	0.00	810.09	2.51	1.13	220.69	157.60
	4598.000	318.00	0.00	0.00	808.50	250.00	810.17	0.00	810.31	46.76	3.01	84.29	36.56
	4598.000	318.00	0.00	0.00	808.50	250.00	810.20	0.00	810.33	44.49	2.94	85.11	37.48
	4916.000	318.00	0.00	0.00	809.70	250.00	811.50	0.00	811.66	38.39	3.25	81.86	40.35
	4916.000	318.00	0.00	0.00	809.70	250.00	811.31	0.00	811.60	36.75	3.26	78.74	39.65
	5234.000	318.00	0.00	0.00	811.50	250.00	813.08	0.00	813.39	73.62	4.53	61.47	28.41
	5234.000	318.00	0.00	0.00	811.50	250.00	813.14	0.00	813.45	78.92	4.51	55.48	28.14
	5552.000	318.00	0.00	0.00	813.00	250.00	815.04	0.00	815.32	49.18	4.39	68.87	35.65
	5552.000	318.00	0.00	0.00	813.00	250.00	815.16	0.00	815.46	51.37	4.36	67.38	34.85
	5872.000	320.00	0.00	0.00	813.90	250.00	816.52	0.00	816.90	48.14	5.20	60.80	36.03
	5872.000	320.00	0.00	0.00	813.80	250.00	816.60	0.00	816.94	41.51	4.95	75.45	38.80
	6292.000	420.00	0.00	0.00	816.00	250.00	818.49	0.00	818.81	64.39	4.66	63.02	37.52
	6292.000	420.00	0.00	0.00	816.30	250.00	818.66	0.00	818.79	48.16	4.78	60.90	36.03
	6712.000	420.00	0.00	0.00	818.00	250.00	820.66	0.00	820.83	51.77	4.77	57.42	34.75
	6712.000	420.00	0.00	0.00	818.00	250.00	820.50	0.00	820.84	49.93	4.72	58.27	35.36
	7132.000	420.00	0.00	0.00	819.90	250.00	822.86	0.00	823.29	65.87	5.31	47.37	30.80
	7132.000	420.00	0.00	0.00	819.90	250.00	822.54	0.00	823.29	67.15	5.34	47.06	30.51
	7332.000	200.00	0.00	0.00	819.90	250.00	823.78	0.00	823.97	19.62	3.54	73.83	56.44
	7332.000	200.00	0.00	0.00	819.90	250.00	823.78	0.00	823.97	19.65	3.54	73.78	56.39
	7532.000	200.00	0.00	0.00	819.90	250.00	824.15	0.00	824.30	13.12	3.08	86.27	69.01
	7532.000	200.00	0.00	0.00	819.90	250.00	824.15	0.00	824.30	13.15	3.09	86.21	68.95

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FORM 1411-CC PRINTED BY ROTARY MANIFOLD FORMS

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CHSEL	CRIUS	EG	10K*S	VCH	AREA	.01K
7800.000	268.00	0.00	0.00	819.80	250.00	824.39	0.00	824.41	1.65	1.25	373.82	194.47
7800.000	268.00	0.00	0.00	819.80	250.00	824.39	0.00	824.41	1.71	1.27	338.93	191.43
7990.000	190.00	0.00	0.00	819.70	250.00	824.43	0.00	824.45	2.67	1.68	449.98	153.09
7990.000	190.00	0.00	0.00	819.70	250.00	824.44	0.00	824.45	2.66	1.68	450.34	153.27
8034.000	44.00	824.60	821.90	819.70	250.00	825.84	0.00	825.84	0.58	0.96	743.94	329.04
8034.000	44.00	824.60	821.90	819.70	250.00	825.84	0.00	825.84	0.58	0.96	743.99	329.07
8084.000	50.00	0.00	0.00	819.70	250.00	825.84	0.00	825.84	0.57	0.96	744.97	329.75
8084.000	50.00	0.00	0.00	819.70	250.00	825.84	0.00	825.84	0.57	0.96	745.03	329.79

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FORM 1411-GD PRINTED BY INSTANT MANIFOLD FORMS

COMSTOCK CREEK-COMSTOCK

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CHSEL	DIFUSP	DIFUSX	PEAK,S	TOPWID	XLOB
	100.000	250.00	764.00	0.00	0.00	0.00	135.00	0.00
	100.000	250.00	766.00	0.00	0.00	0.00	135.00	0.00
	140.000	250.00	764.09	0.00	0.09	0.00	155.53	40.00
	140.000	250.00	764.09	0.00	0.09	0.00	155.53	40.00
	175.000	250.00	764.13	0.00	0.04	0.00	157.45	35.00
	175.000	250.00	764.13	0.00	0.04	0.00	157.45	35.00
☆	180.000	250.00	764.15	0.00	0.02	0.00	156.12	5.00
☆	180.000	250.00	766.15	0.00	0.02	0.00	156.12	5.00
	185.000	250.00	766.47	0.00	0.33	0.00	165.23	5.00
	185.000	250.00	766.47	0.00	0.33	0.00	165.23	5.00
	225.000	250.00	766.53	0.00	0.02	0.00	165.23	40.00
	225.000	250.00	766.53	0.00	0.02	0.00	165.23	40.00
	395.000	250.00	764.61	0.00	0.11	0.00	81.66	170.00
	395.000	250.00	764.61	0.00	0.11	0.00	81.66	170.00
	565.000	250.00	766.99	0.00	0.37	0.00	28.81	170.00
	565.000	250.00	766.99	0.00	0.37	0.00	28.81	170.00
	752.000	250.00	766.69	0.00	1.70	0.00	36.19	187.00
	752.000	250.00	766.69	0.00	1.70	0.00	36.19	187.00
	802.000	250.00	766.85	0.00	0.16	0.00	29.30	50.00
	802.000	250.00	766.85	0.00	0.16	0.00	29.30	50.00
	827.000	250.00	766.95	0.00	0.11	0.00	25.08	25.00
	827.000	250.00	766.95	0.00	0.11	0.00	25.08	25.00
	852.000	250.00	766.95	0.00	-0.01	0.00	12.60	25.00
	852.000	250.00	766.95	0.00	-0.01	0.00	12.60	25.00
	853.000	250.00	766.97	0.00	0.02	0.00	12.60	1.00
	853.000	250.00	766.97	0.00	0.02	0.00	12.60	1.00
	922.000	250.00	768.10	0.00	1.13	0.00	12.60	69.00
	922.000	250.00	768.10	0.00	1.13	0.00	12.60	69.00
	923.000	250.00	768.11	0.00	0.01	0.00	12.60	1.00
	923.000	250.00	768.11	0.00	0.01	0.00	12.60	1.00
	1025.000	250.00	768.96	0.00	0.86	0.00	53.66	102.00
	1025.000	250.00	768.96	0.00	0.86	0.00	53.66	102.00
	1100.000	250.00	769.26	0.00	0.30	0.00	47.88	75.00
	1100.000	250.00	769.26	0.00	0.30	0.00	47.88	75.00
	1175.000	250.00	770.01	0.00	0.75	0.00	64.06	75.00
	1175.000	250.00	770.01	0.00	0.75	0.00	64.06	75.00

	SECNO	Q	CUSEL	DIFWSP	DIFWSX	DIFKUS	TOPWID	XLCH
	1325.000	250.00	771.76	0.00	1.76	0.00	41.03	150.00
	1325.000	250.00	771.76	0.00	1.76	0.00	41.03	150.00
	1465.000	250.00	773.47	0.00	1.71	0.00	34.60	160.00
	1485.000	250.00	773.47	0.00	1.71	0.00	34.60	160.00
	1512.000	250.00	774.06	0.00	0.59	0.00	34.08	27.00
	1512.000	250.00	774.06	0.00	0.59	0.00	34.08	27.00
*	1538.000	250.00	774.75	0.00	0.70	0.00	29.50	26.00
*	1538.000	250.00	774.75	0.00	0.70	0.00	29.50	26.00
*	1568.000	250.00	775.84	0.00	1.09	0.00	31.04	30.00
*	1568.000	250.00	775.84	0.00	1.09	0.00	31.04	30.00
	1569.000	250.00	776.15	0.00	0.31	0.00	33.30	1.00
	1569.000	250.00	776.15	0.00	0.31	0.00	33.30	1.00
	1621.000	250.00	776.50	0.00	0.35	0.00	32.23	52.00
	1621.000	250.00	776.50	0.00	0.35	0.00	32.23	52.00
	1622.000	250.00	776.51	0.00	0.01	0.00	32.25	1.00
	1622.000	250.00	776.51	0.00	0.01	0.00	32.25	1.00
*	1631.000	250.00	776.64	0.00	0.13	0.00	31.03	9.00
*	1631.000	250.00	776.64	0.00	0.13	0.00	31.03	9.00
	1632.000	250.00	776.95	0.00	0.31	0.00	33.29	1.00
	1632.000	250.00	776.95	0.00	0.31	0.00	33.29	1.00
	1659.000	250.00	777.09	0.00	0.14	0.00	31.45	27.00
	1659.000	250.00	777.09	0.00	0.14	0.00	31.45	27.00
	1660.000	250.00	777.11	0.00	0.02	0.00	31.46	1.00
	1660.000	250.00	777.11	0.00	.0.02	0.00	31.46	1.00
*	1690.000	250.00	777.75	0.00	0.64	0.00	31.08	30.00
*	1690.000	250.00	777.75	0.00	0.64	0.00	31.08	30.00
*	1720.000	250.00	778.44	0.00	0.69	0.00	31.03	30.00
*	1720.000	250.00	778.44	0.00	0.69	0.00	31.03	30.00
*	1750.000	250.00	779.14	0.00	0.70	0.00	31.05	30.00
*	1750.000	250.00	779.14	0.00	0.70	0.00	31.05	30.00
	1794.000	250.00	791.91	0.00	12.77	0.00	100.00	44.00
	1794.000	250.00	791.91	0.00	12.77	0.00	100.00	44.00
	1894.000	250.00	791.94	0.00	0.03	0.00	111.13	100.00
	1894.000	250.00	791.94	0.00	0.03	0.00	111.13	100.00
	2300.000	250.00	791.96	0.00	0.02	0.00	67.61	406.00
	2300.000	250.00	791.96	0.00	0.02	0.00	67.61	406.00
	2784.000	250.00	792.48	0.00	0.52	0.00	40.15	484.00
	2784.000	250.00	792.48	0.00	0.52	0.00	40.15	484.00

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FORM 1411-03 PRINTED BY ROTARY MANIFOLD FORMS.

	SECNO	Q	CHSEL	DIFUSP	DIFUSX	DIFKNS	TOPWID	XLOC
*	2824.000	250.00	793.77	0.00	1.29	0.00	25.13	40.00
*	2824.000	250.00	793.77	0.00	1.29	0.00	25.13	40.00
*	2864.000	250.00	795.30	0.00	1.53	0.00	8.00	40.00
*	2864.000	250.00	795.30	0.00	1.53	0.00	8.00	40.00
	2865.000	250.00	795.31	0.00	0.01	0.00	8.00	1.00
	2865.000	250.00	795.31	0.00	0.01	0.00	8.00	1.00
	2901.000	250.00	796.66	0.00	1.36	0.00	8.00	36.00
	2901.000	250.00	796.66	0.00	1.36	0.00	8.00	36.00
	2902.000	250.00	796.90	0.00	0.23	0.00	8.00	1.00
	2902.000	250.00	796.90	0.00	0.23	0.00	8.00	1.00
	2922.000	250.00	797.75	0.00	0.85	0.00	41.83	20.00
	2922.000	250.00	797.75	0.00	0.85	0.00	41.83	20.00
	2957.000	250.00	809.77	0.00	12.02	0.00	112.00	35.00
	2957.000	250.00	809.77	0.00	12.02	0.00	112.00	35.00
	3280.000	250.00	809.87	0.00	0.11	0.01	456.03	323.00
	3280.000	250.00	809.88	0.00	0.11	0.00	203.79	323.00
	4280.000	250.00	810.05	0.00	0.18	0.00	113.47	1300.00
	4280.000	250.00	810.07	0.00	0.19	0.02	90.00	1300.00
	4598.000	250.00	810.17	0.00	0.12	0.02	82.37	318.00
	4598.000	250.00	810.20	0.00	0.13	0.02	79.71	318.00
	4916.000	250.00	811.50	0.00	1.33	0.00	68.01	318.00
	4916.000	250.00	811.51	0.00	1.31	0.00	53.00	318.00
	5236.000	250.00	813.08	0.00	1.58	0.00	54.77	318.00
	5236.000	250.00	813.14	0.00	1.62	0.06	40.00	318.00
	5552.000	250.00	815.04	0.00	1.96	0.00	49.78	318.00
	5552.000	250.00	815.16	0.00	2.08	0.12	30.00	318.00
	5872.000	250.00	816.52	0.00	1.48	0.00	73.73	320.00
	5872.000	250.00	816.60	0.00	1.44	0.08	76.72	320.00
	6292.000	250.00	818.49	0.00	1.97	0.00	43.60	420.00
	6292.000	250.00	818.44	0.00	1.84	-0.05	42.49	420.00
	6712.000	250.00	820.48	0.00	1.99	0.00	40.43	420.00
	6712.000	250.00	820.50	0.00	2.06	0.02	40.85	420.00
	7132.000	250.00	822.86	0.00	2.38	0.00	25.37	420.00
	7132.000	250.00	822.84	0.00	2.34	-0.01	25.29	420.00
	7332.000	250.00	823.78	0.00	0.93	0.00	31.90	200.00
	7332.000	250.00	823.78	0.00	0.94	-0.00	31.89	200.00
	7532.000	250.00	824.15	0.00	0.37	0.00	34.55	200.00
	7532.000	250.00	824.15	0.00	0.37	-0.00	34.53	200.00

FORM 1211-C PRINTED BY ROTARY MANIFOLD FORMS.
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SECNO	Q	CWSEL	DIFWSF	DIFWSX	DIFKWS	TOPWID	XLCH
7800.000	250.00	824.39	0.00	0.23	0.00	300.00	268.00
7800.000	250.00	824.39	0.00	0.24	0.00	210.00	268.00
7990.000	250.00	824.43	0.00	0.05	0.00	206.82	190.00
7990.000	250.00	824.44	0.00	0.05	0.00	206.82	190.00
8034.000	250.00	825.04	0.00	1.40	0.00	211.58	44.00
8034.000	250.00	825.04	0.00	1.40	0.00	211.58	44.00
8084.000	250.00	825.04	0.00	0.00	0.00	211.59	50.00
8084.000	250.00	825.04	0.00	0.00	0.00	211.59	50.00

SUMMARY OF ERRORS

CAUTION SECNO= 180.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 180.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 180.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO= 180.000 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 180.000 PROFILE= 2 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 180.000 PROFILE= 2 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 1538.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1538.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 1538.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO= 1538.000 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1538.000 PROFILE= 2 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 1538.000 PROFILE= 2 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 1568.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1568.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 1568.000 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1568.000 PROFILE= 2 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 1631.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1631.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 1631.000 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1631.000 PROFILE= 2 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 1690.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1690.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 1690.000 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1690.000 PROFILE= 2 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 1720.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1720.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 1720.000 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1720.000 PROFILE= 2 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 1750.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1750.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 1750.000 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1750.000 PROFILE= 2 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 2824.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 2824.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 2824.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO= 2824.000 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 2824.000 PROFILE= 2 PROBABLE MINIMUM SPECIFIC ENERGY

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CAUTION  SECNO= 2824.000  PROFILE= 2  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO= 2864.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 2864.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 2864.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO= 2864.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 2864.000  PROFILE= 2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 2864.000  PROFILE= 2  20 TRIALS ATTEMPTED TO BALANCE WSEL
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FORM 1411-C PRINTED BY ROTARY MANIFOLD FORMS. PRINTED IN U.S.A.

FLOODWAY DATA, COMSTOCK CREEK-COMSTOCK
PROFILE NO. 2

STATION	FLOODWAY WIDTH (FT)	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WATER SURFACE ELEVATION WITHOUT FLOODWAY	DIFFERENCE
100.000	135.	109.	2.3	764.0	764.0	0.0
140.000	156.	151.	1.7	764.1	764.1	0.0
175.000	157.	158.	1.6	764.1	764.1	0.0
180.000	158.	97.	2.6	764.1	764.1	0.0
185.000	165.	214.	1.2	764.5	764.5	0.0
225.000	165.	218.	1.1	764.5	764.5	0.0
395.000	82.	129.	1.9	764.6	764.6	0.0
565.000	29.	39.	6.3	765.0	765.0	0.0
752.000	36.	70.	3.6	766.7	766.7	0.0
802.000	29.	57.	4.4	766.8	766.8	0.0
827.000	25.	48.	5.3	767.0	767.0	0.0
852.000	13.	30.	8.3	766.9	766.9	0.0
853.000	13.	30.	8.3	767.0	767.0	0.0
922.000	13.	43.	5.8	768.1	768.1	0.0
923.000	13.	43.	5.8	768.1	768.1	0.0
1025.000	54.	84.	3.0	769.0	769.0	0.0
1100.000	48.	62.	4.0	769.3	769.3	0.0
1175.000	44.	49.	5.1	770.0	770.0	0.0
1325.000	41.	53.	4.7	771.8	771.8	0.0
1485.000	35.	42.	5.9	773.5	773.5	0.0
1512.000	34.	50.	5.0	774.1	774.1	0.0
1538.000	29.	38.	6.5	774.8	774.8	0.0
1568.000	31.	39.	6.4	775.8	775.8	0.0
1569.000	33.	49.	5.1	776.2	776.2	0.0
1621.000	32.	44.	5.7	776.5	776.5	0.0
1622.000	32.	44.	5.7	776.5	776.5	0.0
1631.000	31.	39.	6.4	776.6	776.6	0.0
1632.000	33.	49.	5.1	777.0	777.0	0.0
1659.000	31.	41.	6.1	777.1	777.1	0.0
1660.000	31.	41.	6.1	777.1	777.1	0.0
1690.000	31.	39.	6.4	777.7	777.7	0.0
1720.000	31.	39.	6.4	778.4	778.4	0.0
1750.000	31.	39.	6.4	779.1	779.1	0.0
1794.000	100.	310.	0.8	791.9	791.9	0.0
1894.000	111.	355.	0.7	791.9	791.9	0.0
2300.000	68.	143.	1.7	792.0	792.0	0.0
2784.000	48.	54.	4.6	792.5	792.5	0.0
2824.000	25.	36.	7.0	793.8	793.8	0.0
2864.000	8.	25.	10.1	795.3	795.3	0.0
2865.000	8.	25.	10.2	795.3	795.3	0.0
2901.000	8.	34.	7.4	796.7	796.7	0.0
2902.000	8.	38.	6.6	796.9	796.9	0.0
2922.000	42.	154.	1.6	797.7	797.7	0.0
2957.000	112.	240.	1.0	809.8	809.8	0.0
3280.000	204.	492.	0.5	809.9	809.9	0.0
4280.000	98.	221.	1.1	810.1	810.1	0.0
4598.000	80.	85.	2.9	810.2	810.2	0.0
4916.000	55.	77.	3.3	811.5	811.5	0.0
5234.000	40.	55.	4.5	813.2	813.1	0.1
5552.000	33.	57.	4.4	815.1	815.0	0.1

FORM 1411-GU PRINTED BY ROTARY MANIFOLD FORMS, PRINTED IN U.S.A.

FLOODWAY DATA, COMSTOCK CREEK-COMSTOCK
PROFILE NO. 2

STATION	FLOODWAY WIDTH (FT)	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WATER SURFACE ELEVATION WITHOUT FLOODWAY	WATER SURFACE ELEVATION DIFFERENCE
5872.000	77.	75.	3.3	816.6	816.5	0.1
6292.000	42.	61.	4.1	818.5	818.5	0.0
6712.000	41.	58.	4.3	820.5	820.5	0.0
7132.000	25.	47.	5.3	822.9	822.9	0.0
7332.000	32.	74.	3.4	823.8	823.8	0.0
7532.000	35.	86.	2.9	824.2	824.2	0.0
7800.000	210.	339.	0.7	824.4	824.4	0.0
7990.000	209.	450.	0.6	824.4	824.4	0.0
8034.000	212.	744.	0.3	825.8	825.8	0.0
8084.000	212.	745.	0.3	825.8	825.8	0.0

PRINTED IN U.S.A.
FORM 1-1-6 PRINTED BY NOTARY MANIFOLD FORMS

1) COUNTY: KALAMAZOO

2) STUDY NAME: COMSTOCK TWP

3) WATERCOURSE: COMSTOCK CREEK

4) DOCUMENT TYPE: 100 YR ENCROACHED RUN

*PROF 2

CCHV= 0.100 CEHV= 0.300

*SECNO 100.000

SECNO	DEPTH	CHSEL	CRIWS	WSELK	EG	HV	HL	QLOSS	BANK ELEV
Q	SLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

100' U/S OF SOUTH AT KALAMAZOO RIVER-75' D/S OF DAM

100.00	3.80	764.00	0.00	764.00	764.12	0.12	0.00	0.00	763.40
250.	7.	263.	0.	26.	85.	0.	0.	0.	764.00
0.00	0.27	2.66	0.00	0.100	0.040	0.100	0.000	760.20	820.00
0.001532	0.	0.	0.	0	0	0	0.00	133.00	955.00

*SECNO 140.000

140' U/S OF SOUTH-35' D/S OF DA

140.00	3.59	764.03	0.00	0.00	764.11	0.08	0.00	0.00	762.60
250.	16.	232.	2.	46.	95.	11.	0.	0.	763.40
0.00	0.34	2.45	0.23	0.100	0.040	0.100	0.039	760.20	830.10
0.000951	40.	40.	40.	2	0	0	0.00	155.53	985.63

*SECNO 175.000

D/S FACE OF DAM

175.00	3.43	764.19	0.00	0.00	764.21	0.02	0.00	0.00	762.60
250.	17.	230.	3.	50.	96.	12.	0.	5.	763.40
0.01	0.34	2.40	0.23	0.100	0.040	0.100	0.039	760.20	830.10
0.000897	35.	35.	35.	0	0	0	0.00	157.45	987.55

*SECNO 180.000

SECNO	DEPTH	CHSEL	CRIWS	WSELK	EG	HV	HL	QLOSS	BANK ELEV
Q	SLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

3685 20 TRIALS ATTEMPTED WSELK-CHSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

CENTER OF DAM

180.00	1.35	764.15	764.15	0.00	764.65	0.36	0.01	0.08	762.00
250.	63.	172.	11.	54.	31.	12.	3.	0.	763.40
0.01	1.26	5.63	0.85	0.100	0.030	0.100	0.038	762.80	830.10
0.012054	5.	5.	5.	20	23	0	0.00	158.12	988.22

*SECNO 185.000

SECNO	DEPTH	CHSEL	CRIWS	WSELK	EG	HV	HL	QLOSS	BANK ELEV
Q	SLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

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        U/S FACE OF DAM

   185.00     4.27   764.47     0.00     0.00   764.53     0.06     0.01     0.03   762.80
     250.      28.    213.       6.      83.    106.      25.       0.       0.   763.40
     0.01     0.34     2.03     0.26    0.100    0.040    0.100    0.038   760.20   830.09
 0.000565       5.       5.       5.        2        0        0     0.00   165.23   995.32

*SECNO 225.000

        45' U/S OF DAM

   225.00     4.30   764.50     0.00     0.00   764.55     0.05     0.02     0.00   762.80
     250.      29.    214.       7.      85.    107.      26.       0.       0.   763.40
     0.02     0.34     2.01     0.26    0.100    0.040    0.100    0.038   760.20   830.09
 0.000547      40.      40.      40.        2        0        0     0.00   165.28   995.37

*SECNO 395.000
   395.00     3.11   764.31     0.00     0.00   764.72     0.11     0.15     0.02   763.00
     250.      17.    211.      22.      25.      72.      33.       1.       1.   763.00
     0.03     0.68     2.92     0.68    0.100    0.040    0.100    0.039   741.50   906.49
 0.001848     160.     170.     160.        2        0        0     0.00    81.66   986.15

*SECNO 565.000

3301 HV CHANGED MORE THAN HVINS

   565.00     2.49   764.99     0.00     0.00   765.61     0.62     0.73     0.15   765.00
     250.       0.     250.       0.       0.      39.       0.       1.       1.   765.00
     0.06     0.02     6.34     0.02    0.100    0.040    0.100    0.039   762.30   927.11
 0.019559     160.     170.     160.        3        0        0     0.00    20.81   955.92

*SECNO 752.000

        100' D/S OF KING HIGHWAY

   752.00     3.19   766.39     0.00     0.00   766.90     0.21     0.25     0.04   766.00
     250.       1.     249.       0.       2.      67.       0.       2.       1.   766.20
     0.06     0.42     3.70     0.32    0.100    0.040    0.100    0.040   763.50   921.18
 0.003326     180.     187.     180.        2        0        0     0.00    36.19   957.38

CCHV=   0.300 CEHV=   0.500
*SECNO 802.000
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        BLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA      LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     XTRIAL    IMP       SCONT     CORAR     TOPWID      ENDST

3470 ENCROACHMENT STATIONS=      922.0      959.5  TYPE=      1  TARGET=      37.500

        30' D/S OF KING HIGHWAY

   802.00     2.85   766.85     0.00     0.00   767.15     0.31     0.21     0.05   766.20
     250.       1.     249.       0.       1.      56.       0.       2.       1.   767.00
     0.06     0.51     4.43     0.00    0.100    0.040    0.100    0.040   764.00   926.5
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0.005333	50.	50.	50.	2	0	0	0.00	29.30	953.76

*SECNO 827.000

827.00	2.75	765.95	0.00	0.00	767.38	0.63	0.17	0.06	767.60
250.	0.	290.	0.	0.	46.	0.	2.	1.	767.50
0.06	0.00	5.23	0.00	0.100	0.030	0.100	0.039	764.20	1195.30
0.008958	25.	25.	25.	0	0	0	0.00	25.08	1220.64

*SECNO 852.000

3301 HV CHANGED MORE THAN HVINS

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 772.10 ELREA= 772.10

D/S FACE KING HIGHWAY

852.00	2.55	766.95	0.00	0.00	768.03	1.08	0.32	0.33	764.70
250.	0.	250.	0.	0.	30.	0.	2.	1.	764.80
0.06	0.00	6.33	0.00	0.100	0.030	0.100	0.039	764.70	1201.70
0.019871	25.	25.	25.	2	0	0	0.00	12.30	1214.30

*SECNO 853.000

3370 NORMAL BRIDGE, NRD= 9 MIN ELTRD= 777.30 MAX ELLC= 772.12

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 777.50 ELREA= 777.50

1 FT. INSIDE D/S END OF KING HWY. BRIDGE

853.00	2.57	766.97	0.00	0.00	768.35	1.13	0.01	0.00	764.70
250.	0.	250.	0.	0.	30.	0.	2.	1.	764.60
0.06	0.00	8.33	0.00	0.100	0.030	0.100	0.039	764.40	1201.70
0.011099	1.	1.	1.	0	0	0	-6.26	12.60	1214.30

*SECNO 922.000

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE, NRD= 9 MIN ELTRD= 777.30 MAX ELLC= 772.20

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 777.50 ELREA= 777.50

1 FT. INSIDE U/S END OF KING HWY. BRIDGE

922.00	3.60	768.10	0.00	0.00	768.62	0.52	0.41	0.17	764.80
250.	0.	250.	0.	0.	43.	0.	2.	1.	764.90
0.06	0.00	5.81	0.00	0.100	0.030	0.100	0.039	764.50	1201.70
0.003661	69.	69.	69.	2	0	0	-3.52	12.60	1214.30

*SECNO 923.000

SECNO	DEPTH	CWSEL	CRIWS	VSELK	EG	HV	FR	QLOSS	BANK ELEV
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	LEFT/RIGHT	

TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	MTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IN2	ICONT	CORAR	TOPWID	ENDST

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 777.30 ELREA= 777.30

U/S FACE KING HIGHWAY

923.30	3.61	768.11	0.00	0.00	768.63	0.52	0.00	0.00	764.81
250.	0.	250.	0.	0.	43.	0.	2.	1.	766.90
0.06	0.00	5.79	0.00	0.100	0.040	0.100	0.039	764.50	1201.70
0.006426	1.	1.	1.	0	0	0	0.00	12.60	1214.30

CONV= 0.100 CONV= 0.300

*SECNO 1025.000

VALLEY SECT. BASED ON ABRAMS #22 APPROX. 100 FT. U/S OF KING HIGHWAY

1025.00	3.36	768.96	0.00	0.00	769.12	0.15	0.45	0.04	765.70
250.	0.	246.	4.	1.	77.	6.	2.	1.	767.83
0.07	0.34	3.18	0.60	0.100	0.040	0.100	0.039	765.60	1184.48
0.003263	102.	102.	102.	2	0	0	0.00	33.86	1230.34

*SECNO 1100.000

1100.00	2.76	765.24	0.00	0.00	769.31	0.25	0.37	0.03	769.00
250.	0.	250.	0.	0.	62.	0.	2.	2.	769.20
0.05	0.01	4.03	0.01	0.100	0.040	0.100	0.039	766.50	1132.74
0.008117	75.	75.	75.	2	0	0	0.00	47.88	1230.62

*SECNO 1175.000

APPROX. 250' U/S OF KING HIGHWAY

1175.00	2.61	770.01	0.00	0.00	770.41	0.40	0.85	0.04	770.00
250.	0.	250.	0.	0.	49.	0.	2.	2.	770.00
0.03	0.02	5.09	0.02	0.100	0.040	0.100	0.039	767.40	765.99
0.016074	70.	70.	70.	4	0	0	0.00	44.06	1010.04

*SECNO 1325.000

APPROX. 400' U/S OF KING HIGHWAY

1325.00	2.53	771.76	0.00	0.00	772.16	0.43	1.76	0.04	772.00
250.	0.	245.	5.	0.	46.	7.	2.	2.	771.00
0.09	0.00	5.33	0.73	0.100	0.040	0.100	0.039	769.20	965.51
0.008790	145.	150.	145.	2	0	0	0.00	41.03	1006.54

*SECNO 1683.000

SECNO	DEPTH	CHSEL	CRIWS	HSELK	EG	HV	HL	QLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	STN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IN2	ICONT	CORAR	TOPWID	ENDST

VALLEY SECT. BASED ON ABRAMS #23 83' D/S OF MICHIGAN AVE.

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1485.00	2.27	773.47	773.37	0.00	774.12	0.64	1.06	0.05	774.60
250.	0.	245.	5.	0.	38.	5.	3.	2.	772.70
0.10	0.00	6.50	0.99	0.100	0.040	0.100	0.039	771.20	967.21
0.016046	155.	160.	155.	4	15	0	0.00	34.60	1001.81

*SECNO 1512.000

1512.00	2.06	774.06	0.00	0.00	774.48	0.42	0.34	0.02	774.50
250.	0.	247.	3.	0.	47.	3.	3.	2.	773.00
0.10	0.00	5.25	0.97	0.100	0.040	0.100	0.039	772.00	966.78
0.010281	27.	27.	27.	3	3	0	0.00	34.09	1000.66

*SECNO 1538.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	UTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IM2	ICONT	CCHAN	TOPWID	ESTA

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1538.00	1.65	774.75	774.75	0.00	775.41	0.66	0.99	0.07	775.60
250.	0.	250.	0.	0.	33.	3.	3.	2.	775.00
0.10	0.00	6.50	0.00	0.100	0.040	0.100	0.039	773.10	966.73
0.021966	26.	26.	26.	20	15	0	0.00	29.50	996.22

CCHV= 0.300 CCHW= 0.300

*SECNO 1568.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	UTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IM2	ICONT	CCHAN	TOPWID	ESTA

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 787.70 ELREA= 787.70

D/S FACE OF MICHIGAN AVE. BRIDGE

1568.00	1.54	775.84	775.84	0.00	776.48	0.64	0.66	0.01	776.60
250.	0.	250.	0.	0.	30.	0.	3.	2.	776.70
0.10	0.00	6.40	0.00	0.100	0.040	0.100	0.039	774.30	697.29
0.022208	30.	30.	30.	2	11	0	0.00	31.04	728.33

*SECNO 1569.000

3370 NORMAL BRIDGE,XRD= 6 MIN ELTRD= 787.70 MAX ELLC= 703.90

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 787.70 ELREA= 787.70

1 FT. INSIDE D/S END OF MICHIGAN AVE. BRIDGE

1569.00	1.85	776.15	0.00	0.00	776.56	0.41	0.01	0.07	776.60
250.	0.	250.	0.	0.	49.	3.	3.	2.	776.70
0.10	0.00	5.12	0.00	0.100	0.030	0.100	0.039	774.30	695.76

0.006339	1.	1.	1.	6	0	0	0.00	33.30	729.06

*SECNO 1621.000

SECNO	DEPTH	CHSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	SLOD	QCH	QROD	ALOB	ACH	AROB	VOL	TOP	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	LTP	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

3370 NORMAL BRIDGE,NRB= 6 MIN ELTRD= 787.70 MAX ELLC= 794.40

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 787.70 ELREA= 787.70

1 FT. INSIDE U/S END OF MICHIGAN AVE. BRIDGE

1621.00	1.70	776.50	0.00	0.00	777.00	0.50	0.39	0.05	777.10
250.	0.	250.	0.	0.	44.	0.	3.	2.	777.20
0.10	0.00	5.66	0.00	0.100	0.030	0.100	0.039	774.80	696.48
0.009779	52.	52.	52.	3	0	0	0.00	32.25	728.72

*SECNO 1622.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 787.70 ELREA= 787.70

U/S FACE OF MICHIGAN AVE. BRIDGE

1622.00	1.71	776.51	0.00	0.00	777.01	0.50	0.01	0.00	777.10
250.	0.	250.	0.	0.	44.	0.	3.	2.	777.20
0.10	0.00	5.65	0.00	0.100	0.047	0.100	0.039	774.50	695.47
0.015519	1.	1.	1.	0	1	0	0.00	32.25	727.72

*SECNO 1631.000

SECNO	DEPTH	CHSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	SLOB	QCH	QROD	ALOB	ACH	AROB	VOL	TOP	LEFT/RIGHT
TIME	VLOD	VCH	VROB	XNL	XNCH	XNR	LTP	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 790.00 ELREA= 789.90

D/S FACE OF R.R. BRIDGE

1631.00	1.34	776.64	776.64	0.00	777.28	0.64	0.17	0.07	777.40
250.	0.	250.	0.	0.	39.	0.	3.	2.	777.50
0.11	0.00	6.41	0.00	0.100	0.040	0.100	0.039	775.10	697.30
0.022389	9.	9.	9.	2	11	0	0.00	31.03	728.32

*SECNO 1632.000

3370 NORMAL BRIDGE,NRB= 6 MIN ELTRD= 789.90 MAX ELLC= 793.90

3695 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 790.00 ELTRA= 789.90

1 FT. INSIDE D/S END OF R.R. BRIDGE

1632.00	1.85	776.95	0.00	0.00	777.36	0.41	0.01	0.07	777.40
250.	0.	250.	0.	0.	40.	5.	3.	2.	777.30
0.11	0.00	5.12	0.00	0.100	0.030	0.100	0.039	775.10	695.77
0.006567	1.	1.	1.	6	0	0	0.00	33.29	729.06

*SECNO 1659.000

3370 NORMAL BRIDGE,NRD= 6 MIN ELTRD= 789.90 MAX ELLC= 784.30

3695 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 790.00 ELTRA= 789.90

1 FT. INSIDE U/S END OF R.R. BRIDGE

1659.00	1.59	777.09	0.00	0.00	777.67	0.58	0.23	0.09	777.80
250.	0.	250.	0.	0.	41.	5.	3.	2.	777.90
0.11	0.00	6.13	0.00	0.100	0.030	0.100	0.038	775.50	697.01
0.011044	27.	27.	27.	2	0	2	2.00	31.45	728.16

*SECNO 1660.000

SECNO	DEPTH	CHSEL	CRIMS	HSELK	EG	HV	HL	CLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

3695 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 790.00 ELTRA= 789.90

U/S FACE OF R.R. BRIDGE

1660.00	1.60	777.11	0.00	0.00	777.69	0.58	0.01	0.00	777.82
250.	0.	250.	0.	0.	41.	0.	3.	2.	777.90
0.11	0.00	6.13	0.00	0.100	0.040	0.100	0.038	775.50	697.01
0.019605	1.	1.	1.	0	0	0	0.00	31.46	728.46

*SECNO 1690.000

SECNO	DEPTH	CHSEL	CRIMS	HSELK	EG	HV	HL	CLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

7103 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1690.00	1.55	777.75	777.75	0.00	778.38	0.63	0.62	0.02	778.50
250.	0.	250.	0.	0.	39.	0.	3.	2.	778.60
0.11	0.00	6.37	0.00	0.100	0.040	0.100	0.038	776.20	697.26
0.022000	30.	30.	30.	2	6	0	0.00	31.08	728.34

CCHV= 0.100 CEHV= 0.300

*SECNO 1720.000

SECNO	DEPTH	CHSEL	CRIMS	HSELK	EG	HV	HL	CLOSS	BANK ELEV

Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IHZ	ICONT	CORAR	TOPWID	ENDST

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1720.00	1.54	778.44	778.44	0.00	779.08	0.64	0.67	0.00	779.20
250.	0.	250.	0.	0.	39.	0.	3.	2.	779.30
0.11	0.00	6.41	0.00	0.100	0.040	0.100	0.038	776.90	697.30
0.022377	30.	30.	30.	0	5	5	0.00	31.05	720.32

*SECNO 1750.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IHZ	ICONT	CORAR	TOPWID	ENDST

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

VALLEY SECTION D/S OF DAM

1750.00	1.54	779.14	779.14	0.00	779.78	0.63	0.67	0.00	779.90
250.	0.	250.	0.	0.	39.	0.	3.	2.	780.00
0.11	0.00	6.39	0.00	0.100	0.040	0.100	0.038	777.60	697.28
0.022200	30.	30.	30.	0	5	0	0.00	31.05	778.33

SPECIAL BRIDGE

SS	XK	NCOR	COPS	SKLEN	EXP	ENTR	EXEA	SS	ELCHD	ELCAD
	0.00	1.50	2.33	0.00	0.10	1.00	0.10	0.10	737.50	777.80

CCHV= 0.300 CEHV= 0.500
*SECNO 1794.000

3301 HV CHANGED MORE THAN 5VIRS

PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
146353.60	780.09	0.00	248.	2.	0.	0.	759.20	739.20

U/S OF DAM

1794.00	3.91	791.91	0.00	0.00	791.94	0.02	12.76	0.00	793.00
250.	66.	124.	60.	124.	74.	112.	3.	2.	798.00
0.12	0.53	1.68	0.53	0.100	0.040	0.100	0.038	788.00	0.00
0.000330	44.	44.	44.	2	0	10	0.00	100.00	100.00

*SECNO 1894.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IHZ	ICONT	CORAR	TOPWID	ENDST

100FT U/S OF DAM

1894.00	4.34	791.64	0.00	0.00	791.95	0.01	0.01	0.00	791.00
250.	0.	250.	0.	1.	382	1.	4.	2.	791.60
0.16	0.02	0.71	0.04	0.100	0.035	0.080	0.038	787.60	863.71
0.000047	100.	100.	100.	2	0	0	0.00	111.18	974.89

CCHV= 0.100 CEHV= 0.300

*SECNO 2300.000

2300.00	2.66	791.96	0.00	0.00	792.01	0.05	0.05	0.01	792.00
250.	0.	250.	0.	0.	143.	0.	6.	3.	792.00
0.23	0.00	1.75	0.00	0.100	0.035	0.080	0.038	789.30	893.22
0.000627	390.	406.	390.	2	0	0	0.00	47.0[illegible]	960.05

*SECNO 2784.000

VALLEY SECT. BASED ON ABRAMS #26 80' D/S OF DRAN RD. CULVERT

2784.00	1.40	792.48	0.00	0.00	793.90	0.42	0.70	0.1[illegible]	791.20
250.	2.	250.	1.	2.	44.	1.	7.	4.	79[illegible].20
0.25	1.07	5.35	1.60	0.100	0.035	0.080	0.037	791.00	1535.64
0.010366	470.	484.	470.	4	0	0	0.00	48.15	1583.79

*SECNO 2824.000

SECNO	DEPTH	CHSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

3685 20 TRIALS ATTEMPTED USEL,CHSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

2824.00	2.17	793.77	793.77	0.00	794.59	0.82	0.49	0.12	793.00
250.	1.	248.	1.	1.	36.	1.	7.	4.	793.00
0.25	0.93	7.31	1.17	0.100	0.035	0.080	0.037	791.60	1544.44
0.016960	60.	60.	60.	20	14	0	0.00	25.13	1569.56

CCHV= 0.300 CEHV= 0.500

*SECNO 2864.000

3301 HV CHANGED MORE THAN HVINS

SECNO	DEPTH	CHSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

3685 20 TRIALS ATTEMPTED USEL,CHSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 797.00 ELREA= 797.00

D/S FACE OF DRAN RD. CULVERT

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  2864.00     3.40   795.30   795.30     0.00   796.88     1.57     0.70     0.38   793.90
     250.       0.     250.       0.       0.      25.       0.       7.       4.   793.90
     0.25     0.00    10.07     0.00    0.100    0.035    0.080    0.037   791.90   758.00
 0.020994      40.      40.      40.       20       14        0     0.00     8.00   766.00

*SECNO 2865.000
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        CLOSS   BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       THA     LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       XTN       ELMIN      SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IN2       ICONT     CORAR     TOPWID     ENDST

3370 NORMAL BRIDGE,NRD= 11 MIN ELTRD=  801.00 MAX ELLC=  797.80

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      797.00 ELREA=      797.00

  2865.00     3.41   795.31   795.28     0.00   796.91     1.60     0.02     0.01   793.90
     250.       0.     250.       0.       0.      25.       0.       7.       4.   793.90
     0.25     0.00    10.15     0.00    0.100    0.030    0.080    0.037   791.90   758.00
 0.016796       1.       1.       1.        2       10        0    -5.84     8.00   766.00

*SECNO 2901.000

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE,NRD= 11 MIN ELTRD=  801.00 MAX ELLC=  797.80

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      799.00 ELREA=      799.00

  2901.00     4.73   796.66     0.00     0.00   797.52     0.86     0.39     0.22   793.90
     250.       0.     250.       0.       0.      34.       0.       7.       4.   793.90
     0.26     0.00     7.44     0.00    0.100    0.030    0.080    0.037   791.90   758.00
 0.007649      36.      36.      36.        3        0        0   -15.26     8.00   766.00

CCHV=   0.300 DCHV=   0.500
*SECNO 2902.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      801.00 ELREA=      801.00

        U/S FACE OF DRAW RD. CULVERT

  2902.00     5.00   796.90     0.00     0.00   797.58     0.69     0.01     0.05   793.90
     250.       0.     250.       0.       0.      38.       0.       7.       4.   793.90
     0.26     0.00     6.64     0.00    0.100    0.035    0.080    0.037   791.90   758.00
 0.006219       1.       1.       1.        2        0        0     0.00     8.00   766.00

*SECNO 2922.000

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS=      701.0      823.0  TYPE=      1  TARGET=      122.000

        VALLEY SECT. D/S OF DAM
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2922.00	4.55	797.75	0.00	0.00	797.79	0.04	0.02	0.19	797.80
250.	0.	250.	0.	0.	154.	0.	7.	4.	797.80
0.26	0.00	1.62	0.00	0.100	0.035	0.080	0.037	793.20	743.06
0.000276	20.	20.	20.	2	0	0	0.00	41.63	704.90

SPECIAL BRIDGE

SB	XK	XKOR	COEF	RDLEN	BWC	ELP	BAREA	SS	ELCHJ	ELCHD
	0.00	1.50	2.63	0.30	0.10	0.00	0.10	0.10	803.90	792.20

*SECNO 2957.000
PRESSURE AND WEIR FLOW

EGPRS	EGLWC	FB	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
146372.20	810.49	0.00	249.	2.	0.	0.	805.90	805.90

JUST U/S OF DAM

2957.00	5.77	809.77	0.00	0.00	809.01	0.05	12.02	0.00	808.00
250.	46.	160.	43.	100.	73.	75.	8.	4.	808.00
0.26	0.47	2.20	0.58	0.100	0.035	0.080	0.037	804.00	0.00
0.000479	35.	35.	35.	2	0	11	0.00	112.00	112.00

*SECNO 3200.000

2800 NAT Q1= 261.00 WSEL= 809.87 ENC Q1= 261.00 WSEL= 809.97 RATIO= 0.0000
NAT Q1= 276. RATIOS LOB,CH,ROB= 0.3543 0.6312 0.0145 WSEL= 809.97

SECNO	DEPTH	CWSEL	CRIWS	AREL	EG	FR	HL	OLOSS	BANK ELEV
Q	VLOB	VCH	VROB	XNL	KNCH	XNR	NTL	ELKIN	LEFT/RIGHT
TIME	WLOB	WCH	WROB	XWL	WNCH	XWR	NTW	ELKOUT	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IN2	ICONT	CORAR	TOPWID	ENDST

3470 ENCROACHMENT STATIONS= 734.7 930.3 TYPE= 6 TARGET= 0.056

VALLEY SECTION U/S OF DAM

3280.00	5.68	809.88	0.00	809.87	809.89	0.01	0.06	0.01	809.70
250.	31.	169.	0.	333.	159.	0.	10.	5.	809.30
0.36	0.24	1.06	0.00	0.100	0.035	0.080	0.037	804.20	734.31
0.000102	323.	323.	323.	1	0	0	0.00	203.79	968.50

CCHV= 0.100 CEHV= 0.300

*SECNO 4200.000

2800 NAT Q1= 159.66 WSEL= 810.05 ENC Q1= 170.35 WSEL= 810.15 RATIO= -3.0682
NAT Q1= 172. RATIOS LOB,CH,ROB= 0.0027 0.9914 0.0059 WSEL= 810.15

3470 ENCROACHMENT STATIONS= 906.0 1004.0 TYPE= 6 TARGET= 0.009

VALLEY SECT. BASED ON ABRAMS #29

6280.00	2.87	810.07	0.00	810.05	810.09	0.02	0.20	0.00	809.12
250.	0.	250.	0.	0.	221.	0.	21.	10.	808.30
0.70	0.00	1.13	0.00	0.100	0.035	0.080	0.036	807.20	906.00
0.000251	1500.	1500.	1500.	2	0	0	0.00	93.00	1004.00

```
*SECNO 4598.000
 2800 NAT Q1=      36.56  WSEL=     810.17  ENC Q1=      41.80  WSEL=     810.27  RATIO= -0.1455
 NAT Q1=      42.  RATIOS LOB,CH,ROB=  0.0025  0.9973  0.0000  WSEL=     810.27

3470 ENCROACHMENT STATIONS=      915.0     1000.0  TYPE=      4  TARGET=        0.003
  4598.00      1.70    810.20      0.00    810.17    810.33      0.13      0.21      0.03    809.50
     250.        0.      250.        0.        0.       85.        0.       22.       10.    810.50
     0.73      0.00      2.94      0.00     0.100     0.035     0.080     0.036    808.50    915.00
 0.004449      300.      318.      300.         3         0         0      0.00     79.71    994.71

*SECNO 4916.000
 2800 NAT Q1=      40.35  WSEL=     811.50  ENC Q1=      44.65  WSEL=     811.60  RATIO= -0.1066
 NAT Q1=      45.  RATIOS LOB,CH,ROB=  0.0088  0.9822  0.0090  WSEL=     811.60

3470 ENCROACHMENT STATIONS=      930.0      985.0  TYPE=      4  TARGET=        0.018
  4916.00      1.81    811.51      0.00    811.50    811.68      0.15      1.34      0.01    810.50
     250.        0.      250.        0.        0.       77.        0.       23.       11.    810.60
     0.75      0.00      3.26      0.00     0.100     0.035     0.080     0.036    809.70    930.00
 0.003975      300.      318.      300.         2         0         0      0.00     55.00    985.00

*SECNO 5234.000
 2800 NAT Q1=      28.41  WSEL=     813.08  ENC Q1=      30.71  WSEL=     813.18  RATIO= -0.0809
 NAT Q1=      32.  RATIOS LOB,CH,ROB=  0.0149  0.9654  0.0197  WSEL=     813.18

3470 ENCROACHMENT STATIONS=      935.0      975.0  TYPE=      4  TARGET=        0.035
  5234.00      1.64    813.14      0.00    813.08    813.45      0.32      1.73      0.05    812.00
     250.        0.      250.        0.        0.       55.        0.       23.       11.    812.00
     0.77      0.00      4.51      0.00     0.100     0.035     0.080     0.036    811.50    935.00
 0.007892      300.      318.      300.         2         0         0      0.00     40.00    975.00

*SECNO 5552.000
 2800 NAT Q1=      35.65  WSEL=     815.04  ENC Q1=      36.77  WSEL=     815.14  RATIO= -0.0314
 NAT Q1=      39.  RATIOS LOB,CH,ROB=  0.0316  0.9369  0.0315  WSEL=     815.14
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        BLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA      LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XML       XMCH      XMR       XTN       ELMIN      ESTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IH2       ICONT     CORAR     TOP.ID     ENDST

3470 ENCROACHMENT STATIONS=      940.0      970.0  TYPE=      4  TARGET=        0.063
  5552.00      2.16    815.16      0.00    815.04    815.46      0.29      2.00      0.00    813.50
     250.        0.      250.        0.        0.       57.        0.       23.       11.    813.50
     0.79      0.00      4.36      0.00     0.100     0.035     0.080     0.036    813.00    940.00
 0.005147      300.      318.      300.         3         0         0      0.00     30.00    970.00

*SECNO 5872.000

3470 ENCROACHMENT STATIONS=      182.0     1392.0  TYPE=      4  TARGET=     1210.000

        VALLEY SECT. BASED ON ABRAMS #30

  5872.00      2.30    816.60      0.00    816.52    816.94      0.34      1.47      0.01    815.00
     250.        9.      220.       21.       11.       44.       20.       24.       12.    814.70
     0.81      0.82      4.95      1.07     0.100     0.035     0.080     0.036    813.80    802.06
 0.004151      300.      320.      300.         3         0         0      0.00     76.72    879.58
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*SECNO 6292.000
  6292.00     2.64   818.44     0.00   818.49   818.79     0.34     1.84     0.00   817.00
     250.       7.     242.       1.       9.      51.       1.      25.      12.   818.00
     0.84     0.03     4.78     0.47    0.100    0.035    0.080    0.036   816.00  1057.73
 0.006816     370.     420.     300.        2        0        0     0.00    42.49  1100.22

*SECNO 6712.000
  6712.00     2.50   820.50     0.00   820.48   820.84     0.34     2.05     0.00   819.50
     250.       3.     246.       1.       5.      52.       1.      25.      13.   820.00
     0.86     0.66     4.72     0.52    0.100    0.035    0.080    0.036   818.00  1060.32
 0.004993     370.     420.     300.        3        0        0     0.00    40.85  1101.17

*SECNO 7132.000

        VALLEY SECT. BASED ON ABRAMS #31

  7132.00     2.56   822.86     0.00   822.86   823.29     0.44     2.42     0.03   822.50
     250.       0.     250.       0.       0.      47.       0.      26.      13.   824.50
     0.88     0.37     5.34     0.00    0.100    0.035    0.080    0.036   819.90  1067.46
 0.006715     360.     420.     300.        3        0        0     0.00    25.29  1092.75

*SECNO 7332.000
    SECNO    DEPTH    CWSEL    CRIWS    USELK    EG       HV       HL       OLOSS   BANK ELEV
    Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      HTN      ELMIN      SSTA
    SLOPE    XLOBL    XLCH     XLOBR    STRIAL   INP      [illegible]   CCRAR    TOPWID     ENDST

  7332.00     3.88   823.78     0.00   823.78   823.97     0.19     0.66     0.02   822.50
     250.       2.     248.       0.       4.      70.       0.      26.      13.   824.50
     0.90     0.48     3.54     0.00    0.100    0.035    0.080    0.036   819.90  1063.26
 0.001965     200.     200.     200.        2        0        0     0.00    34.09  1095.15

*SECNO 7532.000
  7532.00     4.25   824.15     0.00   824.15   824.30     0.15     0.32     0.00   822.50
     250.       3.     247.       0.       6.      80.       0.      26.      13.   824.50
     0.92     0.47     3.09     0.00    0.100    0.035    0.080    0.036   819.90  1061.57
 0.001315     225.     200.     100.        2        0        0     0.00    36.53  1096.11

*SECNO 7800.000

3670 ENCROACHMENT STATIONS=      615.0      825.0  TYPE=      1  TARGET=      210.000

        VALLEY SECT. BASED ON ABRAMS #32

  7800.00     4.59   824.39     0.00   824.39   824.41     0.02     0.10     0.01   822.40
     250.      35.     214.       2.     163.     169.       8.      28.      14.   823.20
     0.99     0.21     1.27     0.21    0.100    0.035    0.080    0.036   819.80   615.00
 0.000171     268.     268.     268.        2        0        0     0.00   210.00   825.00

*SECNO 7990.000

        D/S FACE OF MAIN ST.

  7990.00     4.74   824.46     0.00   824.43   824.45     0.01     0.04     0.00   820.40
     250.      79.      49.     122.     172.      29.     249.      29.      15.   820.50
     1.06     0.46     1.68     0.49    0.100    0.035    0.080    0.036   819.70   818.21
 0.000266     [illegible]     190.     190.        2        0        0     0.00   208.32  1027.03
```

SPECIAL BRIDGE

SB	XK	XKOR	COFC	RDLEN	BLC	BLP	BAREA	SS	ELCRU	ELCRD
	0.00	4.20	3.00	0.00	3.90	0.00	7.00	0.00	820.13	819.70

*SECNO 8034.000
PRESSURE AND WEIR FLOW

EGPRS	EGLLC	HB	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
907.62	824.85	0.00	218.	32.	7.	7.	821.90	824.60

U/S FACE OF MAIN ST. CULVERTS

8034.00	6.14	825.84	0.00	825.84	825.84	0.00	1.39	0.00	820.40
250.	76.	36.	138.	272.	37.	435.	30.	15.	820.50
1.09	0.28	0.96	0.32	0.100	0.035	0.080	0.036	819.70	816.45
0.000033	44.	44.	44.	0	0	0	0.00	211.59	1028.03

*SECNO 8084.000

SECNO	DEPTH	CHSEL	CRIUS	USELK	EG	HV	HL	QLOSS	BANK ELEV
Q	QLOE	QCH	QROE	ALOE	ACH	AROE	VCL	THA	LEFT/RIGHT
TIME	VLOE	VCH	VROE	XNL	XNCH	XNR	HTN	ELMIN	SSTA
SLOPE	XLOEL	XLCH	XLOER	ITRIAL	IHP	ICONT	NCRAR	TOPWID	ENDST

VALLEY SECT. APPROX. 50 FT. U/S OF MAIN ST.

8034.00	6.14	825.84	0.00	825.84	825.84	0.00	0.00	0.00	820.40
250.	76.	36.	138.	272.	37.	436.	31.	15.	820.50
1.12	0.28	0.96	0.32	0.100	0.035	0.080	0.036	819.70	816.44
0.000057	50.	50.	50.	0	0	0	0.00	211.59	1028.03

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FORM 1411-00 PRINTED BY ROTARY MANIFOLD FORM



1) COUNTY: KALAMAZOO

2) STUDY NAME: COMSTOCK TWP

3) WATERCOURSE: COMSTOCK CREEK

4) DOCUMENT TYPE: 100 yr NATURAL RUN



*PROF 1

CCHV= 0.100 CEHV= 0.300

*SECNO 100.000

SECNO	DEPTH	CWSEL	CRIWS	MSELS	EG	HV	HL	QLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	WSL	TOP WID	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	LTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IN2	ICONT	CORAR	TOPWID	ENDST

100' U/S OF SOUTH ST SALMON RIVER-75' D/S OF DAM

100.00	3.80	764.00	0.00	764.00	764.12	0.12	0.00	0.00	763.40
250.	7.	243.	0.	24.	85.	0.	0.	0.	764.00
0.00	0.27	2.65	0.00	0.100	0.040	0.100	0.030	760.20	830.00
0.001552	0.	0.	0.	0	0	0	0.00	135.00	955.00

FLOW DISTRIBUTION FOR SECNO= 100.00 CHSEL= 764.00

STA=	120.	830.	926.	955.
PER Q=	0.3	2.5	97.2	
AREA=	6.0	16.2	35.0	
VEL=	0.1	0.3	2.9	

*SECNO 140.000

140' U/S OF SOUTH-35' D/S OF DAM

140.00	3.89	764.09	0.00	0.00	764.18	0.09	0.05	0.00	762.80
250.	16.	232.	2.	46.	95.	11.	0.	0.	763.40
0.00	0.34	2.65	0.23	0.100	0.040	0.100	0.039	760.20	830.10
0.000951	40.	40.	40.	2	0	0	0.00	135.13	985.05

FLOW DISTRIBUTION FOR SECNO= 140.00 CHSEL= 764.09

STA=	830.	880.	926.	955.	986.
PER Q=	0.6	5.7	92.3	1.0
AREA=	9.4	36.3	94.3	10.6
VEL=	0.2	0.4	2.6	0.2

*SECNO 175.000

D/S FACE OF DAM

175.00	3.93	764.13	0.00	0.00	764.21	0.08	0.03	0.00	762.80
250.	17.	230.	3.	50.	96.	12.	0.	0.	763.40
0.01	0.34	2.40	0.23	0.100	0.040	0.100	0.039	760.20	830.10
0.000897	35.	35.	35.	0	0	0	0.00	157.45	987.55

FLOW DISTRIBUTION FOR SECNO= 175.00 CHSEL= 764.13

STA=	830.	880.	926.	955.	988.
PER Q=	0.0	6.0	92.1	1.1
AREA=	11.6	33.3	96.1	11.9
VEL=	0.2	0.4	2.4	0.2

*SECNO 180.000

SECNO	DEPTH	CWSEL	CRIWS	MSELS	EG	HV	HL	QLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	WSL	TOP WID	LEFT/RIGHT

	TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	HTN	ELMIN	SSTA
	SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

CENTER OF DAM

180.00	1.35	764.15	764.15	0.00	764.49	0.34	0.01	0.08	762.80
250.	68.	172.	11.	34.	31.	12.	0.	0.	765.40
0.01	1.26	5.63	0.85	0.100	0.030	0.100	0.030	762.80	830.10
0.012054	5.	5.	5.	20	23	0	0.00	158.12	988.22

FLOW DISTRIBUTION FOR SECNO= 180.00 CWSEL= 764.15

STA=	330.	860.	926.	955.	988.
PER Q=	4.3	22.8	68.7	4.2	
AREA=	14.8	39.0	30.5	12.4	
VEL=	0.7	1.5	5.6	0.8	

*SECNO 185.000

	SECNO	DEPTH	CWSEL	SRIMB	LSELK	FQ	HV	EL	CLOSS	TOPWIDTH ELEV
	Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
	TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	HTN	ELMIN	SSTA
	SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

U/S FACE OF DAM

185.00	4.27	764.47	0.00	0.00	764.53	0.06	0.01	0.03	762.80
230.	28.	215.	6.	83.	100.	25.	2.	0.	765.40
0.01	0.34	2.03	0.26	0.100	0.040	0.100	0.050	762.80	830.09
0.000565	5.	5.	5.	2	0	0	0.00	165.23	955.32

FLOW DISTRIBUTION FOR SECNO= 185.00 CWSEL= 764.47

STA=	830.	860.	926.	955.	995.
PER Q=	2.0	8.5	86.1	2.6	
AREA=	28.7	54.1	106.0	25.0	
VEL=	0.2	0.4	2.0	0.3	

*SECNO 225.000

45° U/S OF DAM

225.00	4.30	764.50	0.00	0.00	764.55	0.05	0.02	0.00	762.80
250.	29.	214.	7.	85.	107.	26.	0.	0.	763.40
0.02	0.34	2.01	0.26	0.100	0.040	0.100	0.038	760.20	830.09
0.000547	40.	40.	40.	2	2	0	0.00	165.28	955.37

FLOW DISTRIBUTION FOR SECNO= 225.00 CWSEL= 764.50

STA=	830.	860.	926.	955.	995.
PER Q=	2.5	8.8	86.7	2.3	
AREA=	29.9	55.9	106.3	25.9	
VEL=	0.2	0.4	2.0	0.3	

*SECNO 305.000

395.00	3.[illegible]	764.61	0.00	0.00	764.72	0.11	0.15	0.02	763.00
250.	17.	21.	22.	25.	72.	33.	1.	1.	763.30
0.03	0.68	2.92	0.68	0.100	0.040	0.100	0.039	761.50	904.49
0.001848	160.	170.	160.	2	0	0	0.00	81.66	986.15

FLOW DISTRIBUTION FOR SECNO= 395.00 CHSEL= 764.61

STA=	904.	905.	927.	956.	985.	986.
PER Q=	0.0	6.7	64.4	8.8	0.0	
AREA=	0.2	24.4	72.2	32.2	2.4	
VEL=	0.2	0.7	2.9	0.7	0.3	

*SECNO 565.000

3301 HV CHANGED MORE THAN HVINS

565.00	2.49	764.99	0.00	0.00	765.61	0.62	0.73	0.15	765.00
250.	0.	250.	0.	0.	39.	0.	1.	1.	766.20
0.04	0.00	6.34	0.00	0.100	0.040	0.100	0.039	762.50	927.11
0.019559	160.	170.	160.	3	0	0	0.00	28.81	955.92

FLOW DISTRIBUTION FOR SECNO= 565.00 CHSEL= 764.99

STA=	927.	956.
PER Q=	100.0	
AREA=	39.6	
VEL=	6.3	

*SECNO 752.000

100' D/S OF KING HIGHWAY

752.00	3.19	766.65	0.00	0.00	766.90	0.25	0.25	0.04	766.05
250.	1.	249.	0.	2.	67.	0.	2.	1.	766.20
0.06	0.49	3.76	0.32	0.100	0.040	0.100	0.040	763.50	921.13
0.003326	180.	187.	180.	2	0	0	0.00	36.19	957.38

FLOW DISTRIBUTION FOR SECNO= 752.00 CHSEL= 766.65

STA=	921.	927.	956.	957.
PER Q=	0.3	99.6	0.0	
AREA=	2.0	67.3	0.3	
VEL=	0.6	3.7	0.3	

CCHV= 0.300 CENV= 0.300
*SECNO 802.000

SECNO	DEPTH	CHSEL	CRIWS	WSELK	EG	HV	HL	DLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLCHL	XLCH	XLCHR	ITRIAL	IN2	XCONT	CORAR	TOPWID	ENDST

3470 ENCROACHMENT STATIONS= 922.0 959.5 TYPE= 1 TARGET= 37.500

50' D/S OF KING HIGHWAY

802.00	2.80	766.80	0.00	0.00	767.15	0.35	0.21	0.05	766.20
250.	1.	249.	0.	1.	56.	0.	2.	1.	767.00
0.06	0.51	4.45	0.00	0.100	0.040	0.100	0.040	764.00	924.76
0.005333	50.	50.	50.	2	0	0	0.00	29.30	953.76

FLOW DISTRIBUTION FOR SECNO= 802.00 CUSEL= 766.85

STA=	924.	928. 954.
PER Q=	0.2	99.8
AREA=	1.2	56.1
VEL=	0.5	4.4

*SECNO 827.000

827.00	2.75	766.95	0.00	0.00	767.38	0.43	0.17	0.06	767.66
250.	0.	250.	0.	0.	43.	0.	2.	1.	767.50
0.06	0.00	5.26	0.00	0.100	0.360	0.100	0.040	764.22	1195.56
0.008958	25.	25.	25.	0	0	0	0.00	25.08	1220.64

FLOW DISTRIBUTION FOR SECNO= 827.00 CUSEL= 766.95

STA=	1196.	1222.
PER Q=	100.0	
AREA=	47.5	
VEL=	5.3	

*SECNO 352.000

3301 HV CHANGED MORE THAN HVINS

3695 OVERBANK AREA ASSUMED NO-EFFECTIVE,ELLEA= 772.10 ELREA= 772.10

D/S FACE KING HIGHWAY

852.00	2.55	766.95	0.00	0.00	768.03	1.08	0.32	0.33	764.70
250.	0.	250.	0.	0.	30.	0.	2.	1.	764.80
0.06	0.00	8.33	0.00	0.100	0.040	0.100	0.039	764.40	1201.70
0.019571	25.	25.	25.	2	0	1	0.00	12.60	1214.30

FLOW DISTRIBUTION FOR SECNO= 852.00 CWSEL= 766.95

STA=	1202.	1214.
PER Q=	100.0	
AREA=	29.9	
VEL=	8.3	

*SECNO 853.000

3370 NORMAL BRIDGE,XD= 9 MIN ELTRD= 777.50 MAX ELLC= 772.10

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 777.50 ELREA= 777.50

1 FT. INSIDE D/S END OF KING HWY. BRIDGE

853.00	2.57	766.97	0.00	0.30	768.35	1.08	0.01	0.00	764.76
250.	0.	250.	0.	0.	30.	0.	2.	1.	764.80
0.06	0.00	8.33	0.00	0.100	0.030	0.100	0.039	764.40	1201.70
0.011099	1.	1.	1.	0	0	0	-0.26	12.60	1214.30

FLOW DISTRIBUTION FOR SECNO= 853.00 CWSEL= 766.97

STA= 1202. 1214.
PER Q= 100.0
AREA= 30.0
VEL= 8.3

*SECNO 922.000

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE,NRD= 9 RIV ELTRD= 777.50 MAX ELLC= 772.20

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 777.50 ELREA= 777.50

' FT. INSIDE U/S END OF KING HWY. BRIDGE'

922.00	3.00	766.10	0.00	0.00	766.02	0.52	0.41	0.17	764.50
250.	0.	250.	0.	0.	43.	0.	2.	1.	764.90
0.06	0.00	5.81	0.00	0.100	0.030	0.100	0.039	764.50	1201.70
0.003661	69.	69.	69.	2	0	0	-13.52	12.60	1214.30

FLOW DISTRIBUTION FOR SECNO= 922.00 CWSEL= 766. 0

STA= 1202. 1214.
PER Q= 100.0
AREA= 43.2
VEL= 5.8

*SECNO 923.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	XTF	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IHS	ICONT	CORAR	TOPWID	SADST

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 777.50 ELREA= 777.50

U/S FACE KING HIGHWAY

923.00	3.61	768.11	0.00	0.00	768.63	0.52	0.00	0.00	764.80
250.	0.	250.	0.	0.	43.	0.	2.	1.	764.90
0.06	0.00	5.79	0.00	0.100	0.040	0.100	0.039	764.50	1201.70
0.006426	1.	1.	1.	0	0	0	0.00	12.60	1214.30

FLOW DISTRIBUTION FOR SECNO= 923.00 CWSEL= 768.11

STA= 1202. 1214.
PER Q= 100.0
AREA= 43.2
VEL= 5.8

CCHV= 0.100 CEHV= 0.300

*SECNO 1025.000

VALLEY SECT. BASED ON 48DANS 422 APPROX. 100 FT. U/S OF KING HIGHWAY

1025.00	3.36	768.96	0.00	0.00	769.12	0.15	0.43	0.04	765.70
250.	0.	245.	5.	5.	77.	5.	2.	1.	767.80

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0.07	0.34	3.18	0.60	0.100	0.040	0.100	0.039	765.60	1184.40
0.003263	102.	102.	102.	2	0	0	0.00	53.86	1230.34

FLOW DISTRIBUTION FOR SECNO= 1025.00 CWSEL= 768.96

STA=	1164.	1185.	1227.	1237	1230.
PER Q=	0.1	98.4	1.5	0.0	
AREA=	0.3	77.4	6.1	0.0	
VEL=	0.3	3.2	0.6	0.0	

*SECNO 1100.000

1100.00	2.76	769.26	0.00	0.00	769.51	0.25	0.57	0.03	769.00	
250.	0.	250.	0.	0.	62.	0.	2.	2.	769.20	
0.08	0.01	4.03	0.01	0.100	0.040	0.100	0.039	766.50	1182.74	
0.008117	75.	75.	75.	2	0	0	0.00	47.88	1230.62	

FLOW DISTRIBUTION FOR SECNO= 1100.00 CWSEL= 769.26

STA=	1183.	1183.	1229.	1231.
PER Q=	0.0	100.0	0.0	
AREA=	0.0	62.0	0.0	
VEL=	0.0	4.0	0.0	

*SECNO 1175.000

APPROX. 250' U/S OF KING HIGHWAY

1175.00	2.61	770.01	0.00	0.00	770.41	0.40	0.85	0.04	770.00	
250.	0.	250.	0.	0.	49.	2.	2.	2.	770.00	
0.08	0.02	5.08	0.02	0.100	0.040	0.100	0.039	767.40	965.99	
0.016874	70.	75.	70.	4	0	0	0.00	44.06	1010.04	

FLOW DISTRIBUTION FOR SECNO= 1175.00 CWSEL= 770.01

STA=	966.	1010.
PER Q=	100.0	
AREA=	49.2	
VEL=	1.1	

*SECNO 1325.000

APPROX. 400' U/S OF KING HIGHWAY

1325.00	2.56	771.76	0.00	0.00	772.19	0.43	1.70	0.01	772.00	
250.	0.	250.	5.	0.	46.	7.	2.	2.	771.00	
0.09	0.00	5.33	0.73	0.100	0.360	0.100	0.039	769.20	965.51	
0.008790	145.	150.	145.	2	0	0	0.00	41.03	1006.54	

FLOW DISTRIBUTION FOR SECNO= 1325.00 CWSEL= 771.76

STA=	966.	989.	1007.
PER Q=	98.0	2.0	
AREA=	46.0	6.7	
VEL=	5.3	0.7	

*SECNO 1485.000

SECNO	DEPTH	CWSEL	CRWS	WSELR	EG	HV	HL	J-LOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	THA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XMC	XNCH	XMR	WTN	ELMIN	SSTA
SLOPE	XLOB	XLCH	XLOBF	ITRIAL	TW	TOPWT	20PCT	XOF LO	ENDST

VALLEY SECT. BASED ON ABRAMS #23 83' D/S OF MICHIGAN AVE.

1485.00	2.27	773.47	773.37	0.00	774.12	0.64	1.36	0.26	775.63
250.	C.	245.	5.	0.	38.	5.	5.	2.	772.70
0.10	0.00	6.50	0.99	0.100	0.040	0.100	0.039	771.20	967.21
0.016046	155.	160.	155.	4	15	0	0.00	34.60	1001.81

FLOW DISTRIBUTION FOR SECNO= 1485.00 CHSEL= 773.47

STA= 967. 990. 1002.
PER Q= 98.2 1.8
AREA= 37.8 4.5
VEL= 6.5 1.0

*SECNO 1512.000

1512.00	2.06	774.06	0.00	0.00	774.48	0.42	0.34	0.02	774.50
250.	0.	247.	3.	0.	47.	3.	3.	2.	773.00
0.10	0.00	5.25	0.97	0.100	0.040	0.100	0.039	772.00	966.76
0.019201	27.	27.	27.	3	0	-	0.00	34.06	1000.86

FLOW DISTRIBUTION FOR SECNO= 1512.00 CHSEL= 774.06

STA= 967. 995. 1001.
PER Q= [illegible] [illegible]
AREA= 47.0 3.1
VEL= 5.3 [illegible]

*SECNO 1538.000

SECNO	DEPTH	CHSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	SLOB	VCH	VROB	XNL	XNCH	XNR	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	ITR	ELMIN	SSTA
SLOPE	KLOBL	KLCH	KLOBR	ITRIAL	IN2	ICONT	CCRAR	TOPWID	ENDST

3685 20 TRIALS ATTEMPTED WSEL,CHSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1538.00	1.55	774.75	774.75	1.00	775.41	0.66	0.38	0.07	775.31
250.	C.	250.	0.	0.	38.	0.	3.	2.	775.00
0.10	0.00	6.50	0.00	0.100	0.040	0.100	0.039	773.10	966.73
0.021966	26.	26.	26.	20	15	0	0.00	29.50	996.22

FLOW DISTRIBUTION FOR SECNO= 1538.00 CHSEL= 774.75

STA= 967. 997.
PER Q= 100.0
AREA= 38.4
VEL= 6.5

CCHV= 0.300 CEHV= 0.500

*SECNO 1568.000

SECNO	DEPTH	CHSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	CLOB	CCH	CROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	ITR	ELMIN	SSTA
SLOPE	K.OBL	KLCH	KLOBR	ITRIAL	IN2	ICONT	CCRAR	TOPWID	ENDST

7685 MINIMUM SPECIFIC ENERGY

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3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=       787.70 ELREA=       787.70

        D/S FACE OF MICHIGAN AVE. BRIDGE

  1568.00      1.54    775.84    775.84      0.00    776.48      0.64      0.66      0.01    776.60
     250.        0.      250.        0.        0.       39.        0.        3.        2.    776.70
     0.10      0.00      6.60      0.00     0.100     0.040     0.100     0.039    774.30    697.29
 0.022288       30.       30.       30.         2        11         0      0.02     31.04    728.33

FLOW DISTRIBUTION FOR SECNO=    1568.00          CWSEL=     775.84

STA=      697.      731.
  PER Q=     100.0
   AREA=      39.1
    VEL=       6.4

*SECNO 1569.000

3370 NORMAL BRIDGE,NRD=  6 MIN ELTRD=  787.70 MAX ELLC=  783.90

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=       787.70 ELREA=       787.70

        1 FT. INSIDE D/S END OF MICHIGAN AVE. BRIDGE

  1569.00      1.85    776.15      0.00      0.00    776.36      0.41      0.01      0.07    776.60
     250.        0.      250.        0.        0.       49.        0.        3.        2.    776.70
     0.10      0.00      5.12      0.00     0.100     0.030     0.100     0.039    774.30    695.76
 0.006539        1.        1.        1.         6         0         0      0.00     33.30    729.06

FLOW DISTRIBUTION FOR SECNO=    1569.00          CWSEL=     776.15

STA=      696.      731.
  PER Q=     100.0
   AREA=      40.9
    VEL=       5.4

*SECNO 1621.000
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       THA      LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       HTX       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IH2       ICONT     CORAR     TOFWIC      ENDST

3370 NORMAL BRIDGE,NRD=  6 MIN ELTRD=  787.70 MAX ELLC=  784.40

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=       787.70 ELREA=       787.70

        1 FT. INSIDE U/S END OF MICHIGAN AVE. BRIDGE

  1621.00      1.70    776.50      0.00      0.00    777.00      0.50      0.39      0.05    777.10
     250.        0.      250.        0.        0.       44.        0.        3.        2.    777.20
     0.10      0.00      5.66      0.00     0.100     0.030     0.100     0.039    774.80    696.48
 0.008779       52.       52.       52.         3         0         0      0.00     32.23    728.72
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FLOW DISTRIBUTION FOR SECNO=    1621.00          CWSEL=     776.50

STA=      696.      731.
  PER Q=     100.0
   AREA=      44.1
    VEL=       5.7

*SECNO 1622.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=       787.70 ELREA=       787.70

        U/S FACE OF MICHIGAN AVE. BRIDGE

  1622.00      1.71    776.51      0.00      0.00    777.01      0.50      0.01      0.00    777.10
     250.        0.      250.        0.        0.       44.        0.        3.        2.    777.20
     0.10      0.00      5.65      0.00     0.100     0.040     0.100     0.039    776.10    696.47
 0.015519        1.        1.        1.         0         0         0      0.00     32.25    728.72

FLOW DISTRIBUTION FOR SECNO=    1622.00          CWSEL=     776.51

STA=      696.      731.
  PER Q=     100.0
   AREA=      44.2
    VEL=       5.7

*SECNO 1631.000
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HW        HL        OLOSS     BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IH2       ICONT     CORAR     TOPWID    ENDST

7105 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=       790.00 ELREA=       789.90

        D/S FACE OF R.R. BRIDGE

  1631.00      1.54    776.64    776.64      0.00    777.28      0.64      0.17      0.07    777.40
     250.        0.      250.        0.        0.       39.        0.        3.        2.    777.50
     0.11      0.00      6.41      0.00     0.100     0.040     0.100     0.039    775.10    697.30
 0.022309        9.        9.        9.         2        11         0      0.00     31.03    728.32

FLOW DISTRIBUTION FOR SECNO=    1631.00          CWSEL=     776.64

STA=      697.      731.
  PER Q=     100.0
   AREA=      39.0
    VEL=       6.4

*SECNO 1632.000

3370 NORMAL BRIDGE,NRD=  6 MIN ELTRD=  789.90 MAX ELLC=  788.90

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=       790.00 ELREA=       789.90
```

1 FT. INSIDE D/S END OF R.R. BRIDGE

1632.00	1.85	776.95	0.00	0.00	777.36	0.41	0.01	0.07	777.40
250.	0.	250.	0.	0.	49.	0.	3.	2.	777.50
0.11	0.00	6.12	0.00	0.100	0.030	0.100	0.039	773.10	695.77
0.006367	1.	1.	1.	6	0	0	0.00	33.29	729.06

FLOW DISTRIBUTION FOR SECNO= 1632.00 CWSEL= 776.95

STA= 696. 731.
PER Q= 100.0
AREA= 40.8
VEL= 5.1

*SECNO 1659.000

3370 NOTICAL BRIDGE,NB)= 6 MIN ELTRD= 789.90 MAX ELLC= 784.30

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 790.00 ELREA= 789.90

1 FT. INSIDE U/S END OF R.R. BRIDGE

1659.00	1.59	777.09	0.00	0.00	777.67	0.58	0.23	0.09	777.80
250.	0.	250.	0.	0.	41.	0.	3.	2.	777.90
0.11	0.00	6.13	0.00	0.100	0.030	0.100	0.038	775.50	697.01
0.011046	27.	27.	27.	2	0	0	0.00	31.45	720.46

FLOW DISTRIBUTION FOR SECNO= 1659.00 CWSEL= 777.09

STA= 697. 731.
PER Q= 100.0
AREA= 40.8
VEL= 6.1

*SECNO 1660.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
0	OLOB	OCH	ORCB	ALOB	ACH	AROB	VOL	TJA	LEFT/RIGHT
TIME	VLOB	VCH	VRCB	XML	XMCH	XMR	.TW	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	XTRIAL	IN2	ICONT	CORAR	TOPWID	ENDST

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 790.00 ELREA= 789.90

U/S FACE OF R.R. BRIDGE

1660.00	1.60	777.11	0.00	0.00	777.69	0.58	0.01	0.00	777.80
250.	0.	250.	0.	0.	41.	0.	3.	2.	777.90
0.11	0.00	6.12	0.00	0.100	0.030	0.100	0.038	775.50	697.01
0.019603	1.	1.	1.	0	0	0	0.00	31.46	720.46

FLOW DISTRIBUTION FOR SECNO= 1660.00 CWSEL= 777.11

STA= 697. 731.
PER Q= 100.0
AREA= 40.8
VEL= 6.1

*SECNO 1690.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	QLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IN2	ICONT	CORAR	TOPWID	ENDST
7185 MINIMUM SPECIFIC ENERGY									
3720 CRITICAL DEPTH ASSUMED									
1690.00	1.55	777.75	777.75	0.00	778.38	0.63	0.62	0.02	778.50
250.	0.	250.	0.	0.	39.	0.	3.	2.	778.60
0.11	0.00	6.37	0.00	0.100	0.040	0.100	0.036	776.20	697.26
0.022000	30.	30.	30.	2	3	2	0.00	31.00	728.56

FLOW DISTRIBUTION FOR SECNO= 1690.00 CWSEL= 777.75

STA= 697. 731.
PER Q= 100.0
AREA= 39.2
VEL= 6.4

CCHV= 0.100 CEHV= 0.300

*SECNO 1720.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	QLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IN2	ICONT	CORAR	TOPWID	ENDST
7185 MINIMUM SPECIFIC ENERGY									
3720 CRITICAL DEPTH ASSUMED									
1720.00	1.54	778.44	778.44	0.00	779.08	0.64	0.67	0.00	779.20
250.	0.	250.	0.	0.	39.	0.	3.	2.	779.30
0.11	0.00	6.41	0.00	0.100	0.040	0.100	0.036	776.70	697.33
0.022377	30.	30.	30.	0	5	0	0.00	31.03	728.32

FLOW DISTRIBUTION FOR SECNO= 1720.00 CWSEL= 778.44

STA= 697. 731.
PER Q= 100.0
AREA= 39.0
VEL= 6.4

*SECNO 1750.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	QLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IN2	ICONT	CORAR	TOPWID	ENDST
7185 MINIMUM SPECIFIC ENERGY									
3720 CRITICAL DEPTH ASSUMED									
VALLEY SECTION D/S OF DAM									
1750.00	1.54	779.14	779.14	0.00	779.78	0.63	0.67	0.00	779.90
250.	0.	250.	0.	0.	39.	0.	3.	2.	780.00
0.11	0.00	6.39	0.00	0.100	0.040	0.100	0.036	777.60	697.26
0.022200	30.	30.	30.	0	5	0	0.00	31.03	728.33

FLOW DISTRIBUTION FOR SECNO= 1750.00 CWSEL= 779.14

```
STA=      697.      731.
  PER Q=     100.0
   AREA=      39.1
    VEL=       6.4

SPECIAL BRIDGE

SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     0.00      1.50      2.63      0.00      0.10      0.00      0.10      0.10    787.60    777.80

CCHV=   0.300 CEHV=   0.500
*SECNO 1794.000

3301 HV CHANGED MORE THAN HVINS

PRESSURE AND WEIR FLOW

 EGPRS      EGLWC      H3       QWEIR      QPR       BAREA   TRAPEZOID      ELLC      ELTRD
                                                                AREA
146353.60   790.39     0.00     240.        2.        1.        0.       789.20    789.20

          U/S OF DAM

  1794.00     3.91   791.91     0.00      0.00   791.94      0.02     12.16      0.00   785.00
     250.      66.     124.      60.      124.      74.      112.       3.        2.   786.00
     0.12     0.33     1.68     0.33     0.100    0.040    0.100     0.038    786.00     0.00
 0.000330      44.      44.      44.         2         0        10      0.00    100.00    100.00

FLOW DISTRIBUTION FOR SECNO=   1794.00          CWSEL=    791.91

STA=       0.       43.       61.      100.
  PER Q=     26.5      49.6      24.0
   AREA=    123.8      73.9     112.4
    VEL=      0.5       1.7       0.5

*SECNO 1894.000
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        BLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       UTN       ELMIN      SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IH2       ICONT     CORAR     TOPWID     ENDST

        100FT U/S OF DAM

  1894.00     4.34   791.94     0.00      0.00   791.95      0.01      0.01      0.00   791.80
     250.       0.     250.       0.        1.     352.        1.        4.        2.   791.60
     0.16     0.02     0.71     0.04     0.100    0.035    0.080     0.038    787.60   863.71
 0.000047     100.     100.     100.         2         0         0      0.00    111.10   974.69

FLOW DISTRIBUTION FOR SECNO=   1894.00          CWSEL=    791.94

STA=     864.      884.      969.      975.
  PER Q=      0.0     100.0       0.0
   AREA=      1.5     352.2       1.0
    VEL=      0.0       0.7       0.0
```

CCHV= 0.100 CEHV= 0.300
*SECNO 2300.000

2300.00	2.66	791.96	0.00	0.00	792.01	0.05	0.05	0.01	792.00
250.	0.	250.	0.	0.	143.	0.	6.	5.	792.00
0.23	0.00	1.75	0.00	0.100	0.035	0.000	0.000	789.30	893.22
0.000627	390.	406.	390.	2	[illegible]	0	0.00	67.67	960.89

FLOW DISTRIBUTION FOR SECNO= 2300.00 CHSEL= 791.96

STA=	893.	961.
PER Q=	100.0	
AREA=	143.5	
VEL=	1.7	

*SECNO 2784.000

VALLEY SECT. BASED ON ABRAMS '72e RD* D/S OF DRAW RD. CULVERT

2784.00	1.48	792.48	0.00	0.00	792.90	0.42	0.78	0.11	791.20
250.	2.	236.	11.	2.	44.	8.	7.	4.	791.20
0.25	1.07	5.35	1.40	0.100	0.035	0.068	0.037	791.00	1535.64
0.010066	430.	494.	670.	5	0	0	0.00	48.53	1583.99

FLOW DISTRIBUTION FOR SECNO= 2784.00 CHSEL= 792.48

STA=	1536.	1539.	1571.	1584.
PER Q=	0.9	94.5	4.6	
AREA=	2.2	64.1	8.2	
VEL=	1.1	1.5	1.6	

*SECNO 2824.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	KV	ML	QLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	.TM	ELFIX	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IHF	ICONT	COPAR	TOPWID	ENDST

3685 20 TRIALS ATTEMPTED WSEL>CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

2824.00	2.17	793.77	794.77	0.00	794.54	0.02	0.49	1.12	793.00
250.	1.	248.	1.	1.	34.	1.	7.	4.	793.00
0.25	0.93	7.31	1.17	0.100	0.035	0.000	0.037	791.60	1544.44
0.014960	40.	40.	40.	20	14	0	0.00	25.13	1569.56

FLOW DISTRIBUTION FOR SECNO= 2824.00 CHSEL= 793.77

STA=	1544.	1547.	1567.	1570.
PER Q=	0.4	99.2	0.5	
AREA=	1.0	33.9	1.0	
VEL=	0.9	7.3	1.3	

CCHV= 0.300 CEHV= 0.500
*SECNO 2864.000

3301 HV CHANGED MORE THAN HVTOL

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	KV	ML	QLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	.TM	ELFIX	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IHF	ICONT	COPAR	TOPWID	ENDST

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3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=       797.00 ELREA=       797.00


        D/S FACE OF DRAN RD. CULVERT

  2864.00     3.40   795.30   795.30     0.00   796.00     1.57     0.70     0.38   793.90
     250.       0.     250.       0.       0.      25.       0.       7.       4.   793.90
     0.25     0.00    10.07     0.00    0.100    0.035    0.080    0.037   791.90   758.00
 0.020994      40.      40.      40.       20       14        0     0.00     8.00   766.00

FLOW DISTRIBUTION FOR SECNO=   2864.00          CWSEL=    795.30

STA=      758.      766.
  PER Q=     100.0
   AREA=      24.8
    VEL=      10.1

*SECNO 2865.000
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS   BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA   LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN      SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IHZ       ICOUNT    CCTAR     TOPWID     ELDST


3370 NORMAL BRIDGE,NRD= 11 MIN ELTRD=  801.00 MAX ELLC=  797.80

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=       797.00 ELREA=       797.00

  2865.00     3.41   795.31   795.28     0.00   796.91     1.60     0.02     0.01   793.90
     250.       0.     250.       0.       0.      25.       0.       7.       4.   793.90
     0.25     0.00    10.15     0.00    0.100    0.030    0.080    0.037   791.90   758.00
 0.016796       1.       1.       1.        2       10        0    -5.64     8.00   766.00

FLOW DISTRIBUTION FOR SECNO=   2865.00          CWSEL=    795.31

STA=      758.      766.
  PER Q=     100.0
   AREA=      24.6
    VEL=      10.2

*SECNO 2901.000

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE,NRD= 11 MIN ELTRD=  801.00 MAX ELLC=  797.80

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=       799.00 ELREA=       799.00

  2901.00     4.76   796.66     0.00     0.00   797.32     0.86     0.39     0.22   793.90
     250.       0.     250.       0.       0.      34.       0.       7.       4.   793.90
     0.26     0.00     7.44     0.00    0.100    0.030    0.080    0.037   791.90   758.00
 [illegible]
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FLOW DISTRIBUTION FOR SECNO= 2901.00 CHSEL= 796.66

STA= 758. 766.
PER Q= 100.0
AREA= 37.6
VEL= 7.6

CCHV= 0.300 CEHV= 0.500
*SECNO 2902.000

3493 OVERBANK AREA ASSUMED NON-EFFECTIVE.ELLEA= 801.00 ELREA= 801.00

U/S FACE OF DRAN RD. CULVERT

2902.00	3.00	796.90	0.00	0.00	797.50	0.69	0.01	0.05	793.90
250.	0.	350.	0.	0.	30.	0.	7.	4.	793.90
0.26	0.00	6.64	0.00	0.100	0.035	0.000	0.037	791.90	758.00
0.006219	1.	1.	1.	2	0	0	0.00	8.00	766.00

FLOW DISTRIBUTION FOR SECNO= 2902.00 CHSEL= 794.91

STA= 758. 766.
PER Q= 100.0
AREA= 37.6
VEL= 7.6

*SECNO 2922.000

3301 HV CHANGED MORE THAN HVINS

3670 ENCROACHMENT STATIONS= 707.0 823.0 TYPE= 1 THALWEG= 792.000

VALLEY SECT. D/S OF DAM

2922.00	4.35	797.75	0.00	0.00	797.79	0.04	0.02	0.19	797.80
250.	0.	250.	0.	0.	154.	0.	7.	7.	797.82
0.26	0.00	1.62	0.00	0.100	0.035	0.000	0.037	793.20	743.06
0.000275	20.	20.	20.	2	0	0	0.00	4.63	784.90

FLOW DISTRIBUTION FOR SECNO= 2922.00 CHSEL= 797.75

STA= 743. 765.
PER Q= 100.0
AREA= 154.4
VEL= 1.6

SPECIAL BRIDGE

SB	XX	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.50	2.63	0.00	0.10	0.00	0.10	0.10	805.90	792.20

*SECNO 2957.000
PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	CPR	BAREA	TRAPEZOID	ELLC	ELTRD

FORM 1411-CU PRINTED IN U.S.A. ROTARY MANIFOLD FORMS.

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146372.20    810.49     0.00     249.       2.       0.       0.     803.90    805.90

        JUST U/S OF DAM

  2957.00     5.77   809.77     0.00     0.00   809.81     0.05    12.02     0.00   808.00
     250.      46.     160.      43.     100.      73.      75.       8.       4.   808.00
     0.26     0.47     2.20     0.58    0.100    0.035    0.080    0.037   804.00     0.00
 0.000479      35.      35.      35.        2        0       11     0.00   112.00   112.00

FLOW DISTRIBUTION FOR SECNO=   2957.00          CWSEL=    809.77

STA=        0.       57.       70.      112.
  PER Q=      18.6      64.1      17.3
   AREA=      99.7      72.9      75.0
    VEL=       0.5       2.2       0.6

*SECNO 3280.000
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        CLOSS   BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       THA     LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTR       ELMIN   [illegible]
   SLOPE     XLOB      XLOB      XLOBR     ITRIAL    IHP       ICONT     CORAR     TOPWID  [illegible]

        VALLEY SECTION U/S OF DAM

  3280.00     5.67   809.87     0.00     0.00   809.88     0.01     0.06     0.01   809.70
     250.      86.     162.       2.     442.     160.      31.      11.       6.   809.60
     0.39     0.19     1.01     0.08    0.100    0.035    0.080    0.037   804.20   557.58
 0.000092      323.     323.     323.        1        0        0     0.00   496.02  1053.60

FLOW DISTRIBUTION FOR SECNO=   3280.00          CWSEL=    809.87

STA=      558.      804.      850.      906.      939.     1048.     1054.
  PER Q=      10.5      14.0       9.9      64.7       0.9       0.0
   AREA=     207.0     125.6     109.9     159.7      30.7       0.8
    VEL=       0.1       0.3       0.2       1.0       0.1       0.0

CCHV=   0.100 CELV=   0.300
*SECNO 4280.000

        VALLEY SECT. BASED ON ABRAMS #29

  4280.00     2.85   810.05     0.00     0.00   810.07     0.02     0.10     0.00   809.10
     250.       1.     248.       1.       4.     219.       6.      24.      16.   808.50
     0.71     0.14     1.13     0.24    0.100    0.035    0.080    0.036   807.20   897.69
 0.000245     1300.    1300.    1500.        2        0        0     0.00   113.47  1011.15

FLOW DISTRIBUTION FOR SECNO=   4280.00          CWSEL=    810.05

STA=      898.      906.     1004.     1011.
  PER Q=       0.2      99.2       0.5
   AREA=       3.9     218.9       5.5
    VEL=       0.1       1.1       0.2

*SECNO 4598.000
  4598.00     1.67   810.17     0.00     0.00   810.31     0.14     0.21     0.04   809.50
     250.       1.     249.       0.       1.      83.       0.      25.      16.   810.50
     0.76     [illegible]     [illegible]     [illegible]     [illegible]     [illegible]     [illegible]     [illegible]     [illegible]     [illegible]
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 0.004676     300.     318.     300.        2        0        0     0.00    82.37   994.33

FLOW DISTRIBUTION FOR SECNO=   4598.00          CWSEL=    810.17

STA=      912.      915.     1000.
  PER Q=       0.2      99.8
   AREA=       1.0      83.2
    VEL=       0.5       3.0

*SECNO 4916.000
  4916.00     1.30   811.50     0.00     0.00   811.65     0.16     1.34     0.01   813.50
     250.       2.     245.       2.       3.      76.       3.      25.      17.   810.60
     0.77     0.58     3.25     0.67    0.100    0.035    0.080    0.036   809.70   923.33
 0.003839     300.     318.     300.        3        0        0     0.00    68.01   991.34

FLOW DISTRIBUTION FOR SECNO=   4916.00          CWSEL=    81 .50

STA=      923.      930.      985.      991.
  PER Q=       0.8      98.5       0.8
   AREA=       3.3      75.7       2.9
    VEL=       0.6       3.3       0.7

*SECNO 5234.000
  5234.00     1.58   813.08     0.00     0.00   813.39     0.31     1.63     0.04   812.00
     250.       3.     242.       4.       4.      53.       4.      26.      17.   812.00
     0.79     0.86     4.53     1.00    0.100    0.035    0.080    0.036   811.50   927.83
 0.007742     300.     318.     300.        2        0        0     0.00    54.77   [illegible]

FLOW DISTRIBUTION FOR SECNO=   5234.00          CWSEL=    813.08

STA=      928.      935.      975.      983.
  PER Q=       1.3      96.9       1.3
   AREA=       3.9      53.4       [illegible]
    VEL=       0.9       4.5       1.[illegible]

*SECNO 5552.000
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HI        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VCL       TWA      LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       UT.       ELTIN      SSTA
   SLOPE     XLCH      XLCH      XLOCR     ZTR.AL    ZH2       XCONT     ADRAR     TOPWID     ENDST

  5552.00     2.04   815.04     0.00     0.00   815.32     0.28     1.93     0.00   813.50
     250.       7.     235.       7.       3.      54.       7.      26.      18.   813.50
     0.81     0.87     4.39     1.00    0.100    0.035    0.080    0.036   813.00   929.01
 0.004918     300.     318.     300.        3        0        0     0.00    49.78   970.79

FLOW DISTRIBUTION FOR SECNO=   5552.00          CWSEL=    815.04

STA=      929.      940.      970.      979.
  PER Q=       2.9      94.1       2.9
   AREA=       8.5      53.7       6.8
    VEL=       0.9       4.4       1.1

*SECNO 5872.000

        VALLEY SECT. BASED ON ABRAMS [illegible]

  5872.00     2.72   816.52     0.00     0.00   816.90     0.38     1.55     0.03   815.00
     250        9      223.      19       10       43       16       27       18.   814.70
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0.83	0.65	5.22	1.18	0.100	0.035	0.080	0.036	813.00	803.64
0.004814	300.	320.	300.	2	0	0	0.00	73.73	877.37

FLOW DISTRIBUTION FOR SECNO= 6672.00 CWSEL= 816.52

STA=	804.	817.	835.	852.	877.
PER Q=	3.5	89.0	7.5	0.0	
AREA=	10.1	42.8	15.5	0.4	
VEL=	0.9	5.2	1.2	0.1	

*SECNO 6292.000

6292.00	2.65	816.49	0.00	0.00	816.31	0.33	1.51	0.01	817.30
250.	8.	241.	1.	9.	52.	2.	20.	19.	818.00
0.85	0.81	4.66	0.49	0.100	0.035	0.080	0.036	816.00	1057.31
0.006439	370.	420.	300.	2	0	0	0.00	63.60	1100.91

FLOW DISTRIBUTION FOR SECNO= 6292.00 CWSEL= 816.49

STA=	1057.	1070.	1094.	1101.
PER Q=	3.1	96.6	0.3	
AREA=	9.5	51.1	1.7	
VEL=	0.8	4.7	0.5	

*SECNO 6712.000

6712.00	2.48	820.48	0.00	0.00	820.83	0.35	2.00	0.01	819.50
250.	3.	246.	1.	5.	52.	1.	26.	19.	820.00
0.83	0.36	4.77	0.51	0.100	0.035	0.080	0.036	816.00	1050.52
0.003177	370.	420.	300.	3	0	0	0.00	60.43	1100.95

FLOW DISTRIBUTION FOR SECNO= 6712.00 CWSEL= 820.48

STA=	1061.	1070.	1096.	101.
PER Q=	1.2	98.5	0.3	
AREA=	8.6	51.1	1.2	
VEL=	0.7	4.8	0.5	

*SECNO 7132.000

VALLEY SECT. BASED ON ABRAMS #31

7132.00	2.96	822.36	0.00	0.00	823.29	0.44	2.44	0.03	822.50
250.	0.	250.	0.	0.	47.	0.	29.	19.	824.50
0.90	0.37	5.31	0.00	0.100	0.035	0.080	0.036	819.90	1067.41
0.006587	360.	420.	300.	3	0	0	0.00	25.37	1092.78

FLOW DISTRIBUTION FOR SECNO= 7132.00 CWSEL= 822.86

STA=	1067.	1069.	1097.
PER Q=	0.0	100.0	
AREA=	0.3	47.1	
VEL=	0.4	3.3	

*SECNO 7332.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	OLOB	OCH	OROB	FLOL	ACH	AROH	VOL	THA	LEFT/RIGHT
TIME	VLOL	VCH	VROB	XNL	X.CF	XLR	MTX	ELMIN	SSTA
SLOPE	XLOBL	X.CI	X.OBR	ITRIAL	A12	ICONT	SCR.R	TOPWID	ESTA

7332.00	3.83	823.70	0.30	0.00	823.97	0.19	2.66	1.02	822.50

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      250.        2.      248.        0.        4.       70.        0.       29.       19.     824.50
      0.91      0.48      3.54      0.00     0.100     0.035     0.080     0.036    819.90   1063.25
  0.001962      200.      200.      200.         2         0         0      0.00     31.90   1095.15

FLOW DISTRIBUTION FOR SECNO=    7332.00          CWSEL=     823.78

STA=     1063.     1069.     1097.
  PER Q=       0.7      99.3
   AREA=       3.7      70.2
    VEL=       0.5       3.5

*SECNO 7532.000
  7532.00      4.25    824.15      0.00      0.00    824.30      0.15      0.32      0.00    822.50
      250.        3.      247.        0.        6.       80.        0.       29.       20.     824.50
      0.93      0.47      3.08      0.00     0.100     0.035     0.080     0.036    819.90   1061.56
  0.001312      225.      200.      180.         2         0         0      0.00     34.55   1096.11

FLOW DISTRIBUTION FOR SECNO=    7532.00          CWSEL=     824.15

STA=     1062.     1069.     1097.
  PER Q=       1.1      98.9
   AREA=       6.1      80.1
    VEL=       0.5       3.1

*SECNO 7800.000

3470 ENCROACHMENT STATIONS=      570.0      870.0  TYPE=      1  WARRET=      300.000

        VALLEY SECT. BASED ON ABRAMS #32

  7800.00      4.59    824.39      0.00      0.00    824.41      0.02      0.10      0.01    822.40
      250.       37.      210.        3.       184.      169.       21.       31.       21.     823.20
      1.02      0.20      1.25      0.14     0.100     0.035     0.080     0.036    819.00    370.00
  0.000165      260.      260.      260.         2         0         0      0.00    300.00    370.00

FLOW DISTRIBUTION FOR SECNO=    7800.00          CWSEL=     824.39

STA=      570.      650.      768.      816.      828.      870.
  PER Q=       1.8      12.8      84.2       0.7       0.5
   AREA=      38.6     149.7     168.6       8.8      11.9
    VEL=       0.1       0.2       1.2       0.2       0.1

*SECNO 7990.000

        D/S FACE OF MAIN ST.

  7990.00      4.73    824.43      0.00      0.00    824.45      0.01      0.04      0.00    820.40
      250.       79.       49.      122.      171.       29.      249.       32.       22.     820.50
      1.08      0.46      1.68      0.49     0.100     0.035     0.080     0.036    819.70    818.21
  0.000267      190.      190.      190.         2         0         0      0.00    208.32   1027.02

FLOW DISTRIBUTION FOR SECNO=    7990.00          CWSEL=     824.43

STA=      818.      820.      860.      889.      895.      944.     1026.     1027.
  PER Q=       0.1      11.7      19.7      19.8      30.6      18.2       0.0
   AREA=       1.3      77.4      92.8      29.4     130.7     117.6       0.7
    VEL=       0.2       0.4       0.3       1.7       0.6       0.4       0.2

SPECIAL BRIDGE
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SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	4.20	3.00	0.00	3.90	0.00	7.00	0.00	820.10	819.70

*SECNO 8034.000
PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
907.62	824.85	0.00	213.	32.	7.	7.	821.90	824.60

U/S FACE OF MAIN ST. CULVERTS

8034.00	6.14	825.84	0.00	0.00	825.84	0.00	1.39	0.00	820.40
250.	76.	36.	138.	272.	37.	435.	33.	22.	820.50
1.11	0.28	0.96	0.32	0.100	0.035	0.080	0.036	819.70	816.45
0.000058	44.	44.	44.	0	0	8	0.00	211.58	1028.03

FLOW DISTRIBUTION FOR SECNO= 8034.00 CWSEL= 825.84

STA=	816.	820.	860.	889.	895.	944.	1026.	1028.
PER Q=	0.2	13.5	16.7	14.3	28.7	26.4	0.1	
AREA=	5.0	133.6	133.2	37.3	199.2	232.8	2.9	
VEL=	0.1	0.3	0.3	1.0	0.4	0.3	0.1	

*SECNO 8084.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	L	BLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IHZ	ICONT	CORAR	TOPWID	ENDST

VALLEY SECT. APPROX. 50 FT. U/S OF MAIN ST.

8084.00	6.14	825.84	0.00	0.00	825.84	0.00	0.00	0.00	820.40
250.	76.	36.	38.	272.	37.	436.	34.	22.	820.50
1.14	0.28	0.96	0.32	0.100	0.035	0.080	0.036	819.70	816.45
0.000057	50.	50.	50.	0	0	0	0.00	211.59	1028.03

FLOW DISTRIBUTION FOR SECNO= 8084.00 CWSEL= 825.84

STA=	816.	820.	860.	889.	895.	944.	1026	1028.
PER Q=	0.2	13.5	16.7	14.3	28.7	26.4	0.1	
AREA=	5.1	133.8	133.3	37.4	199.4	233.2	2.9	
VEL=	0.1	0.3	0.3	1.0	0.4	0.3	0.1	

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*****************************************************
  HEC2 RELEASE DATED NOV 75 UPDATED FEB 1977
  ERROR CORR -  01
  MODIFICATION -  30,31,32
*****************************************************

T1ENCROACHMENT RUN
T2STARTING WATER SURFACE KALAMZOO RIVER MEAN WATER SURFACE ELEVATION
T3       COMSTOCK CREEK

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

       0.        5.        0.        0.  0.000000      0.00       0.0        0.   764.000     0.000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBP       CHNIM     ITHACE

     15.000     0.000    -1.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
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1) COUNTY: KALAMAZOO

2) STUDY NAME: COMSTOCK TWP.

3) WATERCOURSE: COMSTOCK CREEK

4) DOCUMENT TYPE: CROSS-SECTIONS PLOTS



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**************************************************
  DECZ RELEASE DATED NOV 76 UPDATED FEB 1977
  ERROR CODE -  01
  MODIFICATION -  50.31.52
**************************************************

C
T1100 YEAR PROFILE
T2STARTING WATER SURFACE ELEVATION FROM MEAN WATER SURFACE ELEVATION
T3       COMSTOCK CREEK-COMSTOCK

J1  ICHECK     INQ        NWAV       IDIF       STRT       METRIC     HVINS      Q          NSEL       FS
         0.         4.         0.         1.     .000 30    0.00       1.0        0.     764.300    0.000

J2  NPROF      IPLOT      PREVS      XSECV      XSECH      FN         ALLOC      IBW        CHNIM      ITRACE
       1.000      0.000     -1.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000

J5  LPRNT      IL,SEC                    **********CROSS SECTION DATA**********
      -10.000    -10.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000
QT      5.000    140.000    210.000    250.000    250.000    400.000      0.000      0.000      0.000      0.000
NC      0.100      0.100      0.040      0.100      0.300      0.000      0.000      0.000      0.000      0.000

          100' U/S OF SOUTH ST ***.***.*** ****-**** U/S OF DAM

X1    100.000      9.000    926.000    955.000      0.000      0.000      0.000      0.000      0.000      1.000
GR    770.000    750.000    766.000    620.300    763.800    680.000    763.400    926.000    761.100    931.000
GR    760.200    941.000    750.600    931.000    764.300    955.000    766.300   1014.000      0.000      .000

          140' U/S OF SOUTH-55' D/S OF DAM

X1    140.000     10.000    926.000    955.000     40.000     40.000     40.000      0.000      0.000      0.000
GR    770.000    830.000    764.000    850.100    763.800    630.200    762.620    926.000    760.500    931.000
GR    760.200    941.000    760.600    931.000    763.400    955.300    764.320    995.000    767.300   1000.000

          D/S FACE OF DAM

X1    175.000      0.000      0.000      0.000     35.000     35.000     35.000      0.000      0.000      0.000
NC      0.000      0.000      0.030      0.030      0.000      0.000      0.300      0.000      0.000      0.000

          CENTER OF DAM

X1    180.000      0.000    926.000    955.000      5.000      5.000      5.000      0.000      0.000      0.000
GR    770.000    830.000    763.900    850.100    763.800    680.000    762.800    926.000    763.100    931.000
GR    760.600    955.000    764.300    935.300    767.300   1000.000      0.000      0.000      0.000      0.000
NC      0.000      0.000      0.040      0.000      0.000      0.000      0.000      0.000      0.000      0.000

          U/S FACE OF DAM

X1    185.000     10.000    926.000    955.000      5.000      5.000      5.000      0.000      0.000      0.000
GR    770.000    830.000    764.000    850.100    763.800    630.000    762.620    926.000    760.500    931.000
GR    760.200    941.000    760.600    931.000    763.400    955.300    764.320    995.000    767.300   1000.000
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45' U/S OF DAM

X1	225.000	0.000	0.000	0.000	40.000	40.000	40.000	0.000	0.000	0.000
X1	395.000	1.000	927.000	956.200	760.000	1[illegible]	170.000	0.000	0.000	0.000
GR	770.000	900.000	764.000	985.000	763.000	927.000	761.500	941.000	761.900	950.000
GR	763.000	956.000	764.000	985.000	772.000	1000.000	0.000	0.000	0.000	0.000
X1	565.000	[illegible]	927.000	955.000	[illegible]	[illegible]	170.000	0.000	0.000	0.000
GR	770.000	[illegible]	765.500	910.000	[illegible]	927.000	762.500	941.000	765.500	950.000
GR	765.000	956.000	769.000	970.000	772.000	1000.000	0.000	0.000	0.000	0.000

100' D/S OF KING HIGHWAY

X1	752.000	0.000	772.000	796.000	[illegible]	[illegible]	117.000	0.000	0.000	0.000
GR	760.200	905.000	766.000	910.000	766.000	927.000	764.000	935.000	765.500	941.000
GR	766.200	949.500	766.200	956.000	772.200	972.500	772.200	1000.000	0.000	0.000
NC	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000

5'0 D/S OF KING HIGHWAY

X1	802.000	0.000	920.000	954.000	50.000	[illegible]	50.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	922.000	0.000	959.500	0.000	0.000	0.000	0.000
GR	764.500	910.000	765.000	92[illegible]	764.500	9[illegible]	762.000	942.000	764.500	910.000
GR	767.000	954.000	77[illegible]	9[illegible]	774.000	1000.000	0.000	0.000	0.000	0.000

X1	927.000	9.000	1194.000	1222.000	25.000	[illegible]	25.000	0.000	0.000	0.000
GR	800.000	1189.000	767.900	1190.000	767.600	1194.900	764.700	1201.000	764.200	1208.000
GR	764.700	1215.000	767.[illegible]	1222.0[illegible]	77[illegible]	1233.[illegible]	[illegible].000	1234.000	0.000	0.000

D/S FACE KING HIGHWAY

X1	852.000	18.000	1201.700	1214.300	25.000	25.000	25.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	772.100	772.100	0.000
GR	775.500	0.000	777.600	46.000	779.000	[illegible]	778.700	746.000	776.600	642.000
GR	777.800	924.500	777.500	954.000	777.500	[illegible]	767.800	9194.000	764.700	1201.700
GR	764.700	1201.750	764.400	1208.000	764.800	1214.250	764.800	1214.300	767.700	1222.000
GR	777.500	1233.000	777.600	1320.000	777.900	1404.300	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.030	0.000	0.000	0.000	0.000	0.000	0.000	0.000

1 FT. INSIDE D/S END OF KING HWY. BRIDGE

X1	353.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	777.500	777.500	0.000
BT	9.000	984.000	777.500	0.000	1193.000	777.500	0.000	1194.000	777.500	0.000
BT	1201.700	777.500	0.000	1201.750	777.500	772.100	1214.250	777.500	772.100	1214.300
BT	777.500	0.000	1222.000	777.500	0.000	1233.000	777.500	0.000	0.000	0.000

1 FT. INSIDE U/S END OF KING HWY. BRIDGE

X1	922.000	0.000	0.000	0.000	49.000	49.000	49.000	0.000	0.100	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	777.500	777.500	0.000
NC	0.000	0.000	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000

U/S FACE KING HIGHWAY

X1	923.000	0.000	3.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	3.000	3.000	3.000	0.000	0.000	777.500	777.500	0.000
NC	0.000	0.100	3.000	3.100	3.300	0.000	0.100	0.000	0.000	0.000

VALLEY SECT. BASED ON ABRAMS 422 APPROX. 100 FT. U/S OF KING HIGHWAY

X1	1025.000	9.000	1105.000	1207.000	102.000	102.000	102.000	0.000	0.000	0.000
GR	772.000	1164.000	765.700	1175.100	765.600	1149.100	765.600	1197.000	767.400	1198.000
GR	767.800	1227.000	751.900	1237.300	773.000	1235.100	773.900	1150.000	0.000	0.000
X1	1100.000	7.000	1133.000	1229.000	75.000	75.000	75.000	0.000	0.000	0.000
GR	772.000	1160.000	750.300	1130.300	756.500	1147.500	765.500	1194.300	765.100	1204.000
GR	769.200	1224.000	772.500	1234.300	0.000	0.000	0.000	0.000	0.000	0.000

APPROX. 250' U/S OF KING HIGHWAY

X1	1175.000	7.000	946.100	1011.000	75.000	75.000	75.000	0.000	0.000	0.000
GR	773.000	957.000	772.000	984.000	767.000	967.000	767.500	972.000	765.000	972.000
GR	775.000	1010.000	774.000	1047.000	0.000	0.000	0.000	0.000	0.000	0.000

APPROX. 400' U/S OF KING HIGHWAY

X1	1325.000	7.000	955.000	984.000	125.000	125.000	125.000	0.000	0.000	0.000
GR	774.000	957.000	772.000	985.000	771.200	971.000	771.200	981.000	771.000	979.000
GR	772.000	1012.000	780.000	1010.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SECT. BASED ON ABRAMS 422 APPROX. 100 FT. U/S OF MICHIGAN AVE.

X1	1445.000	13.000	964.000	995.000	155.000	155.000	155.000	0.000	0.000	0.000
GR	784.600	950.000	784.400	897.000	773.900	953.000	774.400	964.000	771.500	974.000
GR	771.200	979.000	771.200	964.000	772.700	990.000	774.200	1013.000	783.100	1050.000
X1	1512.000	9.000	965.000	995.000	27.000	27.000	27.000	0.000	0.000	0.000
GR	775.500	945.000	774.500	965.000	772.000	975.000	773.000	990.000	773.000	995.000
GR	777.500	1020.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	1536.000	6.000	963.000	997.000	28.000	28.000	28.000	0.000	0.000	0.000
GR	782.000	941.000	775.000	963.000	773.100	974.000	774.100	959.000	775.000	997.000
GR	752.000	1023.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.300	0.500	0.000	0.000	0.000	0.000	0.000

D/S FACE OF MICHIGAN AVE. BRIDGE

X1	1365.000	11.000	993.400	757.500	37.000	40.000	40.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	787.700	787.700	0.000
GR	790.000	662.000	787.500	675.000	776.600	693.600	776.600	693.500	774.300	705.000
GR	774.300	712.000	774.300	724.600	776.700	730.400	776.700	730.500	787.700	754.900
GR	739.900	735.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

1 FT. I SIDE D/S END OF MICHIGAN AVE. BRIDGE

X1	1569.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	787.700	787.700	0.000
BT	6.000	662.000	790.000	0.000	693.400	787.700	776.600	693.500	787.700	783.900
BT	730.400	787.700	783.900	730.500	787.700	776.700	786.000	789.900	0.000	0.000

1 FT. INSIDE U/S END OF JACKSON AVE. BRIDGE.

X1	1621.000	0.000	0.000	0.000	52.000	52.000	52.000	0.000	0.000	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	787.700	787.700	0.000
NC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

U/S FACE OF MICHIGAN AVE. BRIDGE

X1	1622.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	787.700	787.700	0.000

D/S FACE OF R.R. BRIDGE

X1	1631.000	0.000	0.000	0.000	30.000	30.000	30.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	790.000	789.900	0.000
NC	0.000	0.000	0.000	0.000	0.300	0.000	0.000	0.000	0.000	0.000

1 FT. INSIDE D/S END OF R.R. BRIDGE

X1	1632.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	790.000	789.900	0.000
BT	6.000	662.000	790.000	0.000	693.400	791.300	0.000	693.500	791.900	783.900
BT	730.400	791.300	783.900	730.500	791.300	0.000	786.000	789.900	0.000	0.000

1 FT. INSIDE U/S END OF R.R. BRIDGE

X1	1659.000	0.000	0.000	0.000	27.000	27.000	27.000	0.000	0.000	0.000
X2	0.000	0.000	0.000	0.000	0.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	790.000	789.900	0.000
NC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

U/S FACE OF R.R. BRIDGE

X1	1660.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	790.000	789.900	0.000

X1	1690.000	0.000	0.000	0.000	30.000	30.000	30.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.100	0.300	0.000	0.000	0.000	0.000	0.000

X1	1720.000	0.000	0.000	0.000	30.000	30.000	30.000	0.000	0.000	0.000

VALLEY SECTION D/S OF DAM

X1	1750.000	0.000	0.000	0.000	30.000	30.000	30.000	0.000	0.000	0.000
SD	0.000	1.500	2.000	0.001	0.100	0.000	0.100	0.100	787.600	777.600
NC	0.000	0.000	0.000	0.300	0.500	0.000	0.000	0.000	0.000	0.000

U/S OF D

X1	1796.000	8.000	42.500	64.400	44.000	44.000	44.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	789.200	789.200	0.000	0.000	0.000	0.000	0.000
BT	6.000	0.000	791.700	0.000	42.500	791.700	0.000	42.600	789.200	0.000
BT	61.300	789.900	0.000	61.400	791.700	0.300	100.000	791.700	0.300	0.000
GR	795.300	0.300	791.000	0.000	791.000	42.300	789.000	42.600	796.000	61.300
GR	733.700	61.400	792.000	100.000	795.000	100.100	0.000	0.000	0.000	0.000
NC	0.100	0.000	0.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000

100FT U/S OF B&H

X1	1794.000	0.000	536.100	549.200	100.700	100.000	100.000	0.000	0.000	0.000
GR	602.100	524.000	793.500	628.000	791.300	894.100	786.000	694.200	787.600	909.200
GR	789.000	969.100	791.600	969.200	801.000	1125.000	0.300	0.000	0.000	0.000
NC	0.000	0.000	0.300	0.100	0.300	0.000	0.000	0.000	0.000	0.000

X1	2300.700	0.000	542.000	561.000	100.000	100.000	406.000	0.000	0.000	0.000
GR	796.000	870.000	792.000	693.000	789.400	809.000	789.300	969.000	792.000	951.000
GR	794.000	980.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SECT. [illegible] OF BCL 1/5 OF D.B. 89, CULV PT

X1	2784.000	37.000	1539.000	1571.000	470.000	470.000	404.000	0.000	0.000	0.000
GR	885.000	74.000	872.600	90.000	459.600	130.000	878.200	172.000	854.800	258.000
GR	856.000	310.000	869.400	342.000	870.300	384.000	877.600	838.000	877.000	424.000
BT	777.000	760.000	670.000	540.000	777.700	0.000	372.300	650.300	871.200	770.000
BT	466.200	644.000	658.300	576.300	725.300	1214.000	911.300	1432.300	886.700	1506.300
BT	796.700	1519.000	799.100	1534.000	796.200	1716.000	741.300	1550.000	791.200	1571.000
GR	792.800	1507.000	797.100	1628.000	799.200	1672.000	302.600	1650.000	805.200	1732.000
GR	808.600	1790.000	809.400	1842.000	812.000	1052.000	815.300	1090.000	816.800	1932.000
GR	826.400	1946.000	827.300	1972.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	2824.000	0.000	1577.300	1597.300	40.300	40.000	40.000	0.000	0.000	0.300
GR	796.000	1557.000	793.000	1547.000	791.600	1551.500	791.600	1550.000	793.000	1567.000
GR	796.000	1577.000	0.300	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.300	0.500	0.000	0.000	0.000	0.000	0.000

D/S FACE OF DRAW RD. CULVERT

X1	2864.000	27.000	756.000	766.000	40.000	40.000	40.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	797.000	797.000	0.000
GR	820.600	0.000	836.400	76.100	111.000	284.000	805.900	832.000	803.000	642.000
GR	801.700	696.000	800.700	742.000	795.500	772.500	793.900	751.000	793.900	758.100
GR	792.300	758.500	792.100	759.300	791.900	742.000	792.900	744.700	792.300	765.500
GR	793.900	765.900	795.900	766.000	794.800	771.700	801.000	796.000	807.800	842.000
GR	804.200	866.000	810.400	952.000	810.800	1004.000	813.200	1010.000	815.200	1052.000
GR	821.100	1102.000	822.800	1142.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	2865.000	0.000	0.300	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	797.000	797.000	0.000
BT	11.000	696.000	801.700	0.000	758.000	801.000	0.000	758.100	801.000	794.800
BT	756.500	801.000	795.300	759.300	801.300	796.000	762.000	801.000	797.000	754.700
BT	801.300	796.000	765.300	801.300	795.800	765.500	801.000	794.300	796.000	871.000
BT	0.000	796.000	871.000	0.300	0.000	0.000	0.000	0.000	0.000	0.000

X2	0.200	0.100	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	799.000	799.000	0.000
NC	0.000	0.000	0.035	0.300	0.500	0.000	0.000	0.000	0.000	0.000

U/S FACE OF DRAIN TO. CULVERT

X1	2902.000	0.000	0.000	0.000	1.300	1.300	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.300	0.300	0.000	0.000	801.000	801.000	0.000

VALLEY SECT. D/S OF DAM

X1	2922.000	15.000	745.000	795.000	20.000	20.000	20.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	701.300	0.000	823.000	0.000	0.000	0.000	0.000
GR	820.000	0.000	816.400	76.000	611.000	224.000	305.900	594.000	803.800	642.000
GR	831.700	696.000	820.700	742.200	797.900	745.000	793.200	749.200	795.200	771.000
GR	797.000	705.000	801.000	796.000	801.100	782.000	804.200	540.000	810.400	952.000
SO	0.000	1.000	2.600	3.000	1.100	2.000	0.100	0.100	805.970	792.200

JUST U/S OF DAM

X1	2957.000	0.200	54.500	64.500	15.000	25.000	35.300	0.000	0.00	0.000
X2	0.100	0.100	1.000	300.000	300.000	1.000	0.100	0.000	0.000	0.000
ST	0.000	0.200	810.000	0.000	56.300	805.700	0.000	57.000	805.900	0.000
ST	69.000	806.000	0.000	69.500	809.700	0.000	112.000	809.900	0.000	0.000
GR	815.000	0.000	808.000	0.000	808.000	56.300	804.000	57.000	804.000	69.000
GR	805.000	69.500	809.000	112.000	811.700	112.000	0.100	0.000	0.000	0.000
ET	0.000	0.000	0.000	0.000	1.410	0.200	0.000	0.000	0.000	0.000

VALLEY SECTION U/S OF DAM

X1	5239.000	13.000	905.000	955.000	825.000	835.000	825.000	0.000	0.000	0.000
GR	819.000	192.000	810.000	540.000	811.200	807.200	778.100	830.000	809.700	905.300
GR	813.500	915.600	804.300	822.000	796.400	801.400	819.000	955.500	809.600	1541.200
GR	811.600	1092.000	813.400	1124.000	815.200	1136.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.100	0.300	0.000	0.000	0.000	0.000	0.000

VALLEY SECT. BASED ON NORMAL TOP

X1	4200.000	29.000	906.000	1004.000	1300.000	1500.000	1300.000	0.000	0.000	1.000
GR	865.400	82.000	865.000	108.000	862.600	152.000	856.300	190.000	861.300	236.000
GR	850.000	340.000	852.000	422.000	833.000	806.000	834.200	710.000	829.200	760.000
GR	829.300	766.000	827.400	874.000	825.200	845.000	821.000	670.000	813.700	892.000
GR	809.100	956.700	801.000	901.000	803.100	921.000	807.000	954.000	807.200	948.000
GR	808.000	1000.300	809.500	1004.000	811.100	1014.000	819.400	1002.000	823.000	1124.000
GR	829.000	1140.000	835.000	1262.000	840.000	1364.000	840.400	1422.000	0.000	0.000

X1	4598.000	5.000	915.000	1000.000	300.000	300.000	310.000	0.000	0.000	0.000
GR	815.000	890.000	809.500	915.000	803.500	965.000	810.500	1020.000	813.000	1030.000

X1	4916.000	5.000	930.000	985.000	300.000	300.000	310.000	0.000	0.000	0.000
GR	815.000	900.000	810.500	930.000	809.700	997.000	810.600	985.000	817.000	1030.000

X1	5234.000	5.000	935.000	975.000	300.000	310.000	318.000	0.000	0.000	0.000
GR	817.000	902.000	812.000	935.000	811.500	955.000	812.000	975.000	817.000	1010.000

X1	5552.000	5.000	940.000	970.000	330.000	300.000	316.000	0.000	0.000	0.000
GR	617.000	915.000	913.300	940.000	913.000	955.000	913.500	970.000	917.000	990.000

VALLEY SECT. BASED ON ARRS #30

X1	5672.000	27.000	917.000	945.000	340.000	301.000	320.000	0.000	0.000	1.000
GR	697.800	30.000	890.000	132.000	860.000	414.000	242.000	436.000	843.300	542.000
GR	840.600	702.000	828.200	727.000	822.000	752.000	819.100	777.000	816.700	802.000
GR	815.000	817.000	814.200	821.000	813.600	327.000	814.000	833.000	814.700	835.000
GR	833.100	952.300	816.500	877.000	817.500	402.000	917.000	927.000	825.300	930.200
GR	847.400	1021.500	345.400	1102.000	344.000	1141.000	847.000	1152.000	755.600	1316.000
GR	359.000	1393.300	363.300	1434.000	0.000	0.300	0.000	0.000	0.200	0.000

X1	6292.000	3.000	1070.000	1094.000	370.000	320.300	420.000	0.000	0.000	0.000
GR	721.000	1021.000	819.000	1070.000	819.000	1076.000	819.000	1090.000	818.500	1094.000
GR	320.000	1122.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	6712.000	6.000	1070.000	1096.000	370.000	300.000	420.000	0.000	0.000	0.000
GR	823.000	1036.000	819.500	1070.000	819.000	1075.000	818.000	1087.300	820.000	1096.000
GR	322.900	1122.000	0.300	0.300	0.300	0.000	0.000	0.300	0.000	0.000

VALLEY SECT. BASED ON ARRAS #31

X1	7132.000	31.000	1069.000	1097.000	360.000	300.000	420.000	0.000	0.000	0.000
GR	836.000	0.000	855.500	891.500	850.100	1 8.000	294.000	233.500	854.000	296.000
GR	852.800	30.000	859.100	270.000	862.900	416.000	236.500	492.000	819.600	810.000
GR	847.000	272.100	845.000	871.200	825.000	325.000	320.300	920.000	826.000	1056.000
GR	820.000	1048.000	824.500	1060.000	822.500	1069.000	820.300	1075.000	819.900	1080.000
GR	820.600	1087.000	324.500	1097.000	525.100	1119.000	831.200	1142.000	831.500	1174.000
GR	834.000	1179.000	839.800	1202.000	843.000	1246.000	840.900	1300.000	841.400	1326.000
GR	845.600	1397.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	7552.000	0.000	0.000	0.000	200.000	200.000	200.000	0.000	0.000	0.000

X1	7532.000	0.000	0.000	0.000	225.000	1 0.000	200.000	0.000	0.000	0.000

VALLEY SECT. BASED ON ARRAS #32

X1	7030.000	41.000	768.000	816.000	263.000	285.000	260.000	0.000	0.000	1.000
GR	647.300	0.000	841.000	90.000	835.000	1 .000	120.300	254.000	329.800	308.000
GR	829.100	330.000	826.200	856.000	827.000	451.000	822.300	476.000	823.900	546.000
GR	823.900	850.000	822.400	768.000	819.500	774.000	920.000	749.000	821.300	304.000
GR	823.200	816.000	824.100	828.000	824.100	870.000	825.000	900.000	825.000	1754.000
GR	828.500	1162.000	825.600	1160.000	835.200	1348.000	834.400	1374.000	837.100	1464.000
GR	844.000	1438.000	841.000	1502.000	843.000	1576.000	847.000	1600.000	849.000	1656.000
GR	849.000	1632.000	849.600	1710.000	849.500	1752.000	978.000	1730.000	845.500	1112.000
GR	845.600	1828.000	840.600	1852.000	835.000	1914.000	839.900	1940.000	830.900	1952.000
GR	837.000	1936.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

D/S FACE OF MAIN ST.

X1	7990.000	34.000	820.700	845.300	190.000	182.000	190.000	0.000	0.000	0.000
X3	10.000	815.700	0.000	0.000	0.000	0.000	0.000	22.000	822.500	0.000
GR	850.200	0.000	850.000	1.0.300	836.700	225.000	834.600	302.000	827.800	512.000
GR	827.000	815.300	823.300	820.300	822.000	862.000	820.600	838.700	820.400	368.750
GR	819.000	830.200	819.500	830.700	821.200	0.000	815.100	830.200	819.500	391.250

GR	820.400	891.750	820.400	891.800	820.500	892.200	820.500	892.250	820.300	892.750
GR	819.200	893.500	819.000	893.750	819.200	894.000	820.000	894.750	820.500	895.250
GR	820.500	895.300	823.000	944.000	823.000	1026.000	828.600	1038.000	830.200	1160.000
GR	831.600	1256.000	832.600	1308.000	833.200	1414.000	835.000	1558.000	0.000	0.000
SJ	0.000	4.200	3.000	0.000	0.900	0.000	7.000	0.000	820.100	819.700

U/S FACE OF MAIN ST. CULVERTS

X1	8034.000	0.000	0.000	0.000	44.000	44.000	44.000	0.000	0.000	0.000
X2	0.000	1.000	1.000	821.900	824.600	0.000	0.000	0.000	0.000	0.000
X3	10.000	820.100	0.000	0.000	0.000	0.000	0.000	824.600	824.500	0.000
BT	20.000	821.000	824.600	0.000	888.700	824.900	0.000	888.750	824.900	820.600
BT	889.250	824.900	820.900	890.000	824.900	821.700	890.250	824.900	821.900	890.500
BT	824.900	821.700	891.250	824.900	820.900	891.750	824.900	820.400	891.800	824.900
BT	0.000	892.200	824.900	0.000	892.250	824.900	820.200	892.750	824.900	820.700
BT	893.500	824.900	821.700	893.750	824.900	821.700	894.000	824.900	821.500	894.750
BT	824.900	820.700	895.250	824.900	820.200	895.300	824.900	0.000	944.000	823.200
BT	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

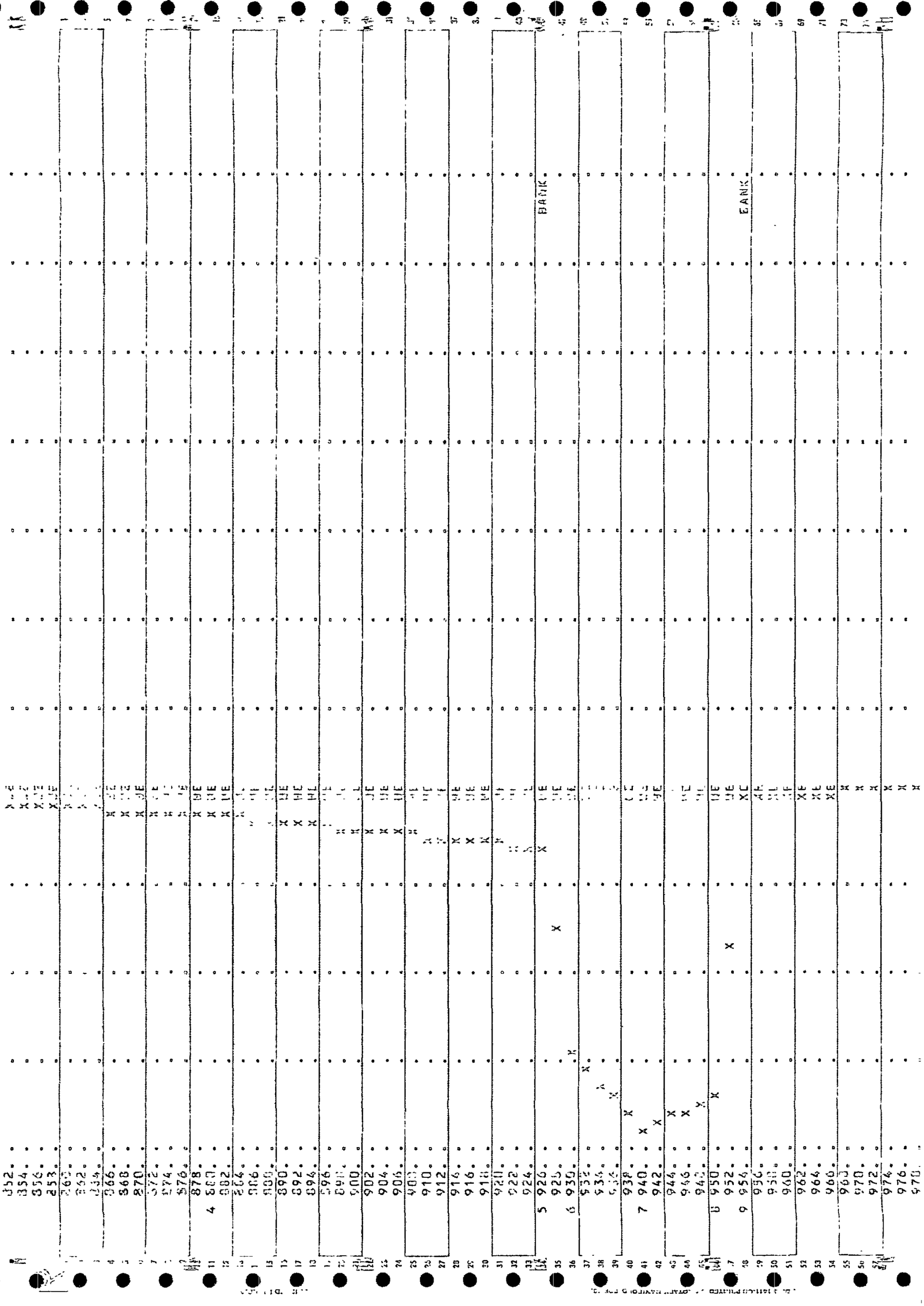
VALLEY SECT. APPROX. 50 FT. U/S OF MAIN ST.

X1	8034.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
EJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

CROSS SECTION 100.00
STREAM CONSTOCK CREEK-CONSTOCK
DISCHARGE= 250.

PLOTTED POINTS (BY PRIORITY)=1=BOTTOM, 2=EDGE OF WATER, 3=WATER SURFACE, X=C OF D, E=CRITICAL DEPTH

ELEV	760.	761.	762.	763.	764.	765.	766.	767.	768.	769.	770.
	STA-FEET										
2	750.										X
	752.									X	
	754.									X	
	756.									X	
	758.										
	760.									X	
	762.									X	
	764.								X		
	766.								X		
	768.										
	770.								X		
	772.										
	774.							X			
	776.							X			
	778.							X			
	780.										
	782.										
	784.										
	786.						X				
	788.						X				
	790.						X				
	792.										
	794.										
	796.										
	798.						X				
	800.										
	802.					X					
	804.										
	806.					X					
	808.										
	810.				X						
	812.				X						
	814.				X						
	816.				X						
	818.				X						
3	820.				XE						
	822.				XE						
	824.				XE						
	826.				XE						
	828.				XE						
	830.				XE						
	832.				XE						
	834.				XE						
	836.				XJE						
	838.				XJE						
	840.				XJE						
	842.				XJE						
	844.				XJE						
	846.				XJE						
	848.				XJ						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  1032.
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ORD=        0 ELLC=  9999999.00 ELTOP=  9999999.00

EL(I),STA(I)
   770.00    750.00    764.00    820.00    763.60    880.00    763.40    926.00    761.10    931.00
   760.20    941.00    760.60    951.00    764.00    955.00    764.30   1034.00
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CROSS SECTION 1465.00
STREAM COMSTOCK CREEK-COMSTOCK
DISCHARGE= 250.

PLOTTED POINTS (BY PRIORITY)=.=BOTTOM ELEVATION OF CHANNEL, X=GROUND, E=END OF REACH ELEV, F=ENERGY GRADIENT, C=CRITICAL DEPTH

	CLEV	770.	772.	774.	776.	778.	780.	782.	784.	786.	788.	790.
	STA-FEET											
	850.								X			
	852.								X			
	854.								X			
	856.								X			
	858.								X			
	860.								X			
	862.								X			
	864.								X			
	866.								X			
	868.								X			
	870.								X			
	872.								X			
	874.								X			
	876.								X			
	878.								X			
	880.								X			
	882.								X			
	884.								X			
	886.								X			
	888.								X			
	890.								X			
	892.								X			
	894.								X			
	896.								X			
	898.							X				
	900.						X					
	902.					X						
	904.					X						
	906.						X					
	908.						X					
	910.					X						
	912.					X						
	914.						X					
	916.						X					
	918.						X					
	920.						X					
	922.						X					
	924.						X					
	926.						X					
	928.						X					
	930.						X					
	932.						X					
	934.						X					
	936.						X					
	938.						X					
	940.						X					
	942.						X					
	944.						X					
	946.						X					
	948.						X					
	950.						X					

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      952.  .  .  .
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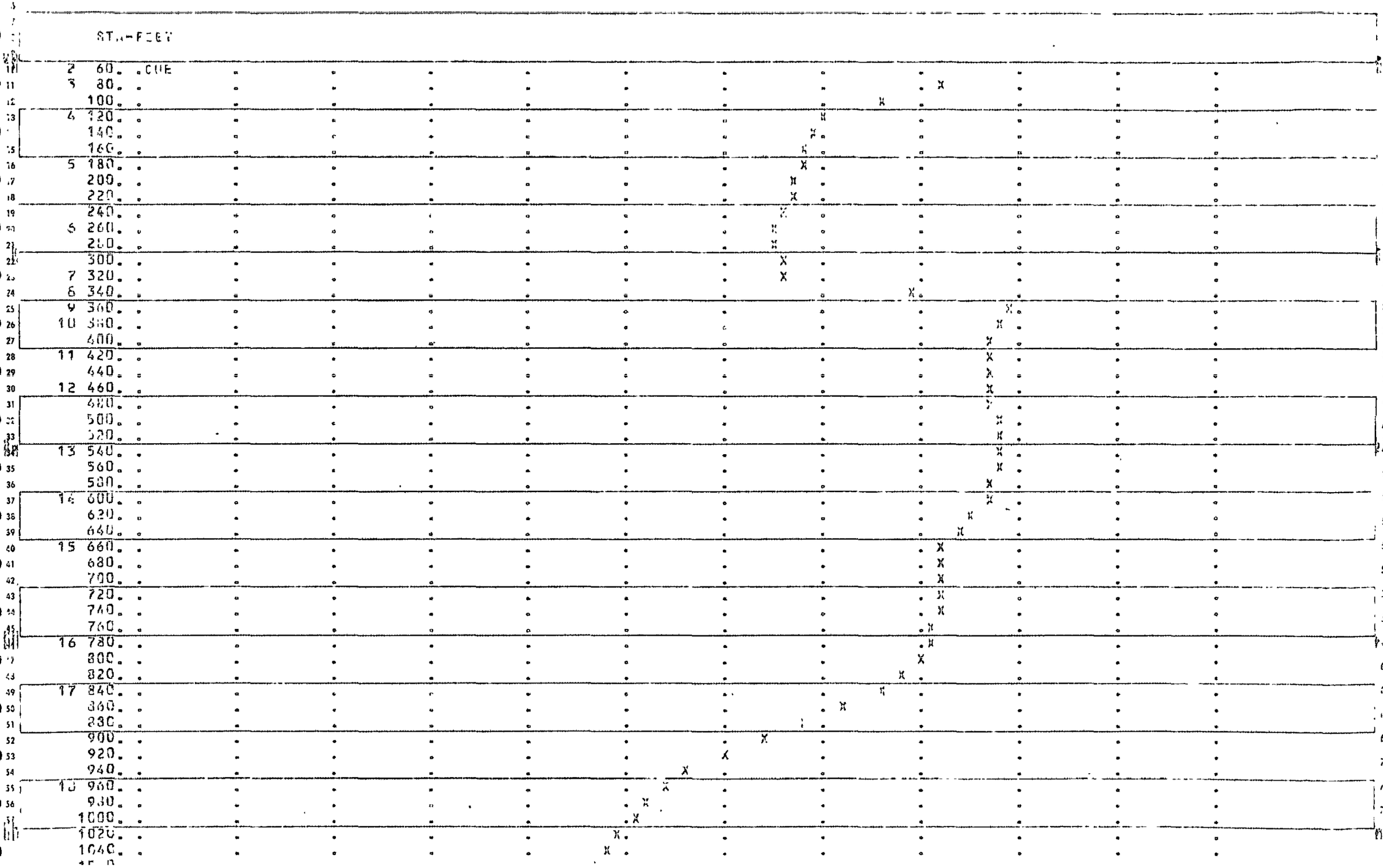
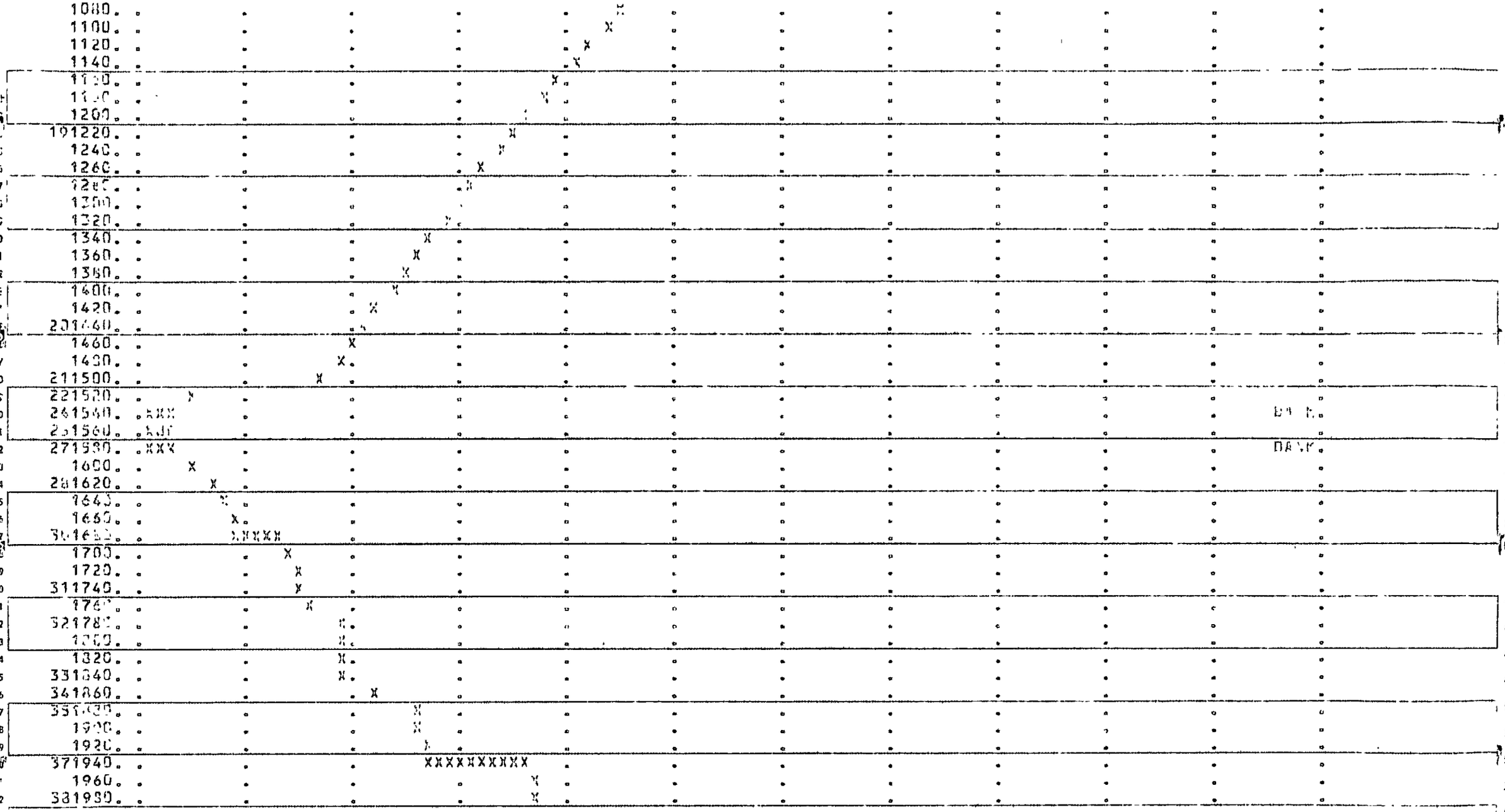
CROSS SECTION 2704.00
STREAM COMSTOCK CREEK-COMSTOCK
DISCHARGE= 250.

PLOTTED POINTS (BY PRIORITY)-M=BOTTOM BRIDGE,T=TOP BRIDGE,X=GROUND,W=WATER SUR,E=ENERGY GRADIENT,C=CRITICAL WSEL





NOD= 0 ELLC= 9999999.00 ELTHD= 9999999.00

FL(I),STA(I)

825.00	74.00	872.40	90.00	859.60	130.00	858.20	172.00	854.80	258.00
856.00	318.00	869.40	342.00	878.80	354.00	877.60	388.00	877.00	424.00
877.00	466.00	878.00	536.00	877.00	600.00	872.30	660.00	873.20	776.00
866.00	844.00	865.00	956.00	825.00	1214.00	811.10	1432.00	806.70	1506.00
794.70	1519.00	793.10	1534.00	791.20	1559.00	791.00	1555.00	791.20	1571.00
792.80	1587.00	797.10	1628.00	799.20	1672.00	802.60	1688.00	805.20	1732.00
808.60	1790.00	809.40	1842.00	812.00	1852.00	815.80	1890.00	816.80	1932.00
826.40	1946.00	827.30	1972.00						

CROSS SECTION 4220.00
STREAM COMSTOCK CREEK-COMSTOCK
DISCHARGE= 250.

PLOTTED POINTS (BY PRIORITY)=1= QTOT 2=PREDICTED TOT 3=BOT 4=WSEL 5=ENERGY 6=CRITICAL 7=FRICTION SLOPE 8=BOTTOM SLOPE 9=CRITICAL WSEL

	ELEV	800.	810.	820.	830.	840.	850.	860.	870.	880.	890.	900.
	STA-FEET											
2	80.							X				
	90.							X				
	100.							X				
3	110.							X				
	120.							X				
4	130.							X				
	140.							X				
	150.							X				
	160.							X				
	170.							X				
	180.							X				
5	190.							X				
	200.							X				
	210.							X				
	220.							X				
	230.							X				
6	240.							X				
	250.							X				
	260.							X				
	270.							X				
	280.							X				
	290.							X				
	300.							X				
	310.							X				
	320.							X				
	330.							X				
7	340.							X				
	350.							X				
	360.							X				
	370.							X				
	380.							X				
	390.							X				
	400.							X				
	410.							X				
8	420.							X				
	430.							X				
	440.							X				
	450.							X				
	460.							X				
	470.							X				
	480.							X				
	490.							X				
	500.							X				
	510.							X				
	520.							X				
	530.							X				
	540.							X				
	550.							X				
	560.							X				
	570.							X				

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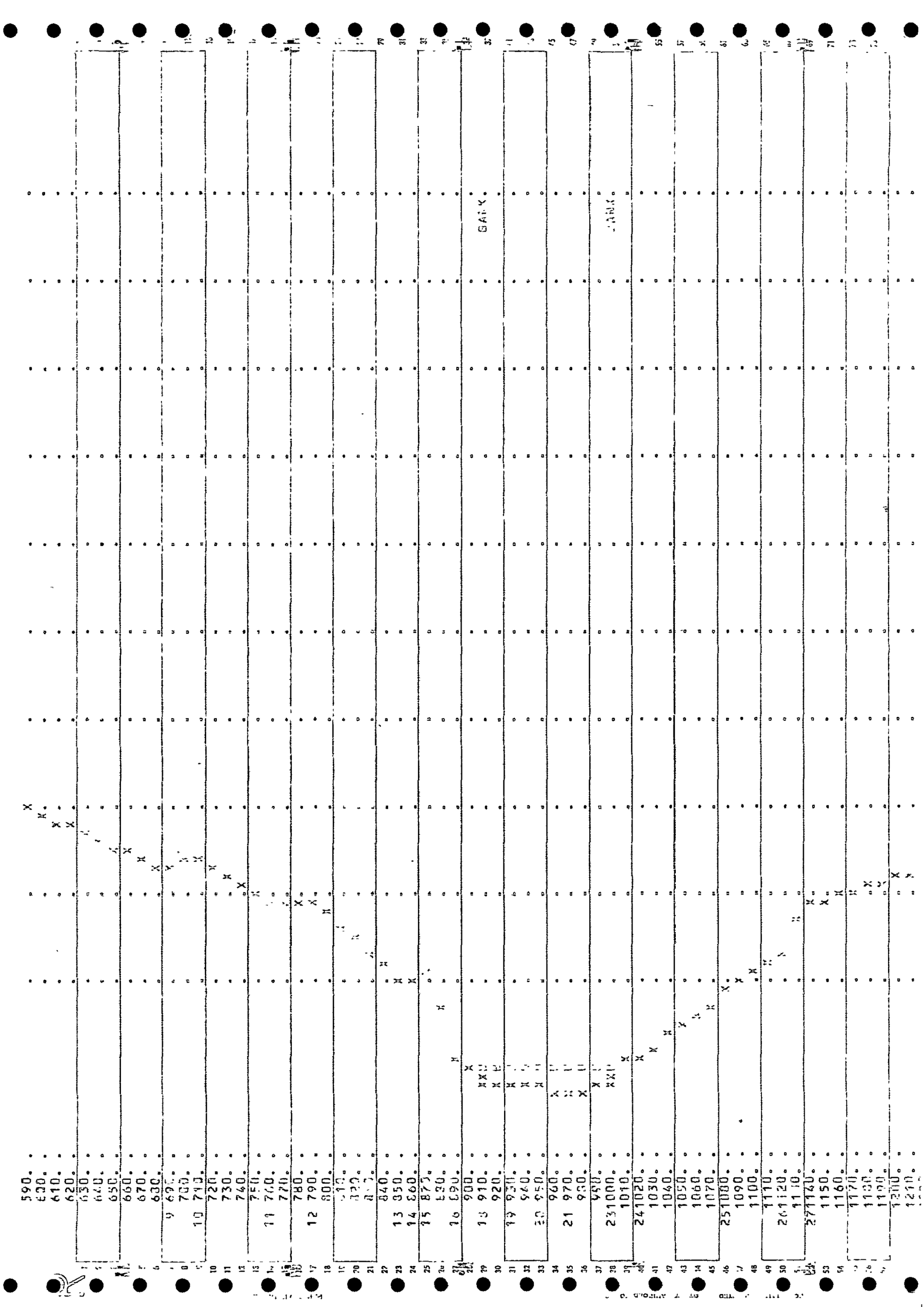
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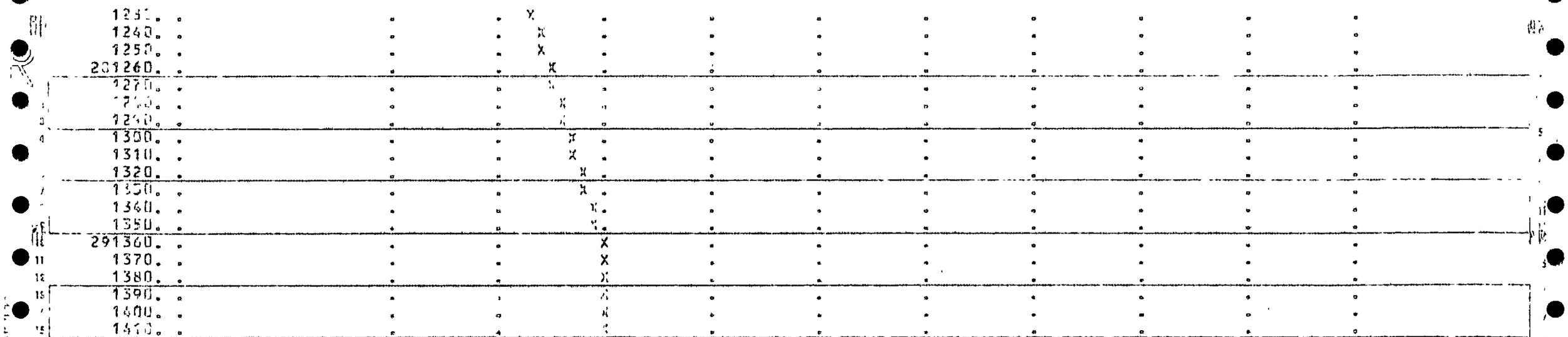

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   1250.  .                  .         .   X     .         .         .         .         .         .         .         .
 201260.  .                  .         .    X    .         .         .         .         .         .         .         .
   1270.  .                  .         .     X   .         .         .         .         .         .         .         .
   1280.  .                  .         .      X  .         .         .         .         .         .         .         .
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   1300.  .                  .         .       X .         .         .         .         .         .         .         .
   1310.  .                  .         .       X .         .         .         .         .         .         .         .
   1320.  .                  .         .        X.         .         .         .         .         .         .         .
   1330.  .                  .         .        X.         .         .         .         .         .         .         .
   1340.  .                  .         .         X.         .         .         .         .         .         .         .
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 291360.  .                  .         .          X         .         .         .         .         .         .         .
   1370.  .                  .         .          X         .         .         .         .         .         .         .
   1380.  .                  .         .          X         .         .         .         .         .         .         .
   1390.  .                  .         .          X         .         .         .         .         .         .         .
   1400.  .                  .         .          X         .         .         .         .         .         .         .
   1410.  .                  .         .          X         .         .         .         .         .         .         .
 301420.  .                  .         .          X         .         .         .         .         .         .         .

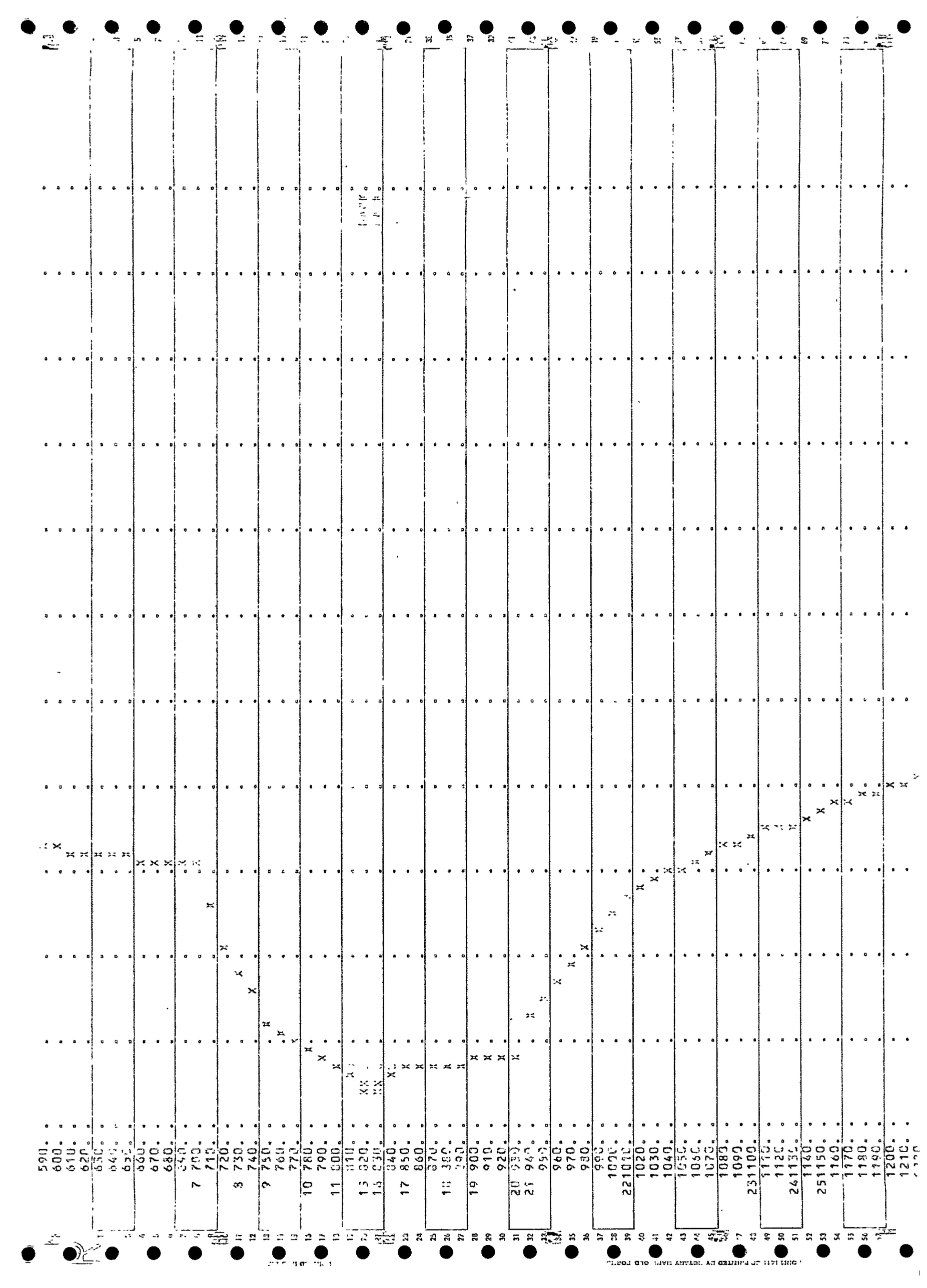
NND=        0 ELLC=  9999995.00 ELTRD=  9999999.00

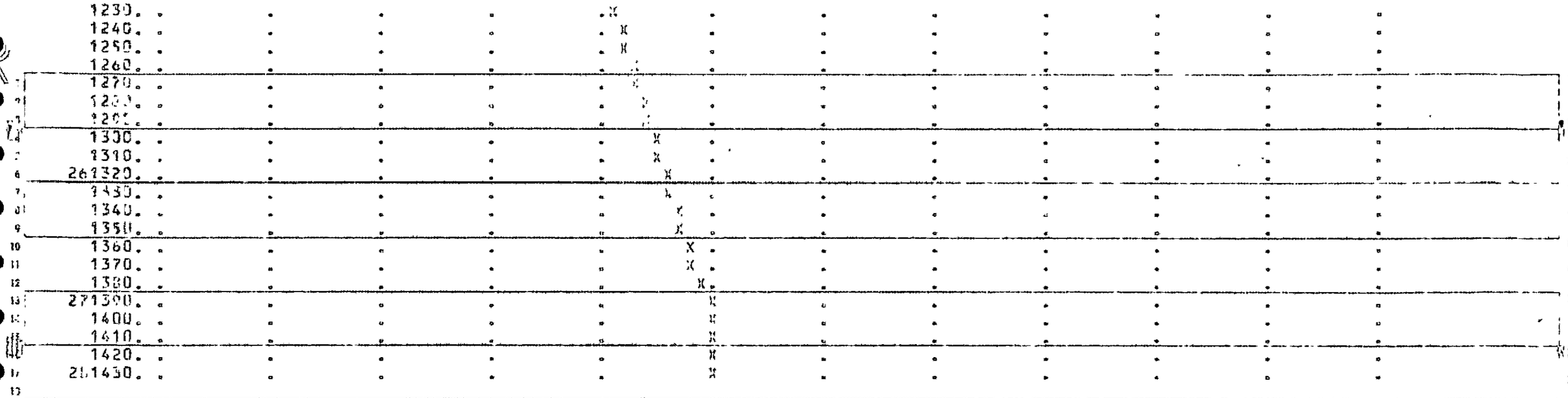
  EL(I),STA(I)
     [illegible]  [illegible]  [illegible]  [illegible]  [illegible]  [illegible]  [illegible]  [illegible]  [illegible]  [illegible]
     850.00   340.00   852.00   622.70   833.00   [illegible]  [illegible]  [illegible]  [illegible]  [illegible]
     829.00   786.00   820.40   846.00   820.20   856.00   821.00   868.00   810.70   892.00
     809.10   906.00   809.00   908.00   804.10   928.00   807.00   954.00   807.20   968.00
     [illegible]  [illegible]  [illegible]  [illegible]  [illegible]  [illegible]  [illegible]  [illegible]  [illegible]  [illegible]
     [illegible]  [illegible]  [illegible]  [illegible]  [illegible]  [illegible]  [illegible]  [illegible]
```

CROSS SECTION 5672.00
STREAM COMSTOCK CREEK-COMSTOCK
DISCHARGE= 250.

PLOTTED POINTS (BY PRIORITY)--.=LEFT EDGE,T=TOP OF BRIDGE,X=GROUND,L=WATER SURFACE,E=ENERGY GRADIENT,C=CRITICAL LEVEL

ELEV	610.	620.	630.	640.	650.	660.	670.	680.	690.	900.	910.
STA-FEET											
2 60.										X	
90.									X		
100.									X		
110.									X		
120.											
130.									X		
140.											
150.									X		
160.									X		
170.									X		
3 180.											
190.											
200.								X			
210.								X			
220.								X			
230.								X			
240.								X			
250.								X			
260.							X				
270.							X				
280.							X				
290.											
300.											
310.											
320.											
330.											
340.							X				
350.											
360.											
370.											
380.											
390.											
400.											
4 410.											
420.											
430.											
5 440.				X							
450.				X							
460.				X							
470.				X							
480.				X							
490.											
500.				X							
510.				X							
520.				X							
530.				X							
6 540.				X							
550.				X							
560.				X							
570.				X							





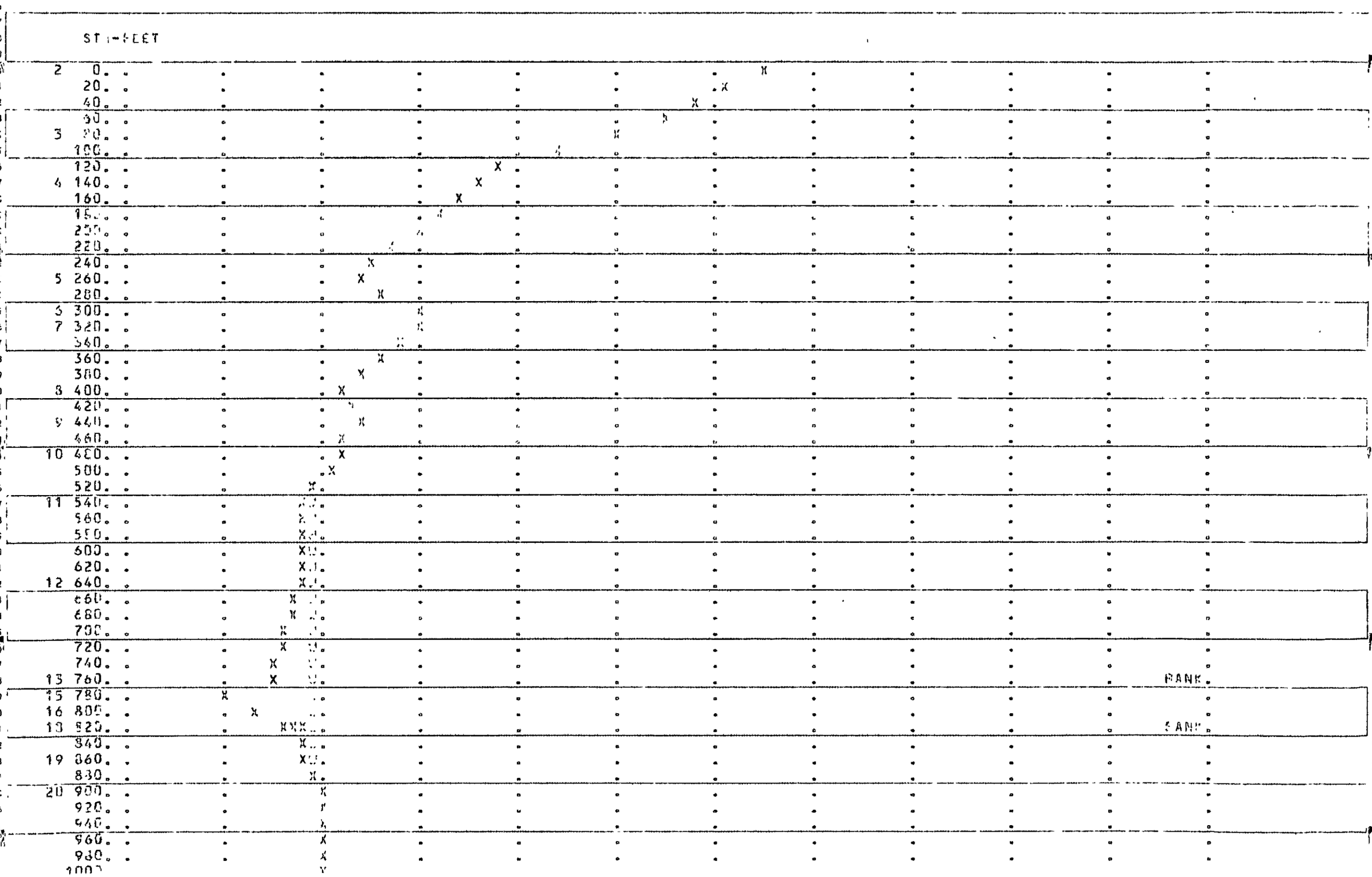
NRD= 0 LLLC= 9999999.00 ELTRD= 9999999.00

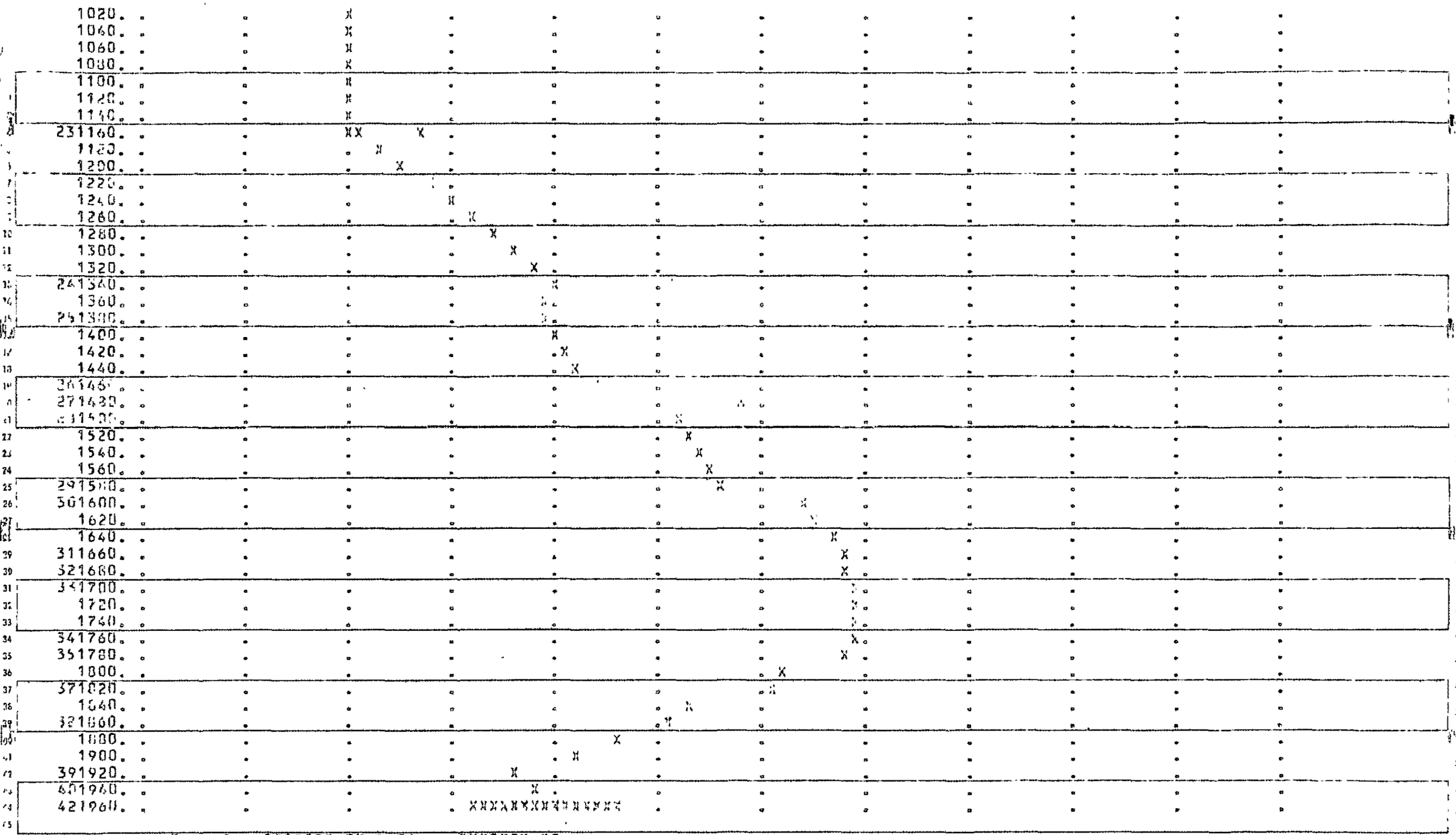
EL(I),STA(I)

897.60	80.00	890.00	182.00	863.00	414.00	842.00	436.00	843.00	842.00
840.60	702.00	828.20	727.00	822.00	732.00	819.10	777.00	816.70	802.00
815.00	817.00	814.20	821.00	813.00	827.00	814.00	833.00	814.70	835.00
815.50	852.00	818.30	877.00	817.50	902.00	817.30	927.00	823.30	936.00
837.40	1008.00	844.40	1102.00	864.00	1152.00	847.00	1152.00	855.60	1316.00
839.60	1392.00	860.30	1434.00						

CROSS SECTION 7800.00
STREAM COMSTOCK CREEK-COMSTOCK
DISCHARGE= 250.

PLOTTED POINTS (BY PRIORITY)- =LOTION BRIDGE,T=TOP BRIDGE,X=GROUND,W=WATER SUR,E=ENERGY GRADIENT,C=CRITICAL WSEL





NRD= 0 ELLC= 9999999.00 ELTRD= 9999999.00

EL(I),STA(I)

847.30	0.00	840.00	90.00	833.00	[illegible]	826.80	254.00	829.00	308.00
829.00	330.00	820.20	406.00	827.00	[illegible]	823.00	476.00	823.90	546.00
823.90	650.00	822.40	760.00	819.80	774.00	810.00	709.00	821.50	804.00
823.20	816.00	824.10	828.00	824.10	870.00	825.00	900.00	825.00	1154.00
821.50	1162.00	825.60	1161.00	835.20	1[illegible].00	836.40	1374.00	837.10	1464.00
844.00	1488.00	841.00	1502.00	843.00	1576.00	847.00	1600.00	849.00	1656.00
849.00	1680.00	849.60	1710.00	849.50	1732.00	848.[illegible]	1785.00	845.50	1812.00
845.00	1828.00	840.60	1852.00	832.00	1916.00	833.90	1949.00	831.20	1952.00
837.80	1968.00								

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*****************************************************************
*                                                               *
*                  E R R O R   S U M M A R Y                    *
*                                                               *
*                                                               *
*      5  ERROR(S) DETECTED BY THE USER PROGRAM                 *
*      3  ERROR(S) DETECTED BY THE MATHEMATICAL PACKAGE         *
*      0  ERROR(S) DETECTED FOR INPUT/OUPUT STATEMENTS          *
*                                                               *
*****************************************************************
```

00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: COMSTOCK TWP

3) WATERCOURSE: COMSTOCK CREEK

4) DOCUMENT TYPE: INPUT DATA 100yr run

00BREAK00

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*****************************************************************
  HEC2 RELEASE DATE: NOV 76 UPDATED FEB 1977
  ERROR CORR - 01
  MODIFICATION - 50451452
*****************************************************************

C
T1100 YEAR PROFILE
T2STARTING WATER SURFACE KALAMAZOO RIVER MEAN WATER SURFACE ELEVATION
T3       COMSTOCK CREEK-COMSTOCK

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

      0.       4.       0.       0.  0.000000    0.00     0.0      0.   764.000   0.000

J2  NPROF    IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

     1.000    0.000   -1.000    0.000    0.000    0.000    0.000    0.000    0.000   15.000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    110.000  150.000  200.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000

QT      5.000  140.000  210.000  250.000  250.000  400.000    0.000    0.000    0.000    0.000
NC      0.100    0.100    0.040    0.100    0.300    0.000    0.000    0.000    0.000    0.000

        100' U/S OF MOUTH AT KALAMAZOO RIVER-75' D/S OF DAM

X1    100.000    9.000  926.000  955.000    0.000    0.000    0.000    0.000    0.000    0.000
GR    770.000  750.000  764.000  830.000  763.800  880.000  763.600  926.000  760.100  931.000
GR    760.200  944.000  760.600  931.000  764.000  955.000  764.300  1000.000    0.000    0.000

        140' U/S OF MOUTH-35' D/S OF DAM

X1    140.000   10.000  926.000  955.000   40.000   40.000   40.000    0.000    0.000    0.000
GR    770.000  830.000  764.000  830.100  763.800  880.000  762.800  926.000  760.500  931.000
GR    760.200  944.000  760.600  931.000  763.400  955.000  764.300  995.000  767.000 1000.000

        D/S FACE OF DAM

X1    175.000    0.000    0.000    0.000   35.000   35.000   35.000    0.000    0.000    0.000
NC      0.000    0.000    0.030    0.000    0.000    0.000    0.000    0.000    0.000    0.000

        CENTER OF DAM

X1    180.000    8.000  926.000  955.000    5.000    5.000    5.000    0.000    0.000    0.000
GR    770.000  830.000  763.900  830.100  763.800  880.000  762.800  926.000  760.100  941.000
GR    763.400  955.000  764.300  995.000  767.000 1000.000    0.000    0.000    0.000    0.000
NC      0.000    0.000    0.040    0.000    0.000    0.000    0.000    0.000    0.000    0.000

        U/S FACE OF DAM

X1    185.000   10.000  926.000  955.000    5.000    5.000    5.000    0.000    0.000    0.000
GR    770.000  830.000  764.000  830.100  763.800  880.000  762.800  926.000  760.500  931.000
GR    760.200  944.000  760.600  931.000  763.400  955.000  764.300  995.000  767.000 1000.000
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45' U/S OF DAM

X1	225.000	0.000	0.000	0.000	40.000	40.000	40.000	0.000	0.000	0.000
X1	395.000	8.000	927.000	956.000	160.000	160.000	170.000	0.000	0.000	0.000
GR	770.000	900.000	764.000	935.000	763.000	927.000	761.500	941.000	761.900	950.000
GR	763.000	956.000	764.000	985.000	772.000	1000.000	0.000	0.000	0.000	0.000
X1	565.000	6.000	927.000	956.000	150.000	160.000	170.000	0.000	0.000	0.000
GR	770.000	905.000	766.500	910.000	765.000	927.000	762.500	941.000	763.500	950.000
GR	765.000	956.000	769.000	970.000	772.000	1000.000	0.000	0.000	0.000	0.000

100' D/S OF KING HIGHWAY

X1	752.000	9.000	927.000	956.000	180.000	130.000	187.000	0.000	0.000	0.000
GR	768.200	905.000	768.000	910.000	766.000	927.300	764.000	933.000	763.500	961.000
GR	764.200	949.500	766.200	956.000	772.000	972.500	772.200	1000.000	0.000	0.000
NC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

50' D/S OF KING HIGHWAY

X1	802.000	8.000	928.000	954.000	50.000	50.000	50.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	972.000	0.000	959.500	0.000	0.000	0.000	0.000
GR	769.500	910.000	766.250	923.000	764.500	913.000	764.000	942.000	766.500	915.000
GR	767.000	934.000	773.000	968.000	774.000	1010.000	0.000	0.000	0.000	0.000
X1	827.000	9.000	1194.000	1222.000	25.000	25.000	25.000	0.000	0.000	0.000
GR	800.000	1194.000	767.950	1195.000	767.000	1197.000	764.700	1201.000	764.200	1208.000
GR	764.700	1215.000	767.500	1222.000	777.000	1235.000	0.000	1234.000	0.000	0.000

D/S FACE KING HIGHWAY

X1	652.000	18.000	1207.700	1214.300	25.000	25.000	25.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	772.100	772.500	0.000
GR	778.300	0.000	777.600	46.000	779.000	241.000	776.300	768.000	778.300	642.000
GR	777.800	904.000	777.500	984.000	777.500	1183.000	767.800	1194.000	764.700	1201.700
GR	764.700	1201.750	764.400	1208.000	764.800	1214.250	764.800	1214.300	767.700	1222.000
GR	777.500	1233.000	777.600	1320.000	777.900	1404.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

1 FT. INSIDE D/S END OF KING HWY. BRIDGE

X1	853.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	777.500	777.500	0.000
BT	0.000	904.000	777.500	0.000	1183.000	777.500	0.000	1194.000	777.500	0.000
BT	1201.700	777.500	0.000	1201.750	777.500	777.100	1214.250	777.500	777.100	1214.300
BT	777.500	0.000	1222.000	777.500	0.000	1233.000	777.500	0.000	0.000	0.000

1 FT. INSIDE D/S END OF KING HWY. BRIDGE

X1	922.000	0.000	0.000	0.000	69.000	69.000	69.000	0.000	0.100	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	777.500	777.500	0.000
NC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

U/S FACE KING HIGHWAY

X1	923.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	777.500	777.500	0.000
NC	0.000	0.000	0.000	0.100	0.300	0.000	0.000	0.000	0.000	0.000

VALLEY SECT. BASED ON ABRAMS 422 APPROX. 100 FT. U/S OF KING HIGHWAY

X1	1025.000	0.000	1165.000	1227.000	102.000	102.000	102.000	0.000	0.000	0.000
GR	772.000	1187.000	765.700	1185.300	765.600	1189.000	765.000	1193.300	767.400	1198.000
GR	767.800	1227.000	768.900	1237.000	773.000	1332.000	778.900	1350.000	0.000	0.000

X1	1100.000	7.000	1133.300	1229.000	75.000	75.000	75.000	0.000	0.000	0.000
GR	772.000	1160.000	769.000	1183.000	766.500	1187.000	766.500	1194.000	768.000	1207.300
GR	769.200	1225.000	772.000	1304.000	0.000	0.000	0.000	0.000	0.000	0.000

APPROX. 250' U/S OF KING HIGHWAY

X1	1175.000	7.000	966.000	1010.000	75.000	70.000	75.000	0.000	0.000	0.000
GR	773.000	957.700	770.000	966.000	767.400	966.000	767.400	972.300	769.200	968.000
GR	770.000	1010.000	774.000	1047.000	0.000	0.000	0.000	0.000	0.000	0.000

APPROX. 400' U/S OF KING HIGHWAY

X1	1325.000	7.000	963.200	989.000	145.000	145.000	130.000	0.000	0.000	0.000
GR	774.000	957.000	772.000	965.000	769.200	971.000	769.200	981.000	771.000	989.000
GR	772.000	1012.000	780.000	1050.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SECT. BASED ON ABRAMS 423 & 424 U/S OF MICHIGAN AVE.

X1	1485.000	10.000	964.000	990.000	155.000	155.000	160.000	0.000	0.000	0.000
GR	784.600	850.000	784.400	897.000	778.900	933.000	774.400	964.000	771.500	974.000
GR	771.200	979.000	771.200	984.000	772.700	990.000	776.200	1013.000	783.100	1030.000

X1	1512.000	6.000	965.000	995.000	27.000	27.000	27.000	0.000	0.000	0.000
GR	778.500	945.000	774.500	965.000	772.000	975.000	772.000	990.000	773.000	995.000
GR	777.500	1020.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	1550.000	6.000	963.000	997.000	26.000	26.000	26.000	0.000	0.000	0.000
GR	782.000	961.000	775.600	963.000	773.100	976.000	773.100	991.000	775.000	997.000
GR	782.000	1021.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.300	0.500	0.000	0.000	0.000	0.000	0.000

D/S FACE OF MICHIGAN AVE. BRIDGE

X1	1566.000	11.000	693.400	730.500	30.000	30.000	30.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	787.700	787.700	0.000
GR	790.000	662.000	787.500	675.000	776.600	693.400	776.600	693.500	774.300	705.000
GR	774.300	772.300	774.500	724.600	774.700	730.600	774.700	730.300	767.700	754.900
GR	789.900	785.000	0.000	0.000	0.000	0.300	0.000	0.300	0.000	0.000
NC	0.000	0.300	0.000	0.000	0.000	0.300	0.000	0.000	0.000	0.000

X1	1569.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	787.700	787.700	0.000
BT	6.000	662.000	790.000	0.000	693.400	787.700	776.600	693.500	787.700	783.900
BT	730.400	787.700	783.900	730.500	787.700	776.700	786.000	789.900	0.000	0.000

1 FT. INSIDE U/S END OF MICHIGAN AVE. BRIDGE

X1	1621.000	0.000	0.000	0.000	52.000	52.000	52.000	0.000	0.500	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.300	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.300	0.000	787.700	787.700	0.000
NC	0.000	0.000	0.040	0.000	0.000	0.300	0.000	0.000	0.000	0.000

U/S FACE OF MICHIGAN AVE. BRIDGE

X1	1622.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	787.700	787.700	0.000

D/S FACE OF R.R. BRIDGE

X1	1631.000	0.000	0.000	0.000	9.000	9.000	9.000	0.000	0.300	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	790.000	789.900	0.000
NC	0.000	0.000	0.030	0.000	0.000	0.000	0.000	0.000	0.000	0.000

1 FT. INSIDE D/S END OF R.R. BRIDGE

X1	1632.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	790.000	789.900	0.000
BT	6.000	662.000	790.000	0.000	693.400	791.300	0.000	693.500	791.300	783.900
BT	730.400	791.300	783.900	730.500	791.300	0.000	786.000	789.900	0.000	0.000

1 FT. INSIDE U/S END OF R.R. BRIDGE

X1	1659.000	0.000	0.000	0.000	27.000	27.000	27.000	0.000	0.400	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	790.000	789.900	0.000
NC	0.000	0.000	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000

U/S FACE OF R.R. BRIDGE

X1	1660.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	790.000	789.900	0.000

X1	1690.000	0.000	0.000	0.000	30.000	30.000	30.000	0.000	0.700	0.000
NC	0.000	0.000	0.000	0.100	0.300	0.000	0.000	0.000	0.000	0.000

X1	1720.000	0.000	0.000	0.000	30.000	30.000	30.000	0.000	0.700	0.000

VALLEY SECTION D/S OF DAM

X1	1750.000	0.000	0.000	0.000	30.000	30.000	30.000	0.000	0.700	0.000
SB	0.000	1.500	2.630	0.000	0.100	0.000	0.000	0.100	787.600	787.600
NC	0.000	0.000	0.000	0.300	0.500	0.000	0.000	0.000	0.000	0.000

U/S OF DAM

X1	1794.000	8.000	42.500	61.400	44.000	44.000	44.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	789.200	789.200	0.000	0.000	0.000	0.000	0.000
BT	0.000	0.000	791.700	0.000	42.500	791.700	0.000	42.500	789.200	0.000
BT	0.000	789.200	0.000	61.400	791.700	0.000	0.000	791.700	0.000	0.000
BT	791.700	0.000	791.000	0.000	42.500	789.200	42.500	0.000	789.000	61.400
GR	788.000	61.400	790.000	100.000	795.000	100.000	0.000	0.000	0.000	0.000
NC	0.100	0.080	0.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000

100FT U/S OF DAM

X1	1894.000	8.000	884.100	969.200	100.000	100.000	100.000	0.000	0.000	0.000
GR	802.100	524.000	793.600	620.000	791.800	884.100	788.000	884.200	787.600	909.200
GR	788.000	969.100	791.600	969.200	801.000	1125.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.100	0.300	0.000	0.000	0.000	0.000	0.000

X1	2300.000	6.000	893.000	961.000	390.000	390.000	406.000	0.000	0.000	0.000
GR	798.000	870.000	792.000	893.000	789.300	909.000	789.300	949.000	792.000	961.000
GR	794.000	980.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SECT. BASED ON ARRANS 22+ 60' D/S OF DRAN RD. CULVERT

X1	2784.000	37.000	1539.000	1571.000	470.000	470.000	484.000	0.000	0.000	0.000
GR	885.000	76.000	872.400	90.000	859.600	130.000	858.200	172.000	854.800	258.000
GR	856.000	348.000	865.400	342.000	872.800	854.000	877.600	868.000	877.000	824.000
GR	877.000	466.000	878.000	836.000	877.000	840.000	872.800	862.000	871.200	776.000
GR	868.200	844.000	843.000	956.000	825.000	1214.000	811.400	1362.000	806.700	1506.000
GR	794.700	1519.000	793.100	1534.000	791.200	1539.000	791.000	1555.000	791.200	1571.000
GR	792.800	1587.000	797.100	1628.000	799.200	1672.000	802.600	1688.000	805.200	1732.000
GR	808.600	1790.000	809.400	1842.000	812.000	1852.000	815.800	1890.000	816.800	1932.000
GR	820.400	1966.000	827.800	1972.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	2824.000	6.000	1547.000	1567.000	40.000	40.000	40.000	0.000	0.000	0.000
GR	796.000	1537.000	793.000	1547.000	791.600	1551.500	791.600	1558.000	793.000	1567.000
GR	796.000	1577.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.300	0.900	0.000	0.000	0.000	0.000	0.000

D/S FACE OF DRAN RD. CULVERT

X1	2864.000	27.000	758.000	766.000	40.000	40.000	40.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	797.000	797.000	0.000
GR	820.600	0.000	816.600	78.000	811.000	224.000	815.800	994.000	803.800	642.000
GR	801.700	696.700	800.700	762.000	795.500	752.300	795.900	758.000	795.900	758.100
GR	792.300	758.500	792.100	759.300	791.900	762.000	792.100	764.700	792.300	765.500
GR	793.900	765.900	793.900	766.000	794.800	771.700	801.000	796.000	801.800	842.000
GR	804.200	866.000	810.400	952.000	810.800	1006.000	813.200	1010.000	815.200	1052.000
GR	821.100	1102.000	822.000	1142.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	2865.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	797.000	797.000	0.000
BT	11.000	696.000	801.700	0.000	758.000	801.000	0.000	758.100	801.000	794.000
BT	755.500	801.000	794.600	759.500	801.000	796.000	762.000	801.000	797.800	756.700
BT	801.000	796.000	765.500	801.000	755.500	765.900	801.000	756.000	756.000	801.000
BT	0.000	796.000	801.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	2901.000	0.000	0.000	0.000	36.300	36.000	36.000	0.000	0.000	0.000
X2	0.000	0.000	0.000	0.000	0.300	0.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.300	0.000	0.000	799.000	799.000	0.000
NC	0.000	0.000	0.035	0.300	0.500	0.000	0.000	0.000	0.000	0.000

U/S FACE OF DRAN RD. CULVERT

X1	2902.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	801.000	801.000	0.000

VALLEY SECT. D/S OF DAM

X1	2922.000	15.000	743.000	785.000	20.000	20.000	20.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	701.000	0.000	823.000	0.000	0.000	0.000	0.000
GR	820.600	0.000	814.400	76.000	311.000	224.200	605.500	594.000	803.000	642.000
GR	801.700	696.300	800.700	742.000	797.800	743.200	793.200	745.000	793.200	775.000
GR	797.800	721.000	801.000	796.000	801.800	862.200	804.200	866.000	810.400	952.000
SB	0.000	1.500	2.630	0.000	0.100	0.000	0.100	0.100	805.900	792.200

JUST U/S OF DA

X1	2957.000	0.000	36.300	69.500	36.300	36.000	36.000	0.300	0.000	0.000
X2	0.000	0.000	1.000	805.900	805.900	0.000	0.000	0.000	0.000	0.000
BT	6.000	0.000	810.000	0.000	56.500	809.700	0.000	57.000	805.900	0.000
BT	69.000	806.000	0.000	69.500	809.700	0.000	812.000	809.900	0.000	0.000
GR	815.000	0.000	806.300	0.200	808.000	56.500	804.300	57.000	804.000	69.000
GR	808.000	69.500	809.700	112.200	815.000	112.000	0.300	0.000	0.000	0.000
ST	0.000	0.000	0.300	0.000	4.000	0.000	0.300	0.000	0.000	0.000

VALLEY SECTION U/S OF DAM

X1	3280.000	13.000	905.500	938.500	325.000	325.000	325.000	0.000	0.000	0.000
GR	819.000	812.000	810.300	540.000	808.200	804.000	806.100	850.000	809.700	905.500
GR	805.500	905.600	804.200	922.000	806.200	938.400	809.600	938.500	809.600	1048.000
GR	811.800	1092.000	813.400	1124.000	815.200	1186.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.100	0.300	0.000	0.000	0.000	0.000	0.000

VALLEY SECT. BASED ON AERIALS 629

X1	4280.000	29.000	906.000	1004.000	1300.000	1500.000	1300.000	0.000	0.000	0.000
GR	865.400	82.000	865.000	108.000	862.600	132.000	858.800	190.000	861.300	236.000
GR	850.000	340.000	852.000	422.000	835.000	686.000	854.200	710.000	829.200	760.000
GR	829.000	756.000	820.600	846.000	820.200	856.000	821.000	866.000	810.700	892.000
GR	809.100	906.000	808.000	908.000	808.100	920.200	807.000	954.000	827.200	969.000
GR	808.000	1000.000	808.500	1004.000	811.100	1016.000	819.400	1082.000	823.000	1124.000
GR	829.000	1140.000	835.000	1262.000	840.000	1364.000	840.400	1422.000	0.000	0.000

X1	4596.000	5.000	915.000	1000.000	300.000	330.000	318.000	0.000	0.000	0.000
GR	815.000	890.000	809.500	915.000	808.300	960.000	810.500	1000.000	815.000	1030.000

X1	4916.000	5.000	930.000	985.000	300.000	330.000	318.000	0.000	0.000	0.000
GR	815.000	900.000	810.300	930.000	809.700	957.200	810.600	965.000	817.300	1030.000

X1	5234.000	5.000	935.000	975.000	300.000	300.000	318.000	0.000	0.000	0.000
GR	817.000	902.000	812.000	955.000	811.500	955.000	812.000	975.000	817.000	1010.000

X1	5552.000	3.000	940.000	970.000	300.000	300.000	318.000	0.000	0.000	0.000
GR	817.000	915.000	815.500	940.000	813.000	955.000	615.500	970.000	847.000	990.000
ET	0.000	0.000	0.000	0.000	7.100	0.300	182.000	1392.000	0.000	0.000

VALLEY SECT. BASED ON ABRAMS #30

X1	5872.000	27.000	817.000	835.000	300.000	300.000	320.000	0.000	0.000	0.000
GR	897.800	80.000	890.000	102.000	860.800	414.000	842.000	436.000	843.300	542.000
GR	840.600	702.000	829.200	727.000	822.000	752.000	819.100	777.000	810.700	802.000
GR	815.000	817.000	814.200	821.000	813.000	827.200	814.000	833.000	814.700	835.000
GR	816.500	832.500	816.500	877.000	817.500	902.500	817.000	927.000	823.300	936.000
GR	837.400	1008.000	844.400	1102.000	844.000	1132.000	847.000	1152.000	855.600	1316.000
GR	859.600	1392.000	860.300	1434.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	6292.000	6.000	1070.000	1094.000	370.000	300.000	420.000	0.000	0.000	0.000
GR	831.000	1036.000	817.000	1070.000	816.200	1073.000	816.000	1090.000	818.200	1094.000
GR	820.000	1122.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	6712.000	6.000	1070.000	1096.100	310.000	300.000	420.000	0.000	0.000	0.000
GR	823.000	1036.000	819.500	1070.000	818.000	1073.000	818.000	1093.000	820.000	1096.000
GR	822.500	1122.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SECT. BASED ON ABRAMS #31

X1	7132.000	31.000	1069.000	1097.000	380.000	300.000	420.000	0.000	0.000	0.000
GR	836.000	0.000	839.600	48.000	850.100	104.000	837.000	830.000	854.000	290.000
GR	852.800	308.000	859.100	376.000	860.900	416.000	856.000	490.000	859.600	616.000
GR	847.000	782.000	844.800	808.000	835.400	926.000	838.600	970.000	826.000	1036.000
GR	826.000	1048.000	824.500	1060.000	822.500	1069.000	820.800	1073.000	819.900	1080.000
GR	820.600	1057.000	824.300	1077.000	823.900	1115.000	831.200	1142.000	851.500	1174.000
GR	834.000	1179.000	839.300	1202.000	845.700	1236.000	870.900	1300.000	841.400	1326.000
GR	845.600	1398.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	7332.000	0.000	0.000	0.000	200.000	200.000	200.000	0.000	0.000	0.000

X1	7532.000	0.000	0.000	0.300	225.100	190.000	200.000	0.000	0.000	0.000
ET	0.000	9.100	9.100	9.100	7.100	9.100	615.000	825.000	570.000	870.000

VALLEY SECT. BASED ON PEAK'S #32

X1	7360.000	41.000	760.000	816.000	260.000	836.300	260.000	0.000	0.000	0.000
GR	847.300	0.000	840.000	90.000	833.000	138.000	826.800	254.000	829.800	308.000
GR	829.800	330.000	826.200	406.000	827.000	450.000	825.800	476.000	823.900	546.000
GR	823.900	650.000	822.400	768.000	819.800	774.000	820.000	789.000	821.300	804.000
GR	823.200	816.000	824.100	328.000	824.100	870.000	825.200	900.000	825.000	1154.500
GR	828.500	1162.000	835.600	1166.000	835.250	1344.000	834.400	1374.000	837.100	1446.000
GR	844.000	1400.000	847.000	1502.000	843.000	1570.000	847.200	1650.000	845.000	1656.000
GR	849.000	1682.000	849.600	1710.000	849.500	1752.000	846.800	1788.000	845.300	1812.000
GR	845.600	1828.000	840.600	1852.000	833.000	1916.000	833.900	1948.000	830.900	1952.000
GR	837.800	1968.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

D/S FACE OF MAIN ST.

X1	7990.000	34.000	800.700	870.300	190.000	190.000	190.000	0.000	0.000	0.000
X1	10.000	819.700	0.000	0.000	0.000	0.000	0.000	822.000	822.500	0.000

GR	850.200	[illegible]	[illegible]	[illegible]	838.700	226.000	833.600	302.000	827.600	512.000
GR	827.000	815.000	823.000	820.000	822.000	860.000	820.400	838.700	820.400	888.750
GR	819.900	889.250	819.100	890.000	818.900	890.250	819.100	890.500	819.900	891.250
GR	820.400	891.750	820.400	891.000	820.500	892.200	820.500	892.250	820.000	892.750
GR	819.200	893.500	819.000	893.750	819.200	894.000	820.000	894.750	820.500	895.250
GR	820.500	893.300	823.000	944.000	823.000	1026.000	828.600	1030.000	830.200	1160.000
GR	831.600	1256.000	832.600	1308.000	833.200	1414.000	835.000	1538.000	0.000	0.000
SB	0.000	4.200	3.000	0.000	3.900	0.000	7.000	0.000	820.100	819.700

U/S FACE OF MAIN ST. CULVERTS

X1	8034.000	0.000	0.000	0.000	44.000	44.000	44.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	821.900	824.600	0.000	0.000	0.000	0.000	0.000
X3	10.000	820.100	0.000	0.000	0.000	0.000	0.000	824.600	824.900	0.000
BT	20.000	860.000	824.600	0.000	888.700	824.900	0.000	888.750	824.900	820.400
BT	889.250	824.900	820.900	890.000	824.900	821.700	890.250	824.900	821.900	890.500
BT	824.900	821.700	891.250	824.900	820.900	891.750	824.900	820.400	891.800	824.900
BT	0.000	892.200	824.900	0.000	892.250	824.900	820.200	892.750	824.900	820.700
BT	893.500	824.900	821.500	893.750	824.900	821.700	894.000	824.900	821.500	894.750
BT	824.900	820.700	895.250	824.900	820.200	895.300	824.900	0.000	944.000	825.200
BT	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SECT. APPROX. 50 FT. U/S OF MAIN ST.

X1	8084.000	0.000	0.000	0.000	50.000	50.000	50.000	0.000	0.000	0.000
EJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000



1) COUNTY: KALAMAZOO

2) STUDY NAME: COMSTOCK TWP.

3) WATERCOURSE: COMSTOCK CREEK

4) DOCUMENT TYPE: MULTI-PROFILE INPUT AND RUN



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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
  ERROR CORR - 01
  MODIFICATION - 50,51,52
*****************************************************

C
T1[illegible] YEAR PROFILE
T2STARTING WATER SURFACE KALAMAZOO RIVER MEAN WATER SURFACE ELEVATION
T3       COMSTOCK CREEK-COMSTOCK

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         HSEL      FC

      0.        0.        0.        0.  0.000000      0.00      0.0       0.   764.000     0.000

J2  NPROF     IPLOT     PRPVS     XSECV     XSECH     FN        ALLDC     IBU       CHNIM     ITRACE

     1.000     0.000    -1.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    150.000   201.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

J5  LPRNT     NUMSEC                    ********REQUESTED SECTION NUMBERS********

    -10.000   -10.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
QT      5.000   140.000   210.000   250.000   [illegible]   [illegible]   0.000     0.000     0.000     0.000
NC      0.100     0.100     0.040     0.100     0.300     0.000     0.000     0.000     0.000     0.000

        100' U/S OF MOUTH AT KALAMAZOO RIVER-75' D/S OF DAM

X1    100.000     9.000   926.000   955.000     0.000     0.000     0.000     0.000     0.000     0.000
GR    770.000   750.000   764.000   820.000   763.800   880.000   763.400   926.000   763.100   931.000
GR    760.200   941.000   760.600   951.000   764.000   955.000   764.300  1034.000     0.000     0.000

        140' U/S OF MOUTH-35' D/S OF DAM

X1    140.000    10.000   926.000   955.000    40.000    40.000    40.000     0.000     0.000     0.000
GR    770.000   830.000   764.000   830.100   763.800   880.000   762.800   926.000   760.500   931.000
GR    760.200   941.000   760.600   951.000   763.400   955.000   764.300   995.000   767.000  1000.000

        D/S FACE OF DAM

X1    175.000     0.000     0.000     0.000    35.000    35.000    35.000     0.000     0.000     0.000
NC      0.000     0.000     0.030     0.000     0.000     0.000     0.000     0.000     0.000     0.000

        CENTER OF DAM

X1    180.000     8.000   926.000   955.000     5.000     5.000     5.000     0.000     0.000     0.000
GR    770.000   830.000   763.900   830.100   763.800   880.000   762.800   926.000   763.100   941.000
GR    763.400   955.000   764.300   995.000   767.000  1000.000     0.000     0.000     0.000     0.000
NC      0.000     0.000     0.040     0.000     0.000     0.000     0.000     0.000     0.000     0.000

        U/S FACE OF DAM
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X1	155.000	10.000	926.000	955.000	5.000	5.000	5.000	0.200	0.000	0.000
GR	770.000	630.000	764.000	630.100	763.800	630.000	762.800	926.000	766.500	931.000
GR	760.200	941.000	760.600	951.000	763.400	955.000	764.300	995.000	767.000	1000.000

45' D/S OF D/S

X1	225.000	0.000	0.000	0.000	40.000	40.000	40.000	0.000	0.000	0.000

X1	595.000	9.000	927.000	956.000	160.000	160.000	170.000	0.000	0.000	0.000
GR	770.000	910.000	764.000	905.000	763.000	927.000	761.500	941.000	761.900	956.000
GR	762.000	956.000	764.000	965.000	772.000	1030.000	0.000	0.000	0.000	0.000

X1	565.000	8.000	927.000	956.000	160.000	160.000	170.000	0.000	0.000	0.000
GR	770.000	905.000	766.400	910.000	765.000	927.000	762.500	941.000	763.500	956.000
GR	765.000	956.000	769.000	972.000	772.000	1030.000	0.000	0.000	0.000	0.000

100' D/S OF KING HIGHWAY

X1	752.000	9.000	929.000	956.000	160.000	160.000	170.000	0.000	0.000	0.000
GR	765.200	905.200	768.000	910.000	766.000	927.200	764.000	930.300	768.500	941.000
GR	764.200	940.500	768.200	972.000	772.000	972.500	772.200	1030.000	0.000	0.000
NC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

50' D/S OF KING HIGHWAY

X1	827.000	9.000	920.000	956.000	30.000	30.000	30.000	0.000	0.000	0.000
XS	0.000	0.000	0.000	922.000	0.000	959.500	0.000	0.000	0.000	0.000
GR	769.500	910.000	766.200	928.000	764.500	935.000	764.000	942.000	764.500	950.000
GR	767.000	954.000	773.000	965.000	774.000	1000.000	0.000	0.000	0.000	0.000

X1	827.000	9.000	1194.000	1222.000	25.000	25.000	25.000	0.000	0.000	0.000
GR	800.000	1189.000	767.900	1196.000	767.600	1194.000	764.700	1201.000	764.200	1200.000
GR	764.700	1215.000	767.500	1222.000	773.000	1233.000	800.000	1234.000	0.000	0.000

D/S FROM KING HIGHWAY

X1	852.000	10.000	1201.700	1214.300	25.000	25.000	25.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	772.100	772.100	0.000
GR	770.300	0.000	777.600	46.000	770.000	298.000	778.000	748.000	778.600	842.000
GR	777.000	904.000	777.500	938.000	777.500	1165.000	767.000	1196.000	764.700	1201.700
GR	764.700	1201.750	764.400	1208.000	764.000	1214.250	764.000	1294.300	767.700	1222.000
GR	777.500	1233.000	777.600	1320.000	777.900	1464.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

1 FT. INSIDE D/S END OF KING HWY. BRIDGE

X1	853.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	777.500	777.500	0.000
BT	9.000	964.000	777.500	0.000	1183.000	777.500	0.000	1194.000	777.500	0.000
BT	1201.700	777.500	0.000	1201.750	777.500	772.100	1214.250	777.500	772.100	1214.300
ET	777.500	0.000	1222.000	777.500	1.000	1233.000	777.500	0.000	0.000	0.000

1 FT. INSIDE D/S END OF KING HWY. BRIDGE

X1	922.100	0.000	0.000	0.000	30.000	0.000	45.000	0.000	0.000	0.000

K2	5.000	0.000	5.030	6.030	5.000	0.000	1.030	5.000	0.000	0.000
K3	10.000	0.000	5.030	6.030	5.000	0.300	0.200	777.500	777.500	0.000
NC	0.000	0.000	0.040	0.000	0.000	0.000	0.030	0.000	0.000	0.000

U/S FACE KING HIGHWAY

X1	923.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	777.500	777.500	0.000
NC	0.000	0.000	0.000	0.100	0.300	0.000	0.000	0.000	0.000	0.000

VALLEY SECT. BASED ON ABRAMS 122 APPROX. 100 FT. U/S OF KING HIGHWAY

X1	1025.000	9.000	1185.000	1227.000	102.000	102.000	102.000	0.000	0.000	0.000
GR	772.000	1184.000	765.700	1185.000	765.600	1189.000	765.800	1193.000	767.400	1198.000
GR	767.000	1227.000	766.900	1227.000	775.000	1232.500	770.950	1550.000	0.000	0.000
X1	1100.000	7.000	1183.000	1225.000	75.000	75.000	75.000	0.000	0.000	0.000
GR	772.000	1160.000	769.000	1183.000	766.500	1187.000	766.500	1194.000	768.000	1204.000
GR	769.200	1229.000	772.000	1304.000	0.000	0.000	0.000	0.000	0.000	0.000

APPROX. 250' U/S OF KING HIGHWAY

X1	1175.000	7.000	966.000	1010.000	70.000	70.000	75.000	0.000	0.000	0.000
GR	773.000	957.000	770.000	966.000	767.400	968.000	767.400	977.000	769.000	982.000
GR	770.000	1010.000	774.000	1017.100	0.200	0.200	0.000	0.000	0.000	0.000

APPROX. 400' U/S OF KING HIGHWAY

X1	1325.000	7.000	965.000	989.000	145.000	145.000	150.000	0.000	0.000	0.000
GR	774.000	957.000	772.300	965.000	769.200	971.000	768.770	981.000	771.200	989.000
GR	772.000	1012.000	780.000	1350.000	0.000	0.200	0.000	0.000	0.000	0.000

VALLEY SECT. BASED ON ABRAMS #23 83' D/S OF MICHIGAN AVE.

X1	1435.000	10.000	964.000	995.000	155.000	155.000	160.000	0.000	0.000	0.000
GR	774.600	850.000	764.000	947.000	770.000	782.000	774.400	964.000	771.500	974.000
GR	771.200	979.000	771.200	964.000	772.700	990.000	774.200	1013.000	763.100	1350.000
X1	1512.000	6.000	965.000	995.000	27.000	27.000	27.000	0.000	0.000	0.000
GR	776.500	943.000	774.500	963.000	772.000	973.000	772.500	960.000	773.000	995.000
GR	777.500	1020.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	1538.000	6.000	963.000	997.000	26.000	26.000	26.000	0.000	0.000	0.000
GR	782.000	941.000	775.600	963.000	773.100	974.000	773.100	991.000	775.000	997.000
SP	783.000	1021.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.000	1.000

D/S FACE OF MICHIGAN AVE. BRIDGE

X1	1568.000	11.000	695.400	730.300	30.300	30.300	30.000	0.000	0.000	0.000
X3	10.000	5.000	0.000	0.000	0.000	0.000	0.000	767.700	767.700	0.000
GR	790.000	662.000	737.500	675.000	776.600	695.400	776.600	695.500	774.300	705.000
GR	774.300	712.000	774.300	724.600	776.700	730.430	776.700	730.500	767.700	754.900
GR	769.900	765.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

1 FT. INSIDE D/S END OF MICHIGAN AVE. BRIDGE

X1	1569.000	0.000	0.300	0.000	1.300	1.000	1.000	0.300	0.000	0.000
X3	10.000	0.000	0.300	0.000	0.300	0.000	0.000	787.700	787.700	0.000
ST	0.000	662.000	790.300	0.000	693.400	787.700	776.600	693.500	787.700	783.900
BT	730.400	787.700	783.900	730.500	787.700	776.700	782.000	789.900	0.000	0.000

1 FT. INSIDE D/S END OF MICHIGAN AVE. BRIDGE

X1	1629.000	0.000	0.000	0.000	52.000	52.000	52.000	0.000	0.500	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	787.700	787.700	0.000
NC	0.000	0.000	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000

D/S FACE OF MICHIGAN AVE. BRIDGE

X1	1622.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	787.700	787.700	0.000

D/S FACE OF R.R. BRIDGE

X1	1631.000	0.000	0.000	0.000	9.000	9.000	9.000	0.000	0.300	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	790.000	789.900	0.000
NC	0.000	0.000	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000

1 FT. INSIDE D/S END OF R.R. BRIDGE

X1	1632.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	790.000	789.900	0.000
ST	6.000	662.000	790.300	0.000	693.400	791.300	0.000	693.500	791.300	783.900
BT	730.400	791.300	783.900	730.500	791.900	0.000	782.000	789.900	0.000	0.000

1 FT. INSIDE U/S END OF R.R. BRIDGE

X1	1639.000	0.000	0.300	0.000	27.000	27.000	27.000	0.000	0.400	0.000
X2	0.000	0.000	0.300	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	790.000	789.900	0.000
NC	0.000	0.000	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000

U/S FACE OF R.R. BRIDGE

X1	1660.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	790.000	789.900	0.000

X1	1690.000	1.000	0.000	0.000	30.000	30.000	29.000	0.000	0.700	0.000
NC	0.000	0.000	0.000	0.100	0.000	0.000	0.000	0.000	0.000	0.000

X1	1720.000	0.000	0.000	0.000	30.000	30.000	30.000	0.000	0.700	0.000

VALLEY SECTION D/S OF DAM

X1	1750.000	1.000	0.000	0.000	50.000	30.000	30.000	0.000	0.700	0.000

NC	0.100	0.300	0.000	0.300	0.500	0.300	1.000	0.300	0.000	0.000

U/S OF DAM

X1	1796.000	0.000	42.500	61.400	42.500	84.000	84.000	0.300	0.000	0.000
X2	0.100	0.000	1.000	789.200	789.200	0.300	1.000	0.300	0.000	0.000
BT	6.000	0.000	791.700	0.000	42.500	791.700	0.000	42.600	789.200	0.000
BT	61.300	789.200	0.000	61.400	791.700	0.000	100.000	791.700	0.000	0.000
GR	795.000	0.000	790.000	0.000	780.000	42.500	783.000	42.600	780.000	61.300
GR	780.000	61.400	790.000	100.000	795.000	100.300	0.000	0.300	0.000	0.000
NC	0.100	0.300	0.000	0.000	0.300	0.300	0.000	0.300	0.000	0.000

100FT U/S OF DAM

X1	1894.000	0.000	804.100	789.200	100.300	100.000	100.000	0.300	0.000	0.000
GR	802.100	824.600	795.400	800.000	791.300	800.100	784.000	804.200	787.600	800.200
GR	788.000	800.100	791.600	805.200	801.300	1100.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.100	0.300	0.000	0.000	0.000	0.000	0.000

X1	2500.000	0.000	800.100	801.000	800.300	800.000	800.000	0.000	0.000	0.000
GR	798.000	800.100	792.000	800.000	798.300	800.100	0.000	804.000	792.200	801.000
GR	794.000	800.100	0.000	0.000	0.300	0.000	0.000	0.000	0.000	0.000

VALLEY SECT. BASED ON AERIALS #26 30' D/S OF DRAN RD. CULVERT

X1	2764.000	37.000	1539.700	1571.300	470.300	470.000	484.000	0.000	0.200	0.000
GR	836.000	74.000	878.300	90.300	490.500	1200.000	852.200	172.000	854.900	258.000
GR	856.000	878.000	869.400	842.000	878.800	854.000	877.600	880.000	877.000	424.000
GR	877.000	466.000	870.000	536.000	877.300	600.000	872.300	660.000	871.200	776.000
GR	866.200	844.000	863.300	956.000	825.000	1214.000	611.100	1432.000	806.700	1506.000
GR	796.700	1319.000	793.100	1594.000	791.300	1590.700	791.000	1559.000	791.200	1573.000
GR	792.300	1547.000	797.100	1620.000	792.200	1674.300	832.400	1600.000	805.200	1732.000
GR	805.600	1750.100	808.400	1842.000	812.000	1832.200	815.000	1800.000	810.000	1932.000
GR	826.400	1946.000	827.500	1972.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	2524.000	0.000	1547.000	1567.000	40.000	40.000	40.000	0.000	0.000	0.000
GR	796.000	1537.000	792.000	1547.000	799.600	1551.000	791.600	1558.000	793.000	1567.000
GR	796.000	1577.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.300	0.500	0.000	0.000	0.000	0.000	0.000

D/S FACE OF DRN. RD. CULVERT

X1	2364.000	27.000	750.000	796.000	40.000	40.000	40.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	797.000	797.000	0.000
GR	820.600	0.000	816.400	76.000	811.000	224.000	805.900	594.000	803.800	642.000
GR	801.700	596.000	800.700	742.000	795.500	792.300	793.900	758.000	793.900	758.100
GR	792.500	753.500	792.700	799.500	791.900	792.000	792.700	764.700	792.300	765.500
GR	793.900	765.400	793.900	796.000	797.000	771.700	801.000	796.000	801.300	742.000
GR	804.800	805.000	810.600	932.000	810.300	1030.300	815.300	1010.000	815.200	1032.000
GR	821.100	1102.000	822.000	1142.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	2665.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	797.000	797.000	0.000
BT	11.000	696.300	801.700	0.000	758.000	801.000	0.000	758.100	801.000	794.800
BT	758.500	801.000	795.600	759.300	801.000	796.600	762.000	801.000	797.000	764.700
BT	801.000	796.500	765.500	801.000	795.600	765.900	801.000	795.900	766.000	801.000

BT	0.000	796.000	801.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	2901.000	0.000	0.000	0.000	36.000	36.000	36.000	0.000	0.000	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.500	0.000	0.000	0.000
X3	70.000	0.000	0.000	0.000	0.000	0.000	0.000	799.000	799.000	0.000
JC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

U/S FACE OF DRAN RD. CULVERT

X1	2902.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	801.000	801.000	0.000

VALLEY SECT. D/S OF DAM

X1	2932.000	15.000	743.000	758.000	20.000	20.000	20.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	801.000	0.000	805.000	0.000	0.000	0.000	0.000
GR	820.600	0.000	816.600	76.000	811.000	224.000	805.900	594.000	803.800	642.000
GR	801.700	696.000	800.700	742.000	797.000	745.000	793.200	749.000	793.200	775.000
GR	797.800	785.000	801.000	796.000	801.000	842.300	804.200	866.000	810.400	952.000
SB	0.000	2.500	2.000	2.000	2.000	0.300	0.100	2.150	801.900	752.200

JUST U/S OF DAM

X1	2957.000	8.000	56.500	69.500	35.000	35.000	35.000	0.000	0.000	0.000
X2	0.000	1.000	1.000	805.000	805.000	0.000	1.500	0.000	0.000	0.000
DT	6.000	0.000	-10.000	0.000	56.500	69.700	0.000	57.000	805.900	0.000
BT	69.000	801.000	0.000	69.500	805.700	0.300	112.000	805.900	0.000	0.000
GR	815.000	0.000	806.000	0.000	806.000	56.500	804.000	57.000	804.000	69.000
GR	806.000	69.500	806.000	112.000	815.000	112.000	0.000	0.000	0.000	0.000
ET	0.000	0.000	0.000	0.000	1.410	0.000	0.000	0.000	0.000	0.000

VALLEY SECTION D/S OF DAM

X1	3780.000	13.000	905.500	938.500	323.000	323.000	323.000	0.000	0.000	0.000
GR	819.000	182.000	810.000	540.000	808.200	804.000	806.100	850.000	809.700	905.500
GR	805.500	905.600	804.200	922.300	796.200	958.400	807.600	935.500	813.600	1048.000
GR	811.600	1092.000	813.400	1124.000	813.200	1106.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.100	0.300	0.000	0.000	0.000	0.000	0.000

VALLEY SECT. BASED ON ABRAMS #29

X1	4200.000	29.000	936.000	1004.000	1300.000	1300.000	1300.000	0.000	0.000	0.000
GR	865.400	62.000	865.000	106.000	862.600	132.300	858.500	190.000	861.300	236.000
GR	850.000	340.000	852.000	422.000	933.000	696.000	834.200	710.000	829.200	760.000
GR	829.000	756.000	820.400	846.000	820.200	856.000	821.000	868.000	810.700	892.000
GR	809.100	906.000	808.000	908.000	808.100	921.000	807.800	954.000	807.200	968.000
GR	830.000	1000.000	808.500	1004.000	811.100	1016.000	819.400	1022.000	823.000	1124.000
GR	829.000	1141.000	835.000	1262.000	840.000	1304.000	840.400	1422.000	0.000	0.000

X1	4598.000	5.000	915.000	1000.000	300.000	300.000	310.000	0.000	0.000	0.000
GR	815.000	890.000	809.500	915.000	803.500	965.000	810.500	1030.000	815.000	1030.000

X1	4916.000	3.000	930.000	983.000	300.000	300.000	310.000	0.000	0.000	0.000
GR	815.000	910.000	810.500	930.000	809.700	957.000	810.600	965.000	817.000	1030.000

X1	5234.300	5.000	935.000	975.300	300.000	300.000	340.200	0.000	0.000	0.000
GR	817.300	902.000	812.500	935.300	811.500	955.000	812.300	975.000	817.000	1010.000
X1	5532.000	5.000	940.000	970.300	300.000	300.000	340.200	0.000	0.000	0.000
CP	817.300	915.000	813.500	940.300	813.000	955.000	813.300	970.000	817.000	990.000
ET	0.000	0.000	0.000	0.000	7.100	7.000	112.300	1392.000	0.000	0.000

VALLEY SECT. BASED ON ABRAMS #30

X1	5072.000	27.000	817.000	839.000	300.000	300.000	320.300	0.000	0.000	0.000
GR	897.000	10.300	892.000	102.000	862.600	414.000	142.200	433.000	843.400	542.000
GR	840.600	702.200	828.200	727.000	822.000	752.000	619.100	777.000	816.700	802.000
GR	815.000	817.200	814.200	821.000	813.000	827.000	814.000	833.000	814.700	835.000
GR	816.500	852.300	816.500	877.000	817.300	902.000	817.800	927.000	823.300	936.000
GR	837.400	1018.200	844.200	1102.000	874.300	1102.000	867.100	1102.000	855.600	1378.000
GR	859.600	1342.000	860.300	1434.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	6292.000	5.000	1070.000	1094.000	370.000	320.000	420.000	0.000	0.000	0.000
GR	821.000	1036.000	817.000	1070.000	816.000	1078.000	816.000	1090.000	818.000	1094.000
GP	120.000	1122.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	6712.000	5.000	1070.000	1096.000	370.000	300.000	420.000	0.000	0.000	0.000
GR	823.000	1036.000	819.500	1070.000	818.000	1075.000	818.000	1087.000	820.000	1096.000
GR	822.500	1122.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SECT. BASED ON ABRAMS #31

X1	7132.000	31.000	1069.000	1097.000	360.000	300.000	420.000	0.000	0.000	0.000
GR	836.000	0.000	835.600	48.000	850.100	136.000	854.000	238.000	854.000	296.000
GR	852.000	364.000	838.100	372.000	860.900	473.300	856.000	494.000	859.600	616.000
GR	867.000	782.000	844.000	802.000	865.400	920.000	834.600	975.000	870.000	1036.000
GR	870.000	1041.000	824.500	1061.000	822.500	1099.000	820.000	1072.000	819.900	1090.000
GR	820.600	1087.000	824.500	1097.000	825.100	1119.000	831.200	1142.000	831.500	1174.000
GR	334.000	1179.000	339.000	1202.000	845.000	1256.000	840.900	1300.000	841.400	1326.000
GR	845.600	1390.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	7332.000	0.000	0.000	0.000	200.000	200.000	220.300	0.000	0.000	0.000

X1	7532.000	0.000	0.000	0.000	225.000	160.000	200.000	0.000	0.000	0.000
ET	0.000	0.000	0.100	0.100	7.100	0.100	611.000	725.000	870.000	870.000

VALLEY SECT. BASED ON ABRAMS #32

X1	7800.000	41.000	768.000	816.000	260.000	268.000	286.000	0.000	0.000	0.000
GR	847.300	0.000	840.000	90.000	843.200	137.000	820.000	254.000	829.800	308.000
GR	829.800	330.000	826.200	436.000	827.300	490.000	825.000	476.000	823.900	546.000
GR	823.900	630.000	822.400	750.000	820.700	778.000	822.000	799.000	821.300	804.000
GR	823.200	816.000	824.700	820.000	824.700	870.000	825.000	900.000	825.000	1154.000
GR	820.500	1162.000	825.600	1166.000	835.200	1340.000	834.400	1374.000	837.100	1464.000
GR	844.000	1408.000	841.000	1502.000	843.000	1576.000	847.000	1600.000	849.000	1656.000
GR	849.000	1652.000	849.600	1730.000	849.500	1752.000	848.000	1764.000	845.300	1814.000
GR	845.600	1821.000	840.600	1932.000	835.000	1918.200	835.900	1948.000	830.900	1952.000
GR	837.500	1961.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	7990.000	34.000	838.700	895.300	190.000	190.000	190.000	0.000	0.000	0.000
X3	10.000	819.700	0.000	0.000	0.000	0.000	0.000	822.000	822.500	0.000
GR	850.200	0.000	840.000	160.000	836.700	226.000	833.600	302.000	827.600	512.000
GR	827.000	815.000	823.000	820.000	822.000	862.000	820.400	888.700	820.400	886.750
GR	819.900	889.250	819.100	890.000	813.900	890.250	819.100	890.500	819.900	891.250
GR	820.400	891.750	820.400	891.000	823.500	892.000	820.500	892.250	820.000	892.750
GR	819.200	893.500	819.000	893.750	819.200	894.000	820.000	894.750	820.500	895.250
GR	820.500	895.300	823.000	944.000	823.000	1026.000	828.600	1030.000	830.200	1160.000
GR	831.600	1256.000	832.600	1308.000	833.200	1414.000	835.000	1558.000	0.000	0.000
SP	0.000	0.200	0.000	0.000	0.900	0.000	7.000	0.000	820.100	819.700

U/S FACE OF MAIN ST. CULVERTS

X1	8034.000	0.000	0.000	0.000	44.000	44.000	44.000	0.000	0.000	0.000
X2	0.000	0.000	0.000	821.900	824.500	0.000	0.000	0.000	0.000	0.000
X3	10.000	820.100	0.000	0.000	0.000	0.000	0.000	824.600	824.900	0.000
BT	23.000	860.000	824.500	0.000	836.700	834.900	0.000	838.750	824.900	820.400
BT	839.250	824.900	820.900	890.000	824.900	821.700	890.250	824.900	821.900	890.500
BT	824.900	821.700	891.250	824.900	820.900	891.750	824.900	820.400	891.800	824.900
BT	0.000	892.200	824.900	0.000	892.250	824.900	820.200	892.750	824.900	823.700
BT	893.500	824.900	821.500	893.750	824.900	821.900	894.000	824.900	821.500	894.750
BT	824.900	820.700	895.250	824.900	820.200	895.500	824.900	0.000	944.000	825.200
BT	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SECT. APPROX. 50 FT. U/S OF MAIN ST.

X1	8034.000	0.000	0.000	0.000	50.000	50.000	50.000	0.000	0.000	0.000
EJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

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*****************************************************
  HEC2 RELEASE DATED NOV 75 UPDATED FEB 1977
  ERROR CORR -  [illegible]
  MODIFICATION -  50,51,52
*****************************************************

T150 YEAR PROFILE
T2STARTING WATER SURFACE KALAMAZOO RIVER MEAN WATER SURFACE ELEVATION
T3       COMSTOCK CREEK-COMSTOCK

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     O         USEL      FQ

       0.        3.        1.        0.  0.[illegible]      0.00      0.0        0.   764.000    0.000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLOC     INQ       CHNIM     ITRACE

     2.000     0.000    -1.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
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*****************************************************
  HECZ RELEASE DATED NOV 76 UPDATED FEB 1977
  ERROR CORR - 01
  MODIFICATION - 52,51,52
*****************************************************

T1100 YEAR PROFILE
T2STARTING WATER SURFACE KALMAZOO RIVER MEAN WATER SURFACE ELEVATION
T3       COMSTOCK CREEK-COMSTOCK

J1  ICHECK    INO       NINV      IDIR      STRT      METRIC    HVINS     Q         USEL      FQ

       0.        4.        0.        0.  0.000000      0.00      0.0        0.   764.000     0.000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IDM       CHWXH     ITRACE

     3.000     0.000    -1.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
  ERROR CORR -  31
  MODIFICATION -  57,51,52
*****************************************************

T1500 YEAR PROFILE
T2STARTING WATER SURFACE WALKING LEVER MEAN WATER SURFACE ELEVATION
T3       COMSTOCK CREEK-CO STOCK
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J1	ICHECK	INO	NINV	IDIR	STRT	METRIC	HVINS	Q	USEL	FQ
	0.	0.	0.	0.	0.00[illegible]	0.00	0.0	0.	764.000	0.000

J2	NPROF	IPLOT	PRFVS	XSECV	XSECR	FN	ALLDC	IDUP	CHNIM	ITRACE
	15.000	0.000	-1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: COMSTOCK TWP.

3) WATERCOURSE: COMSTOCK CREEK

4) DOCUMENT TYPE: MULTI-PROFILE SUMMARY

00BREAK00

****
HEC2 RELEASE DATED NOV 76 UPDATED FEB 1979
ERROR CODE - 01
MODIFICATION - 50,51,52
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

CONSTOCK CREEK-CONSTOCK

SUMMARY PRINTOUT TABLE 150

	SECNO	XLOB	XLOB	XLOB	ELMIN	Q	CWSEL	CRIWS	EG	IFRMS	VCH	AREA	CTR
	100.000	0.00	0.00	0.00	760.20	140.00	764.00	0.00	764.04	4.31	1.60	109.45	63.36
	100.000	0.00	0.00	0.00	760.20	210.00	764.00	0.00	764.09	10.81	2.40	109.45	63.00
	100.000	0.00	0.00	0.00	760.20	250.00	764.00	0.00	764.13	15.52	2.86	109.65	63.58
	100.000	0.00	0.00	0.00	760.20	400.00	764.20	0.00	764.32	35.25	4.51	109.45	63.36
	140.000	40.00	0.00	0.00	760.20	140.00	764.05	0.00	764.06	3.27	1.42	140.37	77.50
	140.000	40.00	0.00	0.00	760.20	210.00	764.06	0.00	764.12	7.06	2.09	145.34	79.03
	140.000	40.00	0.00	0.00	760.20	250.00	764.09	0.00	764.18	9.51	2.45	151.12	81.05
	140.000	40.00	0.00	0.00	760.20	400.00	764.25	0.00	764.46	19.45	3.62	177.54	90.71
	175.000	35.00	0.00	0.00	760.20	140.00	764.04	0.00	764.07	3.19	1.40	143.58	78.41
	175.000	35.00	0.00	0.00	760.20	210.00	764.09	0.00	764.15	6.68	2.05	151.58	81.22
	175.000	35.00	0.00	0.00	760.20	250.00	764.13	0.00	764.21	8.97	2.40	157.80	83.48
	175.000	35.00	0.00	0.00	760.20	400.00	764.34	0.00	764.50	17.41	3.47	191.00	95.88
	180.000	5.00	0.01	0.30	762.30	140.00	764.09	763.65	764.14	116.01	4.50	57.81	13.00
*	180.000	5.00	0.01	0.30	762.30	210.00	764.05	764.05	764.30	126.12	5.37	72.14	16.35
*	180.000	5.00	0.01	0.30	762.30	250.00	764.15	764.15	764.49	120.54	5.63	96.77	22.77
*	180.000	5.00	0.00	0.00	762.80	400.00	764.41	764.41	764.65	122.47	6.59	140.31	36.14
	185.000	5.00	0.00	0.00	762.20	140.00	764.13	0.00	764.16	2.79	1.24	150.96	82.67
	185.000	5.00	0.00	0.00	762.20	210.00	764.17	0.00	764.41	4.60	1.50	190.15	97.63
	185.000	5.00	0.00	0.00	762.20	250.00	764.47	0.00	764.53	5.65	2.03	213.85	105.22
	185.000	5.00	0.00	0.00	762.20	400.00	764.80	0.00	764.90	9.46	2.78	260.66	130.04
	225.000	40.00	0.00	0.00	760.20	140.00	764.15	0.00	764.18	2.74	1.33	100.77	84.52
	225.000	40.00	0.00	0.00	760.20	210.00	764.39	0.00	764.43	4.43	1.70	199.30	99.80
	225.000	40.00	0.00	0.00	760.20	250.00	764.50	0.00	764.55	5.47	2.01	217.68	106.53
	225.000	40.00	0.00	0.00	760.20	400.00	764.84	0.00	764.94	9.04	2.74	274.81	133.85
	395.000	170.00	0.00	0.00	761.50	140.00	764.21	0.00	764.27	11.87	2.08	96.29	40.63
	395.000	170.00	0.00	0.00	761.50	210.00	764.48	0.00	764.57	16.15	2.66	118.83	52.25
	395.000	170.00	0.00	0.00	761.50	250.00	764.61	0.00	764.72	18.48	2.92	129.61	58.15
	395.000	170.00	0.00	0.00	761.50	400.00	765.02	0.00	765.20	26.00	3.83	162.61	78.43
	565.000	170.00	0.00	0.00	762.50	140.00	764.44	0.00	764.92	205.97	5.53	25.33	9.75
	565.000	170.00	0.00	0.00	762.50	210.00	764.61	0.00	765.38	190.79	6.09	34.50	14.89
	565.000	170.00	0.00	0.00	762.50	250.00	764.99	0.00	765.61	195.59	6.34	39.44	17.50
	565.000	170.00	0.00	0.00	762.50	400.00	765.47	765.43	765.93	178.95	7.72	55.41	29.90

FR	SECNO	XLCR	ELTTD	CLLC	ELMIN	Q	CMSEL	CMINS	EC	TORQS	VCA	AREA	.CTR
	752.000	137.00	0.00	0.00	763.50	140.00	766.02	0.00	766.15	30.35	2.90	46.36	25.21
	752.000	137.00	0.00	0.00	763.50	210.00	766.47	0.00	766.65	52.49	3.73	62.19	36.54
	752.000	137.00	0.00	0.00	763.50	250.00	766.69	0.00	766.90	53.26	3.70	69.64	45.35
	752.000	137.00	0.00	0.00	763.50	400.00	767.35	0.00	767.57	56.20	4.56	95.88	66.46
	802.000	50.00	0.00	0.00	764.00	140.00	766.10	0.00	766.36	51.93	3.57	39.18	19.43
	802.000	50.00	0.00	0.00	764.00	210.00	766.63	0.00	766.90	52.32	4.15	51.06	29.03
	802.000	50.00	0.00	0.00	764.00	250.00	766.85	0.00	767.15	55.35	4.45	57.25	34.73
	802.000	50.00	0.00	0.00	764.00	400.00	767.51	0.00	767.85	56.70	5.40	81.10	53.46
	827.000	25.00	0.00	0.00	764.25	140.00	766.36	0.00	766.60	86.10	6.57	52.06	15.04
	827.000	25.00	0.00	0.00	764.25	210.00	766.74	0.00	767.12	80.35	6.97	62.23	22.34
	827.000	25.00	0.00	0.00	764.25	250.00	766.95	0.00	767.38	89.58	5.26	67.54	26.41
	827.000	25.00	0.00	0.00	764.25	400.00	767.62	0.00	768.20	92.55	6.42	85.36	41.58
	852.000	25.00	0.00	0.00	764.40	140.00	766.44	0.00	766.99	136.20	5.97	23.65	12.04
	852.000	25.00	0.00	0.00	764.40	210.00	766.80	0.00	767.67	175.14	7.50	27.99	15.96
	852.000	25.00	0.00	0.00	764.40	250.00	766.95	0.00	768.03	198.71	8.35	29.96	17.73
*	852.000	25.00	0.00	0.00	764.40	400.00	767.72	767.72	769.30	213.63	10.89	39.63	27.37
	853.000	1.00	777.50	772.10	764.40	140.00	766.95	0.00	767.02	74.59	5.90	20.54	10.21
	853.000	1.00	777.50	772.10	764.40	210.00	766.82	0.00	767.00	56.40	7.40	26.06	21.59
	853.000	1.00	777.50	772.10	764.40	250.00	766.97	0.00	769.05	110.99	6.33	30.01	23.73
	853.000	1.00	777.50	772.10	764.40	400.00	768.35	0.00	769.46	69.54	0.43	47.46	47.97
	922.000	69.00	777.50	772.20	764.50	140.00	766.87	0.00	767.40	54.65	4.66	30.06	25.75
	922.000	69.00	777.50	772.20	764.50	210.00	768.79	0.00	768.17	36.21	5.45	38.51	34.01
	922.000	69.00	777.50	772.20	764.50	250.00	768.98	0.00	769.62	58.60	5.71	43.00	41.32
	922.000	69.00	777.50	772.20	764.50	400.00	769.13	0.00	769.92	42.22	7.14	56.02	61.36
	923.000	1.00	0.00	0.00	764.30	140.00	767.07	0.00	767.41	60.77	4.66	30.18	17.96
	923.000	1.00	0.00	0.00	764.30	210.00	767.71	0.00	768.21	36.15	5.45	38.54	33.69
	923.000	1.00	0.00	0.00	764.30	250.00	768.11	0.00	768.53	64.26	5.79	43.17	51.19
	923.000	1.00	0.00	0.00	764.30	400.00	769.14	0.00	769.93	74.43	7.12	56.16	46.36
	1025.000	102.00	0.00	0.00	765.60	140.00	768.03	0.00	768.28	107.22	3.62	39.26	13.52
	1025.000	102.00	0.00	0.00	765.60	210.00	768.61	0.00	768.78	47.08	3.32	66.37	30.61
	1025.000	102.00	0.00	0.00	765.60	250.00	768.93	0.00	769.12	52.63	3.10	74.39	43.77
	1025.000	102.00	0.00	0.00	765.60	400.00	770.10	0.00	770.20	56.61	2.96	104.79	104.63
	1100.000	75.00	0.00	0.00	766.50	140.00	768.75	0.00	768.92	79.80	3.52	39.79	15.67
	1100.000	75.00	0.00	0.00	766.50	210.00	769.04	0.00	769.29	96.62	4.06	51.66	21.59
	1100.000	75.00	0.00	0.00	766.50	250.00	769.26	0.00	769.51	31.17	4.03	62.07	27.75
	1100.000	75.00	0.00	0.00	766.50	400.00	771.23	0.00	770.46	31.52	3.03	123.45	71.95
	1175.000	75.00	0.00	0.00	767.40	140.00	769.49	0.00	769.71	166.25	4.79	29.25	10.79
	1175.000	75.00	0.00	0.00	767.40	210.00	769.87	0.00	770.25	159.99	4.03	43.47	16.60
	1175.000	75.00	0.00	0.00	767.40	250.00	770.11	0.00	770.41	168.74	5.08	49.21	19.25
	1175.000	75.00	0.00	0.00	767.40	400.00	770.47	0.00	770.90	135.07	5.73	71.00	34.42
	1325.000	150.00	0.00	0.00	769.20	140.00	771.20	0.00	771.40	78.47	4.21	35.70	15.04
	1325.000	150.00	0.00	0.00	769.20	210.00	771.57	0.00	771.95	65.65	4.99	45.41	27.07
	1325.000	150.00	0.00	0.00	769.20	250.00	771.76	0.00	772.19	87.90	5.23	52.65	26.66
	1325.000	150.00	0.00	0.00	769.20	400.00	772.19	0.00	772.07	111.95	6.77	72.20	57.01

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CUSCL	CRIUS	EG	TOPS	VCH	AREA	.01K
	1485.000	160.00	0.00	0.00	771.20	140.00	772.68	0.00	773.37	181.16	5.59	25.29	10.40
	1485.000	160.00	0.00	0.00	771.20	210.00	774.21	773.73	773.87	164.64	6.20	36.10	16.57
	1485.000	160.00	0.00	0.00	771.20	250.00	775.47	775.37	775.12	154.66	6.50	42.32	19.71
	1485.000	160.00	0.00	0.00	771.20	400.00	774.14	773.97	774.54	136.67	7.09	58.90	30.19
	1512.000	27.00	0.00	0.00	772.00	140.00	773.46	0.00	773.78	117.85	4.51	31.52	12.90
	1512.000	27.00	0.00	0.00	772.00	210.00	773.65	0.00	774.24	107.25	5.03	43.45	20.20
	1512.000	27.00	0.00	0.00	772.00	250.00	774.66	0.00	774.43	102.07	5.25	50.12	24.66
	1512.000	27.00	0.00	0.00	772.00	400.00	774.62	0.00	775.19	102.50	6.15	70.86	50.51
☆	1538.000	26.00	0.00	0.00	773.10	140.00	774.27	774.27	774.75	241.15	5.60	25.00	9.82
☆	1538.000	26.00	0.00	0.00	773.10	210.00	774.59	774.59	775.19	227.59	6.24	33.65	13.92
☆	1538.000	26.00	0.00	0.00	773.10	250.00	774.75	774.75	775.41	219.66	6.50	38.44	16.07
☆	1538.000	26.00	0.00	0.00	773.10	400.00	775.23	775.23	776.10	204.20	7.33	56.28	27.06
☆	1560.000	30.00	0.00	0.00	774.30	140.00	775.38	775.38	775.85	248.55	5.49	25.50	9.96
☆	1560.000	30.00	0.00	0.00	774.30	210.00	775.69	775.69	776.27	230.23	6.12	34.30	13.64
☆	1560.000	30.00	0.00	0.00	774.30	250.00	775.84	775.84	776.43	222.68	6.40	39.06	16.75
☆	1560.000	30.00	0.00	0.00	774.30	400.00	776.35	776.35	777.15	203.59	7.17	55.76	26.03
	1569.000	1.00	787.70	786.70	774.30	140.00	775.81	0.00	776.34	70.99	4.31	31.96	12.62
	1569.000	1.00	787.70	786.70	774.30	210.00	776.08	0.00	776.54	65.59	4.63	43.19	19.05
	1569.000	1.00	787.70	786.70	774.30	250.00	776.15	0.00	776.56	65.39	5.12	48.87	30.92
	1569.000	1.00	787.70	786.70	774.30	400.00	776.73	0.00	777.24	60.67	5.77	69.29	51.36
	1621.000	52.00	787.70	786.40	774.30	140.00	775.82	0.00	776.36	93.69	4.51	29.90	14.47
	1621.000	52.00	787.70	786.40	774.30	210.00	776.10	0.00	776.79	80.73	5.40	38.27	22.17
	1621.000	52.00	787.70	786.40	774.30	250.00	776.30	0.00	777.00	87.79	5.86	47.14	26.68
	1621.000	52.00	787.70	786.40	774.30	400.00	777.03	0.00	777.67	83.65	6.43	62.23	43.73
	1622.000	1.00	0.00	0.00	774.30	140.00	776.02	0.00	776.38	164.42	4.79	29.21	10.92
	1622.000	1.00	0.00	0.00	774.30	210.00	776.25	0.00	776.50	150.36	5.39	38.96	16.69
	1622.000	1.00	0.00	0.00	774.30	250.00	776.31	0.00	777.01	159.19	5.45	46.22	20.07
	1622.000	1.00	0.00	0.00	774.30	400.00	777.13	0.00	777.70	136.20	6.20	66.51	34.32
☆	1631.000	9.00	0.00	0.00	775.10	140.00	776.13	776.13	776.65	246.16	5.49	25.52	8.92
☆	1631.000	9.00	0.00	0.00	775.10	210.00	776.49	776.49	777.07	230.23	6.12	34.30	13.64
☆	1631.000	9.00	0.00	0.00	775.10	250.00	776.67	776.67	777.26	223.09	6.41	39.99	16.71
	1631.000	9.00	0.00	0.00	775.10	400.00	777.13	777.13	777.95	205.16	7.19	55.60	27.92
	1632.000	1.00	789.90	788.90	775.10	140.00	776.42	0.00	776.71	70.43	4.37	32.03	16.56
	1632.000	1.00	789.90	788.90	775.10	210.00	776.78	0.00	777.14	65.96	4.36	43.19	25.05
	1632.000	1.00	789.90	788.90	775.10	250.00	776.95	0.00	777.36	65.67	5.12	48.79	30.05
	1632.000	1.00	789.90	788.90	775.10	400.00	777.53	0.00	778.04	60.56	5.77	69.33	51.70
	1659.000	27.00	789.90	784.30	775.50	140.00	776.39	776.56	777.08	137.92	5.46	25.55	11.92
	1659.000	27.00	789.90	784.30	775.50	210.00	776.92	0.00	777.46	116.24	5.90	35.58	19.20
	1659.000	27.00	789.90	784.30	775.50	250.00	777.09	0.00	777.67	110.46	6.13	40.79	23.79
	1659.000	27.00	789.90	784.30	775.50	400.00	777.63	0.00	778.35	97.23	6.78	59.04	40.57
	1660.000	1.00	0.00	0.00	775.50	140.00	776.07	0.00	777.12	119.79	4.31	32.51	12.39
	1660.000	1.00	0.00	0.00	775.50	210.00	776.34	0.00	777.48	105.65	5.89	35.66	14.64
	1660.000	1.00	0.00	0.00	775.50	250.00	777.11	0.00	777.69	196.05	6.13	40.81	17.86
	1660.000	1.00	0.00	0.00	775.50	400.00	777.65	0.00	778.36	173.14	6.78	59.00	30.40

	SECNO	XLCN	ELTRD	ELLC	ELUIN	Q	CLSEL	CRIMS	EG	TCK*S	VCH	ARCA	.01K
*	1690.000	30.00	0.00	0.00	776.20	140.00	777.24	777.23	777.75	245.97	5.49	25.52	8.93
*	1690.000	30.00	0.00	0.00	776.20	210.00	777.59	777.59	778.17	327.51	6.10	34.43	13.92
*	1690.000	30.00	0.00	0.00	776.20	250.00	777.79	777.79	778.36	220.30	6.37	39.23	15.86
*	1690.000	30.00	0.00	0.00	776.20	400.00	778.27	778.27	778.85	207.29	7.10	55.09	27.98
	1720.000	30.00	0.00	0.00	776.90	140.00	778.02	0.00	778.45	210.03	5.27	26.57	9.45
*	1720.000	30.00	0.00	0.00	776.90	210.00	778.29	778.29	778.87	229.08	6.11	34.35	13.87
*	1720.000	30.00	0.00	0.00	776.90	250.00	778.44	778.42	779.00	225.77	6.41	39.00	15.91
*	1720.000	30.00	0.00	0.00	776.90	400.00	778.97	778.96	779.75	206.90	7.21	55.64	27.11
	1750.000	30.00	0.00	0.00	777.60	140.00	778.68	778.68	779.15	246.22	5.47	25.58	8.96
*	1750.000	30.00	0.00	0.00	777.60	210.00	778.99	778.99	779.57	230.81	6.15	34.27	13.82
*	1750.000	30.00	0.00	0.00	777.60	250.00	779.14	779.14	779.70	222.00	6.39	39.11	16.78
*	1750.000	30.00	0.00	0.00	777.60	400.00	779.64	779.63	780.45	206.90	7.21	55.66	27.91
	1796.000	44.00	789.20	789.20	783.00	140.00	791.17	0.00	791.10	2.36	1.23	236.72	91.46
	1794.000	44.00	789.20	789.20	783.00	210.00	791.76	0.00	791.78	2.69	1.40	295.95	128.10
	1794.000	44.00	789.20	789.20	783.00	250.00	791.91	0.00	791.94	3.30	1.68	310.16	137.59
	1794.000	44.00	789.20	789.20	783.00	400.00	792.33	0.00	792.38	5.73	2.56	352.10	167.08
	1694.000	100.00	0.00	0.00	787.60	140.00	791.17	0.00	791.19	0.26	0.49	268.06	203.12
	1694.000	100.00	0.00	0.00	787.60	210.00	791.69	0.00	791.79	0.3	0.62	339.07	342.31
	1694.000	100.00	0.00	0.00	787.60	250.00	791.94	0.00	791.95	0.47	0.71	354.62	369.21
	1894.000	100.00	0.00	0.00	787.60	400.00	792.39	0.00	792.41	0.85	1.02	419.97	435.13
	2300.000	406.00	0.00	0.00	769.30	140.00	791.03	0.00	791.25	6.60	1.46	94.77	54.50
	2300.000	406.00	0.00	0.00	769.30	210.00	791.62	0.00	791.74	5.53	1.59	132.67	89.12
	2300.000	406.00	0.00	0.00	769.30	250.00	791.91	0.00	792.01	6.27	1.75	143.26	99.84
	2300.000	406.00	0.00	0.00	769.30	400.00	792.42	0.00	792.50	8.37	2.29	175.73	138.28
*	2784.000	464.00	0.00	0.00	791.00	140.00	791.93	791.93	792.33	135.98	5.11	29.93	10.27
	2784.000	464.00	0.00	0.00	791.00	210.00	792.28	0.00	792.70	196.91	5.83	43.09	15.04
	2784.000	464.00	0.00	0.00	791.00	250.00	792.46	0.00	792.91	183.06	5.35	54.45	24.15
	2784.000	464.00	0.00	0.00	791.00	400.00	792.99	0.00	793.05	201.71	5.87	83.17	45.29
*	2824.000	40.00	0.00	0.00	791.60	140.00	793.23	793.23	793.80	171.03	6.05	23.30	10.71
*	2824.000	40.00	0.00	0.00	791.60	210.00	793.56	793.56	794.32	157.43	6.93	31.28	16.74
*	2824.000	40.00	0.00	0.00	791.60	250.00	793.77	793.77	794.59	149.05	7.34	35.99	20.00
*	2824.000	40.00	0.00	0.00	791.60	400.00	794.40	794.40	795.47	129.61	8.40	53.00	35.11
*	2864.000	40.00	0.00	0.00	791.90	140.00	794.32	794.32	795.58	210.15	8.26	16.96	9.66
*	2864.000	40.00	0.00	0.00	791.90	210.00	794.96	794.96	796.36	210.03	9.50	22.11	14.49
*	2864.000	40.00	0.00	0.00	791.90	250.00	795.30	795.30	796.58	209.94	10.07	24.84	17.25
*	2864.000	40.00	0.00	0.00	791.90	400.00	796.41	796.45	798.60	215.54	11.77	33.99	27.37
	2865.000	1.00	801.00	797.80	791.90	140.00	794.78	0.00	795.49	36.73	6.86	20.66	15.63
	2865.000	1.00	801.00	797.80	791.90	210.00	794.98	794.92	796.38	163.72	9.49	22.15	16.44
	2865.000	1.00	801.00	797.80	791.90	250.00	795.31	795.28	796.91	167.96	10.15	24.63	19.29
*	2865.000	1.00	801.00	797.80	791.90	400.00	796.30	796.30	798.83	236.56	12.76	31.36	25.90
	2901.000	36.00	801.00	797.80	791.90	140.00	795.09	0.00	795.80	53.67	5.72	24.47	19.11
	2901.000	36.00	801.00	797.80	791.90	210.00	795.23	0.00	796.95	68.91	6.01	30.65	25.30
	2901.000	36.00	801.00	797.80	791.90	250.00	796.66	0.00	797.52	76.49	7.44	33.60	28.59
	2901.000	36.00	801.00	797.80	791.90	400.00	798.12	0.00	799.91	241.21	10.74	37.24	25.75

SECND	XLCH	ELTRD	ELLC	ELMIN	Q	CUSEL	CRISS	EG	TOK*S	VCH	ARSA	.UTK
2902.000	1.00	0.00	0.00	791.90	140.00	795.32	0.00	795.81	64.68	5.60	24.99	17.41
2902.000	1.00	0.00	0.00	791.90	210.00	796.36	0.00	796.99	51.67	6.20	35.45	24.72
2902.000	1.00	0.00	0.00	791.90	250.00	796.90	0.00	797.50	62.19	6.56	37.63	31.70
2902.000	1.00	0.00	0.00	791.90	400.00	799.62	0.00	800.24	46.21	6.83	50.55	52.14
2922.000	20.00	0.00	0.00	793.20	140.00	795.92	0.00	795.97	5.21	1.67	83.80	61.36
2922.000	20.00	0.00	0.00	793.20	210.00	797.16	0.00	797.18	3.25	1.62	129.37	116.47
2922.000	20.00	0.00	0.00	793.20	250.00	797.76	0.00	797.79	2.76	1.62	154.39	157.51
2922.000	20.00	0.00	0.00	793.20	400.00	800.42	0.00	800.45	1.14	1.69	279.69	376.44
2957.000	35.00	805.90	805.90	804.00	140.00	806.52	0.00	806.59	6.70	2.21	106.52	53.73
2957.000	35.00	805.90	805.90	804.00	210.00	809.36	0.00	809.41	5.32	2.20	201.76	91.07
2957.000	35.00	805.90	805.90	804.00	250.00	809.77	0.00	809.81	4.79	2.20	247.67	114.24
2957.000	35.00	805.90	805.90	804.00	400.00	810.21	0.00	810.56	7.61	2.90	304.95	145.54
3230.000	323.00	0.00	0.00	804.20	140.00	806.67	0.00	806.80	1.15	0.96	250.74	131.72
3230.000	323.00	0.00	0.00	804.20	210.00	809.47	0.00	809.69	1.05	1.02	463.11	207.39
3230.000	323.00	0.00	0.00	804.20	250.00	809.87	0.00	809.86	0.92	1.01	633.62	261.00
3230.000	323.00	0.00	0.00	804.20	400.00	810.44	0.00	810.45	1.16	1.23	926.14	371.12
4260.000	1300.00	0.00	0.00	807.20	140.00	809.90	0.00	809.95	7.21	1.29	112.60	52.14
4260.000	1300.00	0.00	0.00	807.20	210.00	809.67	0.00	809.71	3.16	1.14	167.77	114.17
4260.000	1300.00	0.00	0.00	807.20	250.00	810.05	0.00	810.07	2.45	1.15	229.40	159.66
4260.000	1300.00	0.00	0.00	807.20	400.00	810.65	0.00	810.68	2.80	1.42	298.80	230.64
4592.000	316.00	0.00	0.00	808.30	140.00	809.31	809.31	809.77	224.75	4.06	38.69	9.24
4592.000	316.00	0.00	0.00	808.30	210.00	809.96	0.00	810.05	95.72	3.57	59.56	21.45
4592.000	316.00	0.00	0.00	808.30	250.00	810.17	0.00	810.31	66.76	3.02	84.28	36.55
4592.000	318.00	0.00	0.00	806.50	400.00	810.76	0.00	810.92	26.80	2.97	137.81	77.27
4916.000	316.00	0.00	0.00	809.70	140.00	811.29	0.00	811.36	21.18	2.16	67.87	30.42
4916.000	316.00	0.00	0.00	809.70	210.00	811.47	0.00	811.59	29.15	2.79	79.81	41.90
4916.000	316.00	0.00	0.00	809.70	250.00	811.91	0.00	811.96	33.39	3.25	81.96	48.35
4916.000	316.00	0.00	0.00	809.70	400.00	812.51	0.00	812.58	49.86	6.21	105.66	87.11
5234.000	318.00	0.00	0.00	811.50	140.00	812.54	0.00	812.34	144.25	4.36	33.69	11.66
5234.000	318.00	0.00	0.00	811.50	210.00	812.88	0.00	813.09	96.17	4.52	50.61	21.41
5234.000	318.00	0.00	0.00	811.50	250.00	813.11	0.00	813.39	77.42	4.33	61.47	28.11
5234.000	318.00	0.00	0.00	811.50	400.00	813.58	0.00	813.97	69.85	5.26	82.79	47.26
5552.000	318.00	0.00	0.00	813.00	140.00	814.67	0.00	814.82	34.54	3.14	51.46	25.39
5552.000	318.00	0.00	0.00	813.00	210.00	814.93	0.00	815.16	43.07	3.94	63.61	32.00
5552.000	318.00	0.00	0.00	813.00	250.00	815.06	0.00	815.32	49.10	4.39	69.87	35.65
5552.000	318.00	0.00	0.00	813.00	400.00	815.51	0.00	815.93	55.16	5.63	93.81	55.16
5872.000	320.00	0.00	0.00	813.30	140.00	816.08	0.00	816.14	47.93	4.22	41.27	20.22
5872.000	320.00	0.00	0.00	813.30	210.00	816.50	0.00	816.64	44.14	4.89	58.65	30.67
5872.000	320.00	0.00	0.00	813.30	250.00	816.52	0.00	816.90	48.14	5.20	60.30	36.03
5872.000	320.00	0.00	0.00	813.30	400.00	817.11	0.00	817.55	46.95	5.96	118.47	50.38
6292.000	420.00	0.00	0.00	816.00	140.00	817.87	0.00	818.00	45.29	3.77	39.08	20.93
6292.000	420.00	0.00	0.00	816.00	210.00	818.27	0.00	818.57	44.81	4.37	56.31	31.37
6292.000	420.00	0.00	0.00	816.00	250.00	818.69	0.00	818.87	46.39	4.66	63.02	37.52
6292.000	420.00	0.00	0.00	816.00	400.00	819.05	0.00	819.53	49.63	5.74	90.85	56.78

SECNO	XLOW	CLERD	ELLC	ELMIN	D	CRSEL	CRIUS	EG	CORES	VCN	AREA	.DIR
6712.000	420.00	0.00	0.00	818.00	160.00	819.89	0.00	820.12	52.00	3.84	37.12	19.40
6712.000	420.00	0.00	0.00	818.00	210.00	820.29	0.00	820.59	51.72	4.46	50.09	27.20
6712.000	420.00	0.00	0.00	818.00	250.00	820.62	0.00	820.83	51.77	4.77	57.62	34.75
6712.000	420.00	0.00	0.00	818.00	400.00	821.11	0.00	821.31	50.91	5.00	87.70	57.19
7132.000	420.00	0.00	0.00	819.90	160.00	822.22	0.00	822.51	61.24	4.30	32.60	17.89
7132.000	420.00	0.00	0.00	819.90	210.00	822.65	0.00	823.03	64.58	4.97	42.34	26.13
7132.000	420.00	0.00	0.00	819.90	250.00	822.98	0.00	823.29	65.07	5.51	47.57	33.12
7132.000	420.00	0.00	0.00	819.90	400.00	823.48	0.00	823.70	72.70	6.62	64.20	46.91
7332.000	200.00	0.00	0.00	819.90	160.00	822.99	0.00	823.11	17.14	2.79	50.58	33.62
7332.000	200.00	0.00	0.00	819.90	210.00	823.52	0.00	823.69	16.77	3.29	65.79	48.47
7332.000	200.00	0.00	0.00	819.90	250.00	823.78	0.00	823.97	19.62	3.56	73.83	56.44
7332.000	200.00	0.00	0.00	819.90	400.00	824.58	0.00	824.86	21.79	4.27	102.05	85.09
7532.000	200.00	0.00	0.00	819.90	160.00	823.29	0.00	823.50	11.12	2.62	59.13	41.05
7532.000	200.00	0.00	0.00	819.90	210.00	823.87	0.00	824.00	12.50	2.87	76.77	59.59
7532.000	200.00	0.00	0.00	819.90	250.00	824.15	0.00	824.30	13.12	3.08	86.27	69.01
7532.000	200.00	0.00	0.00	819.90	400.00	825.01	0.00	825.22	14.23	3.76	123.35	106.02
7802.000	260.00	0.00	0.00	819.00	160.00	824.47	0.00	825.69	1.47	1.07	370.68	113.05
7802.000	260.00	0.00	0.00	819.00	210.00	824.99	0.00	826.11	1.76	1.21	2.5.09	158.29
7802.000	260.00	0.00	0.00	819.00	250.00	824.29	0.00	826.41	1.65	1.25	575.02	194.77
7800.000	260.00	0.00	0.00	819.00	400.00	825.31	0.00	825.35	1.38	1.33	669.07	340.62
7990.000	190.00	0.00	0.00	819.90	160.00	823.52	0.00	823.56	5.61	1.69	260.76	77.05
7990.000	190.00	0.00	0.00	819.90	210.00	824.14	0.00	826.15	2.07	1.67	308.4	123.01
7990.000	190.00	0.00	0.00	819.90	250.00	824.63	0.00	824.46	2.67	1.61	469.09	153.09
7990.000	190.00	0.00	0.00	819.90	400.00	825.35	0.00	825.36	2.35	1.76	641.77	261.16
8034.000	44.00	824.60	821.90	820.10	140.00	825.47	0.00	825.48	0.25	0.61	667.05	277.60
8034.000	44.00	824.60	821.90	820.10	210.00	825.71	0.00	825.72	0.46	0.87	717.92	311.35
8034.000	44.00	824.60	821.90	819.70	250.00	825.84	0.00	825.84	0.58	0.96	743.94	329.04
8034.000	44.00	824.60	821.90	819.70	400.00	826.25	0.00	826.25	1.05	1.36	830.16	395.17
8084.000	50.00	0.30	0.00	820.10	140.00	825.46	0.00	825.46	0.25	0.61	669.80	279.74
8084.000	50.00	0.00	0.00	820.10	210.00	825.72	0.00	825.72	0.45	0.84	719.16	312.07
8084.000	50.00	0.30	0.00	819.70	250.00	825.87	0.00	825.86	0.57	0.96	744.97	329.75
8084.000	50.00	0.00	0.00	819.70	400.00	826.26	0.00	826.25	1.07	1.35	832.51	391.18

COMSTOCK CREEK-COMSTOCK

SUMMARY PRINTOUT TABLE 150

	SELNO	Q	Q SEL	DIFMED	DIF SX	DIFSQR	TOPWID	ELDEP
	100.000	140.00	764.00	0.00	0.00	0.00	135.00	0.00
	100.000	210.00	764.00	0.00	0.00	0.00	135.00	0.00
	100.000	250.00	764.00	0.00	0.00	0.00	135.00	0.00
	100.000	400.00	764.00	0.00	0.00	0.00	135.00	0.00
	140.000	140.00	764.03	0.00	0.03	0.00	152.62	40.00
	140.000	210.00	764.06	0.00	0.06	0.00	153.87	40.00
	140.000	250.00	764.09	0.00	0.09	0.00	155.53	40.00
	140.000	400.00	764.25	0.00	0.25	0.00	162.97	40.00
	175.000	140.00	764.06	0.00	0.11	0.00	152.36	35.00
	175.000	210.00	764.09	0.00	0.03	0.00	155.66	35.00
	175.000	250.00	764.13	0.00	0.04	0.00	157.45	35.00
	175.000	400.00	764.34	0.00	0.03	0.00	166.97	35.00
	180.000	140.00	764.09	0.00	0.13	0.00	141.97	5.00
*	180.000	210.00	764.13	0.00	0.03	0.00	143.66	5.00
*	180.000	250.00	764.15	0.00	0.02	0.00	156.12	5.00
*	180.000	400.00	764.41	0.00	0.03	0.00	165.12	5.00
	185.000	140.00	764.12	0.00	0.03	0.00	137.71	5.00
	185.000	210.00	764.17	0.00	0.04	0.00	139.86	5.00
	185.000	250.00	764.19	0.00	0.02	0.00	140.72	5.00
	185.000	400.00	764.29	0.00	0.09	0.00	145.25	5.00
	225.000	140.00	764.15	0.00	0.01	0.00	150.26	40.00
	225.000	210.00	764.17	0.00	0.02	0.00	163.07	40.00
	225.000	250.00	764.19	0.00	0.02	0.00	165.23	40.00
	225.000	400.00	764.29	0.00	0.09	0.00	165.92	40.00
	395.000	140.00	764.21	0.00	0.06	0.00	80.55	170.00
	395.000	210.00	764.43	0.00	0.09	0.00	81.50	170.00
	395.000	250.00	764.57	0.00	0.11	0.00	81.03	170.00
	395.000	400.00	765.24	0.00	0.16	0.00	82.70	170.00
	565.000	140.00	764.44	0.00	0.23	0.00	25.65	170.00
	565.000	210.00	764.81	0.00	0.32	0.00	27.12	170.00
	565.000	250.00	764.99	0.00	0.37	0.00	28.61	170.00
	565.000	400.00	765.47	0.00	0.42	0.00	36.03	170.00
	752.000	140.00	766.24	0.00	1.53	0.00	20.19	187.00
	752.000	210.00	766.47	0.00	1.66	0.00	33.78	187.00
	752.000	250.00	766.69	0.00	1.70	0.00	36.19	187.00
	752.000	400.00	767.35	0.00	1.88	0.00	43.55	187.00
	802.000	140.00	766.19	0.00	2.16	0.00	24.12	50.00
	802.000	210.00	766.63	0.00	2.14	0.00	27.77	50.00
	802.000	250.00	766.85	0.00	2.16	0.00	29.30	50.00
	802.000	400.00	767.51	0.00	0.16	0.00	33.19	50.00
	827.000	140.00	766.30	0.00	2.12	0.00	21.05	25.00
	827.000	210.00	766.74	0.00	0.11	0.00	26.71	25.00
	827.000	250.00	766.96	0.00	0.11	0.00	28.28	25.00
	827.000	400.00	767.62	0.00	0.17	0.00	28.82	25.00

SECNO	R	CUSEL	DIFUSP	DIFUSX	DIFXUS	TOPDIC	XLCH
852.000	140.00	766.44	0.00	0.14	0.00	12.60	25.00
852.000	210.00	766.[illegible]	0.00	0.06	0.00	12.60	25.00
852.000	250.00	766.[illegible]	0.00	-0.01	0.00	12.60	25.00
852.000	400.00	767.[illegible]	0.00	0.11	0.00	12.60	25.00
853.000	140.00	766.45	0.00	0.02	0.00	12.60	1.00
853.000	210.00	766.82	0.00	0.02	0.00	12.60	1.00
853.000	250.00	766.97	0.00	0.02	0.00	12.60	1.00
853.000	400.00	766.35	0.00	0.63	0.00	12.60	1.00
922.000	140.00	767.07	0.00	0.61	0.00	12.60	69.00
922.000	210.00	767.73	0.00	0.91	0.00	12.60	69.00
922.000	250.00	768.10	0.00	1.15	0.00	12.60	69.00
922.000	400.00	769.1[illegible]	0.00	0.77	0.00	12.60	69.00
923.000	140.00	767.07	0.00	0.01	0.00	12.60	1.00
923.000	210.00	767.73	0.00	0.01	0.00	12.60	1.00
923.000	250.00	768.11	0.00	0.01	0.00	12.60	1.00
923.000	400.00	769.14	0.00	0.01	0.00	12.60	1.00
1025.000	140.00	768.0[illegible]	0.00	0.9[illegible]	0.00	64.49	102.00
1025.000	210.00	768.61	0.00	0.[illegible]	0.00	69.01	102.00
1025.000	250.00	768.96	0.00	0.86	0.00	55.86	102.00
1025.000	400.00	770.15	0.00	1.01	0.00	81.56	102.00
1100.000	140.00	768.7[illegible]	0.00	0.7[illegible]	0.00	75.[illegible]	75.00
1100.000	210.00	769.[illegible]	0.00	0.42	0.00	62.[illegible]	75.00
1100.000	250.00	769.26	0.00	0.[illegible]	0.00	57.[illegible]	75.00
1100.000	400.00	770.25	0.00	0.10	0.00	75.55	75.00
1175.000	140.00	769.45	0.00	0.73	0.00	26.27	75.00
1175.000	210.00	769.37	0.00	0.[illegible]	0.00	40.[illegible]	75.00
1175.000	250.00	770.31	0.00	0.75	0.00	44.[illegible]	75.00
1175.000	400.00	770.47	0.00	0.7[illegible]	0.00	49.7[illegible]	75.00
1325.000	140.00	771.20	0.00	1.73	0.00	27.03	150.00
1325.000	210.00	771.57	0.00	1.70	0.00	36.33	150.00
1325.000	250.00	771.76	0.00	1.76	0.00	41.03	150.00
1325.000	400.00	772.19	0.00	1.72	0.00	[illegible]	150.00
1485.000	140.00	772.88	0.00	1.68	0.00	23.62	160.00
1485.000	210.00	773.28	0.00	1.71	0.00	31.05	160.00
1485.000	250.00	773.47	0.00	1.71	0.00	34.60	160.00
1485.000	400.00	774.12	0.00	1.[illegible]	0.00	46.[illegible]	160.00
1512.000	140.00	773.46	0.00	0.[illegible]	0.00	2[illegible].3[illegible]	27.00
1512.000	210.00	773.85	0.00	0.58	0.00	32.15	27.00
1512.000	250.00	774.06	0.00	0.59	0.00	34.08	27.00
1512.000	400.00	774.62	0.00	0.50	0.00	39.58	27.00
* 1538.000	140.00	774.27	0.00	0.[illegible]	0.00	2[illegible].[illegible]	26.00
* 1538.000	210.00	774.59	0.00	0.73	0.00	[illegible]	26.00
* 1538.000	250.00	774.75	0.00	0.70	0.00	29.50	26.00
* 1538.000	400.00	775.26	0.00	0.64	0.00	33.3[illegible]	26.00

	SECNO	C	CJSEL	DIFUSP	DIFUSX	DIFUSS	TOPWID	XLCH
*	1568.000	140.00	775.38	0.00	1.11	0.00	27.61	30.00
*	1568.000	210.00	775.89	0.00	1.15	0.00	29.18	30.00
*	1568.000	250.00	776.24	0.00	1.01	0.00	30.14	30.00
*	1568.000	400.00	776.37	0.00	0.84	0.00	34.67	30.00
	1569.000	140.00	775.61	0.00	0.23	0.00	29.29	1.00
	1569.000	210.00	775.93	0.00	0.29	0.00	32.01	1.00
	1569.000	250.00	776.14	0.00	0.27	0.00	33.50	1.00
	1569.000	400.00	776.75	0.00	0.21	0.00	37.15	1.00
	1621.000	140.00	776.00	0.00	0.59	0.00	28.56	52.00
	1621.000	210.00	776.35	0.00	0.35	0.00	30.99	52.00
	1621.000	250.00	776.50	0.00	0.35	0.00	32.23	52.00
	1621.000	400.00	777.15	0.00	0.27	0.00	36.19	52.00
	1622.000	140.00	776.11	0.00	1.12	0.00	28.59	1.00
	1622.000	210.00	776.35	0.00	0.01	0.00	31.02	1.00
	1622.000	250.00	776.51	0.00	0.01	0.00	32.25	1.00
	1622.000	400.00	777.10	0.00	0.07	0.00	36.32	1.00
*	1631.000	140.00	776.16	0.00	1.15	0.00	27.64	9.00
*	1631.000	210.00	776.49	0.00	0.14	0.00	29.64	9.00
*	1631.000	250.00	776.64	0.00	0.13	0.00	31.13	9.00
	1631.000	400.00	777.15	0.00	0.04	0.00	34.77	9.00
	1632.000	140.00	776.42	0.00	1.23	0.00	28.11	1.00
	1632.000	210.00	776.73	0.00	0.29	0.00	32.01	1.00
	1632.000	250.00	776.93	0.00	0.27	0.00	33.29	1.00
	1632.000	400.00	777.53	0.00	0.38	0.00	37.15	1.00
	1659.000	140.00	776.59	0.00	0.17	0.00	27.63	27.00
	1659.000	210.00	776.92	0.00	0.14	0.00	30.30	27.00
	1659.000	250.00	777.09	0.00	0.14	0.00	31.44	27.00
	1659.000	400.00	777.67	0.00	0.11	0.00	35.49	27.00
	1660.000	140.00	776.03	0.00	0.24	0.00	29.64	1.00
	1660.000	210.00	776.94	0.00	0.02	0.00	30.21	1.00
	1660.000	250.00	777.11	0.00	0.02	0.00	31.41	1.00
	1660.000	400.00	777.69	0.00	0.01	0.00	35.46	1.00
*	1690.000	140.00	777.28	0.00	0.45	0.00	27.62	30.00
*	1690.000	210.00	777.59	0.00	0.65	0.00	29.92	30.00
*	1690.000	250.00	777.75	0.00	0.64	0.00	31.13	30.00
*	1690.000	400.00	778.25	0.00	0.62	0.00	34.79	30.00
	1720.000	140.00	776.32	0.00	0.75	0.00	27.90	30.00
*	1720.000	210.00	776.29	0.00	0.73	0.00	29.90	30.00
*	1720.000	250.00	776.44	0.00	0.69	0.00	31.03	30.00
*	1720.000	400.00	776.94	0.00	0.69	0.00	34.74	30.00
	1750.000	140.00	776.65	0.00	0.57	0.00	27.63	27.00
*	1750.000	210.00	776.99	0.00	0.70	0.00	29.67	30.00
*	1750.000	250.00	779.14	0.00	0.70	0.00	31.05	30.00
*	1750.000	400.00	779.64	0.00	0.70	0.00	34.74	30.00

	SECNO	Q	CMSEL	DIFMSP	DIFMSX	DIFMMS	TOPWID	XLCH
	1794.000	140.00	791.17	0.00	12.49	0.00	100.00	44.00
	1794.000	210.00	791.73	0.00	12.78	0.00	100.00	44.00
	1794.000	250.00	791.9[illegible]	0.00	12.77	0.00	100.00	44.00
	1794.000	400.00	792.3[illegible]	0.00	12.69	0.00	100.00	44.00
	1894.000	140.00	791.19	0.00	0.02	0.00	83.07	100.00
	1894.000	210.00	791.79	0.00	0.02	0.00	88.18	100.00
	1894.000	250.00	791.94	0.00	0.03	0.00	111.1[illegible]	100.00
	1894.000	400.00	792.3[illegible]	0.00	0.06	0.00	1[illegible].9[illegible]	100.00
	2300.000	140.00	791.20	0.00	0.01	0.00	59.71	406.00
	2300.000	210.00	791.80	0.00	0.02	0.00	65.94	406.00
	2300.000	250.00	791.96	0.00	0.02	0.00	67.61	406.00
	2300.000	400.00	792.62	0.00	0.03	0.00	73.6[illegible]	406.00
*	2784.000	140.00	791.9[illegible]	0.00	0.[illegible]	0.00	41.22	404.00
	2784.000	210.00	792.26	0.00	0.46	0.00	45.32	404.00
	2784.000	250.00	792.46	0.00	0.52	0.00	48.15	404.00
	2784.000	400.00	793.05	0.00	0.63	0.00	55.22	404.00
*	2824.000	140.00	793.2[illegible]	0.00	[illegible]	0.00	21.[illegible]	40.00
*	2824.000	210.00	793.5[illegible]	0.00	[illegible]	0.00	[illegible]	40.00
*	2824.000	250.00	793.77	0.00	1.2[illegible]	0.00	25.[illegible]	40.00
*	2824.000	400.00	794.40	0.00	1.34	0.00	29.31	40.00
*	2864.000	140.00	794.3[illegible]	0.00	1.0[illegible]	0.00	[illegible]	40.00
*	2864.000	210.00	795.96	0.00	1.3[illegible]	0.00	[illegible]	40.00
*	2864.000	250.00	795.3[illegible]	0.00	1.53	0.00	[illegible]	40.00
*	2864.000	400.00	796.45	0.00	2.05	0.00	8.00	40.00
	2865.000	140.00	794.76	0.00	0.45	0.00	8.00	1.00
	2865.000	210.00	794.9[illegible]	0.00	[illegible].02	0.00	[illegible]	1.00
	2865.000	250.00	795.3[illegible]	0.00	[illegible].05	0.00	[illegible]	1.00
*	2865.000	400.00	796.7[illegible]	0.00	-[illegible]	0.00	[illegible]	1.00
	2901.000	140.00	795.29	0.00	0.53	0.00	8.00	36.00
	2901.000	210.00	796.23	0.00	1.25	0.00	8.00	36.00
	2901.000	250.00	796.66	0.00	1.[illegible]	0.00	[illegible]	36.00
	2901.000	400.00	79[illegible].12	0.00	1.12	0.00	[illegible]	36.00
	2902.000	140.00	795.32	0.00	0.03	0.00	8.00	1.00
	2902.000	210.00	796.30	0.00	0.15	0.00	8.00	1.00
	2902.000	250.00	796.90	0.00	0.23	0.00	8.00	1.00
	2902.000	400.00	799.5[illegible]	0.00	1.40	0.00	[illegible]	[illegible]
	2922.000	140.00	795.92	0.00	0.60	0.00	[illegible]	20.00
	2922.000	210.00	797.14	0.00	0.76	0.00	39.70	20.00
	2922.000	250.00	797.75	0.00	0.85	0.00	41.[illegible]	20.00
	2922.000	400.00	800.42	0.00	0.90	0.00	51.92	20.00
	2957.000	140.00	80[illegible].98	0.00	12.50	0.00	112.00	35.00
	2957.000	210.00	80[illegible].3[illegible]	0.00	12.22	0.00	112.0[illegible]	35.00
	2957.000	250.00	809.77	0.00	12.02	0.00	112.00	35.00
	2957.000	400.00	810.25	0.00	9.86	0.00	112.00	35.00

SECOD	Q	CMSEL	DIFUSP	DIFMSX	DIFKUS	TOPWID	XLCM
3280.000	140.00	808.67	0.00	0.15	0.00	187.46	323.00
3280.000	210.00	809.47	0.00	0.12	0.00	319.47	323.00
3280.000	250.00	809.87	0.00	0.11	0.00	406.02	323.00
3280.000	400.00	810.44	0.00	0.10	0.00	542.20	323.00
4280.000	140.00	808.96	0.00	0.29	0.00	99.37	1300.00
4280.000	210.00	809.68	0.00	0.21	0.00	100.56	1300.00
4280.000	250.00	810.15	0.00	0.17	0.00	155.57	1300.00
4280.000	400.00	810.65	0.00	0.29	0.00	131.46	1300.00
4598.000	140.00	809.51	0.00	0.55	0.00	67.74	318.00
4598.000	210.00	809.85	0.00	0.16	0.00	75.31	318.00
4598.000	250.00	810.17	0.00	0.12	0.00	82.37	318.00
4598.000	400.00	810.78	0.00	0.13	0.00	92.89	318.00
4916.000	140.00	811.29	0.00	1.77	0.00	65.12	318.00
4916.000	210.00	811.47	0.00	1.62	0.00	67.61	318.00
4916.000	250.00	811.50	0.00	1.33	0.00	68.01	318.00
4916.000	400.00	811.81	0.00	1.03	0.00	72.27	318.00
5234.000	140.00	812.54	0.00	1.25	0.00	47.32	318.00
5234.000	210.00	812.85	0.00	1.41	0.00	52.01	318.00
5234.000	250.00	813.08	0.00	1.56	0.00	54.77	318.00
5234.000	400.00	813.56	0.00	1.76	0.00	61.18	318.00
5552.000	140.00	814.67	0.00	2.03	0.00	45.06	318.00
5552.000	210.00	814.95	0.00	2.35	0.00	46.40	318.00
5552.000	250.00	815.04	0.00	1.96	0.00	49.78	318.00
5552.000	400.00	815.51	0.00	1.95	0.00	55.85	318.00
5872.000	140.00	815.88	0.00	1.21	0.00	36.88	320.00
5872.000	210.00	816.10	0.00	1.37	0.00	44.37	320.00
5872.000	250.00	816.52	0.00	1.46	0.00	73.73	320.00
5872.000	400.00	817.11	0.00	1.50	0.00	94.39	320.00
6292.000	140.00	817.87	0.00	1.99	0.00	31.05	420.00
6292.000	210.00	818.28	0.00	1.98	0.00	36.88	420.00
6292.000	250.00	818.49	0.00	1.97	0.00	42.80	420.00
6292.000	400.00	819.05	0.00	1.94	0.00	56.73	420.00
6712.000	140.00	819.89	0.00	2.03	0.00	29.27	420.00
6712.000	210.00	820.29	0.00	2.00	0.00	36.60	420.00
6712.000	250.00	820.48	0.00	1.99	0.00	40.43	420.00
6712.000	400.00	821.11	0.00	2.07	0.00	53.41	420.00
7132.000	140.00	822.22	0.00	2.33	0.00	21.49	420.00
7132.000	210.00	822.65	0.00	2.36	0.00	23.93	420.00
7132.000	250.00	822.86	0.00	2.38	0.00	25.37	420.00
7132.000	400.00	823.46	0.00	2.35	0.00	29.69	420.00
7332.000	140.00	822.99	0.00	0.77	0.00	26.25	200.00
7332.000	210.00	823.52	0.00	0.87	0.00	30.07	200.00
7332.000	250.00	823.78	0.00	0.93	0.00	31.92	200.00
7332.000	400.00	824.59	0.00	1.12	0.00	40.85	200.00

SECNO	Q	CUSEL	DIFHSP	DIFWSX	DIFKHS	TOPWID	XLCH
7532.000	140.00	823.29	0.00	0.31	0.00	28.46	200.00
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7532.000	250.00	824.17	0.00	0.37	0.00	34.55	200.00
7532.000	400.00	825.[illegible]	0.00	[illegible]	0.00	59.73	200.00
7800.000	140.00	823.47	0.00	0.18	0.00	136.03	260.00
7800.000	210.00	824.09	0.00	0.22	0.61	257.82	260.00
7800.000	250.00	824.39	0.00	0.23	0.91	300.00	260.00
7800.000	400.00	825.[illegible]	0.00	[illegible]	[illegible]	300.00	260.00
7990.000	140.00	823.52	0.00	0.05	0.00	207.03	190.00
7990.000	210.00	824.14	0.00	0.05	0.61	208.24	190.00
7990.000	250.00	824.43	0.00	0.05	0.91	208.82	190.00
7990.000	400.00	825.35	0.00	0.04	1.82	210.69	190.00
8034.000	140.00	825.47	0.00	1.[illegible]	0.00	210.[illegible]	44.00
8034.000	210.00	825.71	0.00	1.37	0.24	211.34	44.00
8034.000	250.00	825.84	0.00	1.40	0.36	211.53	44.00
8034.000	400.00	826.24	0.00	0.89	0.77	212.38	44.00
8084.000	140.00	825.48	0.00	0.00	0.00	211.[illegible]	50.00
8084.000	210.00	825.72	0.00	0.00	0.24	211.[illegible]	50.00
8084.000	250.00	825.84	0.00	0.00	0.36	211.59	50.00
8084.000	400.00	826.24	0.00	0.01	0.77	212.38	50.00

SUMMARY OF ERRORS

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CAUTION  SECNO=  180.000  PROFILE= 2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=  180.000  PROFILE= 2  20 TRIALS ATTEMPTED TO BALANCE USEL
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CAUTION SECNO= 4596.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

FLOOD INSURANCE ZONE DATA FOR COMSTOCK CREEK-COMSTOCK

FLOOD HAZARD FACTOR FOR ENTIRE REACH USING SECTIONS

SECTION NUMBER	CUMULATIVE DISTANCE	ELEVATION DIFFERENCE BETWEEN BASE FLOOD AND 1%	2%	0.2%
900.000	0.	-0.0	-0.0	0.2
940.000	40.	-0.1	-0.0	0.2
175.000	75.	-0.1	-0.0	0.2
190.000	90.	-0.3	-0.1	0.3
185.000	85.	-0.3	-0.1	0.3
225.000	125.	-0.3	-0.1	0.3
395.000	295.	-0.4	-0.1	0.4
565.000	465.	-0.5	-0.2	0.5
752.000	652.	-0.7	-0.2	0.7
802.000	702.	-0.7	-0.2	0.7
827.000	727.	-0.7	-0.2	0.7
852.000	752.	-0.5	-0.2	0.6
855.000	755.	-0.5	-0.2	1.4
922.000	822.	-1.0	-0.4	1.0
923.000	823.	-1.0	-0.4	1.0
1025.000	925.	-0.9	-0.4	1.2
1100.000	1000.	-0.5	-0.2	1.0
1175.000	1075.	-0.6	-0.2	0.5
1325.000	1225.	-0.6	-0.2	0.4
1485.000	1385.	-0.6	-0.2	0.6
1512.000	1412.	-0.6	-0.2	0.6
1538.000	1438.	-0.5	-0.2	0.5
1568.000	1468.	-0.5	-0.2	0.5
1589.000	1489.	-0.5	-0.2	0.6
1621.000	1521.	-0.5	-0.2	0.5
1622.000	1522.	-0.5	-0.2	0.6
1631.000	1531.	-0.5	-0.2	0.5
1632.000	1532.	-0.5	-0.2	0.6
1659.000	1559.	-0.5	-0.2	0.5
1660.000	1560.	-0.5	-0.2	0.5
1690.000	1590.	-0.5	-0.2	0.5
1720.000	1620.	-0.4	-0.2	0.5
1750.000	1650.	-0.5	-0.2	0.5
1794.000	1694.	-0.7	-0.2	0.6
1896.000	1796.	-0.8	-0.2	0.6
2300.000	2200.	-0.5	-0.2	0.5
2704.000	2604.	-0.6	-0.2	0.6
2824.000	2724.	-0.5	-0.2	0.6
2864.000	2764.	-1.0	-0.3	1.1
2865.000	2765.	-0.5	-0.3	1.0
2901.000	2801.	-1.4	-0.4	1.5
2902.000	2802.	-1.6	-0.5	2.2
2922.000	2822.	-1.8	-0.6	2.2
2957.000	2857.	-1.2	-0.4	0.5
3280.000	3180.	-1.2	-0.4	0.6
4200.000	4600.	-1.1	-0.4	0.6
4598.000	4798.	-0.7	-0.3	0.6
4916.000	5116.	-0.2	-0.0	1.3
5234.000	5434.	-0.3	-0.2	0.5
5552.000	5752.	-0.4	-0.1	0.5
5872.000	6072.	-0.6	-0.2	0.6
6292.000	6492.	-0.8	-0.2	0.6

7132.000	7332.	-0.5	-0.2	0.6
7332.000	7532.	-0.8	-0.5	0.8
7532.000	7732.	-0.9	-0.3	0.9
7800.000	8000.	-0.9	-0.3	0.9
7990.000	8190.	-0.9	-0.3	0.9
8034.000	8234.	-0.9	-0.1	0.9
8084.000	8284.	-0.8	-0.1	0.8
WEIGHTED AVG FOR REACH		-0.7	-0.2	0.6

FHF FOR THE REACH = 1.35 WITH [illegible] OF THE PEAK, WITHIN 0.5 FEET
ZONE FOR THE REACH = A 1



1) COUNTY: KALAMAZOO

2) STUDY NAME: COMSTOCK TWP.

3) WATERCOURSE: COMSTOCK CREEK

4) DOCUMENT TYPE: REPORT



HYDRAULIC REPORT
COMSTOCK CREEK BASIN
COMSTOCK TOWNSHIP, MICHIGAN

Prepared By:

Wade, Trim & Associates, Inc.
25185 Goddard Road
Taylor, Michigan 48180

HUD 2024-07
January, 1981

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LIST OF TABLES

TABLE NO.	DESCRIPTION	PAGE NO.
1	Cross Reference Index	II-1
2	Flood Flow Frequency Data	II-3
3	Comstock Creek Flood Elevations	II-4

LIST OF EXHIBITS

EXHIBIT NO.	DESCRIPTION
1	Field Cross Section Locations and 100-Year Flood Plain - Floodway Maps, 2 Sheets
2	Water Surface Profiles, 3 Sheets
3	Bridge Notes and Sketches, 17 Sheets
4	Mean Annual Water Elevation of Kalamazoo River at Comstock Creek, 2 Sheets
5	HEC-2 Computer Printouts, (Separate Folder)

I INTRODUCTION

The Comstock Creek Basin is approximately 12.5 square miles in size, of which 7.5 square miles is in Comstock Township. Comstock Township is in Kalamazoo County, located about 3 miles from the City of Kalamazoo. The community is basically rural; however, the southern portion has experienced urbanization.

This report summarizes the hydraulic analyses undertaken to support detailed studies of 1.5 miles of the Comstock Creek beginning at its mouth at the Kalamazoo River and ending at J Avenue. Also, an approximate flood plain study was performed for approximately 4.5 miles of Comstock Creek located between J Avenue and G Avenue (Comstock Township/Richland Township boundary). Approximate analyses of two unnamed depressions on the west boundary were also conducted. One of the depressions, located just north of J Avenue and east of Sprinkle Road, has a drainage basin of approximately 0.2 square miles with no outlet. The other depression is a small lake at a gravel pit, located just south of J Avenue and on both sides of Sprinkle Road. This lake has a drainage area of approximately 0.5 square miles with no outlet.

This study was conducted by Wade, Trim & Associates, Inc., Consulting Engineers, and Glen Roberts served as Project Manager.

II COMSTOCK CREEK DETAILED STUDY

Detailed studies were performed on 1.5 miles of the Comstock Creek beginning at its confluence with the Kalamazoo River and ending at J Avenue. A total of 4 bridges, 2 dams and 5 valley cross sections were field surveyed by Wade, Trim & Associates, Inc. in March, 1980. These cross sections were supplemented by aerial topography and U.S.G.S. Quad Maps which consist of 10-foot contour intervals (References 1, 2 and 3).

Cross section locations are shown on Exhibit 1. Table 1 cross references section designations by showing the computer section number which corresponds to each cross section letter shown in Exhibit 1. Table 2 lists discharges which have been approved by the Michigan Department of Natural Resources (MDNR) for this stream (Reference 4).

A. METHOD OF ANALYSIS

The HEC-2 backwater computer program was utilized for the development of water surface profiles (Reference 5). Table 3 presents flood elevations at selected locations along the stream. Water surface profiles resulting from the backwater analyses are presented as Exhibit 2.

Exhibit 3 contains bridge sketches as well as computations of total bridge loss coefficients. HEC-2 printouts along with plots of valley cross sections are presented in a separate folder (Exhibit 5).

TABLE 1

COMSTOCK CREEK

COMSTOCK TOWNSHIP, MICHIGAN

CROSS REFERENCE INDEX

COMPUTER SECTION NUMBER	CROSS SECTION LETTER	LOCATION
100	A	Valley Section, 100 Feet U/S Confluence of Kalamazoo River
852	B	D/S Face King Highway
923	C	U/S Face King Highway
1025	D	Valley Section, 100 Feet U/S of King Highway
1485	E	Valley Section, 80 Feet D/S of Michigan Avenue
1568	F	D/S Face Michigan Avenue
1660	G	U/S Face Penn Central R.R.
1750	H	Section Just D/S of Dam
1794	I	Section Just U/S of Dam
2784	J	Valley Section, 80 Feet D/S of Dran Avenue
2864	K	D/S Face Dran Avenue
2902	L	U/S Face Dran Avenue
2922	M	Section Just D/S of Dam
2957	N	Section Just U/S of Dam
4280	O	Valley Section
5872	P	Valley Section
7132	Q	Valley Section
7800	R	Valley Section
7990	S	D/S Face of Main Street (J Avenue)
8034	T	U/S Face of Main Street (J Avenue)

TABLE 2

COMSTOCK CREEK

COMSTOCK TOWNSHIP, MICHIGAN

FLOOD FLOW FREQUENCY DATA

RECURRENCE INTERVAL (YEARS)	DISCHARGE (CFS)
10	140
50	210
100	250
500	400

TABLE 3

COMSTOCK CREEK FLOOD ELEVATIONS*

COMSTOCK TOWNSHIP, MICHIGAN

LOCATION	FLOOD FREQUENCY 10 YEAR	50 YEAR	100 YEAR	500 YEAR
D/S Face King Highway	766.4	766.8	767.0	767.7
D/S Face Michigan Avenue	775.4	775.7	775.8	776.4
U/S Face Railroad	776.8	776.9	777.1	777.7
Just D/S of Dam	778.7	779.0	779.1	779.6
Just U/S of Dam	791.2	791.8	791.9	792.3
D/S Face of Dran Road	794.3	795.0	795.3	796.4
Just D/S of Dam	795.9	797.1	797.8	800.4
Just U/S of Dam	808.5	809.4	809.8	810.3
D/S Face of Main Street (J Avenue)	823.5	824.1	824.4	825.4
U/S Face of Main Street (J Avenue)	825.5	825.7	825.8	826.2

*Referenced to National Geodetic Vertical Datum

B. VARIABLES AND COEFFICIENTS

Roughness coefficients (Manning's "n") were estimated by field inspection at each cross section. Roughness values varied from .030 to .040 for the main channel and from .08 to .10 for the overbanks. These values are indicative of summer month conditions and are consistent with values recommended and used in engineering practice (Reference 6). Contraction and expansion coefficients ranged from .1 to .3 and .3 to .5, respectively. Expansion and contraction ratios used in effective flow modelling were 1:4 and 1:1, respectively, for all bridge sections and natural constrictions (Reference 5).

C. HIGH WATER MARKS

No documented high water data exists for Comstock Creek.

D. STARTING CONDITIONS

The mean annual water surface elevation of the Kalamazoo River, located at the mouth of Comstock Creek, was used for the starting water surface elevation for the hydraulic analysis of the 10, 50, 100 and 500 year floods. Computations for this mean annual water surface elevation are presented in Exhibit 4.

However, backwater elevations from the Kalamazoo River were plotted on the stream profile, where these elevations exceeded Comstock Creek elevations, to reflect flood conditions from both streams.

E. SPECIAL PROBLEMS

No special problems were encountered in the analysis of the Comstock Creek.

F. GENERAL

Computed water surface elevations were developed to an accuracy of 0.5 feet for floods of the selected recurrence intervals.

All elevations are referenced to the U.S. Coastal and Geodetic Survey (U.S.C.G.S.) Datum. This datum is equivalent to the National Geodetic Vertical Datum of 1929 (N.G.V.D.).

The hydraulic analyses for this study were based only upon the effects of flow unobstructed by ice or debris. The flood elevations are considered valid only if hydraulic structures, in general, remain unobstructed and do not fail.

III APPROXIMATE STUDIES

Approximate hydraulic analyses of the Comstock Creek were performed for a length of 4.5 miles from J Avenue (Main Street) to G Avenue (Comstock Township/Richland Township boundary). Approximate analyses of two unnamed depressions on the west boundary were also conducted.

Field data was collected for about 3,000 feet of Comstock Creek downstream of Campbell Lake. This data included information for culverts on H Avenue and a dirt road (approximately midway between H Avenue and the lake). Normal flow conditions were assumed downstream of H Avenue and the HEC-2 Computer Program was utilized to compute a rating curve for the outlet channel of Campbell Lake. From this rating curve, an elevation of 836.0 was obtained for the lake for a 100-year flood.

Normal depth analyses were performed to compute approximate water surface elevations for the remainder of the stream. For the two unnamed depressions, stage/storage curves were developed to obtain 100-year flood elevations.

A review of the existing Flood Hazard Boundary Map (Reference 7), in comparison with the above referenced analyses, indicated that the existing 100-year flood limits are reasonable. Therefore, the approximate 100-year flood plain corresponds to that shown on the existing Flood Hazard Boundary Map.

REFERENCES

1. Abrams Aerial Survey, Comstock Creek in Comstock Township, 1979.

2. U.S. Geological Survey Topographical Map - Kalamazoo Quadrangle, Kalamazoo County, Michigan, 7.5 Minute Series, 1967, Photorevised 1973.

3. U.S. Geological Survey Topographical Map - Galesburg Quadrangle, Kalamazoo County, Michigan, 7.5 Minute Series, 1961, Photorevised 1972.

4. Wade, Trim & Associates, Inc., Taylor, Michigan, Hydrology Report, Comstock Creek Basin, Comstock Township, Michigan, 1980.

5. U.S. Army Corps of Engineers, HEC-2 Water Surface Profiles, Users Manual, August, 1979.

6. V.T. Chow, Open Channel Hydraulics, McGraw-Hill, Inc., Page 112, 1959.

7. Department of Housing and Urban Development, FIA Flood Hazard Boundary Map, Township of Comstock, Kalamazoo County, Michigan, October, 1975.

COMSTOCK CREEK

EXHIBIT 1

Field Cross Section Locations
and 100-Year Flood Plain - Floodway Maps

COMSTOCK CREEK

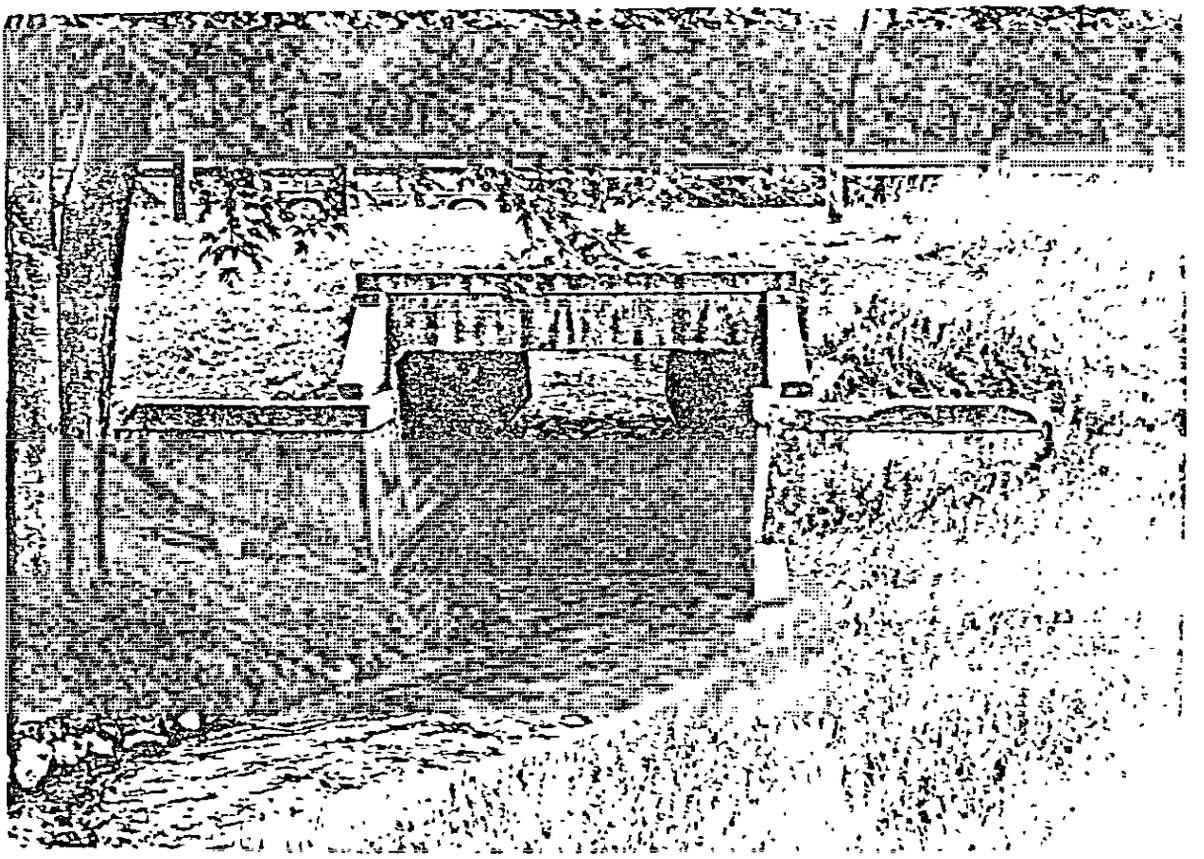
EXHIBIT 2

Water Surface Profiles

COMSTOCK CREEK

EXHIBIT 3

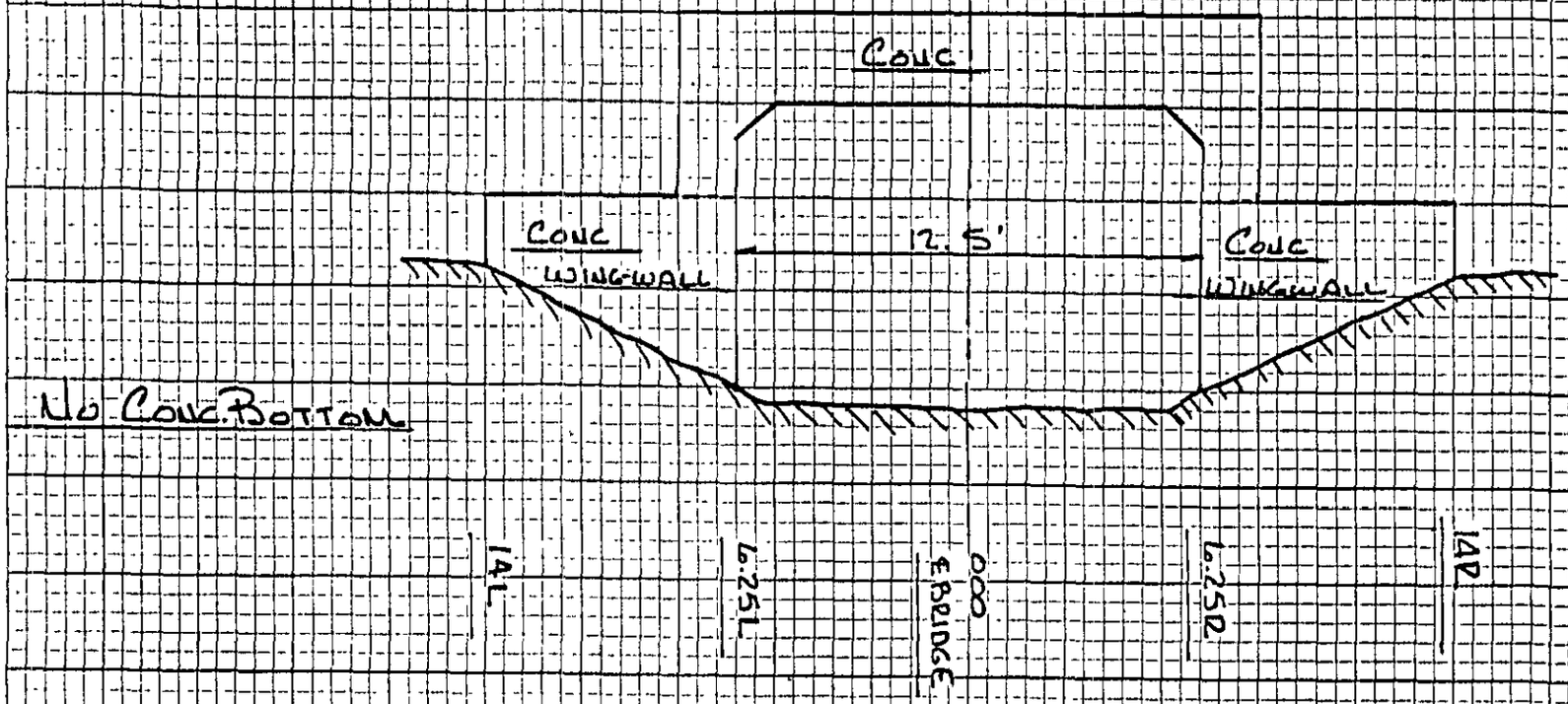
Bridge Notes and Sketches



SECTION #21 KING HWY / COMSTOCK CREEK

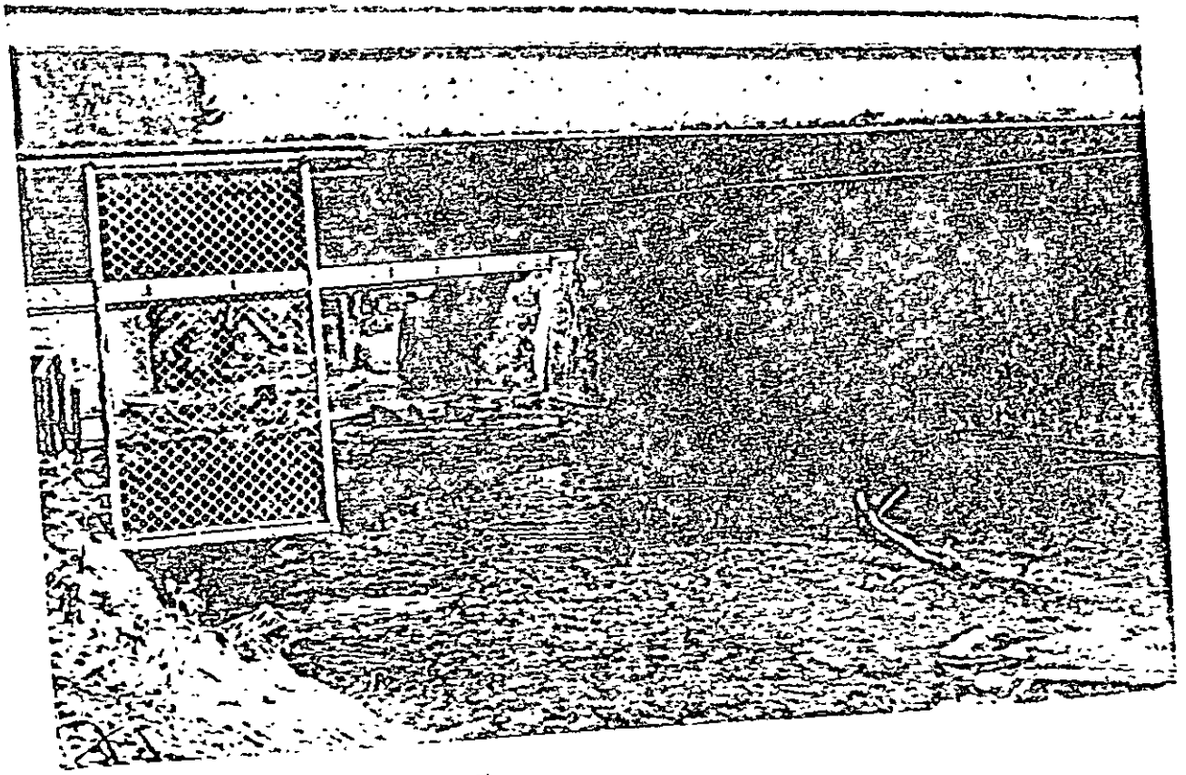
UPSTREAM SIDE

HUD 2024-05 SECTION # 21 COMSTOCK CREEK & KING HWY

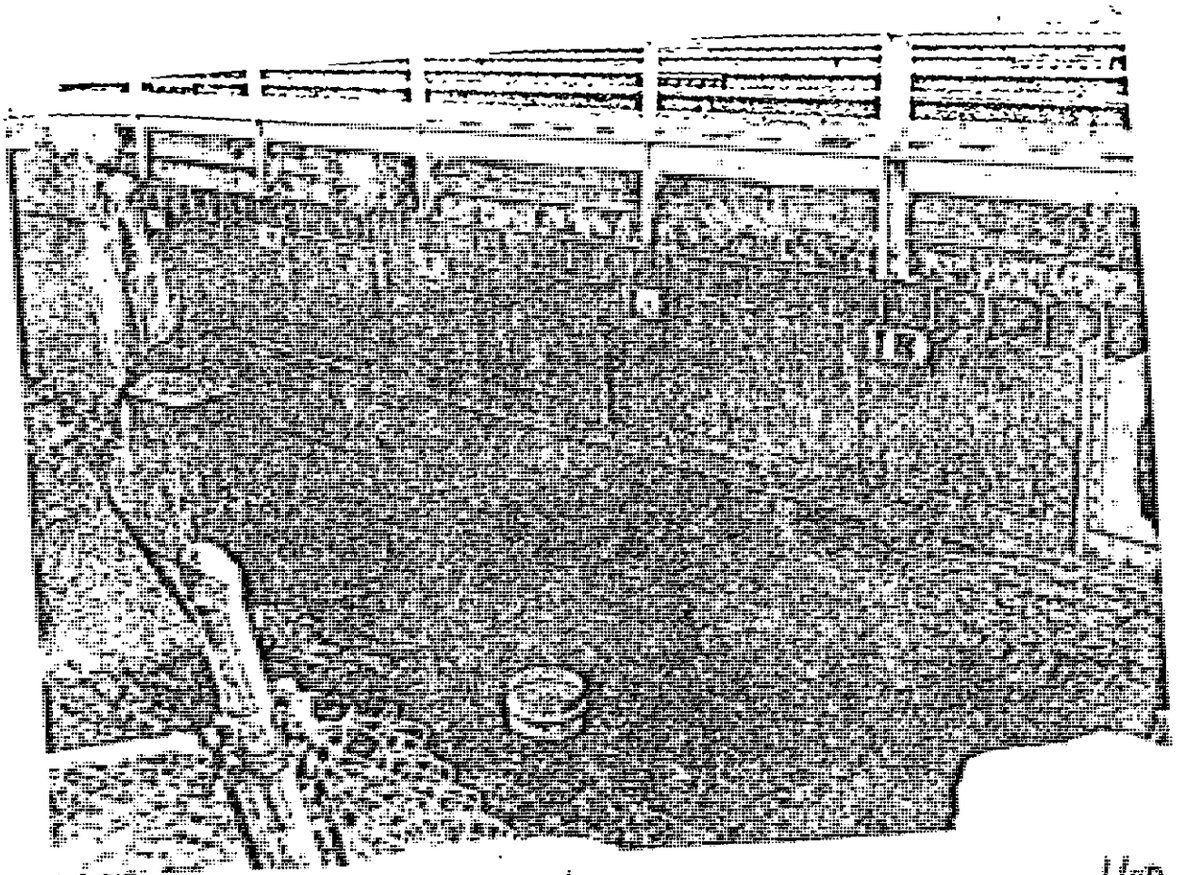


DOWNSTREAM SIDE FACING UPSTREAM

HUD 2024-07
12/80 SHEET 2 OF 17



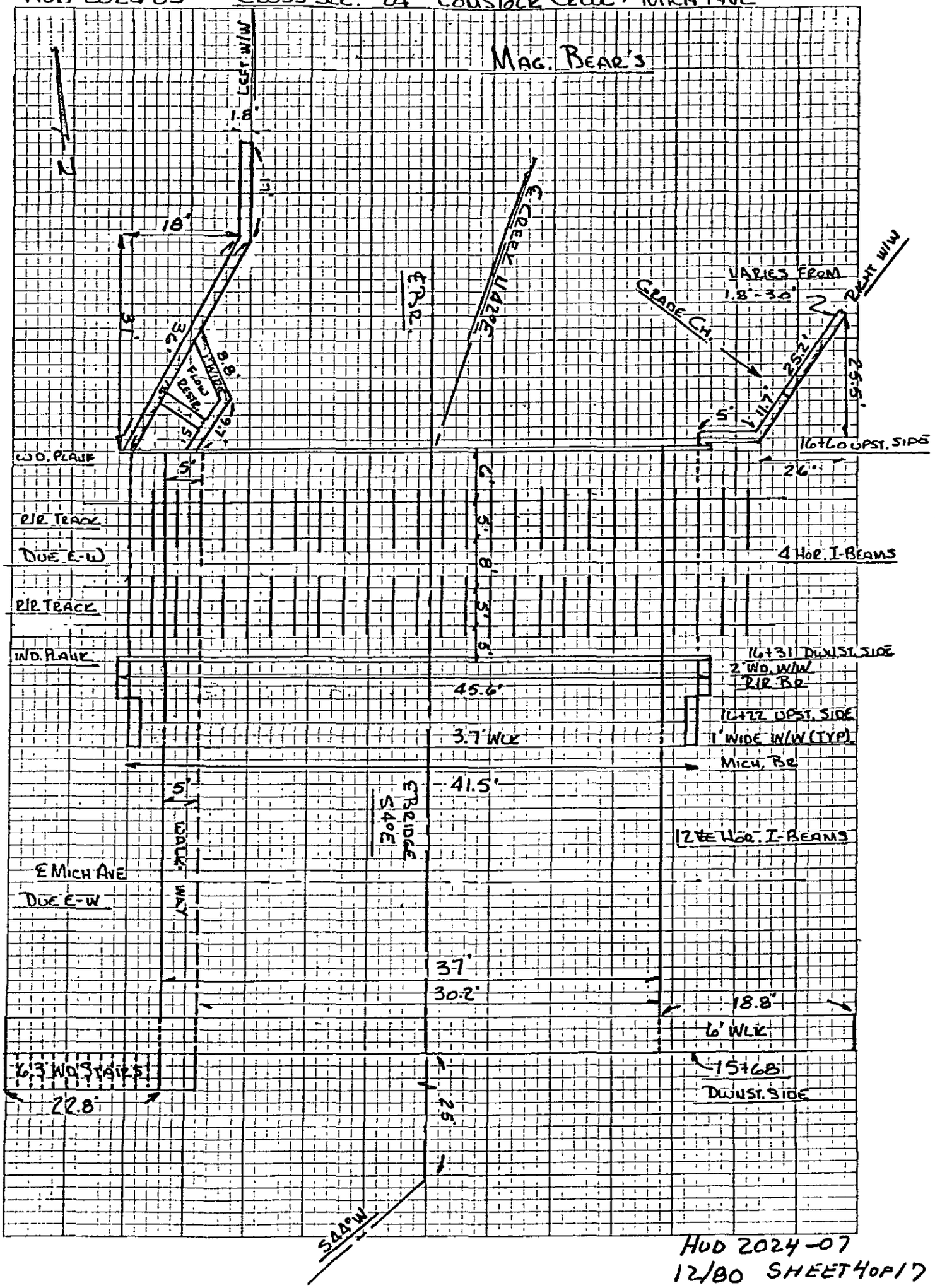
CROSS-SECTION #24
MICH AVE AND COMSTOCK CREEK



CROSS SECTION #24
COMSTOCK CRK AND PENN CENT R/R

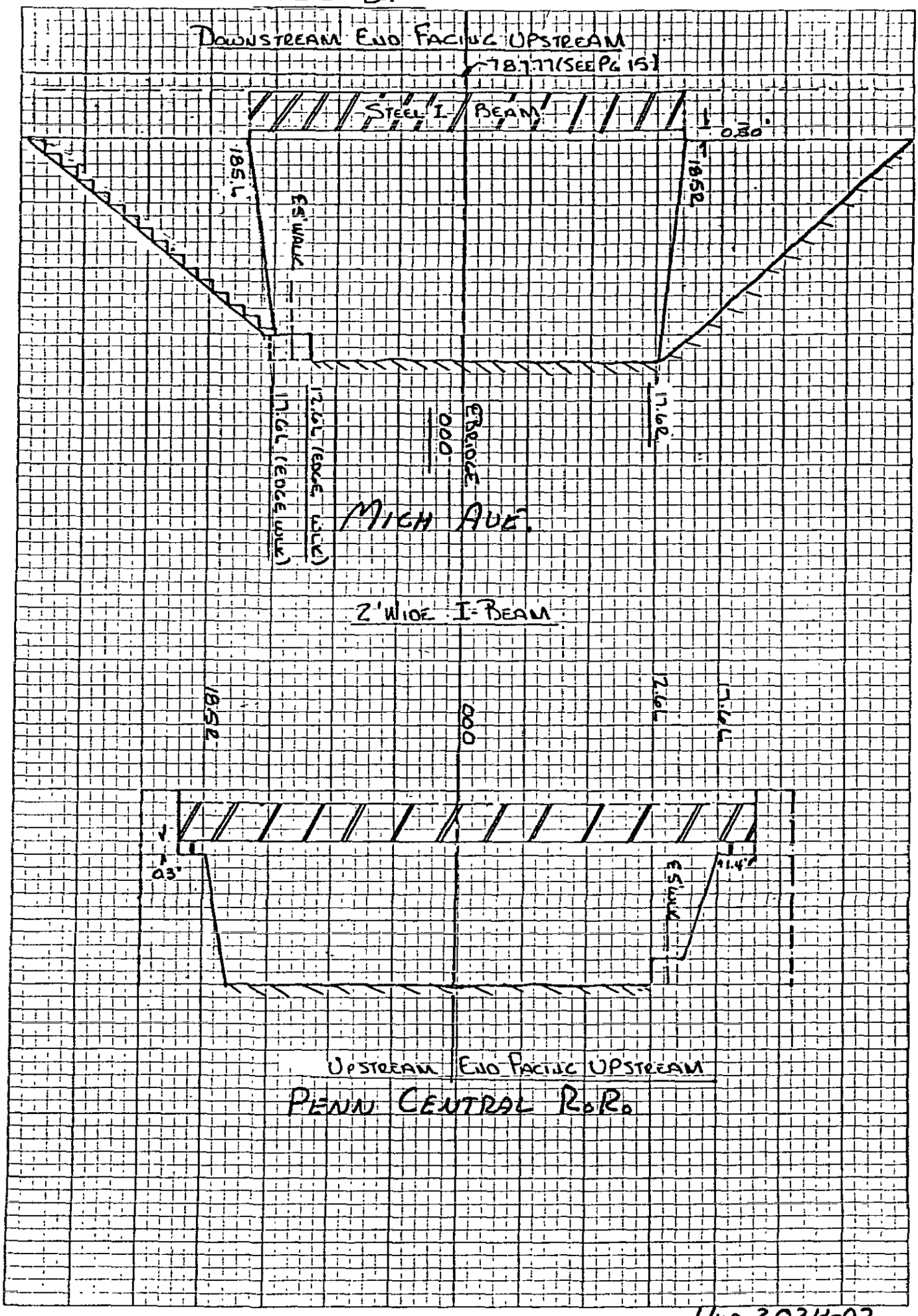
HOD 2024-07
12/00 SHEET 3 OF 7

HUD 2024-05 Cross Sec. #24 Coustock Creek & Mich Ave

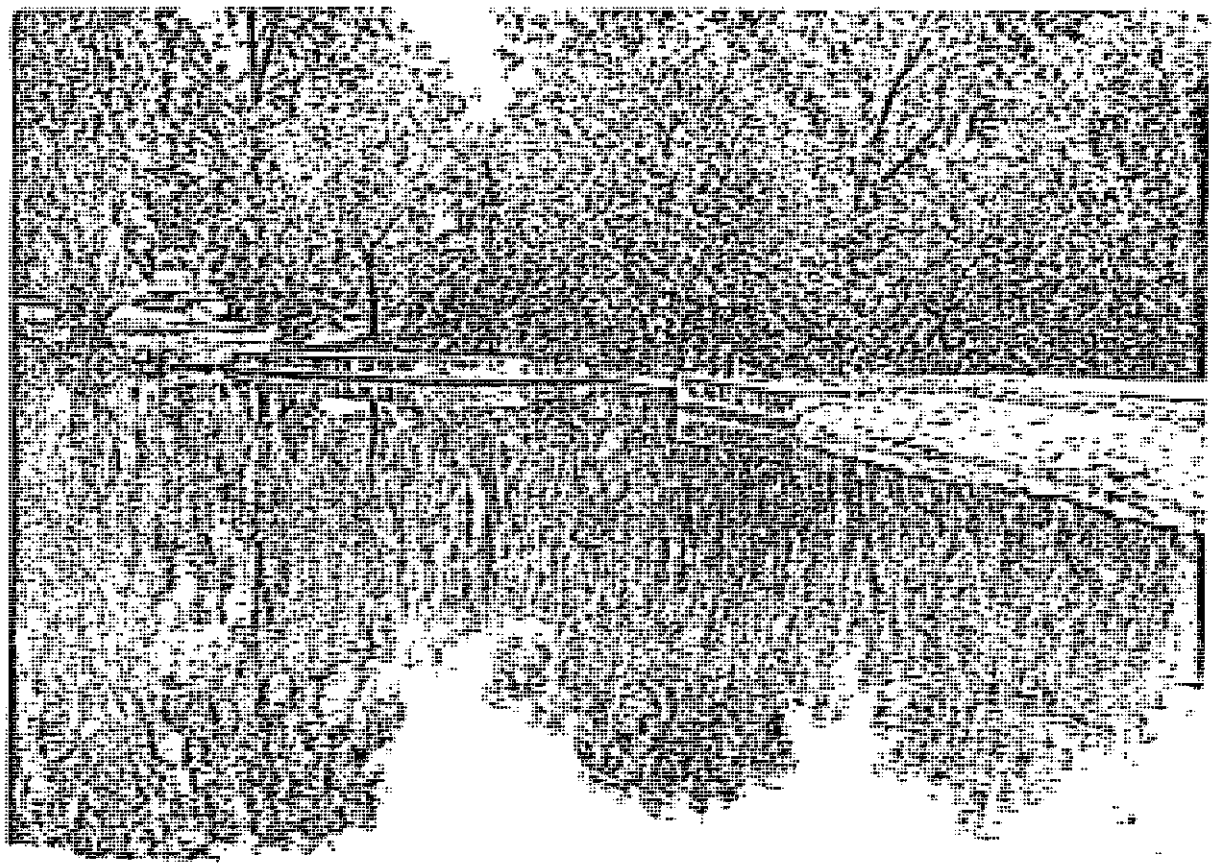


HUD 2024-07
12/80 SHEET 4 OF 17

HUD 2024-05 SEC # 2A 787.77



HUD 2024-07
12/80 SHEET 5 OF 17



Cross Sec #25 UPSTREAM SIDE DAM

FORM 25-0
(313) 291 5400
Wade Trim & Associates Inc.
Civil Engineers • Land Surveyors
WORK SHEET
25185 GODDARD ROAD
TAYLOR, MICHIGAN 48180

Bridge Location : Dam U/S Mich. Ave

Bridge Losses - SB Card

REFERENCE

1. XK (Pier Shape Coefficient) 0 — HEC-2 manual

XKOR (Loss Coefficient) = 1.0 + Σk , $\Sigma k = k_f + k_e + k_p$

where k_f = friction loss coefficient
k_e = entrance loss coefficient
k_p = loss from intermediate piers

Description of Bridge :

$K_f = 29.1\, n^2 L / R^{4/3}$ for English units

Area = ____ Wp = ____

$R = A/wp$ $R^{4/3}$ = ____ L = ____

n (composite) = ____

$K_f = 29.1 \times (\quad)^2 \times \quad / \quad =$

$K_c =$ — Hydraulic Charts for the Selection of Highway Culverts Circular No. 5 Dec. 1965 pg. 49

K_p = 0 if bridge has no intermediate piers

K_p = 0.05 if bridge has intermediate piers — HEC-2 manual

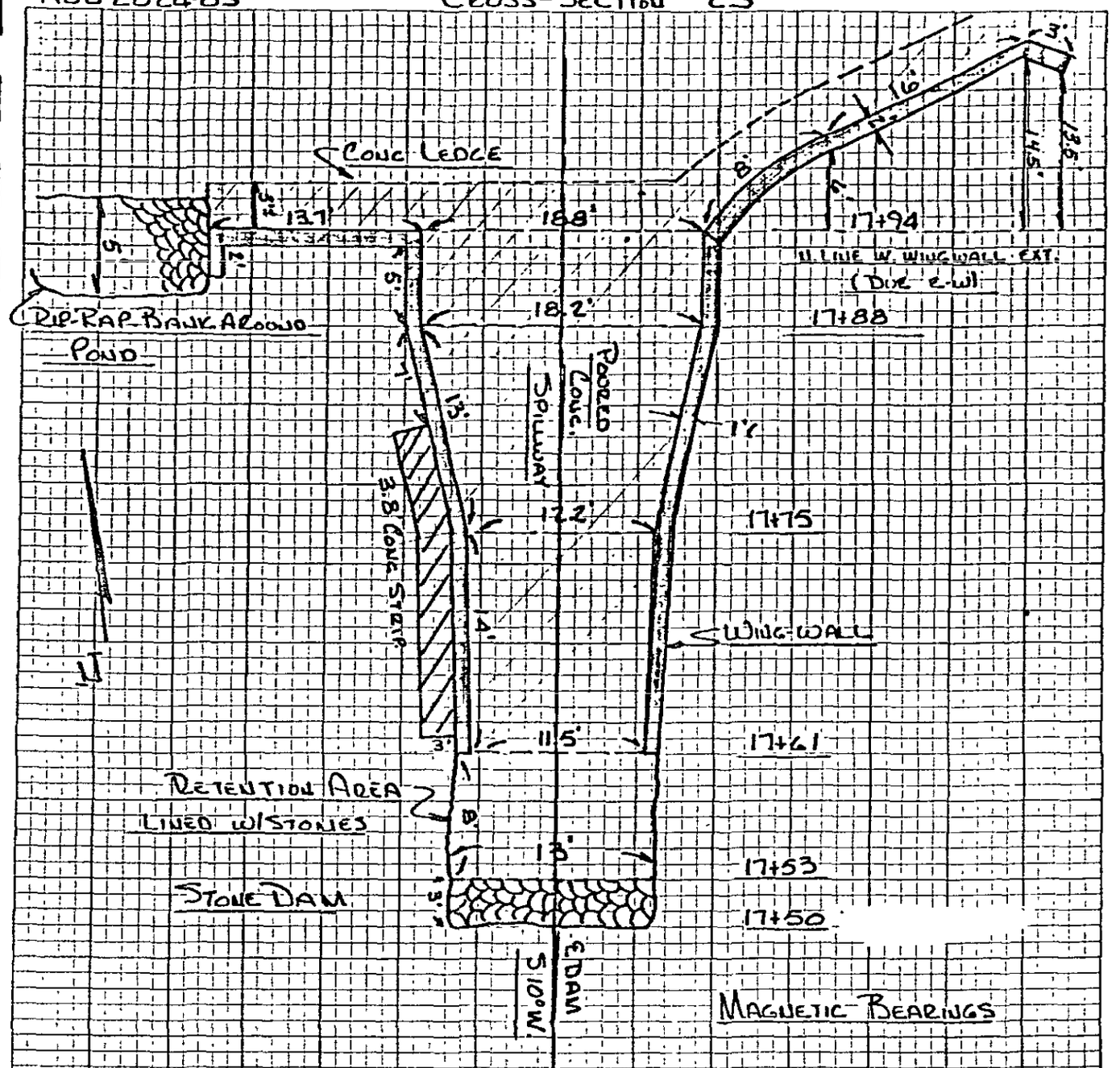
The value of XKOR has little effect on computations as all the flow is over the Dam

2. XKOR = 1 + + + = 1.5 (Assumed)
3. COFQ Coefficient of discharge = 2.63 (King & Brater, p. 5-46) — HEC-2 manual
4. RDLEN = Length of weir = ____ (0 if read off BT cards)
5. BWC - bottom width of bridge opening (inc. piers) : .1 (Negligible value assumed to make all the flow over the Dam)
6. [illegible] width of obstruction = ____ — field data
7. [illegible] bridge opening inc. piers = .1
8. SS = side slope = ____ (horizontal per 1 vertical unit)
9. ELCHU = Elevation of channel invert U/S side = 787.6 (0. if equal to minimum elevation in previous X-sect.)
10. ELCHD = Elevation of channel invert D/S side = 777.8 (0 if equal to minimum elevation in previous X-sect.)

SUBJECT	BY	CHK.	SHEET NO.	File Code No (Job No) Owner Project Suffix
Dam North of Michigan Ave Constock Creek	Sustic		7 OF 12	HUD 2024 07
	DATE Nov. 80	DATE		

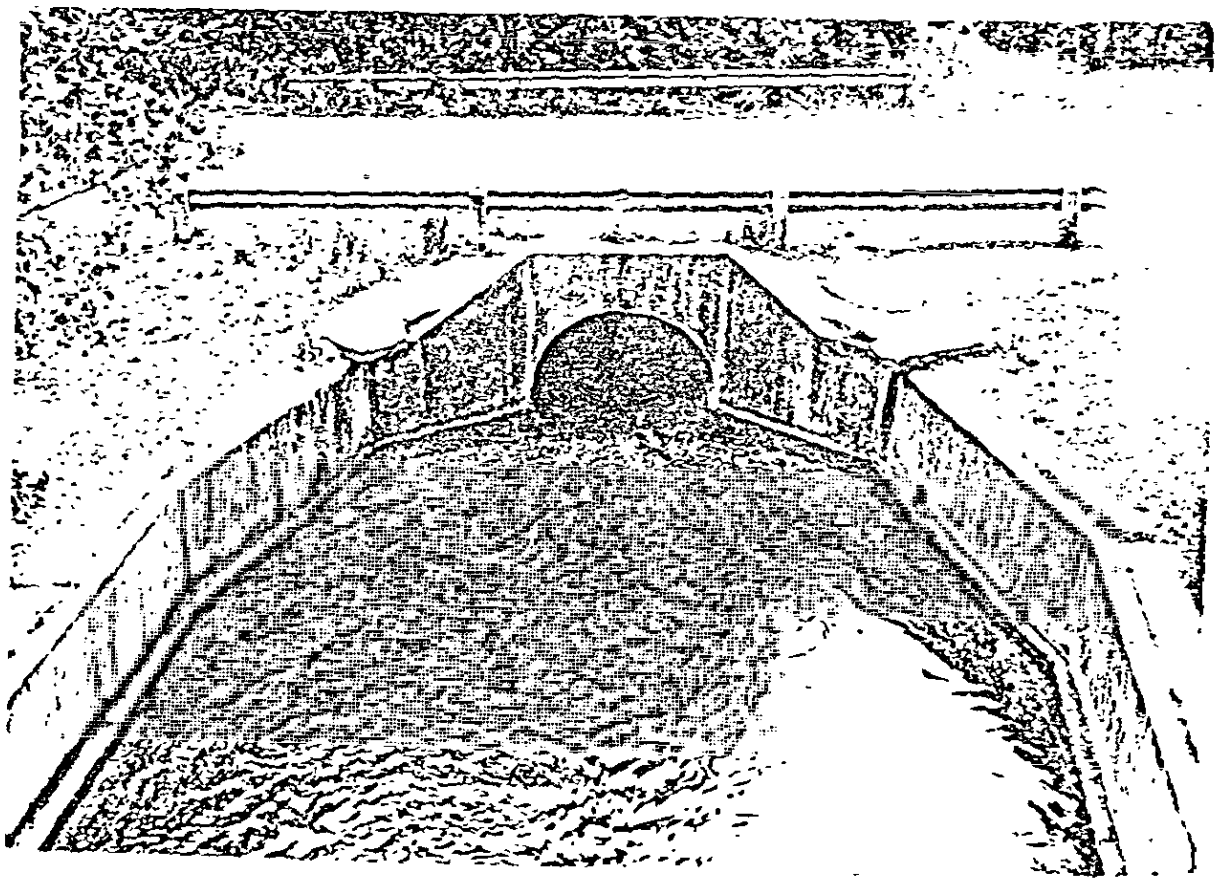
HUD 2024-05

CROSS-SECTION #25



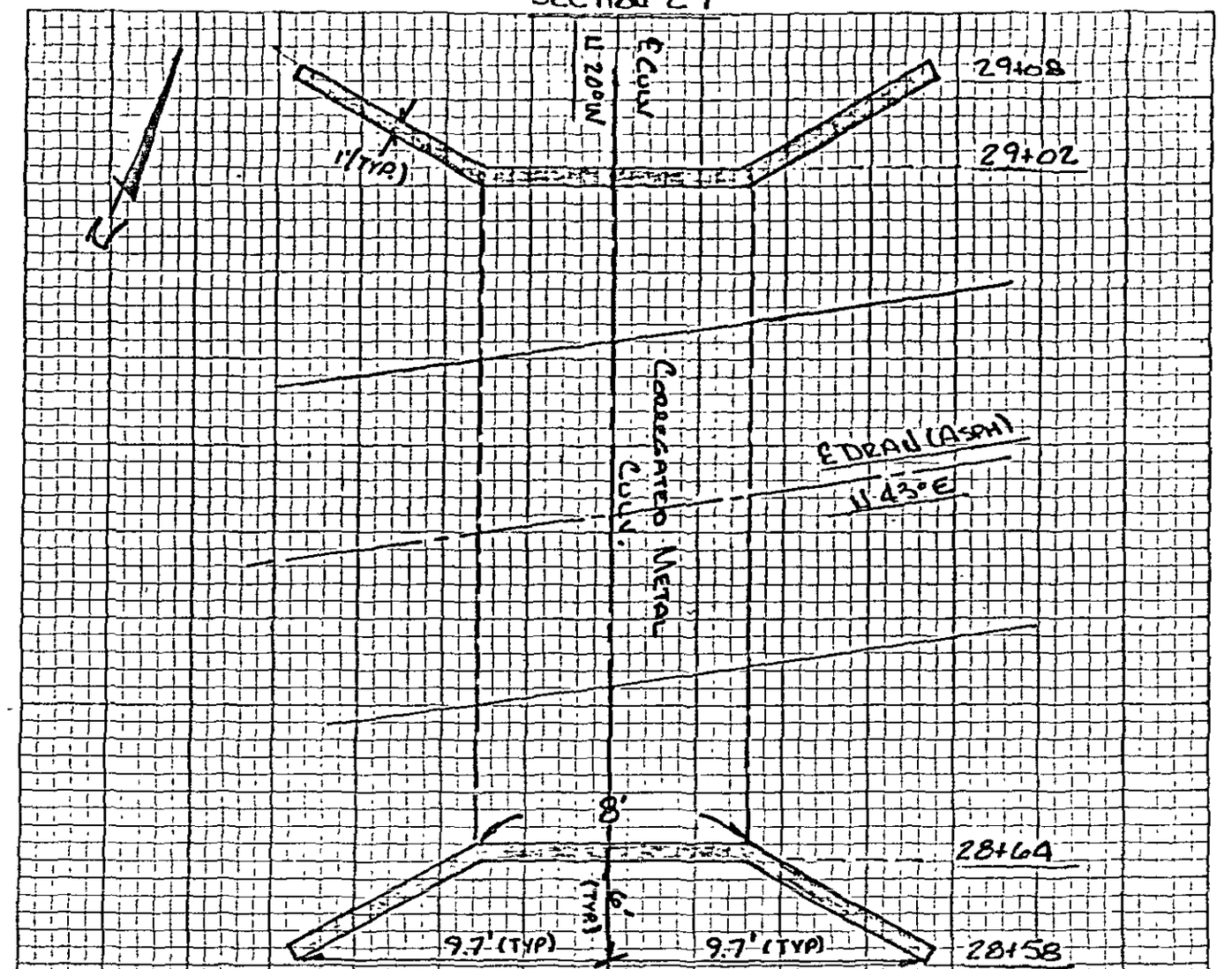
R & L OFFSETS ARE FROM E DAM FACING UPSTREAM

HUD 2024-07
12/80 SHEET 8 OF 11

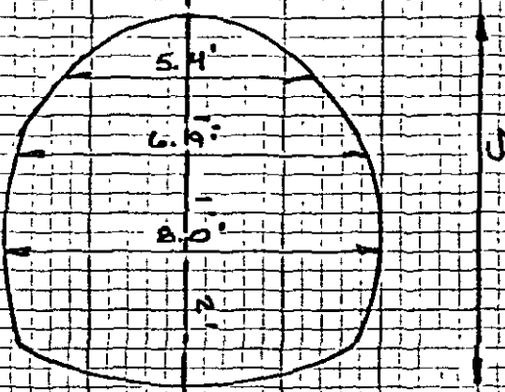


Cross-Section #27
Comstock Creek and Draw

Section 27

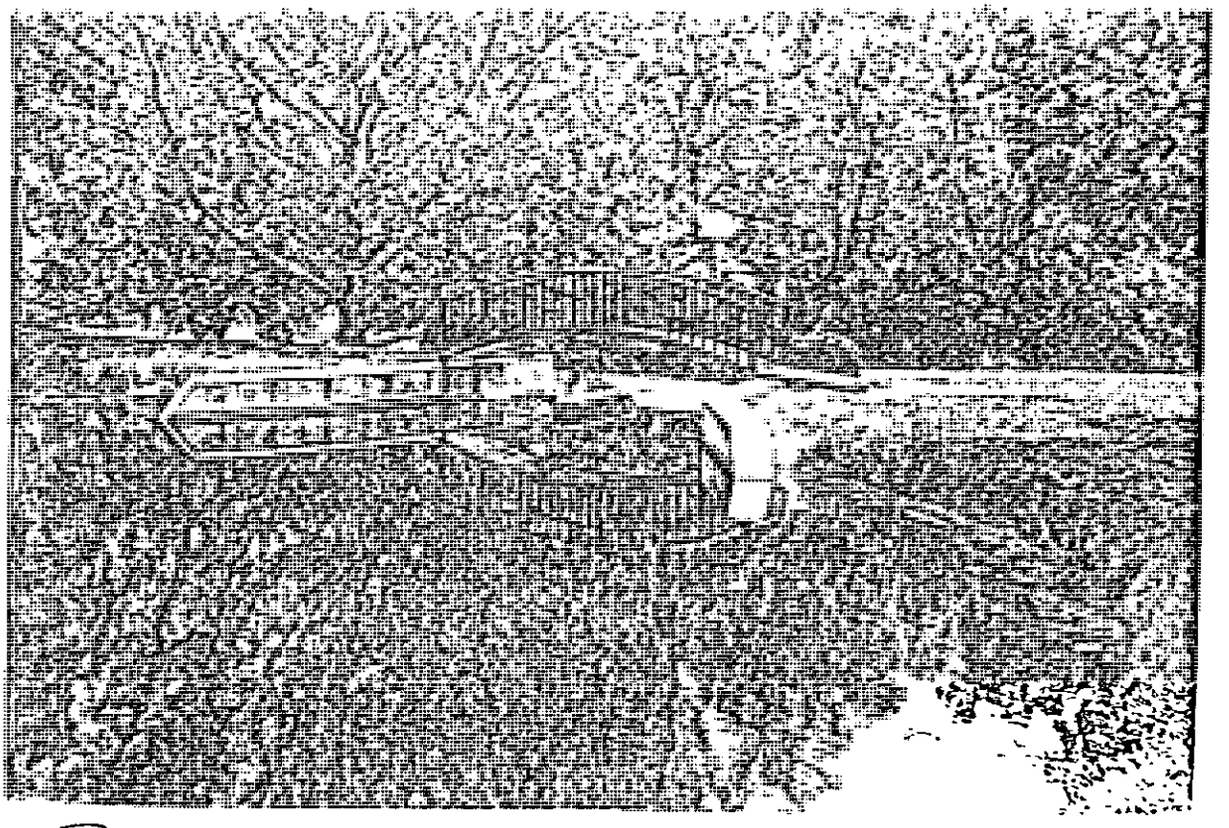


℄ ℄ OFFSET FROM ℄ CULV FACING UPSTREAM

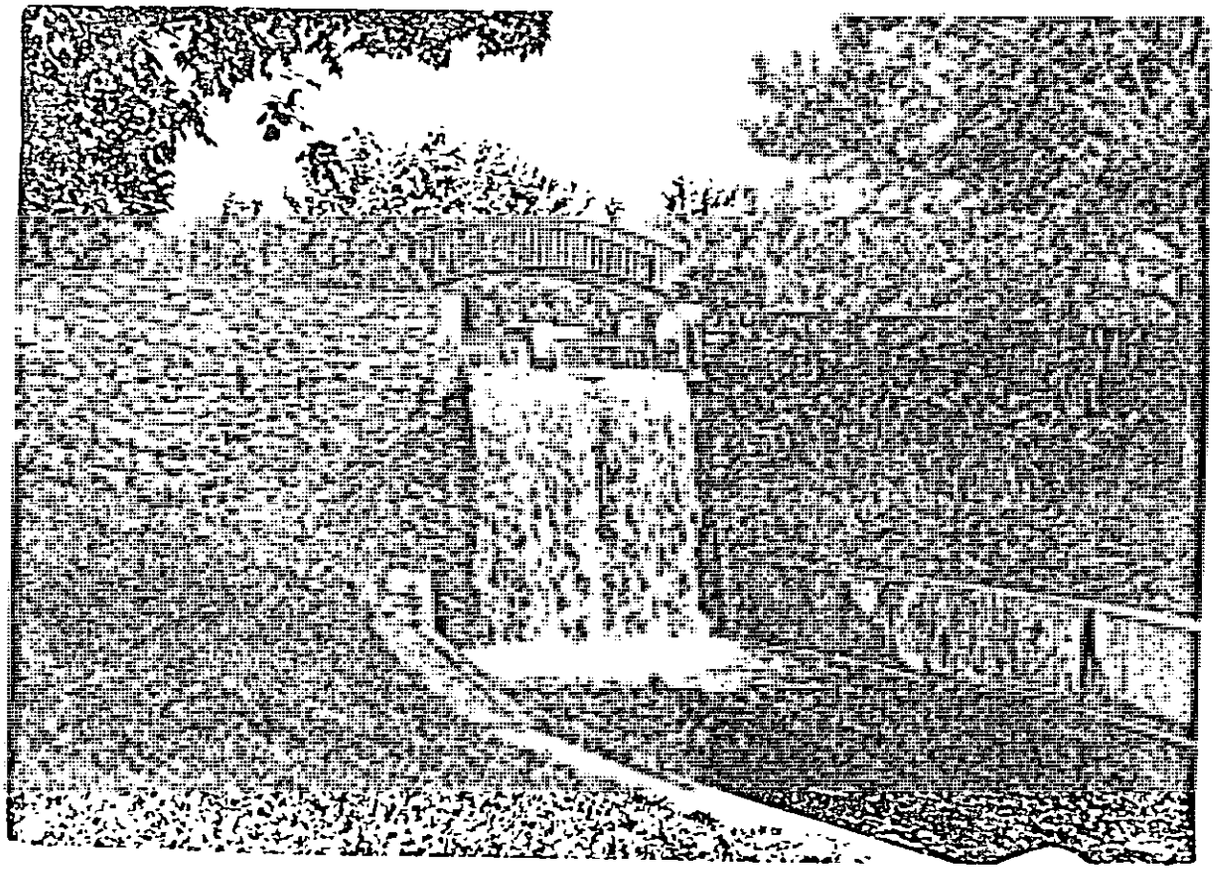


SIDE VIEW OF CULV.

HUD 2024-07
12/80 SHEET 10 OF 17



BRIDGE / DAM SEC 28 (100' N OF DRAIN
250'± E OF 26TH.



HUD 2024-07
12/80 SHEET 11 OF 17

Bridge Location : Dam U/S Dean Ave.

Bridge Losses - SB Card

REFERENCE

1. XK (Pier Shape Coefficient) 0 — HEC-2 manual

XKOR (Loss Coefficient) = 1.0 + Σk, $\Sigma k = k_f + k_e + k_p$

where k_f = friction loss coefficient
k_e = entrance loss coefficient
k_p = loss from intermediate piers

Description of Bridge :

$k_f = 29.1\, n^2 L / R^{4/3}$ for English units

Area = = Wp =

$R = A/wp$ $R^{4/3}$ = L =

n (composite) =

K_f = 29.1 x ( )^2 x / =

K_e =

Hydraulic Charts for the Selection of Highway Culverts Circular No. 5 Dec. 1965 pg. 49

K_p = 0 if bridge has no intermediate piers

K_p = 0.05 if bridge has intermediate piers — HEC-2 manual

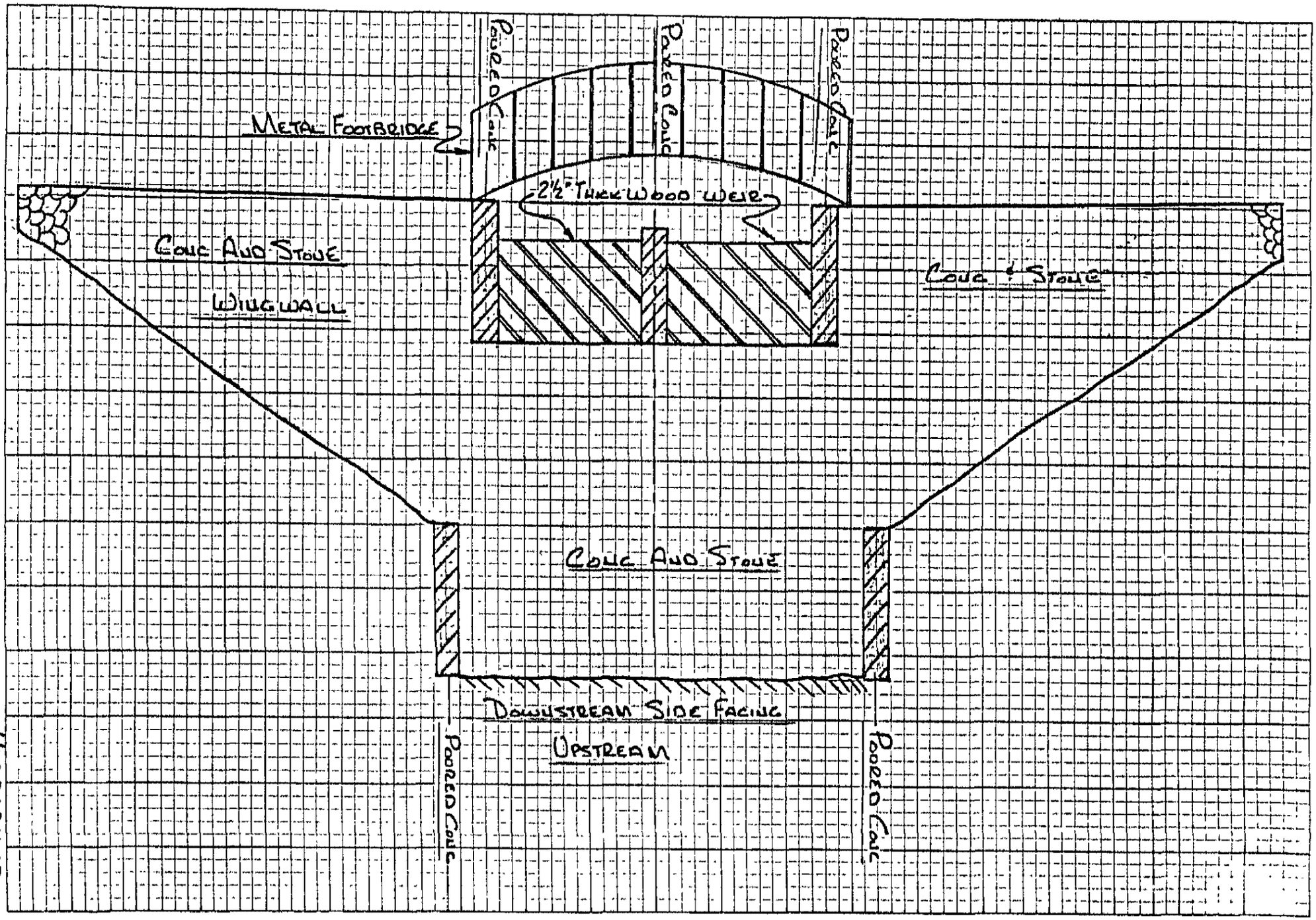
The value of XKOR has little effect on computations as all the flow is over the Dam

2. XKOR = 1 + + + = 1.5 (Assumed)
3. COFQ Coefficient of discharge = 2.63 [King & Brater, p.5-46] — HEC-2 manual
4. RDLEN - Length of weir = _____ (0 if read off BT cards)
5. BWC = Bottom width of bridge opening (inc. piers) = 1 [Negligible value assumed to make all the flow over the Dam] — field data
6. [illegible] width of obstruction = _____
7. Unused - bridge opening inc. piers = .1
8. SS = side slope = _____ (horizontal per 1 vertical unit)
9. ELCHU = Elevation of channel invert U/s side = 805.9 (0 if equal to minimum elevation in previous x-sect.)
10. ELCHD = Elevation of channel invert D/S side = 792.2 (0 if equal to minimum elevation in previous x-sect.)

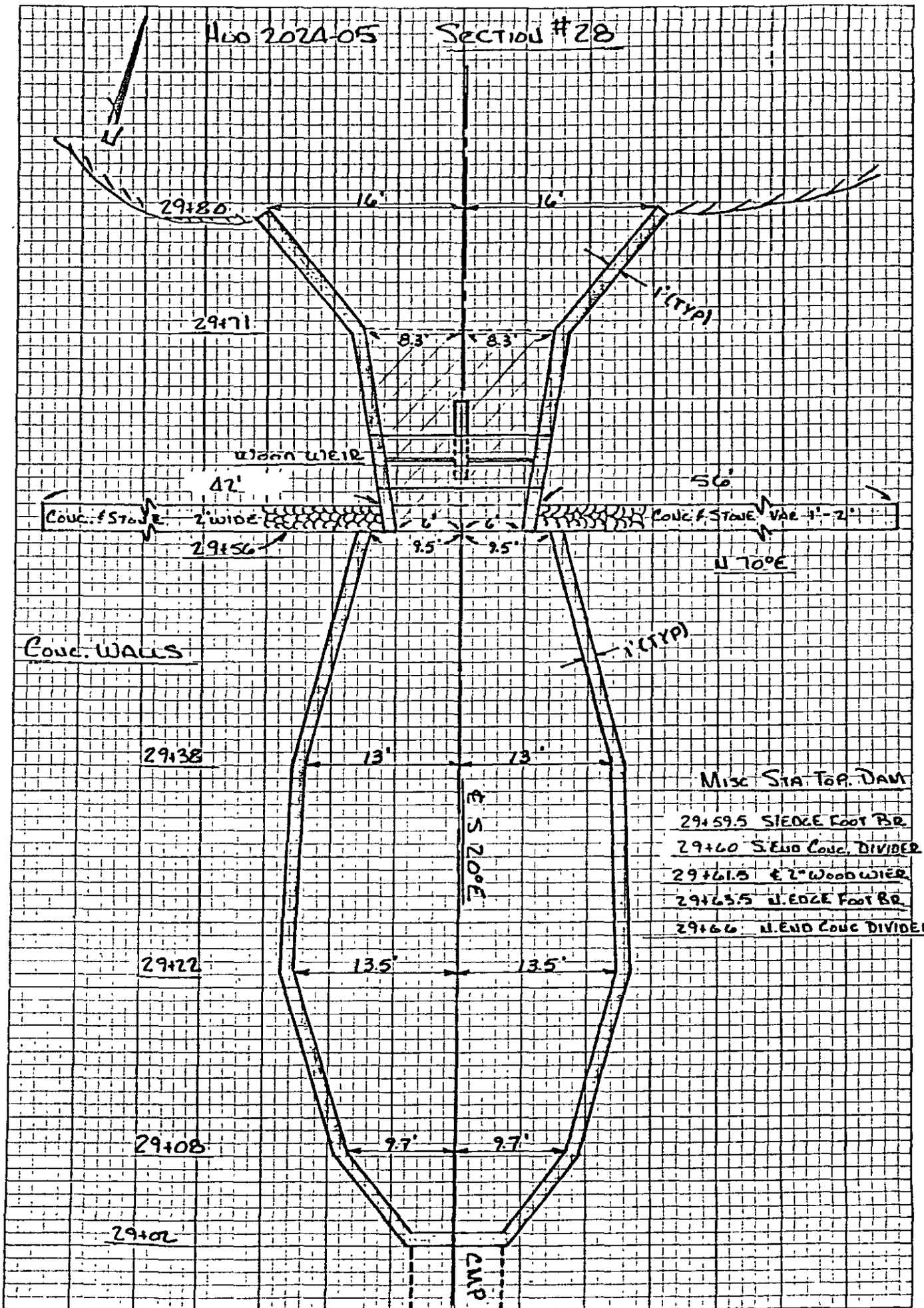
SUBJECT	BY	CHK.	SHEET NO.	File Code No. (Job No.) Owner Project Suffix
Dam North of Dean Road Comstock Creek	Sussel		12 OF 12	HUD • 2024 • 07
	DATE Nov. 80	DATE		

HUD 2024-05

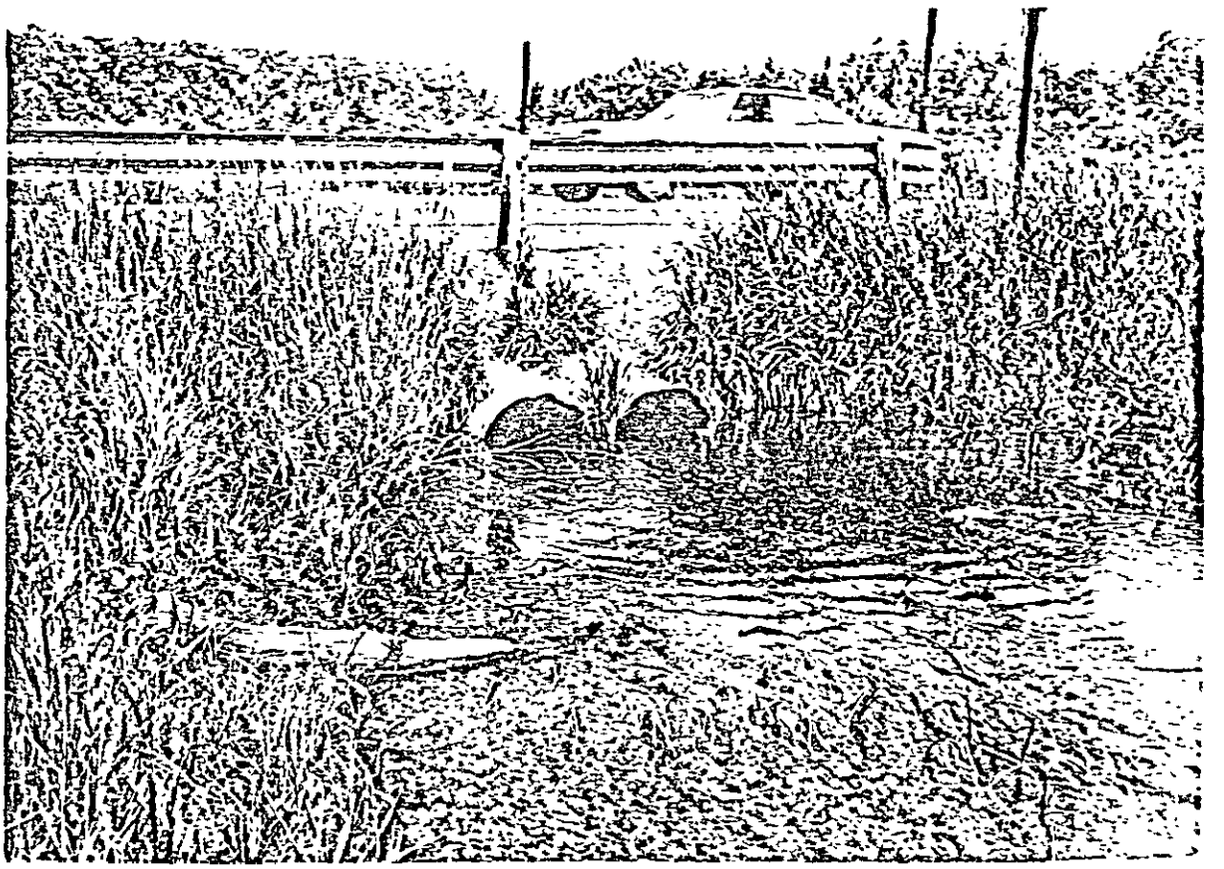
SECTION #28



HUD 2024-07
12/80 SHEET 13 OF 17



HUD 2024-07
12/8C SHEET 14 OR 17



Cross-Section #33 S
Main St & Comstock Creek
"J" Ave

Bridge Location : MAIN STREET

Bridge Losses - SB Card

REFERENCE

1. XK (Pier Shape Coefficient) : No Pier 0 — HEC-2 manual

XKOR (Loss Coefficient) = 1.0 + Σk, $\Sigma k = k_f + k_e + k_p$

where k_f = friction loss coefficient

k_e = entrance loss coefficient

k_p = loss from intermediate piers

Description of Bridge : TWIN 36" CMP CULVERTS ½ silted

$K_f = 29.1\, n^2 L / R^{4/3}$ for English units

Area = $\pi R^2 / 2$ = 3.5 WP = 7.71

$R = A/wp = 0.45$ $R^{4/3} = 0.35$ L = approx. = 44'

n (composite) = 0.025

$K_f = 29.1 \times (0.025)^2 \times 44 \;/ 0.35 = 2.3$

K_e = PROJECTING FROM FILL = 0.9 — Hydraulic Charts for the Selection of Highway Culverts Circular No. 5 Dec. 1965 pg. 49

$K_p = 0$ if bridge has no intermediate piers

$K_p = 0.05$ if bridge has no intermediate piers — HEC-2 manual

2. XKOR = 1 + 2.3 + 0.9 + 0 = 4.2

3. COFQ = Coefficient of discharge = 3.0 — HEC-2 manual

4. RDLEN = Length of weir = 0 (0 if read off BT cards)

5. BWC = bottom width of bridge opening (inc. piers) = 3.9

6. BWP = total width of obstruction = ____ — field data

7. BAREA = bridge opening inc. piers = 7

8. SS = side slope = 0 (horizontal per 1 vertical unit)

9. ELCHU = Elevation of channel invert U/S side = 820.1 (0 if equal to minimum elevation in previous X-sect.)

10. ELCHD = Elevation of channel invert D/S side = 819.7 (0 if equal to minimum elevation in previous x-sect.)

SUBJECT	BY	CHK.	SHEET NO.	File Code No (Job No.) Owner Project Suffix
COMSTOCK CREEK X-sect. #33 MAIN ST.	AM		16 OF 12	HUD • 2024 • 07
	DATE 11/9/79	DATE		

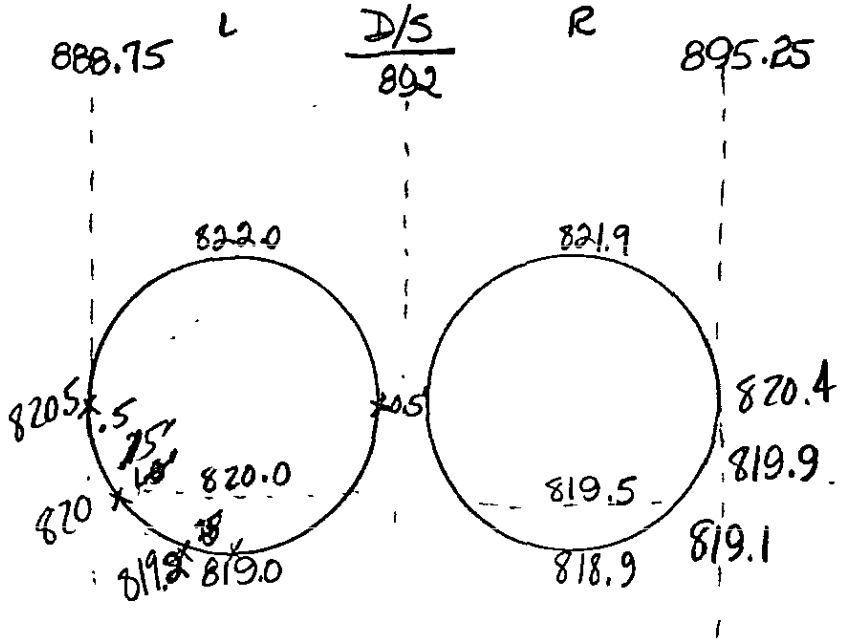
FORM 25-0
(313) 291-5400
Wade, Trim, Associates, Inc.
Civil Engineers • Land Surveyors
25185 GODDARD ROAD
TAYLOR, MICHIGAN 48180

WORK SHEET

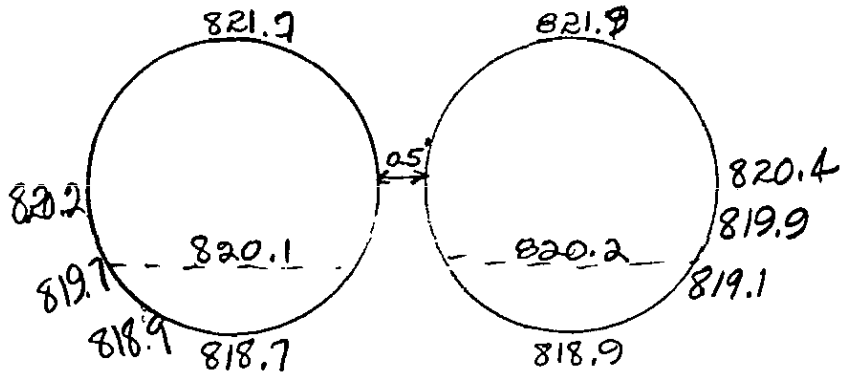
FACING upstream

REFERENCE

TWIN 36" CMP CULVERTS AT MAIN ST.



U/S



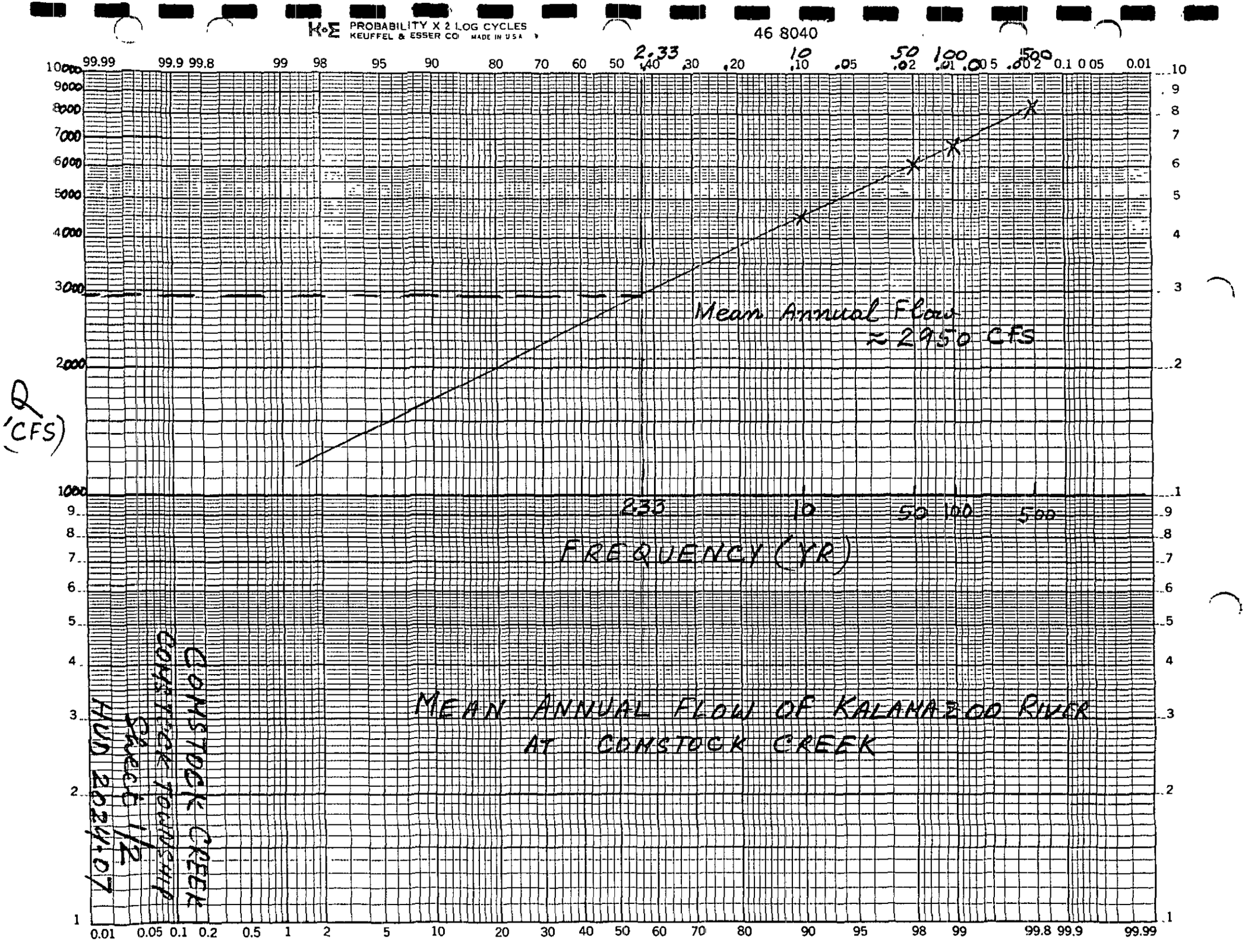
u/s end is ~ half silted up.
so wetted perimeter =

SUBJECT	BY	CHK.	SHEET NO.	File Code No (Job No) Owner Project Suffix
COMSTOCK CREEK X-Sect. #33 MAIN ST.	AM		17 OF 17	HUD • 2024 • 06
	DATE 11/9/79	DATE		

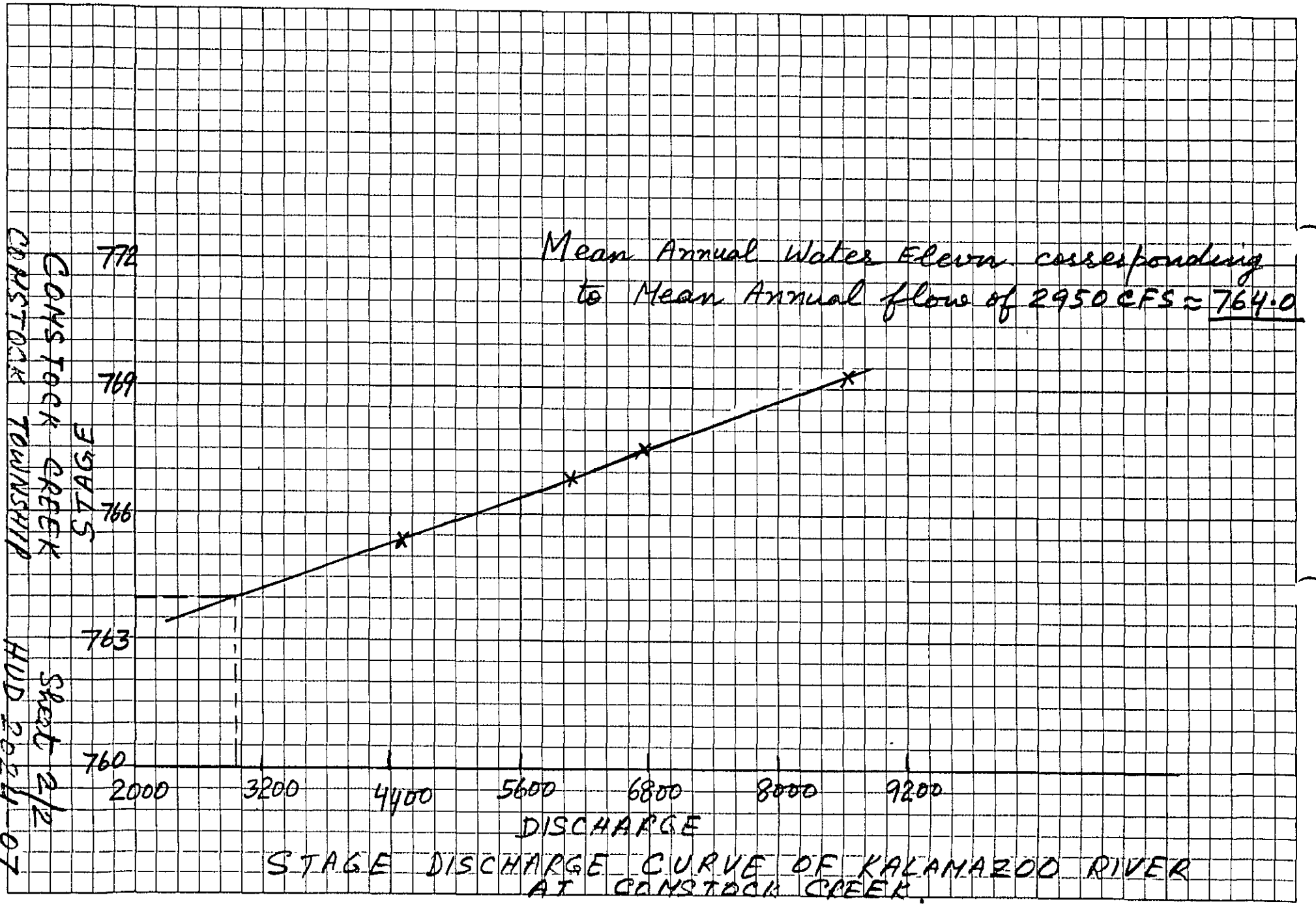
COMSTOCK CREEK

EXHIBIT 4

Mean Annual Water Elevation of
Kalamazoo River at Comstock Creek


K+E PROBABILITY X 2 LOG CYCLES
KEUFFEL & ESSER CO. MADE IN U.S.A.
46 8040
Q (CFS)
FREQUENCY (YR)
2.33
10
50
100
500
Mean Annual Flow
≈ 2950 CFS
MEAN ANNUAL FLOW OF KALAMAZOO RIVER
AT COMSTOCK CREEK
COMSTOCK CREEK
COMSTOCK TOWNSHIP
Sheet 1/2
HUD 2024.07

K•E 6 X 6 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.



STAGE DISCHARGE CURVE OF KALAMAZOO RIVER AT CONSTOCK CREEK

COMSTOCK CREEK

EXHIBIT 5

HEC-2 Computer Printouts
(Separate Folder)

00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: COMSTOCK TWP

3) WATERCOURSE: COMSTOCK CREEK

4) DOCUMENT TYPE: SUMMARY 100 yr run

00BREAK00

```
**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
  ERROR CORR -  01
  MODIFICATION -  50.5,52
**************************************************

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

COMSTOCK CREEK-COMSTOCK

SUMMARY PRINTOUT TABLE  110
```

	SECNO	CWSEL	DIFK.S	FR	TOPWID	XLOB	XCH	XROB	PERENC	STENCL	STCHL	STCHR	STENCR
	100.000	764.00	0.00	764.12	135.00	6.56	243.44	0.00	0.00	0.00	926.00	955.00	0.00
	100.000	764.00	0.00	764.12	135.00	6.56	243.44	0.00	0.00	0.00	926.00	955.00	0.00
	140.000	764.09	0.00	764.16	153.53	13.33	232.00	2.33	0.00	0.00	926.00	955.00	0.00
	140.000	764.09	0.00	764.16	153.53	13.33	232.00	2.33	0.00	0.00	926.00	955.00	0.00
	175.000	764.13	0.00	764.21	157.45	17.02	230.26	2.71	0.00	0.00	926.00	955.00	0.00
	175.000	764.13	0.00	764.21	157.45	17.02	230.26	2.71	0.00	0.00	926.00	955.00	0.00
*	180.000	764.15	0.00	764.49	150.12	67.73	171.75	10.51	0.00	0.00	926.00	955.00	0.00
*	180.000	764.15	0.00	764.49	153.12	67.75	171.75	10.51	0.00	0.00	926.00	955.00	0.00
	185.000	764.47	0.00	764.53	165.23	28.27	215.28	6.46	0.00	0.00	926.00	955.00	0.00
	185.000	764.47	0.00	764.53	165.23	28.27	215.28	6.46	0.00	0.00	926.00	955.00	0.00
	225.000	764.50	0.00	764.55	165.28	29.00	214.24	6.76	0.00	0.00	926.00	955.00	0.00
	225.000	764.50	0.00	764.55	165.28	29.00	214.24	6.76	0.00	0.00	926.00	955.00	0.00
	395.000	764.61	0.00	764.72	81.66	16.78	211.05	22.17	0.00	0.00	927.00	956.00	0.00
	395.000	764.61	0.00	764.72	81.66	16.78	211.05	22.17	0.00	0.00	927.00	956.00	0.00
	565.000	764.79	0.00	765.01	28.97	0.00	250.00	0.00	0.00	0.00	927.00	956.00	0.00
	565.000	764.79	0.00	765.01	28.97	0.00	250.00	0.00	0.00	0.00	927.00	956.00	0.00
	752.000	766.69	0.00	766.90	36.19	0.83	249.06	0.11	0.00	0.00	927.00	956.00	0.00
	752.000	766.69	0.00	766.90	36.19	0.83	249.06	0.11	0.00	0.00	927.00	956.00	0.00
	802.000	766.85	0.00	767.15	29.30	0.56	249.42	0.00	37.50	922.00	928.00	954.00	959.50
	802.000	766.85	0.00	767.15	29.30	0.56	249.42	0.00	37.50	922.00	928.00	954.00	959.50
	827.000	766.95	0.00	767.38	25.08	0.00	250.00	0.00	0.00	0.00	1194.00	1222.00	0.00
	827.000	766.95	0.00	767.38	25.08	0.00	250.00	0.00	0.00	0.00	1194.00	1222.00	0.00
	852.000	766.95	0.00	768.03	12.60	0.00	250.00	0.00	0.00	0.00	1201.70	1214.30	0.00
	852.000	766.95	0.00	768.03	12.60	0.00	250.00	0.00	0.00	0.00	1201.70	1214.30	0.00
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	853.000	766.97	0.00	768.05	12.60	0.00	250.00	0.00	0.00	0.00	1201.70	1214.30	0.00

	SECNO	CWSEL	DIFKHS	EG	TOPWID	QLOB	QCH	QROB	PERENC	STENCL	STCHL	STCHR	STENCR
	922.000	768.10	0.00	768.62	12.60	0.00	250.00	0.00	0.00	0.00	1201.70	1214.30	0.00
	922.000	768.10	0.00	768.62	12.60	0.00	250.00	0.00	0.00	0.00	1201.70	1214.30	0.00
	923.000	768.11	0.00	768.63	12.60	0.00	250.00	0.00	0.00	0.00	1201.70	1214.30	0.00
	923.000	768.11	0.00	768.63	12.60	0.00	250.00	0.00	0.00	0.00	1201.70	1214.30	0.00
	1025.000	768.96	0.00	769.12	53.86	0.29	246.02	3.69	0.00	0.00	1185.00	1227.00	0.00
	1025.000	768.96	0.00	769.12	53.86	0.29	246.02	3.69	0.00	0.00	1185.00	1227.00	0.00
	1100.000	769.26	0.00	769.51	47.88	0.00	250.00	0.00	0.00	0.00	1183.00	1229.00	0.00
	1100.000	769.26	0.00	769.51	47.88	0.00	250.00	0.00	0.00	0.00	1183.00	1229.00	0.00
	1175.000	770.01	0.00	770.41	44.06	0.00	250.00	0.00	0.00	0.00	966.00	1010.00	0.00
	1175.000	770.01	0.00	770.41	44.06	0.00	250.00	0.00	0.00	0.00	966.00	1010.00	0.00
	1325.000	771.76	0.00	772.19	41.03	0.00	245.11	4.89	0.00	0.00	965.00	989.00	0.00
	1325.000	771.76	0.00	772.19	41.03	0.00	245.11	4.89	0.00	0.00	965.00	989.00	0.00
	1485.000	773.47	0.00	774.12	34.60	0.00	245.47	4.53	0.00	0.00	964.00	990.00	0.00
	1485.000	773.47	0.00	774.12	34.60	0.00	245.47	4.53	0.00	0.00	964.00	990.00	0.00
	1512.000	774.06	0.00	774.48	34.08	0.00	246.99	3.00	0.00	0.00	965.00	995.00	0.00
	1512.000	774.06	0.00	774.48	34.08	0.00	246.99	3.00	0.00	0.00	965.00	995.00	0.00
☆	1538.000	774.75	0.00	775.41	29.50	0.00	250.00	0.00	0.00	0.00	963.00	997.00	0.00
☆	1538.000	774.75	0.00	775.41	29.50	0.00	250.00	0.00	0.00	0.00	963.00	997.00	0.00
☆	1568.000	775.84	0.00	776.48	31.04	0.00	250.00	0.00	0.00	0.00	693.40	730.50	0.00
☆	1568.000	775.84	0.00	776.48	31.04	0.00	250.00	0.00	0.00	0.00	693.40	730.50	0.00
	1569.000	776.15	0.00	776.56	33.30	0.00	250.00	0.00	0.00	0.00	693.40	730.50	0.00
	1569.000	776.15	0.00	776.56	33.30	0.00	250.00	0.00	0.00	0.00	693.40	730.50	0.00
	1621.000	776.50	0.00	777.00	32.23	0.00	250.00	0.00	0.00	0.00	693.40	730.50	0.00
	1621.000	776.50	0.00	777.00	32.23	0.00	250.00	0.00	0.00	0.00	693.40	730.50	0.00
	1622.000	776.51	0.00	777.01	32.25	0.00	250.00	0.00	0.00	0.00	693.40	730.50	0.00
	1622.000	776.51	0.00	777.01	32.25	0.00	250.00	0.00	0.00	0.00	693.40	730.50	0.00
☆	1631.000	776.66	0.00	777.28	31.03	0.00	250.00	0.00	0.00	0.00	693.40	730.50	0.00
☆	1631.000	776.66	0.00	777.28	31.03	0.00	250.00	0.00	0.00	0.00	693.40	730.50	0.00
	1632.000	776.95	0.00	777.36	33.29	0.00	250.00	0.00	0.00	0.00	693.40	730.50	0.00
	1632.000	776.95	0.00	777.36	33.29	0.00	250.00	0.00	0.00	0.00	693.40	730.50	0.00
	1659.000	777.09	0.00	777.67	31.45	0.00	250.00	0.00	0.00	0.00	693.40	730.50	0.00
	1659.000	777.09	0.00	777.67	31.45	0.00	250.00	0.00	0.00	0.00	693.40	730.50	0.00
	1660.000	777.11	0.00	777.69	31.46	0.00	250.00	0.00	0.00	0.00	693.40	730.50	0.00
	1660.000	777.11	0.00	777.69	31.46	0.00	250.00	0.00	0.00	0.00	693.40	730.50	0.00
☆	1690.000	777.75	0.00	778.33	31.00	0.00	250.00	0.00	0.00	0.00	693.40	730.50	0.00
☆	1690.000	777.75	0.00	778.38	31.08	0.00	250.00	0.00	0.00	0.00	693.40	730.50	0.00
☆	1720.000	778.46	0.00	779.08	31.03	0.00	250.00	0.00	0.00	0.00	693.40	730.50	0.00
☆	1720.000	778.46	0.00	779.09	31.03	0.00	250.00	0.00	0.00	0.00	693.40	730.50	0.00

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FC-11-11-GD PRINTED BY HOTARY MANIFOLD CO INC.

	SECNO	CHSEL	DIFKHS	ES	TOPHID	CLOB	QCH	CROB	PERENC	STENCL	STCHL	STCHR	STENCR
☆	1750.000	779.14	0.00	779.78	31.05	0.00	250.00	0.00	0.00	0.00	693.60	730.50	0.00
☆	1750.000	779.14	0.00	779.78	31.05	0.00	250.00	0.00	0.00	0.00	693.40	730.50	0.00
	1796.000	791.91	0.00	791.94	100.00	66.15	123.95	59.90	0.00	0.00	42.50	61.40	0.00
	1794.000	791.91	0.00	791.94	100.00	66.15	123.95	59.90	0.00	0.00	42.50	61.40	0.00
	1894.000	791.94	0.00	791.95	111.18	0.03	249.94	0.04	0.00	0.00	884.10	969.20	0.00
	1894.000	791.94	0.00	791.95	111.18	0.03	249.94	0.04	0.00	0.00	884.10	969.20	0.00
	2300.000	791.96	0.00	792.01	67.61	0.00	250.00	0.00	0.00	0.00	893.00	961.00	0.00
	2300.000	791.96	0.00	792.01	67.61	0.00	250.00	0.00	0.00	0.00	893.00	961.00	0.00
	2784.000	792.68	0.00	792.90	68.15	2.31	236.25	11.44	0.00	0.00	1539.00	1571.00	0.00
	2784.000	792.68	0.00	792.90	68.15	2.31	236.25	11.44	0.00	0.00	1539.00	1571.00	0.00
☆	2824.000	793.77	0.00	794.59	25.13	0.92	247.93	4.15	0.00	0.00	1547.00	1567.00	0.00
☆	2824.000	793.77	0.00	794.59	25.13	0.92	247.93	4.15	0.00	0.00	1547.00	1567.00	0.00
☆	2864.000	795.30	0.00	796.88	0.00	0.00	250.00	0.00	0.00	0.00	758.00	766.00	0.00
☆	2864.000	795.30	0.00	796.88	0.00	0.00	250.00	0.00	0.00	0.00	758.00	766.00	0.00
	2865.000	795.31	0.00	796.91	0.00	0.00	250.00	0.00	0.00	0.00	758.00	766.00	0.00
	2865.000	795.31	0.00	796.91	0.00	0.00	250.00	0.00	0.00	0.00	758.00	766.00	0.00
	2901.000	796.66	0.00	797.52	0.00	0.00	250.00	0.00	0.00	0.00	758.00	766.00	0.00
	2901.000	796.66	0.00	797.52	0.00	0.00	250.00	0.00	0.00	0.00	758.00	766.00	0.00
	2902.000	796.90	0.00	797.58	8.00	0.00	250.00	0.00	0.00	0.00	758.00	766.00	0.00
	2902.000	796.90	0.00	797.58	8.00	0.00	250.00	0.00	0.00	0.00	758.00	766.00	0.00
	2922.000	797.75	0.00	797.79	41.83	0.00	250.00	0.00	122.00	701.00	743.00	785.00	823.00
	2922.000	797.75	0.00	797.79	41.83	0.00	250.00	0.00	122.00	701.00	743.00	785.00	823.00
	2957.000	809.77	0.00	809.81	112.20	46.40	160.26	43.34	0.00	0.00	56.30	69.50	0.00
	2957.000	809.77	0.00	809.81	112.00	46.40	160.26	43.34	0.00	0.00	56.50	69.50	0.00
	3280.000	809.87	0.00	809.68	496.02	85.76	161.07	2.37	0.00	0.00	905.50	938.50	0.00
	3280.000	809.88	0.00	809.69	206.79	80.92	169.08	0.00	0.26	734.71	905.50	938.50	938.50
	4280.000	810.05	0.00	810.07	113.47	0.36	248.10	1.34	0.00	0.00	906.00	1004.00	0.00
	4280.000	810.07	0.02	810.09	98.00	0.00	250.00	0.00	0.01	906.00	906.00	1004.00	1004.00
	4598.000	810.17	0.00	810.31	82.37	0.50	249.50	0.00	0.00	0.00	915.00	1000.00	0.00
	4598.000	810.20	0.02	810.33	79.71	0.00	250.00	0.00	0.00	915.00	915.00	1000.00	1000.00
	4916.000	811.50	0.00	811.66	66.01	1.93	246.16	1.52	0.00	0.00	930.00	985.00	0.00
	4916.000	811.51	0.01	811.68	55.00	0.00	250.00	0.00	0.02	930.00	930.00	985.00	985.00
	5234.000	813.08	0.00	813.39	54.77	3.36	242.17	4.46	0.00	0.00	935.00	975.00	0.00
	5234.000	813.14	0.06	813.45	40.00	0.00	250.00	0.00	0.23	935.00	935.00	975.00	975.00
	5552.000	815.04	0.00	815.32	46.70	7.35	235.33	7.32	0.00	0.00	940.00	970.00	0.00
	5552.000	815.16	0.12	815.46	30.00	0.00	250.00	0.00	0.06	940.00	940.00	970.00	970.00
	5872.000	816.52	0.00	816.90	73.73	8.63	222.53	18.84	0.00	0.00	817.00	835.00	0.00
	5872.000	816.60	0.08	816.94	76.72	9.33	219.60	21.07	1270.00	782.00	817.00	835.00	1392.00

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SECNO	CUSEL	DIFKMS	EG	TOPUID	GLOB	GCH	CROB	PERENC	STEXCL	STCHL	STCHR	STEXCR
6292.000	818.49	0.00	818.81	43.60	7.69	241.48	0.83	0.00	0.00	1070.00	1094.00	0.00
6292.000	818.44	-0.05	818.79	42.49	7.32	242.33	0.65	0.00	0.00	1070.00	1094.00	0.00
6712.000	820.43	0.00	820.83	42.43	3.03	246.34	0.60	0.00	0.00	1070.00	1096.00	0.00
6712.000	820.50	0.02	820.84	40.65	3.17	246.16	0.66	0.00	0.00	1070.00	1096.00	0.00
7132.000	822.86	0.00	823.29	25.37	0.11	249.89	0.00	0.00	0.00	1069.00	1097.00	0.00
7132.000	822.84	-0.01	823.29	25.26	0.12	249.90	0.00	0.00	0.00	1069.00	1097.00	0.00
7332.000	823.78	0.00	823.97	31.90	1.77	248.23	0.00	0.00	0.00	1069.00	1097.00	0.00
7332.000	823.78	-0.00	823.97	31.89	1.76	248.24	0.00	0.00	0.00	1069.00	1097.00	0.00
7532.000	824.15	0.00	824.30	34.55	2.07	247.13	0.00	0.00	0.00	1069.00	1097.00	0.00
7532.000	824.15	-0.00	824.30	34.53	2.06	247.14	0.00	0.00	0.00	1069.00	1097.00	0.00
7800.000	824.39	0.00	824.41	300.00	36.56	210.48	2.94	300.00	570.00	768.00	816.00	825.00
7800.000	824.39	0.00	824.41	210.00	34.56	213.85	1.59	210.00	615.00	768.00	816.00	825.00
7990.000	824.43	0.00	824.45	203.82	78.57	49.40	122.03	0.00	0.00	888.70	895.30	0.00
7990.000	824.44	0.00	824.45	203.82	78.57	49.57	122.06	0.00	0.00	888.70	895.30	0.00
8034.000	825.84	0.00	825.84	211.58	76.07	35.86	138.06	0.00	0.00	888.70	895.30	0.00
8034.000	825.84	0.00	825.84	211.58	76.07	35.86	138.06	0.00	0.00	888.70	895.30	0.00
8084.000	825.84	0.00	825.84	211.59	76.07	35.84	138.10	0.00	0.00	888.70	895.30	0.00
8084.000	825.84	0.00	825.84	211.59	76.07	35.84	138.10	0.00	0.00	888.70	895.30	0.00

FORM 1011-G. PRINTED BY HOLAND MANIFOLD FORMS.
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COMSTOCK CREEK-COMSTOCK

SUMMARY PRINTOUT TABLE 150

	SECNO	XLOB	ELTRD	ELLOC	ELMIN	Q	CHSEL	CRIWS	EG	TOPWS	VCH	AREA	.01K
	100.000	0.00	0.00	0.00	760.20	250.00	764.00	0.00	764.12	15.32	2.86	109.45	63.36
	100.000	0.00	0.00	0.00	760.20	250.00	764.00	0.00	764.12	15.32	2.86	109.45	63.86
	140.000	40.00	0.00	0.00	760.20	250.00	764.09	0.00	764.18	9.51	2.45	151.12	81.06
	140.000	40.00	0.00	0.00	760.20	250.00	764.09	0.00	764.18	9.51	2.45	151.12	81.06
	175.000	35.00	0.00	0.00	760.20	250.00	764.13	0.00	764.21	8.97	2.40	157.88	83.48
	175.000	35.00	0.00	0.00	760.20	250.00	764.13	0.00	764.21	8.97	2.40	157.88	83.48
*	180.000	5.00	0.00	0.00	762.00	250.00	764.15	764.15	764.49	120.54	5.63	96.77	22.77
*	180.000	5.00	0.00	0.00	762.00	250.00	764.15	764.15	764.49	120.54	5.63	96.77	22.77
	185.000	5.00	0.00	0.00	760.20	250.00	764.47	0.00	764.53	5.65	2.03	213.85	105.22
	185.000	5.00	0.00	0.00	760.20	250.00	764.47	0.00	764.53	5.65	2.03	213.85	105.22
	225.000	40.00	0.00	0.00	760.20	250.00	764.59	0.00	764.63	5.47	2.01	217.68	106.85
	225.000	40.00	0.00	0.00	760.20	250.00	764.59	0.00	764.63	5.47	2.01	217.68	106.85
	395.000	170.00	0.00	0.00	761.50	250.00	764.61	0.00	764.72	18.48	2.92	129.41	58.15
	395.000	170.00	0.00	0.00	761.50	250.00	764.61	0.00	764.72	18.48	2.92	129.41	58.15
	565.000	170.00	0.00	0.00	762.30	250.00	764.99	0.00	765.61	195.39	6.36	39.46	17.00
	565.000	170.00	0.00	0.00	762.30	250.00	764.99	0.00	765.61	195.39	6.36	39.46	17.00
	752.000	187.00	0.00	0.00	763.50	250.00	766.69	0.00	766.90	33.26	3.70	69.64	43.33
	752.000	187.00	0.00	0.00	763.50	250.00	766.69	0.00	766.90	33.26	3.70	69.64	43.33
	802.000	50.00	0.00	0.00	764.00	250.00	766.85	0.00	767.19	55.33	4.45	57.25	34.23
	802.000	50.00	0.00	0.00	764.00	250.00	766.85	0.00	767.19	55.33	4.45	57.25	34.23
	827.000	25.00	0.00	0.00	764.20	250.00	766.95	0.00	767.38	89.58	5.26	47.54	26.41
	827.000	25.00	0.00	0.00	764.20	250.00	766.95	0.00	767.38	89.58	5.26	47.54	26.41
	852.000	25.00	0.00	0.00	764.40	250.00	766.95	0.00	768.05	196.71	8.35	29.94	17.73
	852.000	25.00	0.00	0.00	764.40	250.00	766.95	0.00	768.05	196.71	8.35	29.94	17.73
	853.000	1.00	777.50	772.10	764.40	250.00	766.97	0.00	768.05	110.99	8.33	30.01	23.73
	853.000	1.00	777.50	772.10	764.40	250.00	766.97	0.00	768.05	110.99	8.33	30.01	23.73
	922.000	69.00	777.50	772.20	764.30	250.00	768.10	0.00	768.62	36.61	5.81	43.00	41.32
	922.000	69.00	777.50	772.20	764.30	250.00	768.10	0.00	768.62	36.61	5.81	43.00	41.32
	923.000	1.00	0.00	0.00	764.50	250.00	768.11	0.00	768.63	64.26	5.79	43.17	31.19
	923.000	1.00	0.00	0.00	764.50	250.00	768.11	0.00	768.63	64.26	5.79	43.17	31.19
	1025.000	102.00	0.00	0.00	765.60	250.00	768.96	0.00	769.12	32.63	3.18	84.39	43.77
	1025.000	102.00	0.00	0.00	765.60	250.00	768.96	0.00	769.12	32.63	3.18	84.39	43.77
	1100.000	75.00	0.00	0.00	766.50	250.00	769.26	0.00	769.51	81.17	4.03	62.07	27.75
	1100.000	75.00	0.00	0.00	766.50	250.00	769.26	0.00	769.51	81.17	4.03	62.07	27.75
	1175.000	75.00	0.00	0.00	767.40	250.00	770.31	0.00	770.41	168.74	5.08	49.21	19.25
	1175.000	75.00	0.00	0.00	767.40	250.00	770.31	0.00	770.41	168.74	5.08	49.21	19.25

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CUSEL	CRIUS	EC	10K*S	VCH	AREA	.01K
	1325.000	150.00	0.00	0.00	769.20	250.00	771.76	0.00	772.19	87.90	5.33	52.65	26.66
	1325.000	150.00	0.00	0.00	769.20	250.00	771.76	0.00	772.19	87.90	5.33	52.65	26.66
	1483.000	160.00	0.00	0.00	771.20	250.00	773.47	773.37	774.12	160.46	6.50	42.32	19.74
	1485.000	160.00	0.00	0.00	771.20	250.00	773.47	773.37	774.12	160.46	6.50	42.32	19.74
	1512.000	27.00	0.00	0.00	772.00	250.00	774.06	0.00	774.48	102.81	5.25	50.12	24.66
	1512.000	27.00	0.00	0.00	772.00	250.00	774.06	0.00	774.48	102.81	5.25	50.12	24.66
*	1538.000	26.00	0.00	0.00	773.10	250.00	774.75	774.75	775.41	219.66	6.50	38.44	16.67
*	1538.000	26.00	0.00	0.00	773.10	250.00	774.75	774.75	775.41	219.66	6.50	38.44	16.67
*	1568.000	30.00	0.00	0.00	774.30	250.00	775.84	775.84	776.48	222.80	6.40	39.06	16.75
*	1568.000	30.00	0.00	0.00	774.30	250.00	775.84	775.84	776.48	222.80	6.40	39.06	16.75
	1569.000	1.00	787.70	783.90	774.30	250.00	776.15	0.00	776.56	65.39	5.12	48.87	30.92
	1569.000	1.00	787.70	783.90	774.30	250.00	776.15	0.00	776.56	65.39	5.12	48.87	30.92
	1621.000	52.00	787.70	784.40	774.90	250.00	776.50	0.00	777.00	87.79	5.66	44.14	26.68
	1621.000	52.00	787.70	784.40	774.90	250.00	776.50	0.00	777.00	87.79	5.66	44.14	26.68
	1622.000	1.00	0.00	0.00	774.80	250.00	776.51	0.00	777.01	155.19	5.65	44.22	20.07
	1622.000	1.00	0.00	0.00	774.80	250.00	776.51	0.00	777.01	155.19	5.65	44.22	20.07
*	1631.000	9.00	0.00	0.00	775.10	250.00	776.64	776.64	777.28	223.89	6.41	38.99	16.71
*	1631.000	9.00	0.00	0.00	775.10	250.00	776.64	776.64	777.28	223.89	6.41	38.99	16.71
	1632.000	1.00	789.90	783.90	775.10	250.00	776.95	0.00	777.36	65.67	5.12	48.79	30.85
	1632.000	1.00	789.90	783.90	775.10	250.00	776.95	0.00	777.36	65.67	5.12	48.79	30.85
	1659.000	27.00	789.90	784.30	775.50	250.00	777.09	0.00	777.67	110.46	6.13	40.79	23.79
	1659.000	27.00	789.90	784.30	775.50	250.00	777.09	0.00	777.67	110.46	6.13	40.79	23.79
	1660.000	1.00	0.00	0.00	775.50	250.00	777.1	0.00	777.69	196.05	6.13	40.81	17.86
	1660.000	1.00	0.00	0.00	775.50	250.00	777.19	0.00	777.69	196.05	6.13	40.81	17.86
*	1690.000	30.00	0.00	0.00	776.20	250.00	777.73	777.73	778.38	220.00	6.37	39.23	16.86
*	1690.000	30.00	0.00	0.00	776.20	250.00	777.73	777.73	778.38	220.00	6.37	39.23	16.86
*	1720.000	30.00	0.00	0.00	776.90	250.00	778.44	778.44	779.08	223.77	6.41	39.00	16.71
*	1720.000	30.00	0.00	0.00	776.90	250.00	778.44	778.44	779.08	223.77	6.41	39.00	16.71
*	1750.000	30.00	0.00	0.00	777.60	250.00	779.14	779.14	779.78	222.00	6.39	39.11	16.78
*	1750.000	30.00	0.00	0.00	777.60	250.00	779.14	779.14	779.78	222.00	6.39	39.11	16.78
	1794.000	44.00	789.20	789.20	788.00	250.00	791.91	0.00	791.94	3.30	1.68	310.16	137.59
	1794.000	44.00	789.20	789.20	788.00	250.00	791.91	0.00	791.94	3.30	1.68	310.16	137.59
	1894.000	100.00	0.00	0.00	787.60	250.00	791.94	0.00	791.95	0.47	0.71	354.62	365.21
	1894.000	100.00	0.00	0.00	787.60	250.00	791.94	0.00	791.95	0.47	0.71	354.62	365.21
	2300.000	406.00	0.00	0.00	789.30	250.00	791.96	0.00	792.01	6.27	1.75	143.26	99.84
	2300.000	406.00	0.00	0.00	789.30	250.00	791.96	0.00	792.01	6.27	1.75	143.26	99.84
	2784.000	484.00	0.00	0.00	791.00	250.00	792.48	0.00	792.90	103.66	5.35	54.45	24.56
	2784.000	484.00	0.00	0.00	791.00	250.00	792.48	0.00	792.90	103.66	5.35	54.45	24.56

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CUSEL	CRILS	EG	TOK-S	VCH	AREA	.01K
☆	2824.000	40.00	0.00	0.00	791.60	250.00	793.77	793.77	794.59	149.60	7.31	35.89	20.44
☆	2824.000	40.00	0.00	0.00	791.60	250.00	793.77	793.77	794.59	149.60	7.31	35.89	20.44
☆	2864.000	40.00	0.00	0.00	791.90	250.00	795.30	795.30	796.88	209.96	10.07	24.84	17.25
☆	2864.000	40.00	0.00	0.00	791.90	250.00	795.30	795.30	796.88	209.96	10.07	24.84	17.25
	2865.000	1.00	801.00	797.80	791.90	250.00	795.31	795.28	796.91	167.96	10.15	24.63	19.29
	2865.000	1.00	801.00	797.80	791.90	250.00	795.31	795.28	796.91	167.96	10.15	24.63	19.29
	2901.000	36.00	801.00	797.80	791.90	250.00	796.66	0.00	797.52	76.49	7.44	33.60	28.59
	2901.000	36.00	801.00	797.80	791.90	250.00	796.66	0.00	797.52	76.49	7.44	33.60	28.59
	2902.000	1.00	0.00	0.00	791.90	250.00	796.90	0.00	797.58	62.19	6.64	37.63	31.70
	2902.000	1.00	0.00	0.00	791.90	250.00	796.90	0.00	797.58	62.19	6.64	37.63	31.70
	2922.000	20.00	0.00	0.00	793.20	250.00	797.75	0.00	797.79	2.76	1.62	154.39	150.51
	2922.000	20.00	0.00	0.00	793.20	250.00	797.75	0.00	797.79	2.76	1.62	154.39	150.51
	2957.000	35.00	805.90	805.90	804.00	250.00	809.77	0.00	809.81	4.79	2.20	247.67	114.24
	2957.000	35.00	805.90	805.90	804.00	250.00	809.77	0.00	809.81	4.79	2.20	247.67	114.24
	3280.000	323.00	0.00	0.00	804.20	250.00	809.87	0.00	809.88	0.92	1.01	633.62	261.00
	3280.000	323.00	0.00	0.00	804.20	250.00	809.88	0.00	809.89	1.02	1.06	492.32	247.16
	4280.000	1300.00	0.00	0.00	807.20	250.00	810.05	0.00	810.07	2.45	1.13	228.40	159.66
	4280.000	1300.00	0.00	0.00	807.20	250.00	810.07	0.00	810.09	2.51	1.13	220.69	157.60
	4598.000	318.00	0.00	0.00	808.51	250.00	810.17	0.00	810.31	46.76	3.01	84.28	36.56
	4598.000	318.00	0.00	0.00	808.50	250.00	810.20	0.00	810.33	44.49	2.94	85.11	37.48
	4916.000	318.00	0.00	0.00	809.70	250.00	811.50	0.00	811.66	38.39	3.25	81.86	40.35
	4916.000	318.00	0.00	0.00	809.70	250.00	811.31	0.00	811.60	39.75	3.28	78.74	39.65
	5234.000	318.00	0.00	0.00	811.50	250.00	813.08	0.00	813.39	73.42	4.53	61.47	28.11
	5234.000	318.00	0.00	0.00	811.50	250.00	813.14	0.00	813.45	78.92	4.51	55.48	28.14
	5552.000	318.00	0.00	0.00	813.00	250.00	815.04	0.00	815.32	49.18	4.39	68.87	35.65
	5552.000	318.00	0.00	0.00	813.20	250.00	815.16	0.00	815.48	51.27	4.36	67.38	34.85
	5872.000	320.00	0.00	0.00	813.80	250.00	816.32	0.00	816.90	66.14	5.20	58.80	36.03
	5872.000	320.00	0.00	0.00	813.80	250.00	816.60	0.00	816.94	41.51	4.95	75.45	38.80
	6292.000	420.00	0.00	0.00	816.00	250.00	818.49	0.00	818.81	44.39	4.66	63.02	37.52
	6292.000	420.00	0.00	0.00	816.00	250.00	818.66	0.00	818.95	48.16	4.78	60.90	36.03
	6712.000	420.00	0.00	0.00	818.00	250.00	820.46	0.00	820.63	51.77	4.77	57.42	34.75
	6712.000	420.00	0.00	0.00	818.00	250.00	820.50	0.00	820.84	49.93	4.72	58.27	35.36
	7132.000	420.00	0.00	0.00	819.90	250.00	822.86	0.00	823.29	65.87	5.31	47.37	30.80
	7132.000	420.00	0.00	0.00	819.90	250.00	822.84	0.00	823.29	67.15	5.34	47.06	30.51
	7332.000	200.00	0.00	0.00	819.90	250.00	823.78	0.00	823.97	19.63	3.54	73.83	56.44
	7332.000	200.00	0.00	0.00	819.90	250.00	823.78	0.00	823.97	19.65	3.54	73.78	56.39
	7532.000	200.00	0.00	0.00	819.90	250.00	824.15	0.00	824.30	13.12	3.08	86.27	69.01
	7532.000	200.00	0.00	0.00	819.90	250.00	824.15	0.00	824.30	13.15	3.09	86.21	68.95

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CHSEL	CRIUS	EG	10K*S	VCH	AREA	.01K
7800.000	268.00	0.00	0.00	819.80	250.00	824.39	0.00	824.41	1.65	1.25	373.82	194.47
7800.000	268.00	0.00	0.00	819.80	250.00	824.39	0.00	824.41	1.71	1.27	338.93	191.43
7990.000	190.00	0.00	0.00	819.70	250.00	824.43	0.00	824.45	2.67	1.68	449.98	153.09
7990.000	190.00	0.00	0.00	819.70	250.00	824.44	0.00	824.45	2.66	1.68	450.34	153.27
8034.000	44.00	824.60	821.90	819.70	250.00	825.84	0.00	825.84	0.58	0.96	743.94	329.04
8034.000	44.00	824.60	821.90	819.70	250.00	825.84	0.00	825.84	0.58	0.96	743.99	329.07
8084.000	50.00	0.00	0.00	819.70	250.00	825.84	0.00	825.84	0.57	0.96	744.97	329.75
8084.000	50.00	0.00	0.00	819.70	250.00	825.84	0.00	825.84	0.57	0.96	745.03	329.79

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FORM 1411-GD PRINTED BY ROTARY MANIFOLD FORMS

COMSTOCK CREEK-COMSTOCK

SUMMARY PRINTOUT TABLE 150

	SECNO	X	CHSEL	DIFWSP	DIFWSX	PEAK S	TOPWID	XLOC
	100.000	250.00	764.00	0.00	0.00	0.00	135.00	0.00
	100.000	250.00	764.00	0.00	0.00	0.00	135.00	0.00
	140.000	250.00	764.09	0.00	0.09	0.00	153.53	40.00
	140.000	250.00	764.09	0.00	0.09	0.00	153.53	40.00
	175.000	250.00	764.13	0.00	0.04	0.00	157.45	35.00
	175.000	250.00	764.13	0.00	0.04	0.00	157.45	35.00
*	180.000	250.00	764.15	0.00	0.02	0.00	156.12	5.00
*	180.000	250.00	764.15	0.00	0.02	0.00	156.12	5.00
	185.000	250.00	764.47	0.00	0.33	0.00	165.23	5.00
	185.000	250.00	764.47	0.00	0.33	0.00	165.23	5.00
	225.000	250.00	764.53	0.00	0.02	0.00	165.23	40.00
	225.000	250.00	764.53	0.00	0.02	0.00	165.23	40.00
	395.000	250.00	764.61	0.00	0.11	0.00	81.66	170.00
	395.000	250.00	764.61	0.00	0.11	0.00	81.66	170.00
	565.000	250.00	764.99	0.00	0.37	0.00	28.81	170.00
	565.000	250.00	764.99	0.00	0.37	0.00	28.81	170.00
	752.000	250.00	766.69	0.00	1.70	0.00	36.19	187.00
	752.000	250.00	766.69	0.00	1.70	0.00	36.19	187.00
	802.000	250.00	766.85	0.00	0.16	0.00	29.30	50.00
	802.000	250.00	766.85	0.00	0.16	0.00	29.30	50.00
	827.000	250.00	766.95	0.00	0.11	0.00	25.08	25.00
	827.000	250.00	766.95	0.00	0.11	0.00	25.08	25.00
	852.000	250.00	766.93	0.00	-0.01	0.00	12.60	25.00
	852.000	250.00	766.93	0.00	-0.01	0.00	12.60	25.00
	853.000	250.00	766.97	0.00	0.02	0.00	12.60	1.00
	853.000	250.00	766.97	0.00	0.02	0.00	12.60	1.00
	922.000	250.00	768.10	0.00	1.13	0.00	12.60	69.00
	922.000	250.00	768.10	0.00	1.13	0.00	12.60	69.00
	923.000	250.00	768.11	0.00	0.01	0.00	12.60	1.00
	923.000	250.00	768.11	0.00	0.01	0.00	12.60	1.00
	1025.000	250.00	768.96	0.00	0.86	0.00	53.66	102.00
	1025.000	250.00	768.96	0.00	0.86	0.00	53.66	102.00
	1100.000	250.00	769.26	0.00	0.30	0.00	47.88	75.00
	1100.000	250.00	769.26	0.00	0.30	0.00	47.88	75.00
	1175.000	250.00	770.01	0.00	0.75	0.00	44.06	75.00
	1175.000	250.00	770.01	0.00	0.75	0.00	44.06	75.00

	SECNO	Q	CUSEL	DIFWSP	DIFSX	DIFKUS	TOPWID	XLCH
	1325.000	250.00	771.76	0.00	1.76	0.00	41.03	150.00
	1325.000	250.00	771.76	0.00	1.76	0.00	41.03	150.00
	1465.000	250.00	773.47	0.00	1.71	0.00	34.60	140.00
	1485.000	250.00	773.47	0.00	1.71	0.00	34.60	160.00
	1512.000	250.00	774.06	0.00	0.59	0.00	34.08	27.00
	1512.000	250.00	774.06	0.00	0.59	0.00	34.08	27.00
*	1530.000	250.00	774.75	0.00	0.70	0.00	29.50	26.00
*	1530.000	250.00	774.75	0.00	0.70	0.00	29.50	26.00
*	1568.000	250.00	775.84	0.00	1.09	0.00	31.04	30.00
*	1560.000	250.00	775.84	0.00	1.09	0.00	31.04	30.00
	1569.000	250.00	776.15	0.00	0.31	0.00	33.30	1.00
	1569.000	250.00	776.15	0.00	0.31	0.00	33.30	1.00
	1621.000	250.00	776.50	0.00	0.35	0.00	32.23	52.00
	1621.000	250.00	776.50	0.00	0.35	0.00	32.23	52.00
	1622.000	250.00	776.51	0.00	0.01	0.00	32.25	1.00
	1622.000	250.00	776.51	0.00	0.01	0.00	32.25	1.00
*	1631.000	250.00	776.64	0.00	0.13	0.00	31.03	9.00
*	1631.000	250.00	776.64	0.00	0.13	0.00	31.03	9.00
	1632.000	250.00	776.95	0.00	0.31	0.00	33.29	1.00
	1632.000	250.00	776.95	0.00	0.31	0.00	33.29	1.00
	1659.000	250.00	777.09	0.00	0.14	0.00	31.45	27.00
	1659.000	250.00	777.09	0.00	0.14	0.00	31.45	27.00
	1660.000	250.00	777.11	0.00	0.02	0.00	31.46	1.00
	1660.000	250.00	777.11	0.00	0.02	0.00	31.46	1.00
*	1690.000	250.00	777.75	0.00	0.64	0.00	31.08	30.00
*	1690.000	250.00	777.75	0.00	0.64	0.00	31.08	30.00
*	1720.000	250.00	778.44	0.00	0.69	0.00	31.03	30.00
*	1720.000	250.00	778.44	0.00	0.69	0.00	31.03	30.00
*	1750.000	250.00	779.14	0.00	0.70	0.00	31.05	30.00
*	1750.000	250.00	779.14	0.00	0.70	0.00	31.05	30.00
	1794.000	250.00	791.91	0.00	12.77	0.00	100.00	44.00
	1794.000	250.00	791.91	0.00	12.77	0.00	100.00	44.00
	1894.000	250.00	791.94	0.00	0.03	0.00	111.13	100.00
	1894.000	250.00	791.94	0.00	0.03	0.00	111.13	100.00
	2300.000	250.00	791.96	0.00	0.02	0.00	67.61	406.00
	2300.000	250.00	791.96	0.00	0.02	0.00	67.61	406.00
	2784.000	250.00	792.48	0.00	0.52	0.00	40.15	484.00
	2784.000	250.00	792.48	0.00	0.52	0.00	40.15	484.00

FORM 1411 (5) PRINTED BY ROTARY MANIFOLD FORMS.
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	SECNO	Q	CHSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	2824.000	250.00	793.77	0.00	1.29	0.00	25.13	40.00
*	2824.000	250.00	793.77	0.00	1.29	0.00	25.13	40.00
*	2864.000	250.00	795.30	0.00	1.53	0.00	8.00	40.00
*	2864.000	250.00	795.30	0.00	1.53	0.00	8.00	40.00
	2865.000	250.00	795.31	0.00	0.01	0.00	8.00	1.00
	2865.000	250.00	795.31	0.00	0.01	0.00	8.00	1.00
	2901.000	250.00	796.66	0.00	1.36	0.00	8.00	36.00
	2901.000	250.00	796.66	0.00	1.36	0.00	8.00	36.00
	2902.000	250.00	796.90	0.00	0.23	0.00	8.00	1.00
	2902.000	250.00	796.90	0.00	0.23	0.00	8.00	1.00
	2922.000	250.00	797.75	0.00	0.85	0.00	41.83	20.00
	2922.000	250.00	797.75	0.00	0.85	0.00	41.83	20.00
	2957.000	250.00	809.77	0.00	12.02	0.00	112.00	35.00
	2957.000	250.00	809.77	0.00	12.02	0.00	112.00	35.00
	3280.000	250.00	809.87	0.00	0.11	0.00	496.02	323.00
	3280.000	250.00	809.88	0.00	0.11	0.00	203.79	323.00
	4280.000	250.00	810.05	0.00	0.18	0.00	113.47	1300.00
	4280.000	250.00	810.07	0.00	0.19	0.02	98.00	1300.00
	4598.000	250.00	810.17	0.00	0.12	0.00	82.37	318.00
	4598.000	250.00	810.20	0.00	0.13	0.02	79.71	318.00
	4916.000	250.00	811.50	0.00	1.33	0.00	68.01	318.00
	4916.000	250.00	811.51	0.00	1.31	0.01	53.00	318.00
	5234.000	250.00	813.08	0.00	1.50	0.00	54.77	318.00
	5234.000	250.00	813.14	0.00	1.62	0.06	40.00	318.00
	5552.000	250.00	815.04	0.00	1.96	0.00	49.78	318.00
	5552.000	250.00	815.16	0.00	2.33	0.12	30.00	318.00
	5872.000	250.00	816.52	0.00	1.48	0.00	73.73	320.00
	5872.000	250.00	816.60	0.00	1.44	0.08	76.72	320.00
	6292.000	250.00	818.49	0.00	1.97	0.00	43.60	420.00
	6292.000	250.00	818.44	0.00	1.84	-0.05	42.49	420.00
	6712.000	250.00	820.48	0.00	1.99	0.00	40.43	420.00
	6712.000	250.00	820.50	0.00	2.06	0.02	40.85	420.00
	7132.000	250.00	822.86	0.00	2.38	0.00	25.37	420.00
	7132.000	250.00	822.84	0.00	2.34	-0.01	25.29	420.00
	7332.000	250.00	823.78	0.00	0.93	0.00	31.90	200.00
	7332.000	250.00	823.78	0.00	0.94	-0.00	31.89	200.00
	7532.000	250.00	824.15	0.00	0.37	0.00	34.55	200.00
	7532.000	250.00	824.15	0.00	0.37	-0.00	34.53	200.00

SECNO	Q	CWSEL	DIFWSF	DIFWSX	DIFKWS	TOPWID	XLCH
7800.000	250.00	824.39	0.00	0.23	0.00	300.00	268.00
7800.000	250.00	824.39	0.00	0.24	0.00	210.00	268.00
7990.000	250.00	824.43	0.00	0.05	0.00	206.82	190.00
7990.000	250.00	824.44	0.00	0.05	0.00	206.82	190.00
8034.000	250.00	825.84	0.00	1.40	0.00	211.58	44.00
8034.000	250.00	825.84	0.00	1.40	0.00	211.58	44.00
8084.000	250.00	825.84	0.00	0.00	0.00	211.59	50.00
8084.000	250.00	825.84	0.00	0.00	0.00	211.59	50.00

SUMMARY OF ERRORS

```
CAUTION  SECNO=  180.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=  180.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=  180.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO=  180.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=  180.000  PROFILE= 2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=  180.000  PROFILE= 2  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO= 1538.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 1538.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 1538.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO= 1538.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 1538.000  PROFILE= 2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 1538.000  PROFILE= 2  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO= 1568.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 1568.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 1568.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 1568.000  PROFILE= 2  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO= 1631.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 1631.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 1631.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 1631.000  PROFILE= 2  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO= 1690.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 1690.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 1690.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 1690.000  PROFILE= 2  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO= 1720.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 1720.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 1720.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 1720.000  PROFILE= 2  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO= 1750.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 1750.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 1750.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 1750.000  PROFILE= 2  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO= 2824.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 2824.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO= 2824.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO= 2824.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO= 2824.000  PROFILE= 2  PROBABLE MINIMUM SPECIFIC ENERGY
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 CAUTION  SECNO= 2824.000  PROFILE= 2  20 TRIALS ATTEMPTED TO BALANCE HSEL

 CAUTION  SECNO= 2864.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO= 2864.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION  SECNO= 2864.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE HSEL
 CAUTION  SECNO= 2864.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO= 2864.000  PROFILE= 2  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION  SECNO= 2864.000  PROFILE= 2  20 TRIALS ATTEMPTED TO BALANCE HSEL
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FLOODWAY DATA, COMSTOCK CREEK-COMSTOCK
PROFILE NO. 2

STATION	FLOODWAY WIDTH (FT)	FLOODWAY SECTION AREA	MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WITHOUT FLOODWAY	DIFFERENCE
100.000	135.	105.	2.3	764.0	764.0	0.0
140.000	156.	151.	1.7	764.1	764.1	0.0
175.000	157.	158.	1.6	764.1	764.1	0.0
180.000	158.	97.	2.6	764.1	764.1	0.0
185.000	165.	214.	1.2	764.5	764.5	0.0
225.000	165.	218.	1.1	764.5	764.5	0.0
395.000	82.	129.	1.9	764.6	764.6	0.0
565.000	29.	59.	5.3	765.0	765.0	0.0
752.000	34.	70.	3.6	766.7	766.7	0.0
802.000	29.	57.	4.4	766.8	766.8	0.0
827.000	25.	48.	5.3	767.0	767.0	0.0
852.000	13.	30.	8.3	766.9	766.9	0.0
853.000	13.	30.	8.3	767.0	767.0	0.0
922.000	13.	45.	5.6	768.1	768.1	0.0
923.000	13.	45.	5.6	768.1	768.1	0.0
1025.000	54.	84.	3.0	769.0	769.0	0.0
1100.000	48.	62.	4.0	769.3	769.3	0.0
1175.000	44.	69.	5.1	770.0	770.0	0.0
1325.000	41.	53.	4.7	771.8	771.8	0.0
1465.000	35.	42.	5.9	773.5	773.5	0.0
1512.000	34.	50.	5.0	774.1	774.1	0.0
1538.000	29.	38.	6.5	774.8	774.8	0.0
1568.000	31.	39.	6.4	775.8	775.8	0.0
1569.000	33.	69.	5.1	776.2	776.2	0.0
1621.000	32.	41.	5.9	776.5	776.5	0.0
1622.000	32.	40.	5.7	776.6	776.6	0.0
1631.000	31.	39.	6.4	776.8	776.8	0.0
1632.000	33.	49.	5.1	777.0	777.0	0.0
1659.000	31.	41.	6.1	777.1	777.1	0.0
1660.000	31.	41.	6.1	777.1	777.1	0.0
1690.000	31.	39.	6.4	777.7	777.7	0.0
1720.000	31.	39.	6.4	778.4	778.4	0.0
1750.000	31.	39.	6.4	779.1	779.1	0.0
1794.000	100.	310.	0.8	791.9	791.9	0.0
1894.000	111.	355.	0.7	791.9	791.9	0.0
2300.000	68.	143.	1.7	792.0	792.0	0.0
2784.000	48.	54.	4.3	792.5	792.5	0.0
2824.000	25.	36.	7.0	793.8	793.8	0.0
2864.000	8.	25.	10.1	795.3	795.3	0.0
2865.000	8.	25.	10.2	795.3	795.3	0.0
2901.000	8.	34.	7.4	796.7	796.7	0.0
2902.000	8.	38.	6.6	796.9	796.9	0.0
2922.000	42.	154.	1.6	797.7	797.7	0.0
2957.000	112.	248.	1.0	809.8	809.8	0.0
3260.000	204.	692.	0.5	809.9	809.9	0.0
4280.000	98.	221.	1.1	810.1	810.1	0.0
4598.000	80.	85.	2.9	810.2	810.2	0.0
4916.000	55.	77.	3.3	811.5	811.5	0.0
5234.000	42.	55.	4.5	813.2	813.1	0.1
5552.000	33.	57.	4.4	815.1	815.0	0.1

FORM 1411 (2) PRINTED BY ROTARY MANIFOLD FORMS

FLOODWAY DATA, COMSTOCK CREEK-COMSTOCK
PROFILE NO. 2

STATION	WIDTH (FT)	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WITHOUT FLOODWAY	DIFFERENCE
5872.000	77.	75.	5.3	816.6	816.5	0.1
6292.000	42.	61.	4.1	813.5	813.5	0.0
6712.000	41.	58.	4.3	820.5	820.5	0.0
7132.000	25.	47.	5.3	822.9	822.9	0.0
7332.000	32.	74.	3.4	823.8	823.8	0.0
7532.000	35.	86.	2.9	824.2	824.2	0.0
7800.000	210.	339.	0.7	824.4	824.4	0.0
7990.000	209.	450.	0.5	824.4	824.4	0.0
8034.000	212.	744.	0.3	825.0	825.0	0.0
8084.000	212.	745.	0.3	825.8	825.8	0.0

00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: ~~KALAMAZOO, CITY OF~~ COMSTOCK TWP

3) WATERCOURSE: KALAMAZOO RIVER

4) DOCUMENT TYPE: 100-YR ENCROACHED RUN

MORROW DAM to 35th Street

00BREAK00

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**************************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
  ERROR CORR -  01
  MODIFICATION -  52,51,52
**************************************************************

T1CONSTOCK INC. FLOOD INSURANCE STUDY
T2.00 YR. STORM.
T3      KALAMAZOO RIVER ENCROACHMENT RUN

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     H         HSEL      FL
      0.        0.        0.        0.  0.000000      0.00      0.0       0.   770.000     0.000

J2  NPROF     IPLOT     PRINT     ASECR     KSECR     FL        ALLDC     IN        SNIM      IYRACE
    15.000     0.000    -1.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
```

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FORM 1411-GB PRINTED BY ROTARY MANIFOLD FORMS.

*PROF 2

CCHV= 0.100 CEAV= 0.300

*SECNO 70.000

2000 VAT Q1= 54985.09 USEL= 776.00 ENC Q1= 55532.98 SSEL= 776.10 RATIO= -0.1107

VAT Q*= 55033. RATIOS LOB/CH/ROB= 0.0000 1.0000 0.0000 USEL= 776.10

SECNO	DEPTH	CWSEL	CRIWS	VOLSTK	EG	FW	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ACOB	ACH	AROB	VOL	THR	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	PTN	ELMIN	SSTA
SLOPE	XLOB	XLCH	XLOB	TTIAL	QMF	TOPWID	CPTN	TOPMIN	ESTA

3470 ENCROACHMENT STATIONS= 2000.0 3300.0 TYPE= 4 TARGET= 0.000

ICE DEPT UPSTREAM OF DOWNSTREAM LAKE DAM

70.00	16.92	774.00	2.00	776.00	776.00	0.00	0.50	0.50	777.00
6750.	0.	6750.	0.	0.	25114.	0.	3.	0.	777.00
0.00	0.00	0.27	0.00	0.110	0.049	0.110	0.000	757.03	2022.56
0.000002	0.	0.	0.	0	0	0	0.30	1754.82	3777.41

*SECNO 71.000

2500 VAT Q1= 92993.00 USEL= 776.00 ENC Q1= 83915.31 SSEL= 776.10 RATIO= -0.0112

VAT Q1= 83915. RATIOS LOB/CH/ROB= 0.0000 1.0000 0.0000 USEL= 776.10

3470 ENCROACHMENT STATIONS= 2000.0 5400.0 TYPE= 4 TARGET= 0.000

FOR CONFINED VALLEY SECTION

71.00	16.83	775.00	3.00	775.00	775.00	0.00	0.00	0.50	778.00
6750.	0.	6750.	0.	0.	41161.	0.	2237.	127.	777.00
4.21	0.00	3.91	0.00	0.110	0.049	0.110	0.000	839.40	2027.25
0.000001	2500.	2500.	2500.	1	1	1	0.00	3250.41	4551.57

*SECNO 72.000

2500 VAT Q1= 83674.31 USEL= 776.01 ENC Q1= 8603.19 SSEL= 776.11 RATIO= -0.0234

VAT Q*= 8680. RATIOS LOB/CH/ROB= 0.0000 1.0000 0.0000 USEL= 776.11

3470 ENCROACHMENT STATIONS= 2050.0 2300.0 TYPE= 4 TARGET= 0.000

FABRICATED VALLEY SECTION

72.00	5.01	775.01	0.00	775.01	776.01	0.01	0.01	0.50	777.00
6750.	0.	6750.	0.	0.	6892.	0.	3344.	240.	777.00
7.04	0.00	7.02	0.00	0.110	0.049	0.110	0.000	757.00	2028.77
0.000063	7500.	7500.	7500.	2	3	0	0.00	1140.70	3169.59

*SECNO 60.000

2000 VAT Q1= 3919.00 USEL= 776.16 ENC Q1= 4047.98 USEL= 776.21 RATIO= -0.1051

VAT Q1= 4040. RATIOS LOB/CH/ROB= 0.0000 1.0000 0.0000 USEL= 776.16

3470 ENCROACHMENT STATIONS= 1780.0 2600.0 TYPE= 4 TARGET= 0.000

SURVEYED VALLEY SECTION (FROM 1 TO

60.00	5.06	776.16	0.00	776.16	776.21	0.07	0.19	0.52	778.00
6750.	0.	6750.	0.	0.	3235.	0.	4531.	177.	778.00
7.25	0.00	7.05	0.00	0.110	0.049	0.110	0.000	757.00	1754.59
0.000297	1600.	1600.	1600.	2	1	1	0.00	599.53	2354.12

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*SECNO 80.100
2800 NAT 31= 10931.95 WSEL= 776.34 ENC 01= 11202.92 ESEL= 776.44 RATIO= -0.0240
NAT 01= 11203. RATIOS LOB,CH,ROB= 0.0000 1.0000 0.0000 USEL= 776.44

SECNO	DEPTH	QUSEL	CIT.S	ISPIN	NC	FW	TL	OLOSS	BANK CLSV
0	SLO	JCH	I.OF	#LOS	NCH	FAOE	VO.	TYP	LEFT/RIGHT
TIME	VLOB	VCH	VIOB	XOL	XNCH	XSB	HTN	GLOBIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	XH2	ICONT	CORAR	TOPWID	ENDST

3420 ENC=BACHELL STATIONS= 2002.0 3670.2 TYPE= 3 CAR.ST= 0.CHE

FABRICATED VALLEY SECTION

30.10	0.95	776.5	1.50	776.74	778.93	2.69	2.12	1.01	777.30
6751.	0.	6757.	0.	0.	5024.	0.	6759.	671.	777.01
7.71	0.00	0.71	1.00	0.110	0.040	0.110	0.000	767.10	2539.20
0.000330	1400.	1400.	1400.	2	0	0	0.00	1562.24	3971.44

*SECNO 80.200
2800 NAT 31= 851[illegible] WSEL= 776.47 ENC 01= 1[illegible]10.47 ESEL= 776.57 RATIO= -0.[illegible]5
NAT 01= 22 [illegible] RATIOS LOB,CH,ROB= 0.0000 1.0000 1.0000 USEL= 776.47

3420 ENCROACHMENT STATIONS= 2000.0 2600.0 TYPE= 4 TARGET= 0.000

[illegible] SIDE HILL SECTION

40.20	3.07	777.47	0.00	777.47	778.51	0.[illegible]	0.30	0.[illegible]	777.[illegible]
6750.	0.	6750.	0.	0.	2526.	0.	6955.	662.	777.80
7.98	0.00	2.67	0.00	0.110	0.040	0.110	0.000	769.40	2015.78
0.000717	2700.	2000.	2030.	2	0	0	0.00	573.93	2599.62

C2.V= 0.[illegible] CSEL= 0.[illegible]

*SECNO 80.900
2800 NAT 01= 832.01 WSEL= 778.57 ENC 01= 948.44 USEL= 778.64 RATIO= -0.0321
NAT 01= 848. RATIOS LOB,CH,ROB= 3.0300 1.0000 0.0000 USEL= 778.64

3301 [illegible] CHANNEL [illegible] TRAP [illegible]

3670 ENCROACHMENT STATIONS= 2000.0 2173.0 TYPE= 4 TARGET= 0.000

3695 OVERBANK AREA [illegible] FOR=EFFECTIVE,ELEV= 778.05 FLOW= 775.25

30.37	7.57	778.57	0.30	778.56	779.73	1.19	2.[illegible]	2.54	765.71
6750.	0.	6750.	0.	0.	772.	0.	7356.	673.	777.90
8.03	0.00	0.76	0.00	0.130	0.040	0.130	0.000	778.93	2006.97
0.006729	2100.	1600.	1600.	3	0	0	0.00	155.92	2162.87

*SECNO 80.300
2800 NAT 01= 2219.68 WSEL= 778.57 ENC 01= 2293.23 ESEL= 778.60 RATIO= -0.0301
NAT 01= 2205. RATIOS LOB,CH,ROB= 0.0000 1.0000 0.0000 WSEL= 778.60

3370 POPEAL BRIDGE,NRD= 14 MIN ELTRD= 733.70 MAX ELLC= 734.00

3420 ENCROACHMENT STATIONS= 2000.0 2170.0 TYPE= 4 TARGET= 0.000

3695 OVERBANK AREA [illegible] FOR=EFFECTIVE,ELEV= 778.70 FLOW= 737.01

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DOWNSTREAM FACE OF 35TH STREET BRIDGE (A)

01.00	7.61	778.53	C.00	778.59	779.73	1.28	0.70	0.74	785.70
6750.	0.	6750.	0.	0.	782.	0.	7056.	678.	787.90
6.03	5.05	4.04	C.00	0.103	C.01%	0.100	0. 50	770.90	2037.[illegible]
0.000928	1.	1.	1.	2	0	0	-20.84	155.56	2162.70

*SECTO 01.00F
2300 NAT 01= 5474.37 WSEL= 779.20 EXC 01= 3555.57 WSEL= 779.36 RATIO= -0.0245
NAT 01= 3760. RATIOS LOB,CH,ROB= 1.0000 1.0000 0.3007 .WSEL= 779.36

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE RATIO= 14.02" FLTR= 779.70 MIN EL.C= 786.63

3470 ENCROACHMENT STATIONS= 2000.0 2170.3 TYPE= 4 TARGET= 0.000

3455 OVERBANK AREA ASSUMED NON-EFFECTIVE.WSEL= 765.70 FLEL= 787.90

81.10	8.[illegible]	779.26	0.00	779.30	779.37	0.24	0.02	0.12	785.70
6750.	0.	6750.	0.	0.	997.	0.	7056.	678.	787.90
8.04	0.00	6.77	0.00	0.100	0.01[illegible]	0.100	0.04[illegible]	779.30	2304.30
0.000370	31.	31.	31.	3	0	0	-20.02	165.64	2165.73

*SEC 3 31.200
2300 NAT 01= 1266.97 WSEL= 779.33 EXC 01= 1529.74 WSEL= 779.43 RATIO= -0.0230
NAT 01= 1527. RATIOS LOB,CH,ROB= 0.0007 1.000 0.0000 WSEL= 779.42

SECNO	DEPTH	CWSEL	CRWS	PSELS	EG	KW	PL	OLOSS	BANK ELEV
0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	LEFTBANK
TOP	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
SLOPE	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

3470 ENCROACHMENT STATIONS= 2000.0 2170.3 TYPE= 4 TARGET= 0.000

3455 OVERBANK AREA ASSUMED NON-EFFECTIVE.WSEL= 765.70 ELBOW= 787.90

81.20	9.03	779.33	0.00	779.38	779.99	0.65	0.00	0.02	785.70
6750.	0.	6750.	0.	0.	1057.	0.	7056.	678.	787.90
[illegible].05	[illegible].00	6.51	0.00	[illegible].101	[illegible].0[illegible]0	[illegible].1[illegible]0	[illegible].04[illegible]	779.30	2303.96
0.000[illegible]15	1.	1.	1.	2	0	3	[illegible].0[illegible]	[illegible].[illegible]	2[illegible].[illegible]

*SECNO 83.000
2600 NAT 01= 3255.35 WSEL= 782.98 EXC 01= 3253.35 WSEL= 783.08 RATIO= 0.0000
NAT 01= 3350. RATIOS LOB,CH,ROB= 0.0003 0.9723 1.5274 WSEL= 783.08

3465 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS= 2302.0 4304.[illegible] TYPE= 4 TARGET= 0.[illegible]

SURVEYED VALLEY SECTION (D)

```
   83.00    11.05   783.05     0.00   782.98   783.16     0.11     3.01     0.17   780.80
   6750.       0.     4697.    2053.       0.     1509.    2830.    7256.     722.    779.80
    8.42     0.00     3.11     0.72    0.100    0.040    0.100    0.040   772.00  3082.00
0.000446    3350.    3375.    3100.        3        0        0     0.00  1165.57  4326.00

CCHV=   0.300 CEHV=   0.300
*SECNO 84.800
 2800 NAT Q1=   3500.03  WSEL=    784.74  ENC Q1=   3500.03  WSEL=    784.84  RATIO=  0.0000
 NAT Q1=   3591.  RATIOS LOS,CH,ROB=  0.0416  0.9319  0.0265  WSEL=    786.84

3670 ENCROACHMENT STATIONS=    1513.1    2237.2  TYPE=     4  TARGET=      0.025

        SURVEYED VALLEY SECTION (C)

   84.80    12.44   784.84     0.00   784.74   785.00     0.16     1.82     0.02   783.57
   6750.     217.    4435.     1[illegible].     622.    1[illegible].     150.    2021.     819.    731.[illegible]
    8.62     0.[illegible]     3.29     0.[illegible]    0.100    0.040    0.100    0.0[illegible]   772.47  1513.1[illegible]
0.000571    [illegible].    [illegible].    4465.        1        0        0     0.00   724.03  2237.21

CCHV=   0.300 CEHV=   0.500
```

FORM 1411-GB-PRINTED BY ROTARY MANIFOLD FORMS.
PRINTED IN U.S.A.

00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: ~~KALAMAZOO, CITY OF~~ COMSTOCK TWP

3) WATERCOURSE: KALAMAZOO RIVER

4) DOCUMENT TYPE: 100-YR INPUT

MORROW DAM to 35th street

00BREAK00

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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
  ERROR CODE =  01
  MODIFICATION =  77,51,52
**************************************************

C
INCREASED TMP. FLOOD DISPERSE STUDY
72100 YR. STORM.
T3       KALAMAZOO RIVER ENCROACHMENT RUN

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     X         LSEL      FQ
          0.        6.        7.        0.  0.0010000  0.30      1.0       7.   771.000   0.170

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE
      1.000     0.000    -1.000     0.000     0.000     0.001     1.000     0.000     5.000     0.000

J3  VARIABLE CODES TO BE USED IN "J" PARAMETERS

    150.000   200.000     0.000     0.500     0.000     0.000     1.000     1.000     0.000     0.000

NC      0.010     0.110     0.040     0.100     0.300     1.000     0.300     0.500     5.000     0.300
OT      5.000   450.000   4020.300   4230.300   4230.700   4231.000     0.300     0.500     1.000     0.700
ET      0.000     1.000     0.700     0.700     0.300     0.000     1.000     1.000     5.000     0.000

                100 FEET UPSTREAM OF THORNAPPLE LAKE DAM

X1     75.000     1.000  2500.000  2500.000     1.000     0.000     1.000     0.300     1.000     1.000
GR    747.300     3.500   772.300  2400.300   757.000  2400.300   757.000   771.000   777.300   800.000
GR    785.300    50.000     1.000     1.000     1.000     0.300     0.000     1.000     0.000     0.000

                FORESTED VALLEY SECTION

X1     71.000     1.000  2000.300  2000.300  2400.300  2400.000  2400.300     0.700     1.000     0.000
GR    750.000   700.000   770.300  1230.300   771.300  2000.000   750.400  2.30.700   757.400   655.000
GR    777.000  5400.000   780.700  5600.000   790.000  3930.000     1.000     0.300     1.000     0.000

                DEVELOPED VALLEY SECTION

X1     72.300     0.500   300.000  2300.000  2100.000  2500.000  2500.000     1.000     0.300     0.000
GR    790.000   550.000   700.000  1200.000   777.000  2000.000   757.000  2300.000   770.000  2000.000
GR    767.200  2900.000   777.000  3200.000   790.000  5500.000   790.000  3000.000     0.000     0.300

                SURVEYED VALLEY SECTION (PRESENT CONDITIONS)

X1     30.000    29.000  1790.300  2400.000  1600.000  1670.300  1600.000     0.700     0.000     0.000
GR    736.000     0.000   764.000   900.000   762.000   410.000   785.000   580.000   780.000  1500.000
GR    778.300  1760.000   776.000  1765.000   774.400  1810.000   772.600  1840.000   770.600  1865.000
GT    760.000  1895.000   769.300  1935.000   769.330  1945.000   769.400  2045.000   769.300  2070.000
GT    769.300  2110.300   772.400  2165.000   767.100   825.000   772.100  2285.000   773.500  2310.000
GT    774.900  2345.000   774.000  2350.000   773.500  2400.000   730.200  2455.000   730.000  2930.000
GR    782.000  3095.000   784.000  3200.000   730.500  3275.000     0.000     1.000     0.000     0.300
```

PRINTED IN U.S.A.
FORM 1111-GB-PRINTED BY ROTARY MANIFOLD FORM...

FABRICATED VALLEY SECTION

X1	80.100	0.000	2000.000	3600.000	1400.000	1400.000	1400.000	0.000	0.000	0.000
GR	790.000	1200.000	780.000	1950.000	777.000	2000.000	768.000	2400.000	770.000	2800.000
GR	767.000	3200.000	777.000	3600.000	780.000	4100.000	0.000	0.000	0.000	0.000

FABRICATED VALLEY SECTION

X1	80.200	0.000	2000.000	2600.000	2000.000	2000.000	2000.000	0.000	0.000	0.000
GR	790.000	800.000	780.000	1700.000	777.000	2000.000	772.000	2150.000	769.400	2450.000
GR	777.000	2600.000	780.000	2900.000	780.000	3200.000	0.000	0.000	0.000	0.000
NC	0.100	0.100	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000

X1	80.900	42.000	2000.000	2178.000	2100.000	1600.000	1600.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	786.350	786.200	0.000
GR	789.200	370.000	787.800	502.000	786.800	604.000	784.800	786.000	784.200	889.000
GR	784.000	986.000	783.800	1088.000	783.400	1188.000	783.500	1290.000	783.500	1392.000
GR	783.500	1494.000	783.600	1596.000	783.600	1704.000	783.700	1808.000	784.100	1902.000
GR	785.700	2000.000	780.300	2000.000	776.500	2023.000	774.600	2039.000	775.600	2054.000
GR	772.200	2077.000	770.900	2109.000	772.300	2136.000	772.000	2145.000	776.700	2156.000
GR	783.600	2178.000	787.900	2178.000	781.200	2279.000	784.600	2379.000	793.100	2481.000
GR	781.900	2481.000	783.100	2500.000	785.700	2700.000	784.000	2800.000	784.500	2900.000
GR	794.100	3000.000	794.700	3195.000	795.100	3400.000	795.200	3495.000	795.500	3491.000
GR	795.500	3575.000	795.000	3691.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000

DOWNSTREAM PAGE OF [illegible] STREET [illegible]

X1	80.000	0.000	2000.000	2178.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
BT	14.000	1000.000	783.700	0.000	2000.000	785.700	0.000	2000.000	785.700	782.400
BT	2050.000	780.400	783.100	2050.100	786.400	773.200	2060.000	780.400	774.700	2060.100
BT	786.400	783.100	2110.000	787.200	783.900	2110.100	787.200	771.400	2120.000	787.200
BT	771.400	2120.100	787.200	783.900	2178.000	787.900	784.600	2178.000	787.900	0.000
BT	2279.000	788.200	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	789.200	370.000	787.800	502.000	786.800	604.000	784.800	786.000	784.200	889.000
GR	784.000	986.000	783.800	1088.000	783.400	1188.000	783.500	1290.000	783.500	1392.000
GR	783.500	1494.000	783.600	1596.000	783.600	1704.000	783.700	1808.000	784.100	1902.000
GR	785.700	2000.000	780.300	2000.000	776.500	2023.000	774.600	2039.000	775.600	2054.000
GR	775.000	2050.000	775.000	2058.100	774.700	2060.000	774.700	2060.100	772.200	2077.000
GR	770.900	2109.000	771.600	2118.000	771.600	2118.100	771.300	2120.000	771.800	2120.100
GR	772.300	2126.000	772.000	2145.000	776.700	2156.000	782.600	2178.000	787.900	2178.000
GR	788.200	2279.000	789.600	2379.000	791.100	2481.000	791.900	2581.000	793.100	2685.000
GR	793.700	2789.000	794.000	2885.000	794.500	2992.000	794.600	3000.000	794.700	3195.000
GR	795.100	3295.000	795.200	3395.000	795.300	3491.000	795.300	3575.000	795.800	3691.000

X1	81.100	50.000	2000.000	2178.000	31.000	31.000	31.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
BT	14.000	1000.000	783.700	0.000	2000.000	785.700	0.000	2000.000	785.700	782.400
BT	2050.000	780.400	783.100	2050.100	786.400	773.200	2060.000	780.400	773.000	2060.100
BT	786.400	783.100	2110.000	787.200	783.900	2110.100	787.200	771.400	2120.000	787.200
BT	771.400	2120.100	787.200	783.900	2178.000	787.900	784.600	2178.000	787.900	0.000
BT	2279.000	788.200	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	789.200	370.000	787.800	502.000	786.800	604.000	784.800	786.000	784.200	889.000
GR	784.000	986.000	783.800	1088.000	783.400	1188.000	783.500	1290.000	783.500	1392.000
GR	783.500	1494.000	783.600	1596.000	783.600	1704.000	783.700	1808.000	784.100	1902.000
GR	785.700	2000.000	780.300	2000.000	776.700	2023.000	774.300	2039.000	773.400	2052.000
GR	773.200	2058.000	773.200	2058.100	773.000	2060.000	773.000	2060.100	771.500	2076.000
GR	770.700	2080.000	771.400	2118.000	771.400	2118.100	771.400	2120.000	771.400	2120.100
GR	770.300	2130.000	771.100	2145.000	776.500	2162.000	782.200	2178.000	787.900	2178.000

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CR	788.200	2279.000	789.600	2379.000	791.100	2481.000	791.900	2581.000	793.100	2685.000
GR	793.700	2789.000	794.000	2885.000	794.500	2993.000	794.600	3095.000	794.700	3195.000
GR	795.100	3295.000	795.200	3393.000	795.300	3491.000	795.500	3575.000	795.800	3691.000
NC	0.000	0.000	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	81.200	0.000	0.000	178.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	785.700	787.900	0.000

SURVEYED VALLEY SECTION (C)

X1	0.000	44.000	3002.000	3269.000	3330.000	3100.000	3023.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	793.600	1718.000	792.500	1708.000	796.000	1896.000	795.200	2002.000	793.200	2132.000
GR	792.500	2228.000	792.600	2324.000	792.600	2420.000	791.700	2514.000	791.100	2634.000
GR	790.400	2728.000	790.200	2820.000	790.300	2900.000	790.500	2972.000	787.500	3086.000
GR	770.800	3002.000	778.400	3097.000	775.100	3110.000	778.500	3147.000	772.000	3167.000
GR	773.700	3193.000	774.400	3224.000	777.900	3266.000	779.500	3269.000	779.400	3316.000
GR	778.300	3316.000	775.200	3338.000	776.000	3356.000	779.600	3362.000	779.900	3480.000
GR	779.200	3574.000	780.200	3708.000	778.800	3806.000	778.900	3902.000	781.600	3988.000
GR	781.700	4074.000	783.600	4218.000	782.000	4326.000	780.800	4422.000	780.400	4498.000
GR	782.800	4582.000	783.000	4584.000	785.300	4676.000	780.100	4774.000	0.000	0.000
NC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ET	0.000	7.100	7.100	7.100	7.100	0.000	1170.000	3[illegible]4.000	0.000	0.000

SURVEYED VALLEY SECTION (C)

X1	[illegible]	[illegible]	3000.000	2145.000	4535.000	[illegible]	[illegible]	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	792.300	396.000	791.300	476.000	791.400	610.000	792.000	684.000	790.400	781.000
GR	790.600	364.000	789.000	1140.000	788.100	1170.000	784.600	1200.000	783.600	1403.000
GR	783.800	1600.000	783.400	1800.000	783.500	2030.000	780.800	2011.000	774.500	2034.000
GR	774.700	2051.000	775.700	2136.000	772.400	2134.000	772.500	2163.000	774.900	2174.000
GR	775.700	2[illegible].000	781.200	2[illegible].000	781.000	2[illegible].000	781.300	3[illegible].000	78[illegible].100	2[illegible].000
GR	787.800	2402.000	789.000	2[illegible]4.000	789.000	2[illegible].000	788.600	2[illegible].000	785.500	2732.000
GR	790.400	2828.000	789.800	2912.000	788.800	3016.000	789.600	3116.000	790.500	3220.000
GR	789.800	3312.000	791.000	3402.000	795.900	3502.000	791.300	3594.000	0.000	0.000
NC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
EJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

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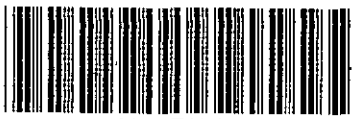
FORM 1411-CD PRINTED BY ROTARY MANIFOLD FORMS.



1) COUNTY: KALAMAZOO

2) STUDY NAME: KALAMAZOO TWP / COMSTOCK TWP

3) WATERCOURSE: KALAMAZOO RIVER

4) DOCUMENT TYPE: 100-YR INPUT DATA



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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
  ERROR CORR -  01
  MODIFICATION -  50,51,52
*****************************************************

C
T1100 YEAR PROFILE
T2STARTING WATER SURFACE FROM KALAMAZOO TWP FIS
T3      KALAMAZOO R-COMSTOCK TWP

J1  ICHECK     INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ
       0.        4.        0.        0.  0.000000      0.00       0.0        0.   763.580     0.000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH      FN       ALLDC     IBW       CHNIM     ITRACE
     1.000     0.000    -1.000     0.000     0.000     0.000     0.000     0.000     0.000    15.000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT
    150.000   200.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

QT      5.000  4620.000  6210.000  6910.000  6910.000  8580.000     0.000     0.000     0.000     0.000
NC      0.080     0.080     0.030     0.100     0.300     0.000     0.000     0.000     0.000     0.000
ET      0.000     0.000     0.000     0.000     1.400     0.000     0.000     0.000     0.000     0.000

        VALLEY SECT. AT CITY OF KALAMAZOO/KALAMAZOO TWP. CORP. BOUNDARY

X1      8.000     9.000     8.000    92.000  1650.000   700.000  1400.000     0.000     0.000     0.000
GR    765.000     0.000   756.600     0.100   754.500     8.000   751.900    20.000   747.600    48.000
GR    747.000    78.000   753.300    92.000   763.300   108.000   765.000   109.100     0.000     0.000
NC      0.000     0.000     0.000     0.300     0.500     0.000     0.000     0.000     0.000     0.000
QT      5.000  4620.000  6210.000  6900.000  6900.000  8570.000     0.000     0.000     0.000     0.000

        VALLEY SECT. 50 FT. D/S OF KING HWY. BRIDGE

X1      8.900    11.000    20.000   155.000  1300.000  1400.000  1350.000     0.000     0.000     0.000
GR    767.000     0.000   757.800     0.100   754.900    20.000   751.600    42.000   749.400    78.000
GR    753.400   110.000   752.000   136.000   754.600   156.000   763.600   174.000   763.000   182.000
GR    767.000   182.100     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

        D/S FACE OF KING HWY. BRIDGE

X1      9.000    21.000     0.000   190.000     0.000     0.000     0.000     0.000     0.000     0.000
X3     10.000     0.000     0.000     0.000     0.000     0.000     0.000   769.000   769.000     0.000
GR    769.000     0.000   758.600     0.000   754.900    10.000   751.300    32.000   749.200    42.000
GR    750.600    58.500   750.600    58.600   750.600    61.500   750.600    61.600   751.800    74.000
GR    751.000    [illegible]   752.300   114.000   753.200   [illegible]   [illegible]   [illegible]   753.300   131.500
GR    753.300   131.600   752.400   146.000   753.800   [illegible]   [illegible]   [illegible]   [illegible]   [illegible]
GR    768.800   190.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
SB      1.250     1.500     3.000     0.000   159.000     6.000  1975.000     0.000   751.300   749.200

        U/S FACE OF KING HWY. BRIDGE

X1      9.100    21.000     0.000   190.000    56.000    56.000    56.000     0.000     0.000     0.000
```

off of previous run

X2	0.000	3.000	1.000	766.200	768.900	3.000	2.000	0.000	0.000	0.000
X3	10.000	3.000	0.300	0.000	0.300	0.000	3.000	769.000	769.000	0.300
BT	12.000	3.000	769.900	0.300	0.200	769.000	769.400	56.500	769.000	768.200
BT	56.600	769.000	751.300	61.500	769.200	751.900	61.000	769.000	764.200	120.500
BT	706.900	764.200	130.300	130.300	752.500	132.500	772.900	752.300	751.600	748.900
BT	764.200	102.000	748.900	752.300	130.700	748.700	2.000	0.000	0.200	0.200
BT	748.900	2.000	748.900	0.300	752.300	12.000	752.000	32.000	751.700	52.300
GR	751.500	87.500	751.500	58.600	751.500	81.500	751.500	87.600	751.300	77.200
GR	751.200	96.000	751.800	117.300	752.900	128.500	752.500	128.600	752.500	131.500
GR	752.500	151.600	752.300	146.300	752.500	165.000	752.100	102.000	752.900	150.500
GR	751.[illegible]	[illegible]	0.200	0.200	1.[illegible]	[illegible]	[illegible]	0.[illegible]	[illegible]	[illegible]
NG	0.000	0.000	0.200	0.100	0.200	0.000	0.000	0.000	0.300	0.200
NC	0.000	0.000	0.200	0.100	0.200	0.000	0.000	0.000	0.300	0.200

X1	0.200	0.000	0.200	0.000	51.000	52.000	50.000	0.300	0.500	0.000

VALLEY SECT. 100 FT. U/S OF SPILLWAY CL.

X1	10.000	12.000	3.000	180.000	1700.000	1702.000	1700.000	0.000	0.000	0.000
GR	770.000	0.000	750.900	0.100	755.400	754.700	46.000	736.200	53.200	[illegible]
GR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	0.[illegible]	0.100	3.[illegible]	[illegible]	0.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

VALLEY SECT. TOWARD [illegible] AT 0010 FT. U/S OF [illegible]

X1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
GR	755.500	[illegible]	[illegible]	178.000	756.000	[illegible]	756.700	253.[illegible]	756.300	273.000
GR	739.100	[illegible]	759.500	761.000	[illegible]	504.000	755.00	[illegible]	753.500	644.000
GR	767.000	692.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.000

VALLEY SECT. TOWARD [illegible] AT [illegible] FT. U/S OF [illegible] CL.

X1	[illegible]	12.000	[illegible]	[illegible]	910.000	[illegible]	340.000	0.000	0.000	0.000
GR	770.000	0.000	750.000	1.000	750.000	655.000	752.000	502.000	756.300	57.000
GR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
GR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
GR	[illegible]	[illegible]	[illegible]	[illegible]	0.200	0.200	[illegible]	[illegible]	[illegible]	0.000
NC	0.000	0.000	0.000	0.100	0.300	[illegible]	0.000	0.000	0.000	0.000

VALLEY SECT. [illegible] FT. U/S OF D/S SLOPE

X1	12.000	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
GR	764.000	0.000	762.000	1.000	761.200	750.000	757.300	[illegible]	753.100	[illegible]
GR	749.500	[illegible]	752.700	[illegible]	754.600	900.000	752.300	[illegible]	756.810	944.000
CR	761.100	956.000	767.500	[illegible]	0.000	0.000	0.300	0.300	0.200	0.000
[illegible]	0.000	0.000	[illegible]	[illegible]	[illegible]	[illegible]	0.000	0.000	[illegible]	[illegible]

VALLEY SECT. 100 FT. D/S OF SPILLWAY CL.

X1	12.000	30.000	[illegible]	249.000	1600.100	[illegible]	1605.000	0.000	0.000	0.200
GR	[illegible]	[illegible]	[illegible]	0.000	757.500	17.000	[illegible]	[illegible]	[illegible]	53.000
GR	756.600	53.100	[illegible]	[illegible]	756.400	57.100	[illegible]	[illegible]	[illegible]	39.000
GR	761.200	94.000	761.600	[illegible]	761.100	[illegible]	[illegible]	[illegible]	761.[illegible]	[illegible]
GR	761.000	159.000	[illegible]	185.300	755.200	174.000	755.[illegible]	[illegible]	[illegible]	[illegible]
GR	759.200	[illegible]	[illegible]	[illegible]	754.200	[illegible]	756.[illegible]	[illegible]	754.[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

D/S FACE OF SPRINKLE RD. BRIDGE

K'	12,910	5,021	0,500	0,500	153,670	161,670	166,050	0,000	0,00[illegible]	0,100
K3	10,0[illegible]	,020	0,500	0,50[illegible]	3,500	3,010	[illegible],020	770,50[illegible]	777,200	0,300

1' INSIDE D/S FACE OF SPRINKLE RD. BRIDGE

K1	13,[illegible]10	0,[illegible]02	1,[illegible]30	[illegible],[illegible]30	[illegible],[illegible]30	3,0[illegible]0	3,0[illegible]2	0,[illegible]05	0,[illegible]30	3,[illegible]70
K3	10,0[illegible]	[illegible],002	0,[illegible]30	0,[illegible]30	0,[illegible]06	,000	[illegible],0[illegible]0	770,50[illegible]	777,200	0,300
ST	20,[illegible]2	0,[illegible]07	[illegible]1,[illegible]70	1,[illegible]70	3,[illegible]30	775,[illegible]20	779,[illegible]27	21,[illegible]05	771,[illegible]05	1,[illegible]300
ST	53,[illegible]00	771,503	756,600	57,300	77[illegible],500	756,600	57,[illegible]00	771,[illegible]05	756,900	114,300
GT	775,[illegible]13	770,[illegible]62	114,100	772,000	76[illegible],400	114,[illegible]30	772,[illegible]29	76[illegible],[illegible]65	116,100	773,500
ST	770,[illegible]49	174,[illegible]03	776,[illegible]30	77[illegible],[illegible]00	171,100	774,[illegible]30	753,[illegible]25	776,[illegible]01	774,[illegible]00	755,200
ST	176,[illegible]2	[illegible]7[illegible],[illegible]1	77[illegible],[illegible]00	[illegible],[illegible]30	773,[illegible]00	773,[illegible]30	[illegible]5[illegible],[illegible]1[illegible]	[illegible]75,[illegible]0[illegible]	[illegible]75,[illegible]0[illegible]	[illegible]5[illegible],[illegible]00
[illegible]	775,[illegible],1	[illegible]7[illegible],[illegible]1	[illegible]3,[illegible]30	[illegible]7[illegible],[illegible]00	[illegible]73,[illegible]10	[illegible]5[illegible],[illegible]20	[illegible]7[illegible],[illegible]1[illegible]	[illegible]7[illegible],[illegible]0[illegible]	[illegible]5[illegible],[illegible]3[illegible]	[illegible]77,200
[illegible]	[illegible],[illegible]2	0,[illegible]0[illegible]	[illegible],[illegible]30	[illegible],[illegible]70	[illegible],[illegible]30	[illegible],[illegible]30	[illegible],[illegible]0[illegible]	0,[illegible]00	0,[illegible]3[illegible]	0,300

[illegible] [illegible] SPRINKLE ROAD BRIDGE D/S

K1	[illegible],[illegible]0	0,[illegible]0[illegible]	[illegible],[illegible]30	[illegible],[illegible]0[illegible]	[illegible],[illegible]30	[illegible],[illegible]0[illegible]	[illegible],[illegible]0[illegible]	[illegible],[illegible]0[illegible]	[illegible],[illegible]0[illegible]	[illegible],[illegible]30[illegible]
K2	[illegible],[illegible]1	[illegible],[illegible]0[illegible]	[illegible],[illegible]30[illegible]	[illegible],[illegible]3[illegible]	[illegible],[illegible]30	[illegible],[illegible]0[illegible]	[illegible],[illegible]0[illegible]	[illegible],[illegible]0[illegible]	[illegible],[illegible]0[illegible]	[illegible],[illegible]30
K3	10,[illegible]70	0,[illegible]07	[illegible],[illegible]70	[illegible],[illegible]70	0,[illegible]30	[illegible],[illegible]30	[illegible],[illegible]0[illegible]	770,[illegible]0[illegible]	777,200	0,300

D/S FACE [illegible] [illegible] BRIDGE

[illegible]	[illegible],[illegible]30	0,[illegible]0[illegible]	[illegible],[illegible]30	[illegible],[illegible]0[illegible]	[illegible],[illegible]0[illegible]	[illegible],[illegible]0[illegible]	[illegible],[illegible]0[illegible]	[illegible],[illegible]0[illegible]	0,[illegible]0[illegible]	[illegible],[illegible]70
K2	10,[illegible]70	0,[illegible]0[illegible]	[illegible],[illegible]30	[illegible],[illegible]2[illegible]	[illegible],[illegible]30	[illegible],[illegible]0[illegible]	[illegible],[illegible]0[illegible]	770,[illegible]0[illegible]	777,200	0,300
ST	0,[illegible]70	[illegible],[illegible]0[illegible]	[illegible],[illegible]30	[illegible],[illegible]30	[illegible],[illegible]30	[illegible],[illegible]30	[illegible],[illegible]72,[illegible]0[illegible]	[illegible],[illegible]0[illegible]	0,[illegible]0[illegible]	0,300

[illegible] [illegible] [illegible] [illegible] [illegible] [illegible]

K'	14,0[illegible]	[illegible],0[illegible]	[illegible]69[illegible],300	[illegible]53[illegible],300	50,200	50,[illegible]0	50,[illegible]0	[illegible],0[illegible]	0,[illegible]0[illegible]	0,[illegible]0[illegible]
GR	773,200	[illegible],0[illegible]	756,000	[illegible]4,[illegible]0[illegible]	739,300	[illegible]5[illegible],[illegible]0[illegible]	[illegible]2[illegible],200	[illegible]5[illegible],0[illegible]	777,6[illegible]	[illegible]6[illegible],[illegible]0[illegible]
GR	775,000	[illegible]6[illegible],[illegible]20	756,100	[illegible]3[illegible],[illegible]0[illegible]	[illegible]37,300	[illegible]3[illegible],[illegible]0[illegible]	[illegible],[illegible]300	752,[illegible]30	76[illegible],9[illegible]	[illegible]00[illegible],[illegible]0[illegible]
GR	[illegible],[illegible]30	[illegible]0[illegible],[illegible]10	[illegible],[illegible]0[illegible]	[illegible]3[illegible],[illegible]0[illegible]	[illegible],[illegible]30	[illegible]2[illegible],[illegible]0[illegible]	[illegible],[illegible]00	[illegible],[illegible]30	[illegible],[illegible]0[illegible]	[illegible],[illegible]0[illegible]
GR	[illegible],[illegible]00	[illegible],[illegible]30	[illegible],[illegible]0[illegible]	[illegible],[illegible]0[illegible]	[illegible],[illegible]0[illegible]	[illegible],[illegible]0[illegible]	[illegible],[illegible]0[illegible]	[illegible],[illegible]30	[illegible],[illegible]0[illegible]	[illegible],[illegible]0[illegible]
GR	755,[illegible]00	2747,000	755,[illegible]0[illegible]	2750,000	[illegible]56,[illegible]0[illegible]	[illegible]750,[illegible]0[illegible]	753,300	2733,[illegible]00	757,[illegible]5[illegible]	[illegible]324,000
GR	739,100	2[illegible]73,[illegible]30	736,[illegible]0[illegible]	[illegible]579,[illegible]0[illegible]	736,[illegible]0[illegible]	[illegible]5[illegible]2,[illegible]0[illegible]	755,[illegible]0[illegible]	[illegible]5[illegible],[illegible]00	754,130	[illegible]9[illegible],[illegible]0[illegible]
GR	756,200	[illegible]0[illegible],[illegible]30	[illegible]7[illegible],[illegible]0[illegible]	[illegible]59[illegible],000	765,[illegible]0[illegible]	[illegible],[illegible]56,[illegible]0[illegible]	760,[illegible]00	[illegible]214,[illegible]30	765,[illegible]30	[illegible]266,[illegible]0[illegible]
GR	755,[illegible]00	[illegible]0[illegible],[illegible]30	77[illegible],[illegible]0[illegible]	[illegible]7[illegible],[illegible]0[illegible]	[illegible]3,[illegible]0[illegible]	[illegible]7[illegible],[illegible]0[illegible]	[illegible]0[illegible],0[illegible]	[illegible]1[illegible],[illegible]00	[illegible],[illegible]30	[illegible],[illegible]0[illegible]
GT	5,300	[illegible]5[illegible],[illegible]30	[illegible]0[illegible],[illegible]0[illegible]	[illegible]7[illegible],[illegible]0[illegible]	[illegible]7[illegible],[illegible]0[illegible]	[illegible]3[illegible],[illegible]0[illegible]	0,[illegible]0[illegible]	[illegible],[illegible]00	[illegible],[illegible]30	[illegible],[illegible]0[illegible]
NR	2,300	1,[illegible]0[illegible]	[illegible],[illegible]0[illegible]	[illegible],[illegible]1[illegible]	0,[illegible]0[illegible]	0,[illegible]0[illegible]	0,[illegible]0[illegible]	0,[illegible]0[illegible]	[illegible],[illegible]30	[illegible],[illegible]0[illegible]
ET	[illegible],300	3,300	[illegible],[illegible]20	[illegible],[illegible]2[illegible]	[illegible],[illegible]2[illegible]	[illegible],[illegible]0[illegible]	[illegible],[illegible]0[illegible]	0,[illegible]0[illegible]	0,[illegible]30	3,[illegible]30

[illegible] [illegible] [illegible] [illegible] [illegible] [

X1	16.000	19.000	2536.000	2206.000	450.000	450.000	450.000	0.000	0.000	0.000
GR	770.000	1859.000	767.900	1866.000	764.600	2011.300	765.300	2056.000	758.900	2004.000
GR	753.700	2103.000	754.200	2131.000	754.700	2136.000	757.400	2192.000	758.900	2196.000
GR	752.000	2206.000	764.500	2214.000	765.000	2242.300	766.400	2334.000	769.300	2410.000

VALLEY SECT. APPROX. 1700 FT. D/S OF RIVER ST. BRIDGE

X1	17.000	14.000	2426.000	2576.000	440.000	440.000	440.000	0.000	0.000	0.000
GR	762.000	2306.000	753.700	2424.000	750.300	2431.000	753.200	2404.000	754.500	2414.000
GR	755.300	2340.000	757.300	2374.000	758.000	2381.000	760.000	2404.000	765.000	2414.000
GR	763.300	2400.000	765.500	2410.000	767.200	2418.200	769.200	2442.000	0.000	0.000

VALLEY SECT. APPROX. 1100 FT. D/S OF RIVER ST. BRIDGE

X1	16.000	17.000	2527.000	2577.000	540.000	540.000	540.000	0.000	0.000	0.000
GR	770.300	2.334.000	763.900	2330.000	767.400	2332.000	771.000	2370.000	767.200	2426.000
GR	765.000	2376.000	769.300	2421.000	736.300	2429.000	755.300	2441.000	756.300	2445.000
GR	759.500	3012.000	763.300	3019.000	764.600	3042.000	769.000	3084.000	780.000	3090.000
GR	764.200	3130.000	770.000	3230.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SECT. JUST D/S OF DIVERSION STRUCTURE

X1	19.000	0.000	1.000	0.000	530.000	530.000	530.000	0.000	0.000	0.000
LC	0.030	0.020	0.030	0.100	0.300	0.030	0.030	0.010	0.000	0.000
ET	0.000	7.100	7.100	7.100	0.000	0.000	1963.000	2002.000	0.000	0.000

VALLEY SECT. APPROX. 1 FT. D/S OF DIVERSION RD.

X1	21.000	19.000	2049.000	2279.000	540.000	540.000	540.000	0.000	0.000	0.000
GR	771.400	1470.000	763.300	1962.000	760.300	2004.000	755.400	2307.000	760.400	2119.000
GR	758.300	1719.000	759.900	1977.000	761.000	2019.000	762.100	2065.000	767.300	2096.000
GR	760.600	2140.000	764.100	2226.000	764.300	2247.000	766.000	2282.000	769.400	2313.000
GR	762.900	2201.000	764.500	2240.000	765.000	2262.000	773.600	2334.000	0.000	0.000
LC	0.020	0.010	0.030	0.100	0.500	0.200	0.020	0.010	0.000	0.000
ET	0.000	7.100	7.100	7.100	0.000	0.000	1980.000	2028.000	0.000	0.000

VALLEY SECT. APPROX. 1 FT. D/S OF RIVER RD.

X1	22.000	22.000	2365.000	2525.000	450.000	450.000	450.000	0.000	0.000	0.000
GR	773.200	24.000	772.600	174.000	770.000	236.300	774.400	550.000	773.700	672.000
GR	775.500	312.000	772.600	922.000	775.000	1210.200	771.800	1370.000	775.900	1378.000
GR	771.900	1361.000	775.000	1536.000	780.000	2206.000	780.200	2334.000	765.300	2365.000
GR	759.400	2400.000	772.600	2401.000	753.400	2421.000	750.300	2439.000	754.000	2446.000
GR	758.200	2515.000	767.400	2555.000	774.400	2594.000	77 .700	2634.000	777.400	2742.000
GR	777.600	2905.000	780.600	2968.000	0.000	0.000	0.000	0.000	0.000	0.000

D/S FACE OF RIVER RD. BRIDGE

ET	23.000	22.000	23.000	2477.000	50.000	50.000	50.000	0.000	0.000	0.000
XS	10.000	0.000	0.200	0.000	0.200	0.000	0.000	772.600	773.000	0.000
GR	774.000	0.000	779.900	540.000	771.600	1104.000	780.300	1960.000	772.600	2246.000
GR	771.400	2312.000	782.500	2330.900	782.600	2337.000	783.000	2356.000	780.400	2355.000
GR	784.200	2372.000	785.300	2377.300	784.300	2390.200	784.300	2402.200	782.400	2409.000
GR	783.300	2427.700	785.300	2447.300	783.300	2460.300	788.100	2482.000	787.600	2488.000
GR	789.900	2472.000	792.300	2477.300	794.600	2487.000	797.300	2503.000	793.400	2514.000
GR	795.600	2770.000	791.300	3134.300	0.000	0.000	0.000	0.000	0.000	0.000

1' INSIDE D/S FACE OF RIVER RD. BRIDGE

X1	20.100	3.030	0.300	0.300	1.000	1.500	4.050	0.000	0.000	0.000
X3	10.000	3.000	0.000	0.300	0.300	0.300	0.050	778.600	773.600	0.300
DT	17.000	2283.000	778.600	0.300	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
DT	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
BT	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
BT	769.000	2427.000	773.300	0.300	2430.200	773.300	0.050	2452.500	773.000	769.300
DT	2477.000	773.300	769.300	2477.100	773.300	0.300	2496.000	773.000	0.000	2546.700
DT	773.600	0.000	0.300	0.300	0.000	0.300	0.050	0.000	0.300	0.200

1' INSIDE D/S FACE OF RIVER RD. BRIDGE

X1	23.900	27.000	2331.000	2477.000	52.500	52.950	52.950	0.000	0.000	0.300
X3	10.000	0.000	0.300	0.000	0.000	0.000	0.050	778.600	773.600	0.300
DT	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
DT	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
BT	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
BT	769.000	2427.000	773.300	0.000	2430.200	773.300	0.050	2452.500	773.000	769.300
DT	2477.000	773.300	769.300	2477.100	773.300	0.300	2496.000	773.000	0.000	2546.700
DT	773.600	0.000	0.300	0.000	0.000	0.300	0.050	0.000	0.000	0.300
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

GR	765.400	2796.300	765.300	2828.000	766.800	2923.000	768.300	2930.000	766.800	3034.000
GR	797.300	3630.000	796.400	3750.000	799.800	4010.000	797.600	4564.000	802.000	4192.300
GR	801.700	4194.300	804.400	4242.000	803.200	4384.000	0.000	0.000	0.000	0.300
XF	0.120	0.120	0.000	0.300	0.500	0.000	0.000	0.000	0.000	0.000
GT	0.300	7.700	7.100	7.100	0.000	0.000	1001.000	1000.000	0.300	0.000

VALLEY SECT. 15 APPROX. 50 FT D/S OF CONSUMERS POWER BRIDGE

X1	25.000	23.700	1334.000	2154.000	1230.000	1101.000	1420.000	0.300	0.000	0.000
GR	[illegible]									
GR	795.300	9[illegible]	795.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
GR	797.300	9[illegible]	797.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
GR	766.100	2199.000	771.600	2378.000	770.600	2418.000	771.700	2043.300	771.800	2764.000
GR	775.000	3129.000	769.600	3274.000	797.800	3396.000	799.200	4074.000	802.800	4162.000

[illegible]

X1	29.000	39.000	1350.000	1351.000	50.000	30.000	30.300	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.300	0.300	774.000	778.200	0.000
GR	777.000	740.000	776.900	342.000	777.300	642.300	777.500	960.000	778.000	1342.000
GR	[illegible]									
GR	[illegible]									
GR	[illegible]									
GT	750.300	1496.100	736.500	1424.500	750.300	1513.500	750.000	1538.500	778.000	1592.000
GR	738.100	1541.000	738.300	1541.500	739.300	1550.500	742.000	1[illegible]	782.000	1579.000
GR	762.500	1580.400	762.400	1594.500	770.500	1620.300	770.500	[illegible]	777.500	1634.300
GT	[illegible]									
XF	[illegible]									

[illegible]

X1	27.700	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
GR	[illegible]									
GR	[illegible]									
GR	[illegible]									
GT	[illegible]									
GT	[illegible]									
GT	[illegible]									
GT	[illegible]									
GT	[illegible]									
XF	[illegible]									

[illegible]

X1	29.700	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
X2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.300	775.000	779.200	0.000

[illegible]

X1	30.000	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	775.300	779.200	0.000

VALLEY SECT. APPROX. 50 FT D/S OF CONSUMERS POWER BRIDGE

X1	31.000	3.500	3.000	5.000	50.000	50.000	50.000	0.300	0.300	0.300
XC	0.080	1.120	2.130	2.150	2.320	2.000	2.000	0.302	0.300	1.000

VALLEY SECT. APPROX. 400 FT D/S OF MORROW DAM

XT	32.000	20.000	1277.000	1651.000	394.000	394.000	394.000	0.000	0.000	0.000
GR	781.500	96.300	773.400	262.000	772.600	328.000	771.800	976.000	778.300	1088.000
GR	776.000	1140.300	749.[illegible]	1208.000	7[illegible].100	1271.000	7[illegible].700	1212.000	756.000	[illegible]
GR	7[illegible].[illegible]00	1[illegible]1.300	757.[illegible]	[illegible]	75[illegible].[illegible]	1[illegible].000	7[illegible]1.900	1571.000	759.100	[illegible]
GR	7[illegible]1.900	1650.300	765.[illegible]	1[illegible]1.000	76[illegible].[illegible]	17[illegible].000	770.[illegible]	1[illegible].000	77[illegible].400	202[illegible].000
GR	780.200	2212.300	767.[illegible]	2373.000	791.200	2[illegible].000	7[illegible]9.700	2594.000	78[illegible].200	27[illegible].000
GR	7[illegible].100	2856.000	784.500	2354.000	798.100	3672.000	0.000	0.000	0.000	0.000
EJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000



1) COUNTY: KALAMAZOO

2) STUDY NAME: COMSTOCK TWP

3) WATERCOURSE: KALAMAZOO RIVER

4) DOCUMENT TYPE: 100-YR NATURAL/ENCROACHED
COMPLETE RUN



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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
  ETRS, CORR -  31
  MODIFICATION -  57.5 .52
**************************************************

C
T1COLSTOCK FLOOD INSURANCE STUDY          2/22/77
T2COLVILLE, ANTHONY, AND ROBELLE
T3       KALAMAZOO RIVER

J1  ICHECK    INN       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ
                .         .         0.        3.  0.100300      1.0.      0.0       1.    Fav.300     0.300

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLOC     IB.       CHNIM     ITRACE
          1.000     0.000    -1.000     0.001     0.000     0.000     0.000     0.000     0.000     0.000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

        150.000   200.300     0.003     0.050     0.200     0.000     0.300     0.000     0.250     0.006

QT        5.000  4530.100  6090.000  6770.000  6770.000  8410.300     0.000     0.300     0.000     0.007
NC        0.010     0.020     0.030     0.100     0.100     0.121     0.000     0.000     0.010     0.010

X1       32.000    28.000   127.000  1651.000   394.000   394.000   394.200     0.001     0.000     0.000
GR      781.500    96.000   771.400   242.000   772.000   526.000   771.800   976.000   778.30.  1085.000
GR      776.000  1146.000   769.400  1203.000   769.100  1271.000   750.700  1272.000   758.000  1345.000
GR      750.000  1361.000   747.300   650.000   745.000  1451.000   744.000   770.000   739.000  1550.000
GR      741.000  1250.000   736.000  1631.000   739.000  1550.000   730.300   770.000   730.000  1550.000
GR      730.000   221.000   734.300  2220.000   744.000   200.000   735.000   733.000   8751.00  2854.000
GR      786.100  2854.000   744.500  2854.000   793.100  3672.000     0.300     0.000     0.000     0.000
NC        0.020     0.020     0.020     0.003     0.200     0.030     0.003     0.000     0.000     0.300
ET        0.005     0.000     0.005     0.000     1.400     0.600     0.000     0.300     0.020     0.000

MULTIPLY PRINTOUT DIMENSIONS BY

X1       33.000     4.300     1.100   109.000   400.000   400.000   400.000     0.000     0.000     0.000
GR      770.000     1.000   755.000     4.100   755.000   109.000   770.000   105.100     0.300     0.000
ET        0.010     0.010     0.010     0.000     0.010     0.000     0.000     0.000     0.000     0.001
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FORM 1611-CUMMINS-LEY NOVATY MANIFOLD FORMS

*PROF 1

CCHV= 0.100 CFHV= 0.300

*SECNO 32.000

SECNO	DEPTH	CHSEL	CHZNS	SELK	EL	[illegible]	[illegible]	OLOSS	[illegible] ELEV
Q	OLOB	[illegible]	[illegible]	ALCB	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELTIM	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IHZ	ICONT	CORAR	TOPWID	ENDST

32.00	17.[illegible]	769.[illegible]	0.00	769.[illegible]	769.[illegible]	0.[illegible]	0.[illegible]	0.[illegible]	768.[illegible]
6770.	3.	6730.	0.	35.	4730	55.	[illegible]	0.	[illegible]
0.00	0.07	1.43	0.09	0.000	0.030	0.120	0.000	751.90	1212.84
0.000030	394.	394.	394.	0	0	0	0.00	505.54	1718.38

*SECNO 33.000

IMMEDIATELY D/S OF COMSTOCK DAM.

33.00	14.13	769.13	0.00	0.00	769.43	0.31	0.02	0.08	755.00
6770.	0.	6770.	0.	1.	15[illegible]	[illegible]	[illegible]	0.	[illegible]
0.0[illegible]	[illegible]	[illegible]	[illegible]	0.023	0.[illegible]	0.020	0.[illegible]	[illegible]	[illegible]
0.000105	400.	400.	400.	2		0	0.00	100.[illegible]	10[illegible].09

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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
  ERROR CORR    [illegible]
  MODIFICATION = [illegible]
*****************************************************

T[illegible]STOCK [illegible] INSURANCE [illegible]
T2[illegible] YR. ENCROACHMENT [illegible]
T[illegible]      KALAMAZOO RIVER

J1  ICHECK    INQ       MINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

       0.        5.        0.        0.  0.000500      0.00       0.0        0.   750,400     0.000

J2  NPROF     IPLOT     PRFMS     NSKIP     XSECH     FN        ALLDC     CBH       CHLEN     [illegible]

     15.000     0.000    -1.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
```

*PROF 2

CCHV= 0.100 CEHV= 0.300

*SECNO 32.000

SECNO	DEPTH	CLSEL	CRCHS	WSELR	EC	[illegible]	[illegible]	DLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	[illegible]	ARC	[illegible]	T.A	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	ETN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST
32.00	17.50	767.40	0.05	769.40	767.42	0.02	0.00	0.00	765.10
6770.	[illegible]	6759.	0.	41.	[illegible]	[illegible]	[illegible]	0.	[illegible]
0.00	0.08	1.42	0.09	0.000	0.030	0.120	0.000	751.90	1208.00
0.000029	394.	394.	394.	0	0	0	0.00	512.70	1720.70

*SECNO 33.000

2800 [illegible] [illegible] LSEL= [illegible] [illegible] [illegible] WSEL= 769.25 [illegible]

NAT Q1= 6399. RATIOS LOB/CH/ROB= 0.0000 1.0000 0.0000 WSEL= 769.23

3470 ENCROACHMENT STATIONS= 1.1 109.0 TYPE= 4 TARGET= 0.000

33.00	14.2[illegible]	769.[illegible]	0.0[illegible]	769.1[illegible]	769.[illegible]	0.[illegible]	0.02	0.0[illegible]	7[illegible]
6770.	0.	[illegible]	0.	0.	15[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	0.[illegible]	0.[illegible]	0.[illegible]	[illegible]	75[illegible]	[illegible]
0.000140	400.	400.	400.	2	0	0	0.00	107.90	109.00

****

HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
ERROR CORD - 01
MODIFICATION - 50,51,52

****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

KALAMAZOO RIVER

SUMMARY PRINTOUT TABLE 150

SECNO	ELCH	E.TRD	E.LC	ELCIN	Q	CUSEL	CRIUS	EG	[illegible]	[illegible]	AREA	[illegible]
32.000	394.00	0.00	0.00	751.90	6770.00	759.30	0.00	759.33	0.30	1.43	4862.83	12345.6[illegible]
32.000	394.00	0.00	0.00	751.90	6770.00	759.40	0.00	759.43	0.29	1.42	4913.67	12513.44
33.000	[illegible]	[illegible]	0.00	[illegible]	[illegible]	[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
33.000	[illegible]	0.00	0.00	[illegible]	[illegible]	[illegible]	0.00	[illegible]	1.40	[illegible]	[illegible]	[illegible]

KALAMAZOO RIVER

SUMMARY PRINTOUT TABLE 150

SECND	Q	CHSEL	[illegible]	DIFMER	DIFRNG	TOPWID	ELEV
52.000	6770.00	769.30	0.00	0.00	0.00	505.54	394.00
52.000	6770.00	769.40	0.00	0.00	0.00	512.70	394.00
53.000	6770.00	769.13	0.00	-0.12	0.00	100.09	420.00
53.000	6770.00	769.25	0.00	-0.12	0.12	107.90	420.00

SUMMARY OF ERRORS

FLOODWAY DATA, KALAMAZOO RIVER
PROFILE NO. 2

STATION	FLOODWAY WIDTH (FT)	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WATER SURFACE ELEVATION WITHOUT FLOODWAY	DIFFERENCE
30.000	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
35.000	120.	[illegible]	4.4	769.2	769.1	0.1

00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: ~~KALAMAZOO, CITY OF~~ COMSTOCK TWP

3) WATERCOURSE: KALAMAZOO RIVER

4) DOCUMENT TYPE: 100-YR SUMMARY

MORROW DAM to 35th Street

00BREAK00

****

HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
ERROR CORR - 01
MODIFICATION - 50,51,52

****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF [illegible]

KALAMAZOO RIVER ENCROACH

SUMMARY PRINTOUT TABLE 150

SECNO	[illegible]	[illegible]	[illegible]	EL-IN	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
70.000	0.00	0.00	0.00	757.08	6750.00	776.00	0.00	776.00	0.02	0.27	25114.48	54985.09
70.000	0.00	0.00	0.00	757.08	6750.00	776.00	0.00	776.00	0.02	0.27	25114.48	54985.09
71.000	[illegible]	0.00	0.00	[illegible]	[illegible]	[illegible]	0.00	[illegible]	[illegible]	0.16	[illegible]	[illegible]
71.000	[illegible]	0.00	0.00	[illegible]	[illegible]	[illegible]	0.00	[illegible]	[illegible]	0.16	[illegible]	[illegible]
72.000	7500.00	0.00	0.00	767.00	6750.00	776.01	0.00	776.02	0.63	0.98	6883.60	8478.[illegible]
72.000	7500.00	0.00	0.00	767.00	6750.00	776.01	0.00	776.02	0.63	0.98	6831.73	8474.93
[illegible]	[illegible]	0.00	0.00	767.10	[illegible]	[illegible]	0.00	[illegible]	2.97	[illegible]	3284.45	[illegible]
[illegible]	[illegible]	0.00	0.00	767.10	[illegible]	[illegible]	0.00	[illegible]	2.97	[illegible]	3284.75	[illegible]
80.100	1400.00	0.00	0.00	767.00	6750.00	776.34	0.00	776.35	0.33	0.75	9047.03	10931.93
80.100	1400.00	0.00	0.00	767.00	[illegible]	776.34	0.00	776.35	0.33	0.75	9047.79	10933.27
[illegible]	[illegible]	[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
80.900	1600.00	0.00	0.00	770.90	6750.00	778.54	0.00	779.74	67.42	8.77	769.77	822.08
80.900	1600.00	0.00	0.00	770.90	6750.00	778.54	0.00	779.73	67.29	8.76	770.27	822.07
[illegible]	[illegible]	783.70	[illegible]	770.[illegible]	6750.00	[illegible]	0.00	779.70	[illegible]	9.08	743.57	[illegible]
[illegible]	[illegible]	783.70	[illegible]	770.[illegible]	6750.00	[illegible]	0.00	779.70	[illegible]	9.09	742.83	[illegible]
81.100	31.00	783.70	784.60	770.30	6750.00	779.26	0.00	779.97	3.77	6.77	996.98	3474.37
81.100	31.00	783.70	784.60	770.30	6750.00	779.26	0.00	779.97	3.76	6.77	996.51	3471.92
[illegible]	1.00	0.00	0.00	770.30	6750.00	[illegible]	0.00	[illegible]	27.13	6.51	1037.37	[illegible]
[illegible]	1.00	0.00	0.00	770.30	6750.00	[illegible]	0.00	[illegible]	27.15	6.51	1036.78	[illegible]
83.000	3375.00	0.00	0.00	772.00	6750.00	782.99	0.00	783.07	4.30	3.07	4739.62	3255.35
83.000	3375.00	0.00	0.00	772.00	6750.00	783.01	0.00	783.16	4.46	3.11	4346.73	3197.9[illegible]
[illegible]	[illegible]	0.00	0.00	772.40	6750.00	[illegible]	0.00	[illegible]	3.72	3.27	3620.05	[illegible]
[illegible]	[illegible]	0.00	0.00	772.40	6750.00	[illegible]	0.00	[illegible]	3.71	3.29	2734.30	[illegible]

$$3375 \times \left(\frac{6750}{325555}\right)^2 = 1.45$$

2.91

KALAMAZOO RIVER ENCROACH

SUMMARY PRINTOUT TABLE 150

SECNO	Q	C.SEL	DIFMSP	DIF.SN	DIFRMS	TOP.ID	ALCH
70.000	6750.00	776.00	0.00	0.00	0.00	1754.82	0.00
70.000	6750.00	776.00	0.00	0.00	0.00	1754.82	0.00
71.000	6750.00	776.00	0.00	0.00	0.00	3200.72	2900.00
71.000	6750.00	776.00	0.00	0.00	0.00	3200.61	2900.00
72.000	6750.00	776.01	0.00	0.01	0.00	1140.10	7500.00
72.000	6750.00	776.01	0.00	0.01	0.00	1140.00	7500.00
80.000	6750.00	776.16	0.00	0.15	0.00	569.57	1600.00
80.000	6750.00	776.16	0.00	0.15	0.00	569.51	1600.00
80.100	6750.00	776.34	0.00	0.16	0.00	1562.19	1600.00
80.100	6750.00	776.34	0.00	0.16	0.00	1562.24	1600.00
80.200	6750.00	776.47	0.00	0.13	0.00	1771.75	2000.00
80.200	6750.00	776.47	0.00	0.13	0.00	1771.83	2000.00
80.900	6750.00	778.54	0.00	2.07	0.00	155.87	1600.00
80.900	6750.00	778.54	0.00	2.07	-0.00	155.90	1600.00
81.000	6750.00	779.52	0.00	-0.01	0.00	155.74	1.00
81.000	6750.00	779.52	0.00	-0.01	-0.00	155.74	1.00
81.100	6750.00	779.24	0.00	0.76	0.00	165.46	11.00
81.100	6750.00	779.24	0.00	0.76	-0.00	165.44	11.00
81.200	6750.00	779.33	0.00	0.07	0.07	165.5[illegible]	1.00
81.200	6750.00	779.33	0.00	0.07	-0.00	165.33	1.00
83.000	6750.00	782.98	0.00	3.65	0.50	1483.40	3375.00
83.000	6750.00	783.05	0.00	3.73	0.57	1165.57	3375.00
84.000	6750.00	784.74	0.00	1.74	0.00	1087.73	4500.00
84.000	6750.00	784.84	0.00	1.79	0.00	724.0[illegible]	4500.00

SUMMARY OF ERRORS

PRINTED IN U.S.A.
FORM 1411-GR-PRINTED BY NOTARY MANIFOLD FORMS

FLOODWAY DATA, KALAMAZOO RIVER ENCROACH
PROFILE NO. 2

STATION	FLOODWAY WIDTH (FT)	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WATER SURFACE ELEVATION WITHOUT FLOODWAY	DIFFERENCE
70.000	1735.	25114.	0.3	776.0	776.0	0.0
71.000	3261.	41161.	0.2	776.0	776.0	0.0
72.000	[illegible]	6802.	1.0	776.0	776.0	0.0
80.000	570.	3285.	2.1	776.2	776.2	0.0
80.100	1542.	9048.	0.7	776.3	776.3	0.0
80.200	574.	2326.	2.7	776.5	776.5	0.0
80.900	156.	775.	8.8	778.5	778.5	0.0
81.000	156.	741.	9.1	778.5	778.5	0.0
81.100	165.	997.	6.8	779.3	779.3	0.0
81.200	166.	1037.	6.5	779.3	779.3	0.0
83.000	1166.	4347.	1.6	783.1	783.0	0.1
84.800	724.	2734.	2.5	784.6	784.7	0.1

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00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: COMSTOCK TWP

3) WATERCOURSE: KALAMAZOO RIVER

4) DOCUMENT TYPE: CROSS SECTION PLOTS

00BREAK00

C[illegible] S[illegible] 12.90
[illegible] RIVER
[illegible]

PLOTTED POINTS (BY PRIORITY)-B=BOTTOM BRIDGE,T=TOP BRIDGE,X=GROUND,W=WATER SUR,E=ENERGY GRADIENT,C=CRITICAL WSEL

[illegible] 750. 760. 770. 775. [illegible]

STA-FEET

	[illegible]														
	[illegible]														
	1				X										
4	15.			X											BANK.
	20.			X											
	25.			X											
	[illegible]			X											
	[illegible]														
	[illegible]			X											
	45.			X											
	50.			X											
9	55.			X											
	[illegible]			X											
	[illegible]			X											
	[illegible]			X											
	75.			X											
10	80.			X											
	85.			X											
	[illegible]														
1	[illegible]					X									
	100.					X									
	105.					X									
	110.					X									
16	115.					X									
	120.					X									
	[illegible]					X									
	[illegible]					X									
	135.					X									
	140.					X									
	145.					X									
	[illegible]					X									
	[illegible]					X									
17	[illegible]					X									
18	165.				X										
	170.			X											
22	175.			XX											
	[illegible]			X											
	[illegible]			X											
	[illegible]														
	195.			X											
	200.			X											
	205.			X											
	[illegible]			X											
	[illegible]			X											
	[illegible]			X											
	225.			X											
	230.		X												
25	235.		X												
27	240.		X												
	245.		X												
	250.		X												

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```
28 255.  .        X        .        .N       .        .        .        .        .        .        .        .
   260.  .        .  X     .        .N       .        .        .        .        .        .        .        .
   265.  .        .     X  .        .N       .        .        .        .        .        .        .        .
29 270.  .        .      X .        .N       .        .        .        .        .        .        .        BANK.
   275.  .        .        .        .N       .        .        .        .        .        .        .        .
   280.  .        .        .      X .N       .        .        .        .        .        .        .        .
   285.  .        .        .        .        .        .        .        .        .        .        .        .
   290.  .        .        .        .        .X       .        .        .        .        .        .        .
31 295.  .        .        .        .        .   XXXXXXXXXX    .        .        .        .        .        .
```

[illegible]

[illegible]

770.30	0.00	765.50	0.00	757.50	37.30	755.80	37.00	756.60	55.00
756.60	55.10	736.60	57.00	756.50	57.10	756.50	79.00	757.90	89.00
761.20	94.00	761.40	116.00	761.40	116.10	761.40	116.05	761.40	116.10
761.00	[illegible]	[illegible]	65.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	176.30
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	735.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

FORM 1411-C7 PRINTED BY ROTARY MANIFOLD 1 O INS.
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CROSS SECTION 13.20
STREAM KALAMAZOO RIVER
DISCHARGE= 6900.

PLOTTED POINTS [illegible]

ELEV 750. 755. 760. 765. 770. 775. 780. 785. 790. 795. 800.

STA-F-B1

3	0.					XXXXXXXXXXX								
	5.				X	W								
	10.				X	W								
4	13.			X		W								DARK.
	20.					W								
	25.			X		W								
	30.		X			W								
5	35.		X			W								
	40.		X			W								
	45.		X											
	50.		X											
9	55.		X											
	60.		X			W								
	65.		X			W								
	70.		X			W								
	75.		X			W								
10	80.		X			W								
	85.		X			W								
11	90.		X			W								
12	95.		X			W								
	100.		X			W								
	105.		X			W								
	110.		X			W								
16	115.		X			W								
	120.		X			W								
	125.		X			W								
	130.		X			W								
	135.		X			W								
	140.		X			W								
	145.		X			W								
	150.		X			W								
	155.		X			W								
17	160.		X			W								
18	165.		X			W								
	170.		X			W								
20	175.		X			W								
	180.		X			W								
	185.		X			W								
	190.		X			W								
	195.		X			W								
	200.		X			W								
	205.		X			W								
	210.		X			W								
23	215.		X			W								
	220.		X			W								
	225.		X			W								
	230.		X			W								
25	235.		X			W								
27	240.		X			W								
	245.		X			W								
	250.		X			W								

```
28 255.  .        X        .        .W       .        .        .        .        .        .        .        .
   260.  .        .  X     .        .W       .        .        .        .        .        .        .        .
   265.  .        .    X   .        .W       .        .        .        .        .        .        .        .
29 270.  .        .      X .        .W       .        .        .        .        .        .        .        BANK.
   275.  .        .        .  X     .W       .        .        .        .        .        .        .        .
   280.  .        .        .      X .W       .        .        .        .        .        .        .        .
   285.  .        .        .        .        .        .        .        .        .        .        .        .
   290.  .        .        .        .        .X       .        .        .        .        .        .        .
31 295.  .        .        .        .        .     XXXXXXXXXX  .        .        .        .        .        .
```

[illegible]

[illegible] STA(Z)

770.30	0.00	765.30	0.00	737.50	17.00	755.00	37.00	756.60	55.00
756.60	55.10	756.60	57.00	756.60	57.10	756.50	79.00	757.90	89.00
761.20	94.00	761.40	116.00	761.40	114.10	761.40	116.00	761.60	116.10
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	257.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

FORM 1411-6 PRINTED BY ROTARY MANIFOLD FORMS.

CROSS SECTION 15.00
STREAM KALAMAZOO RIVER
DISCHARGE= 6780.

[illegible]

ELEV 750. 755. 760. 765. 770. 775. 780. 785. 790. 795. 800.

STA-FEET

21875.
41880.
1885.
1890.
1895.
1900.
1905.
1910.
1915.
1920.
1925.
1930.
1935.
1940.
1945.
31950.
1955.
1960.
1965.
1970.
1975.
1980.
1985.
1990.
1995.
2000.
2005.
2010.
2015.
2020.
2025.
2030.
2035.
2040.
2045.
2050.
2055.
2060.
72065.
2070.
32075.
2080.
92085.
2090.
2095.
2100.
2105.
2110.
2115.
2120.
102125.

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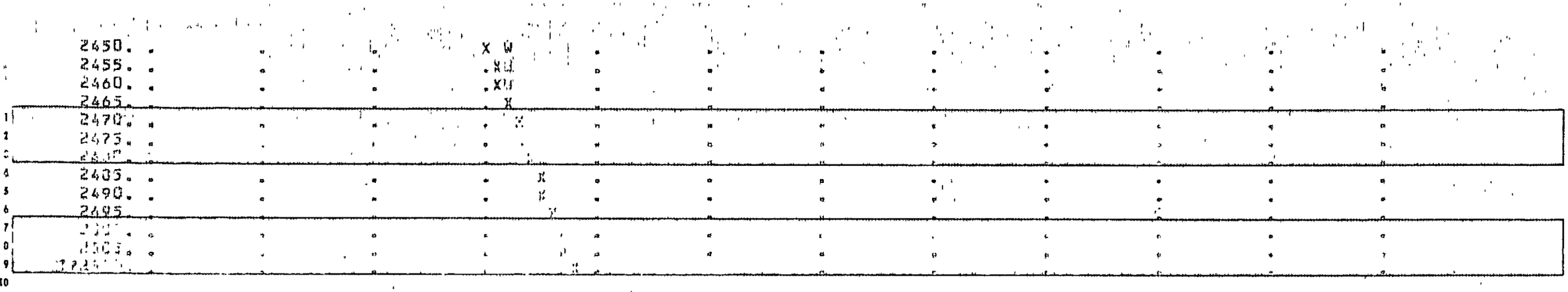
FORM 1411-13 PRINTED BY ROTARY MANIFOLD FORM 5

| | | |

```
2450.
2455.
2460.
2465.
2470.
2475.
2480.
2485.
2490.
2495.
2500.
2505.
2510.
```



NPD= 0 ELLC= 9999999.00 ELTRD= 9999999.00

S.(Z),STA(Z)

775.00	[illegible]	767.10	[illegible]	767.10	[illegible]	756.40	1959.10	[illegible]	[illegible]
767.00	[illegible]	763.75	2075.00	757.00	[illegible]	753.30	2123.00	752.61	2170.00
754.00	2173.00	757.65	2210.00	760.90	2222.00	763.00	2280.00	763.20	2420.00
768.30	2508.00								

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CROSS SECTION 16.00
STREAM KALAMAZOO RIVER
DISCHARGE= 6780.

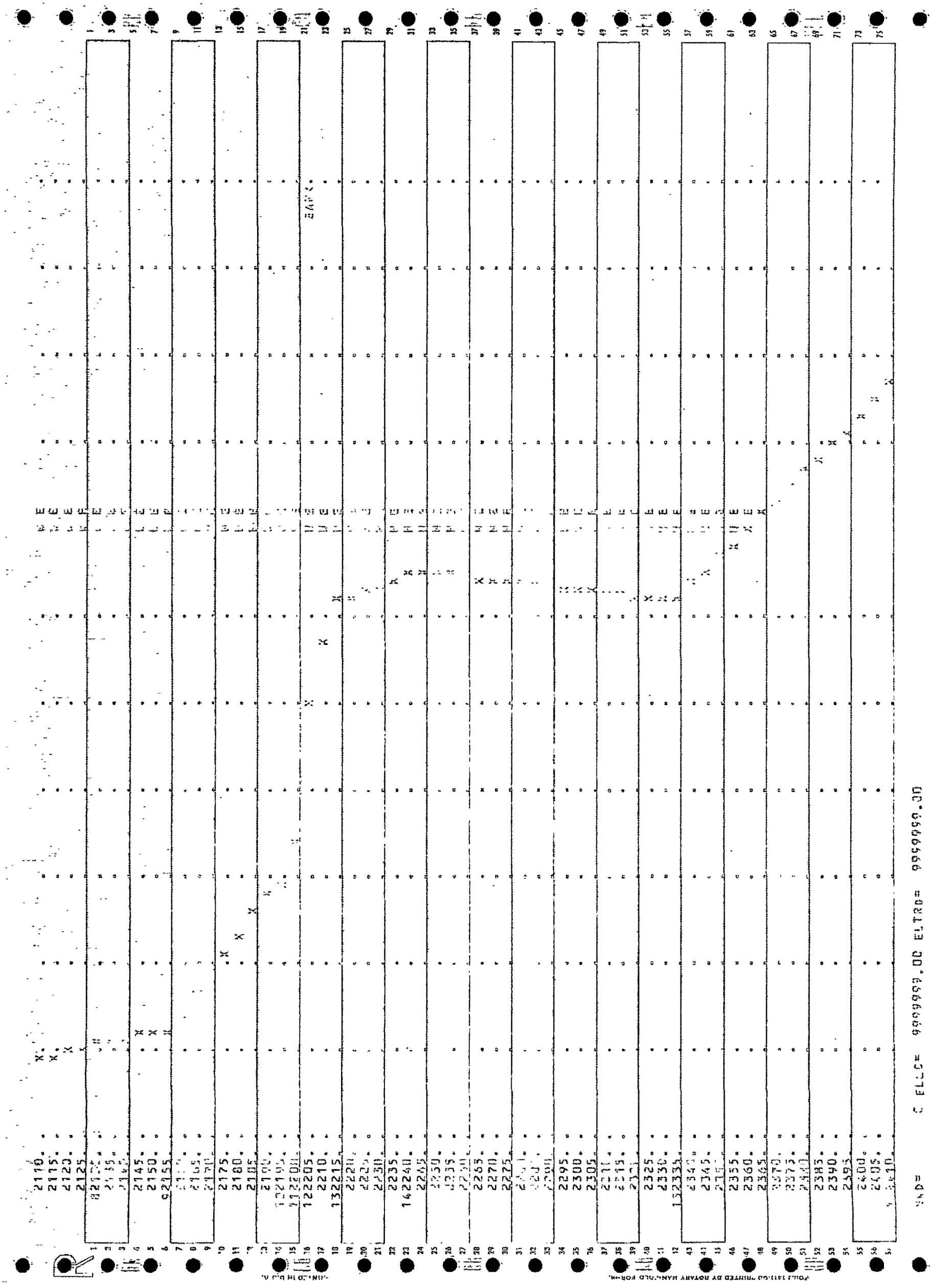
PLOTTED POINTS [illegible]

ELEV 752. 754. 756. 758. 760. 762. 764. 766. 768. 770. 772.

STA-FEET

21855.											
31860.											
1865.											
1870.											
1875.											
1880.											
1885.											
1890.											
1895.											
1900.											
1905.											
1910.											
1915.											
1920.											
1925.											
1930.											
1935.											
1940.											
1945.											
1950.											
1955.											
1960.											
1965.											
1970.											
1975.											
1980.											
1985.											
1990.											
1995.											
2000.											
2005.											
2010.											
2015.											
2020.											
2025.											
2030.											
2035.											
2040.											
2045.											
2050.											
2055.											BANK.
2060.											
2065.											
2070.											
2075.											
2080.											
2085.											
2090.											
2095.											
2100.											
72105.											

FORM 1411-00 PRINTED BY ROTARY MANIFOLD FORMS



```
EL(I),STA(I)
   770.00     1859.00     767.90     1860.00     764.60     2018.00     763.20     2056.00     758.90     2064.00
   753.70     2106.00     754.20     2131.00     754.40     2156.00     757.80     2193.60     758.93     2198.00
   762.00     2206.00     764.30     2214.00     765.00     2262.00     764.40     2334.80     769.30     2410.00
```

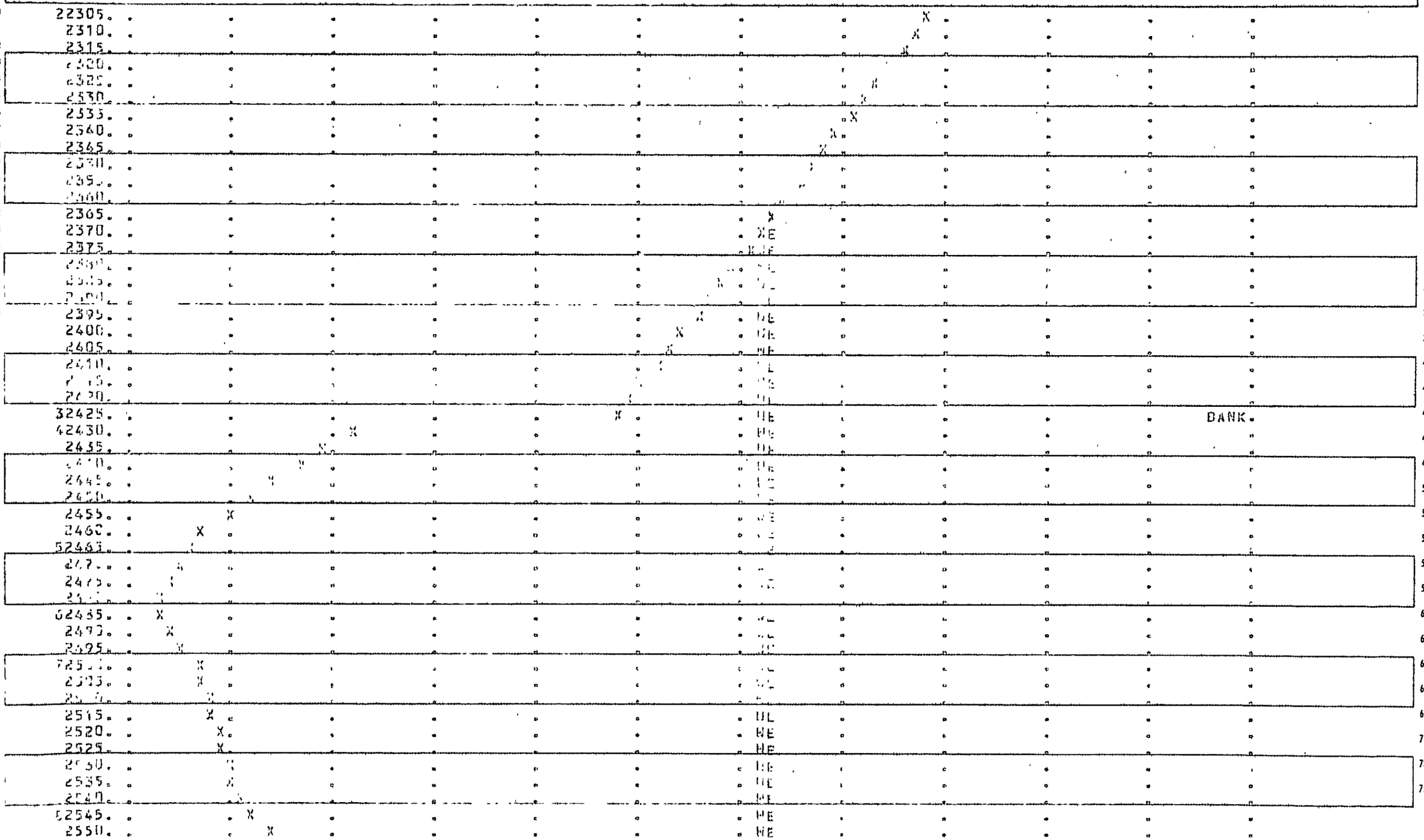
FORM 1611-CO PRINTED BY ROTARY MANIFOLD FORMS.

CROSS SECTION 17.00
STREAM KALAMAZOO RIVER
DISCHARGE= 6730.

PLOTTED [illegible]

ELEV 754. 756. 758. 760. 762. 764. 766. 768. 770. 772. 774.

STA=[illegible]



2560.		X.					WE				
92565.			X				WE				
2570.				X.			WE				
102575.					X		WE				EANK.
112580.						X	WE				
2585.						X	WE				
2590.						X	WE				
2595.						X	WE				
122600.						X.	WE				
2605.						X.	WE				
2610.						X.	WE				
2615.						X.	WE				
2620.						X.	WE				
2625.						X.	WE				
2630.						X.	WE				
2635.						X.	WE				
2640.						X.	WE				
2645.						X.	WE				
2650.						X.	WE				
2655.						X.	WE				
2660.						X.	WE				
2665.						X.	WE				
2670.							WE				
2675.							WE				
2680.							WE				
2685.						X.	WE				
2690.						X.	WE				
2695.						X.	WE				
2700.							WE				
152705.						X.	WE				
2710.							WE				
162715.								X.			
2720.											
2725.											
2730.											
2735.											
2740.											
2745.											
152750.								X.			

[illegible]

[illegible]

759.60	2308.00	763.70	2424.00	758.30	2431.00	755.20	2464.00	734.30	2484.00
755.30	2500.00	756.30	2544.00	758.20	2564.00	762.00	2576.00	765.60	2582.00
763.00	2600.00	763.80	2704.00	762.00	2716.00	765.00	2748.00		

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CROSS SECTION 18.00
STREAM KALAMAZOO RIVER
DISCHARGE= 6730.

PLOTTED POINTS ARE DISCHARGE INCREMENTS FROM HORTON-BRESSE METHOD

ELEV	754.	756.	758.	760.	762.	764.	766.	768.	770.	772.	774.
STA-FLOW											
22450.	.C										
2455.											
2460.											
2465.											
2470.											
2475.											
2480.											
2485.											
2490.											
2495.											
2500.											
2505.											
2510.											
2515.											
2520.											
2525.											
2530.											
2535.											
2540.											
2545.											
2550.											
2555.											
2560.											
2565.											
32570.											
2575.											
2580.											
2585.											
2590.											
2595.											
2600.											
2605.											
2610.											
2615.											
2620.											
2625.											
2630.											
2635.											
2640.											
2645.											
2650.											
2655.											
42660.											
2665.											
2670.											
2675.											
2680.											
2685.											
2690.											
2695.											
2700.											

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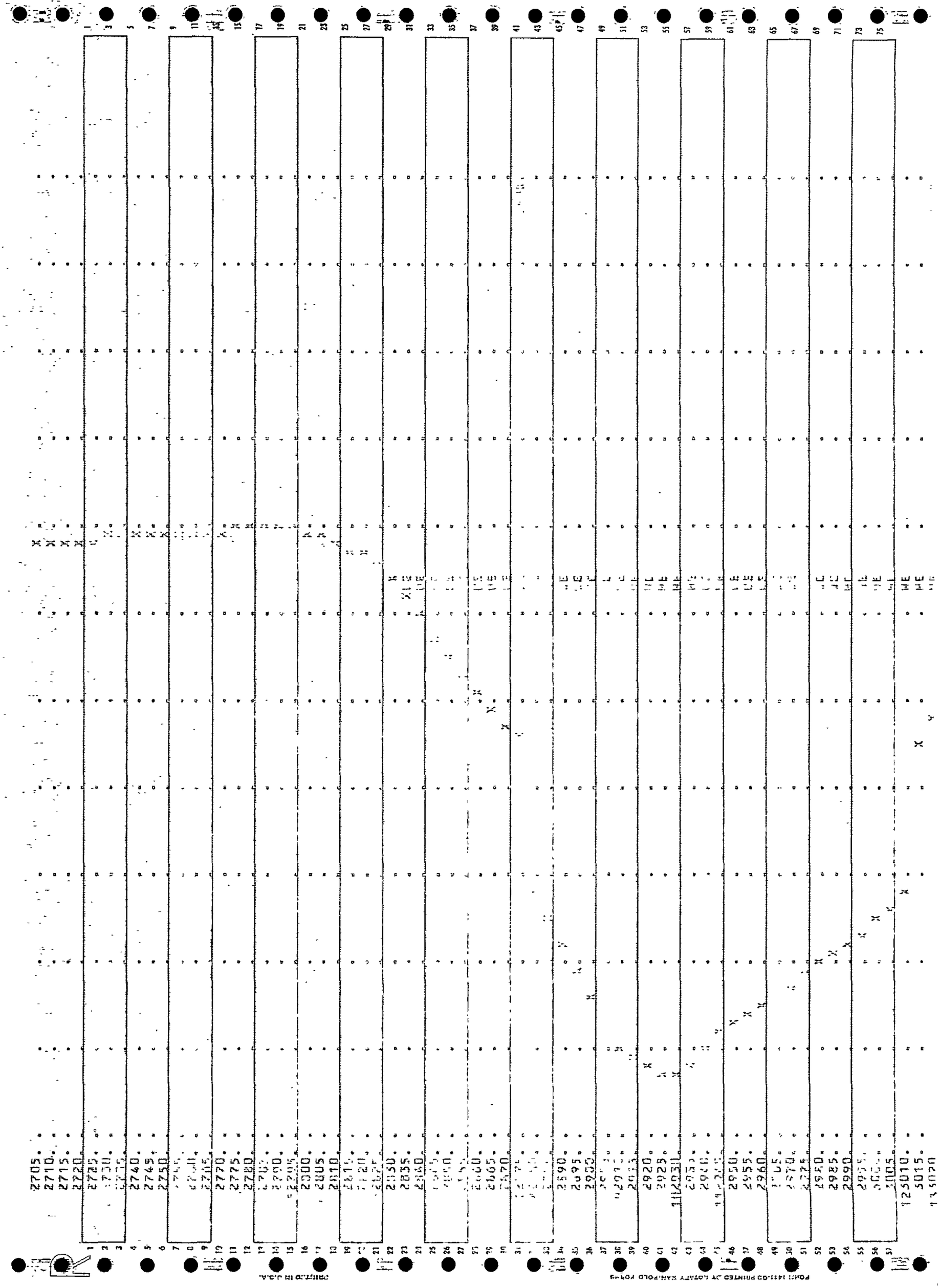
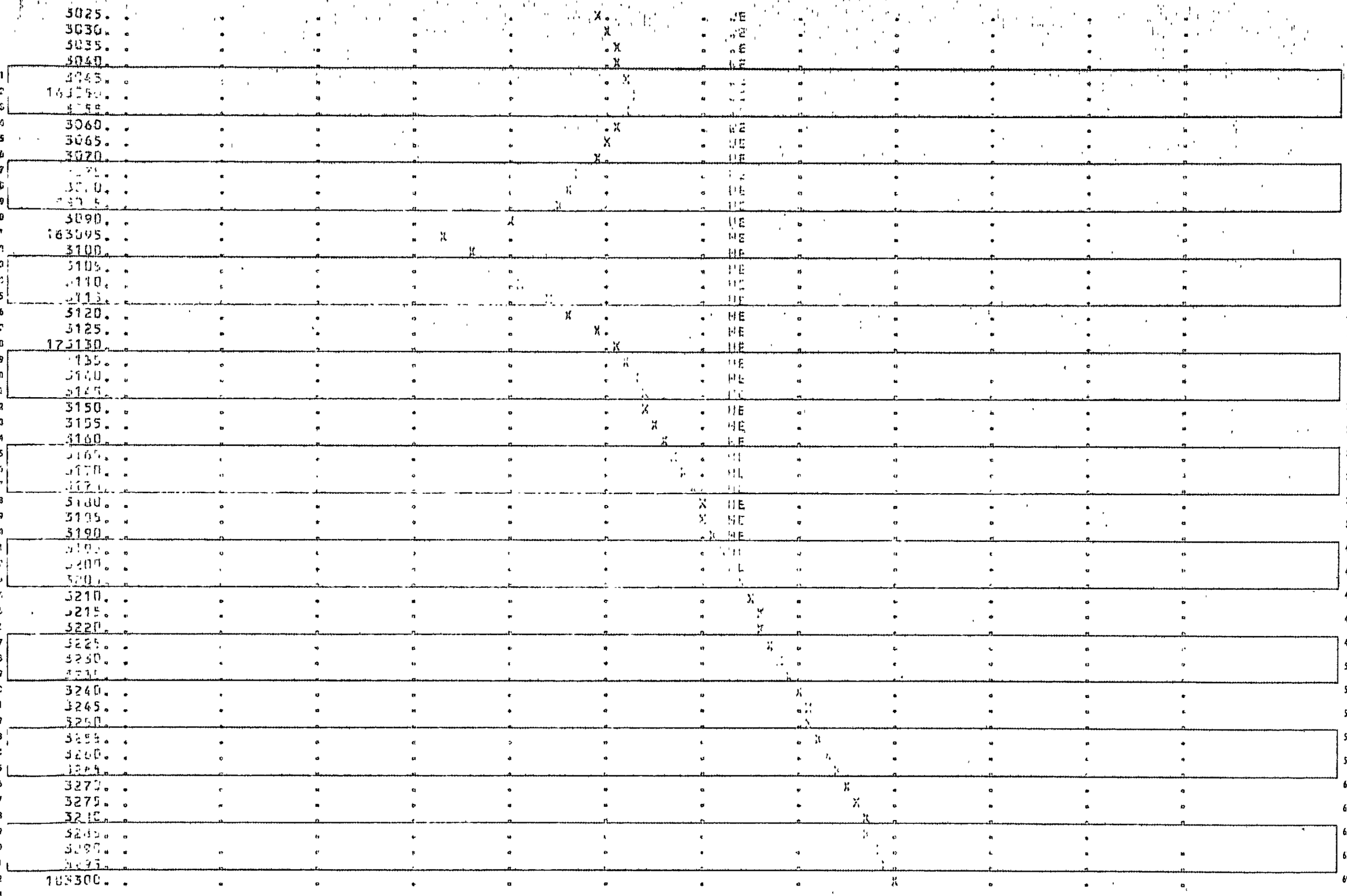
FORM 3411-SR PRINTED BY NATIONAL CARBOLD FORMS.





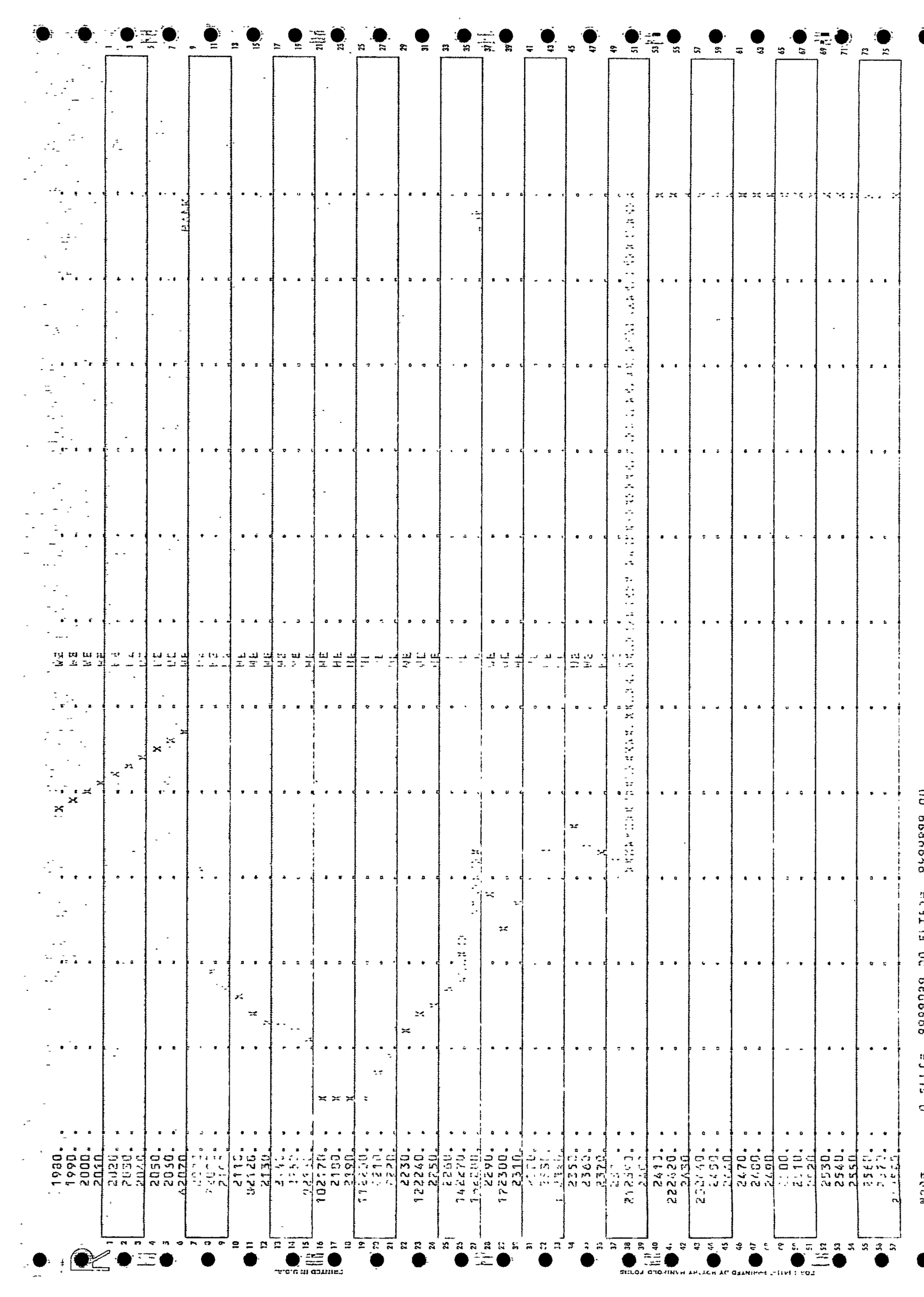
NRD= 0 FLLS= 9999999.00 FLTRD= 9999999.00

FL(I),STA(I)

770.00	2854.00	758.80	2868.00	767.40	2902.00	760.00	2936.00	767.20	2970.00
763.10	2874.00	759.50	2878.00	756.00	2909.00	755.30	2929.00	756.30	2943.00
759.50	3012.00	763.60	3018.00	764.60	3048.00	763.00	3084.00	760.60	3096.00
767.20	3130.00	770.00	3300.00						

CROSS SECTION 21.00
STREAM KALAMAZOO RIVER
DISCHARGE= 6780.

ELEV	736.	758.	760.	762.	764.	766.	768.	770.	772.	774.	776.
STA=FEET											
21670.											X
1680.											X
1690.											X
1500.											
1510.											X
1520.											X
1530.											X
1540.											X
1550.											X
1560.											X
1570.											X
1580											X
1590.											X
1600.											X
1610.											X
1620.											X
1630.											X
1640.											X
1650.											X
1660.											X
1670.											X
1680.											X
1690.											X
1700.											X
1710.											X
1720.											X
1730.											X
1740.											X
1750.											X
1760.											X
1770.											X
1780.											X
1790.											X
1800.											X
1810.											X
1820.											X
1830.											X
1840.											X
1850.											X
1860.											X
1870.											X
1880.											X
1890.											X
1900.											X
1910.											X
1920.											X
1930.											X
1940.											X
1950.											X
51960.											XXXX



EL(I),STA(I)

100000.00	1470.00	100000.00	1956.00	763.40	1956.00	763.30	1962.00	765.30	2069.00
759.80	2087.00	758.80	2119.00	758.20	2159.00	756.90	2174.00	756.80	2199.00
758.80	2239.00	759.50	2266.00	760.60	2269.00	761.10	2276.00	762.50	2279.00
760.00	2298.00	763.40	2382.00	762.05	2392.00	00000.00	2392.00	100000.00	2394.00
100000.00	[illegible]	100000.00	[illegible]	100000.00	[illegible]				

FORM 1411-G PRINTED BY ROTARY MANIFOLD FORMS, PRINTED IN U.S.A.

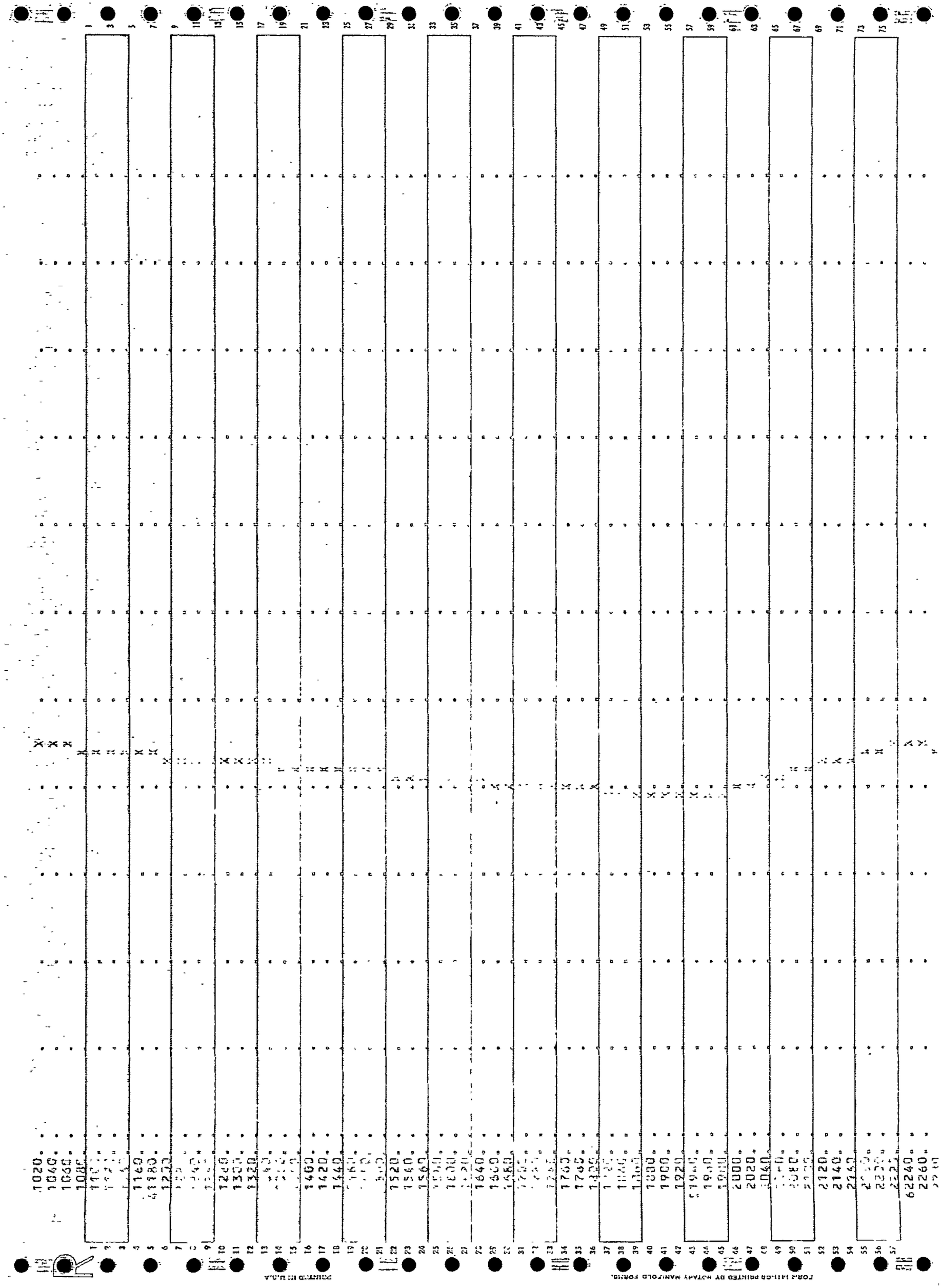
CROSS SECTION 23.00
STREAM KALAMAZOO RIVER
DISCHARGE= 6780.

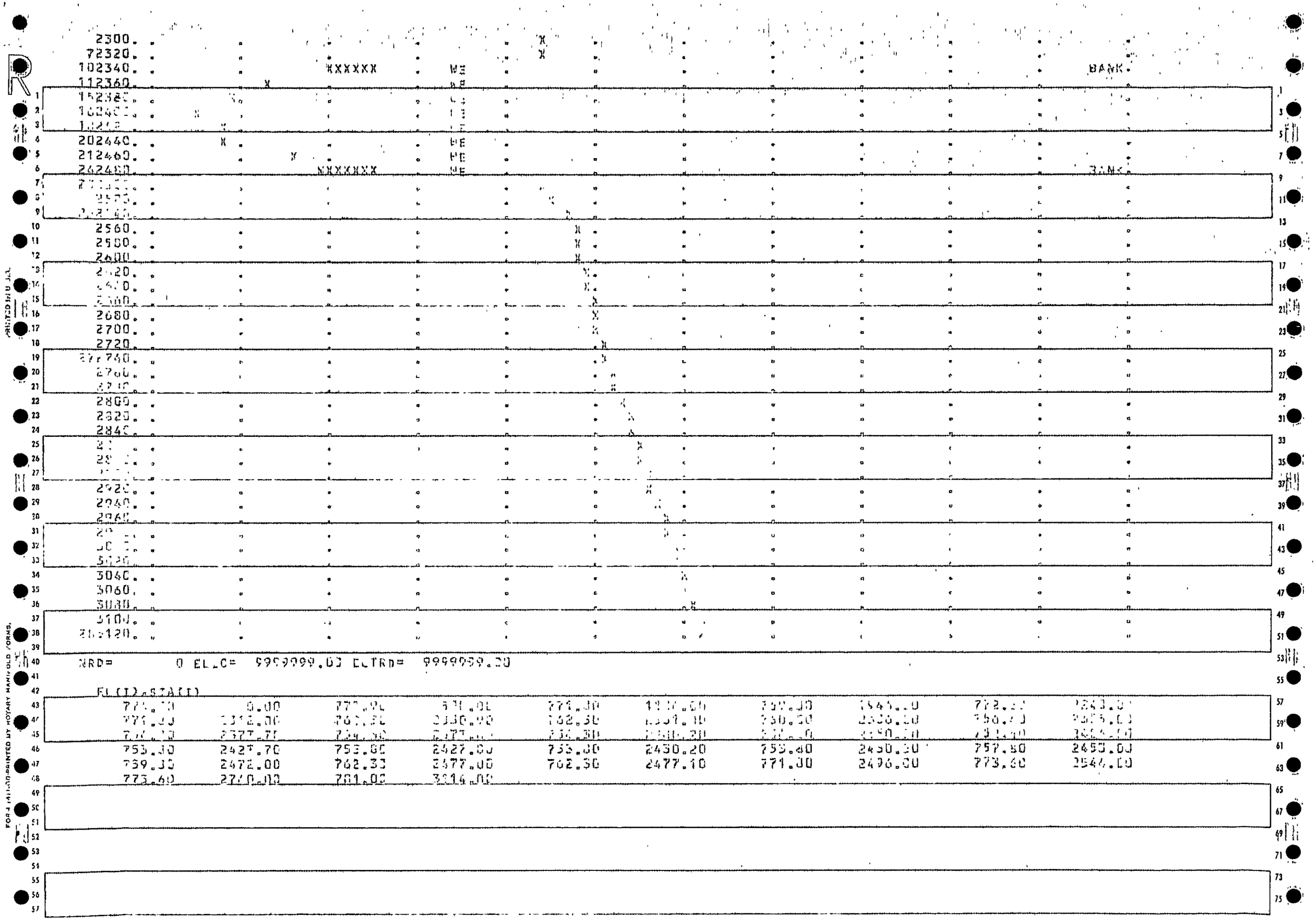
ELEV 750. 755. 760. 765. 770. 775. 780. 785. 790. 795. 800.

STAGE

2 0. X
20. X
40. X
60. X
80. X
100. X
120. X
140. X
160. X
180. X
200. X
220. X
240. X
260. X
280. X
300. X
320. X
340. X
360. X
380. X
400. X
420. X
440. X
460. X
480. X
500. X
520. X
540. X
560. X
580. X
3 600. X
620. X
640. X
660. X
680. X
700. X
720. X
740. X
760. X
780. X
800. X
820. X
840. X
860. X
880. X
900. X
920. X
940. X
960. X
980. X

FOR • 1411-67 PRINTED BY TOTALLY MANIFOLD FORMS.


1020.
1040.
1060.
1160.
1180.
1200.
1240.
1320.
1340.
1400.
1420.
1440.
1520.
1540.
1560.
1640.
1660.
1680.
1760.
1780.
1800.
1880.
1900.
1920.
2000.
2020.
2040.
2120.
2140.
2160.
62240.
2260.
FORM 1411-GR PRINTED BY ROTARY MANIFOLD FORMS.
POINTED TO BLOCK


2300.
72320.
102340.
112360.
152380.
202440.
212460.
242480.
2560.
2580.
2600.
2680.
2700.
2720.
2800.
2820.
2840.
2920.
2940.
2960.
3040.
3060.
3080.
3100.
BANK.
NRD= 0 ELEC= 9999999.00 ELTRD= 9999999.00
FL(I),STA(I)
0.00
2427.70
753.80
2427.00
753.80
2430.20
753.80
2430.30
757.80
2453.00
759.30
2472.00
762.30
2477.00
762.30
2477.10
771.80
2496.00
773.60
2544.00
773.60
2740.00
781.00
3114.00

CROSS SECTION 24.00
STREAM KALAMAZOO RIVER
DISCHARGE= 6780.

[illegible]

ELEV 750. 755. 760. 765. 770. 775. 780. 785. 790. 795. 800.

STA-FEET

2	0.	.	.	.	.	.	X	.	.	.	.	.	.
	20.	.	.	.	.	.	X	.	.	.	.	.	.
	40.	.	.	.	.	.	X	.	.	.	.	.	.
	60.	.	.	.	.	.	X	.	.	.	.	.	.
	80.	.	.	.	.	.	X	.	.	.	.	.	.
	100.	.	.	.	.	.	X	.	.	.	.	.	.
	120.	.	.	.	.	.	X	.	.	.	.	.	.
	140.	.	.	.	.	.	X	.	.	.	.	.	.
	160.	.	.	.	.	.	X	.	.	.	.	.	.
	180.	.	.	.	.	.	X	.	.	.	.	.	.
	200.	.	.	.	.	.	X	.	.	.	.	.	.
	220.	.	.	.	.	.	X	.	.	.	.	.	.
	240.	.	.	.	.	.	X	.	.	.	.	.	.
	260.	.	.	.	.	.	X	.	.	.	.	.	.
	280.	.	.	.	.	.	X	.	.	.	.	.	.
	300.	.	.	.	.	.	X	.	.	.	.	.	.
	320.	.	.	.	.	.	X	.	.	.	.	.	.
	340.	.	.	.	.	.	X	.	.	.	.	.	.
	360.	.	.	.	.	.	X	.	.	.	.	.	.
	380.	.	.	.	.	.	X	.	.	.	.	.	.
	400.	.	.	.	.	.	X	.	.	.	.	.	.
	420.	.	.	.	.	.	X	.	.	.	.	.	.
	440.	.	.	.	.	.	X	.	.	.	.	.	.
	460.	.	.	.	.	.	X	.	.	.	.	.	.
	480.	.	.	.	.	.	X	.	.	.	.	.	.
	500.	.	.	.	.	.	X	.	.	.	.	.	.
	520.	.	.	.	.	.	X	.	.	.	.	.	.
	540.	.	.	.	.	.	X	.	.	.	.	.	.
	560.	.	.	.	.	.	X	.	.	.	.	.	.
	580.	.	.	.	.	.	X	.	.	.	.	.	.
3	600.	.	.	.	.	.	X	.	.	.	.	.	.
	620.	.	.	.	.	.	X	.	.	.	.	.	.
	640.	.	.	.	.	.	X	.	.	.	.	.	.
	660.	.	.	.	.	.	X	.	.	.	.	.	.
	680.	.	.	.	.	.	X	.	.	.	.	.	.
	700.	.	.	.	.	.	X	.	.	.	.	.	.
	720.	.	.	.	.	.	X	.	.	.	.	.	.
	740.	.	.	.	.	.	X	.	.	.	.	.	.
	760.	.	.	.	.	.	X	.	.	.	.	.	.
	780.	.	.	.	.	.	X	.	.	.	.	.	.
	800.	.	.	.	.	.	X	.	.	.	.	.	.
	820.	.	.	.	.	.	X	.	.	.	.	.	.
	840.	.	.	.	.	.	X	.	.	.	.	.	.
	860.	.	.	.	.	.	X	.	.	.	.	.	.
	880.	.	.	.	.	.	X	.	.	.	.	.	.
	900.	.	.	.	.	.	X	.	.	.	.	.	.
	920.	.	.	.	.	.	X	.	.	.	.	.	.
	940.	.	.	.	.	.	X	.	.	.	.	.	.
	960.	.	.	.	.	.	X	.	.	.	.	.	.
	980.	.	.	.	.	.	X	.	.	.	.	.	.
	1000.						X						

1020.
1040.
1060.
1080.
1100.
1120.
1140.
1160.
41180.
1200.
1220.
1240.
1260.
1280.
1300.
1320.
1340.
1360.
1380.
1400.
1420.
1440.
1460.
1480.
1500.
1520.
1540.
1560.
1580.
1600.
1620.
1640.
1660.
1680.
1700.
1720.
1740.
1760.
1780.
1800.
1820.
1840.
1860.
1880.
1900.
1920.
51940.
1960.
1980.
2000.
2020.
2040.
2060.
2080.
2100.
2120.
2140.
2160.
2180.
2200.
2220.
62240.
2260.

```
  2300.
 72320.
102340.                XXX          WE                                                  BANK.
112360.          X                  WE
[illegible]
[illegible]
[illegible]
202440.          X                  WE
212460.          X                  WE
242480.                XXXXX        WE                                                  BANK.
[illegible]
[illegible]
[illegible]
  2560.
  2580.
  2600.
  2620.
  2640.
  2660.
  2680.
  2700.
  2720.
[illegible]
  2760.
  2780.
  2800.
  2820.
  2840.
  2860.
  2880.
  2900.
  2920.
  2940.
  2960.
  2980.
  3000.
  3020.
  3040.
  3060.
  3080.
  3100.
[illegible]
```

NRD= 0 ELLO= 9999999.00 ELTRD= 9999999.00

EL(I),STA(I)

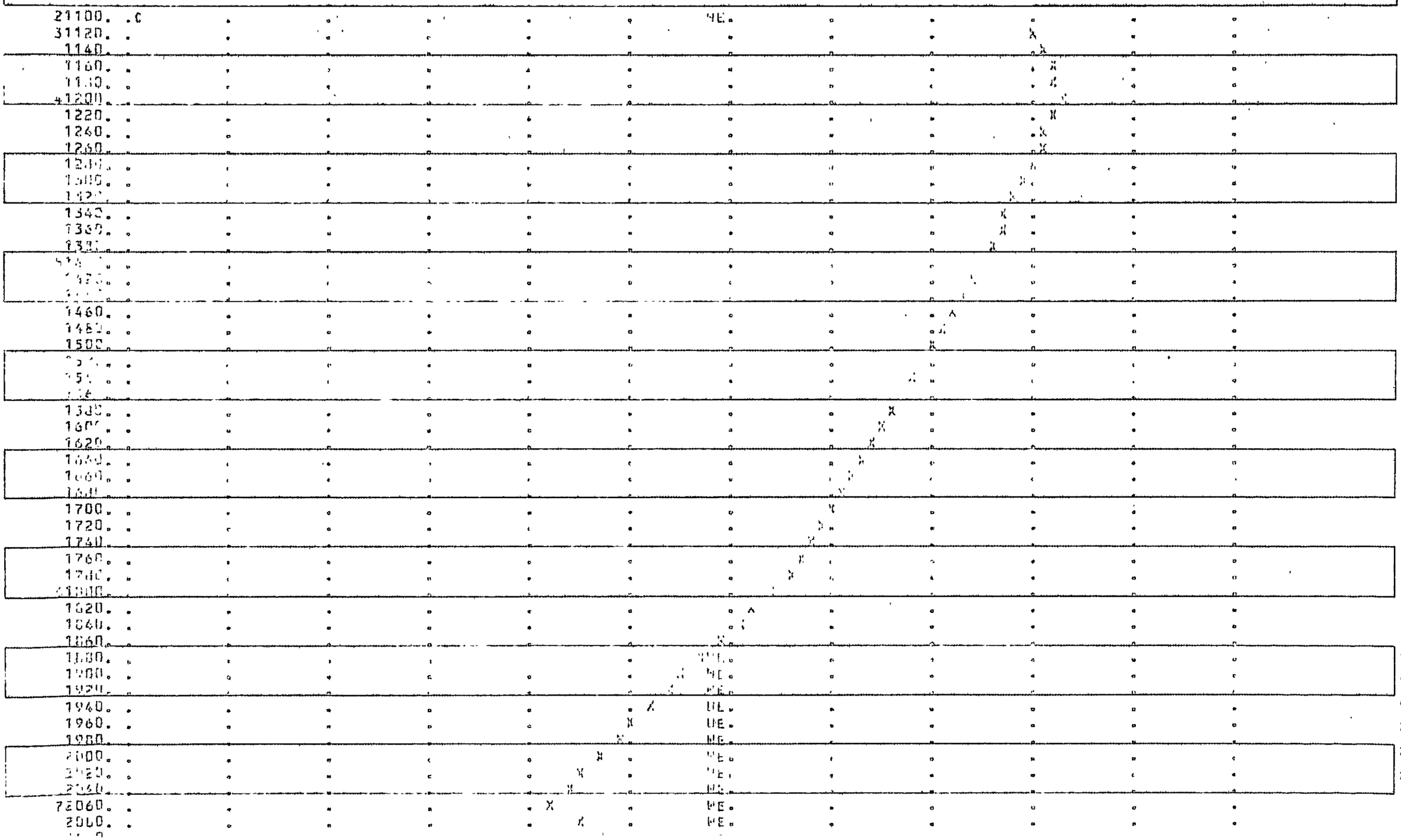
[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
756.40	2427.70	756.40	2427.00	756.40	2430.20	756.40	2430.30	756.60	2453.00
759.90	2472.00	762.20	2477.00	762.20	2477.10	769.02	2496.00	773.60	2544.00
775.60	2740.00	781.00	[illegible]						

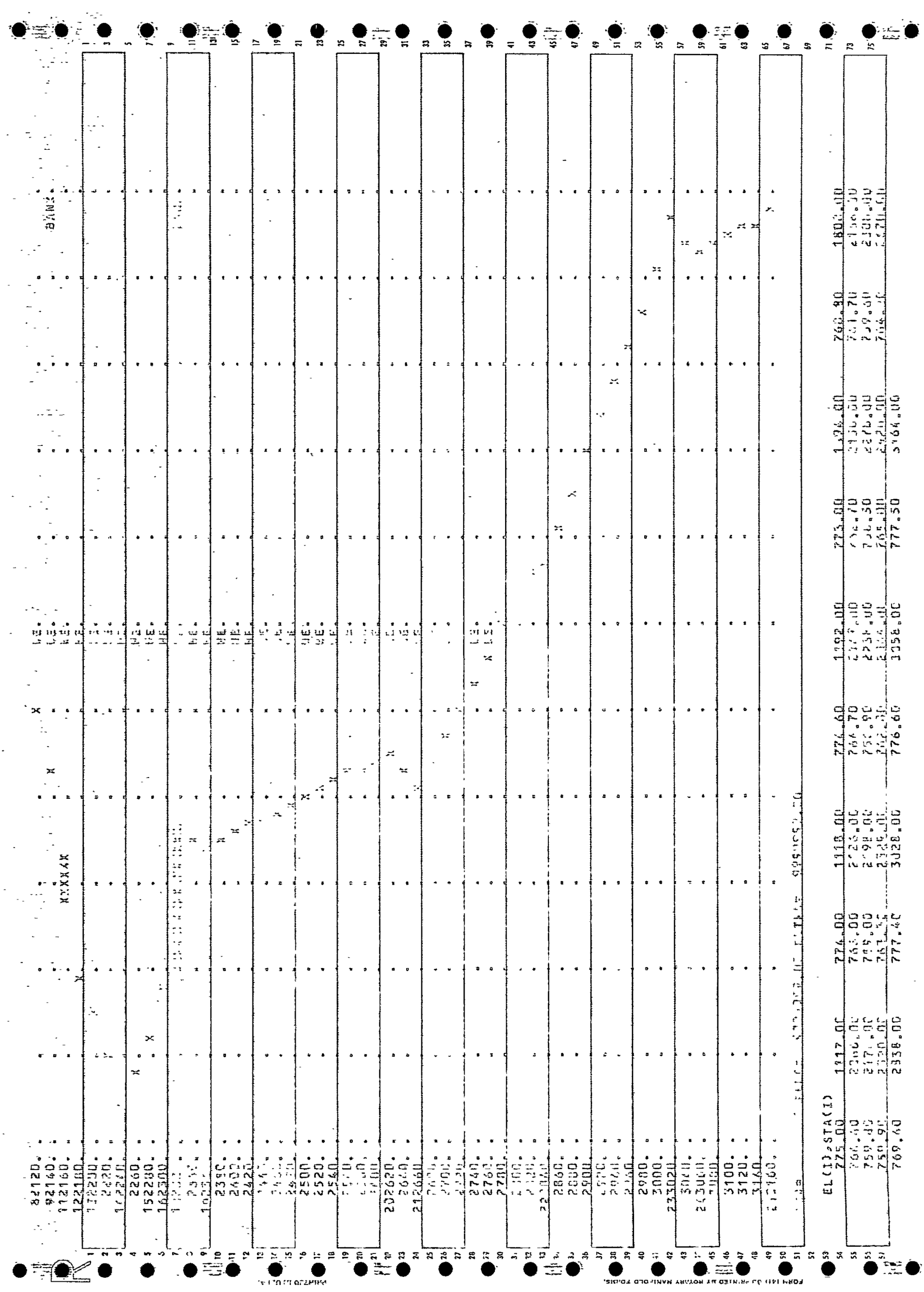
CROSS SECTION 26.00
STREAM. KALAMAZOO RIVER
DISCHARGE= 6770.

PLOTTED POINTS [illegible]

ELEV 756. 758. 760. 762. 764. 766. 768. 770. 772. 774. 776.

STAMPLET





CROSS SECTION 27.00
STREAM KALAMAZOO RIVER
DISCHARGE= 6775.

ELEV 755. 760. 765. 770. 775. 780. 785. 790. 795. 800. 805.

STA-FACT

2 0.
3 50.
4 100.
150.
200.
250.
300.
350.
400.
450.
500.
550.
600.
650.
5 700.
750.
800.
850.
900.
6 950.
1000.
1050.
1100.
1150.
1200.
1250.
1300.
1350.
1400.
1450.
1500.
1550.
1600.
1650.
1700.
1750.
1800.
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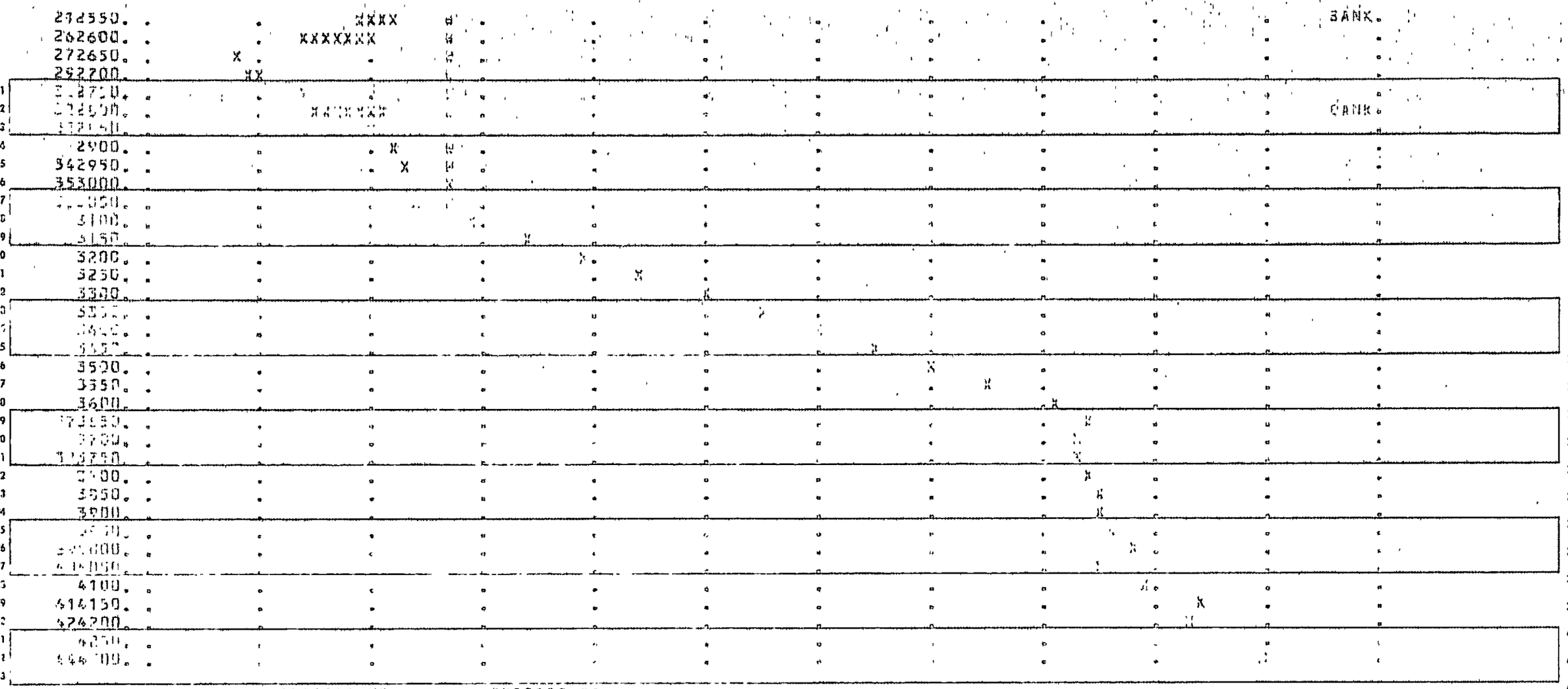
2350.
2400.
2450.



NRD= 0 ELLC= 9999999.00 ELTRD= 9999999.00

FL(I),STA(I)

[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
770.30	[illegible]	765.80	2222.00	765.70	2496.00	764.30	2556.00	766.10	2560.00
764.90	2580.00	762.90	2563.00	763.10	2588.00	762.70	2591.00	761.50	2612.00
759.10	2662.00	759.50	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2737.00
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	3730.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4172.00
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				

CROSS SECTION 29.00
STREAM KALAMAZOO RIVER
DISCHARGE= 6770.

PLOTTED POINTS (OR PRODUCTS) BOTTOM BRIDGE=T=TOP BRIDGE,X=GROUND,U=UNDER SUB,F=FLOW GRADIENT,C=CRITICAL FALL

ELEV 755. 760. 765. 770. 775. 780. 785. 790. 795. 800. 805.

STA-FECT

2 540.					X							
560.					X							
3 580.					X							
600.					X							
620.					X							
640.					X							
660.					X							
680.					X							
700.					X							
720.					X							
740.					X							
760.					X							
780.					X							
800.					X							
820.					X							
4 840.					X							
860.					X							
880.					X							
5 900.					X							
920.					X							
940.					X							
960.					X							
980.					X							
1000.					X							
1020.					X							
1040.					X							
1060.					X							
1080.					X							
1100.					X							
1120.					X							
1140.					X							
1160.					X							
1180.					X							
1200.					X							
1220.					X							
1240.					X							
1260.					X							
1280.					X							
1300.					X							
1320.					X							
91340.					XXXXXXXXXXXXXXXX							DEAK
1360.												
1380.			X									
131400.			X									
141420.		X										
161440.		X										
191460.		X										
211480.		X										
231500.		X										
241520.		X										

291560.
331580.
1600.
341620.
1640.
1660.
1680.
1700.
1720.
1740.
1760.
1780.
1800.
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1860.
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1900.
1920.
1940.
1960.
1980.
2000.
2020.
2040.
2060.
2080.
2100.
2120.
2140.
2160.
382180.
2200.
2220.
2240.
2260.
2280.
2300.
2320.
2340.
2360.
2380.
2400.
2420.
2440.
2460.
2480.
2500.
2520.
392540.
2560.
2580.
2600.
2620.
2640.
2660.
2680.
2700.
2720.
2740.
2760.
2780.
2800.

BANK

PRINTED IN U.S.A.
FORM 1411-GH-PRINTED BY ROTARY MANIFOLD PORTS.

VKD= 0 ELLC= 9999999.00 ELTRU= 9999999.00

EL(I),STA(I)

770.00	1090.00	765.00	1146.00	762.00	1190.00	758.70	1416.00	757.40	1672.00
755.10	1461.00	752.60	1494.00	749.90	1524.00	748.60	1554.00	747.80	1584.00
745.70	1614.00	751.10	1634.00	756.90	1644.00	762.00	1714.00	762.10	1804.00
775.00	1[illegible]								

PRINTED IN U.S.A.

FORM 1-11-69 PRINTED BY ROTARY MANIFOLD FORMS.

CROSS SECTION 16.60
STREAM KALAMAZOO R. KALAMAZOO
DISCHARGE= 6970.

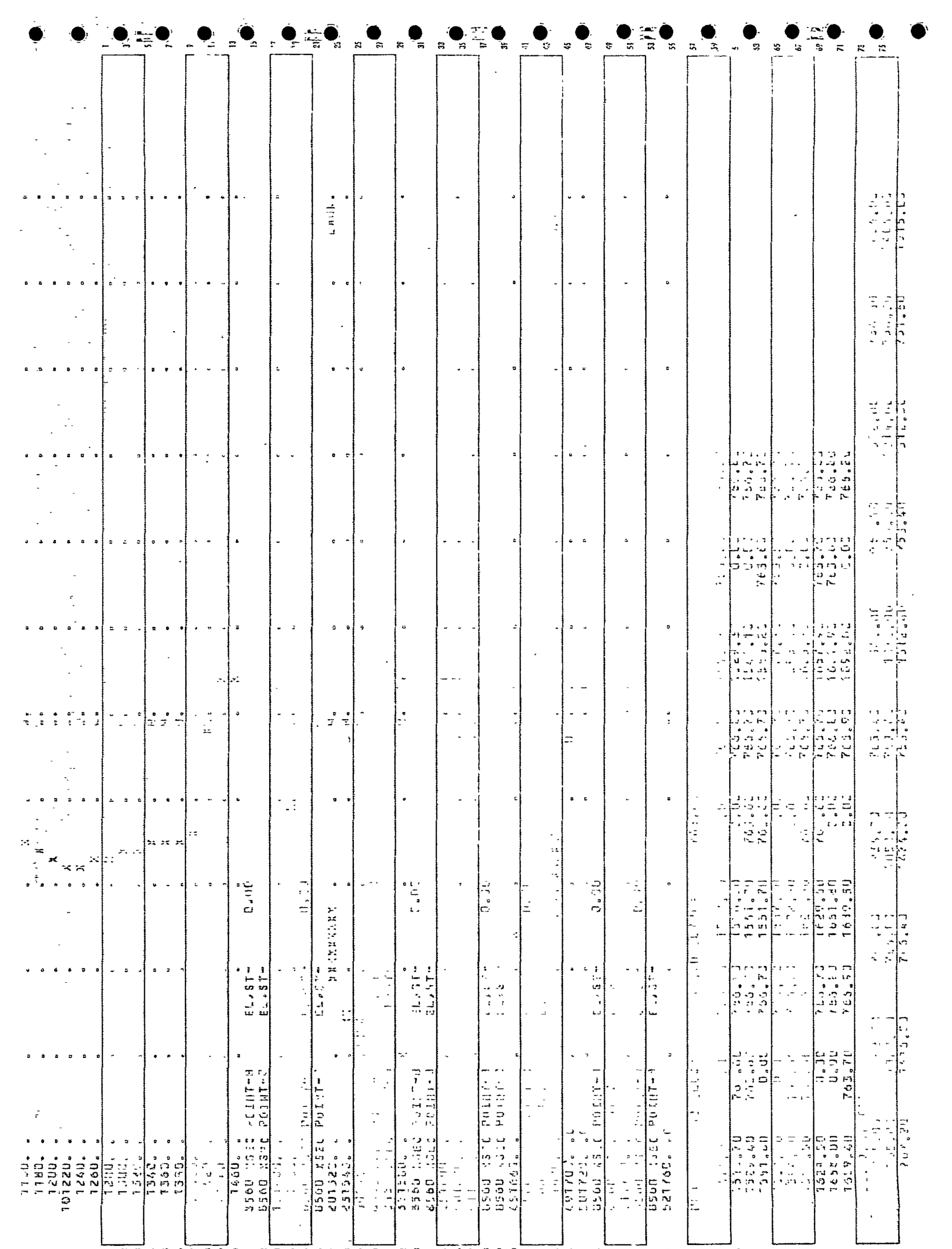
PLOTTED POINTS (BY PERSONNEL)-B=BOTTOM BRIDGE [illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

STA-FEET

[illegible]											
[illegible]											
100.											
200.											
220.											
[illegible]											
[illegible]											
[illegible]											
300.											
320.											
4 340.											
[illegible]											
[illegible]											
400.											
420.											
440.											
460.											
[illegible]											
[illegible]											
[illegible]											
540.											
560.											
5 580.											
[illegible]											
[illegible]											
[illegible]											
660.											
680.											
700.											
[illegible]											
[illegible]											
[illegible]											
780.											
800.											
820.											
[illegible]											
[illegible]											
[illegible]											
900.											
920.											
940.											
[illegible]											
[illegible]											
1000.											
71020.											
1040.											
61060.											
[illegible]											
1100.											
[illegible]											
1140.											

PRINTED IN U.S.A.
FORM 1411-08-PRINTED BY ROTARY MANIFOLD FORMS.



FORM 1811-OR PRINTED BY ROTARY MANIFOLD FORMS.

PRINTED IN U.S.A.

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
747.00	[illegible]	747.00	[illegible]	746.30	1531.50	[illegible]	1531.70	749.50	1557.40
745.90	1563.20	745.90	1563.50	745.70	1567.10	745.70	1567.20	745.50	1563.00
744.70	1592.50	744.70	1592.60	744.70	1596.40	744.70	1596.50	745.50	1611.10
744.50	1625.60	744.50	1625.70	744.70	1629.50	744.70	1629.60	749.90	1643.70
752.00	1657.90	752.00	1650.00	752.00	1661.60	752.00	1661.90	753.10	1675.70
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]								

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FORM 1411-00 PRINTED BY ROTARY MANIFOLD FORMS.

00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: COMSTOCK TWP

3) WATERCOURSE: KALAMAZOO RIVER

4) DOCUMENT TYPE: CROSS-SECTIONS

~~RATING CURVE RUN~~

~~EASTERLY SYNOPS~~S

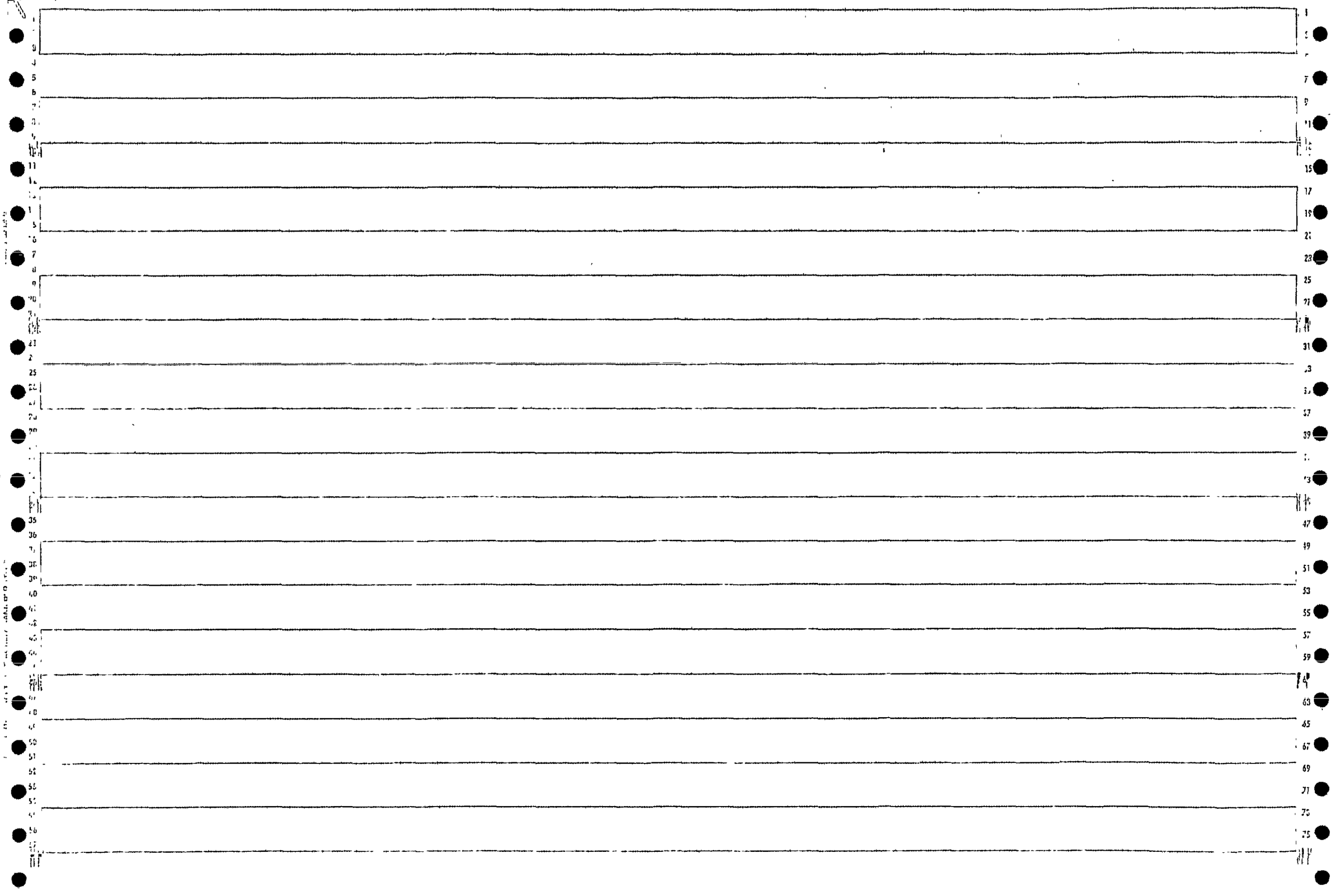
00BREAK00

```
      230.
      232.
      234.
      236.
      238.
      240.
      242.
      244.
      246.
      248.
      250.
      252.
      254.
      256.
      258.
      260.
      262.
      264.
      266.
      268.
      270.
      272.
      274.
      276.
      278.
      280.
      282.
      284.
      286.
      288.
      290.
      292.
      294.
      296.
      298.
   10 300.
      302.
      304.
      306.
      308.
      310.
      312.
      314.
      316.
      318.
      320.
      322.
      324.
      326.
      328.
      330.
      332.
      334.
      336.
      338.
      340.
      342.
      344.
      346.
      348.
   11 350.
```

NRD= 0 ELLC= 9999999.00 ELTRD= 9999999.00

EL(I),STA(I)

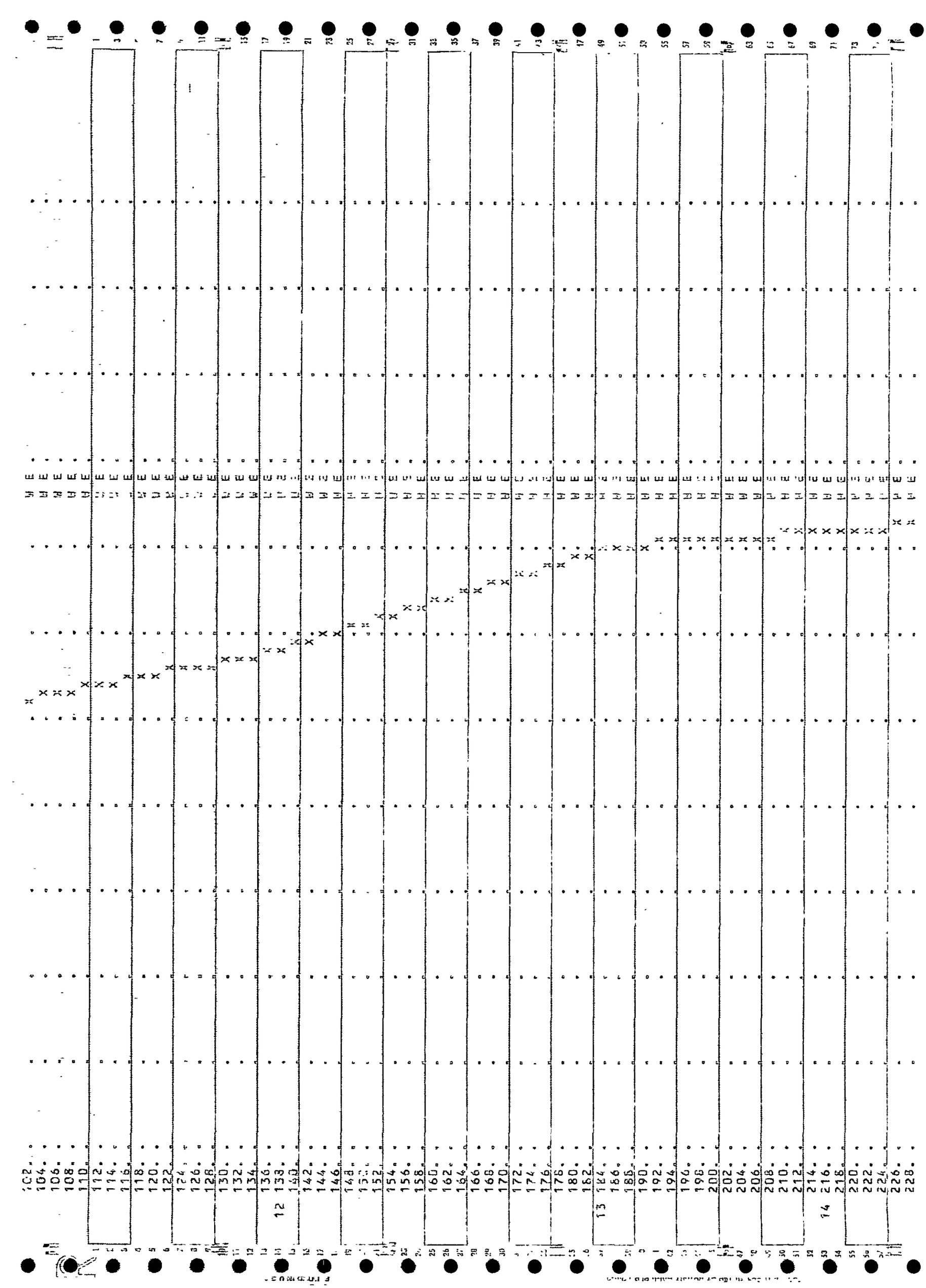
794.00	0.00	791.80	25.00	791.80	95.50	786.90	95.60	786.20	100.00
787.10	104.50	791.80	104.60	791.80	148.50	791.80	300.00	794.00	350.00



CROSS SECTION 34.00
STREAM ARCADIA CREEK KALAMAZOO
DISCHARGE= 1020.

PLOTTED POINTS (BY PRIORITY)-B=BOTTOM BRIDGE,T=TOP BRIDGE,X=GROUND,W=WATER SUR,E=ENERGY GRADIENT,C=CRITICAL W.SEL

ELEV	789.	790.	791.	792.	793.	794.	795.	796.	797.	798.	799.
STA-FEET											
2	0.								X		
	2.								X		
	4.								X		
	6.								X E		
3	8.								X W E		
	10.								X W E		
4	12.								X W E		
	14.								X W E		
	16.								X W E		
	18.								X W E		
	20.								X W E		
	22.								X W E		
	24.								X W E		
	26.								X W E		
	28.								X W E		
	30.								X W E		
	32.								X W E		
5	34.								X W E		BANK
	36.						X		W E		
	38.					X			W E		
	40.						X		W E		
	42.				X				W E		
	44.			X					W E		
6	46.		X						W E		
	48.	X							W E		
	50.	X							W E		
7	52.	X							W E		
	54.	X							W E		
	56.	X							W E		
8	58.		X						W E		
	60.			X					W E		
9	62.				X				W E		BANK
	64.				X				W E		
	66.				X				W E		
	68.				X				W E		
	70.				X				W E		
	72.				X				W E		
	74.				X				W E		
	76.				X				W E		
10	78.				X				W E		
	80.				X				W E		
	82.				X				W E		
	84.				X				W E		
11	86.				X				W E		
	88.				X				W E		
	90.				X				W E		
	92.				X				W E		
	94.				X				W E		
	96.				X				W E		
	98.				X				W E		
	100.				X				W E		



```
      230.                                                    X  W  E
      232.                                                    X  W  E
      234.                                                    X  W  E
      236.                                                    X  W  E
      238.                                                    X  W  E
      240.                                                    X  W  E
      242.                                                    X  W  E
      244.                                                    X  W  E
      246.                                                    X  W  E
      248.                                                    X  W  E
      250.                                                    X  W  E
      252.                                                    X  W  E
      254.                                                    X  W  E
   15 256.                                                    X  W  E
      258.                                                    X  W  E
      260.                                                    X  W  E
      262.                                                    X  W  E
      264.                                                    X  W  E
      266.                                                    X  W  E
      268.                                                    X  W  E
      270.                                                    X  W  E
      272.                                                    X  W  E
      274.                                                    X  W  E
      276.                                                    X  W  E
      278.                                                    X  W  E
      280.                                                    X  W  E
      282.                                                    X  W  E
      284.                                                    X  W  E
      286.                                                    X  W  E
      288.                                                    X  W  E
      290.                                                    X  E
      292.                                                    X  E
      294.                                                    X  E
      296.                                                    X  E
      298.                                                    X  E
   16 300.                                                    X  E

 ARD=        0 ELLC=  9999999.00 ELTRC=  9999999.00

   EL(I),STA(I)
      797.10        0.00      796.40        8.00      796.40       12.00      796.40       35.00      789.70       47.00
      789.30       [illegible].00      790.20       39.00      793.20       62.00      793.90       78.00      794.00       86.00
      794.00      138.00      796.00      184.00      796.20      216.00      796.40      256.00      796.50      300.00
```

CROSS SECTION 39.00
STREAM ARCADIA CREEK KALAMAZOO
DISCHARGE= 890.

PLOTTED POINTS (BY PRIORITY)-B=BOTTOM BRIDGE,T=TOP BRIDGE,X=GROUND,W=WATER SUR,E=ENERGY GRADIENT,C=CRITICAL WSEL

	ELEV	802.	803.	804.	805.	806.	807.	808.	809.	810.	811.	812.
	STA-FEET											
2	0.			X								
	5.			X								
	10.			XE								
	15.		X	E								
	20.		XW	E								
	25.	X	W	E								
	30.	X	W	E								
	35.	X	W	E								
	40.	X	W	E								
	45.	X	W	E								
3	50.	X	W	E							BANK.	
	55.	X	W	E								
	60.	X	W	E								
	65.	X	W	E								
	70.	X	W	E								
	75.	X	W	E								
	80.	X	W	E								
	85.	X	W	E								
	90.	X	W	E								
	95.	X	W	E								
	100.	X	W	E								
	105.	X	W	E								
	110.	X	W	E								
	115.	X	W	E								
	120.	X	W	E								
	125.	X	W	E								
	130.	X	W	E								
	135.	X	W	E								
	140.	X	W	E								
	145.	X	W	E								
	150.	X	W	E								
	155.	X	W	E								
	160.	X	W	E								
	165.	X	W	E								
	170.	X	W	E								
	175.	X	W	E								
	180.	X	W	E								
	185.	X	W	E								
	190.	X	W	E								
	195.	X	W	E								
4	200.	X	W	E							BANK.	
	205.	X	W	E								
	210.	X	W	E								
	215.	X	W	E								
	220.	X	W	E								
	225.	X	W	E								
	230.	X	W	E								
	235.	X	W	E								
	240.	X	W	E								
	245.	X										
5	250.	X										

NRD= 0 ELLC= 9999999.00 ELTRD= 9999999.00

EL(I),STA(I)

804.00 0.00 802.00 50.00 802.00 200.00 804.00 250.00

CROSS SECTION 44.00
STREAM ARCADIA CREEK KALAMAZOO
DISCHARGE= 890.

PLOTTED POINTS (BY PRIORITY)-B=BOTTOM BRIDGE,T=TOP BRIDGE,X=GROUND,W=WATER SUR,E=ENERGY GRADIENT,C=CRITICAL WSEL

	ELEV	808.	809.	810.	811.	812.	813.	814.	815.	816.	817.	818.
	STA-FEET											
2	0.			X E								
	5.			XW. E								
	10.		X	W. E								
	15.		X	W. E								
	20.		X	W. E								
	25.	X		W. E								
	30.	X		W. E								
	35.	X		W. E								
	40.	X		W. E								
	45.	X		W. E								
3	50.	X		W. E							BANK.	
	55.	X		W. E								
	60.	X		W. E								
	65.	X		W. E								
	70.	X		W. E								
	75.	X		W. E								
	80.	X		W. E								
	85.	X		W. E								
	90.	X		W. E								
	95.	X		W. E								
	100.	X		W. E								
	105.	X		W. E								
	110.	X		W. E								
	115.	X		W. E								
	120.	X		W. E								
	125.	X		W. E								
	130.	X		W. E								
	135.	X		W. E								
	140.	X		W. E								
	145.	X		W. E								
4	150.	X		W. E							BANK.	
	155.	X		W. E								
	160.	X		W. E								
	165.	X		W. E								
	170.	X		W. E								
	175.	X		W. E								
	180.	X		W. E								
	185.	X		W. E								
	190.	X		W. E								
	195.	X		W. E								
5	200.	X		E								

NRD= 0 ELEC= 9999999.00 ELTRD= 9999999.00

EL(I),STA(I)

810.00	0.00	808.00	50.00	808.00	150.00	810.00	200.00

CROSS SECTION 49.00
STREAM ARCADIA CREEK KALAMAZOO
DISCHARGE= 1020.

PLOTTED POINTS (BY PRIORITY)-B=BOTTOM BRIDGE,T=TOP BRIDGE,X=GROUND,W=WATER SUR,E=ENERGY GRADIENT,C=CRITICAL WSEL

ELEV 806. 808. 810. 812. 814. 816. 818. 820. 822. 824. 826.

STA-FEET

2	0.					X							
	5.					X							
	10.					X							
	15.					X							
	20.					X							
	25.					X							
	30.					X							
	35.					X							
	40.					X							
	45.					X							
3	50.					X							
	55.					X							
	60.					X							
	65.					X							
	70.					X							
	75.					X							
	80.					X							
	85.					X							
4	90.					X							
	95.					XE							
5	100.					XW	E						BANK.
	105.				X	W	E						
	110.			X		W	E						
	115.		X			W	E						
6	120.	X				W	E						
	125.	X				W	E						
7	130.	X				W	E						
	135.		X			W	E						
8	140.			X		W	E						BANK.
	145.				X	W	E						
	150.				X	W	E						
	155.				X	W	E						
	160.				X	W	E						
9	165.					XW	E						
	170.						X						
	175.							X					
	180.								X				
	185.									X			
	190.										X		
	195.											X	
10	200.											X	

NRD= 0 ELLC= 9999999.00 ELTRD= 9999999.00

EL(I),STA(I)

814.00	0.00	814.00	50.00	813.00	90.00	812.00	102.00	806.50	120.00
806.50	132.00	810.00	142.00	812.00	165.00	820.00	200.00		

CROSS SECTION 60.00
STREAM ARCADIA CREEK KALAMAZOO
DISCHARGE= 485.

PLOTTED POINTS (BY PRIORITY)-B=BOTTOM BRIDGE,T=TOP BRIDGE,R=GROUND,W=WATER SUR,E=ENERGY GRADIENT,C=CRITICAL WSEL

ELEV 814. 816. 818. 820. 822. 824. 826. 828. 830. 832. 834.

STA-FEET

2 0. X
2. X W
4. X W
6. X W
8. X W
3 10. X W
12. X W
14. X W
16. X W
18. X W
20. X W
22. X W
24. X W
26. X W
28. X W
30. X W
32. X W
34. X W
36. X W
38. X W
40. X W
42. X W
44. X W
46. X W
48. X W
50. X W
52. X W
54. X W
56. X W
58. X W
60. X W
62. X W
64. X W
66. X W
68. X W
70. X W
72. X W
74. X W
76. X W
78. X W
80. X W
82. X W
84. X W
86. X W
88. X W
90. X W
92. X W
94. X W
96. X W
98. X W
5 100. XXXXXXXXXXX W BANK.

```
      102.  X
      104.  X
      106.  X
      108.  X
      110.  X
      112.  X
      114.  X
      116.  X
    6 118.  X
    7 120.   X                                                    BANK.
      122.   X
      124.   X
      126.   X
      128.   X
      130.   X
      132.   X
      134.   X
      136.   X
      138.   X
      140.   X
      142.   X
      144.   X
      146.   X
      148.   X
      150.   X
      152.   X
      154.   X
      156.   X
      158.   X
      160.   X
      162.   X
      164.   X
      166.   X
      168.   X
      170.   X
      172.   X
      174.   X
      176.   X
      178.   X
      180.   X
      182.   X
      184.   X
      186.   X
      188.   X
    8 190.   X
      192.    X
      194.     X
      196.      X
      198.       X
    9 200.        X

 NRD=       0 ELLC=  9999999.00 ELTRD=  9999999.00

  EL(I),SYA(I)
     827.00        0.00      816.00       10.00      916.00      100.00      814.00      101.00      816.00      119.00
     816.00      120.00      816.00      190.00      827.00      200.00
```

CROSS SECTION 71.00
STREAM ARCADIA CREEK KALAMAZOO
DISCHARGE= 485.

PLOTTED POINTS (BY PRIORITY)-B=BOTTOM BRIDGE,T=TOP BRIDGE,X=GROUND,W=WATER SLR,E=ENERGY GRADIENT,C=CRITICAL DEPTH

	ELEV	818.	820.	822.	824.	826.	828.	830.	832.	834.	836.	838.
	STA-FEET											
2	0.									X		
	2.								X			
	4.											
	6.								X			
	8.							X				
	10.								X			
	12.											
	14.							X				
	16.						X					
	18.											
	20.						X					
	22.											
	24.					X						
	26.					X		WE				
	28.				X			WE				
	30.					X		WE				
	32.				X			WE				
	34.			X				WE				
3	36.				X			WE				
	38.			X				WE				
	40.				X			WE				
	42.				X			WE				
	44.				X			WE				
	46.							WE				
	48.				X			WC				
4	50.				X			WE				BANK
	52.			X				WE				
	54.		X					WE				
5	56.		X					WE				
	58.		X					WE				
6	60.		X					WE				
	62.		X					WE				
	64.		X					WE				
7	66.		X					WE				
	68.			X				WE				
	70.				X			WE				
8	72.					X		WE				BANK
	74.					X		WE				
	76.					X		WE				
	78.					X		WE				
	80.					X		WE				
	82.					X		WE				
	84.					X		WE				
	86.					X		WE				
	88.					X		WE				
	90.					X		WE				
	92.					X		WE				
	94.					X		WE				
	96.					X		WE				
	98.					X		WE				
	100.					X		WE				

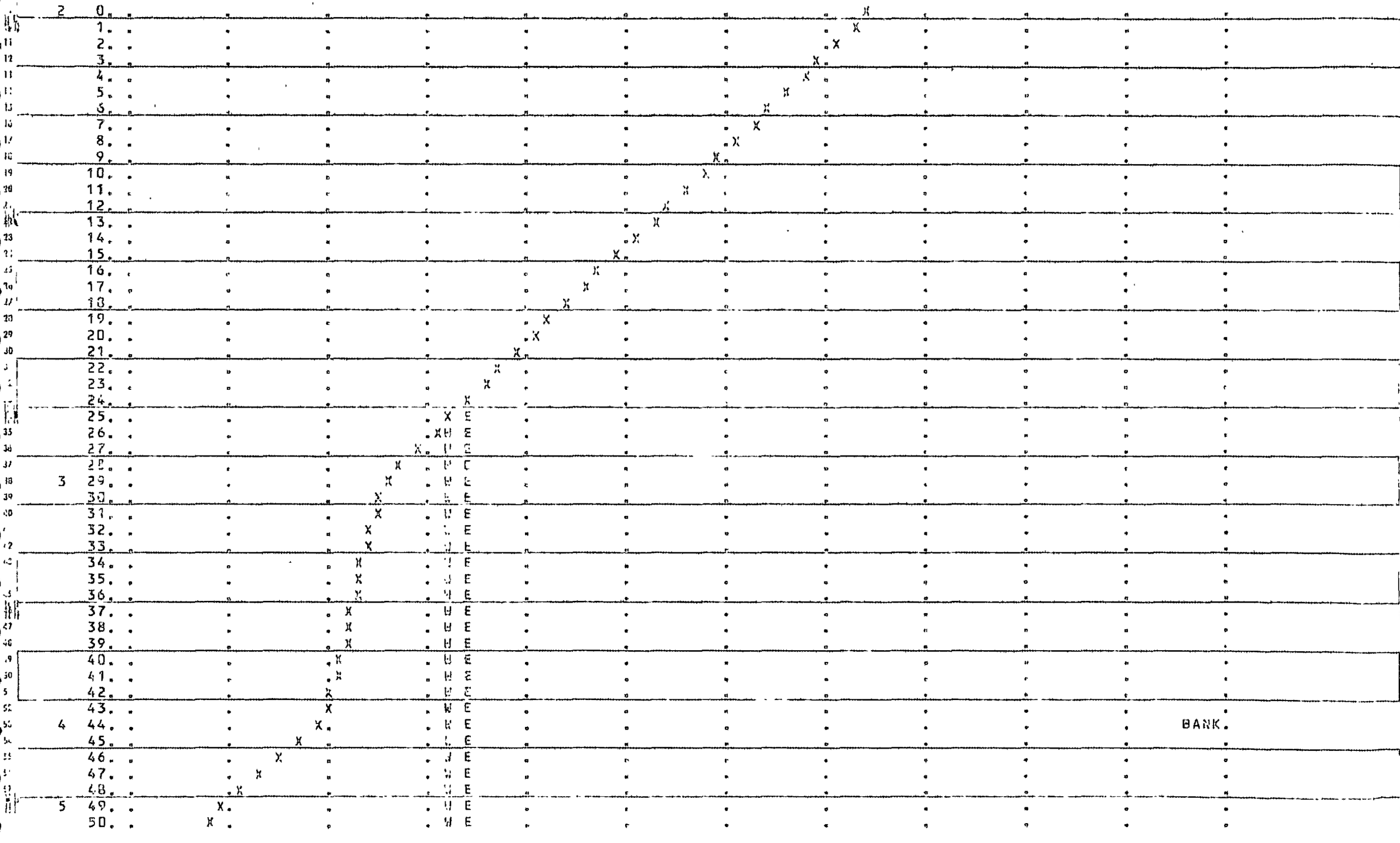
```
      102.  .  .  .
```

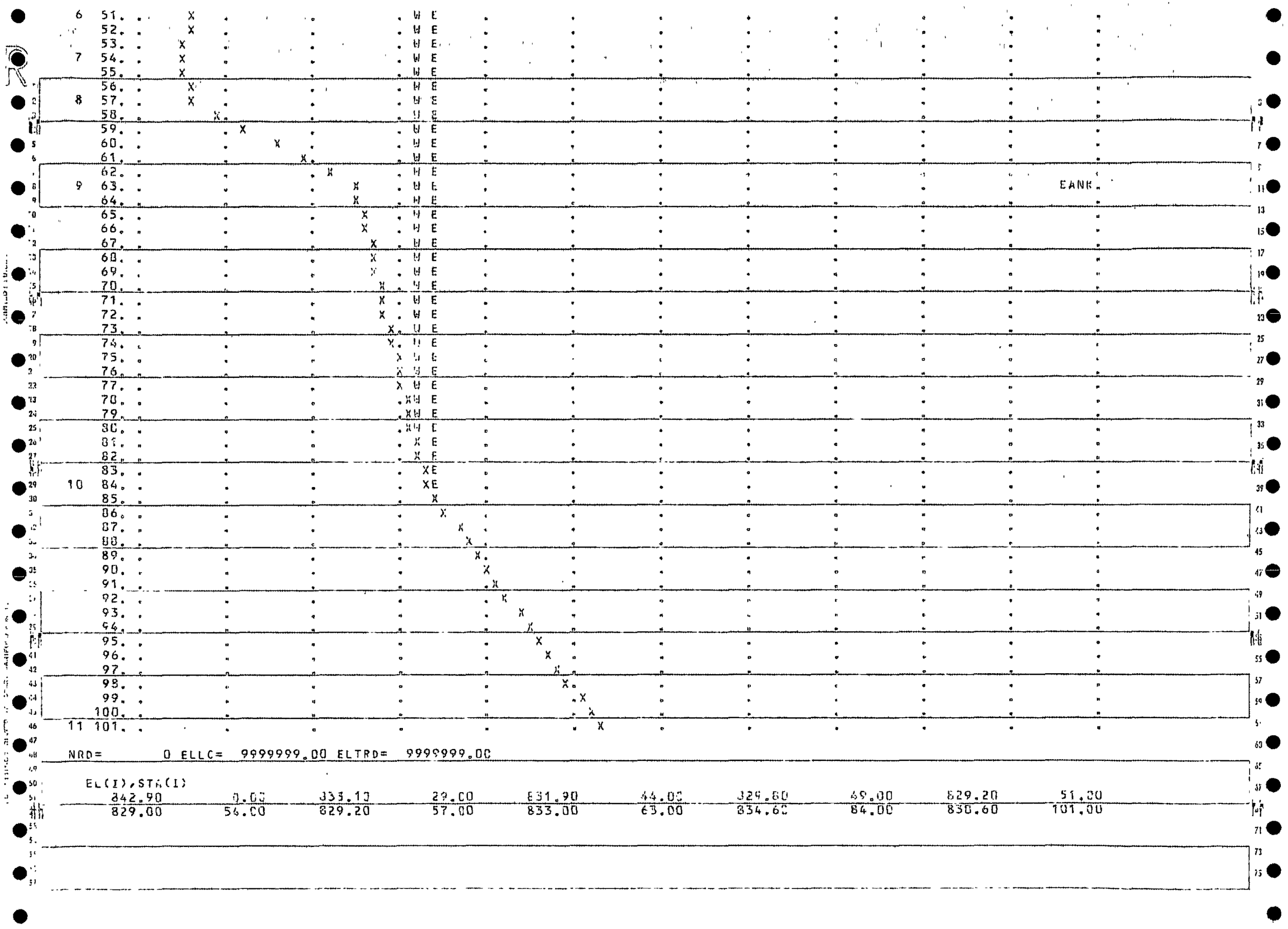
CROSS SECTION 73.00
STREAM ARCADIA CREEK KALAMAZOO
DISCHARGE= 485.

PLOTTED POINTS (BY PRIORITY)-3=BOTTOM BRIDGE,T=TOP BRIDGE,X=GROUND,W=WATER SUR,E=ENERGY GRADIENT,C=CRITICAL WSEL

ELEV 826. 830. 832. 834. 836. 838. 840. 842. 844. 846. 848.

STA-FEET





NRD= 0 ELLC= 9999999.00 ELTRD= 9999999.00

EL(I),STA(I)

842.90	0.00	833.10	29.00	831.90	44.00	829.80	49.00	829.20	51.00
829.00	54.00	829.20	57.00	833.00	63.00	834.60	84.00	838.60	101.00

CROSS SECTION 77.00
STREAM ARCADIA CREEK KALAMAZOO
DISCHARGE= 220.

PLOTTED POINTS (BY PRIORITY)-B=BOTTOM BRIDGE,T=TOP BRIDGE,X=GROUND,W=WATER SURFACE,E=ENERGY GRADIENT,C=CRITICAL WSEL

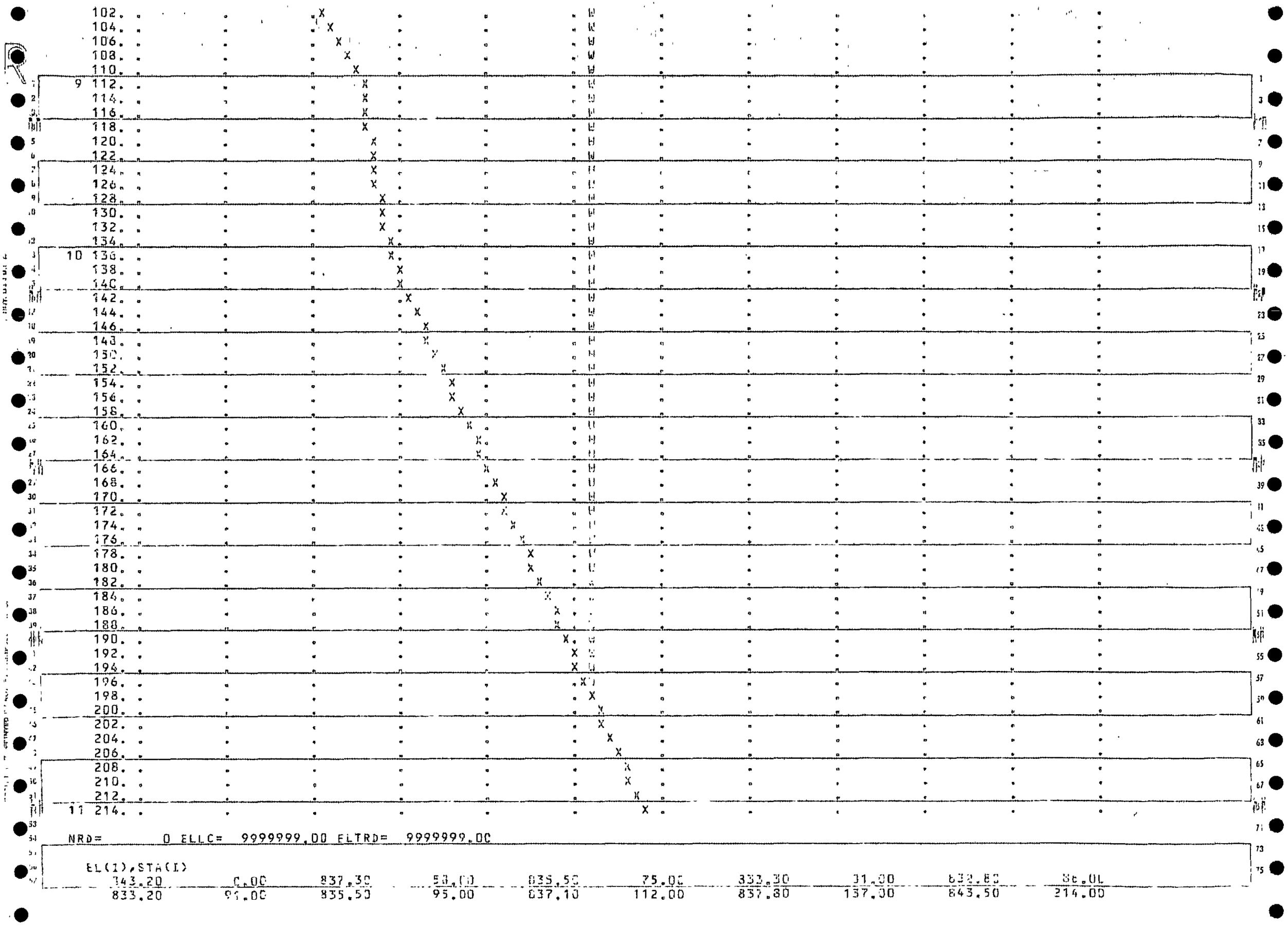
ELEV 832. 834. 836. 838. 840. 842. 844. 846. 848. 850. 852.

STA-FEET

2 0.
2.
4.
6.
8.
10.
12.
14.
16.
18.
20.
22.
24.
26.
28.
30.
32.
34.
36.
38.
40.
42.
44.
46.
48.
50.
52.
54.
56.
3 58.
60.
62.
64.
66.
68.
70.
72.
4 74.
76.
78.
5 80.
82.
84.
6 86.
88.
7 90.
92.
8 94.
96.
98.
100.

BANK.

BANK.



NRD= 0 ELLC= 9999999.00 ELTRD= 9999999.00

EL(1),STA(I)

343.20	0.00	837.30	58.00	835.50	75.00	833.30	31.00	832.80	36.00
833.20	91.00	835.50	95.00	837.10	112.00	837.80	137.00	843.50	214.00

CROSS SECTION 80.00
STREAM ARCADIA CREEK KALAMAZOO
DISCHARGE= 475.

PLOTTED POINTS (BY PRIORITY)-D=BOTTOM BRIDGE,T=TOP BRIDGE,X=GROUND,W=WATER SURFACE,E=ENERGY GRADIENT,C=CRITICAL WSEL

ELEV 840. 845. 850. 855. 860. 865. 870. 875. 880. 885. 890.

	STA-FEET
2	80.
	82.
	84.
	86.
	88.
	90.
	92.
	94.
	96.
	98.
	100.
	102.
	104.
	106.
	108.
3	110.
	112.
	114.
	116.
	118.
	120.
	122.
	124.
	126.
	128.
	130.
	132.
	134.
	136.
	138.
	140.
4	142.
	144.
	146.
	148.
	150.
	152.
	154.
	156.
	158.
	160.
	162.
	164.
	166.
	168.
	170.
	172.
	174.
5	176.
	178.
	180.

| | | |

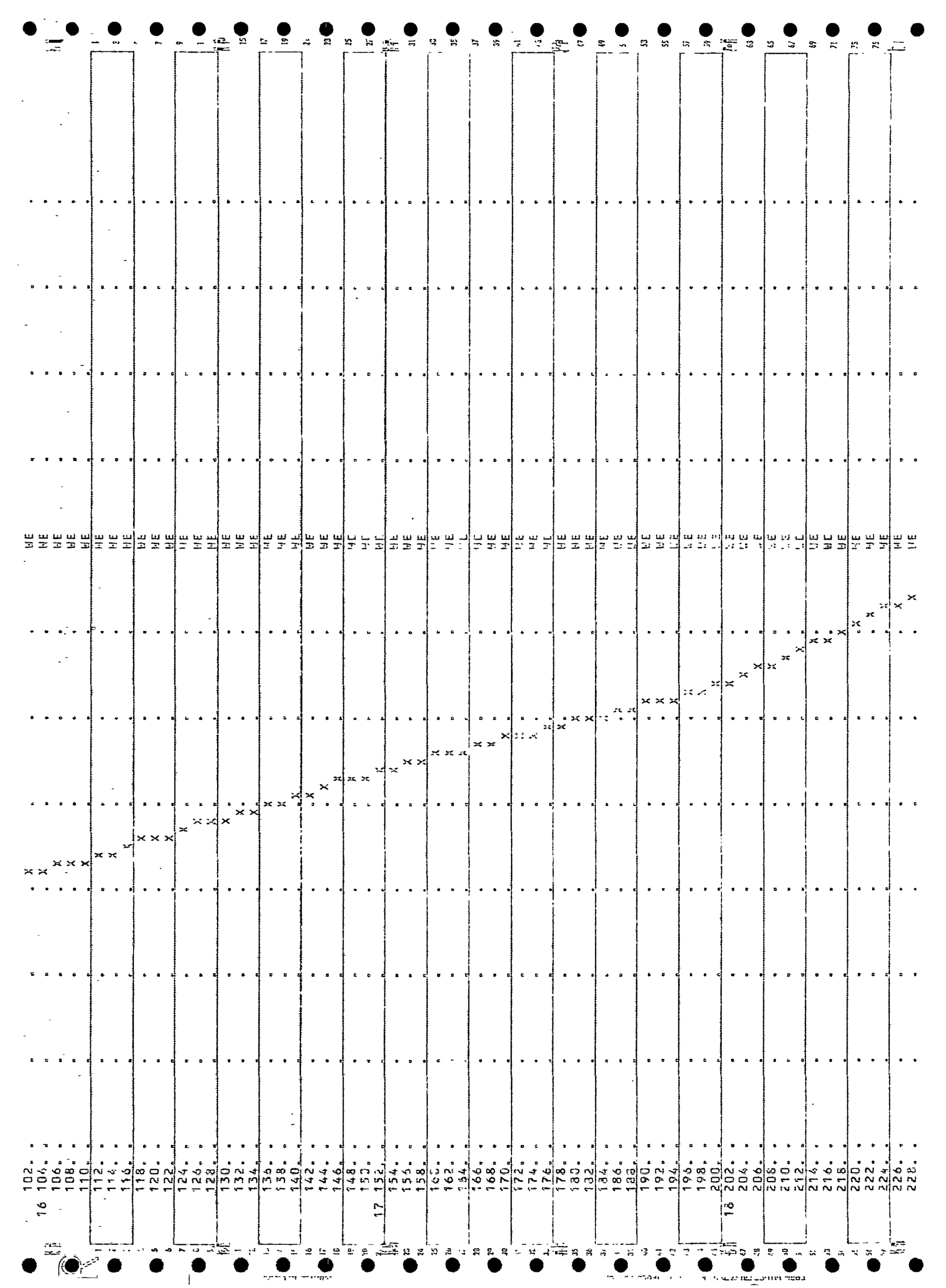
EL(I),STA(I)

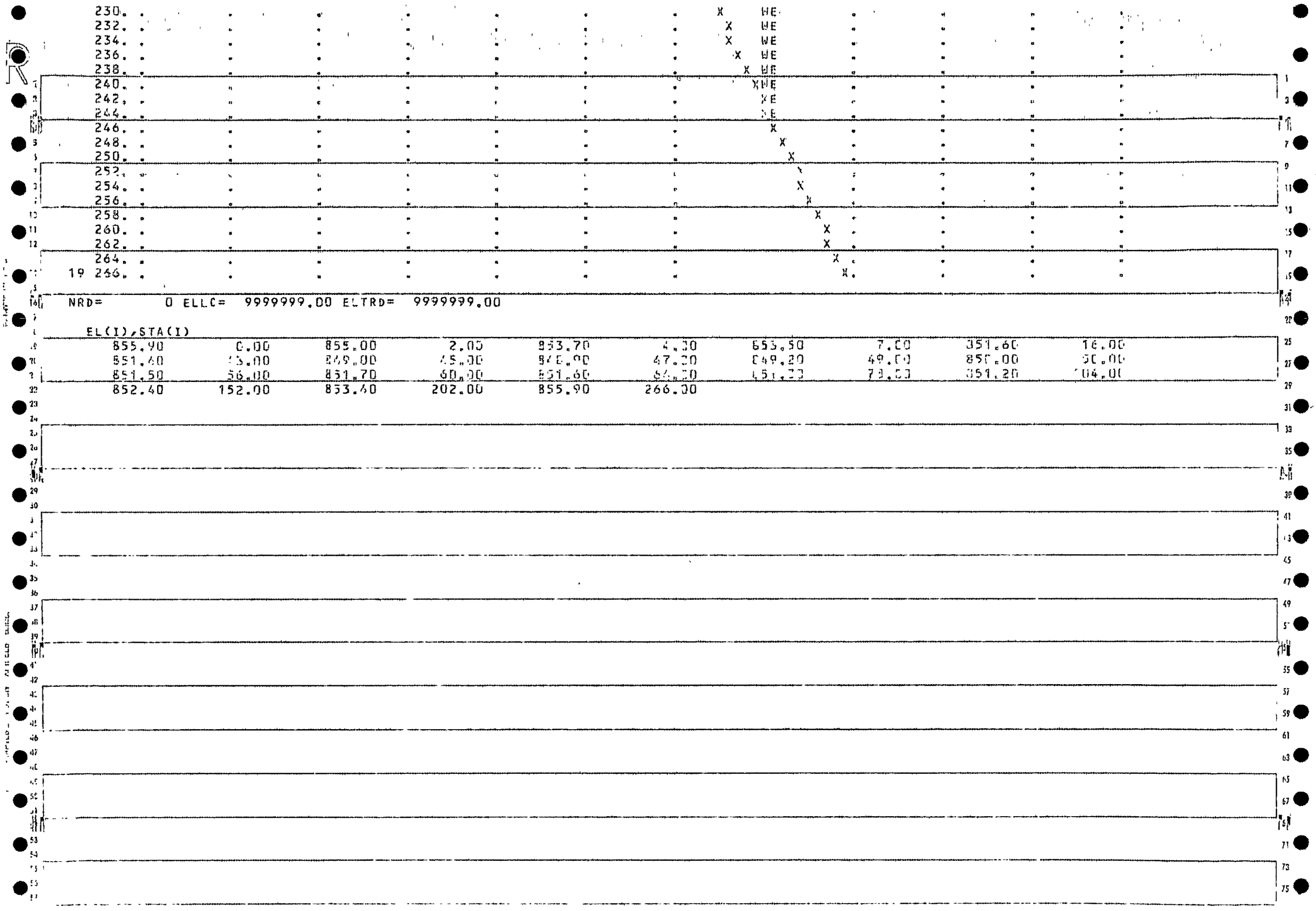
863.40	80.00	862.20	110.00	857.00	142.00	851.00	176.20	847.60	200.00
846.20	214.00	845.80	232.00	845.50	234.00	841.50	246.00	840.80	249.00
841.60	252.00	844.10	262.00	845.10	273.00	855.00	304.00		

CROSS SECTION 82.00
STREAM ARCADIA CREEK KALAMAZOO
DISCHARGE= 475.

PLOTTED POINTS (BY PRIORITY)-B=BOTTOM BRIDGE,T=TOP BRIDGE,X=GROUND,W=WATER SUR,E=ENERGY GRADIENT,C=CRITICAL WSEL

ELEV	STA-FEET	848.	849.	850.	851.	852.	853.	854.	855.	856.	857.	858.	
2	0.									X			
3	2.								XE				
4	4.							X	WE				
5	6.							X	WE				
	8.						X		WE				
	10.						X		WE				
	12.					X			WE				
	14.					X			WE				
6	16.					X			WE				
	18.					X			WE				
	20.					X			WE				
	22.					X			WE				
	24.					X			WE				
	26.					X			WE				
	28.					X			WE				
	30.					X			WE				
	32.					X			WE				
	34.					X			WE				
	36.					X			WE				
	38.					X			WE				
	40.					X			WE				
7	42.					X			WE				BANK.
8	44.		X						WE				
9	46.		X						WE				
10	48.		X						WE				
11	50.			X					WE				
	52.				X				WE				
	54.					X			WE				
12	56.					X			WE				
	58.					X			WE				
13	60.					X			WE				BANK.
	62.					X			WE				
14	64.					X			WE				
	66.					X			WE				
	68.					X			WE				
	70.					X			WE				
	72.					X			WE				
	74.					X			WE				
	76.					X			WE				
15	78.					X			WE				
	80.					X			WE				
	82.					X			WE				
	84.					X			WE				
	86.					X			WE				
	88.					X			WE				
	90.					X			WE				
	92.					X			WE				
	94.					X			WE				
	96.					X			WE				
	98.					X			WE				
	100.					X			WE				





NRD= 0 ELLC= 9999999.00 ELTRD= 9999999.00

EL(I),STA(I)

855.90	0.00	855.00	2.05	853.70	4.30	653.50	7.00	351.60	16.00
851.60	45.00	849.00	45.00	848.90	47.20	849.20	49.00	850.00	50.00
851.50	56.00	851.70	60.00	851.60	64.20	45.20	79.00	351.20	104.00
852.40	152.00	853.40	202.00	855.90	266.30				

CROSS SECTION 84.00
STREAM ARCADIA CREEK KALAMAZOO
DISCHARGE= 475.

PLOTTED POINTS (BY PRIORITY)-F=BOTTOM BRIDGE,T=TOP BRIDGE,X=GROUND,W=WATER SUR,E=ENERGY GRADIENT,C=CRITICAL WSEL

	STA-FEET	ELEV 859.	860.	861.	862.	863.	864.	865.	866.	867.	868.	869.
2	0.										X	
	1.									X		
	2.								X			
	3.							X				
	4.							X				
	5.							X				
	6.							X				
	7.							X				
	8.						X					
	9.						XW,E					
	10.					X	C,E					
	11.				X		C,E					
3	12.						E					
	13.				X		E					
	14.				X		E					
	15.				X		E					
	16.				X		E					
	17.				X		E					
	18.				X		E					
	19.				X		E					
	20.				X		E					
	21.				X		E					
	22.				X		E					
	23.				X		E					
	24.				X		E					
	25.				X		E					
4	26.				X		E					
	27.				X		E					
	28.						E					
	29.				X		E					
	30.				X		E					
5	31.				X		E					
	32.				X		E					
	33.				X		E					
	34.				X		E					
	35.				X		E					
	36.				X		E					
	37.				X		E					
	38.					X	E					
	39.					X	E					
6	40.					X	E					
	41.					X	E					
	42.					X	E					
	43.					X	E					
	44.					X	E					
7	45.					X	E					
	46.				X		E					
	47.				X		E					
8	48.			X			E					BANK.
	49.			X			E					
	50.		X				E					

	51		
	52		
	53		
9	54		
	55		
	56		
	57		
10	58		
	59		
	60		
	61		
11	62		
	63		
12	64		
	65		
	66		
	67		
	68		
13	69		
	70		
	71		
14	72		BANK.
	73		
	74		
	75		
	76		
	77		
	78		
	79		
	80		
	81		
	82		
15	83		
	84		
	85		
	86		
	87		
	88		
	89		
	90		
16	91		

NRD= 0 ELLC= 9999999.00 ELTRD= 9999999.00

EL(I),STA(I)

867.60	0.00	862.50	12.00	862.50	26.50	862.50	31.50	862.70	40.00
862.70	45.00	861.70	48.30	859.90	54.00	859.40	58.00	859.60	62.00
860.00	64.00	859.80	69.30	861.00	72.30	863.50	85.00	865.50	91.00

CROSS SECTION 86.00
STREAM ARCADIA CREEK KALAMAZOO
DISCHARGE= 475.

PLOTTED POINTS (BY PRIORITY)=E=BOTTOM BRIDGE,T=TOP BRIDGE,K=GROUND,W=WATER SURFACE,I=ENERGY GRADIENT,C=CRITICAL WSEL

	ELEV	864.	865.	866.	867.	868.	869.	870.	871.	872.	873.	874.
	STA-FEET											
2	0.										X	
	5.									X		
3	10.								X			
	15.							X				
	20.						X					
	25.					X	W E					
4	30.					X	W E					
5	35.					X	W E					
	40.					X	W E					
6	45.					X	W E					
8	50.				XXXXXXX		W E					
10	55.		XXXXXX				W E					BANK.
11	60.	X					E					
	65.	X					W E					
12	70.	X					W E					
	75.	X					E					
13	80.	X					E					
14	85.		X				E					BANK.
	90.			X			E					
15	95.				X		C					
16	100.						X					
	105.						X					
	110.						X					
	115.						X					
	120.						X					
	125.						X					
	130.						X					
	135.						X					
	140.						X					
	145.						X					
	150.						X					
	155.						X					
	160.						X					
	165.						X					
	170.						X					
	175.						X					
	180.						X					
	185.						X					
	190.						X					
	195.						X					
	200.						X					
	205.						X					
	210.						X					
	215.						X					
	220.						X					
	225.						X					
	230.						X					
	235.						X					
	240.						X					
	245.						X					
	250.						X					

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430.
435.
440.
445.
17 450.
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NRD=        0 ELLC=  9999999.00 ELTRD=  9999999.00

  EL(I),STA(I)
     874.20       0.00     871.00      12.00     868.20      29.50     868.20      34.50     868.30      43.00
     868.30      48.00     867.60      50.00     865.30      53.00     864.80      57.00     864.70      62.00
     864.20      70.00     864.70      78.00     866.00      84.00     868.00      95.00     869.50      98.00
     870.60     452.00
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****
HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
ERROR CORR - 01
MODIFICATION - 50,51,52
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

ARCADIA CREEK KALAMAZOO

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	TOPWS	VCH	AREA	.01K
*	1.000	0.00	0.00	0.00	766.40	670.00	767.49	767.49	767.96	35.46	5.87	299.20	112.52
	2.000	750.00	0.00	0.00	767.00	670.00	768.69	0.00	768.74	3.94	2.69	666.48	537.56
	3.000	335.00	0.00	0.00	768.00	670.00	769.93	0.00	769.95	35.74	2.00	176.98	57.57
	4.000	445.00	0.00	0.00	770.20	670.00	771.62	0.00	771.66	31.16	3.00	414.18	119.95
	5.000	150.00	0.00	0.00	770.20	670.00	771.79	0.00	771.82	5.18	2.11	1016.04	294.50
	6.000	310.00	0.00	0.00	771.50	670.00	772.18	772.11	772.37	382.15	5.60	206.06	54.27
	7.000	150.00	0.00	0.00	773.20	670.00	774.26	0.00	774.35	67.10	4.31	414.85	81.79
*	8.000	125.00	0.00	0.00	775.00	670.00	775.71	775.71	776.08	70.42	6.22	502.05	79.84
*	9.000	110.00	0.00	0.00	775.60	670.00	776.62	776.62	777.00	35.49	5.61	386.54	112.47
*	9.500	55.00	0.00	0.00	776.20	670.00	777.22	777.22	777.60	35.81	5.63	686.11	111.95
*	10.000	60.00	0.00	0.00	777.00	670.00	777.71	777.71	778.07	69.86	6.21	580.75	80.16
*	10.500	55.00	0.00	0.00	777.50	670.00	778.21	778.21	778.57	70.90	6.23	578.04	79.57
	11.000	55.00	0.00	0.00	778.00	670.00	778.76	778.65	779.06	101.60	6.31	540.57	66.47
	12.000	150.00	0.00	0.00	777.40	670.00	779.42	0.00	779.43	7.99	1.49	651.23	236.97
	13.000	50.00	0.00	0.00	777.60	810.00	779.48	0.00	779.50	17.77	3.24	734.19	192.17
	14.000	220.00	0.00	0.00	779.50	810.00	780.32	780.07	780.47	182.72	5.90	456.05	59.92
	15.000	350.00	0.00	0.00	780.00	810.00	781.69	0.00	781.73	14.41	3.01	1054.79	213.55
	16.000	365.00	0.00	0.00	780.60	810.00	782.30	0.00	782.33	18.99	2.57	650.52	185.90
	17.000	148.00	0.00	0.00	781.40	810.00	782.74	0.00	782.79	54.82	1.85	436.61	109.40
	18.000	117.00	0.00	0.00	782.20	810.00	783.42	0.00	783.64	79.77	0.00	213.24	90.69

	SECNO	XLCH	ELTRD	ELLC	ELKIN	G	CRSEL	CRILS	EG	10K*S	VCH	AREA	.01K
	19.000	230.00	0.00	0.00	783.50	790.00	784.88	0.00	785.00	46.46	2.00	303.69	115.90
	20.000	230.00	0.00	0.00	785.00	790.00	786.05	0.00	786.18	70.00	3.84	283.85	94.42
	21.000	220.00	0.00	0.00	786.30	790.00	787.17	0.00	787.42	54.51	4.73	235.26	107.19
	22.000	235.00	0.00	0.00	787.50	790.00	788.20	788.19	788.52	47.82	5.09	209.08	114.24
*	23.000	215.00	0.00	0.00	788.50	790.00	789.18	789.18	789.56	40.77	5.04	218.07	123.72
	24.000	225.00	0.00	0.00	789.30	790.00	790.15	0.00	790.46	35.39	4.95	246.42	132.80
*	25.000	190.00	0.00	0.00	790.10	790.00	790.95	790.95	791.30	39.37	5.21	303.44	125.91
	26.000	180.00	0.00	0.00	790.80	790.00	791.81	0.00	791.96	20.52	4.22	747.20	174.39
*	27.000	270.00	0.00	0.00	786.20	1020.00	792.71	792.71	793.04	77.43	7.65	311.77	115.91
	28.000	45.00	0.00	0.00	786.30	1020.00	793.26	0.00	793.46	42.45	6.06	462.90	156.55
	29.000	82.00	792.80	791.40	786.70	1020.00	794.17	0.00	794.24	16.21	4.00	667.46	253.37
	30.000	55.00	0.00	0.00	786.90	1020.00	794.20	0.00	794.32	7.29	7.52	394.77	377.69
	31.000	300.00	0.00	0.00	787.90	1020.00	794.50	0.00	794.67	38.53	5.40	222.77	164.33
*	32.000	150.00	0.00	0.00	788.90	1020.00	795.52	795.52	796.04	92.86	6.28	251.82	105.85
	33.000	92.00	795.30	794.40	788.90	1020.00	796.51	0.00	796.60	14.12	3.84	512.08	254.04
	34.000	75.00	0.00	0.00	789.30	1020.00	796.58	0.00	796.75	12.58	4.21	411.97	287.58
	35.000	400.00	0.00	0.00	790.30	1020.00	797.15	0.00	797.44	20.37	5.11	315.22	225.02
	36.000	310.00	0.00	0.00	791.00	1020.00	797.77	0.00	798.02	50.52	8.23	123.90	139.15
	37.000	50.00	0.00	0.00	791.30	1020.00	798.06	0.00	799.11	50.75	8.24	123.72	133.07
*	38.000	100.00	0.00	0.00	300.10	890.00	801.92	801.92	802.49	174.33	6.10	156.51	67.40
	39.000	100.00	0.00	0.00	302.00	890.00	803.35	0.00	803.65	72.91	4.41	246.65	106.23
	40.000	125.00	0.00	0.00	303.00	890.00	804.42	804.34	805.04	139.28	6.30	190.85	75.41
	41.000	100.00	0.00	0.00	804.00	890.00	805.59	805.56	806.35	120.78	6.60	202.64	80.98
	42.000	125.00	0.00	0.00	805.00	890.00	807.04	0.00	807.53	54.18	5.46	262.09	111.10
	43.000	175.00	0.00	0.00	806.50	890.00	808.32	0.00	808.90	93.00	6.10	225.15	92.29
	44.000	175.00	0.00	0.00	808.00	890.00	809.35	0.00	810.21	58.26	4.80	270.86	116.56
	45.000	475.00	0.00	0.00	809.50	890.00	811.05	0.00	811.13	8.36	2.32	491.92	304.20
	46.000	450.00	0.00	0.00	809.75	890.00	811.62	0.00	811.78	26.19	3.17	338.91	180.95
	47.000	450.00	0.00	0.00	804.60	1020.00	812.05	0.00	812.15	6.20	2.76	546.02	497.45

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CHSEL	CRIHS	ES	10K*S	VCH	AREA	.01K
48.000	125.00	0.00	0.00	805.60	1020.00	812.08	0.00	812.26	8.92	3.55	379.50	341.51
49.000	230.00	0.00	0.00	806.50	1020.00	812.25	0.00	812.80	32.55	6.04	192.29	178.76
50.000	93.00	0.00	0.00	807.20	485.00	812.97	0.00	813.09	7.19	2.63	174.04	160.81
51.000	126.00	820.40	812.70	807.70	485.00	821.68	0.00	821.69	0.47	1.11	951.62	704.06
52.000	50.00	0.00	0.00	807.60	485.00	821.68	0.00	821.69	0.32	1.20	774.68	854.97
53.000	195.00	0.00	0.00	808.40	485.00	821.70	0.00	821.70	0.66	0.50	2104.35	2064.56
54.000	160.00	0.00	0.00	809.40	485.00	821.70	0.00	821.70	0.08	0.58	1838.90	1710.91
55.000	155.00	0.00	0.00	809.60	485.00	821.70	0.00	821.70	0.09	0.59	1786.17	1643.06
56.000	68.00	824.40	815.40	810.40	485.00	824.69	0.00	824.69	0.08	0.58	2184.03	1675.30
57.000	60.00	0.00	0.00	811.40	485.00	824.69	0.00	824.70	0.29	0.91	592.90	906.10
58.000	46.00	0.00	0.00	812.60	485.00	824.69	0.00	824.70	0.49	1.07	470.89	693.07
59.000	183.00	824.40	817.60	814.60	485.00	826.67	0.00	826.67	1.02	1.22	1110.55	532.79
60.000	100.00	0.00	0.00	814.00	485.00	826.48	0.00	826.48	0.06	0.50	2022.69	2052.74
61.000	50.00	0.00	0.00	814.70	485.00	826.48	0.00	826.48	0.05	0.47	2123.16	2119.12
62.000	100.00	0.00	0.00	814.80	485.00	826.48	0.00	826.48	0.06	0.49	2071.44	2062.27
63.000	120.00	0.00	0.00	815.80	485.00	826.48	0.00	826.48	0.07	0.53	1945.25	1851.23
64.000	20.00	0.00	0.00	814.70	485.00	826.48	0.00	826.48	0.06	0.45	1937.21	1972.61
65.000	110.00	0.00	0.00	814.60	485.00	826.47	0.00	826.49	0.79	1.35	921.36	695.36
65.100	1.00	818.30	817.80	814.60	485.00	826.49	0.00	826.49	1.16	0.87	852.68	445.59
65.900	3.30	818.30	817.80	814.60	485.00	826.49	0.00	826.49	1.10	0.86	853.76	446.34
66.000	1.30	0.00	0.00	814.90	485.00	826.48	0.00	826.50	0.49	1.35	920.81	692.51
67.000	189.00	0.00	0.00	815.60	485.00	826.50	0.00	826.50	0.12	0.52	1966.99	1382.99
67.100	1.30	819.70	818.40	815.60	485.00	826.50	0.00	826.50	0.24	0.39	1778.69	966.72
67.900	10.30	819.70	818.40	815.60	485.00	826.50	0.00	826.50	0.24	0.39	1776.77	966.78
68.000	1.00	0.00	0.00	815.60	485.00	826.50	0.00	826.50	0.12	0.52	1968.67	1384.75
69.000	125.00	0.00	0.00	816.80	485.00	826.50	0.00	826.51	0.23	0.65	1601.81	1020.70
70.000	125.00	0.00	0.00	817.40	485.00	826.48	0.00	826.54	2.26	2.23	359.57	322.39
71.000	125.00	0.00	0.00	818.60	485.00	826.50	0.00	826.61	4.75	2.88	253.35	222.44
71.100	130.00	0.00	0.00	822.60	355.00	826.61	0.00	826.76	82.76	3.27	118.03	39.16

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
71.200	130.00	0.00	0.00	823.60	355.00	827.66	0.00	827.81	78.03	3.22	120.52	40.19
71.300	130.00	0.00	0.00	824.60	355.00	828.66	0.00	828.81	75.37	3.20	121.53	40.52
71.400	130.00	0.00	0.00	825.60	355.00	829.66	0.00	829.81	76.65	3.20	121.40	40.55
71.500	130.00	0.00	0.00	826.60	355.00	830.66	0.00	830.81	77.49	3.21	120.86	40.33
71.600	130.00	0.00	0.00	828.40	355.00	831.68	0.00	831.81	75.78	3.13	127.56	40.78
71.700	130.00	0.00	0.00	829.40	355.00	832.66	0.00	832.80	76.30	3.14	127.26	40.64
72.000	130.00	0.00	0.00	827.50	485.00	833.02	0.00	833.40	24.65	5.26	129.34	97.68
73.000	410.00	0.00	0.00	829.00	485.00	834.44	0.00	834.82	51.78	5.28	125.60	67.40
73.500	30.00	0.00	0.00	828.00	220.00	834.27	0.00	835.49	460.85	8.86	24.83	10.25
74.000	298.00	900.00	833.00	828.00	220.00	842.05	0.00	842.29	53.36	3.93	55.94	30.12
75.000	100.00	0.00	0.00	831.10	220.00	842.36	0.00	842.36	0.04	0.27	1102.42	1163.09
76.000	540.00	0.00	0.00	833.50	220.00	842.36	0.00	842.36	0.06	0.34	1374.11	782.26
77.000	265.00	0.00	0.00	832.80	220.00	842.37	0.00	842.37	0.26	0.61	767.53	433.82
77.500	65.00	0.00	0.00	834.20	220.00	842.36	0.00	842.38	1.39	1.42	362.18	185.50
78.000	65.00	0.00	0.00	835.50	220.00	842.37	0.00	842.39	2.24	1.61	300.74	147.08
79.000	165.00	0.00	0.00	836.40	220.00	842.42	0.00	842.42	0.85	0.88	731.00	238.68
79.100	210.00	0.00	0.00	837.50	220.00	842.29	0.00	842.66	55.48	6.29	72.20	29.54
79.150	210.00	0.00	0.00	838.70	220.00	843.49	0.00	843.91	61.60	1.63	66.93	28.03
79.200	210.00	0.00	0.00	839.90	220.00	845.69	0.00	847.22	475.00	9.26	23.75	10.09
79.500	123.00	900.00	844.50	840.50	220.00	854.45	0.00	854.70	51.00	3.96	55.51	30.81
80.000	450.00	0.00	0.00	840.80	475.00	854.78	0.00	854.79	0.21	0.81	1053.09	894.06
80.200	220.00	0.00	0.00	841.80	475.00	854.79	0.00	854.80	0.41	0.92	910.26	743.51
80.400	220.00	0.00	0.00	842.80	475.00	854.80	0.00	854.81	0.61	1.05	775.72	607.46
80.600	220.00	0.00	0.00	843.80	475.00	854.81	0.00	854.83	0.95	1.23	650.43	486.60
80.800	220.00	0.00	0.00	844.80	475.00	854.83	0.00	854.86	1.55	1.45	534.58	380.97
81.000	220.00	0.00	0.00	845.90	475.00	854.88	0.00	854.89	1.07	1.13	827.26	458.73
81.200	200.00	0.00	0.00	846.90	475.00	854.91	0.00	854.92	1.94	1.40	666.40	340.89
81.400	200.00	0.00	0.00	847.90	475.00	854.95	0.00	854.98	3.90	1.79	518.55	240.51
82.000	200.00	0.00	0.00	848.90	475.00	855.05	0.00	855.06	5.83	1.53	663.63	241.30

SECTO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRITS	EG	10K*S	VCH	AREA	.02K
82.100	160.00	0.00	0.00	850.00	475.00	855.08	0.00	855.32	42.16	4.52	179.03	73.16
82.200	160.00	0.00	0.00	851.00	475.00	856.83	0.00	856.17	57.95	5.05	156.09	62.43
82.300	160.00	0.00	0.00	852.00	475.00	856.78	0.00	857.11	61.98	5.17	151.30	60.54
82.400	160.00	0.00	0.00	853.00	475.00	857.72	0.00	858.11	62.44	5.19	151.01	60.11
82.500	160.00	0.00	0.00	854.00	475.00	858.74	0.00	859.06	56.56	5.04	153.53	63.15
82.600	160.00	0.00	0.00	855.00	475.00	859.66	0.00	860.01	61.20	5.19	148.33	60.72
83.000	170.00	0.00	0.00	855.90	475.00	860.70	0.00	860.99	52.52	4.86	155.13	65.54
83.200	230.00	0.00	0.00	858.90	475.00	861.85	0.00	862.13	43.43	4.55	167.67	72.06
83.400	230.00	0.00	0.00	857.90	475.00	862.85	0.00	863.10	43.46	4.55	167.59	72.03
84.000	250.00	0.00	0.00	859.40	475.00	863.87	0.00	864.14	39.27	4.47	151.75	75.80
84.500	370.00	0.00	0.00	860.40	475.00	865.08	0.00	865.39	28.50	4.21	173.53	88.97
85.000	370.00	0.00	0.00	861.60	475.00	866.44	0.00	866.75	45.37	4.87	154.35	70.52
85.500	415.00	0.00	0.00	862.90	475.00	868.10	0.00	868.34	31.78	4.33	157.00	84.26
86.000	415.00	0.00	0.00	864.20	475.00	869.14	0.00	869.28	16.13	3.18	189.95	176.26

ARCADIA CREEK KALAMAZOO

SUMMARY PRINTOUT TABLE 150

	SECNO	G	CWSEL	DIFMSP	DIFUSX	DIFKMS	TCPWID	KLCH
*	1.000	670.00	767.49	0.00	0.00	-0.51	361.60	0.00
	2.000	670.00	768.69	0.00	1.20	0.00	552.61	750.00
	3.000	670.00	769.93	0.00	0.23	0.00	306.82	335.00
	4.000	670.00	771.62	0.00	2.69	0.00	524.64	445.00
	5.000	670.00	771.79	0.00	0.18	0.00	837.96	150.00
	6.000	670.00	772.18	0.00	0.38	0.00	520.03	310.00
	7.000	670.00	774.26	0.00	2.08	0.00	602.63	150.00
*	8.000	670.00	775.71	0.00	1.46	0.00	757.04	125.00
*	9.000	670.00	776.62	0.00	0.91	0.00	911.62	110.00
*	9.500	670.00	777.22	0.00	0.60	0.00	911.11	55.00
*	10.000	670.00	777.71	0.00	0.50	0.00	864.84	60.00
*	10.500	670.00	778.21	0.00	0.50	0.00	864.36	55.00
	11.000	670.00	778.76	0.00	0.55	0.00	906.43	55.00
	12.000	670.00	779.42	0.00	0.66	0.00	827.46	150.00
	13.000	710.00	779.48	0.00	0.06	0.00	1166.17	55.00
	14.000	810.00	780.32	0.00	0.85	0.00	1013.25	220.00
	15.000	810.00	781.69	0.00	1.37	0.00	1130.71	350.00
	16.000	810.00	782.30	0.00	0.61	0.00	666.32	305.00
	17.000	810.00	782.74	0.00	0.43	0.00	687.40	149.00
	18.000	810.00	783.42	0.00	0.68	0.00	279.58	117.00
	19.000	790.00	784.88	0.00	1.46	0.00	576.48	230.00
	20.000	790.00	786.05	0.00	1.17	0.00	495.60	230.00
	21.000	790.00	787.17	0.00	1.13	0.00	397.45	220.00
	22.000	790.00	788.20	0.00	1.02	0.00	352.85	235.00
*	23.000	790.00	789.18	0.00	0.99	0.00	356.69	215.00
	24.000	790.00	790.15	0.00	0.96	0.00	361.69	225.00
*	25.000	790.00	790.95	0.00	0.80	0.00	453.07	190.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLOC
	26.000	790.00	791.81	0.00	0.86	0.00	1043.39	180.00
*	27.000	1020.00	792.73	0.00	0.91	0.00	306.90	270.00
	28.000	1020.00	793.26	0.00	0.54	0.00	251.76	55.00
	29.000	1020.00	794.17	0.00	0.91	0.00	393.50	82.00
	30.000	1020.00	794.20	0.00	0.03	0.00	287.32	55.00
	31.000	1020.00	794.53	0.00	0.33	0.00	219.16	300.20
*	32.000	1020.00	795.52	0.00	1.02	0.00	205.82	150.00
	33.000	1020.00	796.51	0.00	0.99	0.00	338.47	92.30
	34.000	1020.00	796.58	0.00	0.06	0.00	288.58	75.00
	35.000	1020.00	797.15	0.00	0.58	0.00	172.38	400.00
	36.000	1020.00	797.77	0.00	0.61	0.00	23.09	310.00
	37.000	1020.00	798.06	0.00	0.29	0.00	23.09	50.00
*	38.000	890.00	801.92	0.00	3.86	0.00	144.67	100.00
	39.000	890.00	803.35	0.00	1.43	0.00	217.19	100.00
	40.000	890.00	804.42	0.00	1.07	0.00	170.54	125.00
	41.000	890.00	805.69	0.00	1.27	0.00	160.79	100.00
	42.000	890.00	807.04	0.00	1.35	0.00	177.65	125.00
	43.000	890.00	808.32	0.00	1.28	0.00	167.58	175.00
	44.000	890.00	809.85	0.00	1.53	0.00	192.58	175.00
	45.000	890.00	811.05	0.00	1.20	0.00	235.15	475.00
	46.000	890.00	811.62	0.00	0.57	0.00	212.55	450.00
	47.000	1020.00	812.05	0.00	0.43	0.00	179.05	450.00
	48.000	1020.00	812.08	0.00	0.03	0.00	166.09	125.00
	49.000	1020.00	812.25	0.00	0.17	0.00	67.10	250.00
	50.000	485.00	812.97	0.00	0.72	0.00	67.53	95.00
	51.000	485.00	821.68	0.00	8.71	0.00	139.70	126.00
	52.000	485.00	821.68	0.00	-0.00	0.00	96.33	50.00
	53.000	485.00	821.70	0.00	0.02	0.00	272.76	195.00
	54.000	485.00	821.70	0.00	0.00	0.00	263.12	160.00

SECNO	G	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
55.000	485.00	821.70	0.00	0.00	0.00	261.17	135.00
56.000	485.00	824.69	0.00	2.99	0.00	367.31	66.00
57.000	485.00	826.69	0.00	-0.00	0.00	113.36	60.00
58.000	485.00	824.69	0.00	-0.00	0.00	88.80	48.00
59.000	485.00	826.47	0.00	1.78	0.00	426.94	132.00
60.000	485.00	826.43	0.00	0.01	0.00	199.24	100.00
61.000	485.00	826.48	0.00	0.00	0.00	209.05	50.00
62.000	485.00	826.48	0.00	0.00	0.00	209.02	120.00
63.000	485.00	826.48	0.00	0.00	0.00	208.95	120.00
64.000	485.00	826.48	0.00	0.00	0.00	208.96	20.00
65.000	485.00	826.47	0.00	-0.00	0.00	189.56	166.00
65.100	485.00	826.49	0.00	0.01	0.00	189.60	1.00
65.900	485.00	826.49	0.00	0.00	0.00	189.72	3.00
66.000	485.00	826.48	0.00	-0.00	0.00	189.72	1.00
67.000	485.00	826.50	0.00	0.02	0.00	313.89	199.00
67.100	485.00	826.50	0.00	0.00	0.00	313.93	1.00
67.900	485.00	826.50	0.00	0.00	0.00	313.93	10.00
68.000	485.00	826.50	0.00	0.00	0.00	313.93	1.00
69.000	485.00	826.50	0.00	0.00	0.00	293.65	125.00
70.000	485.00	826.48	0.00	-0.02	0.00	93.16	125.00
71.000	485.00	826.50	0.00	0.02	0.00	63.63	125.00
71.100	355.00	826.61	0.00	0.11	0.00	65.16	130.00
71.200	355.00	827.66	0.00	1.05	0.00	66.50	130.00
71.300	355.00	828.66	0.00	1.01	0.00	67.07	130.00
71.400	355.00	829.66	0.00	0.99	0.00	66.97	130.00
71.500	355.00	830.66	0.00	1.00	0.00	66.69	130.00
71.600	355.00	831.66	0.00	1.02	0.00	63.55	130.00
71.700	355.00	832.66	0.00	0.99	0.00	63.52	130.00
72.300	485.00	833.02	0.00	0.36	0.00	58.00	130.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
73.000	485.00	834.44	0.00	1.42	0.00	56.96	410.00
73.500	220.00	834.27	0.00	-0.17	0.00	4.00	30.00
74.000	220.00	842.05	0.00	7.78	0.00	4.00	290.00
75.000	220.00	842.36	0.00	0.31	0.00	157.41	100.00
76.000	220.00	842.36	0.00	0.00	0.00	358.03	540.00
77.000	220.00	842.37	0.00	0.00	0.00	192.46	265.00
77.500	220.00	842.36	0.00	-0.00	0.00	108.39	65.00
78.000	220.00	842.37	0.00	0.01	0.00	102.66	65.00
79.000	220.00	842.42	0.00	0.04	0.00	346.47	165.00
79.100	220.00	842.29	0.00	-0.12	0.00	38.67	210.00
79.150	220.00	843.49	0.00	1.20	0.00	23.95	210.00
79.200	220.00	845.89	0.00	2.40	0.00	4.00	210.00
79.500	220.00	854.45	0.00	8.56	0.00	4.00	123.00
80.000	475.00	854.78	0.00	0.33	0.00	148.70	450.00
80.200	475.00	854.79	0.00	0.01	0.00	142.00	220.00
80.400	475.00	854.80	0.00	0.01	0.00	131.27	220.00
80.600	475.00	854.81	0.00	0.01	0.00	122.58	220.00
80.800	475.00	854.83	0.00	0.02	0.00	115.43	220.00
81.000	475.00	854.88	0.00	0.05	0.00	169.30	220.00
81.200	475.00	854.91	0.00	0.03	0.00	160.39	200.00
81.400	475.00	854.95	0.00	0.05	0.00	150.30	200.00
82.000	475.00	855.05	0.00	0.09	0.00	242.29	200.00
82.100	475.00	855.08	0.00	0.03	0.00	93.40	160.00
82.200	475.00	855.83	0.00	0.75	0.00	39.93	160.00
82.300	475.00	856.78	0.00	0.95	0.00	89.00	160.00
82.400	475.00	857.77	0.00	0.99	0.00	88.90	160.00
82.500	475.00	858.75	0.00	0.97	0.00	85.56	160.00
82.600	475.00	859.68	0.00	0.93	0.00	84.73	160.00
83.000	475.00	860.70	0.00	1.02	0.00	78.80	170.30

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
83.200	475.00	861.85	0.00	1.15	0.00	79.71	230.00
83.400	475.00	862.85	0.00	1.00	0.00	79.71	230.00
84.000	475.00	863.87	0.00	1.02	0.00	73.10	250.00
84.500	475.00	865.18	0.00	1.31	0.00	71.54	370.00
85.000	475.00	866.47	0.00	1.29	0.00	59.57	370.00
85.500	475.00	868.10	0.00	1.63	0.00	62.26	415.00
86.000	475.00	869.14	0.00	1.04	0.00	73.58	415.00

SUMMARY OF ERRORS

O.K. Road Elevation is higher than Mean Water Level

CAUTION SECNO= 1.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

CAUTION SECNO= 8.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 8.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 9.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 9.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 9.500 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 9.500 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 9.500 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE USEL

O.K. Longitudinal Slope is relatively steep.

CAUTION SECNO= 10.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 10.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 10.500 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 10.500 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 23.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 23.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 25.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 25.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 27.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 27.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 32.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 32.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 38.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 38.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 38.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE USEL

O.K. Overbank flow moves into the channel which is not a Critical elevation.

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FEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
ERROR CORR - 11
MODIFICATION - 50,51,52
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

ARCADIA CREEK KALAMAZOO

SUMMARY PRINTOUT TABLE 150

	SECNO	XLOM	ELTRD	ELLC	ELMIN	Q	CLSEL	CRITWS	EG	TOPWS	VCH	AREA	.01K
*	1.200	0.00	0.00	0.00	766.60	321.00	767.12	767.12	767.42	36.79	4.54	171.33	52.93
*	1.100	0.00	0.00	0.00	766.60	573.00	767.51	767.50	767.72	55.92	5.57	265.21	95.30
*	1.000	0.00	0.00	0.00	766.60	672.00	767.69	767.69	767.76	65.76	5.00	293.96	112.34
*	1.000	0.00	0.00	0.00	766.60	935.00	767.73	767.73	767.80	86.91	6.62	364.19	153.23
	2.000	750.00	0.00	0.00	767.00	321.00	768.15	0.00	768.17	6.04	1.80	378.03	159.64
	2.000	750.00	0.00	0.00	767.00	573.00	768.56	0.00	768.61	6.00	2.28	569.63	256.54
	2.000	750.00	0.00	0.00	767.00	672.00	768.75	0.00	768.75	5.53	2.42	662.64	329.04
	2.000	750.00	0.00	0.00	767.00	935.00	769.04	0.00	769.10	3.63	2.75	960.97	474.65
*	3.000	335.00	0.00	0.00	768.00	321.00	768.50	768.60	768.81	150.25	0.00	68.90	25.13
*	3.000	335.00	0.00	0.00	768.00	573.00	768.81	768.81	768.87	154.74	0.00	161.04	66.06
	3.000	335.00	0.00	0.00	768.00	672.00	768.93	0.00	768.98	154.35	0.00	176.76	57.96
	3.000	335.00	0.00	0.00	768.00	935.00	769.30	0.00	769.32	74.05	4.46	378.35	216.15
	3.500	225.00	0.00	0.00	769.40	321.00	770.03	0.00	770.07	39.39	0.00	100.91	37.10
	3.500	225.00	0.00	0.00	769.10	573.00	770.46	0.00	770.47	59.69	0.00	345.96	101.91
	3.500	225.00	0.00	0.00	769.10	672.00	770.66	0.00	770.50	33.94	0.00	307.65	115.35
	3.500	225.00	0.00	0.00	769.10	935.00	770.56	0.00	770.62	63.59	0.00	440.62	134.54
	4.000	220.00	0.00	0.00	770.20	321.00	770.94	0.00	770.98	62.95	0.00	190.65	70.14
	4.000	220.00	0.00	0.00	770.20	573.00	771.37	0.00	771.35	59.71	0.00	255.16	74.12
	4.000	220.00	0.00	0.00	770.20	672.00	771.39	0.00	771.47	59.73	0.00	331.06	86.95
	4.700	220.00	0.00	0.00	770.20	935.00	771.65	0.00	771.72	53.90	0.00	436.57	127.36
	5.300	150.00	0.00	0.00	770.20	321.00	771.27	0.00	771.28	7.21	1.59	337.50	116.91
	5.300	150.00	0.00	0.00	770.20	573.00	771.57	0.00	771.50	7.60	2.12	490.55	210.42
	5.300	150.00	0.00	0.00	770.20	672.00	771.71	0.00	771.79	7.55	2.39	541.70	267.95
	5.000	150.00	0.00	0.00	770.20	935.00	771.91	0.00	771.97	7.62	2.75	667.39	358.70
*	6.000	310.00	0.00	0.00	771.50	321.00	771.90	771.90	772.12	307.03	0.00	107.59	16.32
	6.000	310.00	0.00	0.00	771.50	573.00	772.34	0.00	772.50	329.29	0.17	191.50	50.06
	6.000	310.00	0.00	0.00	771.50	672.00	772.52	0.00	772.61	304.62	5.52	220.99	69.14
	6.000	310.00	0.00	0.00	771.50	935.00	772.90	772.10	772.09	300.02	7.24	335.44	95.14
	7.000	150.00	0.00	0.00	773.20	321.00	773.93	0.00	774.01	62.99	2.07	252.95	40.74
	7.000	150.00	0.00	0.00	773.20	573.00	774.17	0.00	774.25	68.66	3.84	370.23	69.15
	7.000	150.00	0.00	0.00	773.20	672.00	774.26	0.00	774.34	73.53	4.57	433.60	78.77
	7.000	150.00	0.00	0.00	773.20	935.00	774.47	0.00	774.54	82.51	5.59	494.34	103.02

	SECNO	XLOC	ELTRD	ELLC	ELMIN	Q	CWSEL	CRINS	EG	TOKES	VCH	AREA	.DSC
*	8.000	125.00	0.00	0.30	775.00	321.00	775.44	775.44	775.86	45.55	6.80	297.68	55.12
*	8.000	125.00	0.00	0.30	775.00	573.00	775.64	775.64	775.97	72.57	5.90	469.76	87.29
*	8.000	125.00	0.00	0.30	775.00	672.00	775.72	775.72	776.03	69.83	6.22	506.27	12.35
*	8.000	125.00	0.00	0.30	775.00	935.00	775.89	775.89	776.34	85.04	6.94	639.93	115.94
*	9.000	110.00	0.00	0.00	775.60	321.00	776.31	776.31	776.55	35.93	4.30	412.86	55.11
*	9.000	110.00	0.00	0.00	775.60	573.00	776.54	776.54	776.79	55.97	5.53	615.61	95.64
*	9.000	110.00	0.00	0.00	775.60	672.00	776.62	776.62	777.00	35.29	5.61	641.46	113.19
*	9.000	110.00	0.00	0.00	775.60	935.00	776.81	776.81	777.28	38.14	6.55	845.58	155.42
*	9.500	55.00	0.00	0.00	776.20	321.00	776.91	776.91	777.15	33.93	4.50	412.84	55.11
*	9.500	55.00	0.00	0.00	776.20	573.00	777.14	777.14	777.49	35.04	5.29	610.85	96.79
*	9.500	55.00	0.00	0.00	776.20	672.00	777.22	777.22	777.50	32.09	5.65	684.67	141.36
*	9.500	55.00	0.00	0.00	776.20	935.00	777.41	777.41	777.81	32.35	6.56	869.17	155.00
*	10.000	60.00	0.00	0.00	777.00	321.00	777.44	777.44	777.66	31.65	4.05	347.54	35.55
*	10.000	60.00	0.00	0.00	777.00	573.00	777.64	777.64	777.97	32.96	5.91	518.43	67.07
*	10.000	60.00	0.00	0.00	777.00	672.00	777.72	777.72	778.00	69.56	6.21	582.66	80.57
*	10.000	60.00	0.00	0.00	777.00	935.00	777.90	777.89	778.34	35.15	6.94	738.97	115.63
*	10.300	55.00	0.00	0.00	777.50	321.00	777.94	777.94	778.16	31.55	4.05	347.54	35.55
*	10.300	55.00	0.00	0.00	777.50	573.00	778.14	778.14	778.47	32.90	5.91	518.43	67.07
*	10.300	55.00	0.00	0.00	777.50	672.00	778.21	778.21	778.50	71.32	6.25	578.01	79.57
*	10.300	55.00	0.00	0.00	777.50	935.00	778.39	778.39	778.84	65.60	6.96	734.17	115.64
	11.000	55.00	0.00	0.00	778.00	321.00	778.44	0.00	778.66	30.75	4.26	350.35	35.55
	11.000	55.00	0.00	0.00	778.00	573.00	778.64	0.00	778.96	33.12	5.91	518.49	67.85
	11.000	55.00	0.00	0.00	778.00	672.00	778.72	778.65	779.06	130.43	6.30	543.47	67.06
	11.000	55.00	0.00	0.00	778.00	935.00	778.86	778.85	779.32	110.73	7.47	638.19	85.01
	12.000	150.00	0.00	0.00	778.40	321.00	778.91	0.00	779.13	30.59	4.05	347.54	35.55
	12.000	150.00	0.00	0.00	778.40	573.00	779.11	0.00	779.41	7.41	1.48	452.48	107.32
	12.000	150.00	0.00	0.00	778.40	672.00	779.19	0.00	779.49	6.83	1.49	452.62	267.50
	12.000	150.00	0.00	0.00	778.40	935.00	779.38	0.00	779.74	7.79	2.09	1109.17	595.05
	13.000	50.00	0.00	0.00	778.80	454.00	779.05	0.00	779.23	27.60	0.30	386.62	108.59
	13.000	50.00	0.00	0.00	778.80	713.00	779.25	0.00	779.38	70.72	0.96	577.75	167.50
	13.000	50.00	0.00	0.00	778.80	814.00	779.33	0.00	779.50	17.94	1.25	756.44	192.62
	13.000	50.00	0.00	0.00	778.80	1061.00	779.53	0.00	779.80	15.57	2.25	1190.75	272.95
	14.000	220.00	0.00	0.00	779.50	454.00	780.00	0.00	780.11	487.50	0.00	176.00	20.50
	14.000	220.00	0.00	0.00	779.50	713.00	780.24	780.04	780.37	206.37	5.37	390.51	69.63
	14.000	220.00	0.00	0.00	779.50	814.00	780.33	780.33	780.47	181.16	5.92	459.32	88.45
	14.000	220.00	0.00	0.00	779.50	1061.00	780.54	0.00	780.71	160.72	7.30	610.75	145.27
	15.000	350.00	0.00	0.00	780.00	454.00	780.56	0.00	781.37	11.22	1.90	209.61	152.05
	15.000	350.00	0.00	0.00	780.00	713.00	781.07	0.00	781.43	14.06	2.75	956.70	292.17
	15.000	350.00	0.00	0.00	780.00	814.00	781.69	0.00	781.79	14.45	3.02	1056.66	214.29
	15.000	350.00	0.00	0.00	780.00	1061.00	781.42	0.00	781.95	14.95	3.63	1321.76	273.75
	16.000	365.00	0.00	0.00	781.60	454.00	781.91	0.00	781.97	19.55	0.39	304.51	102.64
	16.000	365.00	0.00	0.00	781.60	713.00	782.21	0.00	782.25	19.26	2.24	504.76	162.46
	16.000	365.00	0.00	0.00	781.60	814.00	782.31	0.00	782.36	18.99	2.56	652.76	116.79
	16.000	365.00	0.00	0.00	781.60	1061.00	782.54	0.00	782.60	18.65	3.31	817.54	252.32

	SECNO	XLOC	ELTRD	ELLC	ELMIN	Q	CHSEL	CRINS	EO	TOK*S	VCP	AREA	.01K
	17.000	146.00	0.00	0.00	781.40	454.00	782.34	0.00	782.61	58.56	0.00	279.13	57.32
	17.000	146.00	0.00	0.00	781.40	713.00	782.52	0.00	782.70	36.53	0.91	375.90	94.63
	17.000	146.00	0.00	0.00	781.40	816.00	782.74	0.00	782.75	34.75	1.00	439.13	117.03
	17.000	146.00	0.00	0.00	781.40	1051.00	782.98	0.00	783.03	69.77	3.56	598.51	153.23
	18.000	117.00	0.00	0.00	782.20	434.00	783.06	0.00	783.27	79.14	0.00	124.66	51.03
	18.000	117.00	0.00	0.00	782.20	692.00	783.34	0.00	783.55	70.02	0.00	190.12	80.75
	18.000	117.00	0.00	0.00	782.20	814.00	783.47	0.00	783.63	79.92	0.70	234.36	91.06
	18.000	117.00	0.00	0.00	782.20	1051.00	783.62	0.00	783.86	86.69	0.00	274.09	117.66
	19.000	230.00	0.00	0.00	783.50	435.00	784.49	0.00	784.61	45.76	0.00	141.29	66.31
	19.000	230.00	0.00	0.00	783.50	692.00	784.79	0.00	784.91	47.40	1.25	255.33	100.51
	19.000	230.00	0.00	0.00	783.50	753.00	784.90	0.00	785.00	46.31	2.02	275.26	106.31
	19.000	230.00	0.00	0.00	783.50	1050.00	785.19	0.00	785.22	44.22	3.31	431.70	150.10
	20.000	230.00	0.00	0.00	785.00	435.00	785.78	0.00	785.90	92.00	1.68	190.57	85.35
	20.000	230.00	0.00	0.00	785.00	692.00	785.99	0.00	786.11	72.05	3.44	254.89	81.53
	20.000	230.00	0.00	0.00	785.00	792.00	786.05	0.00	786.18	70.11	3.85	284.21	94.59
	20.000	230.00	0.00	0.00	785.00	1050.00	786.19	0.00	786.30	65.22	4.72	356.92	129.13
	21.000	220.00	0.00	0.00	786.30	435.00	786.9	0.00	787.12	48.15	3.60	144.50	62.45
	21.000	220.00	0.00	0.00	786.30	692.00	787.12	0.00	787.34	55.58	4.42	215.57	94.53
	21.000	220.00	0.00	0.00	786.30	792.00	787.17	0.00	787.42	54.20	4.73	235.85	107.58
	21.000	220.00	0.00	0.00	786.30	1050.00	787.36	0.00	787.62	55.43	5.45	286.92	142.15
	22.000	255.00	0.00	0.00	787.60	435.00	788.94	787.96	789.21	52.61	6.12	139.55	60.09
	22.000	255.00	0.00	0.00	787.60	692.0	788.19	789.13	788.46	49.94	6.59	184.76	78.32
	22.000	255.00	0.00	0.00	787.60	792.00	788.25	788.15	788.53	43.57	5.12	200.30	193.64
*	22.000	255.00	0.00	0.00	787.60	1050.00	788.54	788.54	788.75	47.04	5.72	258.17	152.97
	23.000	215.00	0.00	0.00	788.40	435.00	789.01	788.97	789.19	47.23	5.45	140.27	58.51
*	23.000	215.00	0.00	0.00	788.40	692.00	789.19	789.13	789.41	47.19	6.19	184.17	176.02
*	23.000	215.00	0.00	0.00	788.40	792.00	789.13	789.13	789.51	40.85	5.05	210.35	123.01
*	23.000	215.00	0.00	0.00	788.40	1050.00	789.35	789.35	789.63	32.30	5.56	290.71	170.96
	24.000	225.00	0.00	0.00	789.30	435.00	789.87	789.87	790.11	40.64	6.74	155.39	68.23
	24.000	225.00	0.00	0.00	789.30	692.00	789.99	0.00	790.17	35.60	7.72	224.72	115.00
	24.000	225.00	0.00	0.00	789.30	792.00	790.05	0.00	790.46	35.20	6.95	247.73	133.35
	24.000	225.00	0.00	0.00	789.30	1050.00	790.31	0.00	790.54	36.40	5.48	326.37	180.38
*	25.000	190.00	0.00	0.00	790.10	435.00	790.71	790.71	790.95	40.29	6.23	190.40	88.53
*	25.000	190.00	0.00	0.00	790.10	692.00	790.59	790.39	791.21	38.96	6.95	277.74	110.67
*	25.000	190.00	0.00	0.00	790.10	792.00	790.95	790.95	791.20	38.71	5.19	305.76	127.29
*	25.000	190.00	0.00	0.00	790.10	1050.00	791.70	791.70	791.33	38.46	5.77	376.31	170.19
	26.000	180.00	0.00	0.00	790.80	435.00	791.51	0.00	791.62	21.39	3.65	467.88	93.63
	26.000	180.00	0.00	0.00	790.80	692.00	791.73	0.00	791.87	21.12	4.06	667.75	150.57
	26.000	180.00	0.00	0.00	790.80	792.00	791.80	0.00	791.96	20.72	4.24	765.92	174.00
	26.000	180.00	0.00	0.00	790.80	1050.00	792.00	0.00	792.17	19.62	4.65	953.07	253.75
*	27.000	270.00	0.00	0.00	736.20	640.00	792.50	792.50	792.84	56.26	6.40	246.86	88.66
*	27.000	270.00	0.00	0.00	736.20	920.00	792.62	792.62	793.01	79.07	7.69	283.22	103.46
*	27.000	270.00	0.00	0.00	736.20	1020.00	792.71	792.71	793.14	77.84	7.71	311.05	115.61
*	27.000	270.00	0.00	0.00	736.20	1235.00	792.96	792.96	793.33	86.10	8.33	356.62	136.91

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	TOK*S	VCH	AREA	.01K
	28.000	45.00	0.00	0.00	786.30	665.00	792.96	0.00	793.07	22.87	4.31	454.53	139.06
	28.000	45.00	0.00	0.00	786.30	920.00	793.25	0.00	793.37	27.09	4.86	540.08	176.76
	28.000	45.00	0.00	0.00	786.30	1020.00	793.41	0.00	793.46	30.37	5.17	556.44	196.40
	28.000	45.00	0.00	0.00	786.30	1285.00	793.80	0.00	793.86	36.51	5.75	614.83	213.24
	29.000	82.00	792.80	791.40	786.70	665.00	794.94	0.00	796.00	15.30	3.40	404.58	170.06
	29.000	82.00	792.80	791.40	786.70	920.00	794.24	0.00	796.13	18.66	4.07	375.69	207.47
	29.000	82.00	792.80	791.40	786.70	1020.00	794.35	0.00	796.45	21.22	4.17	402.11	221.44
	29.000	82.00	792.80	791.40	786.70	1285.00	794.67	0.00	796.70	26.29	4.57	405.19	260.75
	30.000	55.00	0.00	0.00	786.90	665.00	793.99	0.00	794.05	4.30	2.02	333.96	301.24
	30.000	55.00	0.00	0.00	786.90	920.00	794.28	0.00	794.37	5.36	2.18	419.35	408.91
	30.000	55.00	0.00	0.00	786.90	1020.00	794.39	0.00	794.49	5.76	2.16	451.15	446.30
	30.000	55.00	0.00	0.00	786.90	1285.00	794.65	0.00	794.77	5.35	2.25	537.13	556.32
*	31.000	300.00	0.00	0.00	787.90	665.00	794.25	794.25	796.54	37.36	5.20	167.76	108.11
*	31.000	300.00	0.00	0.00	787.90	920.00	794.49	0.00	794.79	32.32	6.94	220.53	161.85
*	31.000	300.00	0.00	0.00	787.90	1020.00	794.59	0.00	794.90	29.44	6.77	243.34	187.99
*	31.000	300.00	0.00	0.00	787.90	1285.00	794.85	0.00	795.17	24.29	6.45	302.02	260.74
*	32.000	150.00	0.00	0.00	788.90	665.00	795.23	795.23	795.68	74.30	7.65	193.55	77.20
*	32.000	150.00	0.00	0.00	788.90	920.00	795.45	795.45	795.95	87.25	7.96	237.68	98.50
*	32.000	150.00	0.00	0.00	788.90	1020.00	795.53	795.53	796.04	91.63	8.23	253.58	106.67
*	32.000	150.00	0.00	0.00	788.90	1285.00	795.73	795.73	796.27	98.38	8.75	296.69	129.55
	33.000	92.00	795.30	794.40	788.90	665.00	796.18	0.00	796.49	13.19	3.56	337.93	183.13
	33.000	92.00	795.30	794.40	788.90	920.00	796.48	0.00	796.69	15.56	3.79	477.01	273.35
	33.000	92.00	795.30	794.40	788.90	1020.00	796.59	0.00	796.80	16.50	3.86	512.96	256.33
	33.000	92.00	795.30	794.40	788.90	1285.00	796.79	0.00	796.89	16.98	4.02	610.65	314.64
	34.000	75.00	0.00	0.00	789.30	665.00	797.17	0.00	797.29	8.29	3.26	335.12	271.70
	34.000	75.00	0.00	0.00	789.30	920.00	797.47	0.00	797.62	10.90	3.92	407.95	277.70
	34.000	75.00	0.00	0.00	789.30	1020.00	797.61	0.00	797.74	11.13	4.13	451.59	296.36
	34.000	75.00	0.00	0.00	789.30	1285.00	796.85	0.00	797.05	13.57	4.75	521.73	340.35
	35.000	400.00	0.00	0.00	791.30	665.00	796.57	0.00	797.25	30.61	6.81	121.70	93.41
	35.000	400.00	0.00	0.00	791.30	920.00	797.11	797.09	797.81	50.58	7.72	164.20	119.71
	35.000	400.00	0.00	0.00	791.30	1020.00	797.15	797.10	797.86	60.56	7.98	182.05	131.04
	35.000	400.0.	0.00	0.00	791.30	1285.00	797.53	797.51	797.89	62.04	8.44	237.77	162.56
	36.000	310.00	0.00	0.00	791.00	665.00	797.90	0.00	798.33	23.20	5.23	127.00	136.06
	36.000	310.00	0.00	0.00	791.00	920.00	798.56	0.00	799.19	32.07	6.47	162.87	160.96
	36.000	310.00	0.00	0.00	791.00	1020.00	798.70	0.00	799.45	37.25	6.99	183.99	187.1.
	36.000	310.00	0.00	0.00	791.00	1285.00	799.03	0.00	800.17	47.91	8.20	157.46	115.65
	37.000	50.00	0.00	0.00	791.30	665.00	796.01	0.00	796.47	25.69	5.42	122.59	139.40
	37.000	50.00	0.00	0.00	791.30	920.00	798.59	0.00	799.38	35.04	6.64	138.57	155.42
	37.000	50.00	0.00	0.00	791.30	1020.00	799.47	0.00	799.66	39.57	7.14	142.94	162.14
	37.000	50.00	0.00	0.00	791.30	1285.00	799.96	0.00	800.45	49.46	8.29	155.09	172.72
*	38.000	100.00	0.00	0.00	792.10	540.00	801.54	801.55	802.95	159.33	5.96	106.20	39.27
*	38.000	100.00	0.00	0.00	792.10	796.00	801.92	801.92	802.57	179.23	5.94	163.14	59.45
*	38.000	100.00	0.00	0.00	792.10	896.00	801.93	801.93	802.53	170.72	6.07	156.65	60.58
*	38.000	100.00	0.00	0.00	792.10	1161.00	802.17	802.17	802.82	163.59	6.49	193.91	90.33

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CHSEL	CRCHS	ES	TOKAS	VCH	AREA	.01Y
39.000	130.00	0.00	0.00	802.00	540.00	802.99	0.00	803.19	74.79	3.64	172.81	69.24
39.000	130.00	0.00	0.00	802.00	796.00	803.26	0.00	803.54	72.96	4.22	227.41	93.20
39.000	130.00	0.00	0.00	802.00	996.00	803.39	0.00	803.66	73.76	4.56	246.41	104.32
39.000	130.00	0.00	0.00	802.00	1161.00	803.58	0.00	803.95	73.37	4.91	298.20	135.02
40.000	125.30	0.00	0.00	803.00	540.00	804.08	0.00	804.47	123.95	4.98	137.59	68.50
40.000	125.30	0.00	0.00	803.00	796.00	804.32	804.24	804.69	124.19	5.86	177.47	87.37
40.000	125.30	0.00	0.00	803.00	996.00	804.45	804.35	805.04	132.59	6.47	192.19	96.11
40.000	125.30	0.00	0.00	803.00	1161.00	804.65	804.61	805.42	147.89	7.14	228.50	95.50
41.000	120.30	0.00	0.00	804.00	540.00	805.26	0.00	805.70	116.64	5.35	138.97	50.00
41.000	120.30	0.00	0.00	804.00	796.00	805.57	805.45	806.19	120.27	6.31	185.72	72.58
41.000	120.30	0.00	0.00	804.00	996.00	805.69	805.57	806.37	127.49	6.83	203.27	81.30
41.000	120.30	0.00	0.00	804.00	1161.00	805.87	805.87	806.61	124.06	7.42	248.01	103.90
42.000	125.30	0.00	0.00	805.00	540.00	806.50	0.00	806.81	66.19	4.59	173.07	68.36
42.000	125.30	0.00	0.00	805.00	796.00	806.90	0.00	807.33	65.11	5.25	237.70	90.65
42.000	125.30	0.00	0.00	805.00	996.00	807.05	0.00	807.51	63.94	5.47	283.95	112.06
42.000	125.30	0.00	0.00	805.00	1161.00	807.20	0.00	807.97	62.62	6.13	330.79	126.45
43.000	175.30	0.00	0.00	806.50	540.00	807.87	0.00	808.23	96.09	5.53	150.51	65.36
43.000	175.30	0.00	0.00	806.50	796.00	808.20	0.00	808.73	93.42	5.15	205.39	82.36
43.000	175.30	0.00	0.00	806.50	996.00	808.33	0.00	808.91	93.02	6.12	226.30	92.91
43.000	175.30	0.00	0.00	806.50	1161.00	808.65	0.00	809.35	90.46	6.75	232.12	121.40
44.000	175.00	0.00	0.00	808.00	540.00	809.31	0.00	809.63	69.06	4.03	170.70	69.10
44.000	175.00	0.00	0.00	808.00	796.00	809.73	0.00	810.06	67.96	4.63	245.27	106.56
44.000	175.00	0.00	0.00	808.00	996.00	809.91	0.00	810.24	56.17	4.85	272.46	119.35
44.000	175.00	0.00	0.00	808.00	1161.00	810.21	0.00	810.64	55.28	5.25	341.41	159.05
45.000	475.00	0.00	0.00	810.50	540.00	810.72	0.00	811.02	7.13	1.87	348.95	905.32
45.000	475.00	0.00	0.00	810.50	796.00	810.90	0.00	811.27	8.20	2.71	636.82	276.72
45.000	475.00	0.00	0.00	810.50	996.00	811.06	0.00	811.44	8.57	2.33	454.22	306.15
45.000	475.00	0.00	0.00	806.50	1161.00	811.47	0.00	811.53	8.78	2.60	595.30	594.10
46.000	430.00	0.00	0.00	809.75	540.00	811.03	0.00	811.15	31.25	2.80	220.02	96.59
46.000	430.00	0.00	0.00	809.75	796.00	811.47	0.00	811.63	35.47	3.01	317.87	139.51
46.000	430.00	0.00	0.00	809.75	996.00	811.63	0.00	811.79	37.12	3.11	367.81	162.13
46.000	430.00	0.00	0.00	809.75	1161.00	811.82	0.00	812.30	31.46	3.40	427.16	253.43
47.000	430.00	0.00	0.00	804.60	665.00	811.39	0.00	811.45	2.96	2.13	430.25	386.57
47.000	430.00	0.00	0.00	804.60	920.00	811.18	0.00	811.97	5.06	2.59	516.62	463.30
47.000	430.00	0.00	0.00	804.60	1020.00	812.35	0.00	812.46	4.17	2.75	547.77	499.22
47.000	430.00	0.00	0.00	804.60	1205.00	812.43	0.00	812.61	4.97	3.13	624.39	579.32
48.000	125.00	0.00	0.00	805.60	665.00	811.41	0.00	811.53	6.79	2.69	276.30	255.22
48.000	125.00	0.00	0.00	805.60	920.00	811.91	0.00	812.08	8.34	3.36	352.00	310.12
48.000	125.00	0.00	0.00	805.60	1020.00	812.00	0.00	812.27	8.63	3.54	381.00	342.00
48.000	125.00	0.00	0.00	805.60	1205.00	812.33	0.00	812.74	9.42	3.97	453.41	406.01
49.000	230.00	0.00	0.00	808.50	665.00	811.44	0.00	812.12	39.53	7.79	156.71	105.23
49.000	230.00	0.00	0.00	808.50	920.00	811.95	0.00	812.64	40.55	9.27	197.30	132.20
49.000	230.00	0.00	0.00	808.50	1020.00	812.10	0.00	813.01	53.07	9.75	212.51	142.02
49.000	230.00	0.00	0.00	808.50	1205.00	812.51	0.00	813.67	59.34	10.83	251.55	166.54

	SECRO	XLCH	ELTRO	ELLC	ELMIN	Q	CNSEL	CPSUS	EG	TOK*S	VCH	ARGA	.01K
1	50.000	95.00	0.00	C.00	E07.20	315.00	812.54	C.00	812.54	7.54	3.47	173.47	114.19
4	50.000	95.00	0.00	C.00	E07.20	435.00	813.17	C.00	813.27	7.31	3.76	243.20	161.54
5	50.000	95.00	0.00	C.00	E07.20	465.00	813.20	C.00	813.54	7.39	3.87	259.76	179.44
6	50.000	95.00	0.00	C.00	E07.20	745.00	813.97	C.00	814.20	11.21	5.08	529.92	222.50
8	51.000	126.00	813.10	812.70	807.70	315.00	815.14	C.00	815.17	1.23	1.42	221.45	283.74
7	51.000	126.00	813.10	812.70	807.70	435.00	815.65	C.00	815.77	1.26	1.60	244.49	327.77
8	51.000	126.00	813.10	812.70	807.70	465.00	815.81	C.01	815.87	2.01	1.65	251.60	342.19
9	51.000	126.00	813.10	812.71	807.70	745.00	816.49	C.01	816.55	3.46	2.72	275.96	402.74
11	52.000	50.00	0.00	0.00	807.60	315.00	815.16	0.00	815.18	1.13	1.38	439.12	296.38
10	52.000	50.00	0.00	0.00	807.60	435.00	815.69	C.00	815.71	1.46	1.66	514.26	354.54
13	52.000	50.00	0.00	0.00	807.60	465.00	815.86	C.00	815.89	1.61	1.77	540.33	372.85
12	52.000	50.00	0.00	0.00	807.60	745.00	816.15	0.00	816.18	2.41	2.32	644.48	479.51
16	53.000	195.00	0.00	0.00	808.40	315.00	815.13	0.00	815.20	0.86	1.09	500.69	340.32
17	53.000	195.00	0.00	0.00	808.40	435.00	815.72	0.00	815.74	1.01	1.27	612.86	432.62
18	53.000	195.00	0.00	0.00	808.40	465.00	815.89	C.00	815.92	1.09	1.33	649.51	464.94
19	53.000	195.00	0.00	0.00	808.40	745.00	816.41	C.00	816.44	1.50	1.77	802.49	601.01
21	54.000	165.00	0.00	0.00	809.20	315.00	815.20	0.00	815.23	2.39	1.57	306.52	203.65
22	54.000	165.00	0.00	0.00	809.20	435.00	815.73	0.00	815.77	2.52	1.76	410.64	273.64
23	54.000	165.00	0.00	0.00	809.20	465.00	815.91	0.00	815.95	2.62	1.84	445.73	299.59
24	54.000	165.00	0.00	0.00	809.20	745.00	816.63	0.00	816.69	3.19	2.24	564.53	417.07
26	55.000	135.00	0.00	0.00	809.80	315.00	815.22	0.00	815.28	2.01	1.47	165.05	165.30
27	55.000	135.00	0.00	0.00	809.80	435.00	815.77	0.00	815.81	3.06	1.71	375.79	249.52
28	55.000	135.00	0.00	0.00	809.80	465.00	815.93	0.00	815.99	3.14	1.90	411.93	275.81
29	55.000	135.00	0.00	0.00	809.80	745.00	816.67	0.00	816.74	3.69	2.35	559.65	397.58
31	56.000	65.00	824.40	815.40	810.40	315.00	815.17	0.00	815.19	2.41	1.17	152.35	232.79
32	56.000	65.00	824.40	815.40	810.40	435.00	815.71	0.00	815.76	0.26	1.31	1004.65	829.77
33	56.000	65.00	824.40	815.40	810.40	465.00	815.87	0.00	815.95	0.20	1.01	1057.44	913.71
34	56.000	65.00	824.40	815.40	810.40	745.00	816.58	0.00	816.70	0.54	1.50	1196.97	1017.32
36	57.000	60.00	0.00	0.00	811.40	315.00	815.23	0.00	815.25	295.35	13.48	30.37	18.33
37	57.000	60.00	0.00	0.00	811.40	435.00	815.78	0.00	815.82	3.47	1.27	191.80	255.26
38	57.000	60.00	0.00	0.00	811.40	465.00	815.94	0.00	815.98	3.49	1.54	618.98	376.77
39	57.000	60.00	0.00	0.00	811.40	745.00	816.63	0.00	816.71	3.23	2.33	731.32	575.65
41	58.000	40.00	0.00	0.00	812.60	315.00	815.21	0.00	815.27	217.67	9.34	35.71	21.35
42	58.000	40.00	0.00	0.00	812.60	435.00	815.74	0.00	815.78	15.47	3.53	293.67	187.19
43	58.000	40.00	0.00	0.00	812.60	465.00	815.90	0.00	815.93	16.23	3.56	330.75	127.30
44	58.000	40.00	0.00	0.00	812.60	745.00	816.58	0.00	816.63	20.12	4.16	636.12	166.09
46	59.000	135.00	824.40	817.60	814.40	315.00	815.20	0.00	815.24	0.79	1.20	377.00	372.19
47	59.000	135.00	824.40	817.60	814.40	435.00	815.71	0.00	815.72	0.98	1.33	775.05	430.34
48	59.000	135.00	824.40	817.60	814.40	465.00	815.79	0.00	815.87	1.03	1.45	795.30	452.43
49	59.000	135.00	824.40	817.60	814.40	745.00	816.48	0.00	816.57	2.03	2.09	991.85	597.58
51	60.000	100.00	0.00	0.00	815.20	315.00	815.25	0.00	815.30	0.32	0.35	1966.14	1996.19
52	60.000	100.00	0.00	0.00	815.20	435.00	815.78	0.00	815.82	0.36	0.43	2072.60	2135.36
53	60.000	100.00	0.00	0.00	815.20	465.00	815.94	0.00	815.98	0.35	0.46	2090.04	2161.39
54	60.000	100.00	0.00	0.00	815.20	745.00	816.63	0.00	816.70	0.71	0.71	2165.69	2252.64

SECNO	XLCK	ELTRD	ELLC	ELMIN	Q	CHSEL	CHIUS	EG	TOX*S	VCH	AREA	.01K
61.000	50.00	0.00	0.00	814.70	315.00	826.30	0.00	826.30	0.02	0.31	2045.27	2050.56
61.000	50.20	0.00	0.00	814.70	435.00	826.72	0.00	826.72	0.04	0.41	2174.93	2227.35
61.000	50.20	0.00	0.00	814.70	485.00	826.81	0.00	826.87	0.05	0.45	2158.34	2237.22
61.000	50.30	0.00	0.00	814.70	745.00	827.19	0.00	827.19	0.10	0.67	2274.19	2340.22
62.000	100.00	0.00	0.00	814.50	315.00	826.30	0.00	826.30	0.02	0.33	2033.56	2052.98
62.000	100.20	0.00	0.00	814.50	435.00	826.72	0.00	826.72	0.04	0.42	2162.00	2214.29
62.000	100.00	0.00	0.00	814.40	485.00	826.81	0.00	826.81	0.05	0.46	2141.64	2214.43
62.000	100.00	0.00	0.00	814.50	745.00	827.19	0.00	827.19	0.10	0.71	2261.94	2260.13
63.000	120.00	0.00	0.00	815.80	315.00	826.30	0.00	826.30	0.03	0.35	1907.22	1793.66
63.000	120.00	0.00	0.00	815.80	435.00	826.72	0.00	826.73	0.05	0.46	1996.83	1932.10
63.000	120.00	0.00	0.00	815.80	485.00	826.81	0.00	826.81	0.06	0.51	2019.25	1959.55
63.000	120.00	0.00	0.00	815.80	745.00	827.19	0.00	827.19	0.10	0.76	2092.70	2001.11
64.000	20.00	0.00	0.00	814.70	315.00	826.30	0.00	826.30	0.03	0.32	1901.14	1912.12
64.000	20.00	0.00	0.00	814.70	435.00	826.72	0.00	826.73	0.04	0.43	1990.69	2055.66
64.000	20.00	0.00	0.00	814.70	485.00	826.81	0.00	826.81	0.05	0.47	2009.06	2015.34
64.000	20.00	0.00	0.00	814.70	745.00	827.19	0.00	827.19	0.10	0.70	2106.75	2213.52
65.000	166.00	0.00	0.00	814.60	315.00	826.30	0.00	826.30	0.23	0.90	887.02	865.53
65.000	166.00	0.00	0.00	814.60	435.00	826.72	0.00	826.73	0.35	1.16	961.67	738.05
65.000	166.00	0.00	0.00	814.60	485.00	826.81	0.00	826.82	0.42	1.27	985.79	752.04
65.000	166.00	0.00	0.00	814.60	745.00	827.19	0.00	827.20	0.82	1.82	1059.96	823.47
65.100	1.00	818.30	817.80	814.60	315.00	826.30	0.00	826.30	0.54	0.59	870.72	422.37
65.100	1.00	818.30	817.80	814.60	435.00	826.72	0.00	826.73	0.83	0.74	897.10	477.41
65.100	1.00	818.30	817.80	814.60	485.00	826.82	0.00	826.82	0.90	0.80	915.46	489.50
65.100	1.00	818.30	817.80	814.60	745.00	827.20	0.00	827.20	1.86	1.13	990.44	567.65
65.900	5.00	818.30	817.80	814.60	315.00	826.30	0.00	826.30	0.55	0.59	870.68	422.91
65.900	5.00	818.30	817.80	814.60	435.00	826.73	0.00	826.73	0.83	0.73	898.10	477.37
65.900	5.00	818.30	817.80	814.60	485.00	826.82	0.00	826.82	0.90	0.80	916.42	491.19
65.900	5.00	818.30	817.80	814.60	745.00	827.20	0.00	827.21	1.86	1.13	990.53	568.73
66.000	1.00	0.00	0.00	814.50	315.00	826.30	0.00	826.30	0.23	0.91	885.81	661.91
66.000	1.00	0.00	0.00	814.50	435.00	826.72	0.00	826.73	0.35	1.16	959.77	738.57
66.000	1.00	0.00	0.00	814.40	485.00	826.82	0.00	826.82	0.42	1.27	985.14	752.52
66.000	1.00	0.00	0.00	814.50	745.00	827.19	0.00	827.21	0.82	1.83	1060.21	823.57
67.000	109.00	0.00	0.00	815.60	315.00	826.31	0.00	826.31	0.06	0.55	1099.02	1518.74
67.000	109.00	0.00	0.00	815.60	435.00	826.74	0.00	826.74	0.09	0.65	2054.61	1460.00
67.000	109.00	0.00	0.00	815.60	485.00	826.83	0.00	826.83	0.11	0.69	2063.75	1460.33
67.000	109.00	0.00	0.00	815.60	745.00	827.22	0.00	827.23	0.21	0.91	2164.10	1625.79
67.100	1.00	819.70	818.40	815.20	315.00	826.31	0.00	826.31	0.11	0.27	1710.59	932.79
67.100	1.00	819.70	818.40	815.60	435.00	826.74	0.00	826.74	0.17	0.34	1845.73	1049.36
67.100	1.00	819.70	818.40	815.60	485.00	826.83	0.00	826.83	0.20	0.37	1874.37	1076.66
67.100	1.00	819.70	818.40	815.40	745.00	827.22	0.00	827.23	0.35	0.53	1997.95	1187.78
67.900	10.00	819.70	818.40	815.60	315.00	826.31	0.00	826.31	0.11	0.27	1710.53	932.79
67.900	10.00	819.70	818.40	815.60	435.00	826.74	0.00	826.74	0.17	0.34	1845.67	1049.42
67.900	10.00	819.70	818.40	815.60	485.00	826.83	0.00	826.83	0.20	0.37	1874.43	1074.71
67.900	10.00	819.70	818.40	815.60	745.00	827.22	0.00	827.23	0.39	0.53	1997.93	1187.25

SECNO	XLCH	ELTRO	ELLC	ELMIN	Q	CWSEL	CRIWS	FG	10X**5	VCH	ARSA	.01R
68.000	1.00	0.00	0.00	615.60	315.00	326.31	0.00	026.31	0.06	0.35	1950.50	1319.46
68.000	1.00	0.00	0.00	614.60	435.00	326.74	0.00	026.74	0.09	0.45	2035.71	1461.36
68.000	1.00	0.00	0.00	615.60	475.00	326.83	0.00	026.83	0.10	0.49	2054.56	1492.04
68.000	1.00	0.00	0.00	615.60	745.00	327.22	0.00	027.23	0.29	0.71	2187.96	1627.80
69.000	125.00	0.00	0.00	616.80	315.00	326.31	0.00	026.31	0.11	0.46	1539.77	964.47
69.000	125.00	0.00	0.00	615.80	435.00	326.74	0.00	026.75	0.19	0.56	1661.80	1087.77
69.000	125.00	0.00	0.00	616.80	475.00	326.84	0.00	026.84	0.19	0.61	1696.59	1114.15
69.000	125.00	0.00	0.00	616.80	745.00	327.23	0.00	027.23	1.37	0.87	1895.26	1282.25
70.000	125.00	0.00	0.00	617.40	315.00	326.31	0.00	026.31	0.37	0.99	879.51	515.05
70.000	125.00	0.00	0.00	617.40	435.00	326.74	0.00	026.75	0.52	1.10	936.46	601.30
70.000	125.00	0.00	0.00	617.40	475.00	326.83	0.00	026.84	0.57	1.20	939.26	620.27
70.000	125.00	0.00	0.00	617.40	745.00	327.23	0.00	027.24	1.12	1.67	1037.98	709.04
71.000	125.00	0.00	0.00	618.60	315.00	326.31	0.00	026.31	0.97	1.27	524.29	319.80
71.000	125.00	0.00	0.00	618.60	435.00	326.75	0.00	026.77	1.28	1.53	626.72	386.45
71.000	125.00	0.00	0.00	618.60	485.00	326.84	0.00	026.86	1.48	1.66	668.51	599.09
71.000	125.00	0.00	0.00	618.60	745.00	327.24	0.00	027.24	2.96	2.27	753.29	506.07
71.100	130.00	0.00	0.00	622.60	190.00	326.72	0.00	026.37	22.20	1.91	110.16	36.64
71.100	130.00	0.00	0.00	622.60	305.00	326.76	0.00	026.84	41.50	2.41	150.06	47.74
71.100	130.00	0.00	0.00	622.60	355.00	326.85	0.00	026.94	48.44	2.66	169.24	51.00
71.100	130.00	0.00	0.00	622.60	605.00	327.26	0.00	027.42	72.14	3.54	231.35	71.25
71.200	130.00	0.00	0.00	623.80	190.00	326.80	0.00	026.51	64.75	2.39	96.67	23.61
71.200	130.00	0.00	0.00	623.80	305.00	327.43	0.00	027.55	70.36	2.89	109.41	26.57
71.200	130.00	0.00	0.00	623.80	355.00	327.60	0.00	027.73	72.97	3.28	116.05	41.42
71.200	130.00	0.00	0.00	623.80	605.00	328.32	0.00	028.39	74.46	3.92	225.91	69.19
71.300	130.00	0.00	0.00	624.40	190.00	327.71	0.00	027.77	73.20	2.53	71.97	20.07
71.300	130.00	0.00	0.00	624.40	305.00	327.77	0.00	027.81	76.28	2.77	116.64	34.97
71.300	130.00	0.00	0.00	624.40	355.00	327.95	0.00	028.00	76.57	3.13	133.97	40.57
71.300	130.00	0.00	0.00	624.60	605.00	328.22	0.00	028.39	77.48	3.64	224.64	61.73
71.400	130.00	0.00	0.00	825.60	190.00	328.74	0.00	028.86	76.60	2.55	74.43	21.71
71.400	130.00	0.00	0.00	825.60	305.00	328.87	0.00	028.98	78.01	2.98	116.63	32.50
71.400	130.00	0.00	0.00	825.60	355.00	329.56	0.00	029.70	77.31	3.14	132.14	40.37
71.400	130.00	0.00	0.00	825.60	605.00	330.27	0.00	030.39	78.44	3.62	225.91	69.19
71.500	130.00	0.00	0.00	827.10	190.00	329.93	0.00	030.11	121.21	3.01	66.18	17.26
71.500	130.00	0.00	0.00	827.10	305.00	330.58	0.00	030.76	120.73	3.44	95.86	27.76
71.500	130.00	0.00	0.00	827.10	355.00	330.78	0.00	030.97	127.47	3.63	106.79	32.34
71.500	130.00	0.00	0.00	827.10	605.00	331.45	0.00	031.61	124.20	4.34	180.56	54.29
71.600	130.00	0.00	0.00	828.40	190.00	331.09	0.00	031.17	56.64	2.31	92.14	25.25
71.600	130.00	0.00	0.00	828.40	305.00	331.69	0.00	031.79	54.22	2.56	121.91	41.42
71.600	130.00	0.00	0.00	828.40	355.00	331.90	0.00	032.01	54.69	2.81	142.56	49.06
71.600	130.00	0.00	0.00	828.40	605.00	332.66	0.00	032.83	93.30	3.55	204.02	75.53
71.700	130.00	0.00	0.00	829.40	190.00	331.94	0.00	032.25	76.46	2.54	72.64	21.60
71.700	130.00	0.00	0.00	829.40	305.00	332.53	0.00	032.82	75.78	2.95	116.18	35.51
71.700	130.00	0.00	0.00	829.40	355.00	332.71	0.00	032.96	72.05	3.09	125.26	41.59
71.700	130.00	0.00	0.00	829.40	605.00	333.54	0.00	033.72	72.01	3.65	185.24	70.90

SECNO	XLCN	ELTRD	ELLC	ELRIN	D	*CNSEL	CRINS	EG.	TOK*S	VCR	AREA	.DSK
72.000	130.00	0.00	0.00	327.50	315.00	632.20	0.00	932.62	25.14	4.66	68.56	88.13
72.000	130.00	0.00	0.00	327.50	430.00	632.91	0.00	933.32	29.00	5.55	80.50	103.79
72.000	130.00	0.00	0.00	327.50	405.00	635.14	0.00	933.59	30.55	5.09	85.00	97.75
72.000	130.00	0.00	0.00	327.50	745.00	635.85	0.00	934.74	40.56	7.60	102.69	146.95
73.000	410.00	0.00	0.00	329.00	315.00	633.73	0.00	934.07	33.42	4.73	67.66	93.10
73.000	410.00	0.00	0.00	329.00	435.00	634.44	0.00	934.91	33.91	5.59	83.35	59.21
73.000	410.00	0.00	0.00	329.00	405.00	634.74	0.00	935.23	33.69	5.53	87.21	96.19
73.000	410.00	0.00	0.00	329.00	745.00	636.08	0.00	936.72	34.90	8.60	116.30	161.29
73.500	30.00	0.00	0.00	328.00	175.00	633.75	0.00	934.55	310.40	7.27	26.06	9.65
73.500	30.00	0.00	0.00	328.00	108.00	634.65	0.00	935.15	178.79	6.09	42.22	14.06
73.500	30.00	0.00	0.00	328.00	192.00	635.14	0.00	935.47	110.97	5.21	34.41	12.59
73.500	30.00	0.00	0.00	328.00	200.00	635.93	0.00	937.03	23.73	2.71	126.99	41.06
74.000	290.00	840.40	833.00	828.00	170.00	840.49	0.00	840.49	1.20	0.79	375.25	150.00
74.000	290.00	840.40	833.00	828.00	108.00	843.65	0.00	840.66	1.42	0.84	390.66	157.89
74.000	290.00	840.40	833.00	828.00	192.00	840.70	0.00	840.71	1.46	0.84	395.23	160.23
74.000	290.00	840.40	833.00	828.00	200.00	840.71	0.00	840.71	1.47	0.93	437.30	186.50
75.000	130.00	0.00	0.00	831.10	170.00	840.49	0.00	840.49	0.05	0.26	122.52	790.20
75.000	130.00	0.00	0.00	831.10	108.00	840.66	0.00	840.66	0.05	0.28	836.76	826.13
75.000	130.00	0.00	0.00	831.10	192.00	840.71	0.00	840.71	0.05	0.29	855.19	834.93
75.000	130.00	0.00	0.00	831.10	200.00	840.64	0.00	840.64	0.05	0.30	872.29	870.90
76.000	540.00	0.00	0.00	833.20	170.00	840.50	0.00	841.50	2.28	2.60	621.65	352.66
76.000	540.00	0.00	0.00	833.50	135.00	840.67	0.00	841.67	2.25	2.51	843.30	376.57
76.000	540.00	0.00	0.00	833.50	192.00	840.71	0.00	841.72	2.25	2.51	879.49	396.30
76.000	540.00	0.00	0.00	833.50	230.00	840.65	0.00	841.65	2.24	2.51	914.74	407.40
77.000	265.00	0.00	0.00	832.30	170.00	840.50	0.00	841.50	0.24	0.93	325.70	190.05
77.000	265.00	0.00	0.00	832.30	135.00	840.67	0.00	841.67	0.19	0.95	331.56	207.42
77.000	265.00	0.00	0.00	832.30	192.00	840.72	0.00	841.73	0.19	0.96	336.40	210.75
77.000	265.00	0.00	0.00	832.30	200.00	840.65	0.00	841.65	0.85	0.97	349.61	219.03
77.500	65.00	0.00	0.00	834.20	170.00	840.52	0.00	841.53	3.23	1.77	192.30	97.55
77.500	65.00	0.00	0.00	834.20	135.00	840.67	0.00	841.67	3.27	1.77	200.31	100.02
77.500	65.00	0.00	0.00	834.20	92.00	840.72	0.00	841.73	3.24	1.78	206.93	103.53
77.500	65.00	0.00	0.00	834.20	200.00	840.65	0.00	841.66	3.23	1.80	219.57	111.23
78.000	65.00	0.00	0.00	835.50	170.00	840.52	0.00	840.57	5.83	2.90	154.85	79.63
78.000	65.00	0.00	0.00	835.50	108.00	840.69	0.00	840.74	6.16	2.21	165.16	75.74
78.000	65.00	0.00	0.00	835.50	192.00	840.74	0.00	840.79	6.20	2.22	168.21	77.34
78.000	65.00	0.00	0.00	835.50	200.00	840.69	0.00	840.92	5.99	2.23	176.50	81.69
79.000	165.00	0.00	0.00	836.40	170.00	840.64	0.00	840.70	10.35	2.46	126.00	51.65
79.000	165.00	0.00	0.00	836.40	108.00	840.80	0.00	840.98	10.96	2.55	136.19	56.78
79.000	165.00	0.00	0.00	836.40	192.00	840.65	0.00	840.93	10.86	2.36	136.91	56.26
79.000	165.00	0.00	0.00	836.40	200.00	840.64	0.00	840.85	10.39	2.35	146.05	62.77
79.100	210.00	0.00	0.00	837.50	170.00	840.64	0.00	841.50	40.09	3.60	52.66	26.00
79.100	210.00	0.00	0.00	837.50	108.00	840.75	0.00	841.56	39.77	3.50	56.96	29.01
79.100	210.00	0.00	0.00	837.50	192.00	840.79	0.00	841.56	39.22	3.51	58.13	30.66
79.100	210.00	0.00	0.00	837.50	200.00	840.70	0.00	841.49	37.16	3.51	61.09	32.41

	SECNO	XLCH	ELTOD	ELLC	ELMIN	C	CHSGL	CRIMB	EG	TOK*S	VCH	AREA	.01%
1	79.120	150.00	2.00	0.30	838.30	170.00	841.74	0.00	842.15	98.11	5.70	36.93	16.11
2	79.120	150.00	2.00	0.30	838.30	180.00	841.19	0.00	842.34	93.91	5.31	39.48	19.04
3	79.120	150.00	2.00	0.30	838.30	192.00	841.53	0.00	842.05	90.49	5.35	40.37	20.36
4	79.120	150.00	2.00	0.30	838.30	200.00	841.99	0.00	842.43	88.23	5.42	42.06	21.29
5													
6	79.180	150.00	2.00	0.30	839.10	170.00	843.01	0.00	843.45	94.55	5.54	40.67	18.49
7	79.180	150.00	2.00	0.30	839.10	180.00	843.17	0.00	843.64	90.80	5.26	44.26	20.30
8	79.180	150.00	2.00	0.30	839.10	192.00	843.62	0.00	843.63	86.06	5.81	45.96	20.70
9	79.180	150.00	2.00	0.30	839.10	200.00	843.88	0.00	843.79	86.56	5.90	46.04	21.50
10													
11	79.190	70.00	0.00	0.00	839.50	170.00	843.78	0.00	844.48	219.43	6.73	25.26	11.48
12	79.190	70.00	0.00	0.00	839.50	180.00	843.95	0.00	844.73	233.26	7.16	26.65	12.31
13	79.190	70.00	0.00	0.00	839.50	192.00	843.98	0.00	844.72	230.30	7.13	26.95	12.49
14	79.190	70.00	0.00	0.00	839.50	200.00	844.09	0.00	844.83	219.11	7.27	27.35	12.95
15													
16	79.200	50.00	0.00	0.00	839.90	170.00	843.09	0.00	846.15	424.41	8.27	20.55	8.25
17	79.200	50.00	0.00	0.00	839.90	180.00	843.33	0.00	846.52	454.46	8.72	21.55	8.82
18	79.200	50.00	0.00	0.00	839.90	192.00	843.59	0.00	846.60	460.80	8.82	21.77	8.96
19	79.200	50.00	0.00	0.00	839.90	200.00	843.77	0.00	846.74	477.50	9.04	22.13	9.19
20													
21	79.300	123.00	900.00	644.50	840.50	170.00	853.24	0.00	853.43	47.06	3.33	46.77	27.79
22	79.300	123.00	900.00	644.50	840.50	180.00	854.15	0.00	854.34	39.32	3.46	54.41	29.90
23	79.300	123.00	900.00	644.50	840.50	192.00	854.67	0.00	854.78	37.85	3.42	56.19	31.21
24	79.300	123.00	900.00	644.50	840.50	200.00	855.48	0.00	855.67	35.26	3.35	59.77	33.68
25													
26	80.000	50.00	0.00	0.00	840.30	170.00	852.51	0.00	852.53	0.07	0.40	726.35	417.21
27	80.000	50.00	0.00	0.00	840.30	345.00	854.47	0.00	854.39	0.20	0.36	551.96	321.43
28	80.000	50.00	0.00	0.00	840.30	475.00	854.91	0.00	854.59	0.29	0.32	1006.37	586.87
29	80.000	50.00	0.00	0.00	840.30	720.00	855.71	0.00	855.72	0.49	1.12	1187.52	1025.43
30													
31	80.200	220.00	0.00	0.00	841.10	170.00	852.54	0.00	852.57	0.94	0.56	507.69	440.92
32	80.200	220.00	0.00	0.00	841.10	345.00	854.29	0.00	854.30	0.29	0.75	750.20	651.35
33	80.200	220.00	0.00	0.00	841.10	475.00	855.33	0.00	854.37	0.41	0.92	912.36	771.62
34	80.200	220.00	0.00	0.00	841.10	720.00	855.72	0.00	855.74	0.68	1.25	992.68	870.25
35													
36	80.400	220.00	0.00	0.00	842.80	170.00	852.51	0.00	852.57	0.24	0.55	493.03	549.05
37	80.400	220.00	0.00	0.00	842.80	345.00	854.40	0.00	854.41	0.09	0.86	711.78	553.15
38	80.400	220.00	0.00	0.00	842.80	475.00	854.84	0.00	854.86	0.01	1.05	768.12	603.04
39	80.400	220.00	0.00	0.00	842.80	720.00	855.73	0.00	855.75	0.91	1.41	870.92	727.29
40													
41	80.600	220.00	0.00	0.00	843.60	170.00	852.52	0.00	852.53	0.62	0.67	391.53	269.97
42	80.600	220.00	0.00	0.00	843.60	345.00	854.41	0.00	854.42	0.69	1.01	593.12	439.87
43	80.600	220.00	0.00	0.00	843.60	475.00	854.86	0.00	854.87	0.95	1.22	647.53	489.55
44	80.600	220.00	0.00	0.00	843.60	720.00	855.76	0.00	855.78	1.08	1.62	755.14	597.69
45													
46	80.800	220.00	0.00	0.00	844.30	170.00	852.53	0.00	852.54	0.64	0.64	290.78	170.45
47	80.800	220.00	0.00	0.00	844.30	345.00	854.43	0.00	854.44	1.15	1.20	435.31	340.69
48	80.800	220.00	0.00	0.00	844.30	475.00	854.89	0.00	854.90	1.53	1.44	535.97	584.11
49	80.800	220.00	0.00	0.00	844.30	720.00	855.79	0.00	855.83	2.25	1.87	639.70	401.98
50													
51	81.000	220.00	0.00	0.00	845.00	170.00	852.55	0.00	852.56	0.70	0.72	456.93	283.45
52	81.000	220.00	0.00	0.00	845.00	345.00	854.43	0.00	854.47	0.91	0.95	757.35	405.70
53	81.000	220.00	0.00	0.00	845.00	475.00	854.93	0.00	854.96	1.36	1.12	854.86	464.75
54	81.000	220.00	0.00	0.00	845.00	720.00	855.66	0.00	855.87	1.45	1.43	998.55	597.61
55													
56													
57													

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CMSEL	CMWS	PB	TDK*S	VCR	AREA	.DSK
	81.200	200.00	0.00	0.00	846.90	170.00	852.57	0.00	852.50	1.77	1.01	322.81	127.75
	81.200	200.00	0.00	0.00	846.90	365.00	854.47	0.00	854.49	1.54	1.10	600.97	294.32
	81.200	200.00	0.00	0.00	846.90	475.00	854.56	0.00	854.57	1.39	1.30	675.55	345.07
	81.200	200.00	0.00	0.00	846.90	720.00	855.89	0.00	855.91	2.43	1.71	831.65	482.08
	81.400	200.00	0.00	0.00	847.90	170.00	852.62	0.00	852.65	5.72	1.55	203.66	71.05
	81.400	200.00	0.00	0.00	847.90	365.00	854.52	0.00	854.54	3.30	1.57	454.20	209.07
	81.400	200.00	0.00	0.00	847.90	475.00	855.02	0.00	855.03	3.77	1.77	525.16	244.69
	81.400	200.00	0.00	0.00	847.90	720.00	855.95	0.00	855.98	5.31	2.10	675.96	364.32
	82.000	200.00	0.00	0.00	848.90	170.00	852.79	0.00	852.82	13.76	1.85	189.72	45.85
	82.000	200.00	0.00	0.00	848.90	365.00	854.60	0.00	854.62	4.62	1.56	455.42	169.77
	82.000	200.00	0.00	0.00	848.90	475.00	855.08	0.00	855.11	4.97	1.74	528.54	256.91
	82.000	200.00	0.00	0.00	848.90	720.00	856.06	0.00	856.08	6.22	2.03	675.79	375.07
	82.100	160.00	0.00	0.00	850.00	170.00	853.16	0.00	853.40	97.65	4.20	97.05	17.22
	82.100	160.00	0.00	0.00	850.00	365.00	854.70	0.00	854.81	24.25	3.19	201.40	76.92
	82.100	160.00	0.00	0.00	850.00	475.00	855.19	0.00	855.30	22.64	3.37	248.34	99.82
	82.100	160.00	0.00	0.00	850.00	720.00	856.21	0.00	856.28	20.21	3.77	365.96	150.77
	82.200	160.00	0.00	0.00	851.00	170.00	853.40	0.00	853.55	58.00	3.32	79.52	23.30
	82.200	160.00	0.00	0.00	851.00	365.00	855.20	0.00	855.39	50.56	4.12	154.12	51.45
	82.200	160.00	0.00	0.00	851.00	475.00	855.65	0.00	855.83	44.30	4.26	196.02	71.37
	82.200	160.00	0.00	0.00	851.00	720.00	856.57	0.00	856.73	35.79	4.50	282.55	120.36
	82.300	160.00	0.00	0.00	852.00	170.00	853.42	0.00	853.65	64.36	3.07	72.05	21.19
	82.300	160.00	0.00	0.00	852.00	365.00	855.10	0.00	855.30	62.20	4.01	142.22	46.53
	82.300	160.00	0.00	0.00	852.00	475.00	856.44	0.00	856.67	59.47	4.72	176.18	61.59
	82.300	160.00	0.00	0.00	852.00	720.00	857.19	0.00	857.45	51.35	5.11	268.62	99.59
	82.400	160.00	0.00	0.00	853.00	170.00	853.55	0.00	853.50	61.51	3.50	73.67	21.47
	82.400	160.00	0.00	0.00	853.00	365.00	855.27	0.00	855.29	62.37	4.44	142.17	46.22
	82.400	160.00	0.00	0.00	853.00	475.00	856.41	0.00	856.65	62.27	4.61	173.33	60.22
	82.400	160.00	0.30	0.00	853.00	720.00	856.57	0.00	856.35	59.03	5.37	236.56	93.30
	82.500	160.00	0.30	0.00	854.00	170.00	853.31	0.00	853.52	63.72	3.77	52.59	21.50
	82.500	160.00	0.30	0.00	854.00	365.00	855.12	0.00	855.30	75.93	5.21	103.27	30.93
	82.500	160.00	0.30	0.00	854.00	475.00	856.46	0.00	856.65	63.05	4.77	129.39	52.12
	82.500	160.00	0.30	0.00	854.00	720.00	856.99	0.00	856.60	65.42	5.60	185.52	77.20
	82.600	160.00	0.30	0.00	855.00	170.00	853.53	0.00	853.54	62.93	3.75	52.97	21.43
	82.600	160.00	0.30	0.00	855.00	365.00	855.32	0.00	855.62	59.45	4.74	118.38	47.34
	82.600	160.00	0.30	0.00	855.00	475.00	856.71	0.00	856.83	58.50	5.14	150.12	61.55
	82.600	160.00	0.30	0.00	855.00	720.00	857.30	0.00	857.28	60.13	5.82	211.14	92.35
	83.000	170.00	0.00	0.00	855.90	170.00	859.33	0.00	859.50	49.96	3.45	56.70	24.05
	83.000	170.00	0.30	0.00	855.90	365.00	860.51	0.00	860.36	50.07	4.44	125.65	51.15
	83.000	170.00	0.30	0.00	855.90	475.00	860.71	0.00	860.99	51.65	4.83	156.20	66.09
	83.000	170.00	0.30	0.00	855.90	720.00	861.41	0.00	861.78	54.62	5.61	219.82	97.27
	83.200	230.00	0.00	0.00	856.90	170.00	860.42	0.00	860.57	43.47	3.32	61.40	25.71
	83.200	230.00	0.00	0.00	856.90	365.00	861.45	0.00	861.65	43.40	4.20	136.57	55.41
	83.200	230.00	0.30	0.00	856.90	475.00	861.84	0.00	862.09	43.85	4.57	167.02	71.75
	83.200	230.00	0.30	0.00	856.90	720.00	862.60	0.00	862.91	44.83	5.24	229.22	107.53

SECNO	XLCH	ELTRD	ELLC	ZLTIN	Q	CHSEL	CRINS	ES	10X*S	VCH	ARGA	.01X
83.400	230.00	0.00	0.00	857.90	170.00	861.42	0.00	861.55	43.54	5.30	61.25	25.76
83.400	230.00	0.00	0.00	857.90	365.00	862.43	0.00	862.65	43.44	4.20	134.61	55.38
83.400	230.00	0.00	0.00	857.90	475.00	862.85	0.00	863.17	43.51	4.56	157.53	72.02
83.400	230.00	0.00	0.00	857.90	720.00	863.63	0.00	863.93	43.71	5.19	231.44	108.90
84.000	250.00	0.00	0.00	859.40	170.00	862.40	0.00	862.54	36.16	3.01	59.03	29.09
84.000	250.00	0.00	0.00	859.40	365.00	863.44	0.00	863.97	33.31	4.06	121.95	57.05
84.000	250.00	0.00	0.00	859.40	475.00	863.87	0.00	864.14	39.23	4.57	151.74	75.79
84.000	250.00	0.00	0.00	859.40	720.00	864.67	0.00	865.08	41.02	5.10	208.99	112.62
84.500	370.00	0.00	0.00	860.40	170.00	863.56	0.00	863.68	27.50	2.81	64.66	32.42
84.500	370.00	0.00	0.00	860.40	365.00	864.71	0.00	864.89	27.92	3.65	140.16	69.08
84.500	370.00	0.00	0.00	860.40	475.00	865.14	0.00	865.39	28.50	4.30	173.35	89.93
84.500	370.00	0.00	0.00	860.40	720.00	866.04	0.00	866.31	29.63	4.44	237.15	132.27
85.000	370.00	0.00	0.00	861.60	170.00	864.79	0.00	864.95	42.95	3.31	57.54	25.94
85.000	370.00	0.00	0.00	861.60	365.00	865.96	0.00	866.23	45.30	4.45	105.86	54.36
85.000	370.00	0.00	0.00	861.60	475.00	866.44	0.00	866.75	45.36	4.87	134.86	70.54
85.000	370.00	0.00	0.00	861.60	720.00	867.32	0.00	867.72	45.54	5.60	190.93	104.52
85.500	415.00	0.00	0.00	862.90	170.00	866.34	0.00	866.46	30.61	2.91	64.43	33.73
85.500	415.00	0.00	0.00	862.90	365.00	867.50	0.00	867.79	31.23	3.94	126.08	65.32
85.500	415.00	0.00	0.00	862.90	475.00	868.10	0.00	868.34	31.79	4.33	156.97	84.24
85.500	415.00	0.00	0.00	862.90	720.00	869.03	0.00	869.34	32.81	5.01	218.49	125.70
86.000	415.00	0.00	0.00	864.20	170.00	867.37	0.00	867.34	15.10	2.13	85.15	43.65
86.000	415.00	0.00	0.00	864.20	365.00	868.59	0.00	868.71	15.74	2.81	151.52	92.50
86.000	415.00	0.00	0.00	864.20	475.00	869.14	0.00	869.26	16.13	3.18	189.95	100.26
86.000	415.00	0.00	0.00	864.20	720.00	870.23	0.00	870.31	16.45	3.68	276.27	177.50

ARCADIA CREEK KALAMAZOO

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	1.000	321.00	767.12	0.00	0.00	-0.88	326.22	0.00
*	1.000	573.00	767.40	0.00	0.00	-0.[illegible]	352.5[illegible]	0.00
*	1.000	672.00	767.49	0.00	0.00	-0.51	38[illegible].5[illegible]	0.00
*	1.000	935.00	767.72	0.00	0.00	-0.2[illegible]	383.48	0.00
	2.000	321.00	768.15	0.00	1.02	0.00	493.07	750.00
	2.000	573.00	768.56	0.00	1.16	0.00	535.6[illegible]	750.00
	2.000	672.00	768.7[illegible]	0.00	1.20	0.00	553.05	750.00
	2.000	935.00	769.0[illegible]	0.00	1.31	0.00	5[illegible].15	750.00
*	3.000	321.00	768.60	0.00	0.46	0.00	224.15	335.00
*	3.000	573.00	768.61	0.00	0.25	0.00	277.19	335.00
	3.000	672.00	768.93	0.00	0.23	0.00	307.82	335.00
	3.000	935.00	769.[illegible]	0.00	0.[illegible]	0.00	624.77	335.00
	3.500	321.00	770.03	0.00	1.12	0.00	34[illegible].1[illegible]	225.00
	3.500	573.00	770.38	0.00	1.57	0.00	564.15	225.00
	3.500	672.00	770.46	0.00	1.35	0.00	577.05	225.00
	3.500	935.00	770.56	0.00	1.26	0.00	621.7[illegible]	225.00
	4.000	321.00	770.94	0.00	0.[illegible]	0.00	30[illegible]	22[illegible].00
	4.000	573.00	771.[illegible]	0.00	0.[illegible]	0.00	40[illegible].11	22[illegible].00
	4.000	672.00	771.39	0.00	0.[illegible]	0.00	456.54	22[illegible].00
	4.000	935.00	771.65	0.00	1.09	0.00	529.59	220.00
	5.000	321.00	771.[illegible]	0.00	0.[illegible]	0.00	47[illegible].07	15[illegible].00
	5.000	57[illegible].00	771.[illegible]	0.00	0.[illegible]	0.00	512.1[illegible]	150.00
	5.000	672.00	77[illegible].6[illegible]	0.00	0.[illegible]	0.00	52[illegible].1[illegible]	150.00
	5.000	935.00	771.91	0.00	0.26	0.00	550.03	150.00
*	6.000	321.00	771.93	0.00	0.71	0.00	39[illegible].55	310.00
	6.000	573.00	772.16	0.00	[illegible]	0.00	5[illegible].72	310.00
	6.000	672.00	772.22	0.00	0.55	0.00	5[illegible].4[illegible]	310.00
	6.000	935.00	772.4[illegible]	0.00	[illegible]	0.00	54[illegible].6[illegible]	310.00
	7.000	321.00	773.98	0.00	2.00	0.00	562.9[illegible]	150.00
	7.000	573.00	774.17	0.00	2.00	0.00	591.9[illegible]	150.00
	7.000	672.00	774.2[illegible]	0.00	2.0[illegible]	0.00	5[illegible].[illegible]	150.00
	7.000	935.00	774.37	0.00	1.97	0.00	6[illegible].[illegible]	150.00
*	8.000	321.00	775.44	0.00	1.45	0.00	71[illegible].41	125.00
*	8.000	573.00	775.64	0.00	1.47	0.00	746.61	125.00
*	8.000	672.00	775.72	0.00	1.47	0.00	757.[illegible]	125.00
*	8.000	935.00	775.89	0.00	[illegible].52	0.00	7[illegible].[illegible]	125.00
*	9.000	321.00	776.[illegible]	0.00	0.87	0.00	[illegible]	110.00
*	9.000	573.00	776.54	0.00	0.89	0.00	594.31	110.00
*	9.000	672.00	776.62	0.00	0.91	0.00	612.34	110.00
*	9.000	935.00	776.81	0.00	0.92	0.00	651.40	110.00
*	9.500	321.00	776.91	0.00	0.60	0.00	366.05	55.00
*	9.500	573.00	777.[illegible]	0.00	0.61	0.00	395.53	55.00
*	9.500	672.00	777.22	0.00	0.59	0.00	511.01	55.00
*	9.500	935.00	777.41	0.00	0.60	0.00	[illegible]31.05	55.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	10.000	321.00	777.46	0.00	0.52	0.00	824.35	60.00
*	10.000	573.00	777.64	0.00	0.50	0.00	854.21	60.00
*	10.000	672.00	777.72	0.00	0.50	0.00	865.12	60.00
*	10.000	935.00	777.89	0.00	0.48	0.00	890.77	60.00
*	10.500	321.00	777.94	0.00	0.50	0.00	824.35	55.00
*	10.500	573.00	778.14	0.00	0.50	0.00	854.21	55.00
*	10.500	672.00	778.21	0.00	0.49	0.00	864.39	55.00
*	10.500	935.00	778.39	0.00	0.50	0.00	890.45	55.00
	11.000	321.00	778.54	0.00	0.60	0.00	855.70	55.00
	11.000	573.00	778.71	0.00	0.57	0.00	894.29	55.00
	11.000	672.00	778.76	0.00	0.55	0.00	907.21	55.00
	11.000	935.00	778.86	0.00	0.47	0.00	931.50	55.00
	12.000	321.00	778.91	0.00	0.37	0.00	561.32	150.00
	12.000	573.00	779.30	0.00	0.59	0.00	810.00	150.00
	12.000	672.00	779.42	0.00	0.66	0.00	827.67	150.00
	12.000	935.00	779.77	0.00	0.66	0.00	870.71	150.00
	13.000	454.00	778.96	0.00	0.[illegible]	0.00	496.[illegible]	5[illegible].00
	13.000	713.00	779.36	0.00	0.85	0.00	806.37	50.00
	13.000	814.00	779.48	0.00	0.86	0.00	1050.96	50.00
	13.000	1081.00	779.78	0.00	0.85	0.00	1200.00	50.00
	14.000	454.00	780.00	0.00	1.[illegible]	0.00	[illegible]34.[illegible]	220.00
	14.000	713.00	780.26	0.00	0.50	0.00	53[illegible]	220.00
	14.000	814.00	780.33	0.00	0.[illegible]	0.00	1016.[illegible]	220.00
	14.000	1081.00	780.46	0.00	0.69	0.00	1141.96	220.00
	15.000	454.00	781.[illegible]	0.00	1.[illegible]	0.00	[illegible]	350.00
	15.000	713.00	781.60	0.00	1.[illegible]	0.00	[illegible]	350.00
	15.000	814.00	781.65	0.00	1.[illegible]	0.00	1112.[illegible]	350.00
	15.000	1081.00	781.92	0.00	1.45	0.00	1282.23	350.00
	16.000	454.00	781.90	0.00	0.54	0.00	596.34	365.00
	16.000	713.00	782.[illegible]	0.00	0.61	0.00	649.40	365.00
	16.000	814.00	782.[illegible]	0.00	0.61	0.00	667.[illegible]	365.00
	16.000	1081.00	782.54	0.00	0.6[illegible]	0.00	[illegible]	365.00
	17.000	454.00	782.34	0.00	0.44	0.00	4[illegible]6.90	148.00
	17.000	713.00	782.63	0.00	0.44	0.00	620.32	148.00
	17.000	814.00	782.74	0.00	0.43	0.00	[illegible]39.74	148.00
	17.000	1081.00	782.94	0.00	0.42	0.00	726.00	148.00
	18.000	454.00	783.06	0.00	0.72	0.00	218.47	117.00
	18.000	713.00	783.34	0.00	0.69	0.00	265.45	117.00
	18.000	814.00	783.42	0.00	0.63	0.00	2[illegible].09	117.00
	18.000	1081.00	783.62	0.00	0.56	0.00	[illegible]	117.00
	19.000	435.00	784.[illegible]	0.00	1.[illegible]	0.00	254.95	230.00
	19.000	692.00	784.79	0.00	1.45	0.00	477.12	230.00
	19.000	792.00	784.88	0.00	1.46	0.00	579.39	230.00
	19.000	1058.00	785.09	0.00	1.47	0.00	600.00	230.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	20.000	435.00	785.78	0.00	1.25	0.00	445.93	230.00
	20.000	692.00	785.99	0.00	1.20	0.00	454.57	230.00
	20.000	792.00	786.05	0.00	1.17	0.00	435.74	230.00
	20.000	1058.00	786.19	0.00	1.10	0.00	522.40	230.00
	21.000	435.00	786.90	0.00	1.20	0.00	366.76	220.00
	21.000	692.00	787.12	0.00	1.14	0.00	[illegible]	220.00
	21.000	792.00	787.17	0.00	1.13	0.00	387.[illegible]	220.00
	21.000	1058.00	787.30	0.00	1.11	0.00	417.76	220.00
	22.000	435.00	787.98	0.00	1.00	0.00	316.76	235.00
	22.000	692.00	788.15	0.00	1.03	0.00	343.52	235.00
	22.000	792.00	788.20	0.00	1.0[illegible]	0.00	342.50	235.00
*	22.000	1058.00	788.34	0.00	1.04	0.00	376.45	235.00
	23.000	435.00	788.95	0.00	0.97	0.00	310.01	215.00
*	23.000	692.00	789.12	0.00	0.97	0.00	343.55	215.00
*	23.000	792.00	789.18	0.00	0.98	0.00	356.84	215.00
*	23.000	1058.00	789.35	0.00	1.01	0.00	370.23	215.00
	24.000	435.00	789.80	0.00	0.95	0.00	330.11	225.00
	24.000	692.00	790.09	0.00	0.97	0.00	354.22	225.00
	24.000	792.00	790.15	0.00	0.97	0.00	361.93	225.00
	24.000	1058.00	790.31	0.00	0.95	0.00	380.61	225.00
*	25.000	435.00	790.7[illegible]	0.00	0.00	0.00	420.71	190.00
*	25.000	692.00	790.[illegible]	0.00	0.00	0.00	446.7[illegible]	190.00
*	25.000	792.00	790.95	0.00	0.00	0.00	453.64	190.00
*	25.000	1058.00	791.10	0.00	0.79	0.00	469.97	190.00
	26.000	435.00	791.51	0.00	0.[illegible]	0.00	[illegible]	[illegible]
	26.000	692.00	791.7[illegible]	0.00	0.[illegible]	0.00	1[illegible]03.[illegible]	[illegible]
	26.000	792.00	791.80	0.00	0.[illegible]	0.00	1[illegible]2.76	[illegible]
	26.000	1058.00	792.00	0.00	0.93	0.00	1095.44	10[illegible].00
*	27.000	665.00	792.50	0.00	0.98	0.00	298.78	270.00
*	27.000	920.00	792.6[illegible]	0.00	0.[illegible]	0.00	302.9[illegible]	270.00
*	27.000	1020.00	792.71	0.00	0.81	0.00	30[illegible].02	270.00
*	27.000	1285.00	792.86	0.00	0.[illegible]	0.00	311.07	270.00
	28.000	665.00	792.96	0.00	0.67	0.00	296.19	45.00
	28.000	920.00	793.25	0.00	0.63	0.00	297.75	45.00
	28.000	1020.00	793.31	0.00	0.60	0.00	297.92	45.00
	28.000	1285.00	793.50	0.00	0.64	0.00	298.51	45.00
	29.000	665.00	793.94	0.00	0.90	0.00	270.42	82.00
	29.000	920.00	794.24	0.00	0.99	0.00	298.[illegible]	82.00
	29.000	1020.00	794.35	0.00	1.04	0.00	307.53	82.00
	29.000	1285.00	794.6[illegible]	0.00	1.11	0.00	320.[illegible]	82.00
	30.000	665.00	793.91	0.00	0.04	0.00	259.[illegible]	55.00
	30.000	920.00	794.23	0.00	0.04	0.00	297.31	55.00
	30.000	1020.00	794.39	0.00	0.04	0.00	310.80	55.00
	30.000	1285.00	794.65	0.00	0.04	0.00	363.71	55.00

	SECNO	Q	CUSEL	DIFUSP	DIFUSX	DIFKHS	TOPHID	XLCH
*	31.000	665.00	794.23	0.00	0.27	0.00	211.68	300.00
	31.000	920.00	794.49	0.00	0.27	0.00	218.06	300.00
	31.000	1020.00	794.39	0.00	0.20	0.00	221.89	300.00
	31.000	1285.00	794.85	0.00	0.20	0.00	263.65	300.00
*	32.000	665.00	795.23	0.00	0.99	0.00	196.70	150.00
*	32.000	920.00	795.45	0.00	0.97	0.00	203.64	150.00
*	32.000	1020.00	795.53	0.00	0.96	0.00	206.06	150.00
*	32.000	1285.00	795.73	0.00	0.86	0.00	212.21	150.00
	33.000	665.00	796.12	0.00	0.80	0.00	294.07	92.00
	33.000	920.00	796.40	0.00	0.95	0.00	326.56	92.00
	33.000	1020.00	796.51	0.00	0.96	0.00	338.62	92.00
	33.000	1285.00	796.79	0.00	1.36	0.00	369.05	92.00
	34.000	665.00	796.17	0.00	0.06	0.00	255.10	75.00
	34.000	920.00	796.47	0.00	0.06	0.00	283.55	75.00
	34.000	1020.00	796.56	0.00	0.07	0.00	294.01	75.00
	34.000	1285.00	796.85	0.00	0.07	0.00	298.05	75.00
	35.000	665.00	796.57	0.00	0.39	0.00	104.92	400.00
	35.000	920.00	797.00	0.00	0.33	0.00	108.56	400.00
	35.000	1020.00	797.16	0.00	0.38	0.00	114.97	400.00
	35.000	1285.00	797.53	0.00	0.66	0.00	129.99	400.00
	36.000	665.00	797.90	0.00	1.37	0.00	23.20	310.00
	36.000	920.00	798.36	0.00	1.37	0.00	24.15	310.00
	36.000	1020.00	798.70	0.00	1.54	0.00	24.95	310.00
	36.000	1285.00	799.13	0.00	1.60	0.00	28.12	310.00
	37.000	665.00	798.07	0.00	0.11	0.00	23.11	50.00
	37.000	920.00	798.67	0.00	0.11	0.00	23.55	50.00
	37.000	1020.00	798.87	0.00	0.11	0.00	24.91	50.00
	37.000	1285.00	799.36	0.00	0.23	0.00	27.60	50.00
*	38.000	540.00	801.55	0.00	3.54	0.00	126.31	100.00
*	38.000	796.00	801.82	0.00	3.13	0.00	140.70	100.00
*	38.000	896.00	801.93	0.00	3.03	0.00	145.20	100.00
*	38.000	1161.00	802.17	0.00	2.90	0.00	156.01	100.00
	39.000	540.00	802.99	0.00	1.44	0.00	199.40	100.00
	39.000	796.00	803.26	0.00	1.44	0.00	212.82	100.00
	39.000	896.00	803.35	0.00	1.42	0.00	217.25	100.00
	39.000	1161.00	803.58	0.00	1.41	0.00	228.74	100.00
	40.000	540.00	804.08	0.00	1.09	0.00	154.14	125.00
	40.000	796.00	804.33	0.00	1.07	0.00	166.72	125.00
	40.000	896.00	804.43	0.00	1.08	0.00	170.94	125.00
	40.000	1161.00	804.63	0.00	1.05	0.00	181.27	125.00
	41.000	540.00	805.26	0.00	1.17	0.00	140.50	100.00
	41.000	796.00	805.57	0.00	1.24	0.00	135.66	100.00
	41.000	896.00	805.69	0.00	1.26	0.00	160.98	100.00
	41.000	1161.00	805.95	0.00	1.32	0.00	173.01	100.00

SECNO	Q	CHSEL	DIFWSP	DIFMSX	DIFKWS	TOPWID	XLCH
42.000	540.00	806.50	0.00	1.24	0.00	151.71	125.00
42.000	796.00	806.90	0.00	1.33	0.00	70.94	125.00
42.000	896.00	807.05	0.00	1.36	0.00	178.16	125.00
42.000	1161.00	807.40	0.00	1.45	0.00	195.34	125.00
43.000	540.00	807.84	0.00	1.36	0.00	144.32	175.00
43.000	796.00	808.20	0.00	1.30	0.00	161.41	175.00
43.000	896.00	808.33	0.00	1.23	0.00	167.73	175.00
43.000	1161.00	808.65	0.00	1.24	0.00	162.96	175.00
44.000	540.00	809.34	0.00	1.50	0.00	166.94	175.00
44.000	796.00	809.73	0.00	1.53	0.00	185.82	175.00
44.000	896.00	809.86	0.00	1.53	0.00	192.99	175.00
44.000	1161.00	810.21	0.00	1.56	0.00	200.30	175.00
45.000	540.00	810.42	0.00	1.09	0.00	214.08	475.00
45.000	796.00	810.90	0.00	1.17	0.00	230.12	475.00
45.000	896.00	811.06	0.00	1.20	0.00	235.47	475.00
45.000	1161.00	811.47	0.00	1.25	0.00	249.10	475.00
46.000	540.00	811.35	0.00	0.61	0.00	192.79	450.00
46.000	796.00	811.47	0.00	0.57	0.00	207.39	450.00
46.000	896.00	811.53	0.00	0.57	0.00	212.46	450.00
46.000	1161.00	812.32	0.00	0.55	0.00	225.78	450.00
47.000	665.00	811.39	0.00	0.33	0.00	170.25	450.00
47.000	920.00	811.53	0.00	0.4[illegible]	0.00	177.10	450.00
47.000	1020.00	812.05	0.00	0.45	0.00	179.11	450.00
47.000	1285.00	812.43	0.00	0.45	0.00	181.83	450.00
48.000	665.00	811.41	0.00	0.33	0.00	154.37	125.00
48.000	920.00	811.21	0.00	0.33	0.00	163.79	125.00
48.000	1020.00	812.39	0.00	0.33	0.00	166.21	125.00
48.000	1285.00	812.52	0.00	0.24	0.00	172.12	125.00
49.000	665.00	811.45	0.00	0.33	0.00	74.63	237.00
49.000	920.00	811.93	0.00	0.32	0.00	86.61	237.00
49.000	1020.00	812.10	0.00	0.31	0.00	90.0[illegible]	237.00
49.000	1285.00	812.31	0.00	-0.01	0.00	97.43	237.00
50.000	315.00	812.34	0.00	0.90	0.00	79.39	95.00
50.000	435.00	813.13	0.00	1.20	0.00	95.95	95.00
50.000	435.00	813.40	0.00	1.30	0.00	103.72	95.00
50.000	745.00	813.97	0.00	1.[illegible]	0.00	113.[illegible]	95.00
51.000	315.00	815.14	0.00	2.79	0.00	40.00	126.00
51.000	435.00	815.65	0.00	2.52	0.00	40.00	126.00
51.000	435.00	815.81	0.00	2.41	0.00	40.00	126.00
51.000	745.00	816.45	0.00	2.48	0.00	40.00	126.00
52.000	315.00	815.16	0.00	0.02	0.00	142.32	50.00
52.000	435.00	815.69	0.00	0.04	0.00	146.41	50.00
52.000	435.00	815.86	0.00	0.05	0.00	147.82	50.00
52.000	745.00	816.55	0.00	0.10	0.00	153.24	50.00

SECNO	Q	CHSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
53.000	315.00	815.18	0.00	0.02	0.00	206.71	195.00
53.000	435.00	815.72	0.00	0.03	0.00	210.71	195.00
53.000	485.00	815.89	0.00	0.04	0.00	212.02	195.00
53.000	745.00	816.61	0.00	0.06	0.00	217.34	195.00
54.000	315.00	815.20	0.00	0.01	0.00	186.57	160.00
54.000	435.00	815.77	0.00	0.01	0.00	199.25	160.00
54.000	485.00	815.91	0.00	0.01	0.00	203.39	160.00
54.000	745.00	816.63	0.00	0.02	0.00	210.07	160.00
55.000	315.00	815.22	0.00	0.03	0.00	46.00	135.00
55.000	435.00	815.77	0.00	0.03	0.00	195.11	135.00
55.000	485.00	815.95	0.00	0.04	0.00	199.25	135.00
55.000	745.00	816.67	0.00	0.04	0.00	208.02	135.00
56.000	315.00	820.02	0.00	4.79	0.00	20.00	66.00
56.000	435.00	824.69	0.00	0.72	0.00	214.65	66.00
56.000	485.00	824.64	0.00	0.69	0.00	218.83	66.00
56.000	745.00	825.08	0.00	0.41	0.00	231.09	66.00
57.000	315.00	819.25	0.00	-0.77	0.00	7.46	60.00
57.000	435.00	824.68	0.00	-0.00	0.00	245.74	60.00
57.000	485.00	824.64	0.00	-0.00	0.00	248.16	60.00
57.000	745.00	825.08	0.00	0.00	0.00	255.31	60.00
58.000	315.00	820.91	0.00	0.03	0.00	8.01	40.00
58.000	435.00	824.67	0.00	-0.02	0.00	226.01	40.00
58.000	485.00	824.63	0.00	-0.01	0.00	228.59	40.00
58.000	745.00	825.08	0.00	-0.00	0.00	236.94	40.00
59.000	315.00	826.21	0.00	0.37	0.00	225.65	133.00
59.000	435.00	826.71	0.00	2.24	0.00	236.09	133.00
59.000	485.00	826.79	0.00	2.17	0.00	238.21	133.00
59.000	745.00	827.14	0.00	2.06	0.00	246.75	133.00
60.000	315.00	826.29	0.00	0.01	0.00	198.72	100.00
60.000	435.00	826.72	0.00	0.02	0.00	199.50	100.00
60.000	485.00	826.81	0.00	0.02	0.00	199.65	100.00
60.000	745.00	827.18	0.00	0.04	0.00	200.02	100.00
61.000	315.00	826.30	0.00	0.00	0.00	208.72	50.00
61.000	435.00	826.72	0.00	0.00	0.00	209.50	50.00
61.000	485.00	826.81	0.00	0.00	0.00	209.65	50.00
61.000	745.00	827.18	0.00	0.00	0.00	210.00	50.00
62.000	315.00	826.30	0.00	0.00	0.00	208.63	100.00
62.000	435.00	826.72	0.00	0.00	0.00	209.47	100.00
62.000	485.00	826.81	0.00	0.00	0.00	209.64	100.00
62.000	745.00	827.18	0.00	0.00	0.00	210.00	100.00
63.000	315.00	826.30	0.00	0.00	0.00	208.11	120.00
63.000	435.00	826.72	0.00	0.00	0.00	209.43	120.00
63.000	485.00	826.81	0.00	0.00	0.00	209.62	120.00
63.000	745.00	827.18	0.00	0.00	0.00	210.00	120.00

SECNO	Q	CHSEL	DIFUSP	DIFUSX	DIFKJS	TOPWID	XLCH
64.000	315.00	826.30	0.00	0.00	0.00	206.59	20.00
64.000	435.00	826.73	0.00	0.00	0.00	209.45	20.00
64.000	485.00	826.81	0.00	0.00	0.00	209.52	20.00
64.000	745.00	827.18	0.00	0.00	0.00	210.00	20.00
65.000	315.00	826.29	0.00	-0.00	0.00	195.93	166.00
65.000	435.00	826.72	0.00	-0.00	0.00	197.57	166.00
65.000	485.00	826.81	0.00	-0.00	0.00	198.00	166.00
65.000	745.00	827.18	0.00	-0.01	0.00	200.00	166.00
65.100	315.00	826.30	0.00	0.01	0.00	185.08	1.00
65.100	435.00	826.73	0.00	0.01	0.00	194.43	1.00
65.100	485.00	826.82	0.00	0.01	0.00	196.25	1.00
65.100	745.00	827.20	0.00	0.02	0.00	200.00	1.00
65.900	315.00	826.30	0.00	0.00	0.00	185.99	3.00
65.900	435.00	826.73	0.00	0.00	0.00	196.60	3.00
65.900	485.00	826.82	0.00	0.00	0.00	196.80	3.00
65.900	745.00	827.20	0.00	0.00	0.00	200.00	3.00
66.000	315.00	826.30	0.00	-0.00	0.00	193.99	1.00
66.000	435.00	826.73	0.00	-0.00	0.00	194.60	1.00
66.000	485.00	826.82	0.00	-0.00	0.00	196.36	1.00
66.000	745.00	827.19	0.00	-0.01	0.00	200.00	1.00
67.000	315.00	826.31	0.00	0.01	0.00	302.99	159.00
67.000	435.00	826.74	0.00	0.00	0.00	312.15	159.00
67.000	485.00	826.83	0.00	0.00	0.00	314.25	159.00
67.000	745.00	827.22	0.00	0.00	0.00	316.60	159.00
67.100	315.00	826.31	0.00	0.00	0.00	306.01	1.00
67.100	435.00	826.74	0.00	0.00	0.00	313.20	1.00
67.100	485.00	826.83	0.00	0.00	0.00	314.25	1.00
67.100	745.00	827.22	0.00	0.00	0.00	316.59	1.00
67.900	315.00	826.31	0.00	0.00	0.00	306.01	17.00
67.900	435.00	826.74	0.00	0.00	0.00	313.20	17.00
67.900	485.00	826.83	0.00	0.00	0.00	314.25	17.00
67.900	745.00	827.22	0.00	0.00	0.00	316.90	17.00
68.000	315.00	826.31	0.00	0.00	0.00	306.01	1.00
68.000	435.00	826.74	0.00	0.00	0.00	313.20	1.00
68.000	485.00	826.83	0.00	0.00	0.00	314.25	1.00
68.000	745.00	827.22	0.00	0.00	0.00	316.90	1.00
69.000	315.00	826.31	0.00	0.00	0.00	293.72	125.00
69.000	435.00	826.74	0.00	0.00	0.00	296.92	125.00
69.000	485.00	826.84	0.00	0.00	0.00	300.01	125.00
69.000	745.00	827.23	0.00	0.00	0.00	302.39	125.00
70.000	315.00	826.31	0.00	-0.00	0.00	245.80	125.00
70.000	435.00	826.74	0.00	-0.00	0.00	247.58	125.00
70.000	485.00	826.83	0.00	-0.00	0.00	248.56	125.00
70.000	745.00	827.23	0.00	-0.00	0.00	252.33	125.00

SECNO	Q	CHSEL	DIFWSP	DIFWSK	DIFKUS	TOPWID	XLCH
71.000	315.00	826.31	0.00	0.00	0.00	232.03	125.00
71.000	435.00	826.75	0.00	0.00	0.00	236.22	125.00
71.000	435.00	826.04	0.00	0.00	0.00	237.10	125.00
71.000	745.00	827.24	0.00	0.01	0.00	240.89	125.00
71.100	190.00	826.32	0.00	0.01	0.00	61.94	130.00
71.100	305.00	826.71	0.00	0.01	0.00	105.71	130.00
71.100	335.00	826.85	0.00	0.01	0.00	133.27	130.00
71.100	605.00	827.28	0.00	0.03	0.00	155.02	130.00
71.200	190.00	826.88	0.00	0.56	0.00	46.26	130.00
71.200	305.00	827.63	0.00	0.67	0.00	93.39	130.00
71.200	335.00	827.65	0.00	0.71	0.00	110.55	130.00
71.200	605.00	828.22	0.00	0.96	0.00	157.61	130.00
71.300	190.00	827.78	0.00	0.90	0.00	45.04	130.00
71.300	305.00	828.37	0.00	0.95	0.00	67.66	130.00
71.300	355.00	828.56	0.00	0.97	0.00	108.27	130.00
71.300	605.00	829.22	0.00	1.00	0.00	157.52	130.00
71.400	190.00	828.71	0.00	0.99	0.00	44.00	130.00
71.400	305.00	829.37	0.00	0.99	0.00	87.39	130.00
71.400	355.00	829.56	0.00	1.00	0.00	107.62	130.00
71.400	605.00	830.23	0.00	1.00	0.00	157.61	130.00
71.500	190.00	829.92	0.00	1.21	0.00	41.55	130.00
71.500	305.00	830.55	0.00	1.21	0.00	55.75	130.00
71.500	355.00	830.73	0.00	1.21	0.00	77.41	130.00
71.500	605.00	831.43	0.00	1.21	0.00	147.74	130.00
71.600	190.00	831.39	0.00	1.12	0.00	39.[illegible]	130.00
71.600	305.00	831.89	0.00	1.12	0.00	55.70	130.00
71.600	335.00	831.30	0.00	1.13	0.00	65.21	130.00
71.600	605.00	832.66	0.00	1.23	0.00	70.69	130.00
71.700	190.00	831.94	0.00	0.34	0.00	56.71	130.00
71.700	305.00	832.30	0.00	0.31	0.00	62.25	130.00
71.700	335.00	832.71	0.00	0.30	0.00	63.74	130.00
71.700	605.00	833.54	0.00	0.31	0.00	69.79	130.00
72.000	315.00	832.28	0.00	0.34	0.00	20.65	130.00
72.000	435.00	832.65	0.00	0.35	0.00	21.34	130.00
72.000	435.00	833.05	0.00	0.35	0.00	21.53	130.00
72.000	745.00	833.85	0.00	0.32	0.00	22.51	130.00
73.000	315.00	833.73	0.00	1.45	0.00	20.63	410.00
73.000	435.00	834.46	0.00	1.62	0.00	21.41	410.00
73.000	465.00	834.74	0.00	1.69	0.00	21.80	410.00
73.000	745.00	836.03	0.00	2.10	0.00	25.30	410.00
73.500	170.00	833.75	0.00	0.33	0.00	12.71	30.00
73.500	188.00	834.65	0.00	0.19	0.00	23.15	30.00
73.500	192.00	835.14	0.00	0.40	0.00	28.00	30.00
73.500	200.00	836.97	0.00	0.94	0.00	53.04	30.00

SECNO	C	CUSEL	DIFUSP	DIFUSX	DIFKUS	TOPWID	XLCH
74.900	170.00	840.49	0.00	6.74	0.00	90.90	295.00
74.900	180.00	840.65	0.00	6.70	0.00	92.98	295.00
74.900	192.00	840.70	0.01	6.67	0.00	95.42	295.00
74.000	200.00	840.84	0.02	6.67	0.00	94.96	295.00
75.000	170.00	840.49	0.00	0.01	0.00	142.94	300.00
75.000	180.00	840.66	0.00	0.01	0.00	144.24	300.00
75.000	192.00	840.71	0.00	0.01	0.00	144.82	300.00
75.000	200.00	840.87	0.00	0.01	0.00	145.67	300.00
76.000	170.00	840.50	0.00	0.00	0.00	264.36	540.00
76.000	180.00	840.67	0.00	0.01	0.00	266.20	540.00
76.000	192.00	840.71	0.01	0.01	0.00	267.37	540.00
76.000	200.00	840.85	0.00	0.01	0.00	269.44	540.00
77.000	170.00	840.50	0.00	0.01	0.00	94.92	265.00
77.000	180.00	840.67	0.00	0.01	0.00	96.14	265.00
77.000	192.00	840.72	0.00	0.01	0.00	99.06	265.00
77.000	200.00	840.15	0.01	0.01	0.00	101.59	265.00
77.300	170.00	840.50	0.01	-0.00	0.00	76.39	65.00
77.300	180.00	840.67	0.00	-0.00	0.00	77.39	65.00
77.300	192.00	840.72	0.00	-0.00	0.00	78.39	65.00
77.300	200.00	840.85	0.00	-0.00	0.00	80.70	65.00
78.000	170.00	840.50	0.01	0.00	0.00	56.70	65.00
78.000	180.00	840.69	0.00	0.00	0.00	61.00	65.00
78.000	192.00	840.76	0.00	0.02	0.00	62.45	65.00
78.000	200.00	840.87	0.00	0.02	0.00	64.09	65.00
79.000	170.00	840.50	0.01	0.00	0.00	54.17	165.00
79.000	180.00	840.68	0.01	0.00	0.00	55.53	165.00
79.000	192.00	840.74	0.01	0.00	0.00	55.93	165.00
79.000	200.00	840.89	0.00	0.12	0.00	56.93	165.00
79.100	170.00	840.96	0.00	0.34	0.00	25.19	290.00
79.100	180.00	841.15	0.00	0.32	0.00	26.59	290.00
79.100	192.00	841.19	0.00	0.32	0.00	27.11	290.00
79.100	200.00	841.37	0.00	0.31	0.00	27.51	290.00
79.120	170.00	841.34	0.00	0.35	0.00	19.21	150.00
79.120	180.00	841.09	0.00	0.34	0.00	20.05	150.00
79.120	192.00	841.92	0.00	0.33	0.00	20.43	150.00
79.120	200.00	841.59	0.00	0.09	0.00	20.70	150.00
79.180	170.00	843.01	0.00	1.26	0.00	21.01	150.00
79.180	180.00	843.13	0.00	1.29	0.00	22.16	150.00
79.180	192.00	843.22	0.00	1.29	0.00	22.39	150.00
79.180	200.00	843.39	0.00	1.29	0.00	22.85	150.00
79.190	170.00	843.78	0.00	0.77	0.00	7.80	75.00
79.190	180.00	843.93	0.00	0.77	0.00	7.96	75.00
79.190	192.00	843.99	0.00	0.78	0.00	7.99	75.00
79.190	200.00	844.06	0.00	0.77	0.00	8.04	75.00

SECNO	Q	CUSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
79.200	170.00	845.09	0.00	1.31	0.00	4.00	50.00
79.200	108.00	845.33	0.00	1.38	0.00	4.00	50.00
79.200	192.00	845.39	0.00	1.40	0.00	4.00	50.00
79.200	200.00	845.48	0.00	1.42	0.00	4.00	50.00
79.500	170.00	852.24	0.00	7.16	0.00	4.00	123.00
79.500	108.00	854.[illegible]	0.00	[illegible]	0.00	4.00	123.00
79.500	192.00	854.60	0.00	1.21	0.00	4.00	123.00
79.500	200.00	855.49	0.00	10.02	0.00	4.00	123.00
80.000	170.00	852.51	0.00	0.27	0.00	110.34	50.00
80.000	365.00	854.39	0.00	0.24	0.00	123.00	50.00
80.000	475.00	854.0[illegible]	0.00	0.23	0.00	125.0[illegible]	50.00
80.000	720.00	855.71	0.00	0.2[illegible]	0.00	127.65	50.00
80.200	170.00	852.51	0.00	0.00	0.00	115.29	220.00
80.200	365.00	854.39	0.00	0.00	0.00	120.86	220.00
80.200	475.00	854.03	0.00	0.01	0.00	122.15	220.00
80.200	720.00	855.7[illegible]	0.00	0.01	0.00	124.77	220.00
80.400	170.00	852.51	0.00	0.00	0.00	108.56	220.00
80.400	365.00	854.47	0.00	0.01	0.00	117.52	220.00
80.400	475.00	854.84	0.00	0.01	0.00	119.22	220.00
80.400	720.00	855.73	0.00	0.02	0.00	12[illegible].85	220.00
80.600	170.00	852.[illegible]	0.00	0.01	0.00	[illegible].11	220.00
80.600	365.00	854.4[illegible]	0.00	0.01	0.00	114.59	220.00
80.600	475.00	854.86	0.00	0.01	0.00	11[illegible].21	220.00
80.600	720.00	855.75	0.00	0.02	0.00	113.96	220.00
80.800	170.00	852.53	0.00	0.01	0.00	[illegible]9.79	220.00
80.800	365.00	854.43	0.00	0.02	0.00	10[illegible].[illegible]	220.00
80.800	475.00	854.88	0.00	0.0[illegible]	0.00	112.[illegible]	220.00
80.800	720.00	855.79	0.00	0.03	0.00	116.09	220.00
81.000	170.00	852.55	0.00	0.02	0.00	14[illegible].61	220.00
81.000	365.00	854.46	0.00	0.03	0.00	16[illegible].[illegible]	220.00
81.000	475.00	854.97	0.00	0.05	0.00	169.53	220.00
81.000	720.00	855.0[illegible]	0.00	0.07	0.00	17[illegible].[illegible]	220.00
81.200	170.00	852.57	0.00	0.02	0.00	131.24	200.00
81.200	365.00	854.41	0.00	0.02	0.00	136.35	200.00
81.200	475.00	854.95	0.00	0.0[illegible]	0.00	150.47	200.00
81.200	720.00	855.39	0.00	0.0[illegible]	0.00	169.3[illegible]	200.00
81.400	170.00	852.62	0.00	0.05	0.00	120.55	200.00
81.400	365.00	854.52	0.00	0.04	0.00	146.47	200.00
81.400	475.00	855.00	0.00	0.05	0.00	151.44	200.00
81.400	720.00	855.95	0.00	0.06	0.00	16[illegible].[illegible]	200.00
82.000	170.00	852.79	0.00	0.07	0.00	141.73	200.00
82.000	365.00	854.60	0.00	0.08	0.00	149.87	200.00
82.000	475.00	855.09	0.00	0.09	0.00	150.79	200.00
82.000	720.00	856.05	0.00	0.10	0.00	152.79	200.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
82.100	170.00	853.14	0.00	0.35	0.00	90.48	160.00
82.100	365.00	854.77	0.00	0.10	0.00	95.45	160.00
82.100	475.00	855.19	0.00	0.10	0.00	97.0[illegible]	160.00
82.100	720.00	856.15	0.00	0.10	0.00	99.72	160.00
82.200	170.00	854.40	0.00	1.25	0.00	91.27	160.00
82.200	365.00	855.2[illegible]	0.00	0.[illegible]	0.00	95.85	160.00
82.200	475.00	855.65	0.00	0.46	0.00	95.27	160.00
82.200	720.00	856.54	0.00	0.39	0.00	95.13	160.00
82.300	170.00	855.32	0.00	0.92	0.00	91.01	160.00
82.300	365.00	856.08	0.00	0.30	0.00	93.64	160.00
82.300	475.00	856.44	0.00	0.79	0.00	94.0[illegible]	160.00
82.300	720.00	857.19	0.00	0.[illegible]	0.00	97.02	160.00
82.400	170.00	856.33	0.00	1.02	0.00	91.07	160.00
82.400	365.00	857.07	0.00	1.00	0.00	93.44	160.00
82.400	475.00	857.41	0.00	0.97	0.00	94.50	160.00
82.400	720.00	858.07	0.00	0.[illegible]	0.00	96.[illegible]	160.00
82.500	170.00	857.31	0.00	0.96	0.00	44.21	160.00
82.500	365.00	858.12	0.00	1.05	0.00	77.01	160.00
82.500	475.00	858.46	0.00	1.05	0.00	81.61	160.00
82.500	720.00	859.09	0.00	1.02	0.00	89.6[illegible]	160.00
82.600	170.00	858.3[illegible]	0.00	1.02	0.00	44.33	160.00
82.600	365.00	859.3[illegible]	0.00	1.[illegible]	0.00	75.7[illegible]	160.00
82.600	475.00	859.71	0.00	1.25	0.00	85.01	160.00
82.600	720.00	860.39	0.00	1.30	0.00	91.76	160.00
83.000	170.00	859.33	0.00	1.[illegible]	0.00	[illegible]	170.00
83.000	365.00	860.31	0.00	0.[illegible]	0.00	[illegible]	170.00
83.000	475.00	860.71	0.00	1.00	0.00	[illegible]	170.00
83.000	720.00	861.41	0.00	1.01	0.00	82.94	170.00
83.200	170.00	860.42	0.00	1.09	0.00	53.31	230.00
83.200	365.00	861.[illegible]	0.00	1.[illegible]	0.00	77.27	230.00
83.200	475.00	861.84	0.00	1.[illegible]	0.00	79.47	230.00
83.200	720.00	862.60	0.00	1.20	0.00	84.1[illegible]	230.00
83.400	170.00	861.42	0.00	1.00	0.00	53.20	230.00
83.400	365.00	862.43	0.00	1.00	0.00	77.26	230.00
83.400	475.00	862.85	0.00	1.01	0.00	79.71	230.00
83.400	720.00	863.6[illegible]	0.00	1.0[illegible]	0.00	84.26	230.00
84.000	170.00	862.40	0.00	0.98	0.00	29.46	250.00
84.000	365.00	863.44	0.00	1.01	0.00	60.[illegible]	250.00
84.000	475.00	863.87	0.00	1.02	0.00	70.10	250.00
84.000	720.00	864.67	0.00	1.04	0.00	73.87	250.00
84.500	170.00	863.55	0.00	1.15	0.00	52.[illegible]	370.00
84.500	365.00	864.71	0.00	1.27	0.00	69.31	370.00
84.500	475.00	865.10	0.00	1.31	0.00	71.54	370.00
84.500	720.00	866.04	0.00	1.35	0.00	75.66	370.00

SECNO	Q	CHSEL	DIFUSP	DIFUSK	DIFFUS	TOPWID	XLCH
85.000	170.00	864.79	3.00	1.24	0.00	28.80	370.00
85.000	365.00	865.94	3.00	1.23	0.00	55.05	370.00
85.000	475.00	866.44	3.00	1.20	0.00	68.17	370.00
85.000	720.00	867.32	3.00	1.20	0.00	65.17	370.00
85.500	170.00	866.33	3.00	1.33	0.00	29.90	415.00
85.500	365.00	867.51	3.00	1.27	0.00	58.47	415.00
85.500	475.00	868.10	3.00	1.26	0.00	42.76	415.00
85.500	720.00	869.03	3.00	1.21	0.00	69.15	415.00
86.000	170.00	867.27	3.00	0.94	0.00	43.56	415.00
86.000	365.00	868.59	3.00	1.01	0.00	69.14	415.00
86.000	475.00	869.14	3.00	1.04	0.00	75.58	415.00
86.000	720.00	870.11	3.00	1.10	0.00	115.23	415.00

SUMMARY OF ERRORS

CAUTION SECNO= 1.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1.000 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1.000 PROFILE= 3 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1.000 PROFILE= 4 CRITICAL DEPTH ASSUMED

O.K. Small discrepancy between Bdry. Elev. and Prof. Elev. at Sec. 1.000.

CAUTION SECNO= 3.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 3.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 3.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE USEL
CAUTION SECNO= 3.000 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 3.000 PROFILE= 2 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 6.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 6.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 6.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE USEL

CAUTION SECNO= 6.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 6.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 6.000 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 6.000 PROFILE= 2 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 6.000 PROFILE= 3 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 6.000 PROFILE= 3 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 6.000 PROFILE= 4 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 6.000 PROFILE= 4 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 9.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 9.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 9.000 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 9.000 PROFILE= 2 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 9.000 PROFILE= 3 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 9.000 PROFILE= 3 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 9.000 PROFILE= 4 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 9.000 PROFILE= 4 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 9.500 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 9.500 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 9.500 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE USEL
CAUTION SECNO= 9.500 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 9.500 PROFILE= 2 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 9.500 PROFILE= 2 20 TRIALS ATTEMPTED TO BALANCE USEL
CAUTION SECNO= 9.500 PROFILE= 3 CRITICAL DEPTH ASSUMED

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 CAUTION  SECNO=     9.500  PROFILE= 3  PROBABLE "MINIMU" SPECIFIC ENERGY

 CAUTION  SECNO=     9.500  PROFILE= 3  20 TRIALS ATTEMPTED TO BALANCE .SEL
 CAUTION  SECNO=     9.500  PROFILE= 4  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO=     9.500  PROFILE= 4  PROBABLE "MINIMU" SPECIFIC ENERGY
 CAUTION  SECNO=     9.500  PROFILE= 4  20 TRIALS ATTEMPTED TO BALANCE .SEL

 CAUTION  SECNO=    10.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO=    10.000  PROFILE= 1  PROBABLE "MINIMU" SPECIFIC ENERGY
 CAUTION  SECNO=    10.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE .SEL
 CAUTION  SECNO=    10.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO=    10.000  PROFILE= 2  "MINIMU" SPECIFIC ENERGY
 CAUTION  SECNO=    10.000  PROFILE= 3  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO=    10.000  PROFILE= 3  "MINIMU" SPECIFIC ENERGY
 CAUTION  SECNO=    10.000  PROFILE= 4  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO=    10.000  PROFILE= 4  "MINIMU" SPECIFIC ENERGY

 CAUTION  SECNO=    10.500  PROFILE= 1  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO=    10.500  PROFILE= 1  "MINIMU" SPECIFIC ENERGY
 CAUTION  SECNO=    10.500  PROFILE= 2  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO=    10.500  PROFILE= 2  "MINIMU" SPECIFIC ENERGY
 CAUTION  SECNO=    10.500  PROFILE= 3  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO=    10.500  PROFILE= 3  "MINIMU" SPECIFIC ENERGY
 CAUTION  SECNO=    10.500  PROFILE= 4  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO=    10.500  PROFILE= 4  "MINIMU" SPECIFIC ENERGY

 CAUTION  SECNO=    22.000  PROFILE= 4  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO=    22.000  PROFILE= 4  "MINIMU" SPECIFIC ENERGY

 CAUTION  SECNO=    23.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO=    23.000  PROFILE= 2  "MINIMU" SPECIFIC ENERGY
 CAUTION  SECNO=    23.000  PROFILE= 3  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO=    23.000  PROFILE= 3  "MINIMU" SPECIFIC ENERGY
 CAUTION  SECNO=    23.000  PROFILE= 4  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO=    23.000  PROFILE= 4  "MINIMU" SPECIFIC ENERGY

 CAUTION  SECNO=    25.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO=    25.000  PROFILE= 1  "MINIMU" SPECIFIC ENERGY
 CAUTION  SECNO=    25.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO=    25.000  PROFILE= 2  MINIMUM SPECIFIC ENERGY
 CAUTION  SECNO=    25.000  PROFILE= 3  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO=    25.000  PROFILE= 3  MINIMUM SPECIFIC ENERGY
 CAUTION  SECNO=    25.000  PROFILE= 4  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO=    25.000  PROFILE= 4  MINIMUM SPECIFIC ENERGY

 CAUTION  SECNO=    27.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO=    27.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY
 CAUTION  SECNO=    27.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO=    27.000  PROFILE= 2  MINIMUM SPECIFIC ENERGY
 CAUTION  SECNO=    27.000  PROFILE= 3  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO=    27.000  PROFILE= 3  MINIMUM SPECIFIC ENERGY
 CAUTION  SECNO=    27.000  PROFILE= 4  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO=    27.000  PROFILE= 4  MINIMUM SPECIFIC ENERGY

 CAUTION  SECNO=    31.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO=    31.000  PROFILE= 1  "MINIMU" SPECIFIC ENERGY

 CAUTION  SECNO=    32.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO=    32.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION  SECNO=    32.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE USEL
 CAUTION  SECNO=    32.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO=    32.000  PROFILE= 2  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION  SECNO=    32.000  PROFILE= 2  20 TRIALS ATTEMPTED TO BALANCE USEL
 CAUTION  SECNO=    32.000  PROFILE= 3  CRITICAL DEPTH ASSUMED
 CAUTION  SECNO=    32.000  PROFILE= 3  PROBABLE MINIMUM SPECIFIC ENERGY
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CAUTION  SECNO=   32.000  PROFILE= 5  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO=   32.000  PROFILE= 4  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   32.000  PROFILE= 4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=   32.000  PROFILE= 4  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO=   38.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   38.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=   38.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO=   38.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   38.000  PROFILE= 2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=   38.000  PROFILE= 2  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO=   38.000  PROFILE= 3  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   38.000  PROFILE= 3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=   38.000  PROFILE= 3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO=   38.000  PROFILE= 4  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   38.000  PROFILE= 4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=   38.000  PROFILE= 4  20 TRIALS ATTEMPTED TO BALANCE WSEL
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O.K. [illegible] flow [illegible] the [illegible]

00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: COMSTOCK TWP

3) WATERCOURSE: KALAMAZOO RIVER

4) DOCUMENT TYPE: DIVIDED FLOW WATER LEVEL PROFILE

00BREAK00

00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: COMSTOCK TWP

3) WATERCOURSE: KALAMAZOO RIVER

4) DOCUMENT TYPE: MULTI-PROFILE INPUT

00BREAK00

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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
  ERROR CORR -  01
  MODIFICATION -  30,51,52
*****************************************************

C
T1COMSTOCK TOWNSHIP FLOOD INSURANCE STUDY
T210 YEAR STORM
T3       KALAMAZOO RIVER NATURAL RUN

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     C         WSEL      FQ

       0.        2.        0.        0.  0.000000      0.00      0.0        0.   772.000     0.000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBC       CHNIM     ITRACE

     1.000     0.000    -1.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

   150.000   201.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

J5  LPRNT    NUMSEC                    ********REQUESTED SECTION NUMBERS********

   -10.000   -10.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
NC     0.110     0.110     0.050     0.100     0.000     0.000     0.000     0.000     0.000     0.000
QT     5.000  4500.000  6070.000  6750.000  6420.000  6750.000     0.000     0.000     0.000     0.000
ET     0.000     0.000     0.000     0.000     0.000     1.410     0.000     0.000     0.000     0.000

                100 FEET UPSTREAM OF MORROW LAKE DAM

X1    70.000     6.000  2000.000  3000.000     0.000     0.000     0.000     0.000     0.000     0.000
GR   780.000     0.000   777.000  2000.000   757.000  2450.000   757.000  3350.000   777.000  3800.000
GR   780.000  3900.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

                FABRICATED VALLEY SECTION

X1    71.000     6.000  2000.000  3400.000  2900.000  2900.000  2900.000     0.000     0.000     0.000
GR   790.000  1500.000   780.000  1800.000   770.000  2000.000   759.400  2830.000   759.400  4550.000
GR   777.000  5400.000   780.000  3600.000   770.000  3900.000     0.000     0.000     0.000     0.000

                FABRICATED VALLEY SECTION

X1    72.000     9.000  2000.000  3200.000  7500.000  7500.000  7300.000     0.000     0.000     0.000
GR   790.000   500.000   780.000  1200.000   777.000  2000.000   767.000  2300.000   770.000  2000.000
GR   767.200  2900.000   777.000  3200.000   770.000  3300.000   790.000  3300.000     0.000     0.000

                SURVEYED VALLEY SECTION (FROM [illegible] T)

X1    80.000    23.000  1780.000  2400.000  1500.000  1600.000  1600.000     0.000     0.000     0.000
GR   766.000     0.000   764.000   100.000   782.000   [illegible]  780.000   [illegible]  780.000  1500.000
GR   778.000  1780.000   776.000  1785.000   774.400  1810.000   772.600  1840.000   770.600  1865.00
GR   760.000  1885.000   768.300  1935.000   769.500  1935.000   769.400  2040.000   769.600  2070.000
GR   769.800  2100.000   770.400  2165.000   767.100  2230.000   772.100  2280.000   773.500  2315.000
GR   774.900  2345.000   776.000  2350.000   775.000  2400.000   780.000  2655.000   780.000  2930.000
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GR	782.000	3095.000	784.000	3200.000	786.000	3270.000	0.000	0.000	0.000	0.000

FABRICATED VALLEY SECTION

X1	30.100	0.000	2000.000	3600.000	1400.000	1470.000	1450.000	0.000	0.000	0.000
GR	790.000	1200.000	782.000	1950.000	777.000	2030.300	768.000	2600.000	770.000	2400.000
GR	767.800	3200.000	777.000	3600.000	780.000	4100.000	0.000	0.000	0.000	0.000

FABRICATED VALLEY SECTION

X1	30.200	0.000	2000.000	2600.000	2000.000	2070.000	2000.000	0.000	0.000	0.000
GR	790.000	600.000	782.000	1700.000	777.000	2030.300	772.000	2150.000	769.600	2450.000
GR	777.000	2600.000	780.000	2900.000	790.000	3200.300	0.000	0.000	0.000	0.000
NC	0.100	0.100	0.000	0.300	0.500	0.600	0.700	0.000	0.000	0.300
X1	30.900	42.000	2000.000	2178.000	2100.000	1470.300	1450.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	784.050	786.250	0.000
GR	789.200	370.000	787.800	502.000	786.000	634.300	784.800	786.000	784.200	889.000
GR	784.000	986.000	783.800	1088.000	783.600	1138.300	783.500	1290.000	783.300	1392.000
GR	783.500	1494.000	783.600	1596.000	783.600	1704.000	783.700	1906.000	784.100	1902.000
GR	785.700	2000.000	780.300	2000.000	774.500	2028.600	774.600	2039.000	775.600	2054.000
GR	775.000	2057.000	775.000	2038.100	776.700	2027.000	774.700	2480.100	772.200	2077.000
GR	770.900	2109.000	771.600	2176.000	771.600	2111.100	771.600	2120.000	771.900	2120.100
GR	772.300	2128.000	772.000	2145.000	776.700	2100.000	782.600	2076.000	787.300	2171.000
GR	780.200	2279.000	789.600	2379.000	791.100	2295.000	794.000	2085.000	793.100	2085.000
GR	793.700	2709.000	794.000	2885.000	794.500	2595.000	794.600	3095.000	794.700	3195.000
GR	795.100	3295.000	795.200	3395.000	795.300	3491.000	795.500	3575.000	795.800	3691.000

DOWNSTREAM FACE OF 35TH STREET BRIDGE (A)

X1	30.000	50.000	2000.000	2178.000	0.000	0.000	0.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GT	14.000	1908.000	783.700	0.000	2003.000	785.700	0.000	2020.000	785.700	782.600
BT	2058.000	786.400	783.100	2058.100	786.400	775.000	2060.000	786.400	774.700	2060.100
BT	786.400	783.100	2118.000	787.200	783.900	2118.100	787.200	771.400	2120.000	787.200
BT	771.400	2120.100	787.200	783.900	2178.000	787.900	784.600	2178.100	787.900	0.000
BT	2279.000	780.200	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GT	789.200	370.000	787.300	502.000	786.000	634.300	784.800	786.000	784.200	889.000
GT	784.000	986.000	783.100	1088.000	783.600	1138.300	783.500	1290.000	783.300	1392.000
GT	783.500	1494.000	783.600	1596.000	783.600	1704.000	783.700	1906.000	784.100	1902.000
GT	785.700	2000.000	780.300	2000.000	774.500	2028.600	774.600	2039.000	775.600	2054.000
GR	775.000	2057.000	775.000	2038.100	776.700	2027.000	774.700	2480.100	772.200	2077.000
GR	770.900	2109.000	771.600	2176.000	771.600	2111.100	771.600	2120.000	771.900	2120.100
GR	772.300	2128.000	772.000	2145.000	776.700	2100.000	782.600	2076.000	787.300	2171.000
GR	780.200	2279.000	789.600	2379.000	791.100	2295.000	794.000	2085.000	793.100	2085.000
GR	793.700	2709.000	794.000	2885.000	794.500	2595.000	794.600	3095.000	794.700	3195.000
GR	795.100	3295.000	795.200	3395.000	795.300	3491.000	795.500	3575.000	795.800	3691.000
X1	30.100	50.000	2000.000	2178.000	50.000	51.300	51.300	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GT	14.000	1908.000	783.700	0.000	2003.000	785.700	0.000	2020.000	785.700	782.600
BT	2058.000	786.400	783.100	2058.100	786.400	773.200	2060.000	786.400	773.000	2060.100
BT	786.400	783.100	2118.000	787.200	783.900	2118.100	787.200	771.400	2120.000	787.200
BT	771.400	2120.100	787.200	783.900	2178.000	787.900	784.600	2178.100	787.900	0.000
BT	2279.000	780.200	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GT	789.200	370.000	787.300	502.000	786.000	634.300	784.800	786.000	784.200	889.000
GT	784.000	986.000	783.100	1088.000	783.600	1138.300	783.500	1290.000	783.300	1392.000
GT	783.500	1494.000	783.600	1596.000	783.600	1704.000	783.700	1906.000	784.100	1902.000
GT	785.700	2000.000	780.300	2000.000	774.700	2028.600	774.600	2039.000	775.700	2054.000

GR	773.200	2058.000	773.200	2058.100	773.000	2060.000	773.000	2060.100	771.500	2076.000
GR	770.700	2068.000	771.400	2118.000	771.400	2118.100	771.400	2120.000	771.400	2120.100
GR	770.300	2130.000	771.100	2146.000	776.500	2162.000	782.200	2178.000	787.900	2178.000
GR	788.200	2279.000	789.600	2379.000	791.100	2481.000	791.900	2581.000	793.100	2605.000
GR	793.700	2789.000	794.000	2883.000	794.500	2993.000	794.500	3095.000	794.700	3195.000
GR	795.100	3295.000	795.200	3393.000	795.300	3491.000	795.500	3575.000	795.800	3591.000
NC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	81.200	0.000	0.000	178.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	795.700	787.900	0.000

SURVEYED VALLEY SECTION (3)

X1	83.000	44.000	3082.000	3269.000	3350.000	3100.000	3375.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	793.600	1716.000	792.500	1788.000	796.000	1896.000	795.200	2000.000	793.200	2132.000
GR	792.500	2220.000	792.600	2324.000	792.600	2420.000	791.700	2514.000	791.100	2634.000
GR	790.400	2728.000	790.200	2822.000	790.300	2908.000	789.800	2972.000	787.500	3066.000
GR	780.000	3032.000	778.400	3093.000	775.100	3118.000	773.500	3143.000	772.000	3168.000
GR	773.700	3193.000	774.400	3224.000	777.900	3266.000	779.800	3269.000	779.400	3316.000
GR	776.300	3316.000	775.200	3338.000	776.800	3354.000	779.600	3362.000	779.900	3485.000
GR	779.200	3574.000	780.200	3709.000	778.800	3806.000	778.900	3902.000	781.600	3984.000
GR	781.700	4074.000	783.600	4218.000	782.000	4326.000	780.800	4422.000	780.400	4493.000
GR	782.800	4592.000	783.000	4654.000	789.300	4676.000	790.100	4774.000	0.000	0.000
NC	0.000	0.000	0.000	0.100	0.300	0.000	0.000	0.000	0.000	0.000
ET	0.000	7.100	7.100	7.100	7.100	0.000	1170.000	3594.000	0.000	0.000

SURVEYED VALLEY SECTION (C)

X1	64.000	39.000	2000.000	2195.000	4525.000	4463.000	4300.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	792.500	376.000	791.000	497.000	791.400	690.000	792.000	614.000	790.400	780.000
GR	790.600	864.000	789.000	1160.000	788.100	1170.000	784.600	1200.000	783.600	1400.000
GR	783.800	1630.000	783.400	1800.000	782.100	2000.000	780.800	2011.000	774.500	2034.000
GR	773.700	2051.000	773.900	2066.000	772.400	2124.000	772.900	2142.000	774.900	2176.000
GR	775.700	2186.000	781.200	2195.000	781.000	2224.000	781.300	2263.000	787.100	2298.000
GR	787.800	2402.000	789.000	2454.000	789.000	2556.000	788.600	2656.000	789.300	2732.000
GR	790.400	2824.000	789.800	2912.000	789.800	3016.000	789.600	3116.000	793.500	3222.000
GR	789.800	3312.000	791.000	3402.000	790.900	3502.000	791.300	3594.000	0.000	0.000
NC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
EJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: COMSTOCK TWP

3) WATERCOURSE: KALAMAZOO RIVER

4) DOCUMENT TYPE: MULTI PROFILE RUN

00BREAK00

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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
  ERROR CORR -  01
  MODIFICATION -  50-51-52
*****************************************************

C
T1COMSTOCK FLOOD INSURANCE STUDY
T2MULTI PROFILE RUN.          2/27/80
T3      KALAMAZOO RIVER

J1  ICHECK     INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

       0.        2.        0.        0.  0.000000      0.00       0.0        0.   767.610     0.000

J   NPROF     IPLOT     PRTVS     XSECV     X ECH     FN        ALLDC     IBW       CHNIM     ITRACE

     1.000     0.000    -1.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    150.000   231.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

J5  LPRNT     NUMSEC                  ********REQUESTED SECTION NUMBERS********

    -10.000   -10.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
QT      5.000  4530.000  6090.000  6770.000  6770.000  8410.000     0.000     0.000     0.000     0.000
NC      0.020     0.120     0.030     0.100     0.300     0.000     0.000     0.000     0.000     0.000

X1     32.000    28.000  1271.000  1651.000   394.000   394.000   394.000     0.000     0.000     0.000
GR    781.500    96.000   771.400   242.000   772.600   528.000   771.800   976.000   778.300  1088.000
GR    776.000  1148.000   769.400  1208.000   768.100  1271.000   756.700  1272.000   758.000  1396.000
GR    756.800  1461.000   757.500  1486.000   754.300  1526.000   751.900  1571.000   759.100  1621.000
GR    751.900  1606.000   766.400  1651.000   769.800  1730.000   770.600  1918.000   770.400  2024.000
GR    780.200  2212.000   787.200  2378.000   791.200  2482.000   789.700  2594.000   783.200  2768.000
GR    786.100  2834.000   784.500  2854.000   798.100  3672.000     0.000     0.000     0.000     0.000
NC      0.020     0.020     0.020     0.000     0.000     0.000     0.000     0.000     0.000     0.000
ET      0.000     0.000     0.000     0.000     1.400     0.000     0.000     0.000     0.000     0.000

      IMMEDIATELY D/S OF COMSTOCK DAM

X1     33.000     4.000     1.100   109.000   400.000   400.000   400.000     0.000     0.000     0.000
GR    770.000     1.000   755.000     1.100   755.000   109.000   770.000   109.100     0.000     0.000
[illegible]
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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
  ERROR CORR -  01
  MODIFICATION -  50,51,52
*****************************************************
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

KALAMAZOO RIVER

SUMMARY PRINTOUT TABLE 150

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
32.000	394.00	0.00	0.00	751.90	4530.00	767.61	0.00	767.65	0.22	1.11	4105.07	9674.46
32.000	394.00	0.00	0.00	751.90	6090.00	768.72	0.00	768.81	0.26	1.34	4609.63	11469.51
32.000	394.00	0.00	0.00	751.90	6770.00	769.30	0.00	769.33	0.30	1.43	4862.83	12345.64
32.000	394.00	0.00	0.00	751.90	8410.00	770.37	0.00	770.41	0.35	1.63	5460.72	14208.66
33.000	400.00	0.00	0.00	755.00	4530.00	767.52	0.00	767.69	0.70	3.35	1351.45	5409.14
33.000	400.00	0.00	0.00	755.00	6090.00	768.65	0.00	768.90	0.95	4.14	1472.19	6237.62
33.000	400.00	0.00	0.00	755.00	6770.00	769.13	0.00	769.43	1.05	4.44	1525.73	6619.95
33.000	400.00	0.00	0.00	755.00	8410.00	770.13	0.00	770.55	1.28	5.15	1634.59	7425.00

KALAMAZOO RIVER

SUMMARY PRINTOUT TABLE 150

32.000	4530.00	767.61	0.30	0.00	3.02	403.04	394.00
32.000	6090.00	767.78	0.30	0.00	3.02	403.04	394.00
[illegible]	[illegible]	[illegible]	[illegible]	0.00	[illegible]	[illegible]	[illegible]
32.000	[illegible]	[illegible]	[illegible]	0.00	[illegible]	[illegible]	[illegible]
33.000	4530.00	767.52	3.03	-0.09	0.00	108.07	402.03
33.000	6090.00	766.63	3.03	-0.05	0.00	108.01	402.00
33.000	7710.00	769.13	3.03	-0.17	0.00	108.09	402.03
33.000	[illegible]	[illegible]	3.03	-0.27	0.00	[illegible]	402.04

SUMMARY OF ERRORS

FORM 1411-69 PRINTED BY ROTARY MANIFOLD FORMS.

FLOOD INSURANCE ZONE DATA FOR KALAMAZOO RIVER

FLOOD HAZARD FACTOR FOR ENTIRE REACH USING SECTIONS

SECTION NUMBER	CUMULATIVE DISTANCE	ELEVATION DIFFERENCE BETWEEN BASE FLOOD AND 10%	2%	0.2%
32.[illegible]	0.	-1.7	-[illegible]	[illegible].1
3[illegible]	[illegible]	-1.[illegible]	-[illegible]	[illegible]
WEIGHTED AVG FOR REACH		-1.7	-0.3	[illegible].0

THE FOR THE REACH = 015 WITH [illegible] OF THE REACH WITHIN 0.5 [illegible]
ZONE FOR THE [illegible]

00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: COMSTOCK TWP

3) WATERCOURSE: KALAMAZOO RIVER

4) DOCUMENT TYPE: MULTI - PROFILE SUMMARY

00BREAK00

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**************************************************
  HECE RELEASE DATED NOV 76 UPDATED FEB 1977
  ERROR CORR -
  COMPILATION - 22.59.52
**************************************************
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERROR LIST

KALAMAZOO RIVER NATURAL

SUMMARY PRINTOUT TABLE 150

SECNO	XLOB	ELTRD	ELLC	ELMIN	Q	LOSS	CRITS	WS	CONVEY	VEL	AREA	TOPWID
70.000	0.00	0.00	0.00	757.08	4500.00	776.00	0.00	776.00	0.01	0.10	25114.48	54985.09
70.000	0.00	0.00	0.00	757.08	6070.00	776.00	0.00	776.00	0.01	0.24	25114.48	54985.09
70.000	0.00	0.00	0.00	757.08	6750.00	776.00	0.00	776.00	0.02	0.27	25114.48	54985.09
70.000	0.00	0.00	0.00	757.08	8420.00	776.70	0.00	776.70	0.02	0.32	25514.61	54978.19
71.000	2900.00	0.00	0.00	759.40	4500.00	776.00	0.00	776.00	0.00	0.11	41177.18	62960.19
71.000	2900.00	0.00	0.00	759.40	6070.00	776.00	0.00	776.00	0.01	0.15	41101.95	62973.88
71.000	2900.00	0.00	0.00	759.40	6750.00	776.00	0.00	776.00	0.01	0.16	41105.13	62985.00
71.000	2900.00	0.00	0.00	759.40	8420.00	776.70	0.00	776.71	0.01	0.19	43495.57	69602.44
72.000	7500.00	0.00	0.00	767.00	4500.00	776.00	0.00	776.01	0.38	0.65	6871.16	9664.17
72.000	7500.00	0.00	0.00	767.00	6070.00	776.01	0.00	776.02	0.51	0.80	6861.17	9673.83
72.000	7500.00	0.00	0.00	767.00	6750.00	776.01	0.00	776.02	0.63	0.90	6883.68	9678.31
72.000	7500.00	0.00	0.00	767.00	8420.00	776.71	0.00	776.73	0.71	1.09	7701.65	9975.18
80.000	1600.00	0.00	0.00	767.10	4500.00	776.07	0.00	776.10	1.81	1.39	3213.16	3821.93
80.000	1600.00	0.00	0.00	767.10	6070.00	776.13	0.00	776.19	2.44	1.66	3263.53	3857.69
80.000	1600.00	0.00	0.00	767.10	6750.00	776.16	0.00	776.23	2.97	2.06	3284.45	3919.30
80.000	1600.00	0.00	0.00	767.10	8420.00	776.30	0.00	776.96	3.25	2.28	3700.18	4672.59
80.100	1400.00	0.00	0.00	767.80	4500.00	776.16	0.00	776.19	0.19	0.59	8715.32	10040.42
80.100	1400.00	0.00	0.00	767.80	6070.00	776.25	0.00	776.25	0.32	0.69	8951.97	10046.30
80.100	1400.00	0.00	0.00	767.80	6750.00	776.34	0.00	776.35	0.38	0.75	9047.65	10051.95
80.100	1400.00	0.00	0.00	767.80	8420.00	777.09	0.00	777.10	0.42	0.82	10296.19	13060.75
80.200	2000.00	0.00	0.00	769.40	4500.00	776.22	0.00	776.28	3.76	1.89	2373.10	2320.74
80.200	2000.00	0.00	0.00	769.40	6070.00	776.39	0.00	776.48	5.12	2.45	2477.30	2452.27
80.200	2000.00	0.00	0.00	769.40	6750.00	776.47	0.00	776.58	7.14	2.67	2525.25	2510.06
80.200	2000.00	0.00	0.00	769.40	8420.00	777.22	0.00	777.34	8.93	2.96	2671.33	3191.01
80.900	1600.00	0.00	0.00	770.90	4500.00	777.37	0.00	778.27	66.06	7.59	592.60	553.66
80.900	1600.00	0.00	0.00	770.90	6070.00	778.20	0.00	779.31	67.76	8.40	716.06	737.38
80.900	1600.00	0.00	0.00	770.90	6750.00	778.54	0.00	779.75	67.42	8.77	769.27	832.05
80.900	1600.00	0.00	0.00	770.90	8420.00	779.43	0.00	780.82	73.97	9.73	865.16	979.29
81.000	1.00	783.70	784.60	773.90	4500.00	777.34	0.00	778.30	9.06	7.06	572.56	1494.89
81.000	1.00	783.70	784.60	773.90	6070.00	778.16	0.00	779.35	9.29	8.77	691.84	1995.44
81.000	1.00	783.70	784.60	773.90	6750.00	778.50	0.00	779.78	9.25	9.00	743.57	2219.68
81.000	1.00	783.70	784.60	773.90	8420.00	779.09	0.00	780.57	10.19	10.04	839.55	2650.40

SECNO	XLCH	ELTRO	ELLC	ELCIN	Q	CUSE	CRIKS	EG	10K*S	VCH	AREA	.CIK
81.100	31.00	783.70	784.60	772.30	4500.00	777.35	0.00	778.45	3.35	5.68	791.99	2460.37
81.100	31.00	783.70	784.60	772.30	6070.00	776.30	0.00	779.53	3.66	6.71	936.67	3163.13
81.100	31.00	783.70	784.60	772.30	6750.00	779.26	0.00	779.97	3.77	6.77	996.55	3472.17
81.100	31.00	783.70	784.60	772.30	8420.00	730.36	0.00	780.91	4.11	7.49	1124.21	4132.59
81.200	1.00	0.00	0.00	772.30	4500.00	778.00	0.00	778.46	24.16	5.47	822.33	915.47
81.200	1.00	0.00	0.00	772.30	6070.00	778.95	0.00	779.55	26.67	6.23	973.84	1179.97
81.200	1.00	0.00	0.00	772.30	6750.00	779.33	0.00	779.99	27.73	6.51	1037.17	1323.50
81.200	1.00	0.00	0.00	772.30	8420.00	780.73	0.00	780.93	29.43	7.15	1170.26	1592.19
83.000	3375.00	0.00	0.00	772.00	4500.00	781.58	0.00	781.69	4.89	2.68	2917.29	2036.86
83.000	3375.00	0.00	0.00	772.00	6070.00	782.59	0.00	782.69	4.47	3.02	4184.07	2870.57
83.000	3375.00	0.00	0.00	772.00	6750.00	782.98	0.00	783.00	4.30	3.07	4739.62	3255.35
83.000	3375.00	0.00	0.00	772.00	8420.00	783.86	0.00	783.95	3.96	3.15	6093.77	4233.21
84.800	4500.00	0.00	0.00	772.40	4500.00	783.30	0.00	783.41	3.06	2.61	3806.49	2570.76
84.800	4500.00	0.00	0.00	772.40	6070.00	784.35	0.00	784.50	3.56	3.13	2617.45	3208.53
84.800	4500.00	0.00	0.00	772.40	6750.01	784.76	0.00	784.90	3.72	3.27	3024.05	3500.03
84.800	4500.00	0.00	0.00	772.40	8420.00	785.58	0.00	785.76	3.96	3.57	3964.89	4230.12

KALAMAZOO RIVER NATURAL

SUMMARY PRINTOUT TABLE 150

H2O

	SEC.D	D	CUSEL	DIFWSP	DIFWSX	DIFKUB	TOPWID	KLOB
P	70.000	4500.00	776.00	0.00	0.00	0.00	1754.82	0.00
	70.000	6070.00	776.00	0.00	0.00	0.00	1754.82	0.00
	70.000	6750.00	776.00	0.00	0.00	0.00	1754.82	0.00
	70.000	8420.00	776.70	0.00	0.00	0.00	1736.44	0.00
Q	71.000	4500.00	776.00	0.00	0.00	0.00	3260.49	2900.00
	71.000	6070.00	776.00	0.00	0.00	0.00	3260.63	2900.00
	71.000	6750.00	776.00	0.00	0.00	0.00	3260.72	2900.00
	71.000	8420.00	776.70	0.00	0.00	0.00	3260.45	2900.00
R	72.000	4500.00	776.00	0.00	0.00	0.00	1139.70	7500.00
	72.000	6070.00	776.01	0.00	0.01	0.00	1139.97	7500.00
	72.000	6750.00	776.01	0.00	0.01	0.00	1140.10	7500.00
	72.000	8420.00	776.71	0.00	0.01	0.00	1182.78	7500.00
S	80.000	4500.00	776.07	0.00	0.07	0.00	367.07	1600.00
	80.000	6070.00	776.11	0.00	0.13	0.00	368.05	1600.00
	80.000	6750.00	776.15	0.00	0.15	0.00	369.52	1600.00
	80.000	8420.00	776.89	0.00	0.17	0.00	389.25	1600.00
T	80.100	4500.00	776.15	0.00	0.06	0.00	1325.94	1400.00
	80.100	6070.00	776.20	0.00	0.05	0.00	1436.72	1400.00
	80.100	6750.00	776.34	0.00	0.06	0.00	1512.15	1400.00
	80.100	8420.00	777.09	0.00	0.20	0.00	1615.53	1400.00
U	80.200	4500.00	776.22	0.00	0.06	0.00	561.29	2000.00
	80.200	6070.00	776.39	0.00	0.11	0.00	565.67	2000.00
	80.200	6750.00	776.47	0.00	0.13	0.00	573.75	2000.00
	80.200	8420.00	777.22	0.00	0.13	0.00	643.97	2000.00
	80.900	4500.00	777.37	0.00	1.15	0.00	146.67	1600.00
	80.900	6070.00	778.20	0.00	1.81	0.00	153.20	1600.00
	80.900	6750.00	778.34	0.00	2.07	0.00	155.67	1600.00
	80.900	8420.00	779.15	0.00	1.93	0.00	160.11	1600.00
V	81.000	4500.00	777.34	0.00	-0.03	0.00	146.65	1.00
	81.000	6070.00	778.16	0.00	-0.04	0.00	152.95	1.00
	81.000	6750.00	778.50	0.00	-0.04	0.00	155.29	1.00
	81.000	8420.00	779.09	0.00	-0.05	0.00	160.14	1.00
	81.100	4500.00	777.95	0.00	0.61	0.00	156.42	31.00
	81.100	6070.00	778.83	0.00	0.72	0.00	162.85	31.00
	81.100	6750.00	779.26	0.00	0.76	0.00	165.46	31.00
	81.100	8420.00	780.04	0.00	0.94	0.00	170.82	31.00
W	81.200	4500.00	778.01	0.00	0.05	0.00	156.75	1.00
	81.200	6070.00	778.95	0.00	0.06	0.00	161.30	1.00
	81.200	6750.00	779.33	0.00	0.07	0.00	165.96	1.00
	81.200	8420.00	780.13	0.00	0.09	0.00	171.46	1.00
X	83.000	4500.00	781.50	0.00	3.58	0.00	1092.59	3375.00
	83.000	6070.00	782.39	0.00	3.65	0.00	1381.37	3375.00
	83.000	6750.00	782.98	0.00	3.63	0.00	1433.48	3375.00
	83.000	8420.00	783.86	0.00	3.73	0.00	1582.30	3375.00

SECNO	Q	CUSEL	DIFUSP	DIFUSX	DIFUSS	TOPWID	XLCH
84.800	4500.00	783.30	0.00	1.71	0.00	272.29	4500.00
84.800	4070.00	784.35	0.00	1.76	1.06	1033.84	4500.00
84.800	3750.00	784.74	0.00	1.76	1.44	1089.73	4500.00
84.800	3420.00	785.58	0.00	1.72	2.26	1050.45	4500.00

SUMMARY OF ERRORS

FLOOD INSURANCE ZONE DATA FOR KALAMAZOO RIVER NATURAL

FLOOD HAZARD FACTOR FOR ENTIRE REACH USING SECTIONS

SECTION NUMBER	CUMULATIVE DISTANCE	ELEVATION DIFFERENCE BETWEEN BASE FLOOD AND 10%	2%	0.2%
70.000	0.	0.0	0.0	0.7
71.000	2900.	-0.0	-0.0	0.7
72.000	10400.	-0.0	-0.0	0.7
80.000	12000.	-0.1	-0.0	0.7
80.100	13600.	-0.2	-0.1	0.7
80.200	15600.	-0.3	-0.1	0.7
80.900	17000.	-1.2	-0.3	0.6
81.000	17000.	-1.2	-0.3	0.6
81.100	17032.	-1.3	-0.4	0.6
81.200	17033.	-1.3	-0.4	0.8
83.000	20608.	-1.4	-0.4	0.9
86.300	24900.	-1.6	-0.5	0.8
WEIGHTED AVG FOR REACH		-0.5	-0.1	0.3

FHF FOR THE REACH = 005 WITH 26.3% OF THE REACH WITHIN 0.5 FEET
ZONE FOR THE REACH = A 1

CONTINUOUS FLOOD HAZARD FACTORS ON EACH INCREMENTS

INC NO.	TOTAL LENGTH	AVG ELEVATION DATA 10%	1%	DIFF.	WTD. AVG.	FHF	PERCENT WITHIN
	0.				SEC.	70.000	
1	415.	776.0	776.0	0.0	0.0	005	100.
2	830.	776.0	776.0	-0.0	-0.0	005	100.
3	1245.	776.0	776.0	-0.0	-0.0	005	100.
4	1660.	776.0	776.0	-0.0	-0.0	005	100.
5	2075.	776.0	776.0	-0.0	-0.0	005	100.
6	2490.	776.0	776.0	-0.0	-0.0	005	100.
	2900.				SEC.	71.000	
7	2905.	776.0	776.0	-0.0	-0.0	005	100.
8	3320.	776.0	776.0	-0.0	-0.0	005	100.
9	3735.	776.0	776.0	-0.0	-0.0	005	100.
10	4150.	776.0	776.0	-0.0	-0.0	005	100.
11	4565.	776.0	776.0	-0.0	-0.0	005	100.
12	4980.	776.0	776.0	-0.0	-0.0	005	100.
13	5395.	776.0	776.0	-0.0	-0.0	005	100.
14	5810.	776.0	776.0	-0.0	-0.0	005	100.
15	6225.	776.0	776.0	-0.0	-0.0	005	100.
16	6640.	776.0	776.0	-0.0	-0.0	005	100.
17	7055.	776.0	776.0	-0.0	-0.0	005	100.
18	7470.	776.0	776.0	-0.0	-0.0	005	100.
19	7885.	776.0	776.0	-0.0	-0.0	005	100.
20	8300.	776.0	776.0	-0.0	-0.0	005	100.
21	8715.	776.0	776.0	-0.0	-0.0	005	100.
22	9130.	776.0	776.0	-0.0	-0.0	005	100.

23	9545.	776.0	776.3	-0.0	-0.0	005	100.
24	9960.	776.0	776.0	-0.0	-0.0	005	100.
25	10375.	776.0	776.0	-0.0	-0.0	005	100.
	10400.				SEC.	72.000	
26	10790.	776.0	776.0	-0.0	-0.0	005	100.
27	11205.	776.0	776.0	-0.0	-0.0	005	100.
28	11620.	776.0	776.1	-0.1	-0.0	005	100.
	12000.				SEC.	80.050	
29	12035.	776.1	776.1	-0.1	-0.0	005	100.
30	12450.	776.1	776.2	-0.1	-0.0	005	100.
31	12863.	776.1	776.2	-0.1	-0.0	005	100.
32	13280.	776.1	776.3	-0.2	-0.0	005	100.
	13600.				SEC.	88.150	
33	13695.	776.2	776.3	-0.2	-0.0	005	100.
34	14110.	776.2	776.4	-0.2	-0.0	005	100.
35	14525.	776.2	776.4	-0.2	-0.0	005	100.
36	14940.	776.2	776.4	-0.2	-0.0	005	100.
37	15355.	776.2	776.5	-0.2	-0.0	005	100.
	15400.				SEC.	89.200	
38	15770.	776.4	776.7	-0.4	-0.1	005	100.
39	16183.	776.6	777.2	-0.6	-0.1	005	97.
40	16600.	776.9	777.3	-0.8	-0.1	005	98.
	17000.				SEC.	89.030	
	17001.				SEC.	89.040	
41	17015.	777.5	778.7	-1.2	-0.1	005	93.
	17032.				SEC.	89.100	
	17033.				SEC.	89.210	
42	17430.	778.2	779.5	-1.3	-0.1	005	93.
43	17845.	778.6	780.0	-1.3	-0.2	005	91.
44	18260.	779.1	780.5	-1.4	-0.2	005	89.
45	18675.	779.5	780.9	-1.4	-0.2	005	87.
46	19090.	780.0	781.3	-1.4	-0.2	005	85.
47	19505.	780.4	781.8	-1.4	-0.2	005	83.
48	19920.	780.8	782.2	-1.4	-0.2	005	81.
49	20335.	781.3	782.7	-1.4	-0.2	005	79.
	21400.				SEC.	99.000	
50	20750.	781.8	783.0	-1.4	-0.3	005	78.
51	21165.	781.8	783.2	-1.4	-0.4	005	78.
52	21580.	782.0	783.4	-1.4	-0.4	005	77.
53	21995.	782.1	783.5	-1.4	-0.4	005	75.
54	22410.	782.3	783.7	-1.4	-0.4	005	74.
55	22825.	782.4	783.8	-1.4	-0.4	005	73.
56	23240.	782.6	784.0	-1.4	-0.4	005	71.
57	23655.	782.7	784.2	-1.4	-0.5	005	70.
58	24070.	782.9	784.3	-1.4	-0.5	005	69.
59	24485.	783.1	784.5	-1.4	-0.5	005	68.
60	24900.	783.2	784.7	-1.4	-0.5	005	67.
	24903.				SEC.	64.030	

THIS REACH CAN BE SUBDIVIDED BY INC NO. TO MEET FIA REQUIREMENTS
INPUT ZON WHERE N IS THE NUMBER OF REACHES AND THEN INPUT THE END
OF EACH REACH BY INC NO. FOR EXAMPLE 202 50 60
A NEGATIVE INC NO. WILL SUPPRESS INTERMEDIATE IPC OUTPUT.

****

JECP AGE,99 DATED NOV 2, PROCESS FEB 1977

ERROR CODE = 01

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KALAMAZOO R-COMSTOCK TWP

SUMMARY POINTOUT TABLE TSD

SECOND	FEET	FEET	LINE	FEET		CASES	CASES		FEET	VOL	ACRES	FEET
6.000	1400.00	0.00	0.00	747.00	5910.00	765.50	0.00	764.07	3.95	3.67	1336.46	5476.96
6.000	1400.00	0.00	0.00	747.00	5910.00	765.56	0.00	764.18	3.95	3.70	1300.79	5476.96
[illegible]												
9.000	50.00	0.00	0.00	749.00	6530.00	766.42	0.00	764.47	1.84	3.12	2310.96	5304.14
9.000	50.00	0.00	0.00	749.20	6570.00	766.54	0.00	764.62	1.89	3.09	2252.79	5134.10
[illegible]												
9.000	50.00	0.00	0.00	749.00	6600.00	766.56	0.00	764.72	1.89	3.14	2294.72	5282.66
9.000	50.00	0.00	0.00	749.10	6600.00	766.67	0.00	764.82	1.89	3.11	2257.14	5282.66
[illegible]												
11.000	1200.00	0.00	0.00	754.00	6960.00	768.59	0.00	765.17	4.23	3.60	6025.75	6105.05
11.000	1200.00	0.00	0.00	754.00	6960.00	768.21	0.00	765.24	4.26	3.51	6007.52	6145.45
[illegible]												
12.000	600.00	0.00	0.00	749.40	6780.00	766.27	0.00	765.20	1.35	3.05	4757.36	6630.00
12.000	600.00	0.00	0.00	749.50	6780.00	766.39	0.00	765.48	1.36	3.04	4734.64	6622.40
[illegible]												
12.000	1400.00	0.00	0.00	750.40	6900.00	766.64	0.00	765.51	4.03	3.66	7130.14	6625.24
12.000	1400.00	0.00	0.00	750.40	6900.00	766.67	0.00	765.72	4.06	3.63	7114.91	6625.24
[illegible]												
12.000	100.00	0.00	0.00	754.20	6900.00	766.51	0.00	765.06	2.73	3.30	4839.56	4177.27
12.000	100.00	0.00	0.00	754.20	6900.00	766.36	0.00	765.08	2.77	3.23	4782.70	4145.45
[illegible]												
13.000	62.30	770.30	774.60	754.20	6930.00	766.56	0.00	765.70	3.03	3.47	2028.44	3965.77
13.000	62.30	770.30	774.60	754.20	6900.00	766.45	0.00	765.65	3.06	3.36	2056.69	3965.77

SECNO	XLCN	ELTPO	ELLC	ELSIM		CUSEL	CUI.S	EG	IDR*S	WCH	AREA	SOIL
13.200	1.00	0.00	0.00	754.20	6900.00	765.53	0.00	765.71	2.70	3.29	2056.78	4201.25
13.200	1.00	0.20	0.00	754.20	6900.00	735.67	0.00	765.93	2.74	3.24	2128.79	4167.00
14.000	50.00	0.20	0.20	754.10	6900.00	765.51	0.00	765.76	2.00	3.29	2534.74	4831.95
14.000	50.00	0.00	0.00	754.10	6900.00	765.73	0.00	765.96	1.90	2.75	2632.65	5009.24
15.000	1400.00	0.00	0.00	753.30	6780.00	765.37	0.00	766.19	2.91	3.55	2543.09	3972.04
15.000	1400.00	0.00	0.00	753.30	6780.00	765.37	0.00	766.19	2.91	3.55	2543.09	3972.04
16.000	450.00	0.00	0.00	753.70	6780.00	765.77	0.00	766.59	2.75	3.44	1625.62	3531.77
16.000	450.00	0.00	0.00	753.70	6780.00	765.77	0.00	766.59	2.75	3.44	1625.62	3531.77
17.000	500.00	0.00	0.00	754.30	6760.00	765.42	0.00	766.01	3.08	4.40	1679.25	3445.47
17.000	500.00	0.00	0.00	754.30	6760.00	765.42	0.00	766.01	3.08	4.40	1679.25	3445.47
18.000	360.00	0.00	0.00	755.50	6760.00	766.61	0.00	767.00	3.56	4.55	1662.27	2273.42
18.000	360.00	0.00	0.00	755.50	6760.00	766.61	0.00	767.00	3.56	4.55	1662.27	2273.42
19.000	300.00	0.00	0.00	755.30	6780.00	766.41	0.00	767.04	3.03	4.70	1672.56	3021.92
19.000	300.00	0.00	0.00	755.30	6780.00	766.41	0.00	767.04	3.03	4.70	1672.56	3021.92
21.000	240.00	0.00	0.00	756.50	6760.00	767.61	0.00	767.28	3.17	4.56	2620.64	3620.27
21.000	240.00	0.00	0.00	756.50	6760.00	767.61	0.00	767.28	3.17	4.56	2620.64	3620.27
22.000	530.00	0.00	0.00	755.00	6780.00	767.11	0.00	767.30	2.20	3.06	1362.61	4567.57
22.000	530.00	0.00	0.00	755.00	6780.00	767.11	0.00	767.30	2.20	3.06	1362.61	4567.57
23.000	50.00	0.00	0.00	752.40	6780.00	767.21	0.00	767.37	2.98	4.09	1635.76	3749.19
25.100	1.00	769.00	769.51	752.40	6780.00	767.07	0.00	767.36	3.35	4.39	1572.02	3733.39
25.100	1.00	769.00	769.51	752.40	6780.00	767.07	0.00	767.36	3.35	4.39	1572.02	3733.39
25.900	32.00	769.00	769.00	754.00	6760.00	767.17	0.00	767.33	2.77	4.70	1442.47	3150.25
25.900	32.00	769.00	769.00	754.00	6760.00	767.17	0.00	767.33	2.77	4.70	1442.47	3150.25
26.000	1.00	0.00	0.00	754.00	6760.00	767.39	0.00	767.42	2.11	4.55	1479.33	3343.54
26.000	1.00	0.00	0.00	754.00	6760.00	767.21	0.00	767.34	2.11	4.55	1479.33	3343.54
26.100	40.00	0.00	0.00	754.00	6760.00	767.23	0.00	767.40	2.09	4.54	1501.27	3410.30
26.100	40.00	0.00	0.00	754.00	6760.00	767.23	0.00	767.36	2.09	4.54	1501.27	3410.30
26.100	960.00	0.00	0.00	754.90	6770.00	767.22	0.00	767.76	2.77	3.39	3474.10	4306.02
26.100	960.00	0.00	0.00	754.90	6770.00	767.22	0.00	767.76	2.77	3.39	3474.10	4306.02
27.000	3120.00	0.00	0.00	755.10	6770.00	766.80	0.00	767.71	2.24	3.30	3711.41	4704.67
27.000	3120.00	0.00	0.00	755.10	6770.00	766.80	0.00	767.62	2.27	3.32	3717.23	4772.07
28.000	1430.00	0.00	0.00	754.10	6770.00	766.91	0.00	767.75	2.59	3.66	2775.06	4125.10
28.000	1430.00	0.00	0.00	754.10	6770.00	766.80	0.00	767.62	2.59	3.66	2771.96	4095.00
29.000	50.00	0.00	0.00	753.40	6770.00	767.07	0.00	767.36	2.93	3.91	2117.76	4149.54
29.000	50.00	0.00	0.00	753.40	6770.00	767.13	0.00	767.28	2.97	3.75	2153.76	4227.67
29.100	1.00	771.20	771.51	753.40	6770.00	767.44	0.00	767.22	6.53	4.22	1613.05	2849.25
29.100	1.00	771.20	771.51	753.40	6770.00	767.07	0.00	767.27	6.53	4.13	1613.05	2849.25

SECNO	KLCH	ELTRD	ELLC	ELMIN	Q	CASEL	CRIAS	EG	TUKAS	VCH	AREA	[illegible]
29.900	44.00	770.20	774.50	758.10	6770.00	760.90	0.00	769.25	6.47	4.19	1615.34	2661.93
29.900	44.00	770.20	774.50	758.10	6770.00	769.[illegible]	0.00	769.50	6.18	4.12	[illegible]	2727.21
30.000	[illegible].00	0.00	0.00	758.10	6770.00	769.[illegible]	0.00	769.20	2.51	3.15	2[illegible].93	[illegible]
30.000	[illegible].00	0.00	0.00	758.10	6770.00	769.2[illegible]	0.00	769.50	2.40	3.10	2183.76	4366.9[illegible]
31.000	[illegible].00	0.00	0.00	758.10	6770.00	769.[illegible]	0.00	769.50	2.45	3.14	2157.84	4292.[illegible]
31.000	[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
32.000	394.00	0.00	0.00	[illegible]	6770.00	[illegible]	0.00	769.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
32.000	394.00	0.00	0.00	758.[illegible]	6770.00	769.[illegible]	0.00	769.[illegible]	[illegible]	1.42	4774.67	12423.[illegible]

KALAMAZOO R-CONSTOCK TOP

SUMMARY PRINTOUT TABLE 150

SEC.ID	T	C.SEL	Q.FUS	LS.SK	DIF.DS	TOT.IR	I.I
5.000	6910.00	761.51	0.00	0.00	0.00	128.15	1420.00
5.000	6910.00	765.68	0.00	0.00	0.12	96.25	1420.00
5.900	6900.00	764.10	0.30	0.02	0.00	152.71	1450.00
5.900	6900.00	764.84	0.30	0.12	0.12	121.11	1450.00
9.000	6900.00	764.62	0.30	0.11	0.00	150.11	50.00
9.000	6900.00	764.54	0.30	0.12	0.12	150.01	50.00
9.100	6910.00	764.57	0.30	0.1	0.12	150.11	50.00
9.100	6900.00	764.67	0.00	0.13	0.12	150.00	50.00
9.200	6900.00	764.56	0.00	0.01	0.00	150.00	50.00
9.200	6900.00	764.07	0.00	0.01	0.12	150.00	50.00
10.000	6900.00	764.59	0.00	0.00	0.00	148.11	1430.00
10.000	6900.00	764.57	0.00	0.00	0.12	126.11	1430.00
11.000	6900.00	765.59	0.00	0.00	0.00	668.33	1230.00
11.000	6900.00	765.27	0.00	0.00	0.12	636.95	1230.00
11.100	6900.00	765.63	0.00	0.00	0.00	114.11	440.00
11.100	6900.00	765.11	0.00	0.00	0.12	127.11	440.00
12.000	6900.00	765.27	0.00	0.00	0.00	100.33	600.00
12.000	6900.00	765.37	0.00	0.00	0.12	100.33	600.00
12.100	6900.00	765.13	0.00	0.00	0.00	231.10	1300.00
12.100	6900.00	765.37	0.00	0.00	0.12	232.00	1300.00
12.400	6900.00	765.31	0.00	0.00	0.00	252.00	300.00
12.400	6900.00	765.34	0.00	0.00	0.12	254.00	300.00
13.00	6900.00	765.10	0.00	0.00	0.00	252.00	0.00
13.00	6900.00	765.00	0.00	0.00	0.12	252.00	0.00
13.100	6930.00	765.52	0.00	0.02	0.00	252.00	50.00
13.100	6930.00	765.69	0.00	0.02	0.12	252.00	50.00
14.200	6900.00	765.51	0.00	0.02	0.00	254.10	1.00
14.200	6900.00	765.17	0.00	0.02	0.12	252.00	1.00
14.000	6900.00	765.51	0.00	0.07	0.00	352.00	50.00
14.000	6900.00	765.76	0.00	0.07	0.12	352.00	50.00
15.00	6900.00	765.07	0.00	0.11	0.00	510.02	1900.00
15.00	6900.00	766.07	0.00	0.11	0.12	470.32	1900.00
16.000	6780.00	766.06	0.00	0.10	0.00	412.37	650.00
16.000	6780.00	766.17	0.00	0.10	0.12	213.40	450.00
17.000	6780.00	766.36	0.00	0.25	0.00	317.18	650.00
17.000	6780.00	766.66	0.00	0.26	0.11	252.14	650.00

SECNO	G	CHSEL	DIFJSP	DIFHSX	DIFKWS	TOPHSD	XLOC
18.000	6780.00	766.33	0.00	0.27	0.00	364.36	560.00
19.000	6780.00	766.64	0.00	0.27	0.21	261.00	360.00
19.900	6781.00	766.71	0.00	0.13	0.30	371.72	300.00
19.900	6783.00	766.82	0.00	0.18	0.12	265.53	300.00
21.000	6780.00	766.97	0.00	0.27	0.30	436.00	260.00
21.100	6781.00	767.10	0.00	0.27	0.21	302.42	260.00
22.100	6781.00	767.10	0.00	0.13	0.30	58.50	0.00
22.900	6780.00	767.22	0.00	0.13	0.15	102.87	550.00
23.000	6780.00	767.06	0.00	-0.03	0.30	166.00	50.00
23.000	6781.00	767.21	0.00	-0.01	0.21	166.00	50.00
23.100	6781.00	767.07	0.00	-0.01	0.20	166.00	1.00
23.100	6783.00	767.19	0.00	-0.01	0.14	166.00	1.00
23.900	6783.00	767.06	0.00	-0.01	0.00	166.00	52.50
24.000	6781.00	767.19	0.00	-0.01	0.15	121.00	50.00
24.000	6780.00	767.06	0.00	0.03	0.30	166.00	1.00
24.100	6780.00	767.22	0.00	0.03	0.15	122.00	1.00
25.000	6780.00	767.10	0.00	0.04	0.00	174.98	51.00
25.100	6781.00	767.23	0.00	0.04	0.21	122.00	50.00
25.900	6781.00	767.10	0.00	0.03	0.00	174.98	50.00
26.000	6781.00	767.24	0.00	0.30	0.12	257.21	965.00
27.000	6781.00	767.24	0.00	0.30	0.21	257.21	965.00
27.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
28.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
28.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
29.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
29.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
30.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
30.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
31.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
31.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
32.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
32.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
33.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
33.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
34.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
34.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
35.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
35.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
36.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
36.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
37.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
37.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
38.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
38.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
39.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
39.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
40.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
40.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
41.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
41.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
42.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
42.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
43.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
43.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
44.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
44.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
45.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
45.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
46.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
46.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
47.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
47.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
48.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
48.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
49.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
49.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
50.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
50.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
51.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
51.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
52.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
52.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
53.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
53.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
54.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
54.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
55.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
55.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
56.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
56.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
57.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
57.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
58.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
58.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
59.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
59.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
60.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
60.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
61.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
61.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
62.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
62.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
63.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
63.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
64.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
64.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
65.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
65.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
66.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
66.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
67.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
67.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
68.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
68.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
69.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
69.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
70.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
70.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
71.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
71.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
72.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
72.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
73.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
73.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
74.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
74.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
75.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
75.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
76.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
76.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
77.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
77.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
78.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
78.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
79.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
79.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
80.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
80.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
81.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
81.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
82.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
82.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
83.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
83.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
84.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
84.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
85.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
85.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
86.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
86.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
87.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
87.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
88.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
88.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
89.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
89.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
90.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
90.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
91.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
91.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
92.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
92.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
93.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
93.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
94.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
94.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
95.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
95.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
96.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
96.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
97.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
97.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
98.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
98.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
99.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
99.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
100.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
100.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
101.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
101.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
102.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
102.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
103.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
103.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
104.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
104.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
105.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
105.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
106.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
106.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
107.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
107.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
108.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
108.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
109.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
109.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
110.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
110.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
111.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
111.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
112.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
112.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
113.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
113.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
114.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
114.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
115.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
115.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
116.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
116.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
117.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
117.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
118.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
118.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
119.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
119.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
120.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
120.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
121.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
121.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
122.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
122.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
123.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
123.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
124.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
124.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
125.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
125.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
126.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
126.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
127.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
127.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
128.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
128.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
129.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
129.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
130.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
130.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
131.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
131.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
132.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
132.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
133.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
133.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
134.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
134.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
135.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
135.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
136.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
136.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
137.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
137.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
138.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
138.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
139.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
139.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
140.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
140.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
141.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
141.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
142.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
142.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
143.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
143.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
144.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
144.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
145.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
145.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
146.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
146.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
147.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
147.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
148.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
148.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
149.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
149.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
150.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
150.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
151.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
151.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
152.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
152.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
153.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
153.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
154.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
154.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
155.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
155.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
156.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
156.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
157.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
157.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
158.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
158.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
159.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
159.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
160.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
160.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
161.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
161.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
162.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
162.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
163.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
163.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
164.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
164.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
165.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
165.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
166.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
166.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
167.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
167.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
168.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
168.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
169.000	6781.00	767.24	0.00	0.30	0.21	273.00	3150.00
169.900	6781.00	767.24	0.00	0.30	0.00	273.00	3150.00
170.000	6781.00	767.24	0.00	0.30	0.21	273.00

FLOODWAY DATA, KALAMAZOO R-COMSTOCK T.P
PROFILE NO. 8

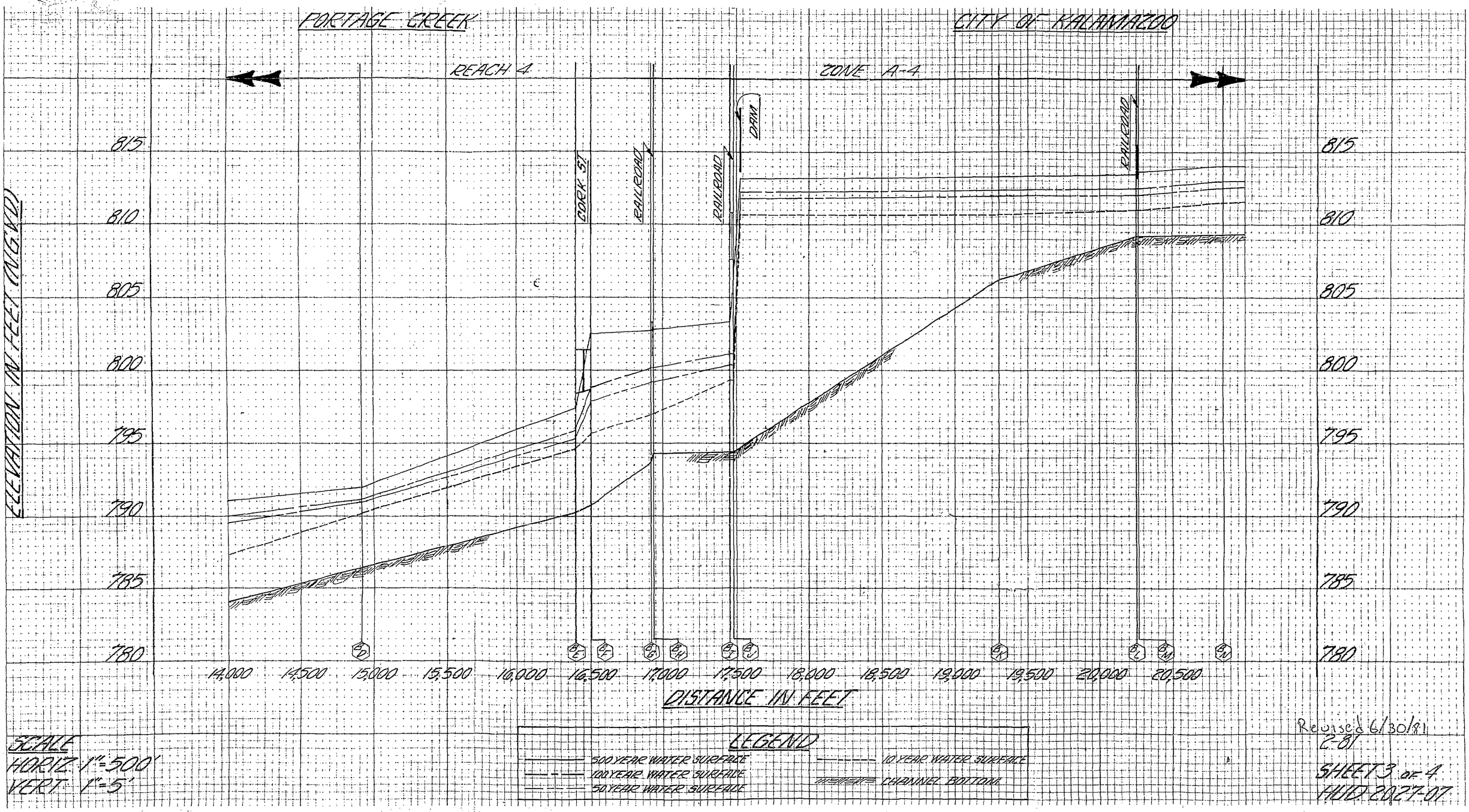
STATION	FLOODWAY WIDTH (FT)	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WATER SURFACE ELEVATION WITHOUT FLOODWAY	DIFFERENCE
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
8.900	117.	[illegible]	3.7	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
9.100	190.	2216.	3.1	764.6	764.5	0.1
9.200	190.	2217.	3.1	764.7	764.6	0.1
10.000	374.	3065.	2.3	765.0	764.9	0.1
[illegible]	[illegible]	[illegible]	1.5	[illegible]	765.1	0.1
[illegible]	[illegible]	[illegible]	1.2	[illegible]	[illegible]	0.1
12.000	[illegible]	[illegible]	1.5	[illegible]	[illegible]	0.1
12.800	252.	2115.	3.3	765.6	765.5	0.1
12.900	252.	2123.	3.3	765.6	765.5	0.1
13.000	252.	2055.	3.4	765.6	765.5	0.1
[illegible]	252.	[illegible]	3.4	[illegible]	[illegible]	0.1
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.1
15.000	303.	2491.	2.9	766.1	766.[illegible]	0.1
16.000	213.	1625.	4.2	766.2	766.1	0.1
17.000	275.	1704.	4.0	766.4	766.3	0.1
[illegible]	[illegible]	[illegible]	4.1	766.6	[illegible]	0.1
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
22.000	163.	1071.	3.6	767.3	767.1	0.1
23.000	145.	1651.	4.1	767.2	767.1	0.1
23.100	145.	[illegible]	[illegible]	767.2	767.1	0.1
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.1
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.1
[illegible]	[illegible]	[illegible]	[illegible]	767.2	767.1	0.1
26.000	638.	3164.	2.1	767.7	767.6	0.1
27.000	645.	3317.	2.0	768.7	768.6	0.1
28.000	220.	1972.	3.4	769.1	769.0	0.1
29.000	[illegible]	[illegible]	[illegible]	[illegible]	769.0	0.1
29.100	[illegible]	1037.	[illegible]	[illegible]	[illegible]	0.1
29.900	[illegible]	[illegible]	[illegible]	769.[illegible]	769.0	0.1
30.000	267.	2135.	3.1	769.2	769.1	0.1
31.000	267.	2137.	3.1	769.2	769.1	0.1
32.000	330.	4773.	1.4	769.4	769.3	0.1

PORTAGE CREEK

CITY OF KALAMAZOO

REACH 4

ZONE A-4



LEGEND

500 YEAR WATER SURFACE

100 YEAR WATER SURFACE

50 YEAR WATER SURFACE

10 YEAR WATER SURFACE

CHANNEL BOTTOM

SCALE
HORIZ. 1"=500'
VERT. 1"=5'

Revised 6/30/81
2-81

SHEET 3 OF 4
HUD 2827-07

```
*PROF 2

 CCHV=   0.100 CEHV=   0.300
 *SECNO 7.000
  2800 NAT Q1=   3728.91  WSEL=    759.95  ENC Q1=   3728.91  WSEL=    760.05  RATIO=  0.0000
  NAT Q1=   3826.  RATIOS LOB/CH/ROB=  0.0444  0.8877  0.0679  WSEL=    760.05
    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA     LEFT/RIGHT
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IH2       ICONT     CORAR     TOPWID      ENDST


 3470 ENCROACHMENT STATIONS=     1740.5     2308.9  TYPE=       4  TARGET=         0.025

          VALLEY SECTION (G) AT TOWNSHIP BOUNDRY -- D/S DISPOSAL PLANT

        7.00     12.45    760.05      0.00    759.95    760.35      0.30      0.00      0.00    754.10
      7390.       245.     6721.      424.      452.     1457.      509.        0.        0.    754.00
        0.00      0.54      4.61      0.83      0.079     0.030     0.079     0.000   747.60   1740.50
   0.000392        0.        0.        0.          0         0         0      0.00   568.38   2308.89


 CCHV=   0.100 CEHV=   0.300
 *SECNO 8.000

 3265 DIVIDED FLOW

 3470 ENCROACHMENT STATIONS=      998.0     1490.0  TYPE=       1  TARGET=       492.000

          VALLEY SECTION APPROX. 1600 FT. U/S OF CITY BOUNDARY AT SEWAGE DISPOSAL

        8.00     18.97    760.57      0.00    760.46    760.82      0.25      0.47      0.00    755.10
      7390.       147.     7186.       57.      347.     1752.      102.       85.       16.    757.40
        0.11      0.42      4.10      0.56      0.100     0.030     0.079     0.030   741.60   1082.01
   0.000226     1600.     1600.     1600.          2         0         0      0.00   525.20   1490.00


 CCHV=   0.300 CEHV=   0.500
 *SECNO 9.100
  2800 NAT Q1=   4476.61  WSEL=    760.84  ENC Q1=   4476.61  WSEL=    760.94  RATIO=  0.0000
  NAT Q1=   4547.  RATIOS LOB/CH/ROB=  0.0184  0.9759  0.0057  WSEL=    760.94

 3470 ENCROACHMENT STATIONS=     1630.0     1840.0  TYPE=       4  TARGET=         0.015

          VALLEY SECT. APPROX. 50 FT. D/S OF PATTERSON RD. BRIDGE

        9.10     16.44    760.94      0.00    760.84    761.12      0.12      0.28      0.02    755.50
      7390.        67.     7323.        0.      105.     2112.        0.       141.       23.    754.10
        0.20      0.65      3.47      0.00      0.100     0.035     0.079     0.032   744.50   1630.04
   0.000286     1100.     1100.     1100.          2         0         0      0.00   209.96   1840.00


 *SECNO 9.200
  2800 NAT Q1=   5077.68  WSEL=    760.92  ENC Q1=   5152.20  WSEL=    761.02  RATIO= -0.0147
  NAT Q1=   5152.  RATIOS LOB/CH/ROB=  0.0000  1.0000  0.0000  WSEL=    761.02

 3470 ENCROACHMENT STATIONS=     1602.0     1878.0  TYPE=       4  TARGET=         0.000

 3495 OVERBANK AREA ASSUMED NON-EFFECTIVE/ELLEA=      769.50 ELREA=      774.80
```

D/S FACE OF PATTERSON RD. BRIDGE

```
     9.20     16.33    761.03      0.00    760.92    761.15      0.13      0.01      0.02    763.20
     7390.        0.     7390.        0.        0.      2592.        0.       143.       23.    768.10
     0.20      0.00      2.85      0.00     0.100     0.035     0.079     0.032   744.70   1610.10
 0.000205       50.       50.       50.         2         0         0      0.00   250.45   1860.55
```

```
 *SECNO 9.300
  2800 NAT Q1=    4316.59  WSEL=     760.91  ENC Q1=    4884.09  WSEL=     761.01  RATIO= -0.0140
  NAT Q1=    4884.  RATIOS LOB,CH,ROB=  0.0000  1.0000  0.0000  WSEL=     761.01
    SECNO     DEPTH     CWSEL     CRIWS     WSELK      EG        HV        HL       OLOSS    BANK ELEV
    Q         QLOB      QCH       QROB      ALOB       ACH       AROB      VOL      TWA      LEFT/RIGHT
    TIME      VLOB      VCH       VROB      XNL        XNCH      XNR       WTN      ELMIN      SSTA
    SLOPE     YLOBL     XLCH      XLOBR     ITRIAL     IH2       ICONT     CORAR    TOPWID     ENDST
```

```
 3370 NORMAL BRIDGE,NRD= 13 MIN ELTRD=  769.50 MAX ELLC=  770.30
```

```
 3470 ENCROACHMENT STATIONS=     1602.0     1878.0  TYPE=       4  TARGET=         0.000
```

```
 3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=       769.50 ELREA=       774.80
```

1 FT. INSIDE D/S FACE PATTERSON RD. BRIDGE

```
     9.30     16.32    761.02      0.00    760.91    761.16      0.13      0.00      0.00    763.20
     7390.        0.     7390.        0.        0.      2511.        0.       143.       23.    768.10
     0.20      0.00      2.94      0.00     0.100     0.035     0.079     0.032   744.70   1610.10
 0.000225         1.        1.        1.         0         0         0    -80.68   250.45   1860.55
```

```
 *SECNO 9.400
  2800 NAT Q1=    4820.20  WSEL=     760.92  ENC Q1=    4891.52  WSEL=     761.02  RATIO= -0.0148
  NAT Q1=    4892.  RATIOS LOB,CH,ROB=  0.0000  1.0000  0.0000  WSEL=     761.02
```

```
 3370 NORMAL BRIDGE,NRD= 13 MIN ELTRD=  769.50 MAX ELLC=  770.30
```

```
 3470 ENCROACHMENT STATIONS=     1602.0     1878.0  TYPE=       4  TARGET=         0.000
```

```
 3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=       769.50 ELREA=       774.80
```

1 FT. INSIDE U/S FACE PATTERSON RD. BRIDGE

```
     9.40     16.33    761.03      0.00    760.92    761.17      0.13      0.01      0.00    763.20
     7390.        0.     7390.        0.        0.      2512.        0.       143.       24.    768.10
     0.21      1.00      2.94      0.00     0.100     0.035     0.079     0.032   744.70   1610.08
 0.000229        45.       45.       45.         0         0         0    -80.92   250.49   1860.56
```

```
 *SECNO 9.500
  2800 NAT Q1=    5087.06  WSEL=     760.93  ENC Q1=    5165.28  WSEL=     761.03  RATIO= -0.0154
  NAT Q1=    5165.  RATIOS LOB,CH,ROB=  0.0000  1.0000  0.0000  WSEL=     761.03
```

```
 3470 ENCROACHMENT STATIONS=     1602.0     1878.0  TYPE=       4  TARGET=         0.000
```

```
 3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=       769.50 ELREA=       774.80
```

```
      9.50     16.34    761.04      0.00    760.93    761.17      0.13      0.00      0.00    763.20
      7390.        0.      7390.        0.        0.      2595.        0.       146.       24.     768.10
      0.21      0.00      2.25      0.00     0.100     0.035     0.079     0.032    744.70   1610.06
  0.000205       1.        1.        1.         1         0         0      0.00    250.52   1860.58

 *SECNO 9.600
  2800 NAT Q1=    5099.33  WSEL=     760.95  ENC Q1=    5173.64  WSEL=     761.05  RATIO= -0.0146
  NAT Q1=    5174.  RATIOS LOB,CH,ROB=  0.0000  1.0000  0.0000  WSEL=     761.05

 3470 ENCROACHMENT STATIONS=    1602.0    1878.0  TYPE=       4  TARGET=        0.000

          VALLEY SECT. APPROX. 50 FT. U/S OF PATTERSON RD. BRIDGE

      9.60     16.35    761.05      0.00    760.95    761.18      0.13      0.01      0.00    763.20
      7390.        0.      7390.        0.        0.      2599.        0.       149.       24.     768.10
      0.21      0.00      2.24      0.00     0.100     0.035     0.079     0.032    744.70   1610.00
  0.000204       50.       50.       50.         0         0         0      0.00    250.62   1860.62

 CCHV=    0.100 CEHV=    0.300
 *SECNO 10.000

 3470 ENCROACHMENT STATIONS=     975.0    1472.0  TYPE=       1  TARGET=      497.000

          VALLEY SECT. APPROX.

     10.00     15.32    761.22      0.00    761.11    761.36      0.16      0.19      0.01    754.30
      7390.      151.      7051.      188.      262.      2148.      353.      203.       30.     754.90
      0.29      0.58      3.28      0.53     0.080     0.035     0.100     0.033    745.90   1065.48
  0.000213       300.      900.      300.         0         0         0      0.00    406.52   1472.00

 CCHV=    0.300 CEHV=    0.500
 *SECNO 11.100
    SECNO     DEPTH     QWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     BANK ELEV
    0         QLOB      QCH       XPOB      ALOB      ACH       AROB      VOL       TWA       LEFT/RIGHT
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IH2       ICONT     CORAR     TOPWID    ENDST

 3470 ENCROACHMENT STATIONS=    1130.0    1390.0  TYPE=       1  TARGET=      240.000

          VALLEY SECT. APPROX. 50 FT. D/S OF GULL ST. BRIDGE

     11.10     13.08    761.38      0.00    761.29    761.69      0.30      0.24      0.07    754.70
      7390.      355.      6998.       37.      262.      1548.      51.       244.       36.     754.50
      0.34      1.36      4.52      0.72     0.080     0.035     0.100     0.033    748.30   1768.48
  0.000510       1250.     750.      300.         0         0         0      0.00    211.47   1372.95

 *SECNO 11.200
  2800 NAT Q1=    3175.60  WSEL=     761.36  ENC Q1=    3232.66  WSEL=     761.46  RATIO= -0.0180
  NAT Q1=    3233.  RATIOS LOB,CH,ROB=  0.0000  1.0000  0.0000  WSEL=     761.46

 3470 ENCROACHMENT STATIONS=    1196.5    1387.5  TYPE=       4  TARGET=        0.000

 3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      767.40 ELREA=      766.80
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      11.20    11.95   761.45     0.00   761.36   761.72     0.27     0.03     0.01   757.50
       7390.       0.    7390.       0.       0.    1769.       0.     246.     36.    754.70
       0.34     0.00     4.18     0.00    0.080    0.035    0.100    0.033   749.50  1196.50
   0.000548      50.      50.      50.        2        0        0     0.00   191.00  1387.50

*SECNO 11.300
 2800 NAT Q1=    3183.47  WSEL=    761.31  ENC Q1=    2221.11  WSEL=    761.41  RATIO= -0.0149
  NAT Q1=    2221.  RATIOS LOB/CH/ROB=  0.0000  1.0000  0.0000  WSEL=    761.41

3370 NORMAL BRIDGE,NRD= 23 MIN ELTRD=  766.80 MAX ELLC=  765.60

3470 ENCROACHMENT STATIONS=     1196.5     1387.5  TYPE=       4  TARGET=         0.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE/ELLEA=       767.40 ELREA=       766.80

          1 FT. INSIDE D/S FACE GULL ST. BRIDGE

      11.30    11.90   761.40     0.00   761.31   761.77     0.37     0.00     0.05   757.50
       7390.       0.    7390.       0.       0.    1619.       0.     246.     36.    754.70
       0.34     0.00     4.86     0.00    0.080    0.035    0.100    0.033   749.50  1196.50
   0.001152       1.       1.       1.        2        0        0  -240.83   191.00  1387.50

*SECNO 11.400
 2800 NAT Q1=    2430.88  WSEL=    761.41  ENC Q1=    2464.74  WSEL=    761.51  RATIO= -0.0139
  NAT Q1=    2465.  RATIOS LOB/CH/ROB=  0.0000  1.0000  0.0000  WSEL=    761.51

3370 NORMAL BRIDGE,NRD= 23 MIN ELTRD=  766.80 MAX ELLC=  765.60

3470 ENCROACHMENT STATIONS=     1196.5     1387.5  TYPE=       4  TARGET=         0.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE/ELLEA=       767.40 ELREA=       766.80

          1 FT. INSIDE D/S FACE GULL ST. BRIDGE

      11.40    12.30   761.50     0.00   761.41   761.83     0.32     0.04     0.01   757.00
       7390.       0.    7390.       0.       0.    1619.       0.     247.     36.    756.10
       0.35     0.00     4.56     0.00    0.080    0.035    0.100    0.033   748.70  1196.50
   0.000929      41.      41.      41.        2        0        0  -261.29   191.00  1387.50

*SECNO 11.500
 2800 NAT Q1=    3580.24  WSEL=    761.53  ENC Q1=    3639.75  WSEL=    761.63  RATIO= -0.0166
  NAT Q1=    3640.  RATIOS LOB/CH/ROB=  0.0000  1.0000  0.0000  WSEL=    761.63

3470 ENCROACHMENT STATIONS=     1196.5     1387.5  TYPE=       4  TARGET=         0.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE/ELLEA=       767.40 ELREA=       766.80

          D/S FACE OF GULL ST. BRIDGE

      11.50    12.92   761.62     0.00   761.53   761.85     0.23     0.00     0.03   757.00
       7390.       0.    7390.       0.       0.    1903.       0.     247.     36.    756.10
       0.35     0.00     3.88     0.00    0.080    0.035    0.100    0.033   748.70  1196.50
   0.000429       1.       1.       1.        2        0        0     0.00   191.00  1387.50
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	DLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

3470 ENCROACHMENT STATIONS= 1146.0 1440.0 TYPE= 1 TARGET= 294.000

VALLEY SECT. APPROX. 50 FT. U/S OF GULL ST.

11.60	12.94	761.64	0.00	761.55	761.87	0.23	0.02	0.00	757.00
7390.	0.	7383.	1.	11.	1908.	4.	250.	37.	756.10
0.35	0.52	3.87	0.22	0.030	0.035	0.100	0.033	748.70	1191.72
0.000396	50.	50.	50.	1	0	0	0.00	197.08	1388.80

CCHV= 0.300 CEHV= 0.500

*SECNO 11.700

3470 ENCROACHMENT STATIONS= 1089.0 1625.0 TYPE= 1 TARGET= 536.000

VALLEY SECT. APPROX.500 FT. U/S OF GULL ST.

11.70	16.33	761.83	0.00	761.74	762.01	0.18	0.12	0.02	753.90
7390.	216.	7133.	41.	463.	2058.	75.	274.	39.	754.70
0.39	0.47	3.47	0.55	0.100	0.030	0.100	0.033	745.50	1069.00
0.000157	250.	500.	650.	0	0	0	0.00	377.34	1466.34

*SECNO 12.000

3470 ENCROACHMENT STATIONS= 377.0 1156.0 TYPE= 1 TARGET= 779.000

VALLEY SECT. APPROX. 50 FT. D/S OF R.R. BRIDGE N. OF MICH. AVE.

12.00	14.32	761.92	0.00	761.84	762.11	0.18	0.10	0.00	752.00
7390.	81.	7208.	101.	148.	2066.	166.	306.	45.	755.00
0.44	0.55	3.49	0.61	0.100	0.030	0.100	0.033	747.60	886.95
0.000172	500.	600.	600.	2	0	0	0.00	244.10	1131.05

*SECNO 12.100

3470 ENCROACHMENT STATIONS= 87.0 1243.0 TYPE= 1 TARGET= 1156.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE.ELLEA= 768.20 ELREA= 769.10

D/S FACE OF R.R. BRIDGE N. OF MICHIGAN AVE.

12.10	14.36	761.96	0.00	761.88	762.13	0.16	0.01	0.01	758.30
7390.	0.	7390.	0.	0.	2300.	0.	311.	44.	758.30
0.44	0.00	3.21	0.00	0.100	0.030	0.100	0.033	747.60	895.00
0.000229	50.	50.	50.	2	0	0	0.00	254.00	1149.00

SPECIAL BRIDGE

SD	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.05	1.50	2.60	0.00	180.00	21.00	1715.00	0.00	751.30	747.60

PRESSURE FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
762.40	762.21	0.02	0.	7390.	1715.	1717.	762.10	768.20

3470 ENCROACHMENT STATIONS= 87.0 1243.0 TYPE= 1 TARGET= 1156.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 768.20 ELREA= 769.10

U/S FACE OF R.R. BRIDGE N.OF MICHIGAN AVE.

12.40	10.88	762.18	0.00	762.09	762.40	0.21	0.27	0.00	758.50
7390.	0.	7390.	0.	0.	1987.	0.	312.	44.	758.50
0.45	0.00	3.72	0.00	0.100	0.030	0.100	0.033	751.30	895.00
0.000374	28.	28.	28.	2	0	0	0.00	254.00	1149.00

*SECNO 12.500
2800 NAT Q1= 3806.91 WSEL= 762.11 ENC Q1= 3883.27 WSEL= 762.21 RATIO= -0.0201
NAT Q1= 3896. RATIOS LOB,CH,ROB= 0.0023 0.9968 0.0009 WSEL= 762.21

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
0	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ILMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IN2	ICONT	CORAR	TOPWID	ENDST

3470 ENCROACHMENT STATIONS= 895.0 1149.0 TYPE= 4 TARGET= 0.003

VALLEY SECT. APPROX. 50 FT. U/S OF R.R. BRIDGE N. OF MICH. AVE.

12.50	10.90	762.20	0.00	762.11	762.42	0.21	0.02	0.00	758.50
7390.	0.	7390.	0.	0.	1992.	0.	314.	44.	758.50
0.45	0.00	3.71	0.00	0.100	0.030	0.100	0.032	751.30	895.00
0.000379	50.	50.	50.	0	0	0	0.00	254.00	1149.00

CCHV= 0.300 CEHV= 0.500

*SECNO 13.100

3470 ENCROACHMENT STATIONS= 730.0 926.0 TYPE= 1 TARGET= 196.000

VALLEY SECT. APPROX. 50 FT. D/S OF MICHIGAN AVE.

13.10	13.42	762.32	0.00	762.23	762.50	0.18	0.08	0.01	754.90
7390.	4.	7384.	2.	15.	2160.	0.	329.	46.	756.20
0.47	0.29	3.47	0.30	0.100	0.030	0.066	0.032	746.90	740.29
0.000190	300.	300.	300.	0	0	0	0.00	185.71	926.00

*SECNO 13.200
2800 NAT Q1= 5318.79 WSEL= 762.24 ENC Q1= 5388.77 WSEL= 762.34 RATIO= -0.0132
NAT Q1= 5389. RATIOS LOB,CH,ROB= 0.0000 1.0000 0.0000 WSEL= 762.34

3470 ENCROACHMENT STATIONS= 744.3 925.0 TYPE= 4 TARGET= 0.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 767.30 ELREA= 767.30

D/S FACE OF MICHIGAN AVE. BRIDGE

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      13.20     13.43    762.33      0.00    762.24    762.51      0.18      0.01      0.00    754.90
       7390.        0.     7390.        0.        0.     2162.        0.       331.       46.    756.20
        0.48      0.00      3.42      0.00     0.100     0.030     0.060     0.032    748.90    744.30
    0.000197       50.       50.       50.         0         0         0      0.00    180.70    925.00


 *SECNO 13.300
  2800 NAT Q1=    1680.00  WSEL=    762.05  ENC Q1=    1695.47  WSEL=    762.15  RATIO= -0.0092
  NAT Q1=    1695.  RATIOS LOB,CH,ROB=  0.0000  1.0000  0.0000  WSEL=    762.15

 3370 NORMAL BRIDGE,NRD= 17 MIN ELTRD=  766.20 MAX ELLC=  763.30


 3470 ENCROACHMENT STATIONS=      744.3      925.0  TYPE=      4  TARGET=        0.000

 3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      767.30 ELREA=      767.30


          1 FT. INSIDE D/S FACE MICHIGAN AVE. BRIDGE   (SKEWED 40 DEGREES)

      13.30     13.24    762.14      0.00    762.05    762.70      0.58      0.00      0.19    754.90
       7390.        0.     7390.        0.        0.     1233.        0.       331.       46.    756.20
        0.48      0.00      6.00      0.00     0.100     0.030     0.060     0.032    748.90    744.30
    0.001965         1.        1.        1.         2         0         0  -695.55    180.70    925.00


 *SECNO 13.400
  2800 NAT Q1=    1695.81  WSEL=    762.16  ENC Q1=    1711.30  WSEL=    762.26  RATIO= -0.0091
  NAT Q1=    1711.  RATIOS LOB,CH,ROB=  0.0000  1.0000  0.0000  WSEL=    762.26

 3370 NORMAL BRIDGE,NRD= 17 MIN ELTRD=  766.20 MAX ELLC=  763.30


 3470 ENCROACHMENT STATIONS=      744.3      925.0  TYPE=      4  TARGET=        0.000

 3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      767.30 ELREA=      767.30


          1 FT. INSIDE D/S FACE MICHIGAN AVE. BRIDGE

      13.40     13.34    762.24      0.00    762.16    762.80      0.65      0.10      0.00    754.90
       7390.        0.     7390.        0.        0.     1239.        0.       332.       46.    756.20
        0.48      0.00      5.96      0.00     0.100     0.030     0.060     0.032    748.90    744.30
    0.001933        49.       49.       49.         0         0         0  -906.00    180.70    925.00


 *SECNO 13.500
  2800 NAT Q1=    5620.81  WSEL=    762.66  ENC Q1=    5694.59  WSEL=    762.76  RATIO= -0.0151
  NAT Q1=    5695.  RATIOS LOB,CH,ROB=  0.0000  1.0000  0.0000  WSEL=    762.76
     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     BANK ELEV
       Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA     LEFT/RIGHT
       TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
       SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IN2       ICONT     CORAR     TOPWID      ENDST


 3470 ENCROACHMENT STATIONS=      744.3      925.0  TYPE=      4  TARGET=        0.000

 3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      767.30 ELREA=      767.30
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      13.50    13.84   762.74     0.00   762.66   762.91     0.17     0.00     0.11   754.90
      7390.       0.     7390.       0.       0.     2237.       0.      332.      46.   756.20
       0.48     0.00     3.30     0.00    0.100    0.030    0.060    0.032   748.90   744.30
   0.000177       1.       1.       1.        2        0        0     0.00   180.70   925.00

  *SECNO 13.000
   2800 NAT Q1=   5252.88  WSEL=    762.64  ENC Q1=   5295.07  WSEL=    762.74  RATIO= -0.0080
   NAT Q1=   5319.  RATIOS LOB,CH,ROB=  0.0031  0.9955  0.0014  WSEL=    762.74

  3470 ENCROACHMENT STATIONS=    1408.7    1549.4  TYPE=       4  TARGET=       0.004

          VALLEY SECT. 50' U/S OF MICHIGAN ABRAN NO.12 (SKEWED 40 DEGREES)

      13.60    14.02   762.72     0.00   762.64   762.95     0.23     0.01     0.03   755.10
      7390.       0.     7390.       0.       0.     1912.       0.      335.      46.   757.70
       0.48     0.00     3.87     0.00    0.100    0.030    0.060    0.032   746.70  1408.66
   0.000219       50.      50.      50.        2        0        0     0.00   140.70  1549.36

  CCHV=   0.300 CEHV=   0.500
  *SECNO 14.100

  3470 ENCROACHMENT STATIONS=    1271.0    1477.0  TYPE=       1  TARGET=     206.000

          VALLEY SECT. APPROX.  50 FT. D/S OF MILL ST.

      14.10    14.25   763.05     0.00   762.95   763.22     0.18     0.26     0.02   755.00
      6910.      19.     6877.      15.      29.     2021.      41.      392.      51.   751.30
       0.59     0.66     3.40     0.36    0.060    0.030    0.120    0.032   748.80  1276.90
   0.000190     1950.    1250.     950.        2        0        0     0.00   194.10  1471.00

  *SECNO 14.200
   2800 NAT Q1=   4782.55  WSEL=    762.96  ENC Q1=   4852.17  WSEL=    763.06  RATIO= -0.0146
   NAT Q1=   4852.  RATIOS LOB,CH,ROB=  0.0000  1.0000  0.0000  WSEL=    763.06

  3470 ENCROACHMENT STATIONS=    1284.0    1464.0  TYPE=       4  TARGET=       0.000

  3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=     766.00 ELREA=     766.40

          D/S FACE OF MILL ST. BRIDGE

      14.20    14.25   763.05     0.00   762.96   763.24     0.18     0.01     0.00   755.00
      6910.       0.     6910.       0.       0.     2022.       0.      395.      51.   751.30
       0.59     0.00     3.42     0.00    0.060    0.030    0.120    0.032   748.80  1284.00
   0.000220       50.      50.      50.        0        0        0     0.00   180.00  1464.00

  *SECNO 14.300
   2800 NAT Q1=   2072.34  WSEL=    762.88  ENC Q1=   2081.86  WSEL=    762.98  RATIO= -0.0046
   NAT Q1=   2082.  RATIOS LOB,CH,ROB=  0.0000  1.0000  0.0000  WSEL=    762.98

  3370 NORMAL BRIDGE,NRD= 25 MIN ELTRD=  766.00 MAX ELLC=  764.90

  3470 ENCROACHMENT STATIONS=    1284.0    1464.0  TYPE=       4  TARGET=       0.000

  3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=     766.00 ELREA=     766.40
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      14.30    14.18   762.98     0.00   762.88   763.31     0.34     0.00     0.08   755.00
      6910.       0.     6910.       0.       0.     1484.       0.      395.      51.   751.30
       0.59     0.00      4.66     0.00     0.060    0.030    0.120    0.032   748.80  1284.00
   0.001159       1.       1.       1.        2        0        0  -524.42   180.00  1464.00

   *SECNO 14.400
    2800 NAT Q1=   2080.19  WSEL=    762.91  ENC Q1=   2090.32  WSEL=    763.01  RATIO= -0.0049
    NAT Q1=   2090.  RATIOS LOB,CH,ROB=  0.0000  1.0000  0.0000  WSEL=    763.01
      SECNO    DEPTH    CWSEL    CRIWS    WSELK     EG       KV       HL       OLOSS   BANK ELEV
      Q        QLOB     QCH      QROB     ALOB      ACH      AROB     VOL      TWA   LEFT/RIGHT
      TIME     VLOB     VCH      VROB     XNL       XNCH     XNR      WTN      ELMIN      SSTA
      SLOPE    XLOBL    XLCH     XLOBR    ITRIAL    INZ      ICONT    CORAR    TOPWID     ENDST

   3370 NORMAL BRIDGE,NRD= 23 MIN ELTRD=  766.00 MAX ELLC=  764.90

   3470 ENCROACHMENT STATIONS=    1234.0    1464.0  TYPE=      4  TARGET=        0.000

   3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=       766.00 ELREA=       766.40

            1 FT. INSIDE U/S FACE MILL ST. BRIDGE

      14.40    13.21   763.01     0.00   762.91   763.36     0.35     0.04     0.00   753.10
      6910.       0.     6910.       0.       0.     1464.       0.      396.      51.   757.40
       0.59     0.00      4.72     0.00     0.060    0.030    0.120    0.032   749.80  1284.00
   0.001122      33.       33.      33.        0        0        0  -536.51   180.00  1464.00

   *SECNO 14.500
    2800 NAT Q1=   4817.57  WSEL=    763.13  ENC Q1=   4887.48  WSEL=    763.23  RATIO= -0.0145
    NAT Q1=   4887.  RATIOS LOB,CH,ROB=  0.0000  1.0000  0.0000  WSEL=    763.23

   3470 ENCROACHMENT STATIONS=    1234.0    1464.0  TYPE=      4  TARGET=        0.000

   3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=       766.00 ELREA=       766.40

            U/S FACE MILL ST. BRIDGE

      14.50    13.43   763.23     0.00   763.13   763.41     0.18     0.00     0.05   753.10
      6910.       0.     6910.       0.       0.     2039.       0.      396.      51.   757.40
       0.59     0.00      3.39     0.00     0.060    0.030    0.120    0.032   749.80  1284.00
   0.000208       1.       1.       1.        2        0        0     0.00   180.00  1464.00

   *SECNO 14.600

   3470 ENCROACHMENT STATIONS=    1234.0    1514.0  TYPE=      1  TARGET=      280.000

            VALLEY SECT. 50 FT. U/S OF MILLS ST.

      14.60    13.44   763.24     0.00   763.14   763.42     0.18     0.01     0.00   753.10
      6910.      25.     6881.       5.      36.     2042.      17.      398.      52.   757.40
       0.60     0.68      3.37     0.27     0.060    0.030    0.120    0.032   749.80  1276.92
   0.000184      50.       50.      50.        2        0        0     0.00   192.92  1469.84
```

3470 ENCROACHMENT STATIONS= 1225.0 1750.0 TYPE= 1 TARGET= 525.000

VALLEY SECT. APPROX. 1450 FT. U/S OF MILLS ST. BRIDGE

15.00	17.80	763.50	0.00	763.41	763.61	0.11	0.18	0.01	757.40
6910.	581.	6304.	76.	892.	2317.	295.	456.	63.	758.10
0.75	0.60	2.72	0.26	0.060	0.030	0.120	0.032	745.70	1225.00
0.000097	1150.	1400.	1450.	3	0	3	0.00	525.00	1750.00

CCHV= 0.300 CEHV= 0.500
*SECNO 16.100

3470 ENCROACHMENT STATIONS= 1500.0 1702.0 TYPE= 1 TARGET= 202.000

VALLEY SECT. 50 FT. D/S OF R.R. BRIDGE

16.10	20.82	763.62	0.00	763.53	763.72	0.10	0.11	0.00	753.40
6910.	57.	6818.	25.	101.	2521.	85.	577.	72.	756.80
0.89	0.66	2.60	0.29	0.060	0.030	0.120	0.031	742.80	1500.00
0.000078	900.	1325.	1450.	2	0	0	0.00	202.00	1702.00

*SECNO 16.200

SECNO	DEPTH	QWSEL	QRIWS	QWELK	EG	HV	HL	QLOSS	BANK ELEV
Q	QLOB	WCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IN2	ICONT	CORAR	TOPWID	ENDST

3470 ENCROACHMENT STATIONS= 143.0 2067.0 TYPE= 1 TARGET= 1924.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 766.40 ELREA= 766.20.

D/S FACE OF R.R.BRIDGE

16.20	20.82	763.62	0.00	763.53	763.73	0.11	0.00	0.00	753.40
6910.	0.	6910.	0.	0.	2022.	0.	581.	73.	756.80
0.90	0.00	2.64	0.00	0.060	0.030	0.120	0.031	742.80	1512.40
0.000086	50.	50.	50.	0	0	0	0.00	177.10	1689.50

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.25	1.55	2.40	0.00	141.00	37.40	2075.00	0.00	743.50	742.80

*SECNO 16.400

CLASS A LOW FLOW

3420 BRIDGE W.S.= 763.88 BRIDGE VELOCITY= 3.22 CALCULATED CHANNEL AREA= 2112.

EGPRS	EGLWC	K3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
0.00	763.78	0.06	0.	6910.	2075.	2113.	763.90	766.40

U/S FACE OF R.R.BRIDGE

```
      16.40     20.18    763.68      0.00    763.59    763.78      0.10      0.05      0.00    753.40
       6910.        0.      6910.       0.        0.      2776.       0.       581.      73.    758.00
        0.90      0.00      2.49      0.00     0.060     0.030     0.120     0.031    743.50   1512.40
   0.000071       11.       11.       11.         0         0         0      0.00    177.10   1689.50
```

*SECNO 16.500

```
3470 ENCROACHMENT STATIONS=     1462.0     1740.0  TYPE=      1  TARGET=      278.000
```

VALLEY SECT. APPROX. 50 FT. OF R.R. BRIDGE

```
      16.50     17.97    763.67      0.00    763.58    763.80      0.13      0.00      0.02    756.20
       6910.       73.      6750.      88.       123.     2340.      265.       584.      73.    759.30
        0.90      0.59      2.88      0.33     0.060     0.030     0.120     0.031    745.70   1486.01
   0.000101       50.       50.       50.         1         0         0      0.00    253.99   1740.00
```

CCHV= 0.100 CEHV= 0.300

```
*SECNO 17.000
 2800 NAT Q1=   3460.91  WSEL=    763.58  ENC Q1=   3460.91  WSEL=    763.68  RATIO= 0.0000
 NAT Q1=   3503.  RATIOS LOB/CH/ROB=  0.0108  0.9792  0.0100  WSEL=    763.65
```

```
3470 ENCROACHMENT STATIONS=        2.1        96.1  TYPE=      4  TARGET=        3.012
```

VALLEY SECT. AT CITY OF KALAMAZOO/KALAMAZOO TWP. CORP. BOUNDARY

```
      17.00     16.66    763.66      0.00    763.58    764.16      0.51      0.25      0.11    754.50
       6910.       35.      6853.      22.       49.     1195.       37.       647.      78.    753.30
        0.97      0.70      5.74      0.61     0.100     0.030     0.100     0.031    747.00      2.10
   0.000402       1650.     1400.      700.        2         0         0      0.00     93.95     96.05
```

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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
  ERROR CORR -  01
  MODIFICATION -  50,51,52
**************************************************

C
T1 10 YEAR PROFILE
T2STARTING WATER SURFACE FROM KALAMAZOO TWP. STUDY
T3      KALAMAZOO R. KALAMAZOO
J1  ICHECK     INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FR
         0.        2.        0.        0.  0.000000      0.00      0.0       0.    756.230     0.000
J2  NPROF      IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE
     1.000     0.000    -1.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
J3  VARIABLE CODES FOR SUMMARY PRINTOUT
   150.000   201.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
J5  LPRNT     NUMSEC                    *********REQUESTED SECTION NUMBERS*********
   -10.000   -10.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
QT     5.000  4950.000  6650.000  7390.000  7390.000  9160.000     0.000     0.000     0.000     0.000
NC     0.079     0.079     0.030     0.100     0.300     0.000     0.000     0.000     0.000     0.000
ET     0.000     0.000     0.000     0.000     1.400     0.000     0.000     0.000     0.000     0.000

          VALLEY SECTION (G) AT TOWNSHIP BOUNDRY -- D/S DISPOSAL PLANT

X1     7.000    12.000  2016.000  2158.000     0.000     0.000     0.000     0.000     0.000     0.000
GR   765.000  1050.000   760.000  1100.000   758.300  2000.000   754.100  2016.000   747.900  2062.000
GR   747.600  2098.000   750.000  2134.000   754.000  2156.000   756.500  2168.000   758.100  2174.000
GR   760.000  2550.000   765.000  2600.000     0.000     0.000     0.000     0.000     0.000     0.000
NC     0.100    0.079     0.030     0.100     0.300     0.000     0.000     0.000     0.000     0.000
QT     5.000 -4940.000  6640.000  7390.000  7390.000  9160.000     0.000     0.000     0.000     0.000
ET     0.000     7.100     7.100     7.100     9.100     7.100   760.000  1729.000   998.000  1490.000

          VALLEY SECTION APPROX. 1600 FT. U/S OF CITY BOUNDARY AT SEWAGE DISPOSAL

X1     5.000    23.000  1325.000  1455.000  1600.000  1600.000  1600.000     0.000     0.000     0.000
GR   777.000   546.000   761.600   370.000   756.400   416.000   761.400   628.000   762.600   760.000
GR   761.100  1080.000   757.400  1094.000   757.500  1100.000   761.300  1108.000   762.000  1131.000
GR   762.000  1152.000   760.400  1196.000   758.200  1252.000   757.600  1304.000   755.100  1325.000
GR   752.000  1345.000   750.000  1350.000   746.300  1370.000   743.200  1390.000   741.800  1400.000
GR   741.600  1420.000   740.900  1440.000   752.000  1445.000   757.400  1455.000   757.000  1462.000
GR   759.000  1498.000   760.600  1676.000   762.300  1750.000     0.000     0.000     0.000     0.000
NC     0.100    0.079     0.035     0.300     0.500     0.000     0.000     0.000     0.000     0.000
ET     0.000    0.000     0.000     0.000     1.400     9.100     0.000     0.000  1605.000  1885.000

          VALLEY SECT. APPROX. 50 FT. D/S OF PATTERSON RD. BRIDGE

X1     9.100    21.000  1650.000  1840.000  1100.000  1100.000  1100.000     0.000     0.000     0.000
GR   764.000   450.000   762.200   564.000   761.100   766.000   762.200  1160.000   766.400  1352.000
GR   769.400  1552.000   768.100  1590.000   764.700  1595.000   756.200  1615.000   755.600  1650.000
```

PRINTED IN U.S.A.
FORM 1411-00 PRINTED BY ROTARY MANIFOLD FORMS.

GR	750.700	1673.000	750.000	1690.000	747.700	1720.000	745.500	1740.000	744.500	1760.000
GR	749.200	1780.000	751.200	1800.000	753.700	1805.000	754.100	1840.000	772.500	1898.000
GR	774.600	1934.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

D/S FACE OF PATTERSON RD. BRIDGE

X1	9.200	28.000	1602.000	1878.000	50.000	50.000	50.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	769.500	774.800	0.000
GR	763.100	446.000	761.400	732.000	761.900	948.000	764.200	1270.000	767.000	1452.000
GR	769.400	1552.000	769.500	1589.000	763.200	1602.000	763.200	1602.100	754.800	1633.000
GR	753.000	1668.200	753.000	1668.300	751.300	1670.600	751.300	1670.700	745.700	1758.800
GR	745.700	1738.900	745.700	1741.100	745.700	1741.200	744.700	1775.000	748.900	1809.400
GR	748.900	1809.500	752.000	1811.700	752.000	1811.800	754.400	1844.300	768.100	1877.900
GR	768.100	1878.000	774.800	1891.700	774.600	1934.000	0.000	0.000	0.000	0.000

1 FT. INSIDE D/S FACE PATTERSON RD. BRIDGE

X1	9.300	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	769.500	774.800	0.000
BT	18.000	1589.000	769.500	0.000	1602.000	769.800	0.000	1602.100	769.800	765.300
BT	1668.200	771.000	766.500	1668.300	771.000	0.000	1670.600	771.000	0.000	1670.700
BT	771.000	766.500	1738.800	772.300	767.800	1738.900	772.300	0.000	1741.100	772.300
BT	0.000	1741.200	772.300	767.800	1809.400	775.500	769.000	1809.500	775.900	0.000
BT	1811.700	773.500	0.000	1811.800	773.500	769.000	1877.900	774.800	770.300	1878.000
BT	774.800	0.000	1891.700	774.800	0.000	0.000	0.000	0.000	0.000	0.000

1 FT. INSIDE U/S FACE PATTERSON RD. BRIDGE

X1	9.400	0.000	0.000	0.000	43.000	43.000	43.000	0.000	0.000	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	769.500	774.800	0.000

U/S FACE OF PATTERSON RD. BRIDGE

X1	9.500	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	769.500	774.800	0.000
ET	0.000	0.000	0.000	0.000	1.400	9.100	0.000	0.000	1552.000	1908.000

VALLEY SECT. APPROX. 50 FT. U/S OF PATTERSON RD. BRIDGE

X1	9.600	0.000	0.000	0.000	50.000	50.000	50.000	0.000	0.000	0.000
NC	0.080	0.100	0.035	0.100	0.300	0.080	0.300	0.000	0.080	0.000
ET	0.000	7.100	7.100	7.100	7.100	7.100	975.000	1472.000	0.000	0.000

VALLEY SECT. APPROX.

X1	10.000	34.000	1209.000	1382.000	600.000	800.000	900.000	0.000	0.000	0.000
GR	763.400	110.000	760.200	136.000	762.600	564.000	762.000	426.000	763.200	530.000
GR	762.000	662.000	762.700	770.000	763.300	824.000	763.400	886.000	763.400	890.000
GR	765.600	940.000	761.200	1066.000	759.800	1124.000	760.700	1158.000	758.100	1179.000
GR	754.300	1209.000	752.500	1214.000	747.000	1229.000	746.000	1249.000	747.700	1269.000
GR	747.000	1279.000	746.600	1289.000	745.900	1309.000	746.300	1329.000	749.600	1344.000
GR	753.400	1349.000	754.900	1382.000	758.000	1409.000	756.300	1560.000	758.400	1786.000
GR	759.700	1906.000	761.000	1956.000	761.400	1996.000	767.600	2002.000	0.000	0.000
NC	0.000	0.000	0.000	0.300	0.500	0.000	0.000	0.000	0.000	0.000
ET	0.000	7.100	7.100	7.100	7.100	7.100	1150.000	1390.000	0.000	0.000

X1	11.100	30.000	1209.000	1358.000	1250.000	300.000	750.000	0.000	0.000	0.000
GR	764.600	164.000	764.400	406.000	763.600	630.000	763.000	834.000	762.700	874.000
GR	764.300	1036.000	766.600	1120.000	764.200	1150.000	761.000	1163.000	756.400	1163.100
GR	754.700	1208.000	751.000	1218.000	749.700	1253.000	748.300	1273.000	749.800	1283.000
GR	750.600	1308.000	751.800	1328.000	754.300	1358.000	754.500	1358.000	763.700	1378.000
GR	764.000	1400.000	762.300	1516.000	762.200	1680.000	762.300	1866.000	760.400	1914.000
GR	760.400	2040.000	761.000	2074.000	761.400	2198.000	764.600	2200.000	766.200	2328.000
ET	0.000	0.000	0.000	0.000	1.400	0.000	0.000	0.000	0.000	0.000

D/S FACE OF GULL ST. BRIDGE

X1	11.200	33.000	1196.500	1387.500	50.000	50.000	50.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	767.400	766.800	0.000
GR	766.700	90.000	764.600	166.000	764.100	312.000	763.800	476.000	762.800	622.000
GR	763.000	962.000	766.400	1168.000	767.200	1186.000	757.500	1196.500	757.500	1196.600
GR	755.700	1211.000	753.900	1226.000	754.500	1243.000	753.100	1255.500	755.100	1255.600
GR	751.700	1262.400	751.700	1262.500	750.600	1275.000	749.500	1292.000	749.700	1308.000
GR	749.900	1321.500	749.900	1321.600	751.400	1328.400	751.400	1328.500	751.200	1341.000
GR	751.000	1358.000	751.700	1374.000	752.400	1387.400	754.700	1387.500	766.800	1390.000
GR	762.400	1516.000	760.400	1952.000	767.300	2414.000	0.000	0.000	0.000	0.000

1 FT. INSIDE D/S FACE GULL ST. BRIDGE

X1	11.300	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	767.400	766.800	0.000
BT	23.000	1186.000	767.200	0.000	1196.500	767.400	0.000	1196.600	771.900	757.900
BT	1211.000	772.200	762.000	1226.000	772.400	764.700	1243.000	772.700	762.000	1255.500
BT	773.100	759.100	1255.600	773.100	0.000	1262.400	773.100	0.000	1262.500	773.100
BT	759.100	1275.000	773.300	762.500	1292.000	773.600	765.600	1308.000	773.400	762.500
BT	1321.500	773.200	759.000	1321.600	773.200	0.000	1328.400	773.200	0.000	1328.500
BT	773.200	759.000	1341.000	772.800	762.000	1358.000	772.400	764.700	1374.000	772.100
BT	762.000	1387.400	771.900	757.700	1387.500	767.400	0.000	1390.000	766.800	0.000

1 FT. INSIDE U/S FACE GULL ST. BRIDGE

X1	11.400	33.000	1196.500	1387.500	41.000	41.000	41.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	767.400	766.800	0.000
BT	23.000	1186.000	767.200	0.000	1196.500	767.400	0.000	1196.600	771.900	757.900
BT	1211.000	772.200	762.000	1226.000	772.400	764.700	1243.000	772.700	762.000	1255.500
BT	773.100	759.100	1255.600	773.100	0.000	1262.400	773.100	0.000	1262.500	773.100
BT	759.100	1275.000	773.300	762.500	1292.000	773.600	765.600	1308.000	773.400	762.500
BT	1321.500	773.200	759.000	1321.600	773.200	0.000	1328.400	773.200	0.000	1328.500
BT	773.200	759.000	1341.000	772.800	762.000	1358.000	772.400	764.700	1374.000	772.100
BT	762.000	1387.400	771.900	757.700	1387.500	767.400	0.000	1390.000	766.800	0.000
GR	766.700	90.000	764.600	166.000	764.100	312.000	763.800	476.000	762.800	622.000
GR	763.000	962.000	766.400	1168.000	767.200	1186.000	757.000	1196.500	757.000	1196.600
GR	755.800	1211.000	754.600	1226.000	754.200	1243.000	753.800	1255.500	755.800	1255.600
GR	752.300	1262.400	752.300	1262.500	750.300	1275.000	748.700	1292.000	748.700	1308.000
GR	748.800	1321.500	748.800	1321.600	748.800	1328.400	748.800	1328.500	749.600	1341.000
GR	750.300	1358.000	751.600	1374.000	752.900	1387.400	756.100	1387.500	766.800	1390.000
GR	762.400	1516.000	760.400	1952.000	767.300	2414.000	0.000	0.000	0.000	0.000

U/S FACE OF GULL ST. BRIDGE

X1	11.500	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	767.400	766.800	0.000
ET	0.000	7.100	7.100	7.100	7.100	7.100	1146.000	1440.000	0.000	0.000

PRINTED IN U.S.A.
FORM 3611 GB PRINTED BY ROYAL MANIFOLD FORMS.

VALLEY SECT. APPROX. 50 FT. D/S OF GULL ST.

X1	11.600	0.000	0.000	0.000	50.000	50.000	50.000	0.000	0.000	0.000
NC	0.100	0.100	0.030	0.300	0.500	0.000	0.000	0.000	0.000	0.000
ET	0.000	7.100	7.100	7.100	7.100	7.100	1089.000	1625.000	0.000	0.000

VALLEY SECT. APPROX.500 FT. D/S OF GULL ST.

X1	11.700	28.000	1297.000	1451.000	250.000	650.000	500.000	0.000	0.000	0.000
GR	767.600	84.000	763.400	548.000	763.400	766.000	762.200	843.000	761.000	1040.000
GR	760.800	1240.000	757.100	1247.000	755.100	1290.000	753.900	1297.000	750.000	1302.000
GR	747.600	1327.000	745.500	1357.000	745.900	1367.000	746.200	1377.000	747.800	1397.000
GR	749.200	1417.000	750.900	1432.000	753.200	1440.000	754.700	1451.000	757.700	1463.000
GR	781.200	1482.000	783.400	1520.000	773.400	1732.000	766.400	1742.000	761.000	1766.000
GR	761.000	2054.000	761.600	2396.000	767.000	2480.000	0.000	0.000	0.000	0.000
ET	0.000	7.100	7.100	7.100	7.100	7.100	877.000	1156.000	0.000	0.000

VALLEY SECT. APPROX. 50 FT. D/S OF R.R. BRIDGE N. OF MICH. AVE.

X1	12.000	27.000	934.000	1099.000	500.000	600.000	600.000	0.000	0.000	0.000
GR	769.700	110.000	767.000	454.000	768.100	506.000	766.900	640.000	764.100	796.000
GR	761.800	892.000	759.700	914.000	752.000	934.000	748.800	959.000	748.000	979.000
GR	748.800	999.000	747.600	1019.000	747.700	1029.000	748.300	1039.000	748.600	1059.000
GR	752.300	1084.000	755.000	1099.000	755.900	1119.000	770.900	1149.000	777.000	1252.000
GR	773.900	1370.000	768.000	1760.000	766.200	1792.000	764.200	1804.000	756.000	2196.000
GR	762.400	2472.000	767.100	2762.000	0.000	0.000	0.000	0.000	0.000	0.000
ET	0.000	0.000	0.000	0.000	9.100	0.000	0.000	0.000	87.000	1243.000

D/S FACE OF R.R. BRIDGE N. OF MICHIGAN AVE.

X1	12.100	26.000	895.000	1149.000	50.000	50.000	50.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	768.200	769.100	0.000
GR	769.400	86.000	769.100	502.000	767.800	662.000	768.200	838.000	758.500	895.000
GR	758.300	895.100	756.200	926.000	755.800	953.500	755.600	953.600	753.000	960.400
GR	753.000	960.500	750.500	989.500	752.600	1018.500	752.600	1018.600	752.600	1025.400
GR	752.600	1025.500	747.600	1054.000	750.500	1083.500	750.500	1083.600	750.500	1090.400
GR	750.500	1090.500	753.200	1118.000	758.300	1148.900	758.300	1149.000	769.500	1175.000
GR	770.200	1244.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SR	1.050	1.500	2.600	0.000	180.000	21.000	1715.000	0.000	751.500	747.000
ET	0.000	0.000	0.000	0.000	9.100	0.000	0.000	0.000	87.000	1243.000

U/S FACE OF R.R. BRIDGE N.OF MICHIGAN AVE.

X1	12.400	26.000	895.000	1149.000	28.000	28.000	28.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	762.100	768.200	0.000	0.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	768.200	769.100	0.000
BT	12.000	838.000	768.200	0.000	895.000	769.800	0.000	895.100	769.800	768.900
BT	953.500	769.700	761.800	954.600	769.700	0.000	960.400	769.700	0.000	960.500
BT	769.700	761.000	1018.500	769.600	761.300	1018.600	769.600	0.000	1025.400	769.600
BT	0.000	1025.500	769.700	761.300	1083.500	769.200	761.700	1083.600	769.200	0.000
BT	1090.400	769.200	0.000	1090.500	769.200	761.700	1148.900	769.100	762.100	1149.000
BT	769.100	0.000	1175.000	769.500	0.000	0.000	0.000	0.000	0.000	0.000
GR	769.400	86.000	769.100	502.000	767.800	662.000	768.200	838.000	758.500	895.000
GR	758.500	895.100	756.900	926.000	754.000	953.500	754.000	953.600	754.000	960.400
GR	752.600	960.500	751.300	989.500	752.600	1018.500	752.600	1018.600	752.600	1025.400
GR	752.600	1025.500	752.900	1054.000	753.000	1083.500	753.000	1083.600	755.800	1090.600
GR	755.600	1090.500	755.300	1118.000	758.500	1148.900	758.500	1149.000	769.500	1175.000
GR	770.200	1244.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ET	0.000	0.000	0.000	0.000	1.400	0.000	0.000	0.000	0.000	0.000

PRINTED IN U.S.A.
FORM 1411-SB PRINTED BY ROTARY MANIFOLD FORMS.

VALLEY SECT. APPROX. 50 FT. U/S OF R.R. BRIDGE N. OF MICH. AVE.

X1	12.500	0.000	0.000	0.000	50.000	50.000	50.000	0.000	0.000	0.000
NC	0.100	0.060	0.030	0.300	0.500	0.000	0.000	0.000	0.000	0.000
ET	0.000	7.100	7.100	7.100	7.100	7.100	730.000	917.000	0.000	0.000

VALLEY SECT. APPROX. 50 FT. D/S OF MICHIGAN AVE.

X1	13.100	22.000	744.300	925.000	300.000	300.000	300.000	0.000	0.000	0.000
GR	766.800	688.000	767.300	737.600	754.900	744.300	754.900	744.400	753.000	748.900
GR	752.200	774.900	749.700	789.600	749.700	789.700	749.700	808.200	749.700	808.300
GR	748.900	834.700	749.400	862.200	749.400	862.300	749.400	880.800	749.400	880.900
GR	749.500	896.700	752.300	924.300	756.200	924.900	756.200	925.000	766.200	936.900
GR	760.400	1306.500	767.000	1307.000	0.000	0.000	0.000	0.000	0.000	0.000
ET	0.000	0.000	0.000	0.000	1.400	0.000	0.000	0.000	0.000	0.000

D/S FACE OF MICHIGAN AVE. BRIDGE

X1	13.200	0.000	0.000	0.000	50.000	50.000	50.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	767.300	767.300	0.000

1 FT. INSIDE D/S FACE MICHIGAN AVE. BRIDGE (SKEWED 40 DEGREES)

X1	13.300	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	767.300	767.300	0.000
BT	17.000	737.600	767.300	0.000	744.300	767.300	0.000	744.400	767.300	755.500
BT	774.900	767.300	763.300	789.600	767.400	756.400	789.700	767.400	0.000	808.200
BT	767.400	0.000	808.300	767.400	756.400	834.700	767.400	763.100	862.200	767.400
BT	756.400	862.300	767.400	0.000	880.800	767.400	0.000	880.900	767.400	756.400
BT	896.700	767.300	763.300	924.900	767.200	756.200	925.000	767.200	0.000	936.900
BT	766.200	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

1 FT. INSIDE U/S FACE MICHIGAN AVE. BRIDGE

X1	13.400	0.000	0.000	0.000	49.000	49.000	49.000	0.000	0.000	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	767.300	767.300	0.000

U/S FACE OF MICHIGAN AVE. BRIDGE

X1	13.500	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	767.300	767.300	0.000

VALLEY SECT. 50' U/S OF MICHIGAN AVRAN NO.12 (SKEWED 40 DEGREES)

X1	13.600	20.000	1341.000	1446.000	50.000	50.000	50.000	1.340	0.000	0.000
GR	767.200	1142.000	766.600	1164.000	766.400	1192.000	762.000	1333.000	755.100	1341.000
GR	751.700	1345.000	749.700	1358.000	749.300	1369.000	748.500	1379.000	747.600	1390.000
GR	747.100	1401.000	747.300	1412.000	746.700	1423.000	748.900	1433.000	752.700	1438.000
GR	754.200	1441.000	755.000	1445.000	757.700	1446.000	765.120	1454.000	765.200	1478.000
NC	0.060	0.120	0.030	0.300	0.500	0.000	0.000	0.000	0.000	0.000
ET	0.000	7.100	7.100	7.100	7.100	7.100	1271.000	1477.000	0.000	0.000
QT	5.000	4620.000	6210.000	6910.000	6910.000	8530.000	0.000	0.000	0.000	0.000

VALLEY SECT. APPROX. 50 FT. D/S OF MILL ST.

PRINTED IN U.S.A.
FORM 1411-QA PRINTED BY ROTARY MANIFOLD FORMS.

X1	14.100	33.000	1284.000	1464.000	1650.000	850.000	1250.000	0.000	0.000	0.000
GR	764.500	356.000	763.000	488.000	763.100	924.000	764.300	1190.000	765.000	1248.000
GR	765.200	1275.000	755.000	1284.000	755.000	1284.100	753.500	1298.000	752.100	1312.200
GR	752.500	1326.000	753.000	1340.500	753.000	1340.600	754.900	1347.400	754.900	1347.500
GR	750.200	1360.000	750.500	1374.000	751.600	1387.000	752.700	1400.500	752.700	1400.600
GR	753.400	1407.400	753.400	1407.500	751.100	1420.000	748.800	1436.000	750.000	1450.000
GR	751.300	1463.900	751.300	1464.000	766.400	1473.000	765.600	1482.000	763.000	1870.000
GR	762.700	1998.000	765.500	2008.000	770.400	2054.000	0.000	0.000	0.000	0.000
ET	0.000	0.000	0.000	0.000	1.400	0.000	0.000	0.000	0.000	0.000

D/S FACE OF MILL ST. BRIDGE

X1	14.200	0.000	0.000	0.000	50.000	50.000	50.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	766.000	766.400	0.000

1 FT. INSIDE D/S FACE MILL ST. BRIDGE

X1	14.300	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	766.000	766.400	0.000
BT	23.000	1275.000	766.000	0.000	1284.000	767.400	0.000	1284.100	767.400	756.700
BT	1298.000	767.700	760.200	1312.200	767.900	763.600	1326.000	768.300	761.000	1340.500
BT	768.600	758.000	1340.600	768.600	0.000	1347.400	768.600	0.000	1347.500	768.600
BT	758.000	1360.000	768.900	761.500	1374.000	769.100	764.900	1387.000	768.800	761.600
BT	1400.500	768.400	758.100	1400.600	768.400	0.000	1407.400	768.400	0.000	1407.500
BT	768.400	758.100	1420.000	768.100	760.900	1436.000	767.800	763.600	1450.000	767.600
BT	760.200	1463.900	767.400	756.700	1464.000	767.400	0.000	1473.000	766.400	0.000

1 FT. INSIDE U/S FACE MILL ST. BRIDGE

X1	14.400	33.000	1284.000	1464.000	33.000	33.000	33.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	766.000	766.400	0.000
BT	23.000	1275.000	766.000	0.000	1284.000	767.400	0.000	1284.100	767.400	756.700
BT	1298.000	767.700	760.200	1312.200	767.900	763.600	1326.000	768.300	761.000	1340.500
BT	768.600	758.000	1340.600	768.600	0.000	1347.400	768.600	0.000	1347.500	768.600
BT	758.000	1360.000	768.900	761.500	1374.000	769.100	764.900	1387.000	768.800	761.600
BT	1400.500	768.400	758.100	1400.600	768.400	0.000	1407.400	768.400	0.000	1407.500
BT	768.400	758.100	1420.000	768.100	760.900	1436.000	767.800	763.600	1450.000	767.600
BT	760.200	1463.900	767.400	756.700	1464.000	767.400	0.000	1473.000	766.400	0.000
GR	764.500	356.000	763.000	488.000	763.100	924.000	764.300	1190.000	765.000	1248.000
GR	766.000	1275.000	753.100	1284.000	753.100	1284.100	752.000	1298.000	751.200	1312.200
GR	751.800	1326.000	752.400	1340.500	752.400	1340.600	752.400	1347.400	752.400	1347.500
GR	751.300	1360.000	750.300	1374.000	751.500	1387.000	752.700	1400.500	752.700	1400.600
GR	753.000	1407.400	753.000	1407.500	751.400	1420.000	749.800	1436.000	752.400	1450.000
GR	757.400	1463.900	757.400	1464.000	766.400	1473.000	765.600	1482.000	763.000	1870.000
GR	762.700	1998.000	765.500	2008.000	770.400	2054.000	0.000	0.000	0.000	0.000

U/S FACE MILL ST. BRIDGE

X1	14.500	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	766.000	766.400	0.000
ET	0.000	7.100	7.100	7.100	7.100	7.100	1234.000	1514.000	0.000	0.000

VALLEY SECT. 50 FT. U/S OF MILLS ST.

X1	14.600	0.000	0.000	0.000	50.000	50.000	50.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.100	0.300	0.000	0.000	0.000	0.000	0.000
ET	0.000	0.000	0.000	0.000	1.400	0.000	0.000	0.000	0.000	0.000

FORM 1411-09 PRINTED BY ROTARY MANIFOLD FORMS.
CO IN U.S.A.

VALLEY SECT. APPROX. 1450 FT. U/S OF MILLS ST. BRIDGE

X1	15.000	16.000	1472.000	1644.000	1150.000	1450.000	1400.000	0.000	0.000	0.000
GR	770.000	1090.000	765.000	1146.000	762.800	1190.000	758.700	1418.000	757.400	1472.000
GR	756.100	1481.000	752.800	1494.000	749.900	1524.000	748.800	1554.000	747.800	1584.000
GR	745.700	1614.000	751.100	1634.000	758.100	1644.000	762.000	1714.000	762.100	1864.000
GR	765.800	1976.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.300	0.500	0.000	0.000	0.000	0.000	0.000
ET	0.000	7.100	7.100	7.100	7.100	7.100	1500.000	1702.000	0.000	0.000

VALLEY SECT. 50 FT. D/S OF R.R. BRIDGE

X1	16.100	51.000	1512.400	1689.500	900.000	1450.000	1325.000	0.000	0.000	0.000
GR	765.000	142.000	761.300	234.000	765.400	346.000	761.100	572.000	764.500	834.000
GR	765.000	1020.000	764.000	1058.000	759.600	1072.000	756.000	1214.000	758.000	1404.000
GR	767.200	1436.000	766.400	1474.000	753.400	1512.400	753.400	1512.500	752.400	1515.000
GR	751.000	1518.700	751.000	1518.800	751.000	1529.300	751.000	1529.400	749.100	1535.200
GR	749.200	1541.000	749.200	1541.100	749.200	1551.600	749.200	1551.700	749.400	1557.400
GR	747.600	1563.200	747.600	1563.300	746.700	1567.100	746.700	1567.200	742.800	1580.000
GR	743.300	1592.500	743.300	1592.600	743.500	1596.400	743.500	1596.500	744.200	1611.100
GR	747.200	1625.600	747.200	1625.700	747.400	1629.500	747.400	1629.600	750.000	1643.700
GR	751.200	1657.900	751.200	1658.000	751.300	1661.800	751.300	1661.900	756.900	1675.700
GR	756.800	1689.400	756.800	1689.500	757.400	1858.000	766.200	1892.000	765.500	2038.000
GR	772.000	2068.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ET	0.000	0.000	0.000	0.000	9.100	0.000	0.000	0.000	143.000	2067.000

D/S FACE OF R.R.BRIDGE

X1	16.200	0.000	0.000	0.000	50.000	50.000	50.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	766.400	766.200	0.000
SR	1.250	1.550	2.800	0.000	141.000	37.400	2075.000	0.000	743.500	742.800

U/S FACE OF R.R.BRIDGE

X1	16.400	51.000	1512.400	1689.500	10.500	10.500	10.500	0.000	0.000	0.000
X2	0.000	0.000	1.000	763.700	766.400	0.000	0.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	766.600	766.600	0.000
BT	30.000	1474.000	766.400	0.000	1512.400	766.800	0.000	1512.500	766.800	763.600
BT	1518.700	766.800	763.600	1518.800	766.800	0.000	1529.300	766.800	0.000	1529.400
BT	766.800	763.600	1541.000	766.700	763.600	1541.100	766.700	0.000	1551.600	766.700
BT	0.000	1551.700	766.700	763.600	1563.200	766.700	763.600	1563.300	766.700	0.000
BT	1567.100	766.700	0.000	1567.200	766.700	763.500	1592.500	766.700	763.500	1592.600
BT	766.700	0.000	1596.400	766.700	0.000	1596.500	766.700	763.500	1625.600	766.700
BT	763.600	1625.700	766.700	0.000	1629.500	766.700	0.000	1629.600	766.700	763.600
BT	1657.900	766.800	763.700	1658.000	766.800	0.000	1661.800	766.800	0.000	1661.900
BT	766.800	763.800	1689.400	766.900	763.700	1689.500	766.900	0.000	1892.000	766.200
BT	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	765.000	142.000	761.300	234.000	765.400	346.000	761.100	572.000	764.500	834.000
GR	765.000	1020.000	764.000	1058.000	759.600	1072.000	756.000	1214.000	758.000	1404.000
GR	767.200	1436.000	766.400	1474.000	753.400	1512.400	753.400	1512.500	751.600	1515.000
GR	749.800	1518.700	749.800	1518.800	749.600	1529.300	749.600	1529.400	747.600	1535.200
GR	747.000	1541.000	747.000	1541.100	746.800	1551.600	746.800	1551.700	746.500	1557.400
GR	745.900	1563.200	745.900	1563.300	745.700	1567.100	745.700	1567.200	745.000	1580.000
GR	744.700	1592.500	744.700	1592.600	744.700	1596.400	744.700	1596.500	745.500	1611.100
GR	744.500	1625.600	744.500	1625.700	744.700	1629.500	744.700	1629.600	749.900	1643.700
GR	752.000	1657.900	752.000	1658.000	752.000	1661.800	752.000	1661.900	753.100	1675.700
GR	758.000	1689.400	758.000	1689.500	757.400	1858.000	766.200	1892.000	765.500	2038.000
GR	772.000	2068.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ET	0.000	7.100	7.100	7.100	7.100	7.100	1462.000	1740.000	0.000	0.000

PRINTED IN U.S.A.
FORM 141-GB PRINTED BY ROTARY MANIFOLD FORMS

VALLEY SECT. APPROX. 50 FT. OF R.R. BRIDGE

X1	16.500	23.000	1519.000	1684.000	50.000	50.000	50.000	0.000	0.000	0.000
GR	764.000	142.000	761.800	234.000	765.400	348.000	761.100	572.050	764.500	834.000
GR	765.000	1020.000	764.000	1058.000	759.600	1072.000	756.000	1214.000	758.000	1404.000
GR	767.200	1436.000	766.400	1474.000	756.200	1519.000	752.700	1528.000	747.100	1549.000
GR	745.700	1574.000	747.100	1600.000	748.700	1624.000	750.800	1649.000	753.100	1672.000
GR	759.300	1684.000	757.400	1838.000	766.200	1892.000	0.000	0.000	0.000	0.000
ET	0.000	0.000	0.000	0.000	1.400	0.000	0.000	0.000	0.000	0.000
NC	0.100	0.100	0.030	0.100	0.300	0.000	0.000	0.000	0.000	0.000

VALLEY SECT. AT CITY OF KALAMAZOO/KALAMAZOO TWP. CORP. BOUNDARY

X1	17.000	9.000	8.000	92.000	1650.000	700.000	1400.000	0.000	0.000	0.000
GR	765.000	0.000	756.600	0.100	754.500	8.000	751.900	20.000	747.600	44.000
GR	747.000	78.000	753.300	92.000	763.300	108.000	765.000	109.100	0.000	0.000
EJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

PRINTED IN U.S.A.
FORM 3411-GB PRINTED BY ROTARY MANIFOLD FORMS.

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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
  ERROR CORR -  01
  MODIFICATION -  50,51,52
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 NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

 KALAMAZOO R. KALAMAZOO

 SUMMARY PRINTOUT TABLE  150
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SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	TOK*S	VCH	AREA	.01K
7.000	0.00	0.00	0.00	747.60	4950.00	758.23	0.00	758.47	3.86	4.02	1491.41	2520.15
7.000	0.00	0.00	0.00	747.60	6650.00	759.47	0.00	759.76	4.00	4.48	2398.22	3324.88
7.000	0.00	0.00	0.00	747.60	7390.00	759.95	0.00	760.24	3.93	4.59	3007.07	3728.91
7.000	0.00	0.00	0.00	747.60	9180.00	761.00	0.00	761.26	3.47	4.61	4538.66	4927.36
8.000	1600.00	0.00	0.00	741.60	4940.00	758.72	0.00	758.88	1.72	3.25	1655.83	3763.01
8.000	1600.00	0.00	0.00	741.60	6640.00	759.99	0.00	760.22	2.13	3.87	2084.35	4546.63
8.000	1600.00	0.00	0.00	741.60	7390.00	760.48	0.00	760.72	2.30	4.12	2299.09	4867.65
8.000	1600.00	0.00	0.00	741.60	9180.00	761.45	0.00	761.77	2.67	4.65	2642.83	5620.27
9.100	1100.00	0.00	0.00	744.50	4940.00	758.99	0.00	759.11	2.29	2.80	1892.07	3264.85
9.100	1100.00	0.00	0.00	744.50	6640.00	760.34	0.00	760.50	2.59	3.25	2225.35	4128.67
9.100	1100.00	0.00	0.00	744.50	7390.00	760.84	0.00	761.02	2.73	3.45	2353.30	4476.61
9.100	1100.00	0.00	0.00	744.50	9180.00	761.86	0.00	762.11	3.08	3.89	2618.11	5229.91
9.200	50.00	0.00	0.00	744.70	4940.00	759.04	0.00	759.13	1.71	2.34	2107.36	3782.00
9.200	50.00	0.00	0.00	744.70	6640.00	760.41	0.00	760.52	1.99	2.72	2438.19	4710.13
9.200	50.00	0.00	0.00	744.70	7390.00	760.92	0.00	761.05	2.12	2.88	2564.48	5077.68
9.200	50.00	0.00	0.00	744.70	9180.00	761.98	0.00	762.14	2.45	3.24	2832.69	5888.85
9.300	1.00	769.50	770.30	744.70	4940.00	759.04	0.00	759.13	1.90	2.42	2040.62	3583.68
9.300	1.00	769.50	770.30	744.70	6640.00	760.41	0.00	760.53	2.21	2.81	2362.29	4460.43
9.300	1.00	769.50	770.30	744.70	7390.00	760.91	0.00	761.05	2.35	2.97	2484.55	4810.59
9.300	1.00	769.50	770.30	744.70	9180.00	761.97	0.00	762.15	2.70	3.34	2745.48	5589.06
9.400	43.00	769.50	770.30	744.70	4940.00	759.05	0.00	759.14	1.90	2.42	2041.69	3586.75
9.400	43.00	769.50	770.30	744.70	6640.00	760.42	0.00	760.54	2.21	2.81	2363.46	4469.75
9.400	43.00	769.50	770.30	744.70	7390.00	760.92	0.00	761.06	2.35	2.97	2485.79	4820.20
9.400	43.00	769.50	770.30	744.70	9180.00	761.98	0.00	762.16	2.69	3.34	2746.94	5593.48
9.500	1.00	0.00	0.00	744.70	4940.00	759.06	0.00	759.14	1.70	2.34	2108.96	3785.78
9.500	1.00	0.00	0.00	744.70	6640.00	760.43	0.00	760.54	1.96	2.72	2440.30	4714.49
9.500	1.00	0.00	0.00	744.70	7390.00	760.93	0.00	761.06	2.11	2.88	2567.65	5087.06
9.500	1.00	0.00	0.00	744.70	9180.00	762.00	0.00	762.16	2.42	3.24	2836.58	5900.63
9.600	50.00	0.00	0.00	744.70	4940.00	759.07	0.00	759.15	1.69	2.34	2112.86	3796.35
9.600	50.00	0.00	0.00	744.70	6640.00	760.44	0.00	760.55	1.97	2.72	2445.30	4728.96
9.600	50.00	0.00	0.00	744.70	7390.00	760.95	0.00	761.07	2.10	2.87	2571.60	5099.33
9.600	50.00	0.00	0.00	744.70	9180.00	762.01	0.00	762.17	2.41	3.23	2841.66	5915.90

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
10.000	900.00	0.00	0.00	745.90	4940.00	759.21	0.00	759.32	1.81	2.69	2066.21	3675.31
10.000	900.00	0.00	0.00	745.90	6640.00	760.59	0.00	760.74	2.08	3.13	2518.73	4607.87
10.000	900.00	0.00	0.00	745.90	7390.00	761.11	0.00	761.28	2.19	3.32	2721.59	4988.86
10.000	900.00	0.00	0.00	745.90	9180.00	762.20	0.00	762.40	2.46	3.71	3189.73	5855.75
11.100	750.00	0.00	0.00	748.30	4940.00	759.36	0.00	759.58	4.86	3.62	1442.66	2241.50
11.100	750.00	0.00	0.00	748.30	6640.00	760.76	0.00	761.04	5.11	4.34	1731.32	2957.34
11.100	750.00	0.00	0.00	748.30	7390.00	761.49	0.00	761.80	5.25	4.57	1840.40	3217.33
11.100	750.00	0.00	0.00	748.30	9180.00	762.39	0.00	762.76	5.69	5.06	2078.32	3849.96
11.200	50.00	0.00	0.00	749.50	4940.00	759.41	0.00	759.61	5.28	3.58	1379.66	2149.56
11.200	50.00	0.00	0.00	749.50	6640.00	760.83	0.00	761.08	5.51	4.02	1649.76	2881.29
11.200	50.00	0.00	0.00	749.50	7390.00	761.56	0.00	761.83	5.62	4.22	1750.77	3175.60
11.200	50.00	0.00	0.00	749.50	9180.00	762.46	0.00	762.80	5.75	4.68	1962.70	3827.57
11.300	1.00	766.80	765.60	749.50	4940.00	759.39	0.00	759.64	9.57	3.98	1242.65	1598.74
11.300	1.00	766.80	765.60	749.50	6640.00	760.79	0.00	761.12	10.80	4.63	1434.51	2020.54
11.300	1.00	766.80	765.60	749.50	7390.00	761.31	0.00	761.68	11.40	4.91	1506.22	2188.47
11.300	1.00	766.80	765.60	749.50	9180.00	762.39	0.00	762.88	18.20	5.62	1632.00	2140.49
11.400	41.00	766.80	765.60	748.70	4940.00	759.47	0.00	759.68	7.48	3.69	1339.87	1806.33
11.400	41.00	766.80	765.60	748.70	6640.00	760.88	0.00	761.17	8.68	4.33	1533.73	2253.67
11.400	41.00	766.80	765.60	748.70	7390.00	761.41	0.00	761.74	9.24	4.60	1606.42	2430.88
11.400	41.00	766.80	765.60	748.70	9180.00	762.53	0.00	762.97	17.09	5.31	1728.32	2220.84
11.500	1.00	0.00	0.00	748.70	4940.00	759.53	0.00	759.69	3.99	3.29	1502.99	2471.70
11.500	1.00	0.00	0.00	748.70	6640.00	760.98	0.00	761.19	4.14	3.73	1780.26	3261.52
11.500	1.00	0.00	0.00	748.70	7390.00	761.53	0.00	761.76	4.26	3.92	1884.78	3560.24
11.500	1.00	0.00	0.00	748.70	9180.00	762.72	0.00	763.01	4.53	4.34	2113.16	4314.94
11.600	50.00	0.00	0.00	748.70	4940.00	759.55	0.00	759.71	5.68	3.27	1515.11	2507.74
11.600	50.00	0.00	0.00	748.70	6640.00	761.00	0.00	761.22	5.99	3.71	1797.42	3325.71
11.600	50.00	0.00	0.00	748.70	7390.00	761.55	0.00	761.79	6.09	3.91	1904.41	3655.12
11.600	50.00	0.00	0.00	748.70	9180.00	762.75	0.00	763.04	6.31	4.33	2139.97	4419.52
11.700	500.00	0.00	0.00	745.50	4940.00	759.71	0.00	759.83	1.29	2.79	1975.54	4356.42
11.700	500.00	0.00	0.00	745.50	6640.00	761.16	0.00	761.35	1.52	3.29	2352.84	5192.92
11.700	500.00	0.00	0.00	745.50	7390.00	761.74	0.00	761.92	1.61	3.49	2561.33	5820.76
11.700	500.00	0.00	0.00	745.50	9180.00	762.96	0.00	763.19	1.81	3.92	3017.85	6626.47
12.000	600.00	0.00	0.00	747.60	4940.00	759.79	0.00	759.92	1.45	2.84	1895.15	4095.68
12.000	600.00	0.00	0.00	747.60	6640.00	761.28	0.00	761.44	1.66	3.32	2225.79	5146.57
12.000	600.00	0.00	0.00	747.60	7390.00	761.84	0.00	762.03	1.76	3.51	2356.54	5572.94
12.000	600.00	0.00	0.00	747.60	9180.00	763.07	0.00	763.30	1.96	3.95	2670.11	6559.88
12.100	50.00	0.00	0.00	747.60	4940.00	759.80	0.00	759.92	2.52	2.82	1750.15	3112.59
12.100	50.00	0.00	0.00	747.60	6640.00	761.31	0.00	761.46	2.37	3.11	2133.07	4311.74
12.100	50.00	0.00	0.00	747.60	7390.00	761.88	0.00	762.04	2.36	3.24	2278.43	4605.40
12.100	50.00	0.00	0.00	747.60	9180.00	763.13	0.00	763.33	2.38	3.54	2596.79	5958.72
12.400	28.00	768.20	762.10	751.30	4940.00	759.82	0.00	760.02	5.48	3.56	1386.48	2110.29
12.400	28.00	768.20	762.10	751.30	6640.00	761.33	0.00	761.55	4.42	3.75	1770.02	3158.15
12.400	28.00	768.20	762.10	751.30	7390.00	762.09	0.00	762.31	3.89	3.76	1964.06	3748.62
12.400	28.00	768.20	762.10	751.30	9180.00	763.56	0.00	763.80	3.38	3.93	2337.12	4990.22

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
12.500	50.00	0.00	0.00	751.30	4940.00	759.85	0.00	760.04	5.38	3.55	1398.94	2130.77
12.500	50.00	0.00	0.00	751.30	6640.00	761.35	0.00	761.57	4.31	3.74	1807.71	3199.66
12.500	50.00	0.00	0.00	751.30	7390.00	762.11	0.00	762.33	3.77	3.74	2021.65	3808.91
12.500	50.00	0.00	0.00	751.30	9180.00	763.58	0.00	763.82	5.24	3.90	2446.85	5096.70
13.100	300.00	0.00	0.00	748.90	4940.00	760.01	0.00	760.15	1.81	2.94	1689.25	3876.92
13.100	300.00	0.00	0.00	748.90	6640.00	761.48	0.00	761.67	2.06	3.43	1943.43	4625.90
13.100	300.00	0.00	0.00	748.90	7390.00	762.22	0.00	762.42	2.07	3.58	2050.04	5136.54
13.100	300.00	0.00	0.00	748.90	9180.00	763.66	0.00	763.90	2.21	3.97	2332.99	6168.75
13.200	50.00	0.00	0.00	748.90	4940.00	760.04	0.00	760.16	1.69	2.83	1746.99	3800.17
13.200	50.00	0.00	0.00	748.90	6640.00	761.51	0.00	761.68	1.92	3.30	2013.15	4788.59
13.200	50.00	0.00	0.00	748.90	7390.00	762.25	0.00	762.45	1.95	3.44	2140.35	5314.55
13.200	50.00	0.00	0.00	748.90	9180.00	763.69	0.00	763.92	2.05	3.81	2408.43	6407.41
13.300	1.00	766.20	763.30	748.90	4940.00	759.94	0.00	760.26	13.08	4.57	1080.70	1365.68
13.300	1.00	766.20	763.30	748.90	6640.00	761.35	0.00	761.84	17.83	5.64	1178.04	1572.87
13.300	1.00	766.20	763.30	748.90	7390.00	762.06	0.00	762.62	19.33	6.02	1227.34	1680.90
13.300	1.00	766.20	763.30	748.90	9180.00	763.42	0.00	764.19	32.86	7.02	1307.87	1801.40
13.400	49.00	766.20	763.30	748.90	4940.00	760.00	0.00	760.32	12.90	4.55	1084.75	1375.26
13.400	49.00	766.20	763.30	748.90	6640.00	761.44	0.00	761.93	17.51	5.61	1184.52	1586.74
13.400	49.00	766.20	763.30	748.90	7390.00	762.16	0.00	762.72	18.97	5.99	1234.45	1696.72
13.400	49.00	766.20	763.30	748.90	9180.00	763.59	0.00	764.35	32.88	7.02	1307.88	1800.90
13.500	1.00	0.00	0.00	748.90	4940.00	760.27	0.00	760.39	1.56	2.76	1789.65	3952.61
13.500	1.00	0.00	0.00	748.90	6640.00	761.87	0.00	762.03	1.73	3.19	2079.45	5047.89
13.500	1.00	0.00	0.00	748.90	7390.00	762.66	0.00	762.84	1.73	3.33	2222.52	5624.43
13.500	1.00	0.00	0.00	748.90	9180.00	764.31	0.00	764.52	1.77	3.64	2520.66	6898.00
13.600	50.00	0.00	0.00	748.70	4940.00	760.26	0.00	760.41	1.70	3.15	1590.61	3795.12
13.600	50.00	0.00	0.00	748.70	6640.00	761.85	0.00	762.07	1.95	3.70	1837.63	4749.55
13.600	50.00	0.00	0.00	748.70	7390.00	762.64	0.00	762.87	1.98	3.87	1971.31	5256.41
13.600	50.00	0.00	0.00	748.70	9180.00	764.28	0.00	764.56	2.06	4.27	2336.45	6395.93
14.100	1250.00	0.00	0.00	748.80	4620.00	760.51	0.00	760.65	2.00	2.94	1603.63	3265.40
14.100	1250.00	0.00	0.00	748.80	6210.00	762.16	0.00	762.33	2.03	3.52	1910.30	4361.65
14.100	1250.00	0.00	0.00	748.80	6910.00	762.95	0.00	763.14	1.96	3.65	2072.59	4939.66
14.100	1250.00	0.00	0.00	748.80	8580.00	764.62	0.00	764.83	1.89	3.70	2398.03	6239.96
14.200	50.00	0.00	0.00	748.80	4620.00	760.52	0.00	760.66	2.09	2.95	1566.59	3197.43
14.200	50.00	0.00	0.00	748.80	6210.00	762.17	0.00	762.34	2.14	3.53	1862.35	4240.81
14.200	50.00	0.00	0.00	748.80	6910.00	762.96	0.00	763.15	2.08	3.66	2005.92	4766.15
14.200	50.00	0.00	0.00	748.80	8580.00	764.63	0.00	764.84	2.04	3.72	2306.06	6003.22
14.300	1.00	766.00	764.90	748.80	4620.00	760.50	0.00	760.68	5.39	3.45	1338.24	1989.51
14.300	1.00	766.00	764.90	748.80	6210.00	762.11	0.00	762.39	9.64	4.29	1447.47	1999.59
14.300	1.00	766.00	764.90	748.80	6910.00	762.89	0.00	763.22	11.11	4.67	1480.52	2072.83
14.300	1.00	766.00	764.90	748.80	8580.00	764.49	0.00	764.98	17.75	5.83	1522.99	2036.55
14.400	33.00	766.00	764.90	749.80	4620.00	760.51	0.00	760.70	5.31	3.51	1316.00	2003.96
14.400	33.00	766.00	764.90	749.80	6210.00	762.14	0.00	762.45	9.59	4.33	1426.82	2005.52
14.400	33.00	766.00	764.90	749.80	6910.00	762.92	0.00	763.27	11.03	4.73	1459.98	2080.19
14.400	33.00	766.00	764.90	749.80	8580.00	764.54	0.00	765.05	17.71	5.71	1502.08	2039.01

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
14.500	1.00	0.00	0.00	749.80	4620.00	760.59	0.00	760.72	2.13	2.96	1563.37	5167.89
14.500	1.00	0.00	0.00	749.80	6210.00	762.30	0.00	762.47	2.14	3.32	1871.39	4249.43
14.500	1.00	0.00	0.00	749.80	6910.00	763.13	0.00	763.32	2.05	3.42	2022.12	4820.98
14.500	1.00	0.00	0.00	749.80	8580.00	764.93	0.00	765.14	1.96	3.66	2345.60	6135.44
14.600	50.00	0.00	0.00	749.80	4620.00	760.60	0.00	760.73	1.99	2.94	1591.40	3273.31
14.600	50.00	0.00	0.00	749.80	6210.00	762.31	0.00	762.48	1.97	3.30	1916.99	4421.55
14.600	50.00	0.00	0.00	749.80	6910.00	763.15	0.00	763.33	1.88	3.40	2078.16	5033.44
14.600	50.00	0.00	0.00	749.80	8580.00	764.95	0.00	765.15	1.77	3.63	2425.86	6441.68
15.000	1400.00	0.00	0.00	745.70	4620.00	760.84	0.00	760.93	1.03	2.42	2210.02	4561.42
15.000	1400.00	0.00	0.00	745.70	6210.00	762.57	0.00	762.68	1.06	2.70	3086.89	6072.61
15.000	1400.00	0.00	0.00	745.70	6910.00	763.41	0.00	763.52	0.99	2.74	3672.09	6948.82
15.000	1400.00	0.00	0.00	745.70	8580.00	765.22	0.00	765.33	0.87	2.80	5069.11	9181.37
16.100	1325.00	0.00	0.00	742.80	4620.00	760.98	0.00	761.04	0.67	2.12	2273.30	5020.20
16.100	1325.00	0.00	0.00	742.80	6210.00	762.71	0.00	762.80	0.78	2.49	2622.95	7039.21
16.100	1325.00	0.00	0.00	742.80	6910.00	763.53	0.00	763.63	0.79	2.62	2789.34	7755.04
16.100	1325.00	0.00	0.00	742.80	8580.00	765.32	0.00	765.45	0.85	2.89	3151.22	9404.85
16.200	50.00	0.00	0.00	742.80	4620.00	760.98	0.00	761.05	0.73	2.14	2154.30	5423.79
16.200	50.00	0.00	0.00	742.80	6210.00	762.71	0.00	762.81	0.85	2.52	2460.86	6729.00
16.200	50.00	0.00	0.00	742.80	6910.00	763.53	0.00	763.64	0.88	2.65	2606.70	7385.35
16.200	50.00	0.00	0.00	742.80	8580.00	765.32	0.00	765.46	0.93	2.93	2923.93	8867.74
16.400	10.50	766.40	763.70	743.50	4620.00	761.02	0.00	761.08	0.53	2.00	2304.87	6068.14
16.400	10.50	766.40	763.70	743.50	6210.00	762.77	0.00	762.85	0.70	2.38	2614.36	7440.12
16.400	10.50	766.40	763.70	743.50	6910.00	763.60	0.00	763.69	0.72	2.50	2761.32	8126.52
16.400	10.50	766.40	763.70	743.50	8580.00	765.62	0.00	765.73	0.75	2.75	3119.02	9886.10
16.500	50.00	0.00	0.00	745.70	4620.00	761.01	0.00	761.10	0.93	2.41	2067.37	4765.91
16.500	50.00	0.00	0.00	745.70	6210.00	762.76	0.00	762.87	1.03	2.78	2497.39	6111.72
16.500	50.00	0.00	0.00	745.70	6910.00	763.59	0.00	763.71	1.04	2.90	2706.27	6792.10
16.500	50.00	0.00	0.00	745.70	8580.00	765.61	0.00	765.75	1.00	3.12	3227.71	8582.42
17.000	1400.00	0.00	0.00	747.00	4620.00	761.07	0.00	761.40	3.46	4.66	1068.90	2482.00
17.000	1400.00	0.00	0.00	747.00	6210.00	762.77	0.00	763.23	3.93	5.44	1249.71	3132.64
17.000	1400.00	0.00	0.00	747.00	6910.00	763.58	0.00	764.08	3.98	5.69	1336.85	3462.75
17.000	1400.00	0.00	0.00	747.00	8580.00	765.55	0.00	766.13	3.94	6.17	1550.65	4324.90

00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: KALAMAZOO, CITY OF

3) WATERCOURSE: ARCADIA CREEK

4) DOCUMENT TYPE: 100-YR NATURAL INPUT DATA
1977

00BREAK00

100 YR NATURAL

RECEIVED
JUL 6 1981
WATER MANAGEMENT

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**********************************************************
   EC2 RELEASE DATED JUL 78 UPDATED FEB 1979
   ERROR CODE = 01
   VERSION# = 30.51
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C
TWOMILE CRK FLOW FROM SOUTH 0.04 SMI
T25 ARTIFICIAL WATER DEPTH IS CENTERLINE ROAD ELEVN, HIGHER THAN MAIN WATER AT OUTL
T3      ARCADIA CREEK KALAMAZOO

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    KVICS     CU        KSEL      FQ
          0.        4.        0.        0.  -1.000000    0.00      0.0       0.    700.000     1.000

J2  NPROP     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNL      ITRACE
       -1.000     0.000    -1.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

PT      4.000   621.000   673.010   672.010   935.710     0.000     0.300     1.000     0.300     1.170
NC      0.000     0.035     0.100     0.330     0.510     0.000     0.300     1.000     0.300     0.100
NH      5.000    10.000   180.000     0.016   210.000    10.000   370.000     0.016   460.000    10.000
NB    600.000     0.000     0.300     0.000     0.000     0.000     0.000     0.000     0.000     0.000

        VALLEY SECTION AT THE SOUTH TWOMILE FLOW 2 FT CONTOUR MAP

X1      1.000     6.000   370.000   460.000     0.000     2.000     0.000     0.000     0.000     0.000
GR    770.000     0.000   766.300   180.000   766.300   210.000   766.400   370.000   766.400   460.000
GR    770.300   600.000     0.000     0.000     0.000     0.000     0.000     0.300     0.000     0.300
NH      7.000    10.000   180.000     0.016   210.000    10.000   370.000     0.016   460.000    10.000
NH    710.000     0.016   780.000    10.000   800.000     0.000     0.000     0.000     0.000     0.000

        VALLEY SECTION ALONG HALDRIDGE ST TAKEN FROM 2 FT CONTOUR MAP

X1      3.000     6.000   370.000   460.000   335.000   250.000   335.000     0.000     0.000     0.000
GR    772.000     0.000   769.000   180.000   769.000   210.000   769.000   770.000   769.000   460.000
GR    768.200   710.000   768.000   780.000   772.000   800.000     0.000     0.000     0.000     0.000
NH      7.000    10.000   180.000     0.016   210.000    10.000   370.000     0.016   460.000    10.000
NB    710.000     0.016   780.000    10.000   800.000     0.000     0.000     0.000     0.000     0.000

        VALLEY SECTION ALONG PENNSYLVANIA RAILROAD 2 FT CONTOUR MAP

X1      3.500     6.000   225.000   290.000   225.000   215.000   225.000     0.000     0.000     0.000
GR    774.000     0.000   773.600   225.000   770.600   290.000   770.200   455.000   770.200   530.000
GR    768.100   710.000   768.100   800.000   772.500   800.000     0.000     0.000     0.000     0.000
NH      7.000    10.000   180.000     0.016   210.000    10.000   370.000     0.016   460.000    10.000
NB    650.000     0.016   780.000    10.000  1000.000     0.000     0.000     0.000     0.000     0.000
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X1	4.000	8.000	370.000	460.000	220.000	235.000	220.000	0.000	0.000	0.000
GR	775.000	0.000	772.200	370.000	772.200	460.000	771.400	540.000	771.400	600.000
GR	770.200	950.000	770.200	1020.000	775.000	1100.000	0.000	0.000	0.000	0.000
NH	7.000	10.000	370.000	0.016	460.000	10.000	510.000	0.016	570.000	10.000
NH	720.000	0.016	790.000	10.000	900.000	0.500	0.000	0.000	0.000	0.000

VALLEY SECTION ALONG PITCHER STREET TAKEN FROM 2 FT CONTOUR MAP

X1	5.000	6.000	370.000	450.000	130.000	145.000	150.000	0.000	0.000	0.000
GR	775.000	0.000	770.800	370.000	770.800	460.000	770.200	510.000	770.200	570.000
GR	770.600	720.000	770.600	720.000	775.000	900.000	0.000	0.000	0.000	0.000
NH	5.000	10.000	370.000	0.016	460.000	10.000	800.000	0.016	860.000	10.000
NH	900.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SECTION BETWEEN PITCHER AND EDWARDS FROM 2 FT CONTOUR MAP

X1	6.000	6.000	370.000	460.000	310.000	275.000	310.000	0.000	0.000	0.000
GR	775.000	0.000	772.000	370.000	772.000	460.000	771.500	800.000	771.500	860.000
GR	775.000	900.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NH	5.000	10.000	1896.000	0.016	1656.000	10.000	2079.000	0.016	2138.000	10.000
NH	2190.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SECTION ALONG EDWARDS ST FROM 4DRAWS SECTION 74

X1	7.000	7.000	1590.000	1643.700	150.000	145.000	170.000	0.000	0.000	0.000
GR	770.000	1222.000	773.900	1546.000	773.000	1052.000	777.800	1086.700	773.700	2079.000
GR	773.200	2137.000	777.700	2190.000	0.000	0.000	0.000	0.000	0.000	0.000
NH	5.000	10.000	370.000	0.016	460.000	10.000	960.000	0.016	1020.000	10.000
NH	1100.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SECTION 125 FT U/S OF EDWARDS ST FROM 2 FT CONTOUR MAP

X1	8.000	6.000	370.000	460.000	125.000	245.000	125.000	0.000	0.000	0.000
GR	778.000	0.000	775.000	370.000	775.000	460.000	775.000	960.000	775.000	1020.000
GR	778.000	1100.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NH	5.000	10.000	370.000	0.016	460.000	10.000	1030.000	0.016	1090.000	10.000
NH	1200.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SECTION 235 FT U/S OF EDWARDS ST FROM 2 FT CONTOUR MAP

X1	9.000	6.000	370.000	460.000	190.000	350.000	190.000	0.000	0.000	0.000
GR	778.000	0.000	775.600	370.000	775.600	460.000	776.200	810.000	776.000	1090.000
GR	778.000	1200.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	9.500	0.000	0.000	0.000	55.000	65.000	55.000	0.000	0.000	0.000
NH	5.000	10.000	370.000	0.016	460.000	10.000	1030.000	0.016	1090.000	10.000
NH	1200.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SECTION 350 FT U/S OF EDWARDS ST FROM 2 FT CONTOUR MAP

GR	10.000	6.000	370.000	460.000	60.000	65.000	60.000	0.000	0.000	0.000
GR	780.000	0.000	777.000	370.000	777.000	460.000	777.000	1030.000	777.000	1130.000
GR	150.000	1300.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	10.500	6.000	0.000	0.000	55.000	55.000	55.000	0.000	0.000	0.000

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NH	5.000	10.000	372.000	0.016	460.000	10.000	1080.000	0.016	1140.000	10.000
NH	1200.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SECTION ALONG BURDICK STREET FROM 2 FT CONTOUR MAP

X1	11.000	8.000	370.000	460.000	55.000	55.000	55.000	0.000	0.000	0.000
GR	780.000	0.000	778.200	370.000	778.200	460.000	778.000	1080.000	778.000	1140.000
GR	780.000	1200.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NH	7.000	10.000	370.000	0.016	460.000	10.000	720.000	0.016	790.000	10.000
NH	1080.000	0.016	1140.000	10.000	1200.000	0.000	0.000	0.000	0.000	0.000

VALLEY SECTION 150 FT U/S OF BURDICK;U/S OF ENCL.1A-2'CONTOUR MAP

X1	12.000	8.000	370.000	460.000	150.000	150.000	150.000	0.000	0.000	0.000
GR	782.000	0.000	779.100	370.000	779.000	460.000	777.400	720.000	777.400	790.000
GR	779.200	1080.000	779.200	1140.000	782.000	1200.000	0.000	0.000	0.000	0.000
GR	4.000	454.000	778.000	814.000	1061.000	0.000	0.000	0.000	0.000	0.000
NH	7.000	10.000	370.000	0.016	460.000	10.000	720.000	0.016	790.000	10.000
NH	1080.000	0.016	1140.000	10.000	1200.000	0.000	0.000	0.000	0.000	0.000

VALLEY SEC 250 FT U/S OF BURDICK;D/S END OF ENCL 1B-2'CONTOUR MAP

X1	13.000	8.000	370.000	460.000	50.000	50.000	50.000	0.000	0.000	0.000
GR	779.500	0.000	779.300	370.000	779.300	460.000	777.600	720.000	777.600	790.000
GR	779.400	1080.000	779.400	1140.000	779.500	1200.000	0.000	0.000	0.000	0.000
NH	7.000	10.000	1748.000	0.016	1838.000	10.000	2290.000	0.016	2360.000	10.000
NH	2652.000	0.016	2712.000	10.000	2746.000	0.000	0.000	0.000	0.000	0.000

VALLEY SEC ALONG ROSE ST;FROM ABRAMS SURVEY;SECTION 75

X1	14.000	8.000	1748.000	1838.000	220.000	220.000	220.000	0.000	0.000	0.000
GR	781.500	1412.000	780.000	1748.000	780.000	1838.000	779.500	2290.000	779.500	2360.000
GR	780.000	2652.000	780.500	2712.000	782.000	2746.000	0.000	0.000	0.000	0.000
NH	7.000	10.000	1748.000	0.016	1838.000	10.000	2290.000	0.016	2360.000	10.000
NH	2652.000	0.016	2712.000	10.000	2746.000	0.000	0.000	0.000	0.000	0.000

VALLEY SEC ALONG CHURCH;INTERPOLATED FROM ABRAMS SECS 75 AND 76

X1	15.000	8.000	1748.000	1838.000	350.000	350.000	350.000	0.000	0.000	0.000
GR	781.000	1412.000	780.900	1748.000	780.900	1838.000	780.000	2290.000	780.000	2360.000
GR	782.200	2652.000	782.200	2712.000	783.500	2746.000	0.000	0.000	0.000	0.000
NH	7.000	10.000	1748.000	0.016	1838.000	10.000	2290.000	0.016	2360.000	10.000
NH	2198.000	0.016	2258.000	10.000	2292.000	0.000	0.000	0.000	0.000	0.000

VALLEY SEC ALONG PARK;U/S END OF ENCL 1B=ABRAMS SEC 76

X1	16.000	8.000	1422.000	1512.000	365.000	365.000	365.000	0.000	0.000	0.000
GR	782.500	1302.000	781.800	1422.000	781.800	1512.000	781.600	1902.000	781.600	1972.000
GR	783.500	2028.000	782.600	2258.000	779.300	2292.000	0.000	0.000	0.000	0.000
NH	5.000	10.000	1422.000	0.016	1512.000	10.000	1902.000	0.016	1972.000	10.000
NH	2028.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SEC ALONG PARK AND DOCLEY STREETS;ABRAMS SEC 77

X1	17.000	8.000	1422.000	1512.000	148.000	148.000	148.000	0.000	0.000	0.000
GR	782.300	1302.000	782.600	1422.000	782.600	1512.000	781.400	1902.000	781.400	1972.000
GR	782.300	2028.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

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NH	5.000	10.000	1502.000	0.016	1592.000	10.000	1822.000	0.016	1892.000	10.000
NH	1916.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SEC ALONG COOLEY'S D/S END OF EXCL TO ABRAM'S SEC 78

X1	10.000	6.000	1502.700	1592.000	117.000	117.000	117.000	0.000	0.000	0.000
GR	783.600	1436.000	783.700	1502.000	783.700	1592.000	782.200	1822.000	782.200	1892.000
GR	783.500	1916.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	4.000	435.000	692.000	792.000	1058.000	0.000	0.000	0.000	0.000	0.000
NH	5.000	10.000	200.700	0.016	250.000	10.000	415.000	0.016	485.000	10.000
NH	600.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SEC; INTERPOLATED FROM ABRAM'S SECS 78 AND 79

X1	19.000	6.000	250.000	290.000	230.000	220.000	230.000	0.000	0.000	0.000
GR	784.900	0.000	786.700	200.000	784.700	290.000	783.500	400.000	783.500	480.000
GR	784.900	600.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NH	5.000	10.000	100.000	0.016	250.000	10.000	400.000	0.016	470.000	10.000
NH	600.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SEC; INTERPOLATED FROM ABRAM'S SECS 78 AND 79

X1	20.000	6.000	100.000	250.000	230.000	205.000	230.000	0.000	0.000	0.000
GR	786.700	0.000	785.700	100.000	785.700	250.000	785.000	400.000	785.000	470.000
GR	786.500	600.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NH	5.000	10.000	100.000	0.016	250.000	10.000	320.000	0.016	390.000	10.000
NH	450.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SEC; INTERPOLATED FROM ABRAMS SECS 78 AND 79

X1	21.000	6.000	100.700	250.000	220.000	175.000	220.000	0.000	0.000	0.000
GR	787.500	0.000	786.600	100.000	786.600	250.000	785.300	320.000	785.300	390.000
GR	787.500	450.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NH	5.000	10.000	100.000	0.016	250.000	10.000	270.000	0.016	340.000	10.000
NH	400.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SEC; INTERPOLATED FROM ABRAMS SECS 78 AND 79

X1	22.000	6.000	100.000	250.000	235.000	170.000	235.000	0.000	0.000	0.000
GR	788.500	0.000	787.500	100.000	787.500	250.000	787.500	270.000	787.500	340.000
GR	788.500	600.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NH	5.000	10.000	300.000	0.016	300.000	10.000	470.000	0.016	0.000	0.000

VALLEY SEC; INTERPOLATED FROM ABRAMS SECS 78 AND 79

X1	23.000	6.000	100.000	300.000	215.000	215.000	215.000	0.000	0.000	0.000
GR	789.400	0.000	788.400	100.000	788.400	300.000	788.400	470.000	0.000	0.000
GR	0.000	10.000	400.000	0.016	160.000	10.000	230.000	0.016	300.000	10.000
NH	600.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SEC; INTERPOLATED FROM ABRAMS SECS 78 AND 79

X1	24.000	6.000	290.000	380.000	225.000	225.000	225.000	0.000	0.000	0.000
GR	790.300	0.000	789.500	150.000	789.500	140.000	788.300	252.000	787.300	320.000
GR	790.300	400.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NH	5.000	10.000	100.000	0.016	140.000	10.000	347.000	0.016	490.000	10.000
NH	500.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

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VALLEY SEC; INTERPOLATED FROM ABRAM'S SECS 78 AND 79

X1	25.000	6.000	340.000	490.000	100.000	100.000	100.000	0.000	0.000	0.000
GR	791.400	0.000	790.400	100.000	790.400	100.000	790.100	340.000	790.100	490.000
GR	791.100	500.000	0.300	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NP	7.000	10.000	1318.000	0.016	1378.000	10.000	1652.000	0.016	1752.000	10.000
NH	1978.000	0.016	2038.000	10.000	2088.000	0.000	0.000	0.000	0.000	0.000

VALLEY SEC ALONG ELM ST; ABRAMS SECTION 79

X1	26.000	8.000	1652.000	1752.000	180.000	400.000	180.000	0.000	0.000	0.000
GR	791.900	974.000	791.200	1318.000	791.200	1378.000	790.800	1652.000	790.800	1752.000
GR	790.800	1978.000	790.800	2038.000	792.700	2088.000	0.000	0.000	0.000	0.000
QT	4.000	665.000	920.300	1020.000	1265.000	0.000	0.000	0.300	0.000	0.000
NH	6.000	10.000	25.000	0.050	85.500	0.035	104.600	0.050	148.500	0.050
NH	300.000	10.000	350.000	0.000	0.000	0.000	0.000	0.300	0.000	0.000

VALLEY SEC U/S OF ENCL 10; CHANNEL SEC ABOUT .7 FT LOWER THAN SEC 81

X1	27.000	10.000	95.500	104.500	270.000	100.000	270.000	0.300	0.000	0.000
GR	794.000	0.000	791.800	25.000	791.800	95.500	790.900	95.500	796.230	100.030
GR	787.100	104.500	791.800	104.600	791.800	148.500	791.800	300.000	794.000	350.000
NC	0.080	0.060	0.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000

D/S FACE OF CULVERT AT WEST MAIN STREET

X1	28.000	9.000	96.300	106.000	45.000	45.000	45.000	0.000	0.300	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	791.100	791.100	0.000
GR	794.000	0.000	792.000	1.000	791.100	95.000	786.300	96.500	786.300	100.000
GR	787.200	101.500	791.100	104.000	792.300	253.000	794.000	300.000	0.000	0.000
SH	0.000	2.100	2.500	0.000	5.750	0.000	27.000	7.000	786.700	786.500

U/S FACE OF CULVERT AT WEST MAIN STREET CROSS SEC 80

X1	29.000	12.000	141.000	152.000	52.000	52.000	92.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	791.400	792.000	0.000	0.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	792.000	792.000	0.000
BT	10.000	140.000	793.700	0.000	123.000	793.700	0.000	146.000	792.800	0.000
BT	146.300	792.800	791.400	148.600	792.800	791.400	151.300	792.800	791.400	152.000
BT	792.800	0.000	276.000	792.800	0.000	277.000	793.000	0.000	320.000	794.400
BT	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	794.500	0.000	793.200	100.200	793.000	110.000	793.000	123.000	791.400	146.000
GR	787.100	146.300	792.700	148.600	787.700	151.300	791.400	152.000	791.400	276.000
GR	791.400	277.000	794.400	320.000	0.000	0.000	0.000	0.000	0.000	0.000
NH	5.000	10.000	100.000	0.050	131.000	0.035	149.000	0.016	300.000	10.000
NH	350.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SEC 30 FT U/S OF WEST MAIN CULVERT; CROSS SECTION 81

X1	30.000	12.000	131.000	140.000	55.000	55.000	55.000	0.000	0.000	0.000
GR	794.700	0.000	793.700	100.000	793.000	103.000	792.300	104.000	792.800	131.000
GR	787.600	131.000	792.900	135.500	787.800	139.900	791.500	140.000	792.700	194.500
CW	792.700	300.000	794.700	350.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SEC 300 FT U/S OF SECTION 80

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X1	31.300	0.000	0.000	0.000	300.000	300.000	300.000	0.000	1.000	0.000
NC	0.050	0.050	0.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000

D/S FACE OF ACADEMY ST CULVERT; SECTION 82

X1	32.000	14.000	193.000	199.000	150.000	150.000	150.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	794.400	794.400	0.000
GR	797.000	0.000	796.000	100.000	796.000	140.000	796.300	160.000	794.400	190.000
GR	790.400	191.200	788.900	191.300	788.900	194.500	789.000	197.700	790.400	197.800
GR	794.400	159.000	794.400	360.000	794.400	360.500	797.500	400.000	0.000	0.000
SA	0.000	2.100	2.600	3.000	6.500	0.000	42.300	0.000	788.500	788.000

U/S FACE OF ACADEMY ST CULVERT; SECTION 82

X1	33.000	0.000	0.000	0.000	92.000	92.000	92.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	794.400	795.300	0.000	0.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	795.300	795.300	0.000
RT	9.000	140.000	800.000	0.000	160.000	795.300	0.000	190.000	795.300	0.000
BT	191.200	795.300	794.400	197.800	795.300	794.400	199.000	795.300	0.000	360.000
BT	795.300	0.000	360.500	800.000	0.000	400.000	800.300	0.000	0.000	0.000
NH	5.000	10.000	7.000	0.050	35.000	0.035	62.500	0.050	254.000	10.000
NH	300.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SEC 75 FT U/S OF ACADEMY ST CULVERT; ABRAMS SEC 83

X1	34.000	15.000	55.000	92.000	75.000	75.000	75.000	0.000	0.000	0.000
GR	797.100	0.000	796.100	8.000	796.100	12.000	796.100	33.000	769.700	47.000
GR	785.300	54.000	790.200	59.000	793.200	62.000	793.900	71.000	794.000	86.000
GR	794.800	138.000	796.000	184.000	796.100	214.000	796.100	256.000	790.600	300.000

VALLEY SEC BETWEEN FIG 6 SECTIONS 75 AND 84

X1	35.000	0.000	0.000	0.000	400.000	400.000	400.000	0.000	0.000	0.000
NH	5.000	10.000	7.000	0.050	30.000	0.035	55.000	0.050	69.000	10.000
NH	97.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SEC 50 FT D/S OF LOVELL STREET; ABRAMS SEC 84

X1	36.000	11.000	30.000	55.000	310.000	310.000	310.000	0.000	0.000	0.000
GR	800.900	0.000	799.700	7.000	799.200	10.000	799.300	30.000	791.100	39.000
GR	791.000	46.000	791.200	53.000	793.600	55.000	800.800	69.000	801.000	83.000
SA	801.400	97.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

D/S OF LOVELL STREET; D/S END OF ENCLOSURE 2

X1	37.000	0.000	0.000	0.000	50.000	50.000	50.000	0.000	0.300	0.000
RT	4.000	570.000	796.300	796.000	1141.700	0.000	0.000	5.000	0.000	0.300
BH	3.000	10.000	324.300	0.035	483.000	10.000	524.000	0.000	0.000	0.000

SECTION AT LOVELL STREET FOR OVERLAND FLOW; ABRAMS SEC 85

X1	30.000	0.000	334.000	442.000	100.000	100.000	100.000	0.000	0.000	0.000
GR	803.000	292.000	802.100	324.000	801.500	364.000	801.700	403.100	800.130	457.000
GR	800.100	472.000	800.600	442.000	798.400	504.000	0.300	0.000	0.000	0.000
NH	3.000	10.000	50.000	0.035	200.000	10.000	250.000	0.000	0.000	0.000

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APPROX. 100 FT U/S OF LOVELL STREET

X1	39.000	4.000	50.000	200.000	100.000	100.000	100.000	0.000	0.000	0.000
GR	304.000	0.000	802.000	50.000	802.000	200.000	804.000	250.000	0.000	0.000
NH	3.000	10.000	50.000	0.035	150.000	50.000	200.000	5.000	0.000	0.000

APPROX. 225 FT U/S OF LOVELL STREET

X1	40.000	4.000	50.000	150.000	125.000	125.000	125.000	0.000	0.000	0.000
GR	305.000	0.000	803.000	50.000	803.000	150.000	805.000	200.000	0.000	0.000
NH	3.000	10.000	50.000	0.035	150.000	50.000	200.000	5.000	0.000	0.000

APPROX. 325 FT U/S OF LOVELL STREET

X1	41.000	4.000	50.000	150.000	100.000	100.000	100.000	0.000	0.000	0.000
GR	306.500	0.000	804.000	50.000	804.000	150.000	806.500	200.000	0.000	0.000

APPROX. 450 FT U/S OF LOVELL STREET AT MICHIGAN AVE

X1	42.000	0.000	0.000	0.000	125.000	125.000	125.000	0.000	1.000	0.000

APPROX. 625 FT U/S OF LOVELL STREET

X1	43.000	0.000	0.000	0.000	175.000	175.000	175.000	0.000	1.500	0.000
[illegible]	5.000	10.000	53.000	2.035	150.000	10.000	200.000	5.000	5.000	5.000

APPROX. 800 FT U/S OF LOVELL STREET

X1	44.000	4.000	50.000	150.000	175.000	175.000	175.000	0.000	0.000	0.000
GR	610.500	0.000	809.000	50.000	809.000	150.000	810.000	200.000	0.000	0.000
NH	3.000	10.000	53.000	0.035	200.000	10.000	250.000	0.000	0.000	0.000

APPROX. 1275 FT U/S OF LOVELL STREET

X1	45.000	4.000	50.000	150.000	475.000	475.000	475.000	0.000	0.000	0.000
GR	611.500	0.000	806.500	50.000	808.500	250.500	811.500	250.000	0.000	0.000

APPROX. 1725 FT U/S OF LOVELL STREET

X1	46.000	0.000	0.000	0.000	450.000	450.000	450.000	0.000	0.000	0.000
CT	4.000	665.000	920.000	1120.000	1205.000	0.000	0.000	0.000	0.000	0.000
C	0.000	1.000	0.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000

APPROX. 2175 FT U/S OF LOVELL; U/S END OF EXCL. VALLEY SEC 86

X1	47.000	10.000	650.000	700.000	650.000	650.000	650.000	0.000	0.000	0.000
GT	814.200	694.000	813.500	522.000	813.400	522.000	812.000	538.000	670.000	557.000
GR	810.400	580.000	810.000	598.000	809.000	638.000	809.600	650.000	804.800	668.000
GR	804.700	674.000	804.600	690.000	806.200	683.000	806.900	706.000	815.900	725.000

VALLEY SEC APPROX. 125 FT U/S OF ENCLOSURE

X1	48.000	0.000	0.000	0.000	125.000	125.000	125.000	0.000	1.000	0.000

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INTERPOLATED SEC FROM ABRAMS SECTIONS 88 AND 90

X1	49.000	9.000	120.000	132.000	230.000	230.000	230.000	0.000	0.000	0.000
GR	814.000	0.000	814.000	50.000	811.000	90.000	811.000	102.000	806.500	120.000
GR	806.500	132.000	310.000	162.000	812.000	153.000	820.000	200.000	0.000	0.000
BT	4.000	315.000	435.000	485.000	745.000	0.000	0.000	0.000	0.000	0.000

D/S FACE OF CULVERT AT OLIVER STREET

X1	50.000	12.000	200.000	240.000	95.000	95.000	95.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	812.000	812.700	0.000
GR	825.000	1.000	312.500	1.000	812.700	50.000	812.000	100.000	811.000	200.000
GR	811.000	210.000	807.700	232.000	807.700	235.930	811.000	240.000	813.000	260.000
GR	821.600	274.000	825.000	279.000	0.000	0.000	0.000	0.000	0.000	0.000
SB	0.000	2.600	2.600	0.000	3.930	0.000	19.600	0.000	807.700	807.200

U/S FACE OF CULVERT AT OLIVER STREET

X1	51.000	0.000	0.000	0.000	126.000	126.000	126.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	812.700	813.100	0.000	0.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	813.100	813.100	0.000
BT	8.000	0.000	325.000	0.000	1.000	813.100	0.000	50.000	813.000	0.000
BT	150.000	819.600	0.000	232.000	821.600	812.700	235.930	821.600	812.700	274.000
BT	821.600	0.000	279.000	825.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SECTION: ABRAMS SEC 90

X1	52.000	0.000	237.000	260.000	30.000	30.000	30.000	0.000	0.000	0.000
GR	818.500	0.000	811.400	61.000	811.200	137.000	808.100	147.000	807.600	152.000
GR	807.900	155.000	813.100	160.000	814.600	210.000	819.500	300.000	0.000	0.000

VALLEY SECTION: ABRAMS SEC 91

X1	53.000	13.000	800.000	846.000	195.000	195.000	195.000	0.000	0.000	0.000
GR	825.000	602.000	813.600	670.000	813.200	716.000	812.800	738.000	813.100	760.000
GR	813.000	771.000	813.800	800.000	808.800	822.000	808.400	830.000	808.700	838.000
GR	815.300	846.200	815.000	867.000	825.000	362.000	0.000	0.000	0.000	0.000

VALLEY SECTION: 160 FT U/S OF ABRAMS SEC 91

X1	54.000	0.000	0.000	0.000	160.000	160.000	160.000	0.000	1.000	0.000

D/S FACE OF CULVERT AT RAILROAD: FIRST CROSSING WEST OF OLIVER ST

X1	55.000	0.000	0.000	0.000	150.000	120.000	135.000	0.000	0.200	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	815.400	815.600	0.000
SB	0.000	2.300	5.400	0.000	5.400	0.200	27.200	0.000	810.400	809.500

U/S FACE OF CULVERT AT RAILROAD

X1	56.000	0.000	220.000	240.000	66.000	66.000	66.000	0.000	0.000	0.000
X2	0.000	1.000	0.000	815.400	824.400	0.000	0.000	0.000	0.000	0.000
X3	10.000	1.000	0.000	0.000	0.000	0.000	0.000	824.400	824.400	0.000
SB	0.000	51.000	824.200	0.000	70.000	824.400	0.000	227.500	824.400	815.400
BT	232.500	824.400	815.400	282.000	824.400	0.000	375.000	890.000	0.000	0.000
GR	826.200	50.000	824.400	70.000	816.000	220.000	810.400	227.500	810.400	232.500
GR	816.000	240.000	824.400	282.000	830.000	375.000	0.000	0.000	0.000	0.000

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VALLEY SECTION BETWEEN CULVERTS AT RAILROAD AND STADIUM DR; SEC 93A

X1	37.000	8.000	172.000	132.000	40.000	60.000	60.000	0.000	0.000	0.000
GR	826.000	0.000	822.500	50.000	822.500	150.000	822.600	172.000	818.400	177.000
GR	821.000	100.000	821.000	192.000	822.000	240.000	826.000	270.000	0.000	0.000

D/S FACE OF CULVERT AT STADIUM DRIVE;FIRST CROSSING WEST OF CLIVER ST

X1	56.000	0.000	0.000	0.000	70.000	30.000	48.000	0.000	1.200	0.500
X2	10.000	0.000	0.000	0.000	0.000	0.000	0.000	817.600	817.600	0.000
SB	0.000	2.600	2.600	0.000	3.930	0.000	19.600	0.000	814.400	812.600

U/S FACE OF CULVERT AT STADIUM DRIVE

X1	59.000	11.000	318.000	325.000	137.000	133.300	133.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	817.600	824.400	0.000	0.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	824.400	824.400	0.000
BT	9.000	0.000	828.000	0.000	162.000	828.000	0.000	246.000	826.200	0.000
BT	316.000	826.200	818.600	813.930	826.200	819.400	346.300	827.700	0.000	391.000
BT	525.400	0.000	832.000	828.000	0.000	460.000	520.300	0.000	0.000	0.000
GR	828.000	0.000	828.000	162.000	823.000	240.000	823.000	310.000	814.400	816.000
GR	814.600	319.930	823.000	325.000	823.000	366.000	826.000	398.000	823.000	430.000
GR	828.000	460.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SEC APPROX. 100 FT U/S OF STADIUM DRIVE CULVERT

X1	60.000	8.000	100.000	120.000	80.000	120.000	100.000	0.000	0.000	0.000
GR	827.000	0.000	816.000	10.000	816.000	100.000	814.000	101.000	816.000	119.000
GR	816.000	120.000	816.000	190.000	827.000	200.000	0.000	0.000	0.000	0.000

SECTION AT TOP OF THE DAM APPROX. 150 FT U/S OF STADIUM DR.CULVERT

X1	61.000	10.000	100.000	120.000	40.000	60.000	50.000	0.000	0.000	0.000
GR	827.000	0.000	816.000	10.000	815.700	100.000	815.700	113.400	814.900	114.200
G1	817.700	119.200	815.700	120.000	815.700	125.000	816.000	230.100	827.000	240.000

VALLEY SECTION BETWEEN THE TWO DAMS

X1	62.000	8.000	100.000	120.000	120.000	80.000	100.000	0.000	0.000	0.000
GR	827.000	0.000	826.500	10.000	816.300	130.000	814.500	102.000	814.300	119.000
GR	816.000	120.000	816.500	230.000	827.300	210.000	0.000	0.000	0.000	0.000

SECTION AT TOP OF THE DAM APPROX. 20FT D/S OF PIPE LINE CROSSING

X1	65.000	13.000	100.000	120.000	130.000	130.000	120.300	0.300	0.000	0.000
GR	827.000	0.100	817.000	10.000	816.100	130.000	816.100	103.000	816.000	116.100
G1	115.300	119.500	816.000	120.000	817.100	125.000	817.100	200.000	827.000	210.100

SECTION AT THE PIPE LINE;MAIN PIPES DO NOT OBSTRUCT FLOW;HENCE NEGLECTED

X1	64.000	5.000	100.000	131.000	80.000	80.000	80.000	0.000	0.000	0.000
GR	827.000	0.000	827.000	10.000	827.000	130.000	815.100	102.000	819.000	119.500
GR	814.700	130.000	817.300	131.000	817.000	230.000	827.000	210.000	0.000	0.000

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D/S FACE OF THE FOOT BRIDGE

X1	65.000	7.000	100.000	116.000	180.000	166.000	166.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	817.800	817.800	0.000
GR	827.000	0.000	817.800	100.000	814.900	106.000	814.500	108.000	815.200	110.500
GR	817.800	116.000	827.000	200.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	65.100	9.000	106.000	110.000	1.000	1.000	1.000	0.000	0.000	0.000
X2	0.000	0.000	0.000	817.800	818.300	0.000	0.000	0.000	0.000	0.000
GR	827.000	0.000	817.800	100.000	817.800	106.000	814.900	106.120	816.600	108.700
GR	815.000	109.900	817.800	110.000	817.800	116.300	827.000	200.000	0.000	0.000
X1	65.900	0.000	0.000	0.000	3.000	3.000	3.000	0.000	0.000	0.000
X2	0.000	0.000	0.000	817.800	818.300	0.000	0.000	0.000	0.000	0.000

U/S FACE OF THE FOOT BRIDGE

X1	66.000	7.000	100.000	116.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	818.300	818.300	0.000
GR	827.000	0.000	817.800	100.000	814.900	106.000	815.100	108.300	815.800	110.000
GR	817.300	116.000	827.000	200.000	0.000	0.000	0.000	0.000	0.000	0.000

D/S FACE OF CULVERT ATSABRAMS SECTION 95

X1	67.000	14.000	173.000	183.000	189.000	189.000	189.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	818.400	818.400	0.000
GR	829.000	0.000	824.000	12.000	819.400	30.000	818.200	90.000	818.400	191.000
GR	818.800	160.000	818.400	178.000	816.000	178.100	815.900	182.000	815.600	185.900
GR	818.400	186.000	820.800	226.000	822.200	280.000	827.000	324.000	0.000	0.000
X1	67.100	0.000	0.300	0.300	1.200	1.000	1.000	0.000	0.300	0.300
X2	0.000	0.000	0.300	818.400	819.700	0.000	0.000	0.000	0.000	0.000
X1	67.900	0.000	0.000	0.000	10.000	10.000	10.000	0.000	0.000	0.000
X2	0.000	0.000	0.000	818.400	818.700	0.000	0.000	0.000	0.000	0.000

U/S FACE OF CULVERT AT ABRAMS SECTION 95

X1	68.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	818.700	818.700	0.000

INTERPOLATED SECTION BETWEEN ABRAMS SECTIONS 95 AND 96

X1	69.000	0.000	0.000	0.000	120.000	130.000	125.000	0.000	1.200	0.000

125 FT D/S OF ABRAMS SEC 95 INTERPOLATED FOR [illegible] SEC 96

X1	70.000	9.000	101.000	123.000	125.000	125.000	125.000	0.000	0.000	0.000
GR	832.300	0.000	821.600	57.000	820.400	101.000	818.200	106.000	818.000	111.000
GR	817.400	115.000	827.000	123.000	824.000	238.000	827.000	277.000	0.000	0.000

D/S FACE OF DIVERSION FROM ABRAMS SECS 96 TO 99;ABRAMS SEC 96

X1	71.000	0.000	0.000	0.000	125.000	125.000	125.000	0.000	1.200	0.000

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QT	4.000	190.000	305.000	355.000	605.000	0.000	0.000	0.000	0.000	0.000
NC	0.080	0.080	0.000	0.300	0.500	0.000	0.000	0.000	0.000	0.000

DIVERSION FROM ABRAMS SECS 96 TO 99 ALONG RIGHT SIDE OF STADIUM DRIVE

X1	71.100	6.000	57.000	93.000	130.000	130.000	130.000	0.000	0.000	0.000
GR	834.500	0.000	823.800	57.000	822.600	71.000	826.000	93.000	827.000	195.000
GR	830.600	217.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	71.200	0.000	0.000	0.000	130.000	130.000	130.000	0.000	1.000	0.000

X1	71.300	0.000	0.000	0.000	130.000	130.000	130.000	0.000	1.000	0.000

X1	71.400	0.000	0.000	0.000	130.000	130.000	130.000	0.000	1.000	0.000

X1	71.500	0.000	0.000	0.000	130.000	130.000	130.000	0.000	1.500	0.000

X1	71.600	6.000	29.000	63.000	130.000	130.000	130.000	0.000	0.000	0.000
GR	839.400	0.000	829.600	29.000	828.400	44.000	829.500	63.000	839.100	84.000
GR	835.100	101.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	71.700	0.000	0.000	0.000	130.000	130.000	130.000	0.000	1.000	0.000
QT	4.000	315.000	435.000	445.000	745.000	0.000	0.000	0.000	0.000	0.000
NC	0.000	0.100	0.000	0.300	0.500	0.000	0.000	0.000	0.000	0.000

U/S END OF DIVERSION, ABRAMS SEC 99

X1	72.000	10.000	46.000	53.000	130.000	130.000	130.000	0.000	0.000	0.000
GR	841.400	0.000	836.000	40.000	830.400	46.000	828.300	49.000	827.700	51.000
GR	827.500	54.000	827.700	57.000	831.500	63.000	836.000	65.000	837.100	101.000
NC	0.100	0.100	0.050	0.300	0.500	0.000	0.000	0.000	0.000	0.000

D/S END AT HOWARD; ALSO D/S END OF DIVERSION BETWEEN ABRAMS SECS100TO107

X1	73.000	0.000	0.000	0.000	420.000	420.000	410.000	0.000	1.500	0.000
QT	4.000	170.000	188.000	192.000	200.000	0.000	0.000	0.000	0.000	0.000

D/S END OF HOWARD ST CULVERT

X1	73.500	6.000	50.000	54.000	30.000	30.000	30.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	831.000	831.000	0.000
GR	843.000	0.000	833.000	50.000	828.000	50.050	828.000	53.950	833.000	54.000
GR	843.000	120.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SC	0.000	6.200	2.500	130.000	3.030	0.000	19.600	0.000	827.000	828.000

U/S END OF HOWARD ST CULVERT EXTENDING UPTP CHRISTIAN HIGH SCHOOL ROAD

X1	74.000	0.000	0.000	0.000	294.000	294.000	294.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	853.000	840.400	0.000	0.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	833.000	833.000	0.000

VALLEY SECTION; ABRAMS SECTION 101

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X1	75.000	12.000	74.000	141.000	100.000	100.000	100.000	0.000	0.000	0.000
GR	843.700	0.000	839.200	26.000	838.900	39.000	834.100	74.000	832.600	79.000
GR	831.500	93.000	831.100	108.000	831.500	118.000	832.200	128.000	833.500	141.000
GR	835.200	151.000	843.800	168.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SECTION; ABRAMS SECTION 102

X1	76.000	13.000	843.000	863.000	560.000	560.000	540.000	0.000	0.000	0.000
GR	853.200	733.000	837.400	736.000	836.900	874.100	826.000	836.700	844.000	
GR	833.000	844.000	833.500	854.300	833.900	859.000	835.900	863.700	837.200	887.000
GR	838.700	924.000	838.700	972.000	843.100	1036.000	0.000	0.000	0.000	0.000

VALLEY SECTION; ABRAMS SECTION 103

X1	77.000	10.000	75.000	95.000	265.000	265.000	265.000	0.000	0.000	0.000
GR	843.200	30.000	839.300	50.000	835.500	75.500	833.300	61.000	832.300	86.000
GR	833.200	91.000	835.500	95.000	837.100	112.000	839.300	130.000	863.500	180.000

X1	77.500	6.000	55.000	65.000	60.000	70.000	65.000	0.000	0.000	0.000
GR	843.000	0.000	837.000	50.000	836.200	55.000	834.200	69.000	839.000	70.000
GR	843.000	120.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

46 INCH CMP CONSIDERED AS VALLEY SECTION; ABRAMS SEC 104

X1	73.000	9.000	55.000	65.000	60.000	70.000	65.000	0.000	0.000	0.000
GR	843.000	0.000	837.500	50.000	835.500	55.000	835.500	69.000	839.000	84.000
GR	843.000	120.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

42 INCH CMP CONSIDERED AS VALLEY SECTION; ABRAMS SEC 104

X1	79.000	16.000	868.000	878.000	197.000	197.000	965.000	0.000	0.000	0.000
GR	846.000	636.000	846.000	676.000	846.000	720.000	846.000	778.000	846.000	794.000
GR	846.000	816.000	838.800	852.000	838.800	858.000	836.800	869.000	836.400	874.000
GR	836.900	879.000	840.000	895.000	841.000	898.000	846.000	930.000	866.000	974.000
GR	846.000	1021.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	79.100	8.000	52.000	72.000	210.000	210.000	210.000	0.000	0.000	0.000
GR	846.000	30.000	846.000	40.000	840.000	52.000	837.500	60.000	837.500	64.000
GR	840.000	72.000	844.000	84.000	846.000	94.000	0.000	0.000	0.000	0.000

X1	79.120	5.000	24.000	36.000	150.000	150.000	150.000	0.000	0.000	0.000
GR	849.000	0.000	846.000	8.000	840.500	24.000	838.300	28.000	836.300	32.000
GR	840.500	36.000	846.000	52.000	849.000	60.000	0.000	0.000	0.000	0.000

X1	79.130	6.000	26.000	36.000	150.000	150.000	150.000	0.000	0.000	0.000
GR	840.000	0.000	840.000	26.000	839.000	31.000	839.130	32.000	840.000	34.000
GR	849.000	60.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	79.100	8.000	26.000	36.000	70.000	70.000	70.000	0.000	0.000	0.000
GR	846.000	0.000	846.000	26.000	839.500	28.000	839.500	32.000	846.000	36.000
GR	849.000	60.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

D/S FACE OF CULVERT AT STATION BEING JUST OF ROADWAY ABRAMS SEC 106

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X1	79.200	6.000	58.000	54.000	50.000	50.000	50.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	900.000	900.000	0.000
GR	854.100	0.000	843.900	50.000	839.900	50.050	839.900	53.950	843.900	54.000
GR	854.100	100.000	3.000	0.000	3.000	0.000	0.000	0.000	0.000	0.000
SB	0.000	6.200	2.600	0.000	4.000	0.000	6.000	0.000	840.500	839.200

U/S FACE OF CULVERT AT STADIUM DRIVE WEST OF HOWARD

X1	79.500	0.000	0.000	0.000	123.000	123.000	123.000	0.000	0.000	0.000
X2	80.000	0.000	1.000	844.500	900.000	0.000	0.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	900.000	900.000	0.000
GT	4.000	170.000	365.000	475.000	720.000	0.000	0.000	0.000	0.000	0.000

U/S EDGE OF DIVERSION; ABRAMS SEC 107

X1	80.000	14.000	234.000	262.000	60.000	40.000	50.000	0.000	0.000	0.000
GR	863.400	80.000	862.200	110.000	860.000	175.000	851.000	176.000	847.600	200.000
GR	846.200	214.000	845.800	232.000	845.500	234.000	841.500	246.000	840.800	249.000
GR	841.600	252.000	844.100	262.000	845.100	273.000	856.000	304.000	0.000	0.000

X1	80.200	0.000	0.100	0.200	220.000	220.000	220.000	0.000	1.000	0.000

X1	80.400	0.000	0.000	0.000	230.000	230.000	220.000	0.000	1.000	0.000

X1	80.600	0.000	0.000	0.300	220.000	220.000	220.000	0.000	1.000	0.000

X1	80.800	0.000	0.000	0.000	220.000	220.000	220.000	0.000	1.000	0.000

VALLEY SECTIONS ABRAMS SECTION 107

X1	81.000	13.000	46.000	66.000	220.000	220.000	220.000	0.000	0.000	0.000
GR	855.200	0.000	853.300	2.000	852.000	3.000	852.000	10.000	849.800	17.000
GT	849.400	52.000	846.200	49.000	845.900	52.000	846.400	58.000	847.000	60.000
GT	848.600	86.000	849.400	125.000	855.800	127.000	0.000	0.000	0.000	0.000

X1	81.200	0.000	0.000	0.300	200.000	200.000	200.000	0.000	1.000	0.000

X1	81.400	0.000	0.000	0.000	200.000	200.000	200.000	0.000	1.000	0.000

VALLEY SECTIONS ABRAMS SECTION 109

X1	82.200	11.000	43.000	65.000	200.000	200.000	200.000	0.000	0.000	0.000
GR	855.900	0.000	855.000	2.000	851.700	4.000	851.500	7.000	851.600	16.000
GR	851.400	42.000	848.800	45.000	848.900	47.000	849.200	49.000	849.000	50.000
GR	851.500	56.000	851.700	60.000	851.600	64.000	851.300	78.000	851.200	104.000
GR	852.400	152.000	857.000	153.000	857.000	203.000	0.000	0.000	0.000	0.000

VALLEY SECTIONS INTERPOLATED FROM ABRAMS SECTIONS 109 AND 111

X1	82.100	7.000	37.000	58.000	160.000	160.000	160.000	0.000	0.000	0.000
GR	854.000	0.000	853.000	6.000	853.000	37.000	850.000	46.000	852.500	58.000
GR	853.000	96.000	856.000	102.000	0.000	0.000	0.000	0.000	0.000	0.000

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X1	82.200	0.000	0.000	0.000	160.000	160.000	160.000	0.000	1.000	0.000
X1	82.300	0.000	0.000	0.000	160.000	160.000	160.000	0.000	1.000	0.000
X1	82.400	0.000	0.000	0.000	160.000	160.000	160.000	0.000	1.000	0.000

VALLEY SECTION; INTERPOLATED FROM ABRAMS SECTIONS 109 AND 110

X1	82.500	7.000	47.000	68.000	160.000	160.000	160.000	0.000	0.000	0.000
GR	860.000	0.000	858.000	10.000	857.000	47.000	854.000	58.000	856.000	68.000
GR	859.000	94.000	861.000	98.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	82.600	0.000	0.000	0.000	160.000	160.000	160.000	0.000	1.000	0.000

VALLEY SECTION; ABRAMS SECTION 110

X1	83.000	14.000	55.000	76.000	170.000	170.000	170.000	0.000	0.000	0.000
GR	864.200	7.000	859.400	14.000	859.200	74.000	859.600	36.500	859.600	41.500
GR	859.400	50.000	859.500	55.000	858.600	57.000	856.400	63.000	855.900	66.000
GR	856.500	69.000	857.900	76.000	857.600	80.000	862.400	94.000	0.000	0.000
X1	83.200	0.000	0.000	0.000	230.000	230.000	230.000	0.000	1.000	0.000

VALLEY SECTION; ABRAMS SECTION 111

X1	84.000	15.000	40.000	72.000	250.000	250.000	250.000	0.000	0.000	0.000
GR	867.600	0.000	862.500	12.000	862.500	26.500	862.500	31.500	862.700	40.000
GR	862.700	45.000	861.700	48.000	859.900	54.000	859.400	58.000	859.600	62.000
GR	861.000	64.000	859.300	69.000	861.000	72.300	865.600	93.000	865.500	91.000
X1	84.500	0.000	0.000	0.000	370.000	370.000	370.000	0.000	1.000	0.000

VALLEY SECTION; ABRAMS SECTION 112

X1	87.000	12.000	57.000	78.000	370.000	370.000	370.000	0.000	0.000	0.000
GR	871.600	0.000	865.100	36.500	865.200	41.500	865.500	50.000	865.500	55.000
GR	864.700	57.000	862.400	62.000	862.200	63.000	862.000	65.000	861.600	68.000
GR	862.300	74.000	863.300	78.000	863.300	83.000	871.700	98.000	0.000	0.000
X1	85.300	0.000	0.000	0.000	415.000	415.000	415.000	0.000	1.000	0.000

VALLEY SECTION; ABRAMS SECTION 113

X1	90.000	15.000	53.000	84.000	415.000	415.000	415.000	0.000	0.000	0.000
GR	874.200	0.000	871.000	12.000	865.200	29.500	865.200	34.500	864.700	43.000
GR	868.300	48.000	867.600	50.000	865.300	53.000	864.800	57.300	864.700	62.000
GR	864.200	70.000	864.700	78.000	866.000	84.000	865.000	95.300	859.500	98.000
GR	870.600	150.700	7.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

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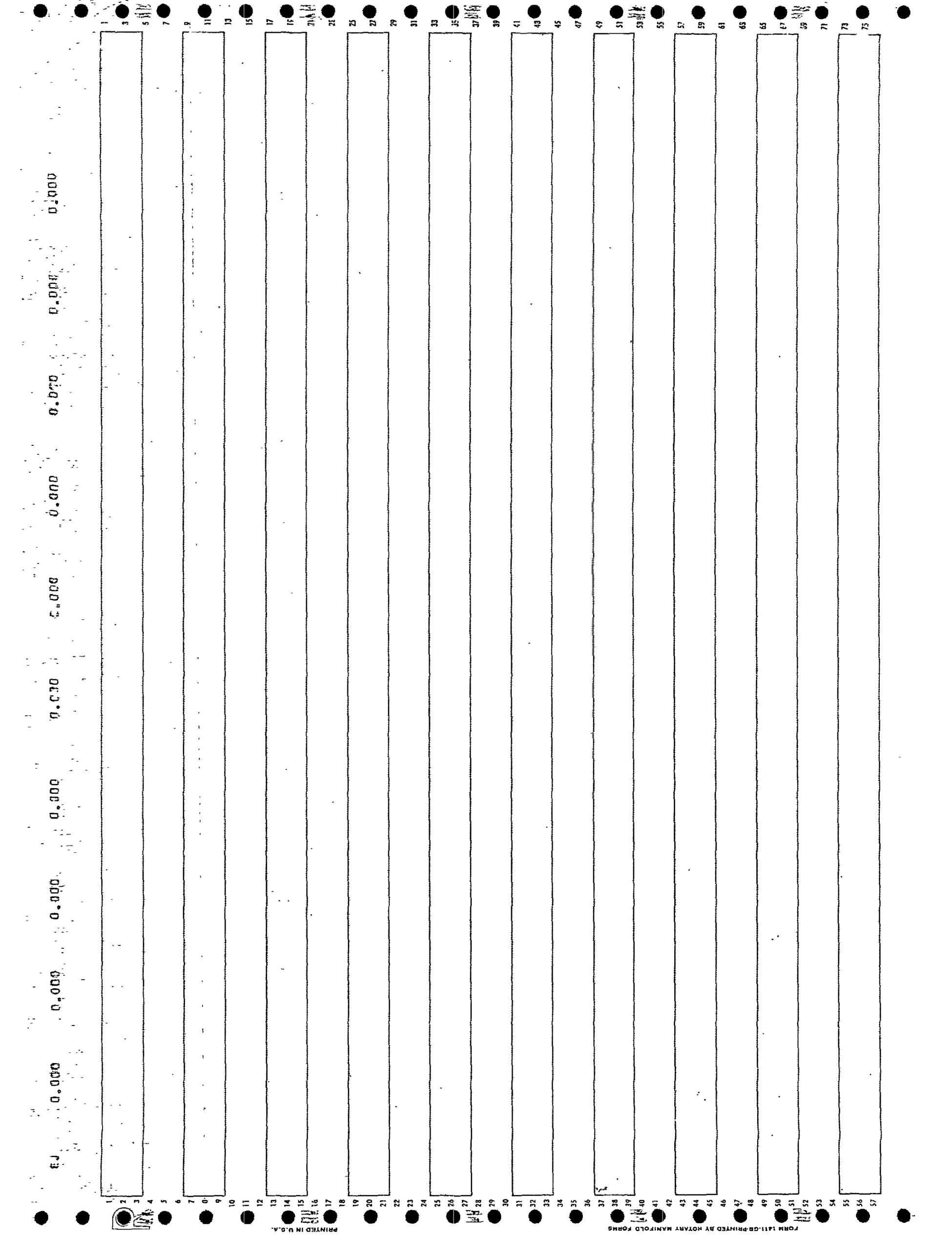
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00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: KALAMAZOO, CITY OF

3) WATERCOURSE: ARCADIA CREEK

4) DOCUMENT TYPE: 100-YR NATURAL RUN 1977

00BREAK00

*PROF 1

CCHV= 0.300 CEHV= 0.500

1490 NH CARD USED
*SECNO 1.000

SECNO	DEPTH	CHSEL	CRIMS	HSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST
372C CRITICAL DEPTH ASSUMED									
1.00	1.09	767.49	767.49	768.00	767.96	0.47	0.00	0.00	766.40
672.	92.	-500.	0.	177.	98.	23.	0.	0.	766.40
0.00	0.52	5.89	0.01	0.161	0.016	10.000	0.000	766.40	141.00
0.003576	0.	0.	0.	0	18	0	0.00	361.53	502.52

VALLEY SECTION AT THE MOUTH TAKEN FROM 2 FT CONTOUR MAP

1490 NH CARD USED
*SECNO 2.000

VALLEY SECTION ALONG WALBRIDGE ST TAKEN FROM 2 FT CONTOUR MAP

2.00	1.70	768.70	0.00	0.00	768.75	0.05	0.66	0.12	767.20
672.	31.	327.	346.	220.	135.	313.	8.	8.	767.20
0.15	0.14	2.62	1.00	0.203	0.016	0.039	0.000	767.00	116.70
0.030793	750.	750.	740.	4	0	0	0.00	553.05	669.75

1490 NH CARD USED
*SECNO 3.000

VALLEY SECTION BETWEEN POINTER AND WALBRIDGE FROM 2 FT CONTOUR MAP

3.00	0.93	768.93	0.00	0.00	769.16	0.23	0.32	0.09	769.00
672.	0.	0.	672.	0.	0.	176.	11.	11.	769.00
0.15	0.00	0.00	3.81	0.102	0.016	0.383	1.000	769.00	476.35
0.013435	335.	335.	260.	3	0	0	0.00	307.82	784.66

1490 NH CARD USED
*SECNO 3.500

3.50	1.35	770.48	0.00	0.00	770.50	0.03	1.29	0.05	770.60
672.	0.	0.	672.	0.	0.	384.	13.	13.	770.60
0.15	0.00	0.00	1.73	0.102	0.016	0.045	0.300	769.10	349.30
0.003394	225.	225.	215.	2	0	0	0.00	577.85	927.65

1490 NH CARD USED
*SECNO 4.000

SECNO	DEPTH	CHSEL	CRIMS	HSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST
VALLEY SECTION ALONG PENNSYLVANIA RAILROAD FROM 2 FT CONTOUR MAP									
4.00	1.19	771.39	0.00	0.00	771.47	0.08	0.9[illegible]	0.02	772.20

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672.	0.	0.	672.	0.	0.	301.	14.	15.	772.20
0.21	0.00	0.00	2.23	10.000	0.016	0.042	0.000	770.20	603.28
0.005973	220.	220.	215.	3	0	0	0.00	436.54	1039.81

1490 NH CARD USED
*SECNO 5.000

VALLEY SECTION ALONG PITCHER STREET TAKEN FROM 2 FT CONTOUR MAP

5.00	1.43	771.68	0.00	0.00	771.71	0.04	0.23	0.01	770.00
672.	0.	182.	490.	34.	79.	429.	16.	17.	770.80
0.24	0.00	2.31	1.14	10.000	0.016	0.041	0.000	770.20	292.74
0.000735	150.	150.	145.	3	0	0	0.00	524.18	816.92

1490 NH CARD USED
*SECNO 6.000

VALLEY SECTION BETWEEN PITCHER AND EDWARDS FROM 2 FT CONTOUR MAP

6.00	0.72	772.22	0.00	0.00	772.41	0.18	0.62	0.07	772.00
672.	0.	115.	557.	3.	20.	206.	18.	20.	772.00
0.26	0.01	5.82	2.70	10.000	0.016	0.061	0.000	771.30	342.01
0.029483	310.	310.	275.	2	0	0	0.00	525.42	868.23

1490 NH CARD USED
*SECNO 7.000

VALLEY SECTION ALONG EDWARDS ST FROM ABRAMS SECTION 74

7.00	1.04	774.24	0.00	0.00	774.34	0.09	1.91	0.03	773.90
672.	0.	160.	512.	7.	37.	359.	19.	22.	773.80
0.25	0.00	4.37	1.42	10.000	0.016	0.570	0.000	770.20	1552.30
0.007333	150.	150.	145.	4	0	0	0.00	599.92	2152.22

1490 NH CARD USED
*SECNO 8.000

SECNO	DEPTH	CHSEL	CRIWS	WSELK	EG	HV	HL	ELOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELTRK	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

VALLEY SECTION 125 FT U/S OF EDWARDS ST FROM 2 FT CONTOUR MAP

8.00	0.72	775.72	775.72	0.00	776.00	0.36	1.39	0.13	775.00
672.	0.	401.	271.	32.	64.	409.	22.	26.	775.00
0.29	0.01	6.22	3.66	10.000	0.016	0.149	0.000	775.00	281.63
0.006988	125.	125.	245.	5	16	0	0.00	757.48	1039.11

1490 NH CARD USED
*SECNO 9.000

SECNO	DEPTH	CHSEL	CRIWS	WSELK	EG	HV	HL	ELOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELTRK	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

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7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

VALLEY SECTION 235 FT U/S OF EDWARDS ST FROM 2 FT CONTOUR MAP

9.00	1.02	776.62	775.62	0.00	777.00	0.38	0.56	0.01	775.60
672.	0.	517.	155.	81.	92.	518.	23.	28.	775.60
0.30	0.01	5.60	0.30	10.000	0.016	0.254	0.000	775.60	212.03
0.003525	110.	110.	130.	2	11	0	0.00	912.34	1124.36

*SECNO 9.500

SECNO	DEPTH	CHSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IN2	ICONT	CORAR	TOPWID	ENDST

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

9.50	1.02	777.22	777.22	0.00	777.60	0.38	0.20	0.00	776.20
672.	0.	518.	154.	80.	92.	514.	26.	29.	776.20
0.30	0.01	5.65	0.30	10.000	0.016	0.255	0.000	776.20	213.00
0.003609	55.	55.	65.	20	5	0	0.00	911.01	1124.01

1490 NH CARD USED
*SECNO 10.000

SECNO	DEPTH	CHSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

VALLEY SECTION 350 FT U/S OF EDWARDS ST FROM 2 FT CONTOUR MAP

10.00	0.72	777.72	777.72	0.00	778.09	0.36	0.30	0.01	777.00
672.	0.	400.	271.	32.	65.	486.	25.	31.	777.00
0.31	0.01	6.21	0.56	10.000	0.016	0.177	0.000	777.00	281.56
0.006956	60.	60.	65.	0	15	0	0.00	865.17	1146.73

*SECNO 10.500

SECNO	DEPTH	CHSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

10.50	0.71	778.21	778.21	0.00	778.58	0.36	0.39	0.00	777.50
672.	0.	400.	271.	31.	64.	483.	26.	32.	777.50
0.31	0.01	6.25	0.50	10.000	0.016	0.177	0.000	777.50	282.25
0.007152	55.	55.	55.	2	5	0	0.00	864.38	1146.69

1490 NH CARD USED
*SECNO 11.000

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VALLEY SECTION ALONG HURDICK STREET FROM 2 FT CONTOUR MAP

11.00	0.76	778.76	778.65	0.00	779.06	0.29	0.46	0.02	778.20
672.	0.	314.	956.	32.	50.	461.	27.	33.	778.20
0.32	0.01	6.30	0.77	10.000	0.016	0.147	1.000	775.00	255.48
0.010042	55.	55.	55.	3	11	0	0.00	907.23	1162.71

1490 NH CARD USED
*SECNO 12.000

SECNO	DCPTR	CHSEL	CPIUS.	JSELK	EG	HV	HL	OLOSS	BANK ELEV
0	QLOI	QCH	QFOB	ALOS	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

VALLEY SECTION 150 FT U/S OF HURDICK;U/S OF ENCL.1A-2'CONTOUR MAP

12.00	2.02	779.42	0.00	0.00	779.44	0.01	0.29	0.09	779.00
672.	0.	58.	614.	11.	39.	803.	29.	36.	779.00
0.57	0.00	1.49	0.77	10.000	0.016	0.065	0.000	777.60	317.22
0.000301	150.	150.	150.	3	0	0	0.00	827.67	1144.89

1490 NH CARD USED
*SECNO 13.000

VALLEY SEC 200 FT U/S OF HURDICK;U/S END OF ENCL 1B-2'CONTOUR MAP

13.00	1.88	779.48	0.00	0.00	779.50	0.02	0.06	0.00	779.30
814.	0.	20.	794.	30.	16.	690.	30.	37.	779.30
0.30	0.00	1.25	1.15	10.000	0.016	0.060	0.000	777.60	37.05
0.001780	50.	50.	50.	2	0	0	0.00	1150.95	1187.00

1490 NH CARD USED
*SECNO 14.000

VALLEY SEC ALONG ROSE ST;FROM ABRAMS SURVEY;SECTION 75

16.00	0.93	780.33	780.01	0.00	780.47	0.15	0.31	0.06	780.00
814.	0.	173.	640.	36.	29.	395.	33.	43.	780.00
0.40	0.01	5.92	1.62	10.000	0.016	0.085	0.000	779.50	1529.14
0.018116	220.	220.	220.	10	15	0	0.00	1016.31	2545.45

1490 NH CARD USED
*SECNO 15.000

VALLEY SEC ALONG CHURCH;INTERPOLATED FROM ABRAMS SECS 75 AND 76

15.00	1.59	781.59	0.00	0.00	781.73	0.06	1.23	0.03	780.90
814.	0.	219.	590.	117.	71.	870.	39.	51.	780.90
0.48	0.00	3.02	0.69	10.000	0.016	0.093	0.000	780.00	1452.19
0.001443	350.	350.	350.	6	0	0	0.00	1132.44	2584.63

1490 NH CARD USED
*SECNO 16.000

VALLEY SEC ALONG PARK;U/S END OF ENCL 1B-ABRAMS SEC 76

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16.00	1.71	782.31	0.00	0.00	782.34	0.03	0.69	0.00	781.80
814.	0.	118.	696.	10.	46.	597.	66.	59.	781.80
0.55	0.00	2.58	1.17	10.000	0.016	0.061	0.000	780.60	1409.24
0.001399	365.	365.	365.	4	0	0	0.00	667.46	2076.69

1490 NH CARD USED
*SECNO 17.000

SECNO	DEPTH	CHSEL	CRIWS	WSELK	EG	HV	HL	QLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IM2	ICONT	CORAR	TOPWID	ENDST

VALLEY SEC BETWEEN PARK AND COOLEY STREETS; ABRAMS SEC 77

17.00	1.36	782.76	0.00	0.00	782.79	0.05	0.43	0.01	782.60
314.	0.	24.	790.	6.	13.	620.	48.	69.	782.60
0.57	0.00	1.88	1.88	10.000	0.016	0.053	0.000	781.40	1335.99
0.005473	148.	148.	148.	2	0	0	0.00	689.74	2025.74

1490 NH CARD USED
*SECNO 18.000

VALLEY SEC ALONG COOLEY;D/S END OF ENCL 1C ABRAMS SEC 78

18.00	1.22	783.52	0.00	0.00	783.65	0.22	0.77	0.08	783.70
814.	0.	0.	814.	0.	0.	214.	49.	62.	783.70
0.56	0.00	0.00	3.80	10.000	0.016	0.031	0.000	782.20	1634.69
0.007992	117.	117.	117.	2	0	0	0.00	280.09	1914.58

1490 NH CARD USED
*SECNO 19.000

VALLEY SEC; INTERPOLATED FROM ABRAMS SECS 78 AND 79

19.00	1.38	784.88	0.00	0.00	785.00	0.12	1.32	0.03	784.70
792.	0.	52.	739.	16.	16.	273.	55.	64.	784.70
0.60	0.00	2.02	2.78	10.000	0.016	0.035	0.000	783.50	19.05
0.004631	230.	230.	220.	2	0	0	0.00	579.39	598.44

1490 NH CARD USED
*SECNO 20.000

VALLEY SEC; INTERPOLATED FROM ABRAMS SECS 78 AND 79

20.00	1.05	786.05	0.00	0.00	786.18	0.14	1.16	0.01	785.70
792.	0.	201.	591.	6.	52.	226.	52.	67.	785.70
0.52	0.00	3.35	2.61	10.000	0.016	0.040	0.000	785.00	65.14
0.007091	230.	230.	205.	3	0	0	0.00	495.74	560.88

1490 NH CARD USED
*SECNO 21.000

VALLEY SEC; INTERPOLATED FROM ABRAMS SECS 78 AND 79

21.00	0.87	787.17	0.00	0.00	787.42	0.24	1.19	0.05	786.60
792.	0.	408.	384.	18.	86.	131.	53.	69.	786.60
0.64	0.00	4.73	2.93	10.000	0.016	0.031	0.000	786.30	36.08

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0.005420	220.	220.	175.	3	0	0	0.00	397.68	433.76

1490 NH CARD USED
*SECNO 22.000

SECNO	DEPTH	CHSEL	CRIWS	HSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TOA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	ETN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

VALLEY SEC; INTERPOLATED FROM ABRAMS SECS 78 AND 79

22.00	0.70	788.20	788.19	0.00	788.53	0.33	1.07	0.04	787.50
792.	0.	540.	252.	25.	105.	78.	54.	71.	787.50
0.65	0.01	5.12	5.23	10.000	0.016	0.026	0.000	787.50	29.69
0.004857	235.	235.	170.	6	15	0	0.00	352.50	382.19

1490 NH CARD USED
*SECNO 23.000

SECNO	DEPTH	CHSEL	CRIWS	HSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TOA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	ETN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

7105 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

VALLEY SEC; INTERPOLATED FROM ABRAMS SECS 78 AND 79

23.00	0.78	789.18	789.18	0.00	789.58	0.40	0.96	0.03	788.40
792.	0.	792.	0.	31.	157.	31.	55.	73.	788.40
0.66	0.01	5.05	0.09	10.000	0.016	10.000	0.000	788.40	21.59
0.004085	215.	215.	215.	2	0	0	0.00	356.84	378.42

1490 NH CARD USED
*SECNO 24.000

VALLEY SEC; INTERPOLATED FROM ABRAMS SECS 78 AND 79

24.00	0.85	790.15	0.00	0.00	790.46	0.31	0.85	0.03	789.30
792.	162.	630.	0.	113.	127.	7.	56.	75.	789.30
0.68	1.44	4.95	0.00	0.045	0.016	10.000	0.000	789.30	35.06
0.003528	225.	225.	225.	2	0	0	0.00	361.93	396.99

1490 NH CARD USED
*SECNO 25.000

SECNO	DEPTH	CHSEL	CRIWS	HSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TOA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	ETN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

7105 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

VALLEY SEC; INTERPOLATED FROM ABRAMS SECS 78 AND 79

25.00	0.85	790.95	790.95	0.00	791.30	0.35	0.69	0.02	790.10

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792.	129.	663.	0.	174.	128.	4.	57.	76.	790.10
0.69	0.74	5.19	0.01	0.092	0.016	10.000	0.000	790.10	44.87
0.003871	180.	190.	190.	1	5	0	0.00	453.64	498.51

1490 NH CARD USED
*SECNO 26.000

VALLEY SEC ALONG ELM ST; ABRAMS SECTION 79

26.00	1.00	791.00	0.00	0.00	791.96	0.15	0.60	0.06	790.80
792.	111.	425.	256.	545.	100.	300.	60.	80.	790.80
0.71	0.32	4.24	0.85	0.136	0.016	0.079	0.000	790.00	1021.64
0.002072	180.	180.	400.	2	0	0	0.00	1042.76	2064.39

1490 NH CARD USED
*SECNO 27.000

SECNO	DEPTH	CHSEL	CHWS	ASELK	EG	HV	HL	DLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	YLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

VALLEY SEC U/S OF ENCL 1C; CHANNEL SEC ABOUT .7 FT LOWER THAN SEC 81

27.00	6.51	792.71	792.71	0.00	793.14	0.43	0.81	0.14	791.80
1020.	156.	434.	430.	69.	55.	137.	63.	93.	791.80
0.72	2.29	7.71	2.34	0.052	0.035	0.052	0.000	786.20	14.66
0.007784	270.	270.	100.	2	31	0	0.00	306.02	320.68

*SECNO 28.000

D/S FACE OF CULVERT AT WEST MAIN STREET

28.00	7.01	793.31	0.00	0.00	793.44	0.13	0.21	0.09	791.10
1320.	249.	250.	503.	167.	52.	337.	65.	84.	791.10
0.73	1.49	5.17	1.49	0.098	0.035	0.080	0.000	786.30	0.35
0.003457	45.	45.	45.	3	0	0	0.00	297.92	298.26

SPECIAL BRIDGE

SK	XX	XCOR	CDFO	BOLEN	BUC	BWP	BAREA	BS	ELCHD	ELCRD
	0.00	2.10	2.60	0.00	5.75	0.00	27.00	0.00	786.70	786.30

*SECNO 29.000
PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
839.84	793.84	0.00	863.	158.	27.	27.	791.40	792.80

U/S FACE OF CULVERT AT WEST MAIN STREET CROSS SEC 80

29.00	7.65	794.35	0.00	0.00	794.43	0.08	0.[illegible]	0.00	791.40

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1020.	131.	172.	717.	130.	41.	431.	64.	84.	791.40
0.74	1.01	4.17	1.66	0.060	0.035	0.080	0.001	786.70	11.72
0.002122	82.	82.	82.	2	0	7	0.00	307.53	319.25

1490 NH CARD USED
*SECNO 30.000

VALLEY SEC 55 FT U/S OF WEST MAIN CULVERT; CROSS SECTION B1

30.00	7.49	794.39	0.00	0.00	794.49	0.10	0.05	0.01	792.30
1020.	54.	137.	830.	78.	63.	310.	65.	85.	792.50
0.75	0.69	2.16	2.60	0.057	0.035	0.017	0.001	786.90	31.30
0.000516	55.	55.	55.	2	0	0	0.00	310.88	342.18

*SECNO 31.000

VALLEY SEC 300 FT U/S OF SECTION 30

31.00	6.69	794.59	0.00	0.00	794.90	0.31	0.31	0.10	793.80
1020.	49.	267.	704.	30.	56.	157.	67.	86.	793.50
0.77	1.65	4.77	4.47	0.050	0.035	0.017	0.003	787.70	100.40
0.002964	300.	300.	300.	2	0	0	0.00	221.09	322.35

*SECNO 32.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
0	SLOP	CCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	PTS	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPLIN	ENDST

3685 20 TRIALS ATTEMPTED WSEL/CWSEL
3697 PROPABLE MINIMUM SPECIFIC ENERGY
3727 CRITICAL DEPTH ASSUMED

D/S FACE OF ACADEMY ST CULVERT; SECTION 82

32.00	6.63	795.53	795.53	0.00	796.04	0.51	0.72	0.10	794.40
1020.	23.	419.	570.	12.	51.	190.	68.	87.	794.60
0.77	1.54	8.23	3.03	0.050	0.035	0.050	0.003	736.90	158.83
0.709143	150.	150.	150.	20	6	0	0.00	206.06	376.89

SPECIAL BRIDGE

SS	XC	XKOR	COPS	RDLEN	SUC	SHP	SAREA	SS	ELCHU	ELCHD
	0.00	2.10	2.60	0.00	6.50	0.00	42.00	0.00	788.50	788.80

*SECNO 33.000
PRESSURE AND WEIR FLOW

EGPRS	EGLOC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
814.76	802.34	0.00	780.	241.	42.	38.	794.40	795.30

U/S FACE OF ACADEMY ST CULVERT; SECTION 82

33.00	7.61	796.51	0.00	0.00	796.60	0.09	0.56	0.10	794.40

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	1020.	86.	230.	704.	83.	60.	370.	69.	88.	794.40
	0.78	1.03	3.84	1.91	0.050	0.035	0.050	0.004	788.90	48.78
	0.001608	92.	92.	92.	2	0	6	0.00	338.63	387.41

1490 NH CARD USED
*SECNO 34.000

VALLEY SEC 75 FT U/S OF ACADEMY ST CULVERT; ABRAMS SEC 83

	34.00	7.28	796.50	0.00	0.00	796.74	0.17	0.10	0.04	796.10
	1020.	8.	587.	425.	14.	162.	233.	70.	98.	793.20
	0.79	0.56	4.13	1.30	0.052	0.035	0.050	0.004	789.30	4.17
	0.001183	75.	75.	75.	2	0	0	0.00	294.01	298.17

*SECNO 35.000

3301 HV CHANGED MORE THAN HVINS

VALLEY SEC BETWEEN ABRAMS SECTIONS 83 AND 84

	35.00	5.86	797.16	797.10	0.00	797.98	0.83	0.91	0.33	798.10
	1020.	0.	835.	185.	0.	105.	77.	72.	90.	795.20
	0.81	0.00	7.98	2.39	0.050	0.035	0.050	0.006	791.30	36.77
	0.006058	400.	400.	400.	4	16	0	0.00	114.97	151.74

1490 NH CARD USED
*SECNO 36.000

VALLEY SEC 50 FT D/S OF LOVELL STREET; ABRAMS SEC 84

	36.00	7.70	798.70	0.00	0.00	799.45	0.76	1.45	0.02	799.30
	1020.	0.	1020.	0.	0.	166.	0.	74.	91.	798.60
	0.82	0.00	6.99	0.00	0.050	0.035	0.050	0.007	791.00	30.66
	0.003724	310.	310.	310.	3	0	0	0.00	24.95	55.61

*SECNO 37.000

SECNO	DEPTH	CNTRL	CRIWS	WSELK	EG	HV	HL	QLOSS	BANK ELEV
0	QLOB	QCH	QROB	XLOB	ACH	AROB	VOL	TRA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

D/S OF LOVELL STREET; D/S END OF ENCLOSURE 2

	37.00	7.57	798.87	0.00	0.00	799.66	0.79	0.19	0.02	799.60
	1020.	0.	1020.	0.	0.	143.	0.	74.	91.	798.90
	0.82	0.00	7.14	0.00	0.050	0.035	0.050	0.007	791.30	30.30
	0.003957	50.	50.	50.	2	0	0	0.00	24.19	54.39

1490 NH CARD USED
*SECNO 38.000

SECNO	DEPTH	CNTRL	CRIWS	WSELK	EG	HV	HL	QLOSS	BANK ELEV
0	QLOB	QCH	QROB	XLOB	ACH	AROB	VOL	TRA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

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3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

SECTION AT LOVELL STREET FOR OVERLAND FLOW; ABRAM'S SEC 35

38.00	1.83	801.93	801.93	0.00	802.50	0.57	0.69	0.07	802.00
896.	0.	896.	0.	0.	148.	11.	74.	91.	800.60
0.83	0.00	6.07	0.01	10.000	0.035	10.000	0.008	800.10	352.98
0.017072	100.	100.	100.	20	14	0	0.00	145.28	498.26

1490 NH CARD USED
*SECNO 39.000

APPROX. 100 FT U/S OF LOVELL STREET

39.00	1.35	803.35	0.00	0.00	803.66	0.31	1.07	0.08	802.00
896.	0.	896.	0.	23.	202.	23.	75.	91.	802.00
0.83	0.01	4.44	0.01	10.000	0.035	10.000	0.008	802.00	16.39
0.007376	100.	100.	100.	2	0	0	0.00	217.21	233.61

1490 NH CARD USED
*SECNO 40.000

APPROX. 225 FT U/S OF LOVELL STREET

40.00	1.49	804.49	804.35	0.00	805.04	0.62	1.23	0.16	803.00
896.	0.	895.	0.	28.	142.	25.	75.	92.	803.00
0.84	0.01	6.31	0.01	10.000	0.035	10.000	0.008	803.00	14.53
0.013859	125.	125.	125.	4	5	0	0.00	170.94	185.47

1490 NH CARD USED
*SECNO 41.000

APPROX. 325 FT U/S OF LOVELL STREET

41.00	1.69	805.69	805.57	0.00	806.37	0.68	1.30	0.03	804.00
896.	0.	895.	1.	2°.	135.	40.	76.	92.	804.00
0.84	0.01	6.69	0.01	10.000	0.035	10.000	0.009	804.00	16.26
0.012145	100.	100.	100.	2	8	0	0.00	160.98	177.24

*SECNO 42.000

SECNO	DEPTH	CWSEL	CRITS	HSELK	EG	HV	FR	QLOSS	BANK ELEV
I	QLOB	QCH	QTOP	ALOB	ACH	AROB	VCL	TWA	LEFT/RIGHT
TIME	VLOB	VCL	VTOP	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IN2	ICONT	CORAR	TOPWID	ENDST

APPROX. 450 FT U/S OF LOVELL STREET AT MICHIGAN AVE

42.00	2.05	807.05	0.00	0.00	807.51	0.46	1.07	0.07	805.00
896.	1.	895.	1.	42.	164.	59.	76.	93.	805.00
0.85	0.01	5.47	0.01	10.000	0.035	10.000	0.009	805.00	9.10
0.006394	125.	125.	125.	2	0	0	0.00	178.16	207.26

*SECNO 43.000

APPROX. 625 FT U/S OF LOVELL STREET

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     43.00      1.83    808.33      0.00      0.00    808.91      0.58      1.34      0.06    806.50
      896.        0.      895.        1.       33.      146.       47.       77.       93.    806.50
      0.86      0.01      6.12      0.01    10.000     0.035    10.000     0.012    806.50     13.45
  0.009300      175.      175.      175.         3         0         0      0.00    167.73    181.17

1490 NN CARD USED
*SECNO 44.000

        APPROX. 800 FT U/S OF LOVELL STREET

     44.00      1.86    809.66      0.00      0.00    810.22      0.36      1.25      0.07    808.00
      896.        0.      895.        0.       43.      186.       43.       78.       94.    808.00
      0.87      0.01      4.81      0.01    10.000     0.035    10.000     0.010    808.00      3.50
  0.005617      175.      175.      175.         2         0         0      0.00    192.99    196.50

1490 NN CARD USED
*SECNO 45.000

        APPROX. 1275 FT U/S OF LOVELL STREET

     45.00      2.56    811.06      0.00      0.00    811.14      0.00      0.84      0.08    808.50
      896.        0.      895.        0.       55.      385.       55.       83.       96.    808.50
      0.92      0.01      2.33      0.01    10.000     0.035    10.000     0.012    808.50      7.26
  0.000857      475.      475.      475.         4         0         0      0.00    235.47    242.74

*SECNO 46.000

        APPROX. 1725 FT U/S OF LOVELL STREET

     46.00      1.88    811.63      0.00      0.00    811.79      0.16      0.61      0.04    809.75
      896.        0.      896.        0.       29.      282.       29.       87.       99.    809.75
      0.96      0.01      3.11      0.01    10.000     0.035    10.000     0.013    809.75     18.67
  0.000412      450.      450.      450.         3         0         0      0.00    212.66    231.33

*SECNO 47.000
SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        GLOSS     BANK ELEV
Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       THA       LEFT/RIGHT
TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IH2       ICONT     CORAR     TOPWID    ENDST

        APPROX. 2175 FT U/S OF LOVELL, U/S END OF ENCL. VALLEY SEC 80

     47.00      7.45    812.05      0.00      0.00    812.16      0.10      0.36      0.02    809.60
     1020.       115.      886.       19.      198.      322.       28.       91.      101.    806.90
      1.01      0.58      2.75      0.67     0.080     0.035     0.080     0.014    804.60    537.77
  0.000417      450.      450.      450.         2         0         0      0.00    179.11    716.88

*SECNO 48.000

        VALLEY SEC  APPROX. 125 FT U/S OF ENCLOSURE

     48.00      6.49    812.09      0.00      0.00    812.27      0.18      0.07      0.04    810.60
     1020.       54.      950.       16.       94.      268.       19.       93.      101.    807.90
      1.02      0.57      3.54      0.35     0.080     0.035     0.080     0.014    805.60    548.63
  0.000885      125.      125.      125.         2         0         0      0.00    166.21    714.84
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*SECNO 49.000

3301 HV CHANGED MORE THAN HVIN'S

INTERPOLATED SEC FROM ABRAMS SECTIONS 08 AND 90

49.00	5.60	812.10	0.00	0.00	813.08	0.98	0.41	0.40	806.50
1020.	205.	655.	159.	82.	67.	64.	94.	102.	806.50
1.03	2.32	5.75	2.50	0.080	0.035	0.060	0.015	806.50	75.38
0.005307	230.	230.	230.	2	0	0	0.00	90.09	165.47

*SECNO 50.000

3301 HV CHANGED MORE THAN HVINS

D/S FACE OF CULVERT AT OLIVER STREET

50.00	5.77	813.47	0.00	0.00	813.52	0.05	0.15	0.28	811.00
455.	144.	326.	15.	250.	155.	30.	95.	102.	811.00
1.05	0.30	2.11	0.49	0.080	0.035	0.060	0.015	807.70	0.92
0.000426	95.	95.	95.	3	0	0	0.00	259.84	260.76

SPECIAL BRIDGE

SK	XK	XKOR	COFQ	PDLEN	BWC	PWP	BAREA	SS	ELCRD	ELCHD
	0.00	2.60	2.60	0.00	3.93	0.00	19.60	0.00	807.70	807.20

*SECNO 51.000

PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	PWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
838.19	813.52	0.00	334.	151.	20.	20.	812.70	813.10

U/S FACE OF CULVERT AT OLIVER STREET

51.00	8.17	815.87	0.00	0.00	815.88	0.01	2.36	0.00	811.00
485.	230.	231.	24.	760.	251.	36.	97.	103.	811.00
1.11	0.30	3.92	0.29	0.080	0.035	0.060	0.015	807.70	0.73
0.000043	126.	126.	126.	0	0	0	0.00	263.95	264.68

*SECNO 52.000

SECNO	DEPTH	CHSEL	CRIWS	HSELR	EG	HV	HL	CLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	THA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XPL	XNCH	XPR	HTY	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

VALLEY SECTIONS ABRA S SEC 90

52.00	8.26	815.86	0.00	0.00	815.89	0.02	0.00	0.01	811.20
485.	196.	251.	38.	370.	154.	116.	98.	103.	813.10
1.12	0.53	1.62	0.32	0.080	0.035	0.030	0.015	807.10	29.98

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0.000137	50.	50.	50.	1	0	0	0.00	203.38	233.36

*SECNO 53.000

VALLEY SECTION; ABRA'S SEC 91

53.00	7.49	815.89	0.00	0.00	815.91	0.02	0.02	0.00	813.80
485.	132.	345.	8.	361.	255.	32.	101.	104.	813.80
1.17	0.37	1.35	0.25	0.080	0.035	0.080	0.015	808.40	656.39
0.000110	195.	191.	195.	0	0	0	0.00	211.93	868.32

*SECNO 54.000

VALLEY SECTION; 160 FT U/S OF ABRA'S SEC 91

54.00	6.51	815.91	0.00	0.00	815.95	0.04	0.03	0.01	814.80
485.	95.	307.	2.	224.	210.	11.	103.	105.	814.00
1.20	0.43	1.84	0.20	0.080	0.035	0.080	0.016	809.40	662.18
0.000264	160.	160.	160.	0	0	0	0.00	203.26	865.44

*SECNO 55.000

D/S FACE OF CULVERT AT RAILROAD; FIRST CROSSING WEST OF OLIVER ST

55.00	6.34	815.94	0.00	0.00	815.99	0.05	0.04	0.00	815.00
485.	97.	397.	2.	200.	202.	0.	103.	106.	815.00
1.22	0.43	1.96	0.20	0.080	0.035	0.080	0.016	809.60	643.22
0.000315	150.	155.	120.	1	0	0	0.00	199.17	582.39

SPECIAL BRIDGE

SB	XR	XCOR	COFQ	BDLEN	SYC	BWP	BAREA	SS	ELCHC	ELCHO
	0.00	2.30	2.60	0.00	5.40	0.00	27.00	0.00	810.40	809.60

*SECNO 56.000

PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
827.47	817.25	0.00	68.	422.	27.	27.	815.40	824.40

U/S FACE OF CULVERT AT RAILROAD

56.00	14.24	824.64	0.00	0.00	824.65	0.01	8.65	0.00	816.00
485.	178.	253.	49.	667.	243.	187.	106.	106.	816.00
1.25	0.27	1.86	0.26	0.080	0.035	0.080	0.016	810.40	67.26
0.000225	66.	66.	65.	0	0	0	0.00	213.63	266.09

*SECNO 57.000

SECNO	DEPTH	CWSEL	CRITS	USELK	EG	HV	FL	FLOSS	BANK ELEV
0	QLOB	QCH	QROS	ALOB	ACH	AROB	VOL	TOP LEFT/RIGHT	
TIME	VLOL	VCH	VROB	XNL	XNCH	XNR	WTN	ELFIX	BST4
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

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VALLEY SECTION BETWEEN CULVERTS AT RAILROAD AND STADIUM DR; SEC 93A

57.00	13.24	824.64	0.00	0.00	824.66	0.02	0.00	0.01	822.40
485.	103.	149.	153.	325.	81.	213.	107.	106.	821.30
1.27	0.56	1.84	0.72	0.080	0.035	0.080	0.016	811.40	11.65
0.000349	40.	60.	80.	1	0	0	0.00	240.16	259.61

*SECNO 58.000

D/S FACE OF CULVERT AT STADIUM DRIVE;FIRST CROSSING WEST OF OLIVER ST

58.00	12.02	824.62	0.00	0.00	824.73	0.11	0.03	0.04	823.60
485.	96.	245.	144.	136.	69.	124.	107.	107.	822.20
1.27	0.71	3.56	1.16	0.080	0.035	0.080	0.016	812.60	22.09
0.001625	70.	40.	30.	2	0	0	0.00	228.59	250.68

SPECIAL BRIDGE

SP	XK	XWOR	COFQ	RDLEN	RWC	PWP	BAREA	SS	ELCHU	ELCHD
	0.00	2.60	2.60	0.00	3.93	0.00	19.40	0.00	814.40	812.60

*SECNO 59.000
PRESSURE AND WEIR FLOW

EGPRS	EGLWC	HH	QWEIR	QPR	BAREA	TRAPEZOID AREA	CLLC	ELTRD
849.34	826.53	0.00	342.	144.	20.	13.	817.60	824.40

U/S FACE OF CULVERT AT STADIUM DRIVE

59.00	12.39	826.79	0.00	0.00	826.81	0.02	2.08	0.00	823.00
485.	155.	200.	130.	364.	138.	293.	109.	107.	823.00
1.31	0.42	1.45	0.44	0.080	0.035	0.080	0.016	814.40	182.18
0.000115	133.	133.	133.	1	0	2	0.00	230.21	420.39

*SECNO 60.000

VALLEY SEC APPROX. 100 FT U/S OF STADIUM DRIVE CULVERT

60.00	12.01	826.81	0.00	0.00	826.81	0.00	0.00	0.00	816.00
485.	204.	122.	159.	1026.	254.	810.	112.	100.	814.00
1.42	0.20	0.48	0.20	0.080	0.035	0.080	0.017	814.00	0.17
0.000005	80.	100.	120.	2	0	0	0.00	199.65	199.83

*SECNO 61.000

SECTION AT TOP OF THE DAM APPROX. 150 FT U/S OF STADIUM DR.CULVERT

61.00	12.11	826.81	0.00	0.00	826.81	0.00	0.00	0.00	815.70
485.	202.	103.	150.	1040.	227.	931.	115.	105.	815.70
1.47	0.19	0.65	0.19	0.080	0.035	0.080	0.017	814.70	0.17
0.000005	40.	50.	60.	0	0	0	0.00	209.66	209.83

*SECNO 62.000

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	CLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IM2	ICONT	CORAR	TOPWID	ENDST

VALLEY SECTION BETWEEN THE TWO DAMS

62.00	12.31	826.81	0.00	0.00	826.81	0.00	0.00	0.00	816.00
485.	195.	117.	173.	1001.	265.	896.	120.	109.	817.00
1.52	0.19	0.48	0.19	0.080	0.035	0.080	0.017	814.50	0.18
0.000035	920.	100.	80.	0	0	0	0.00	209.64	209.82

*SECNO 63.000

SECTION AT TOP OF THE DAM APPROX. 20FT D/S OF PIPE LINE CROSSING

63.00	11.01	826.81	0.00	0.00	826.81	0.00	0.00	0.00	816.10
485.	206.	111.	169.	972.	216.	827.	126.	109.	816.00
1.71	0.21	0.51	0.20	0.080	0.035	0.080	0.017	815.80	0.19
0.000004	130.	120.	130.	0	1	0	0.00	209.62	209.31

*SECNO 64.000

SECTION AT THE PIPE LINE;MAIN PIPES DO NOT OBSTRUCT FLOW;HENCE NEGLECTED

64.00	12.11	826.81	0.00	0.00	826.81	0.00	0.00	0.00	817.00
485.	180.	167.	139.	951.	353.	725.	127.	109.	817.00
1.73	0.19	0.47	0.19	0.080	0.035	0.080	0.017	814.70	0.19
0.000005	20.	20.	20.	0	0	0	0.00	209.62	209.81

*SECNO 65.000

D/S FACE OF THE FOOT BRIDGE

65.00	12.21	826.81	0.00	0.00	826.82	0.01	0.00	0.01	817.80
485.	144.	227.	121.	742.	173.	379.	153.	110.	817.90
1.79	0.33	1.27	0.53	0.080	0.035	0.080	0.017	814.60	2.07
0.000062	160.	166.	166.	0	0	0	0.00	196.26	196.29

*SECNO 65.100

3370 NORMAL BRIDGE,NRD= 0 MIN ELTRD= 818.30 MAX ELLC= 817.80

65.10	12.22	826.82	0.00	0.00	826.82	0.00	0.00	0.00	817.80
485.	240.	37.	208.	468.	46.	401.	133.	110.	817.80
1.79	0.51	0.80	0.52	0.080	0.035	0.080	0.017	814.60	2.02
0.000098	1.	1.	1.	1	0	0	-53.07	196.20	196.30

*SECNO 65.900

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IM2	ICONT	CORAR	TOPWID	ENDST

3370 NORMAL BRIDGE,NRD= 0 MIN ELTRD= 818.30 MAX ELLC= 817.80

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65.90	12.22	826.82	0.00	0.00	826.82	0.00	0.00	0.00	817.60
485.	240.	37.	208.	469.	46.	402.	133.	110.	817.90
1.79	0.51	0.80	0.52	0.080	0.035	0.080	0.017	814.60	1.97
0.000096	3.	3.	3.	0	0	0	-53.10	196.38	198.35

*SECNO 66.000

U/S FACE OF THE FOOT BRIDGE

66.30	11.92	826.82	0.00	0.00	826.83	0.01	0.00	0.00	817.80
485.	145.	219.	121.	462.	172.	371.	133.	110.	817.90
1.79	0.33	1.27	0.33	0.080	0.035	0.080	0.017	814.90	1.97
0.000042	1.	1.	1.	0	0	0	0.00	196.38	198.35

*SECNO 67.000

D/S FACE OF CULVERT ATSABRAMS SECTION 95

67.00	11.23	826.83	0.00	0.00	826.83	0.00	0.00	0.00	818.40
485.	313.	43.	129.	1302.	89.	675.	140.	111.	818.40
2.00	0.24	0.49	0.19	0.080	0.035	0.080	0.018	815.60	8.20
0.000011	169.	169.	169.	0	0	0	0.00	314.23	322.43

*SECNO 67.100

3370 NORMAL BRIDGE,NRD= 0 MIN ELTRD= 819.70 MAX ELLC= 818.40

67.10	11.23	826.83	0.00	0.00	826.83	0.00	0.00	0.00	818.40
485.	291.	29.	166.	1147.	77.	650.	140.	111.	818.40
2.00	0.25	0.37	0.25	0.080	0.035	0.080	0.018	815.60	8.18
0.000027	1.	1.	1.	0	0	0	-189.91	314.29	322.48

*SECNO 67.900

3370 NORMAL BRIDGE,NRD= 0 MIN ELTRD= 819.70 MAX ELLC= 818.40

67.90	11.23	826.83	0.00	0.00	826.83	0.00	0.00	0.00	818.40
485.	291.	29.	166.	1147.	77.	650.	140.	111.	818.40
2.01	0.25	0.37	0.25	0.080	0.035	0.080	0.018	815.60	8.18
0.000020	10.	10.	10.	0	0	0	-189.91	314.29	322.48

*SECNO 68.000

SECNO	DEPTH	CUSEL	CRIWS	WSELK	EG	VV	HL	OLOSS	BANK CLEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	ETN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

U/S FACE OF CULVERT AT ABRAMS SECTION 95

68.00	11.23	826.83	0.00	0.00	826.83	0.00	0.00	0.00	818.40
485.	313.	43.	129.	1301.	88.	676.	140.	111.	818.40
2.01	0.24	0.49	0.19	0.080	0.035	0.080	0.018	815.60	8.18
0.000211	1.	1.	1.	0	0	0	0.00	314.29	322.48

*SECNO 69.000

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*PROF 1

CCHV=   0.100 CENV=   0.300
*SECNO 70.000
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        BLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN      SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IN2       ICONT     CORAR     TOPWID     ENDST

                 100 FEET UPSTREAM OF MORROW LAKE DAM

    70.00     18.92    776.00      0.00    776.00    776.00      0.00      0.00      0.00    777.00
    6750.        0.     6750.        0.        0.    25114.        0.        0.        0.    777.00
     0.30      0.00      0.27      0.30     0.110     0.040     0.110     0.000    767.08   2022.59
 0.000002        0.        0.        0.         0         0         0      0.00   1754.82   3777.41

*SECNO 71.000

                 FABRICATED VALLEY SECTION

    71.00     16.00    776.00      0.00      0.00    776.00      0.00      0.00      0.00    776.00
    6750.        0.     6750.        0.        0.    41105.        0.     2207.      167.    777.00
     4.92      0.00      0.16      0.00     0.110     0.040     0.110     0.040    759.40   2091.20
 0.000001     2900.     2900.     2900.         0         0         0      0.00   3260.72   5351.92

*SECNO 72.000

                 FABRICATED VALLEY SECTION

    72.00      9.01    776.01      0.00      0.00    776.02      0.01      0.02      0.00    777.00
    6750.        0.     6750.        0.        0.     6641.        0.     6345.      346.    777.00
     7.06      0.00      0.98      0.00     0.110     0.040     0.110     0.040    767.30   2022.61
 0.000063     7500.     7500.     7500.         0         0         0      0.00   1140.10   3169.75

*SECNO 80.000

                 SURVEYED VALLEY SECTION (CROSS 3 T)

    80.00      9.06    776.16      0.00      0.00    776.23      0.07      0.19      0.02    778.00
    6750.        0.     6750.        0.        0.     3284.        0.     6532.      577.    778.00
     7.26      0.00      2.06      0.00     0.110     0.040     0.110     0.040    767.10   1764.59
 0.000297     1600.     1600.     1600.         2         0         0      0.00    569.52   2354.11

*SECNO 80.100
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        BLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN      SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IN2       ICONT     CORAR     TOPWID     ENDST

                 FABRICATED VALLEY SECTION

    80.10      8.54    776.34      0.00      0.00    776.35      0.01      0.12      0.00    777.00
    6750.        0.     6750.        0.        0.     9947.        0.     6730.      611.    777.00
     7.76      0.00      3.75      0.00     0.110     0.040     0.110     0.040    767.80   2029.22
 0.000038     1400.     1400.     1400.         2         0         0      0.00   1542.19   3571.41
```

*SECNO 80.200

FABRICATED VALLEY SECTION

80.20	7.07	776.47	0.00	0.00	776.56	0.11	0.20	0.03	777.01
6750.	0.	6750.	0.	0.	2525.	0.	6996.	660.	777.00
7.99	0.00	2.67	0.00	0.110	0.040	0.110	0.040	769.40	2015.84
0.000718	2000.	2000.	2000.	2	0	0	0.00	573.75	2589.58

CCHV= 0.300 CEHV= 0.500

*SECNO 80.900

3301 HV CHANGED MORE THAN HVINS

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 786.33 ELREA= 776.34

80.90	7.64	778.54	0.00	0.00	779.74	1.19	2.61	0.54	785.78
6750.	0.	6750.	0.	0.	770.	0.	7056.	673.	787.90
8.04	0.00	7.77	0.00	0.100	0.045	0.100	0.040	770.50	2006.53
0.000742	2130.	1630.	1630.	3	0	0	0.00	153.87	2162.03

*SECNO 81.000

3370 NORMAL BRIDGE,NRD= 14 CIM ELTRD= 783.70 MAX ELLC= 784.60

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 785.70 ELREA= 787.90

DOWNSTREAM FACE OF 35TH STREET BRIDGE (A)

81.20	7.62	778.50	1.00	0.00	779.70	1.20	0.05	0.04	785.70
6750.	0.	6750.	0.	0.	744.	0.	7056.	673.	787.90
8.04	0.00	9.08	0.00	0.100	0.014	0.100	0.040	770.90	2007.13
0.000925	1.	1.	1.	2	0	0	-20.91	155.59	2162.72

*SECNO 81.100

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE,NRD= 14 CIM ELTRD= 783.70 MAX ELLC= 784.60

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 785.70 ELREA= 787.90

81.10	8.96	779.26	0.00	0.00	779.97	0.71	0.02	0.17	785.70
6750.	0.	6750.	0.	0.	997.	0.	7057.	673.	787.90
8.04	0.00	6.77	0.00	0.100	0.014	0.100	0.04	771.30	2004.21
0.000377	31.	31.	31.	3	0	0	-28.03	165.46	2169.74

*SECNO 81.200

SECNO	DEPTH	CHSEL	CRIWS	LSELK	EG	KV	KL	QLOSS	BANK ELEV
Q	QLOB	SCH	CRDH	ALOB	ACH	AROB	VOL	T.A	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	LTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

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3495 OVERBANK AREA ASSUMED NON-EFFECTIVE.ELLEA= 785.70 ELREA= 787.90

81.20	9.03	779.33	0.00	0.00	779.99	0.66	0.00	0.72	785.70
6750.	0.	6750.	0.	0.	1037.	0.	7057.	673.	737.90
8.04	0.00	6.51	0.00	0.00	0.040	0.100	0.040	770.30	2005.99
0.002713	1.	1.	1.	2	0	0	0.00	165.96	2169.94

*SECNO 83.000

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

SURVEYED VALLEY SECTION (B)

83.00	10.98	782.93	0.00	0.00	783.08	0.10	2.93	0.17	780.30
6750.	2.	4300.	2162.	6.	1496.	3230.	7270.	733.	779.80
8.44	0.31	4.17	0.67	0.100	0.040	0.100	0.040	772.00	3276.79
0.000430	3330.	3375.	3100.	3		0	0.00	73.48	4665.70

CCHV= 0.100 CEHV= 0.300
*SECNO 84.000

3470 ENCROACHMENT STATIONS= 1170.0 3594.0 TYPE= 1 TARGET= 2424.000

SURVEYED VALLEY SECTION (C)

84.80	12.34	784.74	0.00	0.00	784.90	0.16	1.79	0.02	783.50
6750.	247.	6329.	174.	802.	1965.	274.	7072.	665.	771.20
8.54	0.30	3.27	0.64	0.100	0.040	0.100	0.040	772.41	1198.81
0.000372	4515.	4500.	4463.	4	0	0	0.00	1033.73	2282.53

CCHV= 0.300 CEHV= 0.500

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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
  ERROR CORR - C1
  MODIFICATION - 30,5[illegible],52
*****************************************************

C
T1RATING CURVE COMPUTATIONS FOR FLOW IN THE CHANNEL FROM [illegible]
T2STARTING WATER DEPTH TAKEN FROM A D/S RUN
T3      ARCADIA CREEK KALAMAZOO

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        HSEL     FQ
      0.       2.       0.       0.  0.00[illegible]  [illegible]  0.[illegible]  0.  [illegible]26.530  0.[illegible]

J2  NPROF    IPLOT    PRFVS    XSECV    XSECH    FK       ALLDC    IBW      CHNIM    ITRACE
     1.000    0.000   -1.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000

J5  LPRNT    NUMBEC                  ********REQUESTED SECTION NO BLNS********
    -10.000  -10.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000
J3  VARIABLE CODES FOR SUMMARY PRINTOUT
    150.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000

QT    12.000  315.000  315.000  315.000  435.000  435.000  435.000  435.000  435.000  435.000
QT   765.000  765.000  765.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000
NC     0.080    0.080    0.035    0.300    0.500    0.000    0.000    0.000    0.000    0.000

      D/S FACE OF DIVERSION FROM ARRANS SECS 95 TO 95[illegible]

X1    71.000    0.000  101.000  123.000    0.000    0.000    0.000    0.000    0.000    0.000
GR   833.500    0.000  822.000   37.000  821.600  101.000  819.400  106.000  819.200  111.000
GR   818.600  116.000  825.000  123.000  826.000  255.000  829.600  277.000    0.000    0.000
QT    12.000   90.000  115.000  140.000   85.000  110.000  135.000   85.000  110.000  135.000
QT    95.000  120.000  145.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000

      D/S FACE OF STADIUM DRIVE CULVERT

X1    71.050    0.000    0.000    0.000   50.000   50.000   50.000    0.000    0.000    0.000
X3    10.000    0.000    0.000    0.000    0.000    0.000    0.000  900.000  900.000    0.000
SB     0.000    2.900    2.600    0.000    5.000    0.000   20.800    0.000  817.600  [illegible]

      U/S FACE OF STADIUM DR CULVERT;SECOND CROSSING NORTH EAST OF HOWARD

X1    71.100    6.000   10.000   15.000  136.000  [illegible]  136.000    0.000    0.000    0.000
X2     0.000    0.000    1.000  821.800  900.000    0.0[illegible]    0.000    0.000    0.000    1.000
X3    10.000    0.000    0.000    0.000    0.000    0.0[illegible]    0.000  900.000  900.000    0.000
GR   822.000    0.000  821.800   10.000  817.600   10.1[illegible]  817.600   14.900  821.800   15.000
GR   822.000   25.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000

      D/S FACE OF RAILROAD CULVERT; SECOND CROSSING NORTH EAST [illegible]

X1    71.200    0.000    0.000    0.000  [illegible]  [illegible]  [illegible]500    0.000    0.000    0.000
X3    10.000    0.000    0.000    0.000    0.000    0.000    [illegible]  900.000  900.000    0.000
```

CAUTION

SEE

ATTACHED COMMENTS

SB	0.000	1.900	3.600	0.020	[illegible]	0.300	19.600	0.000	819.200	819.600

D/S FACE OF RAILROAD CULVERT; SECOND CROSSING NORTH EAST OF HOWARD

X1	71.300	6.300	11.000	14.000	78.000	72.300	70.300	0.000	0.000	0.000
X2	0.000	0.000	1.000	824.200	900.000	0.000	0.300	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.300	900.000	900.000	0.000
GR	825.000	0.000	824.200	10.000	819.200	10.050	819.200	13.950	824.200	14.000
GR	825.000	25.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SECTIONS ABRAMS SEC 97

X1	71.400	8.000	17.000	56.000	100.000	70.000	85.000	0.000	0.000	0.000
GR	832.000	0.000	830.200	17.000	822.500	31.000	822.500	36.000	823.300	41.000
GR	826.500	56.000	826.900	71.000	834.600	105.000	0.000	0.000	0.000	0.000
X1	71.500	0.000	0.000	0.000	130.000	130.000	130.000	0.000	1.000	0.000
X1	71.600	0.000	0.000	0.000	130.000	130.000	130.000	0.000	1.000	0.000
X1	71.700	0.000	0.000	0.000	130.000	130.000	130.000	0.000	1.000	0.000

VALLEY SECTIONS ABRAMS SEC 98

X1	71.800	9.000	17.000	38.000	160.000	160.000	160.000	0.000	0.400	0.000
GR	833.900	0.000	833.800	3.000	823.200	17.000	327.300	21.000	826.700	27.000
GR	826.900	33.000	827.500	38.000	829.000	48.000	839.100	86.000	0.000	0.000

D/S FACE OF RAILROAD CULVERT; FIRST CROSSING NORTH EAST OF HOWARD

X1	71.900	6.000	10.000	14.000	346.000	320.300	130.300	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	900.000	900.000	0.000
GR	830.000	0.300	828.700	10.000	823.700	10.050	823.700	13.950	828.700	14.000
GR	830.000	25.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SB	0.000	1.900	2.600	0.020	5.900	0.000	19.300	0.000	829.200	829.700

D/S FACE OF RAILROAD CULVERT; FIRST CROSSING NORTH EAST OF HOWARD

X1	71.920	0.000	0.000	0.000	87.000	87.000	87.000	0.000	0.300	0.000
X2	0.000	0.000	1.000	829.000	900.000	0.000	0.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	900.000	900.000	0.000

D/S FACE OF STADIUM DR CULVERT;FIRST CROSSING NORTH EAST OF HOWARD

X1	71.940	6.000	10.000	15.000	35.500	35.500	35.500	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	900.000	900.000	0.000
GR	832.000	0.000	830.900	10.000	826.900	10.000	826.900	14.500	832.500	15.000
GR	832.000	25.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SB	0.000	2.300	2.600	0.000	5.000	0.000	19.300	0.000	826.900	826.900

D/S FACE OF STADIUM DRIVE CULVERT;FIRST CROSSING NORTH EAST OF HOWARD

X1	72.000	0.000	0.000	0.000	122.500	122.500	122.500	0.000	0.000	0.000
X2	0.000	0.000	1.000	830.900	900.000	0.000	0.000	0.000	0.000	0.000

XB	10.000	0.000	0.300	0.300	0.300	0.300	0.000	900.000	900.000	3.030
ZJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.300	0.000

HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
ERROR CORT - 0*
MODIFICATION - 50,51,52

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE ON SUMMARY OF ERRORS LIST

ARCADIA CREEK KALAMAZOO

SUMMARY PRINTOUT TABLE 150

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	TOPWID	WCH	AREA	.01K
71.000	0.00	0.00	0.00	818.60	315.00	826.53	0.00	826.54	0.80	1.19	575.55	351.26
71.000	0.00	0.00	0.00	818.60	315.00	826.53	0.00	826.54	0.80	1.19	575.55	351.26
71.000	0.00	0.00	0.00	818.60	315.00	826.53	0.00	826.54	0.80	1.19	575.55	351.26
71.000	0.00	0.00	0.00	818.60	455.00	826.77	0.00	826.79	1.26	1.57	792.02	517.95
71.000	0.00	0.00	0.00	818.60	455.00	826.77	0.00	826.79	1.26	1.57	792.02	517.95
71.000	0.00	0.00	0.00	818.60	455.00	826.77	0.00	826.79	1.26	1.57	792.02	517.95
71.000	0.00	0.00	0.00	818.60	485.00	826.86	0.00	826.88	1.45	1.65	853.36	402.39
71.000	0.00	0.00	0.00	818.60	485.00	826.86	0.00	826.88	1.45	1.65	853.36	402.39
71.000	0.00	0.00	0.00	818.60	485.00	826.86	0.00	826.88	1.45	1.65	853.36	402.39
71.000	0.00	0.00	0.00	818.60	745.00	827.25	0.00	827.29	2.33	2.26	760.61	460.53
71.000	0.00	0.00	0.00	818.60	745.00	827.25	0.00	827.29	2.33	2.26	760.61	460.53
71.000	0.00	0.00	0.00	818.60	745.00	827.25	0.00	827.29	2.33	2.26	760.61	460.53
71.050	50.00	0.00	0.00	818.60	90.00	826.54	0.00	826.55	0.29	0.65	137.65	168.03
71.050	50.00	0.00	0.00	818.60	115.00	826.54	0.00	826.55	0.47	0.84	137.65	168.03
71.050	50.00	0.00	0.00	818.60	140.00	826.55	0.00	826.58	0.69	1.03	137.65	168.03
71.050	50.00	0.00	0.00	818.60	95.00	826.79	0.00	826.80	0.23	0.59	153.97	178.14
71.050	50.00	0.00	0.00	818.60	110.00	826.75	0.00	826.76	0.3	0.72	153.41	178.14
71.050	50.00	0.00	0.00	818.60	135.00	826.78	0.00	826.80	0.57	0.94	142.98	178.10
71.050	50.00	0.00	0.00	818.60	85.00	826.89	0.00	826.89	0.22	0.56	165.43	182.90
71.050	50.00	0.00	0.00	818.60	110.00	826.88	0.00	826.89	0.36	0.76	165.17	182.39
71.050	50.00	0.00	0.00	818.60	135.00	826.87	0.00	826.89	0.55	0.95	165.11	182.25
71.050	50.00	0.00	0.00	818.60	95.00	827.30	0.00	827.31	0.22	0.61	154.60	200.43
71.050	50.00	0.00	0.00	818.60	120.00	827.30	0.00	827.31	0.36	0.75	154.57	200.70
71.050	50.00	0.00	0.00	818.60	145.00	827.30	0.00	827.31	0.52	0.94	154.40	200.50
71.100	136.00	900.00	821.80	817.60	90.00	827.33	0.00	827.38	5.47	1.87	48.23	38.47
71.100	136.00	900.00	821.80	817.60	115.00	827.35	0.00	827.41	7.68	2.87	50.72	41.72
71.100	136.00	900.00	821.80	817.60	140.00	827.47	0.00	827.57	9.60	3.60	65.92	49.58
71.100	136.00	900.00	821.80	817.60	90.00	827.30	0.00	827.55	4.66	1.73	69.07	37.56
71.100	136.00	900.00	821.80	817.60	110.00	827.98	0.00	828.05	6.89	2.14	51.46	41.91
71.100	136.00	900.00	821.80	817.60	135.00	828.58	0.00	828.68	8.93	2.48	54.50	45.17
71.100	136.00	900.00	821.80	817.60	85.00	827.59	0.00	827.64	4.55	1.72	49.55	39.17
71.100	136.00	900.00	821.80	817.60	110.00	828.07	0.00	828.16	6.72	2.16	51.05	42.72
71.100	136.00	900.00	821.80	817.60	135.00	828.67	0.00	828.78	8.73	2.48	54.99	46.11
71.100	136.00	900.00	821.80	817.60	95.00	828.19	0.00	828.24	4.87	1.89	52.55	42.26
71.100	136.00	900.00	821.80	817.60	120.00	828.73	0.00	828.80	6.82	2.17	53.21	45.24
71.100	136.00	900.00	821.80	817.60	145.00	829.39	0.00	829.48	8.57	2.48	58.52	49.56

SECNO	XLCH	ELTRD	ELLC	ELBIK	Q	C.SEL	COINS	EG	TCK*S	VCH	AREA	.01K
71.200	34.50	0.00	0.00	818.60	90.00	827.35	0.00	827.41	7.31	2.08	63.20	33.30
71.200	34.50	0.00	0.00	818.60	115.00	827.85	0.00	827.95	10.24	2.51	45.81	35.93
71.200	34.50	0.00	0.00	818.60	140.00	828.49	0.00	828.63	12.70	2.86	46.01	[illegible]
71.200	34.50	0.00	0.00	818.60	95.00	827.51	0.00	827.57	8.99	1.93	44.11	[illegible]
71.200	34.50	0.00	0.00	818.60	110.00	828.00	0.00	828.08	8.99	2.36	66.53	[illegible]
71.200	34.50	0.00	0.00	818.60	135.00	828.61	0.00	828.72	11.45	2.72	69.58	39.90
71.200	34.50	0.00	0.00	818.60	85.00	827.61	0.00	827.66	6.01	1.91	64.59	34.66
71.200	34.50	0.00	0.00	818.60	120.00	828.09	0.00	828.18	8.75	2.34	67.05	37.18
71.200	34.50	0.00	0.00	818.60	115.00	828.71	0.00	828.82	11.16	2.75	51.57	40.72
71.200	34.50	0.00	0.00	818.60	95.00	828.21	0.00	828.27	6.32	2.00	47.59	37.69
71.200	34.50	0.00	0.00	818.60	120.00	828.73	0.00	828.83	8.72	2.39	57.27	40.15
71.200	34.50	0.00	0.00	818.60	145.00	829.41	0.00	829.53	10.76	2.71	53.60	44.20
71.300	78.00	900.00	824.20	819.20	90.00	827.86	0.00	827.97	15.50	2.62	54.39	22.06
71.300	78.00	900.00	824.20	819.20	115.00	828.72	0.00	828.87	19.00	3.05	47.16	25.95
71.300	78.00	900.00	824.20	819.20	140.00	829.62	0.00	830.05	24.72	3.39	42.27	30.04
71.300	78.00	900.00	824.20	819.20	95.00	827.97	0.00	828.07	13.35	2.44	38.15	25.30
71.300	78.00	900.00	824.20	819.20	110.00	828.80	0.00	828.93	17.59	2.88	30.13	26.23
71.300	78.00	900.00	824.20	819.20	135.00	829.85	0.00	830.01	20.10	3.19	42.36	30.11
71.300	78.00	900.00	824.20	819.20	85.00	828.07	0.00	828.16	12.96	2.41	35.24	25.61
71.300	78.00	900.00	824.20	819.20	110.00	828.91	0.00	829.02	17.1[illegible]	2.95	30.53	[illegible]
71.300	78.00	900.00	824.20	819.20	135.00	829.95	0.00	830.07	19.82	3.16	43.75	30.69
71.300	78.00	900.00	824.20	819.20	95.00	828.06	0.00	828.16	14.52	2.69	34.12	[illegible]
71.300	78.00	900.00	824.20	819.20	120.00	829.72	0.00	829.85	16.40	2.97	41.84	29.65
71.300	78.00	900.00	824.20	819.20	145.00	830.88	0.00	831.03	18.25	3.12	46.46	33.95
71.400	85.00	0.00	0.00	822.50	90.00	828.01	0.00	828.07	0.30	0.56	329.27	177.15
71.400	85.00	0.00	0.00	822.50	115.00	828.91	0.00	828.92	0.33	0.67	201.89	[illegible]
71.400	85.00	0.00	0.00	822.50	140.00	830.05	0.00	830.06	0.26	0.62	274.81	225.65
71.400	85.00	0.00	0.00	822.50	85.00	828.10	0.00	828.10	0.41	0.65	154.52	133.46
71.400	85.00	0.00	0.00	822.50	110.00	828.97	0.00	828.97	0.33	0.64	205.05	190.29
71.400	85.00	0.00	0.00	822.50	135.00	830.06	0.00	830.06	0.24	0.60	275.19	270.13
71.400	85.00	0.00	0.00	822.50	90.00	828.[illegible]	0.00	828.[illegible]	0.37	0.[illegible]	159.[illegible]	[illegible]
71.400	85.00	0.00	0.00	822.50	110.00	829.36	0.00	829.07	0.31	0.62	210.87	[illegible]
71.400	85.00	0.00	0.00	822.50	135.00	830.[illegible]	0.00	830.16	0.23	0.59	2[illegible]	[illegible]
71.400	85.00	0.00	0.00	822.50	95.00	828.93	0.00	828.93	0.26	0.55	202.86	187.70
71.400	85.00	0.00	0.00	822.50	120.00	829.89	0.00	829.89	0.21	0.56	263.93	261.89
71.400	85.00	0.00	0.00	822.50	145.00	831.07	0.00	831.08	0.15	0.53	349.97	375.84
71.500	130.00	0.00	0.00	823.50	90.00	828.01	0.00	828.07	1.37	0.96	97.85	[illegible]
71.500	130.00	0.00	0.00	823.50	115.00	828.92	0.00	828.98	0.87	0.90	144.72	123.03
71.500	130.00	0.00	0.00	823.50	140.00	830.05	0.00	830.06	0.51	0.79	210.45	196.64
71.500	130.00	0.00	0.00	823.50	85.00	828.10	0.00	828.11	1.10	0.88	102.39	80.94
71.500	130.00	0.00	0.00	823.50	110.00	828.97	0.00	828.98	0.76	0.84	147.47	123.95
71.500	130.00	0.00	0.00	823.50	135.00	830.[illegible]	0.00	830.07	0.[illegible]	[illegible]	210.[illegible]	[illegible]
71.500	130.00	0.00	0.00	823.50	85.00	828.20	0.00	828.21	0.99	0.65	157.16	[illegible]
71.500	130.00	0.00	0.00	823.50	110.00	829.06	0.00	829.07	0.70	[illegible]	192.80	[illegible]
71.500	130.00	0.00	0.00	823.50	135.00	830.15	0.00	830.16	0.44	0.74	216.66	204.00
71.500	130.00	0.00	0.00	823.50	95.00	828.93	0.00	828.94	0.59	0.74	145.52	123.09
71.500	130.00	0.00	0.00	823.50	120.00	829.89	0.00	829.90	0.42	0.71	200.58	185.07
71.500	130.00	0.00	0.00	823.50	145.00	831.07	0.00	831.07	0.27	0.[illegible]	270.[illegible]	[illegible]

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CHSEL	CPOLS	EG	TOKAS	VCH	ATCA	.01
71.600	130.00	0.00	0.00	824.50	90.00	828.03	0.00	828.06	4.56	1.46	61.03	42.13
71.600	130.00	0.00	0.00	824.50	115.00	828.93	0.00	828.95	2.67	1.27	93.86	73.15
71.600	130.00	0.00	0.00	824.50	140.00	830.04	0.00	830.06	.14	1.24	152.41	131.82
71.600	130.00	0.00	0.00	824.50	85.00	828.12	0.00	828.15	3.63	1.32	64.50	41.60
71.600	130.00	0.00	0.00	824.50	110.00	828.95	0.00	828.98	2.13	1.19	90.29	69.33
71.600	130.00	0.00	0.00	824.50	135.00	830.06	0.00	830.09	1.05	1.00	152.66	131.49
71.600	130.00	0.00	0.00	824.50	85.00	828.21	0.00	828.23	3.24	1.26	67.29	47.22
71.600	130.00	0.00	0.00	824.50	110.00	829.07	0.00	829.09	1.91	1.15	100.08	79.54
71.600	130.00	0.00	0.00	824.50	135.00	830.16	0.00	830.17	0.97	0.98	97.52	177.71
71.600	130.00	0.00	0.00	824.50	85.00	828.24	0.00	828.26	1.66	1.07	98.62	78.65
71.600	130.00	0.00	0.00	824.50	120.00	829.92	0.00	829.94	0.97	0.98	142.43	121.24
71.600	130.00	0.00	0.00	824.50	145.00	831.08	0.00	831.09	0.53	0.81	211.62	198.25
71.700	130.00	0.00	0.00	825.50	90.00	828.11	0.00	828.19	17.19	2.38	37.86	21.71
71.700	130.00	0.00	0.00	825.50	115.00	829.11	0.00	829.22	8.27	1.91	67.09	50.59
71.700	130.00	0.00	0.00	825.50	140.00	830.07	0.00	830.11	5.10	1.76	102.10	79.56
71.700	130.00	0.00	0.00	825.50	90.00	828.11	0.00	828.20	13.61	2.15	79.54	23.24
71.700	130.00	0.00	0.00	825.50	110.00	829.01	0.00	829.06	6.96	1.79	81.33	61.69
71.700	130.00	0.00	0.00	825.50	135.00	830.03	0.00	830.11	2.87	1.61	101.07	79.72
71.700	130.00	0.00	0.00	825.50	85.00	828.26	0.00	828.33	11.87	2.04	41.60	24.67
71.700	130.00	0.00	0.00	825.50	110.00	829.11	0.00	829.19	6.20	1.78	64.53	47.26
71.700	130.00	0.00	0.00	825.50	135.00	830.17	0.00	830.20	2.36	1.56	113.72	91.06
71.700	130.00	0.00	0.00	825.50	85.00	828.37	0.00	828.38	5.50	1.64	80.57	63.54
71.700	130.00	0.00	0.00	825.50	120.00	829.91	0.00	829.94	2.76	1.33	92.87	72.26
71.700	130.00	0.00	0.00	825.50	145.00	831.08	0.00	831.10	1.20	1.07	153.68	132.56
71.800	160.00	0.00	0.00	826.70	90.00	828.17	0.00	828.22	18.97	2.16	31.70	14.16
71.800	160.00	0.00	0.00	826.70	115.00	829.12	0.00	829.22	10.53	2.01	51.46	30.57
71.800	160.00	0.00	0.00	826.70	140.00	830.13	0.00	830.18	5.24	2.02	80.29	61.16
71.800	160.00	0.00	0.00	826.70	85.00	828.47	0.00	828.60	33.14	2.95	31.33	14.76
71.800	160.00	0.00	0.00	826.70	110.00	829.16	0.00	829.23	13.64	2.46	52.25	30.01
71.800	160.00	0.00	0.00	826.70	135.00	830.13	0.00	830.18	4.87	1.93	80.31	61.15
71.800	160.00	0.00	0.00	826.70	85.00	828.32	0.00	828.45	25.41	2.63	32.65	15.07
71.800	160.00	0.00	0.00	826.70	110.00	829.22	0.00	829.30	10.23	2.37	54.79	32.03
71.800	160.00	0.00	0.00	826.70	135.00	830.14	0.00	830.16	4.33	1.91	82.91	63.57
71.800	160.00	0.00	0.00	826.70	95.00	829.07	0.00	829.14	11.40	2.22	49.06	28.13
71.800	160.00	0.00	0.00	826.70	120.00	829.96	0.00	830.00	4.76	1.84	81.59	55.02
71.800	160.00	0.00	0.00	826.70	145.00	831.10	0.00	831.13	2.00	1.50	130.43	102.48
71.900	330.00	0.00	0.00	823.70	90.00	829.74	0.00	829.86	41.39	3.76	23.51	10.09
71.900	330.00	0.00	0.00	823.70	115.00	830.41	0.00	830.35	22.45	4.05	38.50	16.10
71.900	330.00	0.00	0.00	823.70	140.00	830.37	0.00	830.81	76.84	5.30	26.43	15.97
71.900	330.00	0.00	0.00	823.70	85.00	829.63	0.00	829.83	39.54	3.62	23.45	13.52
71.900	330.00	0.00	0.00	823.70	110.00	829.34	0.00	830.16	59.77	4.52	26.33	14.23
71.900	330.00	0.00	0.00	823.70	135.00	830.35	0.00	830.76	77.95	5.12	26.36	15.99
71.900	330.00	0.00	0.00	823.70	85.00	829.60	0.00	829.61	40.01	3.64	23.35	13.41
71.900	330.00	0.00	0.00	823.70	110.00	829.35	0.00	830.16	59.73	4.52	26.30	15.80
71.900	330.00	0.00	0.00	823.70	135.00	830.41	0.00	830.81	70.36	5.08	26.58	16.09
71.900	330.00	0.00	0.00	823.70	95.00	829.66	0.00	829.92	48.50	4.02	23.60	13.64
71.900	330.00	0.00	0.00	823.70	120.00	830.19	0.00	830.53	60.85	4.66	25.73	15.30
71.900	330.00	0.00	0.00	823.70	145.00	831.12	0.00	831.40	51.46	4.93	29.42	18.00

SSCNO	XLCN	ELTRD	ELLC	ELMIN	Q	CNSEL	TIMS	EG	TJKeS	VCK	APEA	.DSK
71.920	87.00	900.00	829.00	824.00	90.00	830.15	0.00	830.36	39.36	3.69	24.36	14.26
71.920	87.00	900.00	829.00	824.00	115.00	830.69	0.00	830.92	52.83	4.30	23.25	15.82
71.920	87.00	900.00	829.00	824.00	140.00	831.14	0.00	831.30	67.77	4.91	27.02	16.84
71.920	87.00	900.00	829.00	824.00	85.00	829.93	0.00	830.10	38.49	3.59	23.68	14.20
71.920	87.00	900.00	829.00	824.00	110.00	830.56	0.00	830.77	51.25	4.21	25.71	15.37
71.920	87.00	900.00	829.00	824.00	135.00	831.43	0.00	831.75	53.03	4.58	29.48	16.54
71.920	87.00	900.00	829.00	824.00	85.00	829.96	0.00	830.16	38.98	3.61	23.57	13.91
71.920	87.00	900.00	829.00	824.00	110.00	830.49	0.00	830.77	51.20	4.28	25.71	15.37
71.920	87.00	900.00	829.00	824.00	135.00	831.43	0.00	831.81	51.87	5.35	29.33	16.49
71.920	87.00	900.00	829.00	824.00	95.00	830.12	0.00	830.36	45.10	3.98	24.22	14.62
71.920	87.00	900.00	829.00	824.00	120.00	830.87	0.00	831.10	49.14	4.52	27.91	16.13
71.920	87.00	900.00	829.00	824.00	145.00	832.44	0.00	832.73	63.14	4.33	33.51	22.00
71.940	35.50	0.00	0.00	826.90	90.00	830.24	0.00	830.71	105.82	5.52	16.31	8.75
71.940	35.50	0.00	0.00	826.90	115.00	831.73	0.00	831.33	78.06	6.06	20.19	10.85
71.940	35.50	0.00	0.00	826.90	140.00	831.80	0.00	832.23	96.06	5.96	23.51	12.34
71.940	35.50	0.00	0.00	826.90	85.00	830.20	0.00	830.53	104.95	5.51	15.42	8.16
71.940	35.50	0.00	0.00	826.90	110.00	830.61	0.00	831.18	120.02	6.06	18.16	10.04
71.940	35.50	0.00	0.00	826.90	135.00	831.57	0.00	832.10	94.51	5.89	22.96	13.89
71.940	35.50	0.00	0.00	826.90	85.00	830.03	0.00	830.51	111.63	5.56	15.29	8.05
71.940	35.50	0.00	0.00	826.90	110.00	830.61	0.00	831.18	119.92	6.03	18.17	10.05
71.940	35.50	0.00	0.00	826.90	135.00	831.42	0.00	832.10	98.20	5.81	22.22	13.14
71.940	35.50	0.00	0.00	826.90	95.00	830.42	0.00	830.75	119.95	5.66	16.20	8.65
71.940	35.50	0.00	0.00	826.90	120.00	831.14	0.00	831.65	99.26	5.77	20.79	12.04
71.940	35.50	0.00	0.00	826.90	145.00	832.56	0.00	832.98	62.44	5.20	27.89	16.35
72.000	122.50	900.00	830.90	826.90	90.00	831.74	0.00	832.06	102.64	6.53	9.34	5.67
72.000	122.50	900.00	830.90	826.90	115.00	831.48	0.00	832.22	56.02	6.69	24.32	15.28
72.000	122.50	900.00	830.90	826.90	140.00	833.53	0.00	833.86	36.43	4.24	32.90	22.11
72.000	122.50	900.00	830.90	826.90	85.00	831.54	0.00	831.63	94.99	4.33	19.63	8.72
72.000	122.50	900.00	830.90	826.90	110.00	831.60	0.00	831.95	61.25	4.76	23.13	14.05
72.000	122.50	900.00	830.90	826.90	135.00	833.31	0.00	833.59	38.06	4.27	31.63	21.68
72.000	122.50	900.00	830.90	826.90	95.00	831.92	0.00	832.28	121.53	4.03	19.65	8.62
72.000	122.50	900.00	830.90	826.90	120.00	832.43	0.00	832.73	65.55	4.40	27.27	17.78
72.000	122.50	900.00	830.90	826.90	145.00	834.67	0.00	834.89	25.69	3.77	38.45	26.61

ARCADIA CREEK KALAMAZOO

SUMMARY PRINTOUT TABLE 150

SECNO	Q	CHSEL	DIFHSF	DIFHSX	DIFHSZ	TOPWID	XLOC
71.000	315.00	826.53	0.00	0.00	0.00	234.14	0.00
71.000	315.00	826.53	0.00	0.00	0.00	234.14	0.00
71.000	315.00	826.53	0.00	0.00	0.00	234.14	0.00
71.000	435.00	826.77	0.00	0.00	0.00	236.43	0.00
71.000	435.00	826.77	0.00	0.00	0.00	236.43	0.00
71.000	435.00	826.77	0.00	0.00	0.00	236.43	0.00
71.000	405.00	826.66	0.00	0.00	0.00	237.30	0.00
71.000	485.00	826.86	0.00	0.00	0.00	237.30	0.00
71.000	485.00	826.86	0.00	0.00	0.00	237.30	0.00
71.000	745.00	827.25	0.00	0.00	0.00	241.03	0.00
71.000	745.00	827.25	0.00	0.00	0.00	241.03	0.00
71.000	745.00	827.25	0.00	0.00	0.00	241.03	0.00
71.050	90.00	826.54	0.00	0.01	0.00	22.00	50.00
71.050	115.00	826.54	0.00	0.01	0.00	22.00	50.00
71.050	140.00	826.55	0.00	0.00	0.00	22.00	50.00
71.050	85.00	826.79	0.00	0.02	0.00	22.00	50.00
71.050	110.00	826.79	0.00	0.02	0.00	22.00	50.00
71.050	135.00	826.73	0.00	0.01	0.00	22.00	50.00
71.050	85.00	826.89	0.00	0.03	0.00	22.00	50.00
71.050	110.00	826.88	0.00	0.02	0.00	22.00	50.00
71.050	135.00	826.80	0.00	0.02	0.00	22.00	50.00
71.050	95.00	827.00	0.00	0.05	0.00	22.00	50.00
71.050	120.00	827.50	0.00	0.05	0.00	22.00	50.00
71.050	145.00	827.30	0.00	0.05	0.00	22.00	50.00
71.100	90.00	827.33	0.00	0.79	0.00	5.00	136.00
71.100	115.00	827.85	0.00	1.30	0.00	5.00	136.00
71.100	140.00	828.67	0.00	1.84	0.00	5.00	136.00
71.100	85.00	827.50	0.00	0.71	0.00	5.00	136.00
71.100	110.00	827.98	0.00	1.19	0.00	5.00	136.00
71.100	135.00	828.58	0.00	1.80	0.00	5.00	136.00
71.100	85.00	827.59	0.00	0.71	0.00	5.00	136.00
71.100	110.00	828.07	0.00	1.19	0.00	5.00	136.00
71.100	135.00	828.68	0.00	1.80	0.00	5.00	136.00
71.100	95.00	828.19	0.00	0.89	0.00	5.00	136.00
71.100	120.00	828.73	0.00	1.43	0.00	5.00	136.00
71.100	145.00	829.39	0.00	2.09	0.00	5.00	136.00
71.200	90.00	827.35	0.00	0.02	0.00	5.00	34.50
71.200	115.00	827.35	0.00	0.02	0.00	5.00	34.50
71.200	140.00	827.49	0.00	0.03	0.00	5.00	34.50
71.200	85.00	827.51	0.00	0.01	0.00	5.00	34.50
71.200	110.00	828.00	0.00	0.02	0.00	5.00	34.50
71.200	135.00	828.61	0.00	0.02	0.00	5.00	34.50
71.200	85.00	827.69	0.00	0.01	0.00	5.00	34.50
71.200	110.00	828.09	0.00	0.02	0.00	5.00	34.50
71.200	135.00	828.71	0.00	0.02	0.00	5.00	34.50
71.200	95.00	828.21	0.00	0.01	0.00	5.00	34.50
71.200	120.00	828.75	0.00	0.02	0.00	5.00	34.50
71.200	145.00	829.41	0.00	0.02	0.00	5.00	34.50

SECNO	C	CHSEL	DIFLSP	DIFHSX	DIFKES	TOPMID	WLCR
71.300	90.00	827.86	0.03	0.52	0.00	4.00	78.00
71.300	115.00	828.73	0.00	0.37	0.00	4.00	78.00
71.300	140.00	829.03	0.00	1.35	0.00	4.00	78.00
71.300	85.00	827.97	0.00	0.46	0.00	4.00	78.00
71.300	110.00	828.80	0.00	0.80	0.00	4.00	78.00
71.300	135.00	829.35	0.00	1.24	0.00	4.00	78.00
71.300	85.00	828.07	0.00	0.46	0.00	4.00	78.00
71.300	110.00	828.90	0.00	0.80	0.00	4.00	78.00
71.300	135.00	829.35	0.00	1.24	0.00	4.00	78.00
71.300	95.00	828.40	0.00	0.60	0.00	4.00	78.00
71.300	120.00	829.72	0.00	0.80	0.00	4.00	78.00
71.300	145.00	830.86	0.00	1.46	0.00	4.00	78.00
71.400	90.00	828.00	0.00	0.16	0.00	58.37	85.00
71.400	115.00	828.91	0.00	0.29	0.00	60.5	85.00
71.400	140.00	830.03	0.00	0.22	0.00	67.58	85.00
71.400	85.00	829.10	0.00	0.12	0.00	55.46	85.00
71.400	110.00	828.97	0.00	0.17	0.00	60.88	85.00
71.400	135.00	830.06	0.00	0.20	0.00	67.68	85.00
71.400	85.00	828.19	0.00	0.12	0.00	56.05	85.00
71.400	110.00	829.06	0.00	0.17	0.00	61.77	85.00
71.400	135.00	830.15	0.00	0.20	0.00	68.27	85.00
71.400	95.00	828.93	0.00	0.13	0.00	60.55	85.00
71.400	120.00	829.89	0.00	0.17	0.00	66.63	85.00
71.400	145.00	831.07	0.00	0.20	0.00	80.65	85.00
71.500	90.00	828.01	0.00	0.01	0.00	48.57	130.00
71.500	115.00	828.92	0.00	0.00	0.00	54.55	130.00
71.500	140.00	830.05	0.00	0.00	0.00	61.45	130.00
71.500	85.00	828.10	0.00	0.01	0.00	49.26	130.00
71.500	110.00	828.97	0.00	0.00	0.00	54.66	130.00
71.500	135.00	830.06	0.00	0.00	0.00	61.46	130.00
71.500	85.00	828.20	0.00	0.00	0.00	49.44	130.00
71.500	110.00	829.09	0.00	0.00	0.00	55.25	130.00
71.500	135.00	830.15	0.00	0.00	0.00	62.05	130.00
71.500	95.00	828.93	0.00	0.00	0.00	54.64	130.00
71.500	120.00	829.89	0.00	0.00	0.00	60.42	130.00
71.500	145.00	831.07	0.00	0.00	0.00	67.73	130.00
71.600	90.00	828.03	0.00	0.02	0.00	29.15	130.00
71.600	115.00	828.93	0.00	0.01	0.00	43.15	130.00
71.600	140.00	830.06	0.00	0.01	0.00	55.22	130.00
71.600	85.00	828.12	0.00	0.02	0.00	29.75	130.00
71.600	110.00	828.90	0.00	0.01	0.00	48.47	130.00
71.600	135.00	830.06	0.00	0.01	0.00	55.23	130.00
71.600	85.00	828.21	0.00	0.01	0.00	30.35	130.00
71.600	110.00	829.07	0.00	0.01	0.00	49.06	130.00
71.600	135.00	830.16	0.00	0.01	0.00	55.85	130.00
71.600	95.00	828.96	0.00	0.01	0.00	48.24	130.00
71.600	120.00	829.90	0.00	0.00	0.00	54.21	130.00
71.600	145.00	831.08	0.00	0.20	0.00	61.97	130.00

SECNO	Q	CLSEL	DIFMSP	DIFMSX	DIFKMS	TOPWID	XLCF
71.700	90.00	829.11	0.00	3.08	0.00	23.20	130.00
71.700	115.00	828.97	0.00	0.04	0.00	28.75	130.00
71.700	140.00	830.37	0.00	1.07	0.01	44.56	130.00
71.700	85.00	828.96	0.00	0.06	0.00	23.67	130.00
71.700	110.00	829.01	0.00	0.01	0.00	29.33	130.00
71.700	135.00	830.08	0.00	0.01	0.00	49.09	130.00
71.700	85.00	828.26	0.00	0.05	0.00	24.22	130.00
71.700	110.00	829.10	0.00	0.03	0.00	29.66	130.00
71.700	135.00	830.17	0.00	0.01	0.00	49.26	130.00
71.700	95.00	828.97	0.00	0.03	0.00	26.76	130.00
71.700	120.00	829.91	0.00	0.01	0.00	40.33	130.00
71.700	145.00	831.08	0.00	0.01	0.00	55.37	130.00
71.800	90.00	828.47	0.00	0.36	0.00	28.10	160.00
71.800	115.00	829.12	0.00	0.15	0.00	34.27	160.00
71.800	140.00	830.13	0.00	0.05	0.00	50.20	160.00
71.800	85.00	828.47	0.00	0.29	0.00	28.13	160.00
71.800	110.00	829.16	0.00	0.13	0.00	33.89	160.00
71.800	135.00	830.13	0.00	0.05	0.00	40.00	160.00
71.800	85.00	828.52	0.00	0.26	0.00	28.58	160.00
71.800	110.00	829.22	0.00	0.12	0.00	34.24	160.00
71.800	135.00	830.21	0.00	0.04	0.00	40.34	160.00
71.800	95.00	829.07	0.00	0.11	0.00	35.14	160.00
71.800	120.00	829.96	0.00	0.05	0.00	38.94	160.00
71.800	145.00	831.10	0.00	0.02	0.00	46.15	160.00
71.900	90.00	829.74	0.00	0.25	0.00	4.30	330.00
71.900	115.00	829.91	0.00	0.79	0.00	4.30	330.00
71.900	140.00	830.37	0.00	0.24	0.00	4.00	330.00
71.900	85.00	829.63	0.00	1.16	0.00	4.00	330.00
71.900	110.00	829.84	0.00	0.70	0.00	4.00	330.00
71.900	135.00	830.35	0.00	0.23	0.00	4.00	330.00
71.900	85.00	829.60	0.00	1.08	0.00	4.30	330.00
71.900	110.00	829.75	0.00	0.63	0.00	4.00	330.00
71.900	135.00	830.41	0.00	0.19	0.00	4.00	330.00
71.900	95.00	829.66	0.00	0.59	0.00	4.00	330.00
71.900	120.00	830.19	0.00	0.24	0.00	4.00	330.00
71.900	145.00	831.12	0.00	0.02	0.00	4.00	330.00
71.920	90.00	830.15	0.00	0.41	0.00	4.00	87.00
71.920	115.00	830.63	0.00	0.74	0.00	4.00	87.00
71.920	140.00	831.54	0.00	1.17	0.00	4.00	87.00
71.920	85.00	829.98	0.00	0.35	0.00	4.00	87.00
71.920	110.00	830.49	0.00	0.64	0.00	4.00	87.00
71.920	135.00	831.43	0.00	1.07	0.00	4.00	87.00
71.920	85.00	829.96	0.00	0.35	0.00	4.00	87.00
71.920	110.00	830.49	0.00	0.65	0.00	4.00	87.00
71.920	135.00	831.49	0.00	1.08	0.00	4.00	87.00
71.920	95.00	830.12	0.00	0.45	0.00	4.00	87.00
71.920	120.00	831.01	0.00	0.82	0.00	4.00	87.00
71.920	145.00	832.46	0.00	1.32	0.00	4.00	87.00

SECNO	Q	CLSEL	DIFUSP	DIFUSX	DIFKLS	TOPPID	XLCH
71.940	90.00	830.24	0.00	0.09	0.00	4.97	35.50
71.940	115.00	830.76	0.00	0.13	0.00	4.99	35.50
71.940	140.00	831.30	0.00	0.15	0.00	5.00	35.50
71.940	85.00	830.06	0.00	0.08	0.00	4.96	35.50
71.940	110.00	830.61	0.00	0.12	0.00	4.99	35.50
71.940	135.00	831.57	0.00	0.14	0.00	5.00	35.50
71.940	85.00	830.03	0.00	0.08	0.00	6.96	35.50
71.940	110.00	830.61	0.00	0.12	0.00	4.99	35.50
71.940	135.00	831.62	0.00	0.14	0.00	5.00	35.50
71.940	85.00	830.22	0.00	0.10	0.00	4.97	35.50
71.940	120.00	831.14	0.00	0.13	0.00	5.00	35.50
71.940	145.00	832.56	0.00	0.12	0.00	5.00	35.50
72.000	90.00	831.74	0.00	1.50	0.00	5.00	122.50
72.000	115.00	833.58	0.00	1.13	0.00	5.00	122.50
72.000	140.00	833.58	0.00	1.09	0.00	5.00	122.50
72.000	85.00	831.54	0.00	1.50	0.00	5.00	122.50
72.000	110.00	831.60	0.00	0.99	0.00	5.00	122.50
72.000	135.00	833.31	0.00	1.74	0.00	5.00	122.50
72.000	85.00	831.54	0.00	1.50	0.00	5.00	122.50
72.000	110.00	831.60	0.00	0.99	0.00	5.00	122.50
72.000	135.00	833.37	0.00	1.74	0.00	5.00	122.50
72.000	85.00	831.92	0.00	1.70	0.00	5.00	122.50
72.000	120.00	832.43	0.00	1.30	0.00	5.00	122.50
72.000	145.00	834.67	0.00	2.11	0.00	5.00	122.50

SUMMARY OF ERRORS

FORM 25 0
(313) 291-5400

Wade, Trim & Associates, Inc.
Civil Engineers • Land Surveyors
WORK SHEET

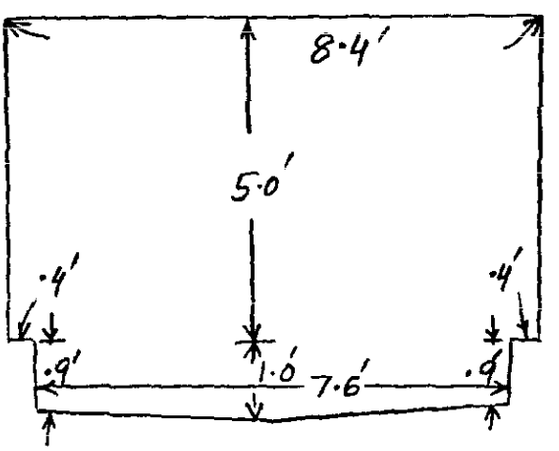
25185 GODDARD ROAD
TAYLOR, MICHIGAN 48180

REFERENCE

(ii) Cross section from 46 +53·3 to 48+89

$$A = 8{\cdot}4 \times 5{\cdot}0 + 7{\cdot}6 \times {\cdot}9 + \frac{7{\cdot}6 \times {\cdot}1}{2}$$

$$= \underline{49{\cdot}2 \text{ ft}^2}$$



$$P = 8{\cdot}4 + 2(5{\cdot}0) + 2({\cdot}4) + 2({\cdot}9) + 7{\cdot}6$$

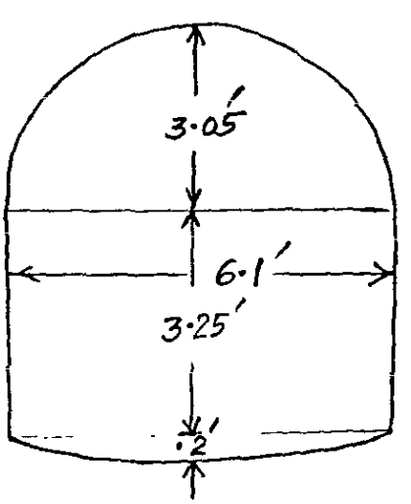
$$= \underline{28{\cdot}6 \text{ ft}}$$

$$R = \frac{A}{P} = \underline{1{\cdot}72 \text{ ft}}$$

(iii) Cross section from 48+89 to 56+45

$$A = \frac{\pi (3{\cdot}05)^2}{2} + 6{\cdot}1 \times 3{\cdot}25 + \frac{6{\cdot}1 \times {\cdot}2}{2}$$

$$= \underline{35{\cdot}0 \text{ ft}^2}$$



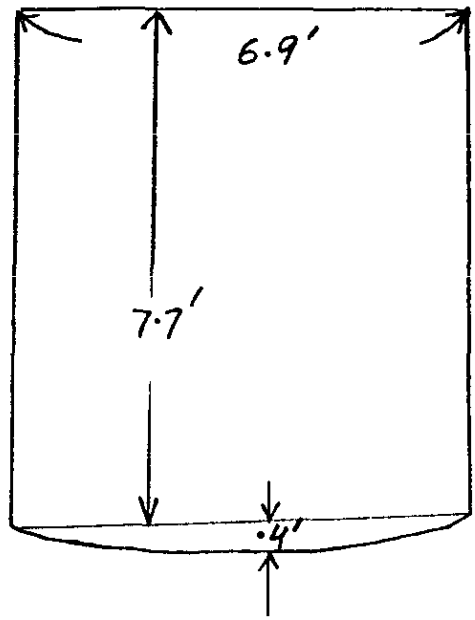
$$P = \pi(3{\cdot}05) + 2(3{\cdot}25) + 6{\cdot}1$$

$$= \underline{22{\cdot}2 \text{ ft}}$$

$$R = A/P = \underline{1{\cdot}58 \text{ ft}}$$

REFERENCE

(iv) Cross section from 56+45 to 59+50



$A = 6.9 \times 7.7 + \frac{6.9 \times .4}{2}$

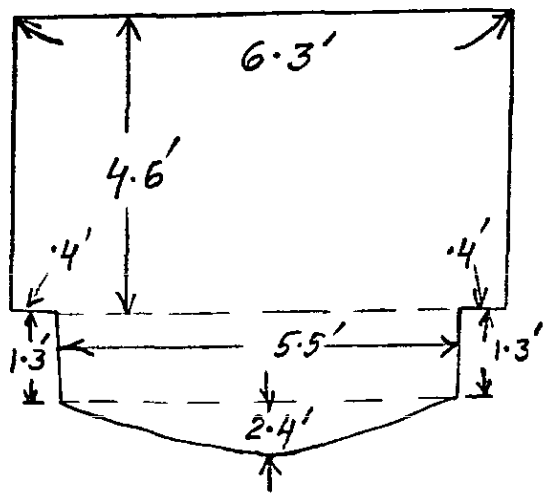
$= 54.5 \text{ ft}^2$

$P = 6.9 + 2(7.7) + 7.0$

$= 29.3 \text{ ft}$

$R = \frac{A}{P} = 1.86 \text{ ft}$

(V) Cross section from 59+50 to 60+18



$A = 6.3 \times 4.6 + 5.5 \times 1.3 + \frac{5.5 \times 2.4}{2}$

$= 42.7 \text{ sq. ft}$

$P = 6.3 + 2(4.6) + 2(.4) + 2(1.3) + 7.3$

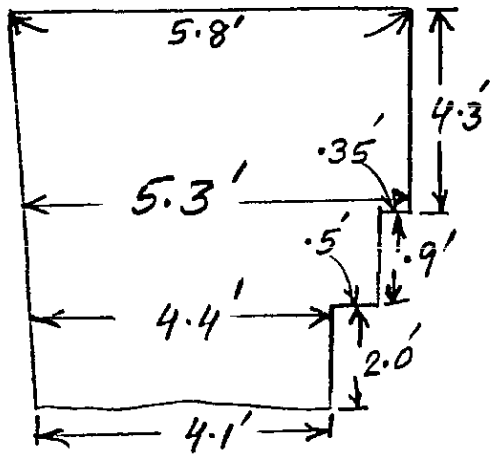
$= 26.2 \text{ ft}$

$R = A/P = 1.63 \text{ ft}$

SUBJECT	BY	CHK.	SHEET NO	File Code No / Job No / Owner / Project / Suffix
Arcadia Creek Enclosure #1C	DATE 4/7/80	DATE	4 OF 14	HUD • 2027 • 07

REFERENCE

(VI) Cross section from 60+18 to 60+53



$$A = \frac{5.8+5.3}{2}(4.3) + 4.95 \times 0.9 + \frac{4.4+4.1}{2}(2.0)$$

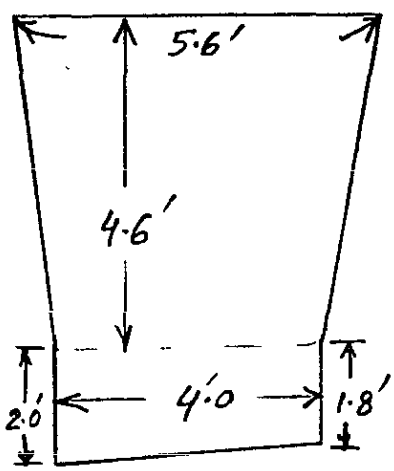
$$= \underline{36.8 \text{ sq. ft.}}$$

$$P = 5.8 + 4.3 + .35 + .9 + .5 + 2.0 + 4.1 + 7.3$$

$$= \underline{25.3 \text{ ft}}$$

$$R = \frac{A}{P} = \underline{1.46 \text{ ft}}$$

(VII) Cross section from 60+53 to 62+26 (U/S End)



$$A = \frac{5.6+4.0}{2}(4.6) + \frac{2.0+1.8}{2}(4.0)$$

$$= \underline{29.7 \text{ sq. ft}}$$

$$P = 5.6 + 4.9 + 1.8 + 4.0 + 2.0 + 4.6$$

$$= \underline{22.9'}$$

$$R = A/P = \underline{1.30'}$$

SUBJECT	BY	CHK.	SHEET NO	File Code No (Job No.) Owner / Project / Suffix
Arcadia Creek Enclosure #1 IC	Sushil		5 OF 14	HUD • 202? • 07
	DATE 4/3/80	DATE		

REFERENCE

Computations for XKOR

(i) XKOR for the Enclosure Length from 43+16 to 46+53.3

$$XKOR = K_f + K_b + K_{exit}$$

where $K_f = \dfrac{29.1(0.02)^2 337.3}{(1.88)^{4/3}}$

$= \underline{1.7}$ $(n \approx 0.02)$

K_b

one 24° bend, one 10° bend, and one 8° bend.

Take $K_b \approx 0.4$ for 24° bend
$\approx .2$ for 10° or 8° bend.

$\therefore K_b = .4 + .2 + .2 = \underline{0.8}$

$K_{exit} = 1.0$

$\therefore XKOR = 1.7 + 0.8 + 1.0$

$= \underline{3.5}$

SUBJECT	BY	CHK	SHEET NO	File Code No (Job No) Owner Project Suffix
Arcadia Creek Enclosure # 1C	DATE 4/3/80	DATE	6 OF 14	HUD 2027 07

REFERENCE

(ii) XKOR for the Enclosure Length from 46+53.3 to 48+89

$$XKOR = K_f + K_b$$

where $K_f = \dfrac{29.1\,(0.02)^2\,235.7}{(1.72)^{4/3}}$ $(n \approx 0.02)$

$= 1.3$

K_b

one 9° bend and one 17° bend

Take $K_b \approx 0.2$ for 9° bend

$K_b \approx 0.4$ for 17° bend

$\therefore K_b = 0.2 + 0.4 = 0.6$

$\therefore XKOR = 1.3 + 0.6 = 1.9$

(iii) XKOR for the Enclosure Length from 48+89 to 56+45

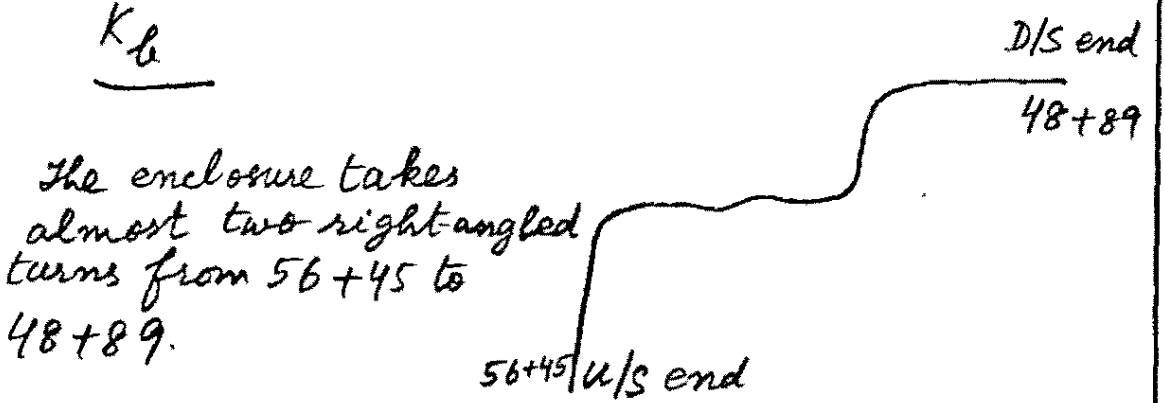
$$XKOR = K_f + K_b$$

where $K_f = \dfrac{29.1\,(0.02)^2\,756}{(1.58)^{4/3}}$

$= 4.8$

REFERENCE

K_b



The enclosure takes almost two right-angled turns from 56+45 to 48+89.

Take $K_b \approx 2(1.0)$

$= \underline{2.0}$

$\therefore \quad XKOR = 4.8 + 2.0$

$= \underline{6.8}$

(iv) XKOR for the Enclosure Length from 56+45 to 59+50

$$XKOR = K_f + K_b$$

where $$K_f = \frac{29.1\,(0.02)^2\,305}{(1.86)^{4/3}} \quad (n \approx 0.02)$$

$= \underline{1.6}$

K_b

Three almost $22\frac{1}{2}^\circ$ bends, and one 30° bend

$\therefore \quad K_b = 3(0.4) + 0.5 = \underline{1.7}$

$\therefore \quad XKOR = 1.6 + 1.7 = \underline{3.3}$

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WORK SHEET

25185 GODDARD ROAD
TAYLOR, MICHIGAN 48180

REFERENCE

(V) XKOR for the Enclosure Length from 59+50 to 60+18

$$XKOR = K_f \quad \text{(There is no bend)}$$

$$= \frac{29.1\,(0.02)^2 68}{(1.63)^{4/3}} \quad (n \simeq 0.02)$$

$$= \underline{0.4}$$

(Vi) XKOR for the Enclosure Length from 60+18 to 60+53

$$XKOR = K_f + K_b$$

where $$K_f = \frac{29.1\,(0.02)\,35}{(1.46)^{4/3}} \quad (n \simeq 0.02)$$

$$= \underline{0.3}$$

K_b

one 54° bend

Take $K_b \simeq \underline{0.8}$

Hence $XKOR = 0.3 + 0.8$

$$= \underline{1.1}$$

SUBJECT	BY	CHK	SHEET NO	File Code No (Job No.) Owner Project Suffix
Arcadia Creek Enclosure # 1C	DATE 4/3/80	DATE	9 OF 14	HUD • 202 • 0

REFERENCE

(Vii) XKOR for the Enclosure Length from 60+53 to 62+26 (U/S end)

$$XKOR = k_f + K_{entry}$$

where $$k_f = \frac{29.1\,(0.02)^2\,173}{(1.3)^{4/3}} \qquad (n \simeq 0.02)$$

$$= 1.4$$

Take $K_{entry} \simeq 0.4$

$\therefore$ $XKOR = 1.4 + 0.4 = 1.8$

Computations for average value of XKOR to be used in SB Card for Pressure Flow

Total Head loss through the Enclosure

$$= \sum_{i=1}^{7} h_i$$

$$= \sum_{i=1}^{7} \frac{(XKOR)_i \left(\frac{Q}{A_i}\right)^2}{2g}$$

REFERENCE

Hence, Total Head loss

$$= \frac{3.5\left(\frac{Q}{54.3}\right)^2}{2g} + \frac{1.9\left(\frac{Q}{49.2}\right)^2}{2g}$$

$$+ \frac{6.8\left(\frac{Q}{35.0}\right)^2}{2g} + \frac{3.3\left(\frac{Q}{54.5}\right)^2}{2g} + \frac{0.4\left(\frac{Q}{42.7}\right)^2}{2g}$$

$$+ \frac{1.1\left(\frac{Q}{36.8}\right)^2}{2g} + \frac{1.8\left(\frac{Q}{29.7}\right)^2}{2g}$$

$$= \frac{0.011171\,Q^2}{2g}$$

The average area of flow through the Enclosure to be used in SB card shall be taken equal to the area available on the D/S side.

Therefore, taking area of flow equal to $54.3\ ft^2$, the above noted eqn. can be written as

Total Head loss through the Enclosure

$$= \frac{34.5\left(\frac{Q}{54.3}\right)^2}{2g}$$

Hence av. value of XKOR = 34.5

BAREA, Ave. area of flow = $54.3\ ft^2$

As per output enclosed (under a

SUBJECT	BY	CHK	SHEET NO.	File Code No (Job No) Owner Project Suffix
Arcadia Creek Enclosure # 1C	DATE 4/3/80	DATE	11 OF 14	HUD • 202? • 07

FORM 25 0
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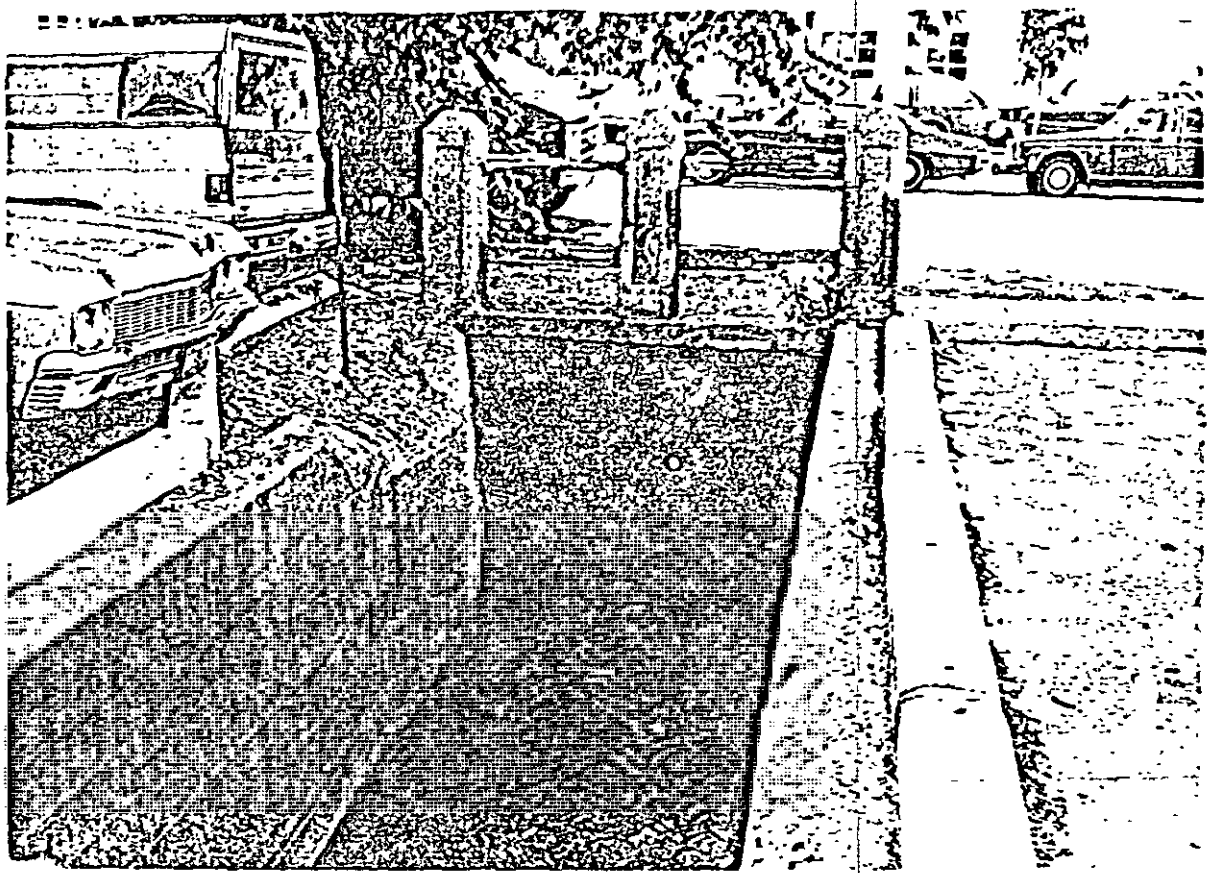
Civil Engineers • Land Surveyors
WORK SHEET

25185 GODDARD ROAD
TAYLOR, MICHIGAN 48180

REFERENCE

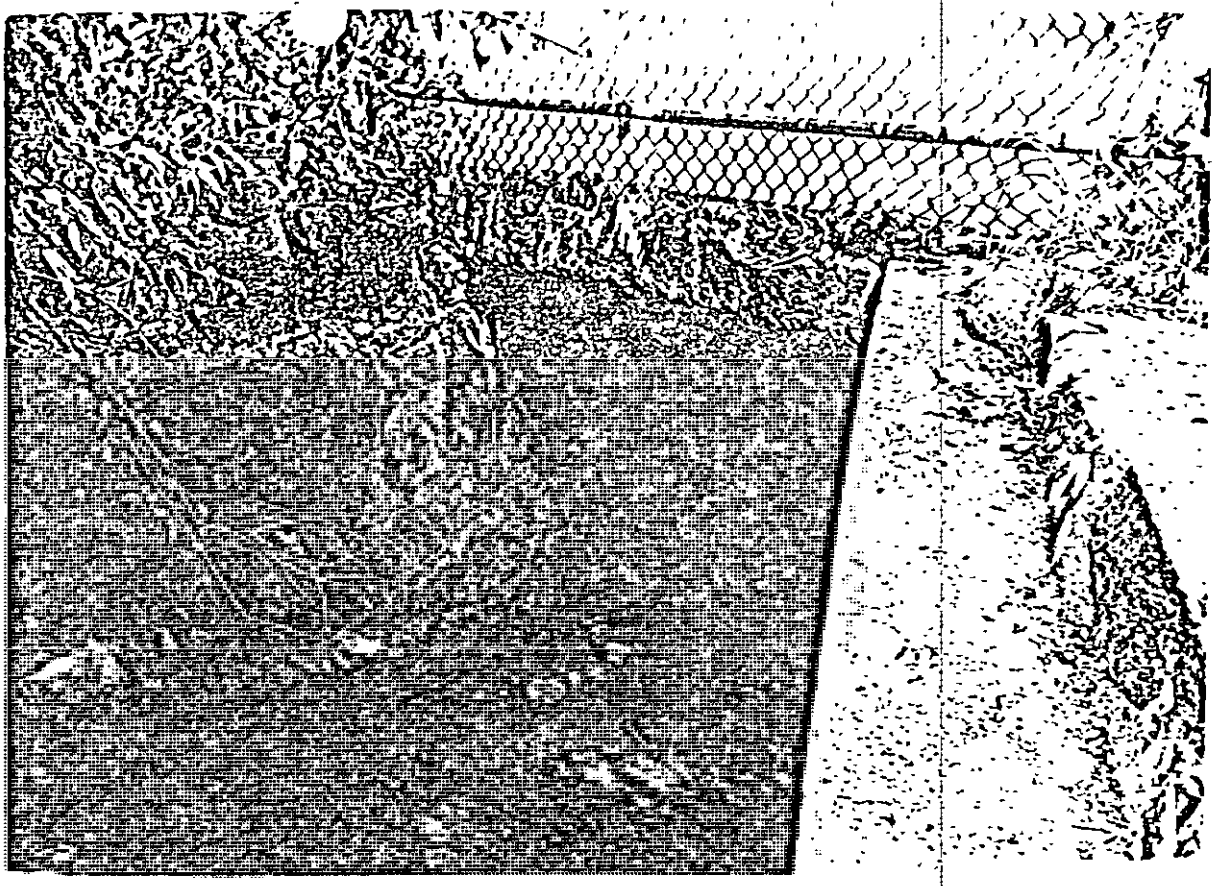
separate folder), flow through the Enclosure is given below:-

10 yr	50 yr	100 yr	500 yr
230 CFS	228 CFS	228 CFS	227 CFS



ARCADIA DRAIN AT COOLEY (END ENCLOSED SYSTEM) SECTION #78

D/S END OF ENCLOSURE



ARCADIA DRAIN ATELM (REG ENCLOSED SYSTEM) SECTION #79

U/S END OF ENCLOSURE

Sheet 14/14

HUD 2027-07

REFERENCE

Pressure Flow Computations for Arcadia Creek Enclosures

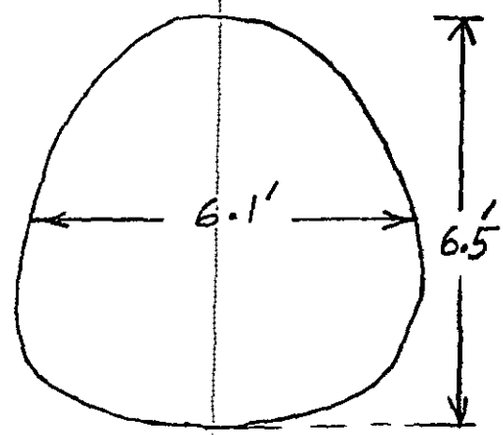
2) Enclosure from Lovel St. to U/S of Culvert on Stadium Drive

Data taken from Survey Notes

Alignment of the Enclosure shown on the next sheet.

(i) Cross section from 0+00 to 1+95

Refer sheet 3

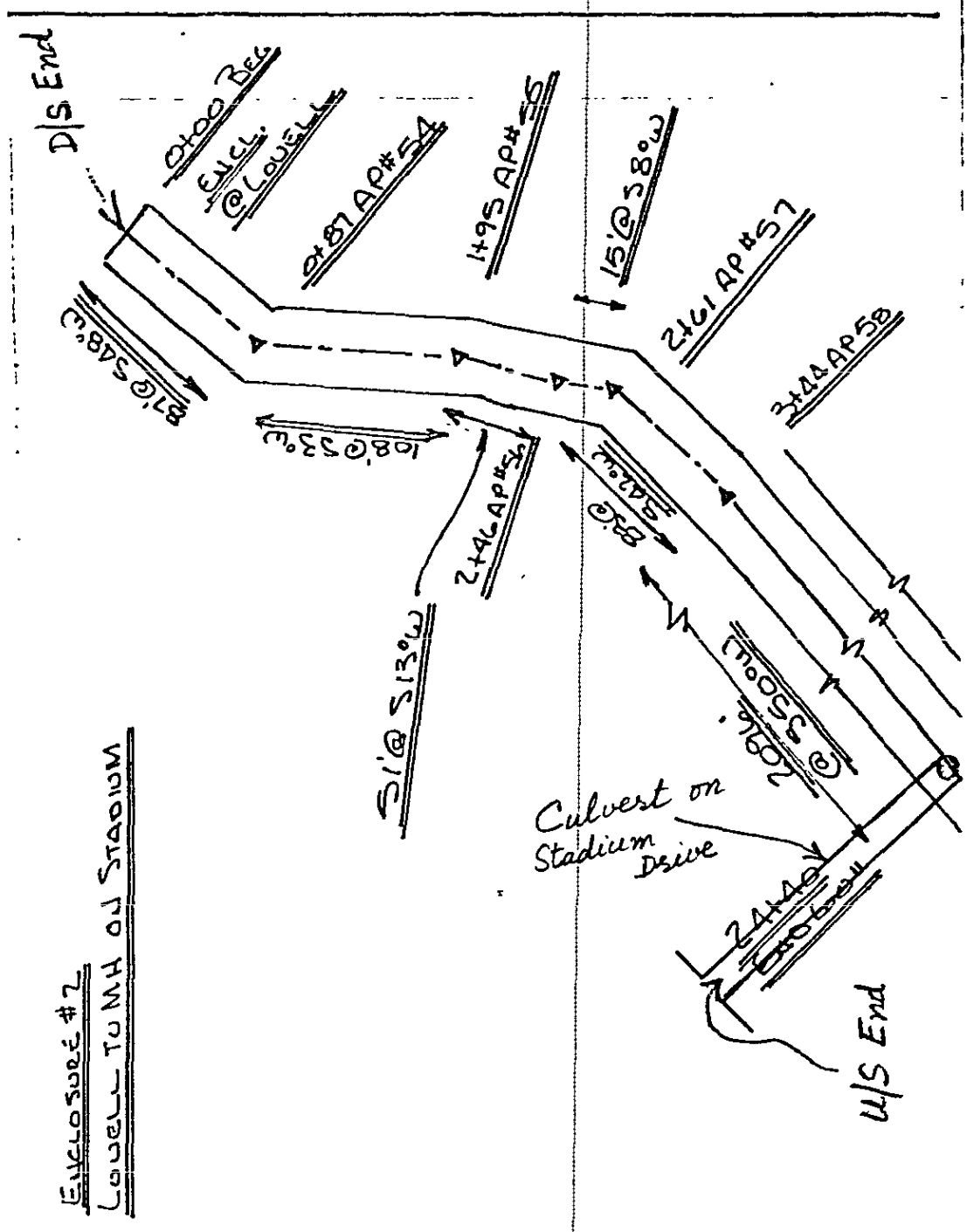


$A = 32.7 \text{ ft}^2$

$P = 21.2 \text{ ft}$

$R = \frac{A}{P} = 1.54 \text{ ft}$

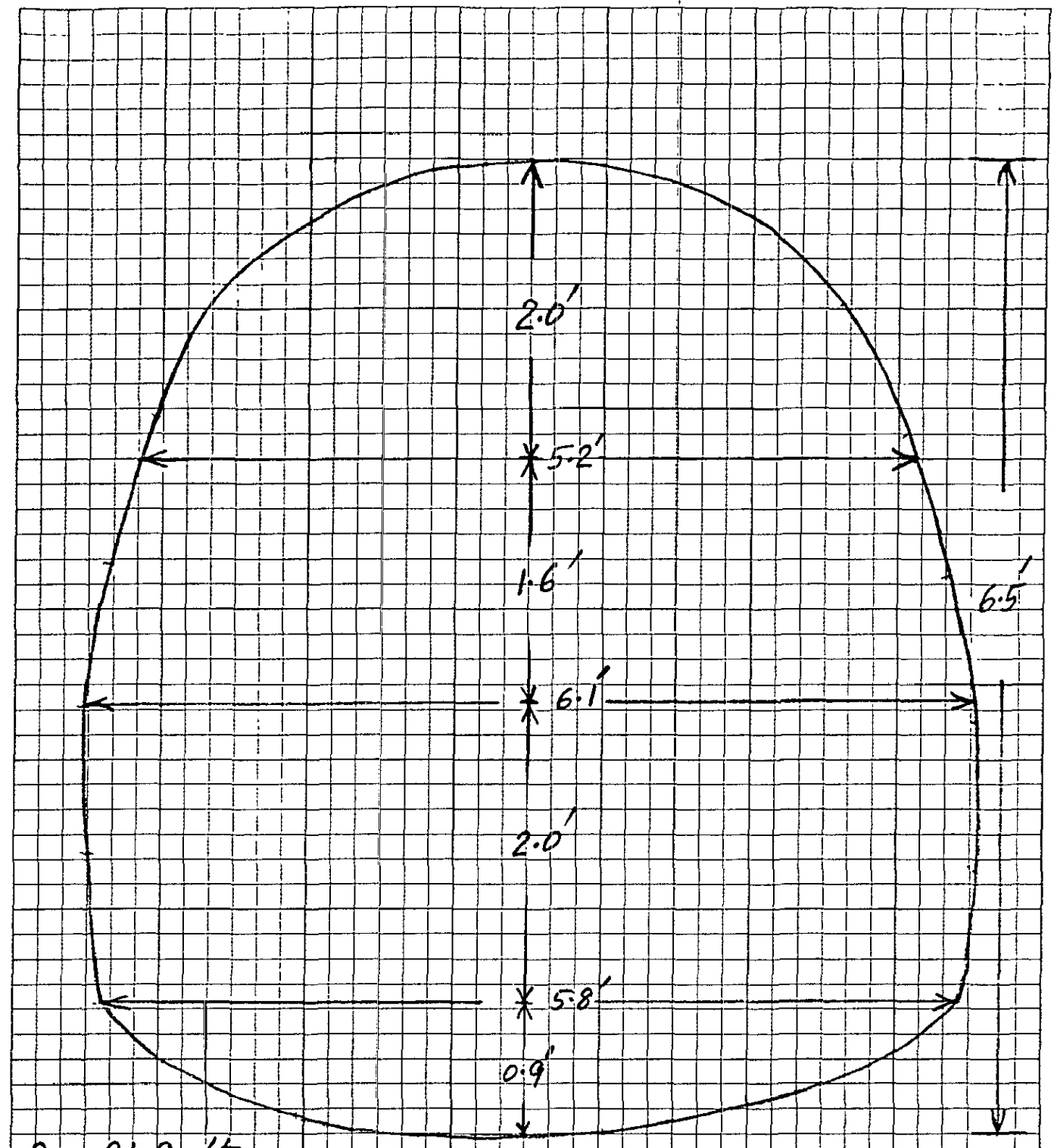
SUBJECT	BY	CHK.	SHEET NO	File Code No (Job No.) Owner Project Suffix
Arcadia Creek Enclosure #2	DATE 4/3/84	DATE	1 OF 11	HUD • 2077 • 07



Subject
Arcadia Cr.
Enclosure #2

Sheet
2 of 11

Sushil
4/3/80
HUD 2027-07



P = 21.2 ft
A = 32.7 ft²

Scale 1" = 1'

Enclosure X sec. from 0+00 to 1+95

Subject
Arcadia Creek
Enclosure #2

Sushil
4/3/80

Sheet
3 of 11 HUD 2027-7

46 0460
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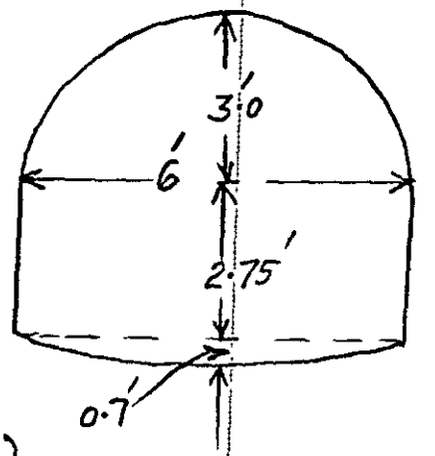
REFERENCE

(ii) Cross section from 1+95 to 2+46

$$A = \frac{\pi(3.0)^2}{2} + 6 \times 2.75 + \frac{6 \times .7}{2}$$

$$= \underline{32.7\ ft^2}$$



$$P = \pi(3.0) + 2(2.75) + 6.2$$

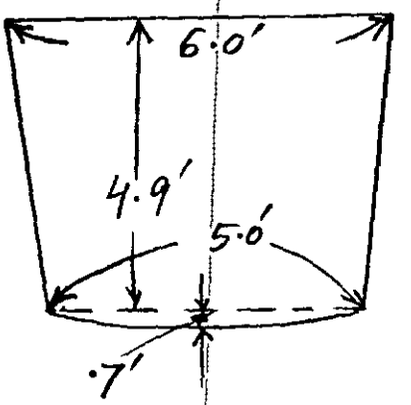
$$= \underline{21.1\ ft}$$

$$R = \frac{A}{P} = \underline{1.55\ ft}$$

(iii) Cross section from 2+46 to 3+44

$$A = \frac{6+5}{2}(4.9) + \frac{5 \times .7}{2}$$

$$= \underline{28.7\ ft^2}$$



$$P = 6 + 2(5) + 5$$

$$= \underline{21.0\ ft}$$

$$R = \frac{A}{P} = \underline{1.37\ ft}$$

SUBJECT	BY	CHK	SHEET NO.	File Code No. (Job No.) Owner Project Suffix
Arcadia Creek Enclosure # 2	Sushil		4 OF 11	HOD • 202[illegible] • 07
	DATE 4/4/80	DATE		

REFERENCE

(iv) Cross section from 3+44 to 24+40 (U/S end)

60" Concrete Pipe

$A = \pi(30/12)^2 = 19.63\ ft^2$

$P = \pi(\frac{60}{12}) = 15.71\ ft$

$R = A/P = 1.25\ ft$

(v) Culvert at Stadium Drive

$A = 6(808.47 - 803.05) = 32.5\ ft^2$

$P = 2(6 + 5.42) = 22.8\ ft$

$R = A/P = 1.43\ ft$

Computations for XKOR

(i) XKOR for the Enclosure Length from 0+00 to 1+95

$XKOR = K_f + K_b + K_{exit}$

where $K_f = \frac{29.1(0.02)^2 195}{(1.54)^{4/3}}$ $(n \approx 0.02)$

$= 1.3$

K_b one 45° bend, and one 8° bend

Take $K_b = 0.7$ for 45° bend, and
$K_b \approx 0.2$ for 8° bend.

SUBJECT	BY	CHK	SHEET NO	File Code No / Job No / Owner / Project / Suffix
Arcadia Creek Enclosure #2	SWJ		5 OF 11	HUD • 2027 • 07
	DATE 4/4/89	DATE		

REFERENCE

$\therefore \quad K_b = 0.7 + 0.2 = \underline{0.9}$

$K_{exit} = \underline{1.0}$

$\therefore \quad XKOR = 1.3 + 0.9 + 1.0 = \underline{3.2}$

(ii) XKOR for the Enclosure Length from 1+95 to 2+46

$XKOR = K_f$ (There is no bend)

$= \dfrac{29.1 (0.02)^2 51}{(1.55)^{4/3}}$ $(n \approx 0.02)$

$= \underline{0.3}$

(iii) XKOR for the Enclosure Length from 2+46 to 3+44

$XKOR = K_f + K_b$

where $K_f = \dfrac{29.1 (0.02)^2 98}{(1.37)^{4/3}}$ $(n \approx 0.02)$

$= \underline{0.8}$

SUBJECT	BY	CHK	SHEET NO	File Code No. (Job No: Owner • Project • Suffix)
Arcadia Creek Enclosure #2	Susan		6 OF 11	HUD • 2027 • 07
	DATE 4/4/89	DATE		

REFERENCE

K_b

one 34° bend, and one 8° bend.

$K_b = 0.5 + 0.2 = 0.7$

$\therefore XKOR = 0.8 + 0.7 = \underline{1.5}$

(iv) XKOR for the Enclosure Length from 3+44 to 29+40

Straight Alignment

$$XKOR = K_f + K_{bend}$$

where $K_f = \dfrac{29.1(.02)^2 2096}{(1.25)^{4/3}}$ $(n \approx .02)$

$= \underline{18.1}$

K_{bend} For 90° turn through the manhole at Stadium Drive, take $K_b \approx \underline{1.0}$

Hence $XKOR = 18.1 + 1.0 = \underline{19.1}$

(v) XKOR for the Culvert at Stadium Drive

$$XKOR = K_f + K_{Entry}$$

where $K_f = \dfrac{29.1(.02)^2(178.5 - 82.3)}{(1.43)^{4/3}}$ $(n \approx 0.02)$

$= \underline{0.70}$

Take $K_{entry} \approx \underline{0.5}$

$\therefore XKOR = 0.7 + 0.5 = \underline{1.2}$

SUBJECT	BY	CHK	SHEET NO	File Code No (Job No) Owner Project Suffix
Arcadia Creek Enclosure #2	Susie		7 OF 11	HUD • 2037 • 07
	DATE 4/4/80	DATE		

REFERENCE

Computations for average value of XKOR to be used in SB Card for Pressure Flow

Total Head Loss through the Enclosure

$$= \sum_{i=1}^{5} h_i$$

$$= \sum_{i=1}^{5} \frac{(XKOR)_i \left(\frac{Q}{A_i}\right)^2}{2g}$$

$$= \frac{3.2\left(\frac{Q}{32.7}\right)^2}{2g} + \frac{0.3\left(\frac{Q}{32.7}\right)^2}{2g}$$

$$+ \frac{1.5\left(\frac{Q}{28.7}\right)^2}{2g} + \frac{19.1\left(\frac{Q}{19.63}\right)^2}{2g}$$

$$+ \frac{1.2\left(\frac{Q}{32.5}\right)^2}{2g} = .0558\,\frac{Q^2}{2g}$$

The average area of flow through the Enclosure to be used in SB Card shall be taken equal to the area of 5 ft dia concrete pipe running from 3+44 to 24+40 length of the enclosure.

Therefore, taking area of flow equal to 19.63 ft^2, the above noted eq. can be written as

Total Head Loss through the Enclosure

$$= 21.5\,\frac{\left(\frac{Q}{19.63}\right)^2}{2g}$$

Hence, av. value of XKOR = **21.5**

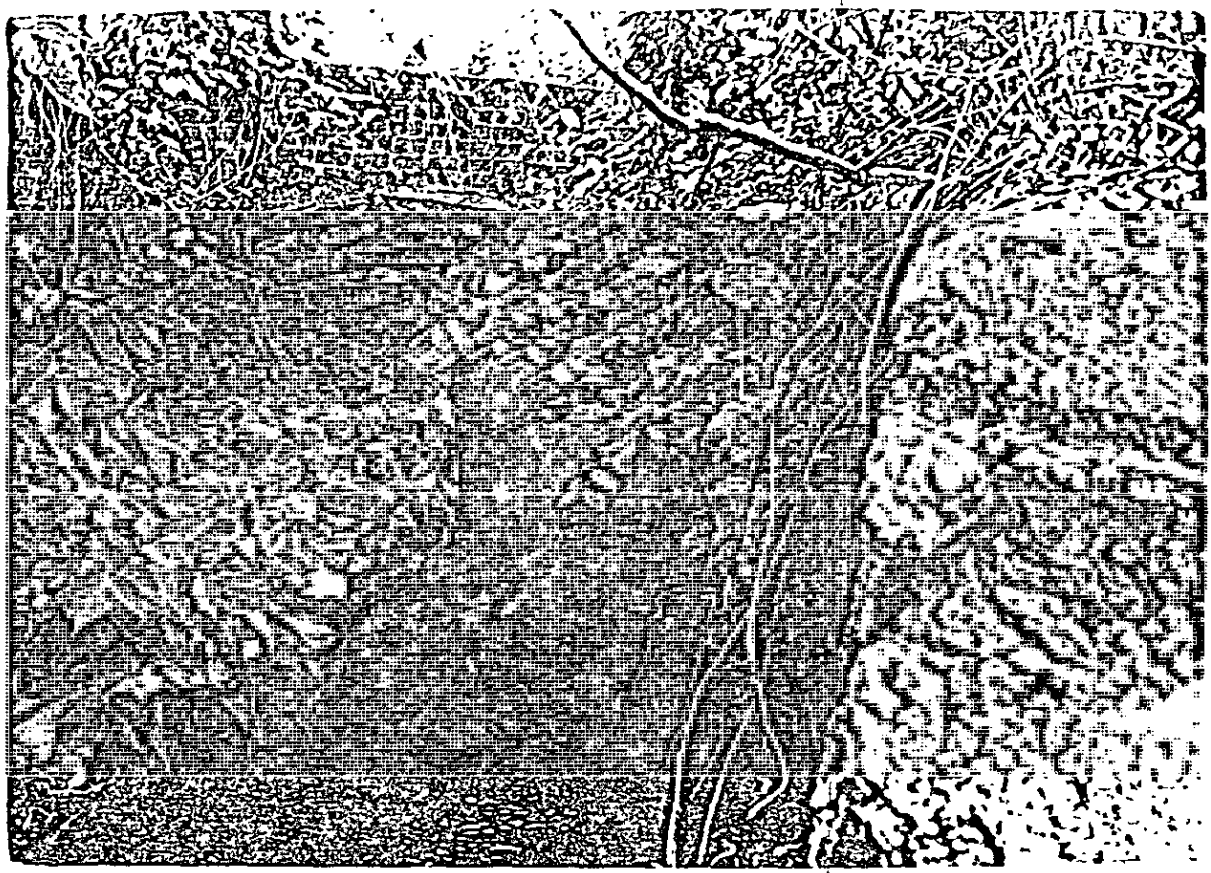
Av. area of flow = **19.63 ft2**

SUBJECT	BY	CHK	SHEET NO	File Code No (Job No) Owner • Project • Suffix
Arcadia Creek Enclosure #2	S Ashraf		8 OF 11	HUD • 2027 • C7
	DATE 4/4/80	DATE		

REFERENCE

As per output enclosed (under a separate folder), flow through the Enclosure is given below:-

10 Yr	50 Yr	100 Yr	500 Yr
125 CFS	124 CFS	124 CFS	124 CFS

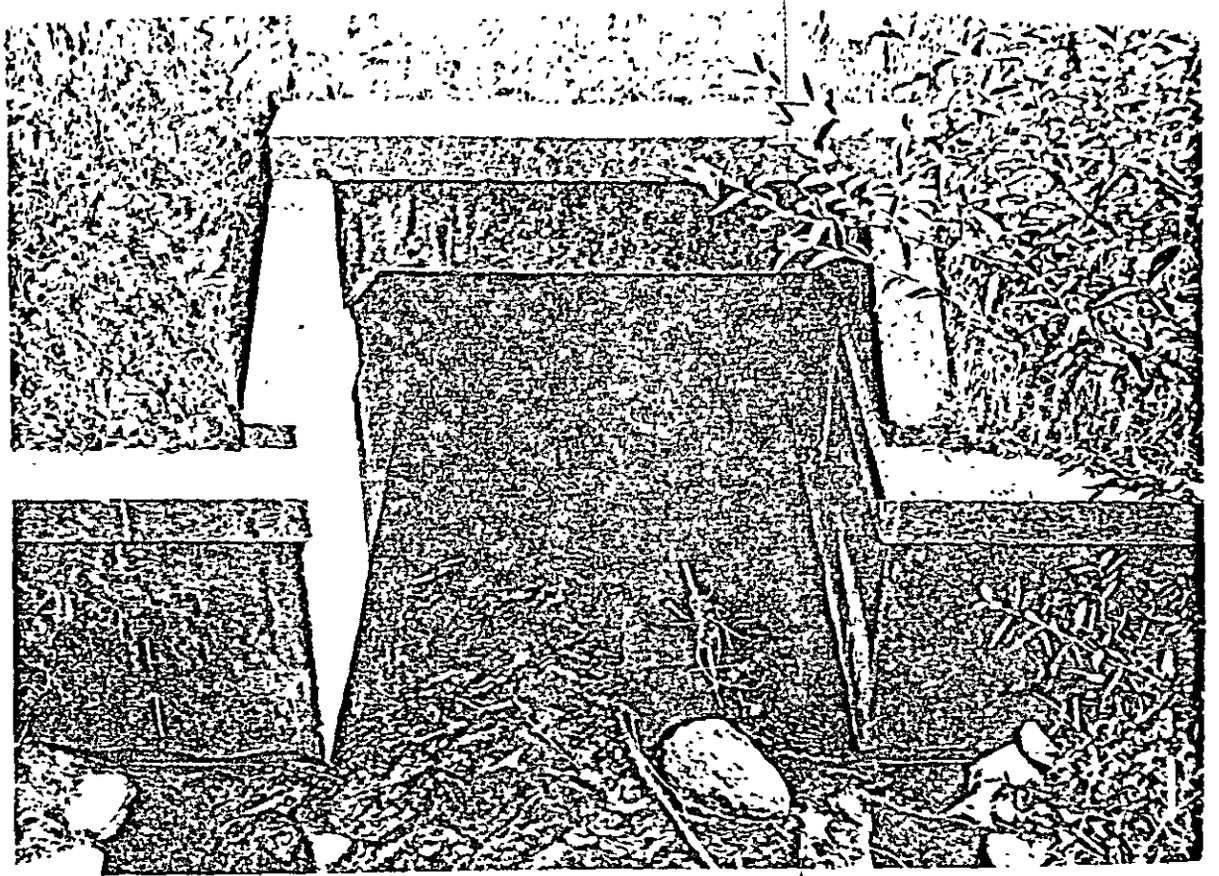


ARCADIA DRAIN E/SIDE LOWELL, END ENCLOSED SYSTEM
SEC #85

D/S END OF ENCLOSURE

Sheet 10/11

HUD 2027-07



ARCADIA DRAIN AND STADIUM DR 1ST CROSSING EAST OF OLIVER ST (UPSTEM END FLOWS IS INTO STORM SYSTEM M.H)

U/S END OF ENCLOSURE

Sheet 11/11

HUD 2027-07

ARCADIA CREEK

CITY OF KALAMAZOO, MICHIGAN

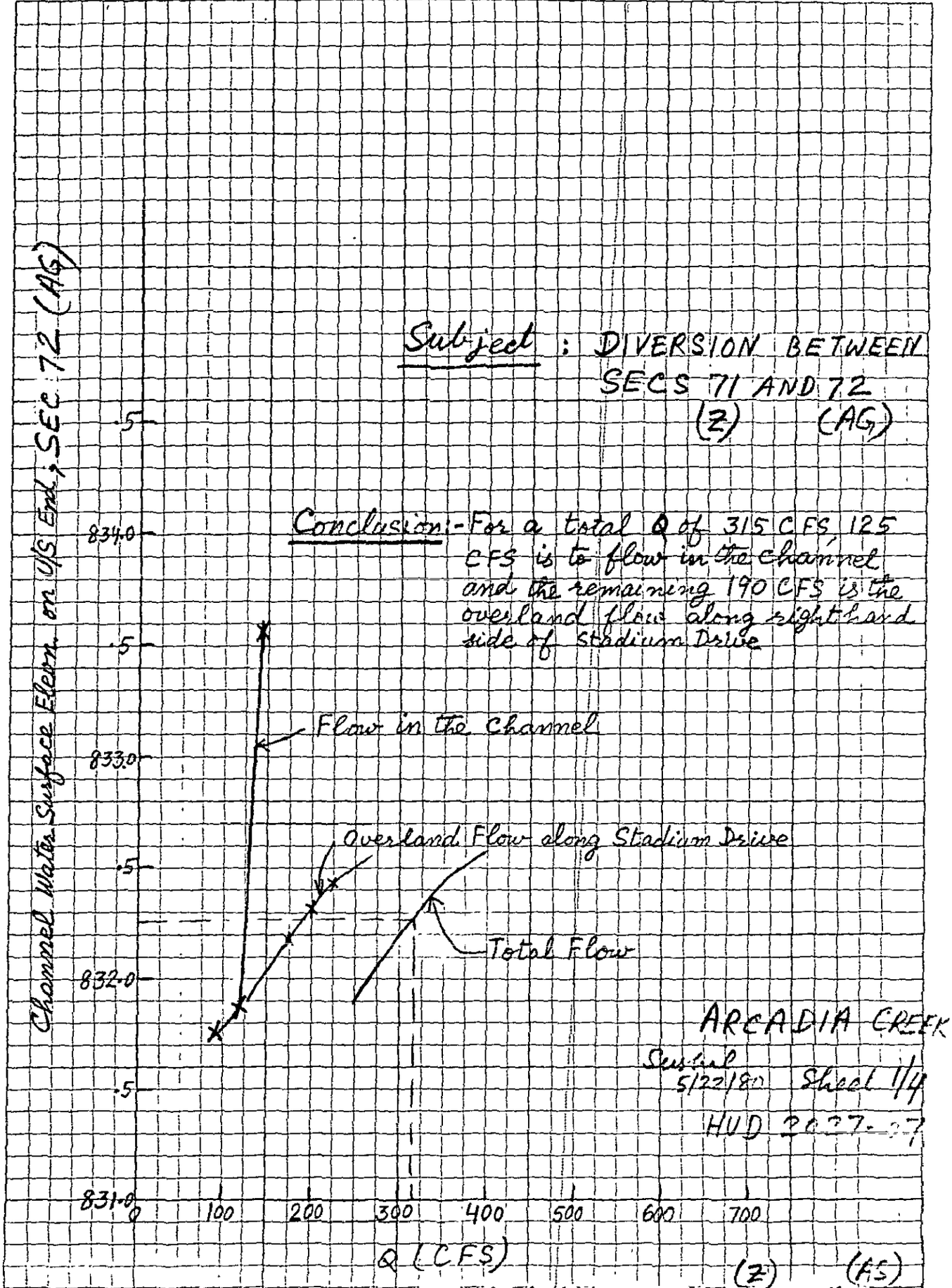
EXHIBIT 6

DIVERSION ANALYSES

46 0460
K&E 6 x 6 TO THE INCH • 7 x 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

Subject : DIVERSION BETWEEN SECS 71 AND 72
(Z) (AG)

Conclusion:- For a total Q of 315 CFS 125 CFS is to flow in the channel and the remaining 190 CFS is the overland flow along right hand side of Stadium Drive



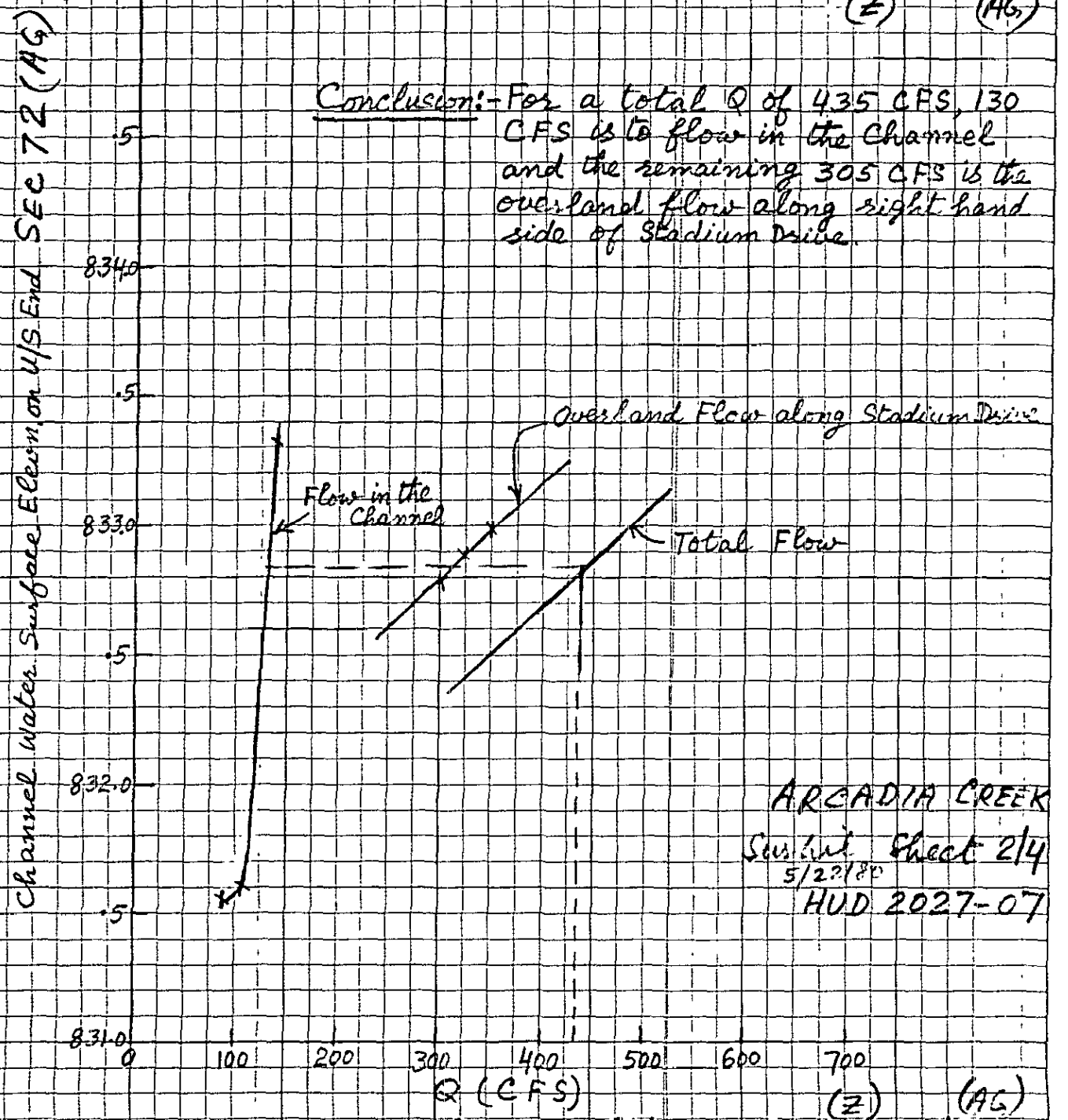
ARCADIA CREEK
Sessinal
5/22/80 Sheet 1/4
HUD 2077-27

10 Year Storm; Diversion between Secs 71 and 72
(Z) (AS)

Sheet 1/4

Subject: DIVERSION BETWEEN SECS 71 AND 72
(Z) (AG)

Conclusion:- For a total Q of 435 CFS, 130 CFS is to flow in the Channel and the remaining 305 CFS is the overland flow along right hand side of Stadium Drive.



ARCADIA CREEK
Sushil Sheet 2/4
5/22/80
HUD 2027-07

50 year Storm; Diversion between Secs 71 and 72
(Z) (AG)

Sheet 2/4

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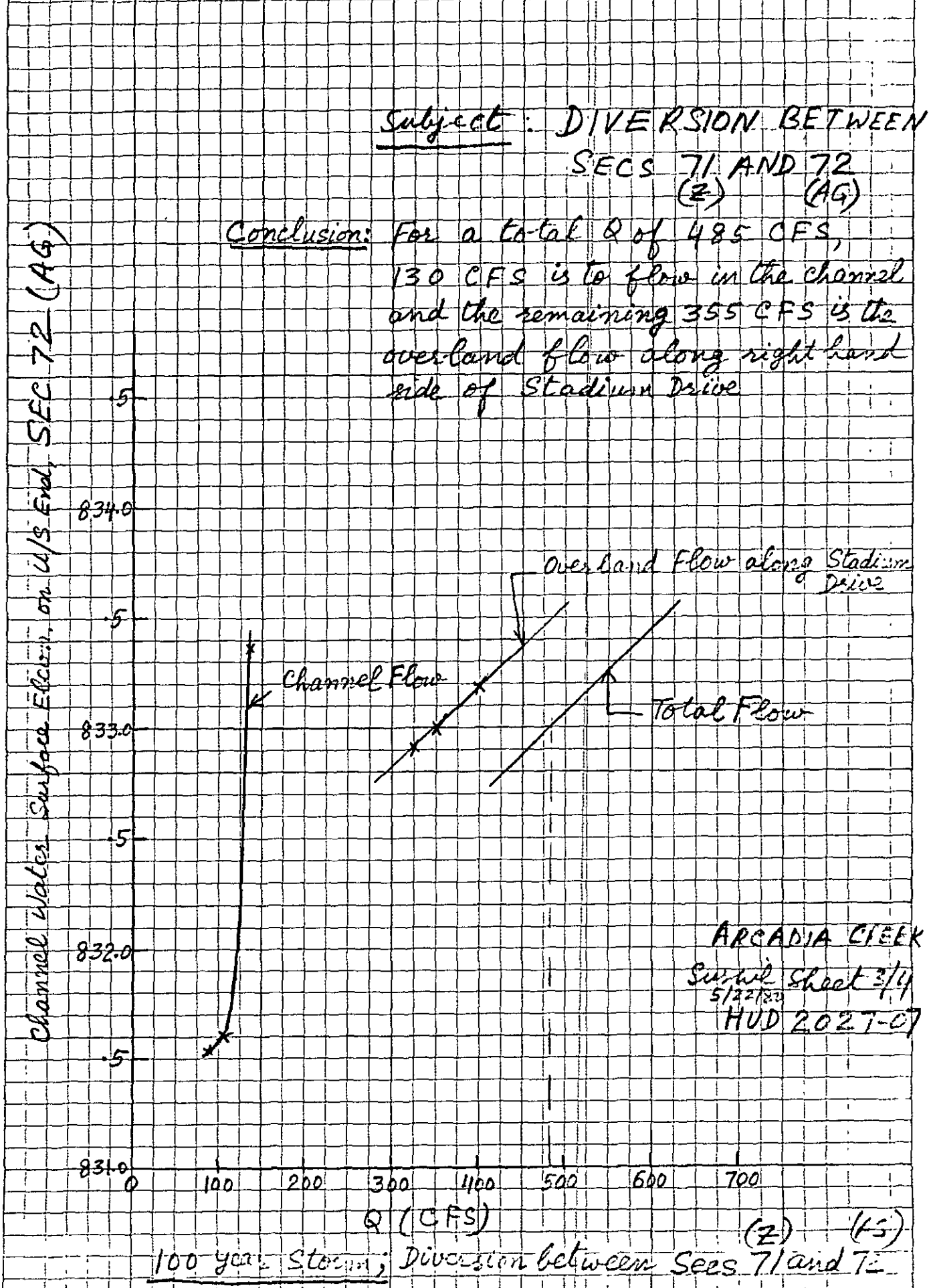
46 0460
K·E 6 x 6 TO THE INCH • 7 x 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

Subject: DIVERSION BETWEEN SECS 71 AND 72
(Z) (AG)

Conclusion: For a total Q of 485 CFS, 130 CFS is to flow in the channel and the remaining 355 CFS is the overland flow along right hand side of Stadium Drive

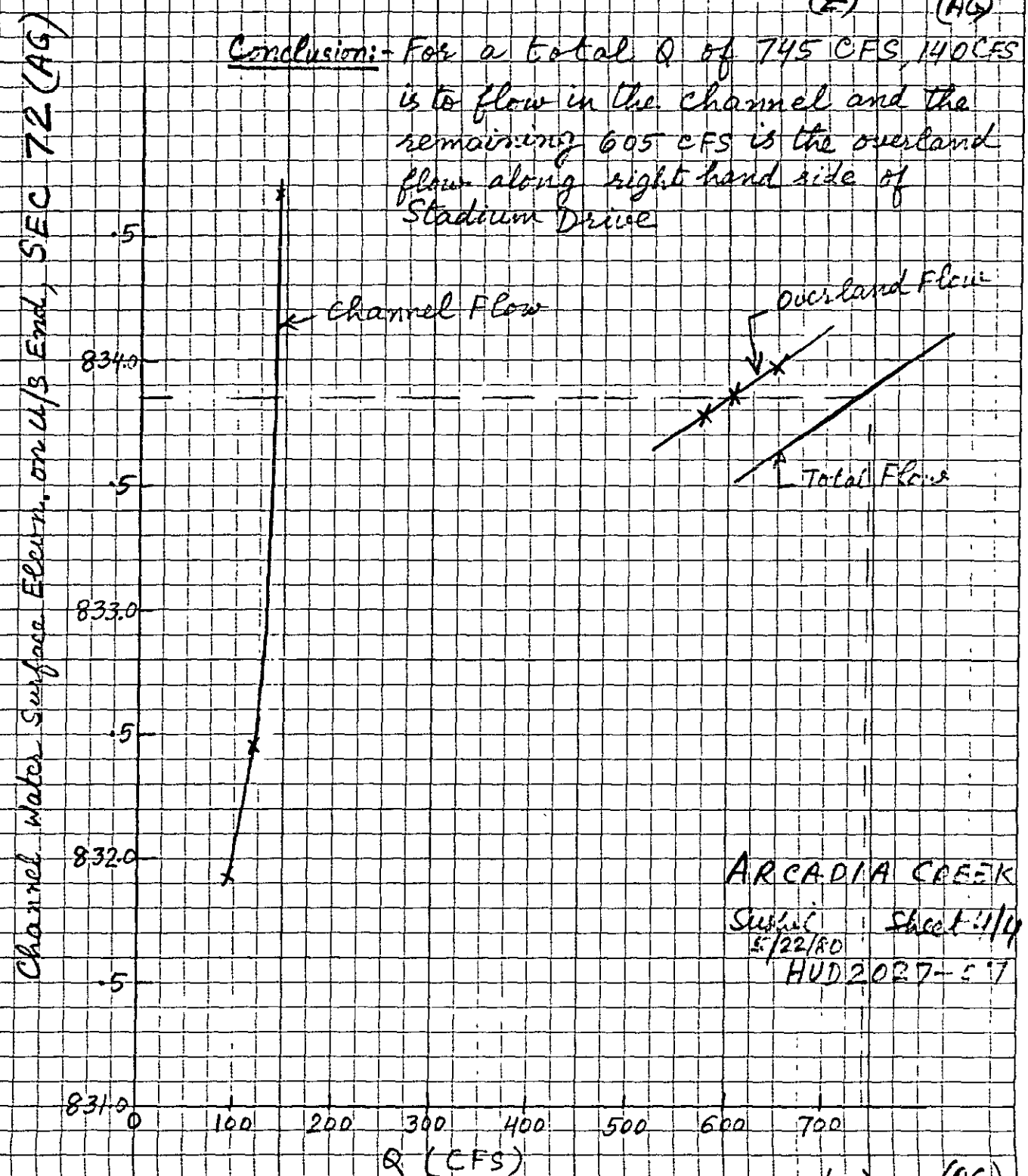


ARCADIA CREEK
Submit Sheet 3/4
5/22/83
HUD 2027-07

100 year Storm; Diversion between Secs 71 and 72
(Z) (AG)

Subject: DIVERSION BETWEEN SESC 71 (Z) AND 72 (AG)

Conclusion:- For a total Q of 745 CFS, 140 CFS is to flow in the channel and the remaining 605 CFS is the overland flow along right hand side of Stadium Drive



ARCADIA CREEK
Suphil 5/22/80 Sheet 4/4
HUD 2027-5 7

500 year Storm; Diversion between Secs 71 (Z) and 72 (AG)

Sheet 4/4

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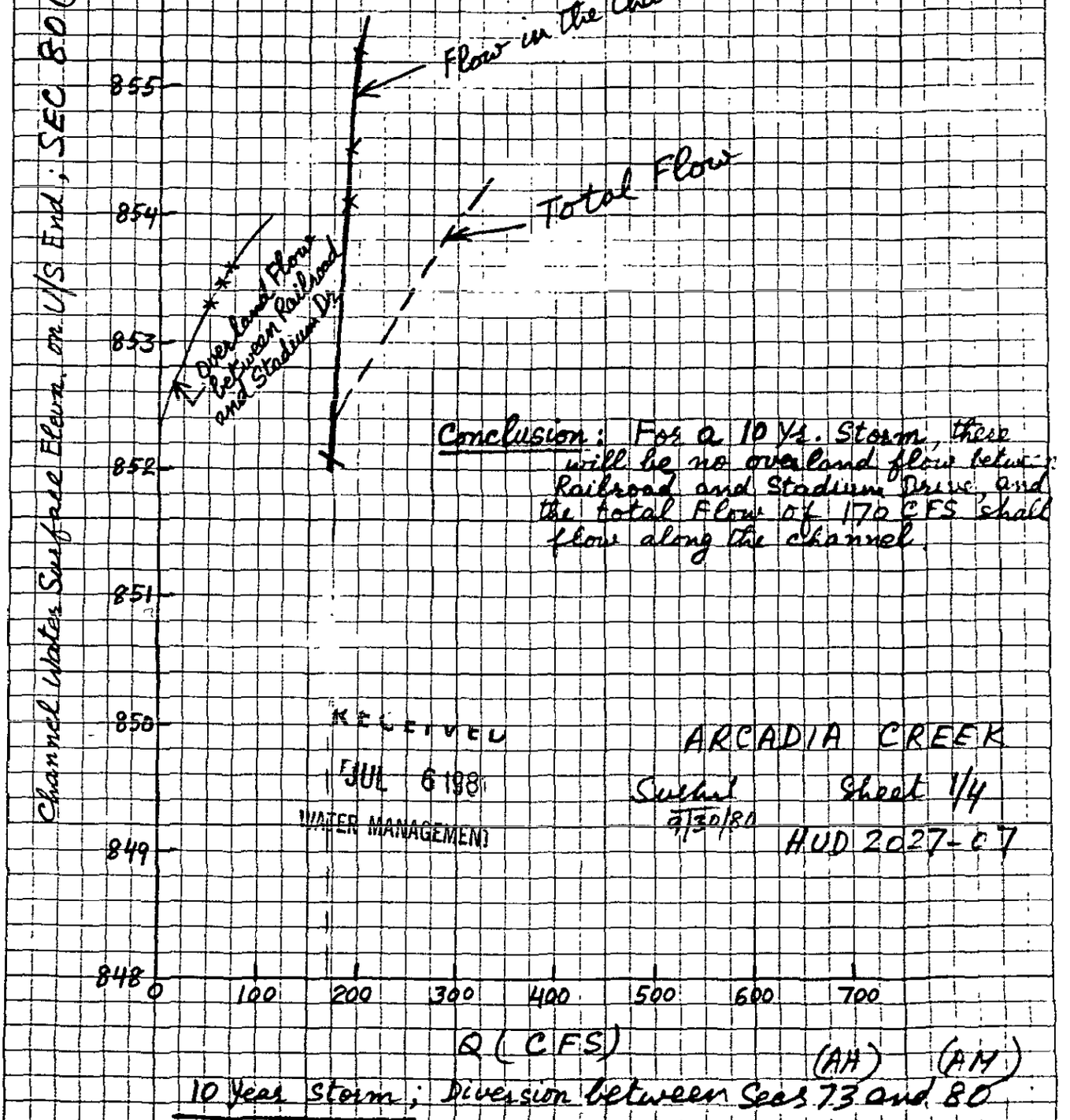
46 0460
K+E 6 x 6 TO THE INCH • 7 x 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

Subject: DIVERSION BETWEEN SECS 73 AND 80 (AH) (AM)



Conclusion: For a 10 Yr. Storm, there will be no overland flow between Railroad and Stadium Drive and the total flow of 170 CFS shall flow along the channel.

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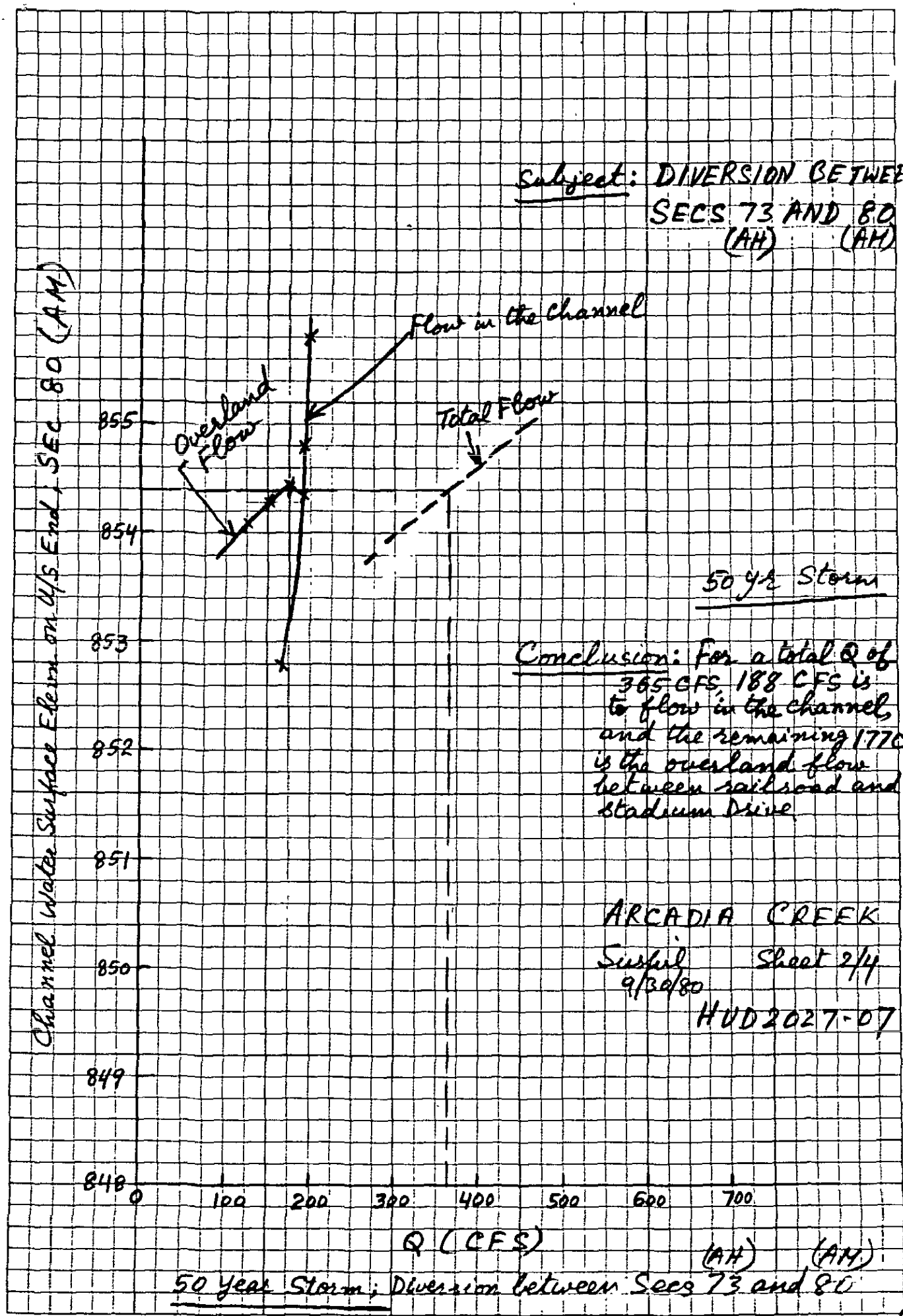
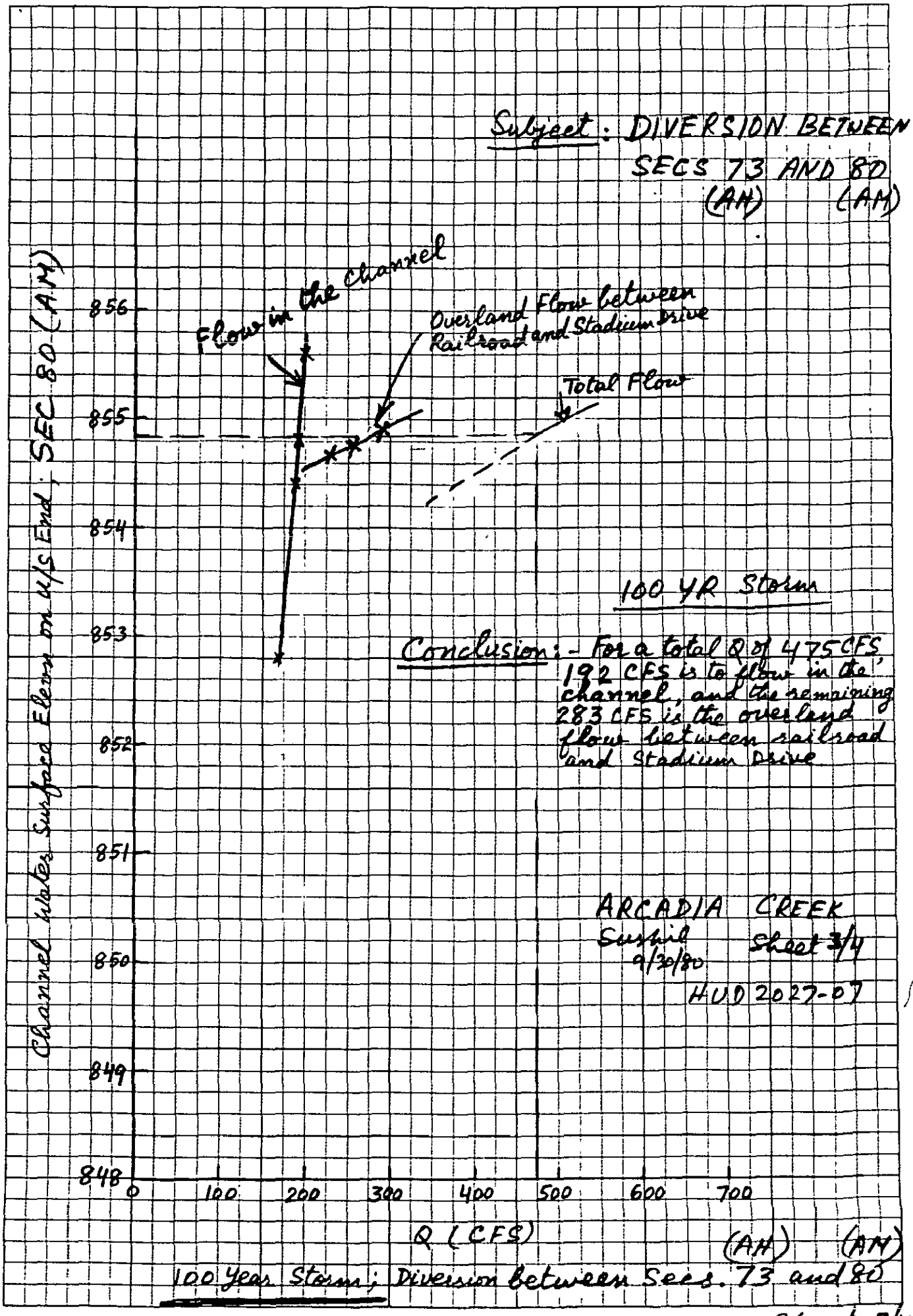
ARCADIA CREEK
Subdivision
7/30/80
Sheet 1/4
HUD 2027-C7

(AH) (AM)

10 Year Storm; Diversion between Secs 73 and 80


Subject: DIVERSION BETWEEN SECS 73 AND 80 (AH) (AH)
Flow in the Channel
Overland Flow
Total Flow
855
854
853
852
851
850
849
848
0
100
200
300
400
500
600
700
Channel Water Surface Elev. on U/S End, SEC 80 (AM)
Q (CFS)
50 Yr Storm
Conclusion: For a total Q of 365 CFS, 188 CFS is to flow in the channel, and the remaining 177 CFS is the overland flow between railroad and Stadium Drive
ARCADIA CREEK
Sheet 2/4
9/30/80
HUD 2027-07
(AH) (AH)
50 Year Storm; Diversion between Secs 73 and 80
Sheet 2/4

Subject: DIVERSION BETWEEN SECS 73 AND 80 (AM) (AM)



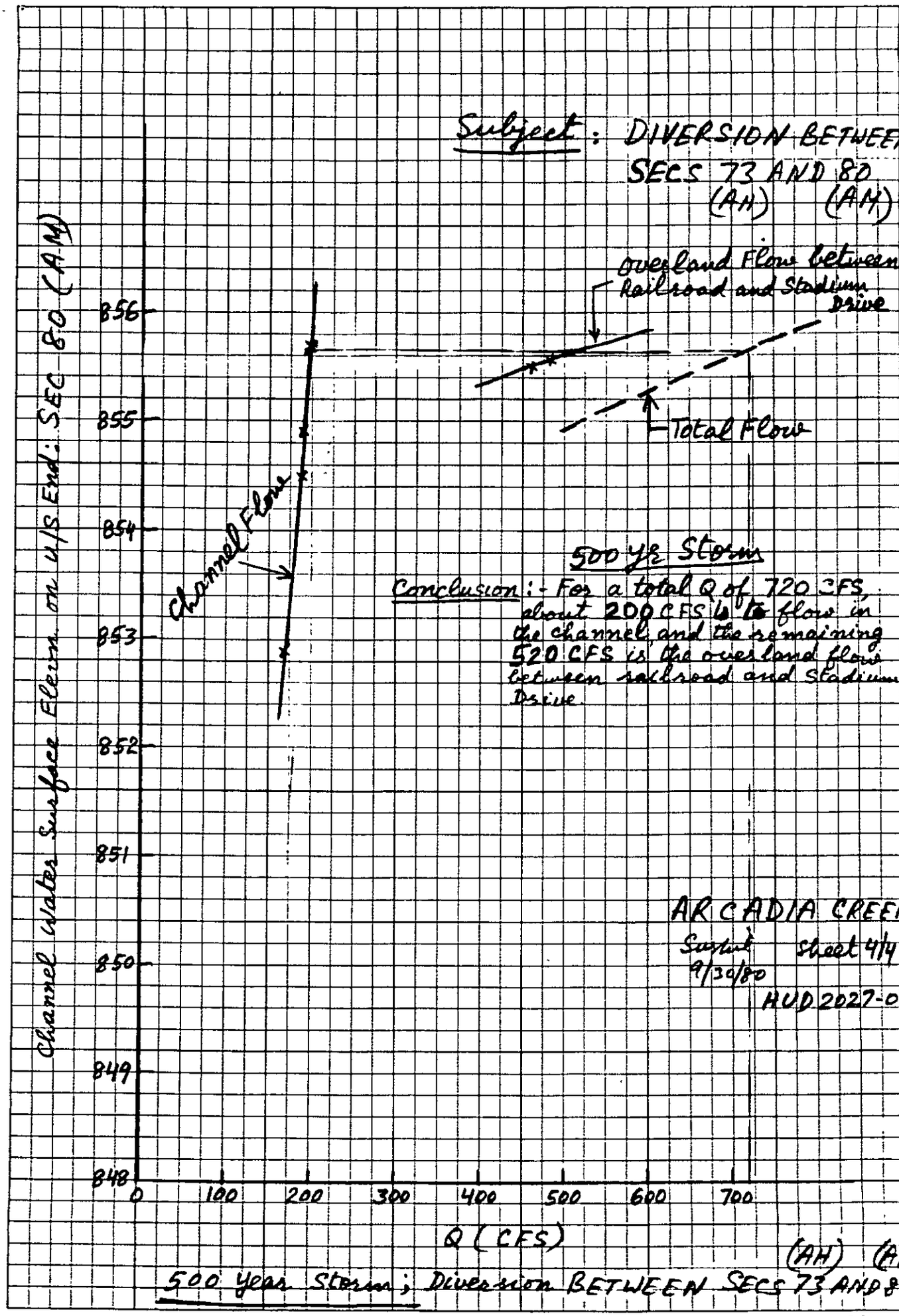
100 YR Storm

Conclusion:- For a total Q of 475 CFS, 192 CFS is to flow in the channel, and the remaining 283 CFS is the overland flow between railroad and Stadium Drive

ARCADIA CREEK
Sunhill 9/30/80 Sheet 3/4
HUD 2027-07

100 Year Storm; Diversion between Secs. 73 and 80 (AM) (AM)

Sheet 3/4



Sheet 1/1

46 0460
K+E 6 x 6 TO THE INCH • 7 x 10 INCHES KEUFFEL & ESSER CO MADE IN U.S.A.

00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: KALAMAZOO, CITY OF

3) WATERCOURSE: ARCADIA CREEK

4) DOCUMENT TYPE: 100-YR SUMMARY
Natural [redacted] 1977

00BREAK00

****

HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
ERROR CORR - 01
MODIFICATION - 50,51,52

****

NOTE-ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

ARCADIA CREEK KALAMAZOO

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
*	1.000	0.00	0.00	0.00	766.40	672.00	767.49	767.49	767.96	35.76	5.89	298.94	112.30
	2.000	750.00	0.00	0.00	767.00	672.00	768.70	0.00	768.75	3.93	2.42	660.64	339.04
	3.000	335.00	0.00	0.00	768.00	672.00	768.93	0.00	769.16	134.35	0.00	176.18	57.98
	3.500	225.00	0.00	0.00	769.10	672.00	770.46	0.00	770.50	33.94	0.00	387.65	115.35
	4.000	220.00	0.00	0.00	770.20	672.00	771.39	0.00	771.47	59.73	0.00	301.06	86.95
	5.000	150.00	0.00	0.00	770.20	672.00	771.66	0.00	771.71	7.35	2.31	541.70	267.95
	6.000	310.00	0.00	0.00	771.50	672.00	772.22	0.00	772.41	294.83	5.82	228.99	39.14
	7.000	150.00	0.00	0.00	773.20	672.00	774.24	0.00	774.54	73.33	6.57	403.40	78.47
*	8.000	125.00	0.00	0.00	773.00	672.00	775.72	775.72	776.08	69.88	6.22	506.27	80.39
*	9.000	110.00	0.00	0.00	775.60	672.00	776.62	776.62	777.00	35.25	5.60	691.46	113.19
*	9.500	55.00	0.00	0.00	776.20	672.00	777.22	777.22	777.60	36.09	5.65	685.67	111.86
*	10.000	60.00	0.00	0.00	777.00	672.00	777.72	777.72	778.08	69.56	6.21	592.66	80.57
*	10.500	55.00	0.00	0.00	777.50	672.00	778.21	778.21	778.58	71.32	6.25	578.01	79.57
	11.000	55.00	0.00	0.00	778.00	672.00	778.76	778.85	779.06	100.62	6.30	369.47	67.06
	12.000	150.00	0.00	0.00	777.40	672.00	779.42	0.00	779.44	8.01	1.49	852.44	237.39
	13.000	50.00	0.00	0.00	777.60	814.00	779.48	0.00	779.50	17.86	1.25	736.44	192.62
	14.000	220.00	0.00	0.00	779.50	814.00	780.33	780.08	781.47	131.16	5.92	459.57	60.46
	15.000	350.00	0.00	0.00	780.00	814.00	781.69	0.00	781.73	14.43	3.08	1058.66	214.29
	16.000	365.00	0.00	0.00	780.60	814.00	782.31	0.00	782.34	18.99	2.58	652.76	186.79
	17.000	148.00	0.00	0.00	781.40	814.00	782.74	0.00	782.79	54.73	1.80	459.13	110.03

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	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CUSEL	CRIMS	EG	10K*S	VCH	AREA	.01K
	18.000	117.00	0.00	0.00	782.20	814.00	783.42	0.00	783.65	79.92	0.00	214.06	91.06
	19.000	230.00	0.00	0.00	783.50	792.00	784.80	0.00	785.00	46.31	2.02	305.24	116.32
	20.000	230.00	0.00	0.00	785.00	792.00	786.05	0.00	786.18	70.11	3.85	284.21	94.59
	21.000	220.00	0.00	0.00	786.30	792.00	787.17	0.00	787.42	54.20	4.73	235.85	107.58
	22.000	235.00	0.00	0.00	787.50	792.00	788.20	788.19	788.53	48.57	5.12	208.30	113.64
*	23.000	215.00	0.00	0.00	788.40	792.00	789.18	789.18	789.58	60.85	5.05	218.33	123.91
	24.000	225.00	0.00	0.00	789.30	792.00	790.15	0.00	790.46	35.28	4.95	247.13	133.35
*	25.000	190.00	0.00	0.00	790.10	792.00	790.95	790.95	791.30	30.71	5.19	305.76	127.29
	26.000	180.00	0.00	0.00	790.80	792.00	791.80	0.00	791.96	20.72	4.24	745.92	174.00
*	27.000	270.00	0.00	0.00	786.20	1020.00	792.71	792.71	793.14	77.86	7.71	311.09	115.61
	28.000	45.00	0.00	0.00	786.30	1020.00	793.31	0.00	793.44	30.57	5.17	556.64	186.48
	29.000	82.00	792.80	791.40	786.70	1020.00	794.35	0.00	794.43	21.22	4.17	602.11	221.44
	30.000	55.00	0.00	0.00	786.90	1020.00	794.39	0.00	794.49	5.16	2.16	451.15	448.99
	31.000	300.00	0.00	0.00	787.90	1020.00	794.59	0.00	794.90	29.44	4.77	243.34	197.99
*	32.000	150.00	0.00	0.00	788.90	1020.00	795.53	795.53	796.04	91.43	8.23	253.38	106.67
	33.000	92.00	795.30	794.40	788.90	1020.00	796.51	0.00	796.60	16.08	3.84	512.58	256.33
	34.000	75.00	0.00	0.00	789.30	1020.00	796.58	0.00	796.74	11.83	4.13	439.39	296.54
	35.000	400.00	0.00	0.00	791.30	1020.00	797.16	797.10	797.98	60.58	7.98	182.01	131.04
	36.000	310.00	0.00	0.00	791.00	1020.00	798.70	0.00	799.45	37.24	6.99	145.99	167.16
	37.000	50.00	0.00	0.00	791.30	1020.00	798.87	0.00	799.66	39.57	7.16	142.94	162.14
*	38.000	100.00	0.00	0.00	800.10	896.00	801.93	801.93	802.50	170.72	6.07	158.45	68.58
	39.000	100.00	0.00	0.00	802.00	896.00	803.35	0.00	803.66	73.76	4.44	246.81	104.33
	40.000	125.00	0.00	0.00	803.00	896.00	804.43	804.35	805.04	138.59	6.31	192.19	76.11
	41.000	100.00	0.00	0.00	804.00	896.00	805.69	805.57	806.37	121.48	6.63	203.27	91.29
	42.000	125.00	0.00	0.00	805.00	896.00	807.05	0.00	807.51	63.94	5.47	263.95	112.06
	43.000	175.00	0.00	0.00	806.50	896.00	808.33	0.00	808.91	93.00	6.12	224.38	92.91
	44.000	175.00	0.00	0.00	808.00	896.00	809.86	0.00	810.22	56.17	4.81	272.46	119.55
	45.000	475.00	0.00	0.00	808.50	896.00	811.06	0.00	811.14	8.57	2.33	694.22	306.14
	46.000	450.00	0.00	0.00	809.75	896.00	811.69	0.00	811.79	24.12	3.18	340.88	102.45

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SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CHSEL	CRWS	EG	10K*S	VCH	AREA	.01K
47.000	450.00	0.00	0.00	804.60	1020.00	812.05	0.00	812.16	4.17	2.75	547.77	499.22
48.000	125.00	0.00	0.00	805.60	1020.00	812.09	0.00	812.27	8.85	3.54	351.00	342.00
49.000	230.00	0.00	0.00	806.50	1020.00	812.10	0.00	813.02	53.07	9.75	212.51	140.02
50.000	95.00	0.00	0.00	807.70	485.00	813.47	0.00	813.52	4.26	2.11	474.04	235.00
51.000	126.00	813.10	812.70	807.70	485.00	815.87	0.00	815.80	0.43	0.92	1104.67	743.36
52.000	50.00	0.00	0.00	807.60	485.00	815.86	0.00	815.89	1.37	1.64	639.64	413.78
53.000	195.00	0.00	0.00	808.40	485.00	815.89	0.00	815.91	1.10	1.35	647.07	462.78
54.000	160.00	0.00	0.00	809.40	485.00	815.91	0.00	815.93	2.64	1.84	446.98	298.60
55.000	135.00	0.00	0.00	809.60	485.00	815.94	0.00	815.99	3.15	1.96	409.96	273.37
56.000	66.00	824.40	815.40	810.40	485.00	824.64	0.00	824.65	0.28	1.06	1097.46	913.70
57.000	60.00	0.00	0.00	811.40	485.00	824.64	0.00	824.66	3.49	1.04	618.98	259.72
58.000	48.00	0.00	0.00	812.60	485.00	824.62	0.00	824.73	16.25	3.56	328.75	120.30
59.000	133.00	824.40	817.60	814.40	485.00	826.79	0.00	826.81	1.15	1.45	795.38	452.43
60.000	100.00	0.00	0.00	814.00	485.00	826.81	0.00	826.81	0.05	0.48	2090.06	2161.39
61.000	50.00	0.00	0.00	814.70	485.00	826.81	0.00	826.81	0.05	0.45	2198.34	2232.22
62.000	100.00	0.00	0.00	814.50	485.00	826.81	0.00	826.81	0.05	0.48	2141.45	2173.46
63.000	120.00	0.00	0.00	815.80	485.00	826.81	0.00	826.81	0.06	0.51	2015.25	1958.55
64.000	20.00	0.00	0.00	814.70	485.00	826.81	0.00	826.81	0.05	0.47	2009.06	2085.34
65.000	166.00	0.00	0.00	814.60	485.00	826.81	0.00	826.82	0.42	1.27	985.79	752.04
65.100	1.00	818.30	817.80	814.60	485.00	826.82	0.00	826.82	0.98	0.80	915.44	689.50
65.900	3.00	818.30	817.80	814.60	485.00	826.82	0.00	826.82	0.98	0.80	916.42	490.19
66.000	1.00	0.00	0.00	814.90	485.00	826.82	0.00	826.83	0.42	1.27	985.14	748.80
67.000	100.00	0.00	0.00	815.60	485.00	826.83	0.00	826.83	0.11	0.49	2062.75	1490.31
67.100	1.00	819.70	818.40	815.60	485.00	826.83	0.00	826.83	0.20	0.37	1874.37	1074.64
67.900	10.00	819.70	818.40	815.60	485.00	826.83	0.00	826.83	0.20	0.37	1874.45	1074.71
68.000	1.00	0.00	0.00	815.60	485.00	826.83	0.00	826.83	0.11	0.49	2064.36	1492.04
69.000	125.00	0.00	0.00	816.80	485.00	826.84	0.00	826.84	0.19	0.61	1696.39	1114.15
70.000	125.00	0.00	0.00	817.40	485.00	826.83	0.00	826.85	0.61	1.20	939.24	620.27
71.000	125.00	0.00	0.00	818.60	485.00	826.84	0.00	826.86	1.48	1.66	642.51	399.09

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SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CUSEL	CRITS	EG	10K*S	VCH	AREA	.01K
71.100	130.00	0.00	0.00	822.60	355.00	826.85	0.00	826.94	48.46	2.66	169.24	51.00
71.200	130.00	0.00	0.00	823.60	355.00	827.83	0.00	827.93	72.97	3.00	136.85	41.56
71.300	130.00	0.00	0.00	824.60	355.00	828.56	0.00	828.70	76.57	3.13	133.50	40.57
71.400	130.00	0.00	0.00	825.60	355.00	829.56	0.00	829.70	77.31	3.14	132.84	40.37
71.500	130.00	0.00	0.00	827.10	355.00	830.78	0.00	830.97	120.47	3.64	106.79	32.36
71.600	130.00	0.00	0.00	828.40	355.00	831.90	0.00	832.01	54.69	2.81	142.58	48.00
71.700	130.00	0.00	0.00	829.40	355.00	832.71	0.00	832.84	72.85	3.09	129.26	41.59
72.000	130.00	0.00	0.00	827.50	485.00	833.05	0.00	833.59	30.55	5.89	85.00	87.75
73.000	410.00	0.00	0.00	829.00	485.00	834.74	0.00	835.23	53.69	5.63	89.21	66.19
73.500	30.00	0.00	0.00	828.00	192.00	835.14	0.00	835.47	119.17	5.21	54.81	17.59
74.000	240.30	640.40	933.70	828.00	192.00	840.70	0.00	840.71	1.46	0.04	395.23	160.23
75.000	100.00	0.00	0.00	831.10	192.00	840.71	0.00	840.71	0.05	0.29	853.19	834.93
76.000	540.00	0.00	0.00	833.50	192.00	840.71	0.00	840.72	0.25	0.51	879.41	386.30
77.000	265.00	0.00	0.00	832.80	192.00	840.72	0.00	840.73	0.33	0.96	336.40	210.75
77.500	65.00	0.00	0.00	834.20	192.00	840.72	0.00	840.75	3.28	1.88	208.93	105.95
78.000	65.00	0.00	0.00	835.50	192.00	840.74	0.00	840.79	6.16	2.22	168.21	77.34
79.000	165.00	0.00	0.00	836.40	192.00	840.86	0.00	840.93	10.86	2.56	138.93	58.26
79.100	210.00	0.00	0.00	837.50	192.00	841.19	0.00	841.38	39.22	3.51	58.13	30.66
79.120	150.00	0.00	0.00	838.30	192.00	841.92	0.00	842.35	88.89	5.35	40.57	20.36
79.130	150.00	0.00	0.00	839.10	192.00	843.22	0.00	843.68	86.04	5.01	45.06	20.70
79.190	70.00	0.00	0.00	839.50	192.00	843.99	0.00	844.78	236.30	7.13	26.95	12.49
79.200	50.00	0.00	0.00	839.90	192.00	845.39	0.00	846.60	460.88	8.82	21.77	8.94
79.500	123.00	920.50	944.50	840.30	192.00	854.60	0.00	854.78	37.35	3.62	56.19	31.21
80.000	50.00	0.00	0.00	840.80	475.00	854.83	0.00	854.83	0.29	0.82	1006.37	886.87
80.200	220.00	0.00	0.00	841.60	475.00	854.83	0.00	854.84	0.41	0.92	883.56	741.62
80.400	220.00	0.00	0.00	842.80	475.00	854.84	0.00	854.86	0.61	1.05	763.82	608.74
80.600	220.00	0.00	0.00	843.80	475.00	854.86	0.00	854.87	0.94	1.22	647.58	489.55
80.800	220.00	0.00	0.00	844.80	475.00	854.88	0.00	854.90	1.53	1.44	535.07	384.11
81.000	220.00	0.00	0.00	845.90	475.00	854.93	0.00	854.94	3.04	1.72	834.08	464.75

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SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CHSTL	CRIWS	EG	10K*S	VCH	AREA	.01K
81.200	200.00	0.00	0.00	846.90	475.00	854.95	0.00	854.97	1.89	1.38	675.55	345.97
81.600	200.00	0.00	0.00	847.90	475.00	855.00	0.00	855.02	3.77	1.77	525.16	244.69
82.000	200.00	0.00	0.00	848.90	475.00	855.09	0.00	855.11	4.91	1.74	528.66	214.31
82.100	160.00	0.00	0.00	850.00	475.00	855.19	0.00	855.30	22.64	3.37	248.54	99.82
82.200	160.00	0.00	0.00	851.00	475.00	855.69	0.00	855.83	44.30	4.26	196.07	71.37
82.300	160.00	0.00	0.00	852.00	475.00	856.44	0.00	856.67	59.47	4.72	176.18	61.59
82.400	160.00	0.00	0.00	853.00	475.00	857.41	0.00	857.65	62.22	4.80	173.30	60.22
82.500	160.00	0.00	0.00	854.00	475.00	858.46	0.00	858.39	83.05	5.77	129.39	52.12
82.600	160.00	0.00	0.00	855.00	475.00	859.71	0.00	860.03	59.56	5.14	150.12	61.55
83.000	170.00	0.00	0.00	855.90	475.00	860.71	0.00	860.99	51.65	4.83	156.20	66.09
83.200	230.00	0.00	0.00	856.90	475.00	861.04	0.00	862.09	43.83	4.57	167.02	71.75
83.400	230.00	0.00	0.00	857.90	475.00	862.85	0.00	863.10	43.50	4.56	167.53	72.02
84.000	250.00	0.00	0.00	859.40	475.00	863.87	0.00	864.14	39.28	4.47	151.74	75.79
86.300	370.00	0.00	0.00	860.40	475.00	865.10	0.00	865.39	20.50	4.00	173.35	88.99
85.000	370.00	0.00	0.00	861.60	475.00	866.44	0.00	866.75	45.34	4.87	134.86	70.54
85.500	415.00	0.00	0.00	862.90	475.00	868.10	0.00	868.34	31.79	4.33	156.97	84.24
86.000	415.00	0.00	0.00	864.20	475.00	869.14	0.00	869.28	15.13	3.98	189.95	118.26

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ARCADIA CREEK KALAMAZOO

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CUSEL	DIFUSU	DIFUSX	DIFCUS	TOPWID	XLCH
*	1.000	672.00	767.49	0.00	0.00	-0.51	361.53	0.00
	2.000	672.00	768.70	0.00	1.20	0.00	553.05	750.00
	3.000	672.00	768.93	0.00	0.23	0.00	307.82	335.00
	3.500	672.00	770.46	0.00	1.53	0.00	577.85	225.00
	4.000	672.00	771.39	0.00	0.93	0.00	436.54	220.00
	5.000	672.00	771.68	0.00	0.29	0.00	524.19	150.00
	6.000	672.00	772.22	0.00	0.55	0.00	525.42	310.00
	7.000	672.00	774.24	0.00	2.02	0.00	599.92	190.00
*	8.000	672.00	775.72	0.00	1.47	0.00	757.46	125.00
*	9.000	672.00	776.62	0.00	0.91	0.00	912.34	110.00
*	9.500	672.00	777.22	0.00	0.59	0.00	911.01	55.00
*	10.000	672.00	777.72	0.00	0.50	0.00	865.17	60.00
*	10.500	672.00	778.21	0.00	0.49	0.00	864.38	55.00
	11.000	672.00	778.74	0.00	0.55	0.00	907.23	55.00
	12.000	672.00	779.82	0.00	0.65	0.00	827.67	130.00
	13.000	814.00	779.48	0.00	0.06	0.00	1150.96	50.00
	14.000	814.00	780.55	0.00	0.05	0.00	1016.36	220.00
	15.000	814.00	781.69	0.00	1.37	0.00	1132.44	350.00
	16.000	814.00	782.31	0.00	0.61	0.00	667.46	365.00
	17.000	814.00	782.74	0.00	0.43	0.00	389.74	140.00
	18.000	814.00	783.62	0.00	0.88	0.00	280.09	117.00
	19.000	792.00	784.88	0.00	1.46	0.00	579.39	230.00
	20.000	792.00	786.05	0.00	1.17	0.00	495.74	230.00
	21.000	792.00	787.17	0.00	1.13	0.00	597.65	221.00
	22.000	792.00	788.20	0.00	1.03	0.00	352.50	235.00
*	23.000	792.00	789.18	0.00	0.98	0.00	356.14	215.00
	24.000	792.00	791.13	0.00	0.37	0.00	361.93	225.00

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	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	25.000	792.00	790.95	0.00	0.80	0.00	453.64	190.00
	26.000	792.00	791.80	0.00	0.85	0.00	1042.76	130.50
*	27.000	1020.00	792.71	0.00	0.91	0.00	306.02	270.00
	28.000	1020.00	793.31	0.00	0.60	0.00	297.92	45.00
	29.000	1020.00	794.35	0.00	1.04	0.00	307.53	92.50
	30.000	1020.00	794.39	0.00	0.04	0.00	310.88	55.00
	31.000	1020.00	794.59	0.00	0.20	0.00	221.89	300.00
*	32.000	1020.00	795.53	0.00	0.94	0.00	206.06	150.00
	33.000	1020.00	796.51	0.00	0.96	0.00	338.63	92.00
	34.000	1020.00	796.58	0.00	0.07	0.00	294.01	75.00
	35.000	1020.00	797.16	0.00	0.58	0.00	114.97	400.00
	36.000	1020.00	798.70	0.00	1.54	0.00	24.95	310.00
	37.000	1020.00	798.87	0.00	0.18	0.00	24.19	50.00
*	38.000	896.00	801.93	0.00	3.06	0.00	145.26	100.00
	39.000	896.00	803.35	0.00	1.42	0.00	217.21	100.00
	40.000	896.00	804.43	0.00	1.08	0.00	170.96	125.00
	41.000	896.00	805.69	0.00	1.26	0.00	160.98	100.00
	42.000	896.00	807.05	0.00	1.36	0.00	178.16	125.00
	43.000	896.00	808.33	0.00	1.28	0.00	167.73	175.00
	44.000	896.00	809.96	0.00	1.63	0.00	192.99	175.00
	45.000	896.00	811.06	0.00	1.20	0.00	235.47	475.00
	46.000	896.00	811.63	0.00	0.57	0.00	212.66	450.00
	47.000	1020.00	812.05	0.00	0.43	0.00	179.11	450.00
	48.000	1020.00	812.09	0.00	0.03	0.00	166.21	125.00
	49.000	1020.00	812.10	0.00	0.01	0.00	90.09	230.00
	50.000	495.00	813.47	0.00	1.37	0.00	259.04	95.00
	51.000	485.00	815.87	0.00	2.40	0.00	263.95	126.00
	52.000	485.00	815.86	0.00	-0.00	0.00	203.38	50.00
	53.000	485.00	815.89	0.00	0.03	0.00	217.93	195.00

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SECNO	Q	CUSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
54.000	485.00	815.91	0.00	0.01	0.00	203.26	160.00
55.000	485.00	815.94	0.00	0.04	0.00	199.17	135.00
56.000	485.00	824.64	0.00	8.69	0.00	218.83	66.00
57.000	485.00	824.64	0.00	-0.00	0.00	248.16	60.00
58.000	485.00	824.62	0.00	-0.01	0.00	228.59	48.00
59.000	485.00	826.79	0.00	2.17	0.00	238.21	133.00
60.000	485.00	826.81	0.00	0.02	0.00	199.65	100.00
61.000	485.00	826.81	0.00	0.00	0.00	209.66	50.00
62.000	485.00	826.81	0.00	0.00	0.00	209.64	100.00
63.000	485.00	826.81	0.00	0.00	0.00	209.62	120.00
64.000	485.00	826.81	0.00	0.00	0.00	209.62	20.00
65.000	485.00	826.81	0.00	-0.00	0.00	196.26	166.00
65.100	485.00	826.82	0.00	0.01	0.00	196.28	1.00
65.900	485.00	826.82	0.00	0.00	0.00	196.34	8.00
66.000	485.00	826.82	0.00	-0.00	0.00	196.38	1.00
67.000	485.00	826.83	0.00	0.02	0.00	314.23	189.00
67.100	485.00	826.83	0.00	0.00	0.00	314.29	1.00
67.900	485.00	826.83	0.00	0.00	0.00	314.29	10.00
68.000	485.00	826.83	0.00	0.00	0.00	314.29	1.00
69.000	485.00	826.84	0.00	0.00	0.00	300.01	125.00
70.000	485.00	826.83	0.00	-0.00	0.00	248.56	125.00
71.000	485.00	826.84	0.00	0.00	0.00	237.10	125.00
71.100	355.00	826.85	0.00	0.01	0.00	139.27	130.00
71.200	355.00	827.60	0.00	0.75	0.00	111.55	130.00
71.300	355.00	828.56	0.00	0.97	0.00	108.27	130.00
71.400	355.00	829.56	0.00	1.00	0.00	107.62	130.00
71.500	355.00	830.78	0.00	1.21	0.00	77.41	130.00
71.600	355.00	831.90	0.00	1.13	0.00	65.21	130.00
71.700	355.00	832.71	0.00	0.80	0.00	63.74	130.00

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SECNO	K	CHSEL	DIFHSP	DIFHSX	DIFKHS	TOPWID	XLCH
72.000	485.00	833.05	0.00	0.35	0.00	21.51	130.00
73.000	485.00	834.74	0.00	1.69	0.00	21.60	410.00
73.500	192.00	835.14	0.00	0.40	0.00	28.80	30.00
74.000	192.00	840.70	0.00	5.57	0.00	93.42	298.00
75.000	192.00	840.71	0.00	0.01	0.00	144.62	100.00
76.000	192.00	840.71	0.00	0.01	0.00	267.52	540.00
77.000	192.00	840.72	0.00	0.01	0.00	99.08	265.00
77.500	192.00	840.72	0.00	-0.00	0.00	78.29	65.00
78.000	192.00	840.74	0.00	0.02	0.00	62.45	65.00
79.000	192.00	840.86	0.00	0.12	0.00	55.92	165.00
79.100	192.00	841.19	0.00	0.33	0.00	27.16	210.00
79.120	192.00	841.92	0.00	0.73	0.00	20.28	150.00
79.180	192.00	843.22	0.00	1.29	0.00	22.39	150.00
79.190	192.00	843.99	0.00	0.78	0.00	7.99	70.00
79.200	192.00	845.39	0.00	1.40	0.00	4.00	50.00
79.500	192.00	854.60	0.00	9.21	0.00	4.00	123.00
80.000	475.00	854.83	0.00	0.23	0.00	125.09	90.00
80.200	475.00	854.83	0.00	0.01	0.00	122.15	220.00
80.400	475.00	854.84	0.00	0.01	0.00	119.22	220.00
80.600	475.00	854.86	0.00	0.01	0.00	116.31	220.00
80.800	475.00	854.88	0.00	0.02	0.00	112.54	220.00
81.000	475.00	854.93	0.00	0.05	0.00	169.53	220.00
81.200	475.00	854.95	0.00	0.02	0.00	160.67	200.00
81.400	475.00	855.00	0.00	0.05	0.00	151.44	200.00
82.000	475.00	855.09	0.00	0.09	0.00	150.79	200.00
82.100	475.00	855.19	0.00	0.10	0.00	97.01	100.00
82.200	475.00	855.65	0.00	0.46	0.00	95.27	160.00
82.300	475.00	856.44	0.00	0.79	0.00	94.60	160.00
82.400	475.00	857.41	0.00	0.97	0.00	94.50	160.00

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SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
82.500	475.00	858.46	0.00	1.05	0.00	81.61	160.00
82.600	475.00	859.71	0.00	1.25	0.00	85.01	160.00
83.000	475.00	860.71	0.00	1.00	0.00	78.88	170.00
83.200	475.00	861.84	0.00	1.14	0.00	79.67	230.00
83.400	475.00	862.85	0.00	1.01	0.00	79.71	230.00
84.000	475.00	863.87	0.00	1.02	0.00	70.10	250.00
84.500	475.00	865.18	0.00	1.31	0.00	71.54	370.00
85.000	475.00	866.44	0.00	1.26	0.00	59.57	370.00
85.500	475.00	868.10	0.00	1.66	0.00	62.26	415.00
86.000	475.00	869.14	0.00	1.04	0.00	73.58	415.00

SUMMARY OF ERRORS

```
CAUTION  SECNO=   1.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   8.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   8.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=   9.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   9.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=   9.500  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   9.500  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=   9.500  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO=  10.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=  10.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=  10.500  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=  10.500  PROFILE= 1  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=  23.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=  23.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=  25.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=  25.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=  27.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=  27.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=  32.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=  32.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=  32.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO=  38.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=  38.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=  38.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL
```

O.K., road elevation is higher than mean water level at the mouth.

O.K. longitudinal slope is relatively steep.

O.K., overland flow moves into the channel which is at a lower elevation.

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00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: KALAMAZOO, CITY OF

3) WATERCOURSE: ARCADIA CREEK

4) DOCUMENT TYPE: CROSS-SECTION PLOTS

00BREAK00

CROSS SECTION 1.00
STREAM ARCADIA CREEK KALAMAZOO
DISCHARGE= 670.

PLOTTED POINTS (BY PRIORITY)-B=BOTTOM BRIDGE,T=TOP BRIDGE,X=GROUND,W=WATER SUR,E=ENERGY GRADIENT,C=CRITICAL WSEL

	ELEV	766.	767.	768.	769.	770.	771.	772.	773.	774.	775.	776.
	SQ-FEET											
2	0.					X						
	10.					X						
	20.					X						
	30.					X						
	40.				X							
	50.				X							
	60.				X							
	70.				X							
	80.				X							
	90.				X							
	100.				X							
	110.				X							
	120.				X E							
	130.			X	E							
	140.			X	E							
	150.		X		E							
	160.		X		E							
	170.		X		E							
3	100.	X			E							
	190.	X		W	E							
	200.	X		W	E							
4	210.	X		W	E							
	220.	X			E							
	230.	X			E							
	240.	X			E							
	250.	X		W	E							
	260.	X		W	E							
	270.	X			E							
	280.	X		W	E							
	290.	X			E							
	300.	X			E							
	310.	X		W	E							
	320.	X			E							
	330.	X		W	E							
	340.	X			E							
	350.	X			E							
	360.	X			E							
5	370.	X		W	E						BANK	
	380.	X		W	E							
	390.	X			E							
	400.	X			E							
	410.	X			E							
	420.	X			E							
	430.	X		W	E							
	440.	X		W	E							
	450.	X			E							
6	460.	X		W	E						BANK	
	470.		X		E							
	480.		X		E							
	490.			X	E							
	500.			X	E							

```
      510.  .  .  .
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CROSS SECTION 4.00
STREAM ARCADIA CREEK KALAMAZOO
DISCHARGE= 670.

PLOTTED POINTS (BY PRIORITY)-B=BOTTOM BRIDGE,T=TOP BRIDGE,X=GROUND,W=WATER SURFACE,E=ENERGY GRADIENT,C=CRITICAL WSEL

	ELEV	770.	771.	772.	773.	774.	775.	776.	777.	778.	779.	780.
	STA-FEET											
2	0.						X					
	20.						X					
	40.						X					
	60.						X					
	80.						X					
	100.						X					
	120.						X					
	140.					X						
	160.					X						
	180.					X						
	200.					X						
	220.					X						
	240.					X						
	260.				X							
	280.				X							
	300.				X							
	320.				X							
	340.			X								
3	360.			X								BANK
	380.			X								
	400.				X							
	420.				X							
	440.				X							
4	460.				X							BANK
	480.				X							
	500.					X						
	520.				XE							
5	540.				X	E						
	560.				X	E						
	580.				X	E						
6	600.				X	E						
	620.				X	E						
	640.				X	E						
	660.				X	E						
	680.				X	E						
	700.				X	E						
	720.				X	E						
	740.			X		E						
	760.			X		E						
	780.			X		E						
	800.			X		E						
	820.			X		E						
	840.			X		E						
	860.		X			E						
	880.		X			E						
	900.		X			E						
	920.		X			E						
7	940.		X			E						
	960.		X			E						
	980.		X			E						
	1000.		X			E						

```
81020. . X        .     .E  .         .         .         .         .         .         .         .         .         .
 1040. .          .   X CE  .         .         .         .         .         .         .         .         .         .
 1060. .          .         .     X   .         .         .         .         .         .         .         .         .
 1080. .          .         .         .       X .         .         .         .         .         .         .         .
91100. .          .         .         .         .         X         .         .         .         .         .         .
```

```
NRD=        0 ELLC=  9999999.00 ELTRD=  9999999.00
```

```
EL(I),STA(I)
   775.00        0.00      772.20      370.00      772.20      460.00      771.40      540.00      771.40      600.00
   770.20      950.00      770.20     1020.00      775.00     1100.00
```

CROSS SECTION 9.00
STREAM ARCADIA CREEK KALAMAZOO
DISCHARGE= 670.

PLOTTED POINTS (BY PRIORITY)-B=BOTTOM BRIDGE,T=TOP BRIDGE,X=GROUND,W=WATER SUR,E=ENERGY GRADIENT,C=CRITICAL WSEL

ELEV	775.	776.	777.	778.	779.	780.	781.	782.	783.	784.	785.
STA=FEET											
2 0.				X							
20.				X							
40.				X							
60.				X							
80.				X							
100.				X							
120.				X							
140.				X							
160.				X							
180.			X	E							
200.			X	E							
220.			X	E							
240.			X	E							
260.			X	W E							
280.			X	W E							
300.			X	W E							
320.			X	W E							
340.			X	W E							
3 360.		X		W E						BANK	
380.		X		W E							
400.		X		W E							
420.		X		W E							
440.		X		W E							
4 460.		X		W E						BANK	
480.		X		W E							
500.		X		W E							
520.		X		W E							
540.		X		W E							
560.		X		W E							
580.		X		W E							
600.		X		W E							
620.		X		W E							
640.		X		W E							
660.		X		W E							
680.		X		W E							
700.		X		W E							
720.		X		W E							
740.		X		W E							
760.		X		W E							
780.		X		W E							
800.		X		W E							
820.		X		W E							
840.		X		W E							
860.		X		W E							
880.		X		W E							
900.		X		W E							
920.		X		W E							
940.		X		W E							
960.		X		W E							
980.		X		W E							
1000.		X		W E							

```
51020. .        X     W   E        .        .        .        .        .        .        .        .        .
 1040. .        X     W   E        .        .        .        .        .        .        .        .        .
 1060. .        X     W   E        .        .        .        .        .        .        .        .        .
61080. .        X     W   E        .        .        .        .        .        .        .        .        .
 1100. .        .   X W   E        .        .        .        .        .        .        .        .        .
 1120. .        .      X  E        .        .        .        .        .        .        .        .        .
 1140. .        .          X        .        .        .        .        .        .        .        .        .
 1160. .        .              X    .        .        .        .        .        .        .        .        .
 1180. .        .                 X .        .        .        .        .        .        .        .        .
71200. .        .                   X        .        .        .        .        .        .        .        .

NRD=        0 ELLC=  9999999.00 ELTRD=  9999999.00

  EL(I),STA(I)
     778.00        0.00      775.60      370.00      775.60      460.00      776.00     1030.00      776.00     1090.00
     778.00     1200.00
```

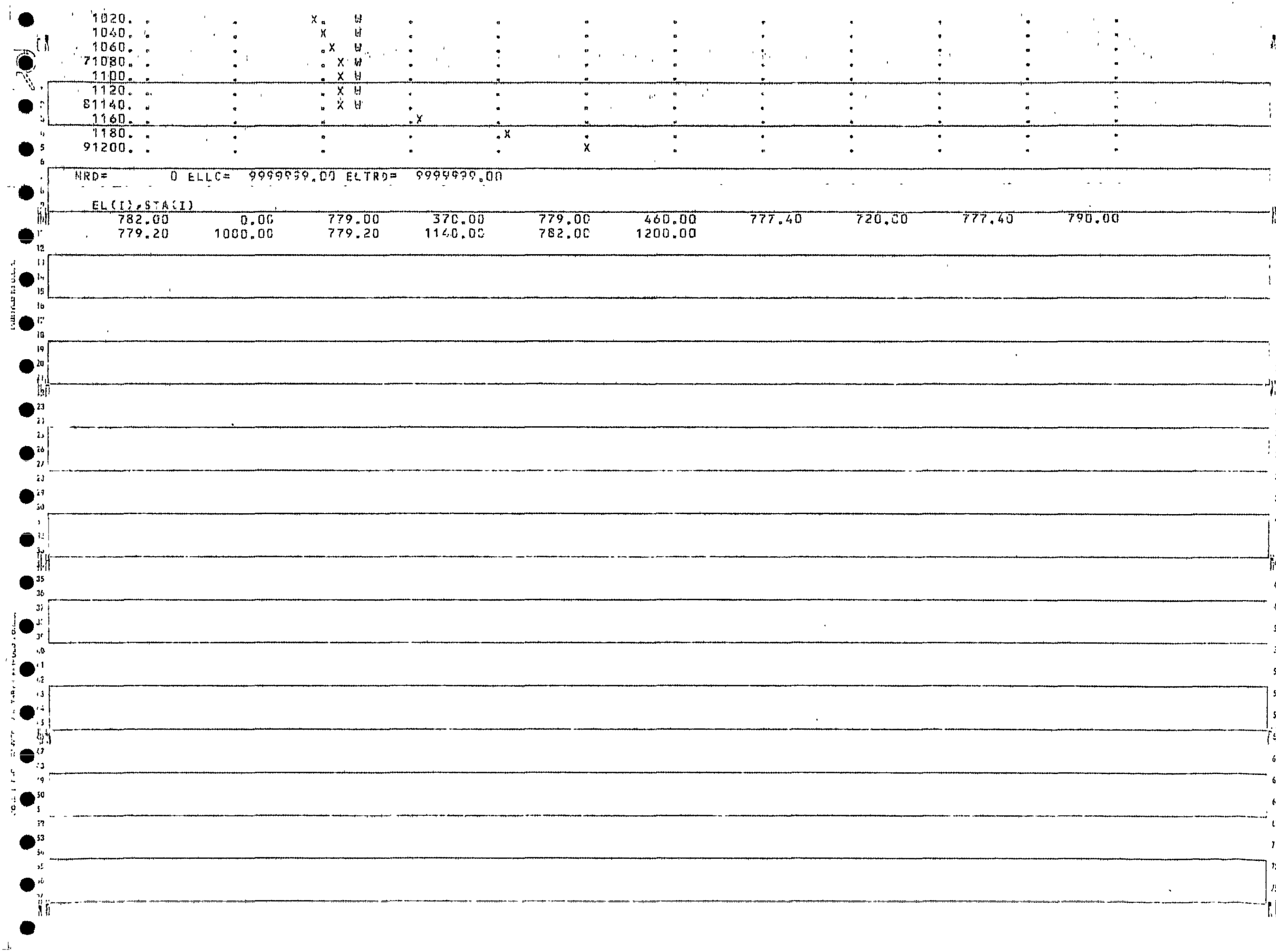
CROSS SECTION 12.00
STREAM ARCADIA CREEK KALAMAZOO
DISCHARGE= 670.

PLOTTED POINTS (BY PRIORITY):-B=BOTTOM BRIDGE,T=TOP BRIDGE,X=GROUND,W=WATER SURFACE,E=ENERGY GRADIENT,C=CRITICAL WSEL

ELEV	777.	778.	779.	780.	781.	782.	783.	784.	785.	786.	787.

STA-FEET

2	0.	
	20.	
	40.	
	60.	
	80.	
	100.	
	120.	
	140.	
	160.	
	180.	
	200.	
	220.	
	240.	
	260.	
	280.	
	300.	
	320.	
	340.	
3	360.	BANK
	380.	
	400.	
	420.	
	440.	
4	460.	BANK
	480.	
	500.	
	520.	
	540.	
	560.	
	580.	
	600.	
	620.	
	640.	
	660.	
	680.	
	700.	
5	720.	
	740.	
	760.	
6	780.	
	800.	
	820.	
	840.	
	860.	
	880.	
	900.	
	920.	
	940.	
	960.	
	980.	
	1000.	


1020. X W
1040. X W
1060. X W
71080. X W
1100. X W
1120. X W
81140. X W
1160. X
1180. X
91200. X
NRD= 0 ELLC= 9999999.00 ELTRD= 9999999.00
EL(I),STA(I)
782.00 0.00 779.00 370.00 779.00 460.00 777.40 720.00 777.40 790.00
779.20 1000.00 779.20 1140.00 782.00 1200.00

CROSS SECTION 17.00
STREAM ARCADIA CREEK KALAMAZOO
DISCHARGE= 810.

PLOTTED POINTS (BY PRIORITY)-B=BOTTOM BRIDGE,T=TOP BRIDGE,X=GROUND,W=WATER SURF,E=ENERGY GRADIENT,C=CRITICAL USE.

ELEV	781.	782.	783.	784.	785.	786.	787.	788.	789.	790.	791.	
STA-FEET												
21300.			X									
1320.			X									
1340.			XE									
1360.			XE									
1380.			XE									
1400.			XE									
31420.			XE									BANK.
1440.			XE									
1460.			XE									
1480.			XE									
1500.			XE									
41520.			XE									BANK.
1540.			X E									
1560.			X E									
1580.			X E									
1600.			X E									
1620.			X E									
1640.			X E									
1660.			X E									
1680.			X E									
1700.			X	E								
1720.			X	E								
1740.			X	E								
1760.			X	E								
1780.			X	E								
1800.			X	E								
1820.			X	E								
1840.			X	E								
1860.			X	E								
1880.			X	E								
51900.			X	E								
1920.			X	E								
1940.			X	E								
1960.			X	E								
61950.			X	E								
2000.				X E								
72020.				X								

NRD= 0 ELLC= 9999999.00 ELTRD= 9999999.00

EL(I),STA(I)

782.80	1302.00	782.60	1422.00	782.60	1512.00	781.40	1902.00	781.40	1972.00
782.80	2026.00								

CROSS SECTION 22.00
STREAM ARCADIA CREEK KALAMAZOO
DISCHARGE= 790.

PLOTTED POINTS (BY PRIORITY)=B=BOTTOM BRIDGE,T=TOP BRIDGE,X=GROUND,W=WATER SUR,E=ENERGY GRADIENT,C=CRITICAL WSEL

	ELEV	787.	788.	789.	790.	791.	792.	793.	794.	795.	796.	797.
	STA=EET											
2	0.											
	10.				XE							
	20.				X E							
	30.				X E							
	40.				XW E							
	50.				X W E							
	60.			X	. W E							
	70.			X	. W E							
	80.			X	. W E							
	90.			X	. W E							
3	100.		X		. W E							BANK.
	110.		X		. W E							
	120.		X		. W E							
	130.		X		. W E							
	140.		X		. W E							
	150.		X		. W E							
	160.		X		. W E							
	170.		X		. W E							
	180.		X		. W E							
	190.		X		. W E							
	200.		X		. W E							
	210.		X		. W E							
	220.		X		. W E							
	230.		X		. W E							
	240.		X		. W E							
4	250.		X		. W E							BANK.
	260.		X		. W E							
5	270.		X		. W E							
	280.		X		. W E							
	290.		X		. W E							
	300.		X		. W E							
	310.		X		. W E							
	320.		X		. W E							
	330.		X		. W E							
6	340.		X		. W E							
	350.			X	. W E							
	360.			X	. W E							
	370.			X	W E							
	380.				X E							
	390.				X E							
7	400.				X							

ARD= 0 ELLO= 9999999.00 ELTRD= 9999999.00

EL(I),STA(I)

788.50	0.00	787.50	100.00	787.50	250.00	787.50	270.00	787.50	340.00	
788.50	400.00									

CROSS SECTION 27.00
STREAM ARCADIA CREEK KALAMAZOO
DISCHARGE= 1020.

PLOTTED POINTS (BY PRIORITY)-B=BOTTOM BRIDGE,T=TOP BRIDGE,X=GROUND,L=WATER SUR,E=ENERGY GRADIENT,C=CRITICAL WSEL

```
ELEV  786.     787.     788.     789.     790.     791.     792.     793.     794.     795.     796.
      STA-FEET
  2   0.                                                                    X
      2.                                                                  X
      4.                                                                X
      6.                                                              X
      8.                                                            X
      10.                                                         X
      12.                                                       X .E
      14.                                                    X  .E
      16.                                                 XW    .E
      18.                                              X  W    .E
      20.                                           X     U    .E
      22.                                        X        U    .E
  3   24.                                     X           U    .E
      26.                                     X           U    .E
      28.                                     X           U    .E
      30.                                     X           U    .E
      32.                                     X           U    .E
      34.                                     X           U    .E
      36.                                     X           U    .E
      38.                                     X           U    .E
      40.                                     X           U    .E
      42.                                     X           U    .E
      44.                                     X           U    .E
      46.                                     X           U    .E
      48.                                     X           U    .E
      50.                                     X           U    .E
      52.                                     X           U    .E
      54.                                     X           U    .E
      56.                                     X           U    .E
      58.                                     X           U    .E
      60.                                     X           U    .E
      62.                                     X           U    .E
      64.                                     X           U    .E
      66.                                     X           U    .E
      68.                                     X           U    .E
      70.                                     X           U    .E
      72.                                     X           U    .E
      74.                                     X           U    .E
      76.                                     X           U    .E
      78.                                     X           U    .E
      80.                                     X           U    .E
      82.                                     X           U    .E
      84.                                     X           U    .E
      86.                                     X           U    .E
      88.                                     X           U    .E
      90.                                     X           U    .E
      92.                                     X           U    .E
      94.                                     X           U    .E
  5   96.   XXXX
```

| | | |

INTERPOLATED SECTION BETWEEN ABRAMS SECTIONS 95 AND 96

69.00	10.03	826.84	0.00	0.00	826.84	0.00	0.00	0.00	819.60
485.	328.	47.	117.	1099.	78.	519.	145.	112.	819.60
2.12	0.29	0.[illegible]	0.23	0.080	0.035	0.080	0.018	816.00	11.49
0.000019	120.	125.	130.	0	0	0	0.00	300.01	311.49

*SECNO 70.000

125 FT D/S OF ABRAMS SEC 96;INTERPOLATED FROM ABRAMS SEC 96

70.00	9.43	826.03	0.00	0.00	826.85	0.01	0.00	0.00	820.40
485.	189.	204.	92.	421.	171.	346.	149.	113.	823.80
2.17	0.45	1.20	0.27	0.080	0.035	0.080	0.018	817.40	18.89
0.000061	125.	125.	125.	0	0	0	0.00	240.56	267.45

*SECNO 71.000

D/S FACE OF DIVERSION FROM ABRAMS SECS 96 TO 99;ABRAMS SEC 96

71.00	8.24	826.04	0.00	0.00	824.08	0.02	0.01	0.01	821.60
485.	196.	240.	49.	325.	144.	179.	151.	114.	825.00
2.20	0.60	1.66	0.27	0.080	0.035	0.080	0.018	818.60	23.03
0.000148	125.	125.	125.	0	0	0	0.00	237.10	260.13

CCHV= 0.000 CCHV= 0.000
*SECNO 7[illegible]

DIVERSION FROM ABRAMS SECS 96 TO 99 ALONG RIGHT SIDE OF STADIUM DRIVE

71.[illegible]	4.25	[illegible]	0.00	0.00	826.94	0.09	0.00	0.04	823.30
355.	42.	204.	27.	25.	107.	37.	155.	114.	826.00
3.22	1.65	2.65	0.77	0.080	0.080	0.080	0.019	822.40	40.77
0.004846	130.	130.	130.	0	0	0	0.00	139.27	180.01

*SECNO 71.200

SECNO	DEPTH	CHSEL	CHIS	USELK	SG	KV	HL	BLOSS	RAMP ELEV
N	SLOP	SCH	SROP	ALOP	ACH	AROD	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

71.20	4.00	827.60	0.00	0.00	827.73	0.13	0.76	0.02	824.30
355.	41.	301.	13.	21.	98.	16.	153.	115.	827.00
2.23	1.96	3.08	0.71	0.080	0.080	0.080	0.019	823.60	42.11
0.007297	130.	130.	130.	2	0	0	0.00	111.55	153.66

*SECNO 71.300

71.30	3.96	828.56	0.00	0.00	828.70	0.14	0.99	0.00	[illegible]
355.	41.	303.	11.	20.	97.	16.	154.	115.	828.00
2.24	1.99	3.13	0.70	0.080	0.080	0.080	0.020	824.60	42.27
0.007657	130.	130.	130.	2	0	0	0.00	108.27	150.55

*SECNO 71.400

71.40	3.96	829.56	0.00	0.00	829.70	0.14	1.00	0.03	826.80
355	41.	303.	11.	20.	97.	16.	154.	115.	829.00

```
0.007731    130.    130.    130.      1       0       0     0.00   107.62   149.93

*SECNO 71.500
   71.50    3.68   830.73    0.00    0.00   830.97    0.19    1.24    0.03   828.30
    355.     30.    [illegible]      2.     16.     37.      4.    154.    116.   830.50
    2.27    2.32    3.64    0.55   0.080   0.080   0.030   0.021   827.10    43.81
0.012047    130.    130.    130.       2       0       0     0.00    77.41   121.21

*SECNO 71.600
   71.60    7.50   831.90    0.00    0.00   832.01    0.11    1.02    0.03   829.60
    355.     11.    280.     54.      8.    130.     35.    155.    116.   829.50
    2.28    1.45    2.81    1.85   0.080   0.080   0.030   0.022   828.40    22.19
0.005469    130.    130.    130.       2       0       0     0.00    65.21    87.40

*SECNO 71.700
   SECNO    DEPTH    CUSEL    CMINS    ISELK    EG       HV       HL       QLOSS   BANK ELEV
   Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA     LEFT/RIGHT
   TIME     VLOE     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
   SLOPE    XLOFL    XLCH     XLOBR    ITRIAL   IH2      ICONT    CORAR    TOPWID     ENDST

   71.70    3.31   832.71    0.30    0.00   832.36    0.13    0.02    0.01   830.60
    355.     10.    286.     59.      7.     93.     30.    155.    116.   830.50
    2.29    1.58    3.09    1.95   0.080   0.080   0.080   0.022   829.40    22.79
0.007285    130.    130.    130.       2       0       0     0.00    63.74    86.54

CCNV=   0.300 CEMV=   0.500
*SECNO 72.000

        D/S END OF DIVERSION,ABRAMS SEC 99

   72.00    5.53   833.[illegible]    0.30    0.00   833.59    0.54    0.55    0.20   830.40
    485.      2.    483.      0.      3.     22.      1.    155.    116.   831.50
    2.30    0.86    5.89    0.47   0.080   0.035   0.030   0.023   827.50    42.11
0.003055    130.    130.    130.       2       0       0     0.00    21.58    63.69

CC V=   0.300 CEMV=   0.500
*SECNO 73.000

        D/S END AT HOLARD; ALSO D/S END OF DIVERSION BETWEEN ABRAMS SECS100TO107

   73.00    5.74   834.74    0.00    0.00   835.23    0.[illegible]    1.6[illegible]    0.01   831.90
    485.      3.    482.      0.      3.     86.      1.    156.    116.   833.00
    2.32    0.96    5.63    0.54   0.100   0.050   0.100   0.023   829.00    41.[illegible]
0.005369    420.    410.    420.       2       0       0     0.00    21.80    63.77

*SECNO 73.500

        D/S END OF HOLARD ST CULVERT

   73.50    7.14   835.14    0.00    0.00   835.47    0.33    0.20    0.05   833.00
    192.     19.    147.     25.     11.     28.     13.    156.    116.   833.00
    2.32    1.67    5.21    1.68   0.100   0.050   0.100   0.023   828.50    39.31
0.011917     30.     30.     30.       3       0       0     0.00    28.90    68.11

SPECIAL BRIDGE
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SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	6.20	2.60	100.00	3.93	0.00	19.60	0.00	826.00	828.00

*SECNO 74.000
PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
[illegible]	[illegible]	0.00	49.	169.	20.	20.	833.00	[illegible]

U/S END OF HOWARD ST CULVERT EXTENDING UPTP CHRISTIAN HIGH SCHOOL ROAD

74.00	12.70	840.70	0.00	0.00	840.71	0.00	5.24	0.00	833.00
192.	64.	43.	65.	749.	51.	196.	150.	117.	833.00
2.48	0.43	0.84	0.43	0.100	0.050	0.100	0.024	828.00	91.46
0.000144	298.	298.	298.	0	0	5	0.00	93.42	104.88

*SECNO 75.000

SEC O	DEPTH	CWSEL	CWSHS	WSELN	EG	HV	HL	ELOSS	BANK ELEV
[illegible]	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

VALLEY SECTION; ADRAMS SECTION 101

75.00	9.61	840.71	0.00	0.00	840.71	0.00	0.00	0.00	834.10
192.	14.	168.	9.	176.	584.	94.	159.	117.	833.50
2.50	[illegible]	[illegible]	0.10	0.100	0.050	0.100	0.024	831.50	[illegible]
0.000003	100.	100.	100.	0	0	0	0.00	[illegible]	[illegible]

*SECNO 76.000

VALLEY SECTION; ADRAMS SECTION 102

76.00	7.21	840.71	0.00	0.00	840.72	0.00	0.01	0.00	834.71
192.	79.	68.	45.	428.	133.	319.	170.	120.	835.90
3.11	0.19	0.51	0.14	0.100	0.050	0.100	0.025	833.50	733.79
0.000025	560.	560.	560.	2	0	0	0.00	267.52	1001.31

*SECNO 77.000

VALLEY SECTION; ADRAMS SECTION 103

77.00	7.50	840.72	0.00	0.00	840.73	0.01	0.01	0.00	835.50
192.	47.	135.	40.	64.	140.	132.	174.	121.	835.50
3.22	0.27	[illegible]	[illegible]	0.100	0.050	0.100	[illegible]	837.00	[illegible]
0.000083	265.	265.	265.	0	0	0	0.00	99.08	146.89

*SECNO 77.500

77.50	5.52	840.72	0.00	0.00	840.75	0.04	0.01	0.01	834.20
192.	42.	123.	27.	83.	65.	60.	174.	121.	834.20
3.22	0.51	1.88	0.45	0.100	0.050	0.100	0.026	834.20	18.96
0.000328	40.	65.	70.	0	0	0	0.01	78.29	97.25

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*SECNO 78.000

48 INCH CMP CONSIDERED AS VALLEY SECTION; ABRAMS SEC 104

78.00	5.24	840.74	0.00	0.00	840.79	0.05	0.05	0.01	835.50
192.	43.	176.	32.	69.	52.	47.	175.	121.	835.50
3.23	0.63	2.22	0.68	0.100	0.050	0.100	0.026	835.50	20.62
0.000616	60.	65.	70.	0	0	0	0.00	62.45	83.07

*SECNO 79.000

SECNO	DEPTH	CHSEL	CRIWS	WSELK	EG	HV	HL	CLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	UTW	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

42 INCH CMP CONSIDERED AS VALLEY SECTION; ABRAMS SEC 105

79.00	4.46	840.86	0.00	0.00	840.93	0.06	0.13	0.01	836.80
192.	50.	108.	34.	57.	42.	40.	175.	121.	836.80
3.26	0.87	2.56	0.86	0.100	0.050	0.100	0.027	836.60	841.64
0.001086	120.	103.	100.	2	0	0	0.00	55.92	997.59

*SECNO 79.100

79.10	3.99	841.09	0.20	0.20	841.38	0.19	0.29	0.06	840.30
192.	1.	179.	1.	2.	54.	2.	176.	121.	840.00
3.27	0.64	3.51	0.64	0.100	0.050	0.100	0.026	837.50	40.49
0.003922	210.	210.	210.	2	0	0	0.00	27.16	75.58

*SECNO 79.120

79.12	3.52	841.09	0.30	0.30	841.33	0.23	0.65	0.12	840.50
192.	3.	176.	3.	5.	35.	5.	176.	121.	840.50
3.28	1.00	5.35	1.08	0.100	0.050	0.100	0.027	838.30	19.86
0.008889	150.	150.	150.	2	0	0	0.00	20.28	40.14

*SECNO 79.160

79.16	4.12	843.22	0.00	0.00	843.69	0.47	1.33	1.03	841.00
192.	11.	169.	11.	0.	29.	0.	176.	122.	841.00
3.29	1.43	5.81	1.43	0.100	0.050	0.100	0.027	839.10	18.00
0.006606	150.	150.	150.	2	0	0	0.00	22.39	41.20

*SECNO 79.190

79.19	4.69	843.99	0.00	0.00	844.78	0.79	0.92	0.16	844.00
192.	0.	192.	0.	0.	27.	0.	176.	122.	844.00
3.29	0.00	7.13	0.00	0.100	0.050	0.100	0.027	839.50	26.00
0.023630	70.	70.	70.	2	0	0	0.00	7.30	31.05

*SECNO 79.200

SECNO	DEPTH	CHSEL	CRIWS	WSELK	EG	HV	HL	CLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	UTW	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 900.00 ELREA= 900.00

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D/S FACE OF CULVERT AT STADIUM DRIVE WEST OF HOWARD; ABRAMS SEC 106

79.20	5.49	845.39	0.00	0.00	846.60	1.21	1.60	2.21	863.90
192.	0.	192.	0.	0.	22.	0.	176.	122.	843.90
3.29	0.00	8.02	0.00	0.100	0.050	0.100	0.027	839.90	50.00
0.046087	50.	50.	50.	2	0	0	0.00	4.00	54.00

SPECIAL BRIDGE

SB XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
0.00	4.20	2.60	0.00	4.00	0.00	16.00	0.00	840.50	839.90

*SECNO 79.500

3301 HV CHANGED MORE THAN HVINS

PRESSURE FLOW

EGPRS	EGLWC	HZ	HVEIN	SPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
854.78	847.20	0.00	0.	192.	16.	16.	844.50	900.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,FLEA= 900.00 ELREA= 900.00

U/S FACE OF CULVERT AT STADIUM DRIVE WEST OF HOWARD

79.50	14.10	854.60	0.00	0.00	854.70	0.10	0.14	0.00	844.50
192.	0.	192.	0.	0.	56.	0.	176.	122.	844.50
3.30	0.00	3.42	0.00	0.100	0.050	0.100	0.027	840.50	50.00
0.003785	123.	123.	123.	2	0	0	0.00	4.00	54.00

*SECNO 80.000

U/S END OF DIVERSION; ABRAMS SEC 107

80.00	14.03	854.83	0.00	0.00	854.83	0.01	0.00	0.05	845.50
475.	128.	275.	72.	422.	338.	247.	177.	122.	844.10
3.33	0.32	3.12	0.29	0.100	0.050	0.100	0.027	840.00	175.57
0.000029	60.	50.	50.	2	0	0	0.00	120.09	300.67

*SECNO 80.200

80.20	13.03	854.83	0.00	0.00	854.84	0.01	0.01	0.00	846.50
475.	121.	285.	69.	364.	310.	210.	192.	122.	843.10
3.41	0.33	3.92	0.32	0.100	0.050	0.100	0.027	841.20	175.48
0.000061	220.	220.	220.	2	0	0	0.00	122.03	297.04

*SECNO 80.400

80.40	12.04	854.84	0.00	0.00	854.86	0.01	0.01	0.00	847.50
475.	112.	297.	66.	306.	282.	176.	186.	123.	846.10
3.49	0.37	1.05	0.38	0.100	0.050	0.100	0.028	842.80	175.80
0.000061	230.	220.	230.	0	0	0	0.00	119.22	295.02

*SECNO 80.600

SECNO	DEPTH	CUSEL	CRIWS	USELK	EG	FV	HL	DLOSS	BANK ELEV
Q	QLOB	QCP	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	PTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IN2	ICONT	CORAR	TOPWID	ESST
80.60	11.06	854.86	0.00	0.00	854.87	0.02	0.02	0.00	846.50
475.	101.	311.	63.	249.	254.	145.	109.	124.	847.10
3.56	0.41	1.22	0.44	0.100	0.050	0.100	0.028	843.80	175.91
0.000096	220.	220.	220.	0	0	0	0.03	116.31	292.21

*SECNO 80.800

80.80	10.08	854.88	0.00	0.00	854.90	0.02	0.03	0.00	849.50
475.	87.	326.	60.	192.	227.	116.	192.	124.	848.10
3.61	0.46	1.44	0.52	0.100	0.050	0.100	0.028	844.80	176.83
0.000153	220.	220.	220.	0	0	0	0.02	112.54	239.42

*SECNO 81.000

VALLEY SECTION; ABRAMS SECTION 108

81.00	9.03	854.93	0.00	0.00	854.94	0.01	0.03	0.00	849.90
475.	82.	177.	216.	205.	157.	473.	196.	125.	848.60
3.70	0.43	1.12	0.44	0.100	0.050	0.100	0.029	845.90	0.30
0.000104	220.	220.	220.	1	0	0	0.00	169.53	169.82

*SECNO 81.200

81.20	8.05	854.95	0.00	0.00	854.97	0.01	0.03	0.00	850.40
475.	82.	191.	203.	161.	138.	374.	199.	126.	849.60
3.76	0.51	1.38	0.54	0.100	0.050	0.100	0.029	846.90	1.31
0.000119	200.	200.	200.	0	0	0	0.00	160.07	161.05

*SECNO 81.400

81.40	7.10	855.00	0.00	0.00	855.02	0.03	0.05	0.01	851.40
475.	72.	210.	193.	119.	119.	280.	202.	126.	850.60
3.81	0.59	1.77	1.67	0.100	0.050	0.100	0.029	847.90	2.72
0.000377	200.	200.	200.	4	1	2	0.00	151.47	155.19

*SECNO 82.000

SECNO	DEPTH	CUSEL	CRIWS	USELK	ES	HV	HL	DLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	PTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IN2	ICONT	CORAR	TOPWID	ESST

VALLEY SECTION; ABRAMS SECTION 109

82.00	6.19	855.09	0.00	0.00	855.11	0.02	0.03	0.02	851.70
475.	91.	138.	246.	126.	80.	323.	204.	127.	851.70
3.86	0.72	1.74	0.76	0.100	0.050	0.100	0.029	848.90	1.60
0.000491	200.	200.	200.	2	0	0	0.00	150.79	152.58

*SECNO 82.100

VALLEY SECTION; INTERPOLATED FROM ABRAMS SECTIONS 109 AND 110

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82.10	5.19	855.19	0.00	0.00	855.30	0.11	0.15	0.05	853.00
475.	84.	270.	121.	73.	80.	96.	206.	127.	852.50
3.88	1.16	3.37	1.26	0.100	0.050	0.100	0.029	850.00	1.62
0.002264	160.	160.	160.	2	0	0	0.00	97.01	98.63

*SECNO 82.200

82.20	4.65	855.65	0.00	0.00	855.83	0.19	0.49	0.04	854.00
475.	73.	292.	110.	54.	69.	74.	207.	128.	853.50
3.90	1.35	4.26	1.50	0.100	0.050	0.100	0.030	851.00	2.71
0.004430	160.	160.	160.	2	0	0	0.00	93.27	97.98

*SECNO 82.300

82.30	4.44	856.44	0.00	0.00	856.67	0.23	0.82	0.02	855.00
475.	67.	303.	135.	47.	64.	65.	207.	128.	854.50
3.91	1.43	4.72	1.61	0.100	0.050	0.100	0.030	852.00	3.13
0.005947	160.	160.	160.	2	0	0	0.00	94.60	97.72

*SECNO 82.400

82.40	4.41	857.41	0.00	0.00	857.65	0.24	0.97	0.00	856.00
475.	66.	305.	135.	46.	64.	66.	206.	128.	853.50
3.92	1.45	4.82	1.63	0.100	0.050	0.100	0.030	853.00	3.14
0.006222	160.	160.	160.	2	0	0	0.00	94.53	97.69

*SECNO 82.500

SECNO	DEPTH	CHAEL	CNL S	LSELK	EG	RW	EL	OLOSS	RANK ELEV
Q	ALO-	CCH	CHOL	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLO	LCH	VLOB	K.L.	RACH	XNR	HYN	CL TH	BSTA
SLOPE	XLOFL	XLCH	XLOBR	ITRIAL	IM2	ICONT	CORAR	TOPWID	ENDST

VALLEY SECTION; INTERPOLATED FROM ADAMS SECTIONS 109 AND 110

82.50	4.46	858.46	0.00	0.00	858.89	0.43	1.14	0.09	857.00
475.	47.	387.	41.	36.	67.	26.	209.	129.	856.00
3.93	1.31	5.77	1.55	0.100	0.050	0.100	0.030	854.00	7.79
0.003955	160.	160.	160.	2	0	0	0.00	81.61	89.39

*SECNO 82.600

82.60	4.71	859.71	0.00	0.00	860.03	0.33	1.12	0.03	858.00
475.	59.	372.	44.	46.	72.	32.	209.	129.	857.00
3.94	1.28	5.14	1.48	0.100	0.050	0.100	0.030	855.00	6.46
0.005956	160.	160.	160.	2	0	0	0.00	85.01	91.47

*SECNO 83.000

VALLEY SECTION; INTERPOLATED FROM ADAMS SECTION 110

83.00	4.81	863.71	0.00	0.00	864.09	0.37	0.94	0.01	859.50
475.	70.	359.	45.	56.	74.	26.	210.	129.	857.90
3.95	1.26	4.83	1.75	0.100	0.050	0.100	0.031	855.90	10.19
0.005165	170.	170.	170.	2	0	0	0.00	78.88	89.06

*SECNO 83.200

83.20	4.94	861.84	0.00	0.00	862.09	0.25	1.09	0.01	860.50
475.	77.	352.	46.	62.	77.	23.	211.	130.	858.90
3.97	1.23	4.57	1.66	0.100	0.050	0.100	0.031	856.90	9.79

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0.004383	230.	230.	230.	2	0	0	0.00	79.67	89.46

*SECNO 83.400

83.40	4.95	862.85	0.00	0.00	863.10	0.25	1.30	0.00	861.50
475.	77.	352.	46.	62.	77.	23.	211.	131.	859.90
3.99	1.23	4.56	1.65	0.100	0.052	0.100	0.031	857.90	0.77
0.004350	230.	230.	230.	2	3	0	0.00	79.71	89.48

*SECNO 84.000

SECNO	DEPTH	SPEED	CHANS	DSELK	EC	NV	PL	FLOBS	BANK ELEV
Q	QLOB	QCH	QROB	ALJB	ACH	AROB	VOL	TAA	LEFT/RIGHT
TIRE	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	FLMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IH2	ICONT	CORAR	TOPWID	ENDST

VALLEY SECTION; ADAMS SECTION 111

84.00	4.47	863.87	0.00	0.00	864.14	0.27	1.03	0.01	861.70
475.	57.	407.	11.	51.	91.	10.	212.	131.	861.00
4.00	1.17	4.47	1.12	0.100	0.050	0.100	0.031	859.40	0.77
0.003985	250.	250.	250.	2	1	0	0.00	70.10	70.57

*SECNO 84.500

84.50	4.78	865.18	0.00	0.00	865.39	0.21	1.23	0.02	862.70
475.	65.	393.	12.	69.	99.	12.	211.	131.	862.00
4.02	1.09	4.30	1.02	0.100	0.050	0.100	0.032	860.60	0.95
0.002030	370.	371.	370.	2	0	0	0.00	71.56	79.60

*SECNO 85.000

VALLEY SECTION; ADAMS SECTION 112

85.00	4.34	866.44	0.00	0.00	866.75	0.32	1.31	0.05	864.70
475.	29.	402.	44.	28.	83.	24.	215.	132.	863.30
4.06	1.02	4.67	1.02	0.100	0.050	0.100	0.032	861.60	29.02
0.004334	370.	371.	370.	2	2	0	0.00	69.47	79.59

*SECNO 85.500

85.50	5.20	868.10	0.00	0.00	868.34	0.24	1.56	0.02	866.00
475.	39.	390.	46.	32.	90.	28.	216.	132.	864.60
4.09	1.02	4.35	1.01	0.100	0.050	0.100	0.033	862.90	28.90
0.003179	415.	415.	415.	2	0	0	0.00	62.26	89.24

*SECNO 86.000

VALLEY SECTION; ADAMS SECTION 113

86.00	4.02	866.14	0.00	0.00	866.20	0.14	0.91	0.03	863.33
475.	19.	432.	23.	29.	136.	25.	218.	133.	866.00
4.13	0.66	3.18	0.95	0.100	0.050	0.100	0.033	864.20	23.68
0.001613	415.	415.	415.	2	0	0	0.00	73.58	97.26

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00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: KALAMAZOO, CITY OF

3) WATERCOURSE: ARCADIA CREEK

4) DOCUMENT TYPE: MULTI PROFILE RUN

EXISTING BYPASS DIVERSION

50-YR

00BREAK00

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**********************************************
*  HEC-2 WATER SURFACE PROFILES              *
*                                            *
*  Version   4.6.0;  February 1991           *
*                                            *
*  RUN DATE     28JUL92     TIME    11:51:52  *
**********************************************
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**************************************
*  U.S. ARMY CORPS OF ENGINEERS
*  HYDROLOGIC ENGINEERING CENTER
*  609 SECOND STREET, SUITE D
*  DAVIS, CALIFORNIA 95616-4687
*         (916) 756-1104
**************************************
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X      X  XXXXXXX   XXXXX              XXXXX
X      X  X        X     X           X     X
X      X  X        X                 X     X
XXXXXXX   XXXX     X          XXXXX    XXXXX
X      X  X        X                 X
X      X  X        X     X           X
X      X  XXXXXXX   XXXXX            XXXXXXX
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THIS RUN EXECUTED 28JUL92 11:51:53

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**************************************
 HEC-2 WATER SURFACE PROFILES

 Version  4.6.0;  February 1991
**************************************


T1        ARCADIA CREEK HYDRAULIC ANALYSIS
T2        EXISTING BYPASS DIVERSION (POND-JUNCTION) 50-YEAR
T3        JTP 10/30/86 [RATINGEE2.HEC] REVISED DEH 9/22/89, 7/17/92 BAS

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

          2.0                                                                  768.10

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

  1.0             -1.0


J3  VARIABLE CODES FOR SUMMARY PRINTOUT

 150.0

NC   0.015     0.015     0.015
QT      4.0       890.      890.      890.
X1    23.62        8.       150.    170.01        0.        0.        0.
BT       4.       150.     771.5      769.     159.5     771.5      769.     160.5     771.5      769.
BT  170.01      771.5      769.
GR   771.5       100.     771.5       150.     760.7    150.01     760.7     159.5     760.7     160.5
GR   760.7       170.     771.5    170.01      771.5       200.

X1   23.63                                      .1        .1        .1
X2                                                                  1.
X5      -4.       .25       .25       .25       .25

QT       4.       100.      150.      200.      300.
X1   23.93         4.       100.     108.2       30.       30.       30.
BT       2.       100.      780.    771.67     108.2      780.    771.67
GR   771.1       100.     760.7      100.1     760.7     108.1     771.1     108.2

X1       5.0       11.      100.     108.5       1.0       1.0       1.0                 .57
BT       2.0      100.     780.0    771.67     108.5      780.    771.67
GR   771.1       100.     766.1      100.5     766.1       101.     765.1     101.1    763.85     102.5
GR  763.56     104.25    763.85       106.     765.1     107.5     766.1    107.51     766.1     108.0
GR   771.1      108.5

X1       5.1                                    100.      100.      100.                 .51
X2                                                                  1.
```

X1	5.2				300.	300.	300.		.60	
X2							1.			
X1	5.3				60.	60.	60.		.23	
X2							1.			
X1	5.4	6.0	100.25	108.25	1.	1.	1.			
BT	2.	100.25	775.0	771.9	108.25	775.0	771.9			
GR	778.0	100.	771.9	100.01	764.9	100.02	764.9	108.02	771.9	108.03
GR	780.0	108.04								
X1	5.5				25.	25.	25.		.80	
X2							1.			
X5	-4.	.08	.09	.11	.14					
X1	5.6	4.	100.	109.2	2.	2.	2.			
BT	2.	100.	775.	771.	109.2	775.	771.			
GR	771.0	100.	765.	100.1	765.	109.1	771.	109.2		
X1	5.7				20.	20.	20.			
X2							1.			
NC	.04	.04	.035	.1	.3					
X1	5.8	4.	100.	109.2	1.	1.	1.			
GR	771.	100.	763.	100.1	763.	109.1	771.	109.2		
QT	4.	885.	885.	885.	885.					
X1	28.99	8.	128.	148.1	20.	20.	20.			
GR	774.	100.	772.	150.	765.	175.	760.	185.	760.	205.
GR	765.	215.	772.	240.	774.	295.				

THIS RUN EXECUTED 28JUL92 11:52:05

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.0; February 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

JTP 10/30/86 [RATINGEE

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRO	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	23.620	0.00	771.50	769.00	760.70	890.00	768.10	0.00	768.66	5.35	6.01	147.98	384.86
	23.620	0.00	771.50	769.00	760.70	890.00	768.10	0.00	768.66	5.35	6.01	147.98	384.86
	23.620	0.00	771.50	769.00	760.70	890.00	768.10	0.00	768.66	5.35	6.01	147.98	384.86
	23.620	0.00	771.50	769.00	760.70	890.00	768.10	0.00	768.66	5.35	6.01	147.98	384.86
*	23.630	0.10	771.50	769.00	760.70	890.00	768.35	0.00	768.88	4.88	5.82	152.98	402.93
*	23.630	0.10	771.50	769.00	760.70	890.00	768.35	0.00	768.88	4.88	5.82	152.98	402.93
*	23.630	0.10	771.50	769.00	760.70	890.00	768.35	0.00	768.88	4.88	5.82	152.98	402.93
*	23.630	0.10	771.50	769.00	760.70	890.00	768.35	0.00	768.88	4.88	5.82	152.98	402.93
*	23.930	30.00	780.00	771.67	760.70	100.00	768.85	0.00	768.89	0.62	1.52	65.84	126.77
*	23.930	30.00	780.00	771.67	760.70	150.00	768.81	0.00	768.89	1.42	2.29	65.48	125.92
*	23.930	30.00	780.00	771.67	760.70	200.00	768.74	0.00	768.89	2.57	3.08	64.96	124.68
*	23.930	30.00	780.00	771.67	760.70	300.00	768.54	0.00	768.89	6.16	4.74	63.33	120.88
*	5.000	1.00	780.00	771.67	764.13	100.00	768.70	0.00	768.89	4.91	3.47	28.78	45.14
*	5.000	1.00	780.00	771.67	764.13	150.00	768.38	0.00	768.89	14.07	5.71	26.28	39.99
*	5.000	1.00	780.00	771.67	764.13	200.00	767.72	767.72	769.11	45.39	9.48	21.10	29.68
*	5.000	1.00	780.00	771.67	764.13	300.00	768.59	768.59	770.38	47.92	10.75	27.91	43.34
	5.100	100.00	780.00	772.18	764.64	100.00	768.69	0.00	768.95	7.38	4.05	24.72	36.81
	5.100	100.00	780.00	772.18	764.64	150.00	768.34	0.00	769.06	22.71	6.81	22.03	31.48
*	5.100	100.00	780.00	772.18	764.64	200.00	768.23	768.23	769.62	45.39	9.48	21.10	29.68
*	5.100	100.00	780.00	772.18	764.64	300.00	769.10	769.10	770.89	47.92	10.75	27.91	43.34
	5.200	300.00	780.00	772.78	765.24	100.00	768.87	0.00	769.21	10.80	4.65	21.49	30.43
	5.200	300.00	780.00	772.78	765.24	150.00	769.04	0.00	769.71	20.72	6.58	22.78	32.96
*	5.200	300.00	780.00	772.78	765.24	200.00	769.72	0.00	770.51	20.89	7.11	28.12	43.76
*	5.200	300.00	780.00	772.78	765.24	300.00	770.83	0.00	771.85	22.84	8.11	37.01	62.78
	5.300	60.00	780.00	773.01	765.47	100.00	768.89	0.00	769.28	13.50	5.05	19.81	27.21
	5.300	60.00	780.00	773.01	765.47	150.00	769.08	0.00	769.85	24.90	7.04	21.30	30.06
	5.300	60.00	780.00	773.01	765.47	200.00	769.77	0.00	770.64	23.95	7.49	26.72	40.87
	5.300	60.00	780.00	773.01	765.47	300.00	770.90	0.00	772.00	25.17	8.42	35.65	59.80

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	5.400	1.00	775.00	771.90	764.90	100.00	769.15	0.00	769.28	2.26	2.94	34.03	66.58
*	5.400	1.00	775.00	771.90	764.90	150.00	769.61	0.00	769.85	3.78	3.98	37.73	77.14
*	5.400	1.00	775.00	771.90	764.90	200.00	770.32	0.00	770.65	4.52	4.61	43.42	94.03
*	5.400	1.00	775.00	771.90	764.90	300.00	771.50	0.00	772.00	5.90	5.67	52.91	123.53
*	5.500	25.00	775.00	772.70	765.70	100.00	769.23	0.00	769.42	3.87	3.54	28.26	50.85
*	5.500	25.00	775.00	772.70	765.70	150.00	769.70	0.00	770.04	6.07	4.69	31.98	60.89
*	5.500	25.00	775.00	772.70	765.70	200.00	770.43	0.00	770.86	6.67	5.29	37.84	77.45
*	5.500	25.00	775.00	772.70	765.70	300.00	771.64	0.00	772.26	7.91	6.31	47.55	106.66
	5.600	2.00	775.00	771.00	765.00	100.00	769.32	0.00	769.42	2.28	2.55	39.23	66.19
	5.600	2.00	775.00	771.00	765.00	150.00	769.86	0.00	770.04	3.75	3.40	44.12	77.42
	5.600	2.00	775.00	771.00	765.00	200.00	770.62	0.00	770.86	4.53	3.91	51.14	93.96
	5.600	2.00	775.00	771.00	765.00	300.00	771.79	0.00	772.26	13.97	5.49	54.60	80.27
	5.700	20.00	775.00	771.00	765.00	100.00	769.33	0.00	769.43	2.27	2.55	39.28	66.32
	5.700	20.00	775.00	771.00	765.00	150.00	769.87	0.00	770.05	3.73	3.39	44.21	77.62
	5.700	20.00	775.00	771.00	765.00	200.00	770.63	0.00	770.87	4.51	3.90	51.24	94.20
	5.700	20.00	775.00	771.00	765.00	300.00	771.82	0.00	772.29	13.97	5.49	54.60	80.27
	5.800	1.00	0.00	0.00	763.00	100.00	769.39	0.00	769.44	4.46	1.72	58.01	47.33
*	5.800	1.00	0.00	0.00	763.00	150.00	769.97	0.00	770.06	8.04	2.37	63.32	52.90
*	5.800	1.00	0.00	0.00	763.00	200.00	770.76	0.00	770.88	10.88	2.83	70.57	60.63
	5.800	1.00	0.00	0.00	763.00	300.00	772.11	0.00	772.31	16.38	3.61	83.03	74.14
*	28.990	20.00	0.00	0.00	760.00	885.00	769.37	0.00	769.45	2.87	0.00	393.17	522.60
*	28.990	20.00	0.00	0.00	760.00	885.00	770.00	0.00	770.06	2.17	0.00	438.48	601.28
*	28.990	20.00	0.00	0.00	760.00	885.00	770.85	0.00	770.89	1.50	0.00	505.87	722.11
*	28.990	20.00	0.00	0.00	760.00	885.00	772.30	0.00	772.33	0.84	0.00	634.76	965.18

JTP 10/30/86 [RATINGEE

SUMMARY PRINTOUT TABLE 150

	SECNO	Q'	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	23.620	890.00	768.10	0.00	0.00	0.00	20.00	0.00
	23.620	890.00	768.10	0.00	0.00	0.00	20.00	0.00
	23.620	890.00	768.10	0.00	0.00	0.00	20.00	0.00
	23.620	890.00	768.10	0.00	0.00	0.00	20.00	0.00
*	23.630	890.00	768.35	0.00	0.25	0.00	20.00	0.10
*	23.630	890.00	768.35	0.00	0.25	0.00	20.00	0.10
*	23.630	890.00	768.35	0.00	0.25	0.00	20.00	0.10
*	23.630	890.00	768.35	0.00	0.25	0.00	20.00	0.10
*	23.930	100.00	768.85	0.00	0.50	0.00	8.16	30.00
*	23.930	150.00	768.81	-0.04	0.46	0.00	8.16	30.00
*	23.930	200.00	768.74	-0.06	0.39	0.00	8.15	30.00
*	23.930	300.00	768.54	-0.20	0.19	0.00	8.15	30.00
*	5.000	100.00	768.70	0.00	-0.15	0.00	7.91	1.00
*	5.000	150.00	768.38	-0.32	-0.42	0.00	7.84	1.00
*	5.000	200.00	767.72	-0.67	-1.03	0.00	7.71	1.00
*	5.000	300.00	768.59	0.87	0.05	0.00	7.88	1.00
	5.100	100.00	768.69	0.00	-0.01	0.00	7.80	100.00
	5.100	150.00	768.34	-0.35	-0.04	0.00	7.73	100.00
*	5.100	200.00	768.23	-0.12	0.51	0.00	7.71	100.00
*	5.100	300.00	769.10	0.87	0.51	0.00	7.88	100.00
	5.200	100.00	768.87	0.00	0.18	0.00	7.72	300.00
	5.200	150.00	769.04	0.17	0.70	0.00	7.75	300.00
*	5.200	200.00	769.72	0.68	1.50	0.00	7.89	300.00
*	5.200	300.00	770.83	1.11	1.73	0.00	8.11	300.00
	5.300	100.00	768.89	0.00	0.01	0.00	7.68	60.00
	5.300	150.00	769.08	0.19	0.04	0.00	7.71	60.00
	5.300	200.00	769.77	0.69	0.05	0.00	7.85	60.00
	5.300	300.00	770.90	1.12	0.06	0.00	8.08	60.00
*	5.400	100.00	769.15	0.00	0.26	0.00	8.01	1.00
*	5.400	150.00	769.61	0.46	0.53	0.00	8.01	1.00
*	5.400	200.00	770.32	0.71	0.54	0.00	8.02	1.00
*	5.400	300.00	771.50	1.18	0.60	0.00	8.02	1.00
*	5.500	100.00	769.23	0.00	0.08	0.00	8.01	25.00
*	5.500	150.00	769.70	0.47	0.09	0.00	8.01	25.00
*	5.500	200.00	770.43	0.73	0.11	0.00	8.01	25.00
*	5.500	300.00	771.64	1.21	0.14	0.00	8.02	25.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	5.600	100.00	769.32	0.00	0.09	0.00	9.14	2.00
	5.600	150.00	769.86	0.53	0.16	0.00	9.16	2.00
	5.600	200.00	770.62	0.76	0.20	0.00	9.19	2.00
	5.600	300.00	771.79	1.17	0.15	0.00	9.20	2.00
	5.700	100.00	769.33	0.00	0.00	0.00	9.14	20.00
	5.700	150.00	769.87	0.54	0.01	0.00	9.16	20.00
	5.700	200.00	770.63	0.77	0.01	0.00	9.19	20.00
	5.700	300.00	771.82	1.18	0.03	0.00	9.20	20.00
	5.800	100.00	769.39	0.00	0.06	0.00	9.16	1.00
*	5.800	150.00	769.97	0.58	0.10	0.00	9.17	1.00
*	5.800	200.00	770.76	0.79	0.12	0.00	9.19	1.00
	5.800	300.00	772.11	1.35	0.29	0.00	9.20	1.00
*	28.990	885.00	769.37	0.00	-0.02	0.00	71.23	20.00
*	28.990	885.00	770.00	0.63	0.03	0.00	75.64	20.00
*	28.990	885.00	770.85	0.85	0.09	0.00	81.76	20.00
*	28.990	885.00	772.30	1.46	0.19	0.00	105.95	20.00

SUMMARY OF ERRORS AND SPECIAL NOTES

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NOTE     SECNO=     23.630  PROFILE=  1  WSEL BASED ON X5 CARD
NOTE     SECNO=     23.630  PROFILE=  2  WSEL BASED ON X5 CARD
NOTE     SECNO=     23.630  PROFILE=  3  WSEL BASED ON X5 CARD
NOTE     SECNO=     23.630  PROFILE=  4  WSEL BASED ON X5 CARD

WARNING  SECNO=     23.930  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=     23.930  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=     23.930  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=     23.930  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING  SECNO=      5.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=      5.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
CAUTION  SECNO=      5.000  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=      5.000  PROFILE=  3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=      5.000  PROFILE=  3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO=      5.000  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=      5.000  PROFILE=  4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=      5.000  PROFILE=  4  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO=      5.100  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=      5.100  PROFILE=  3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=      5.100  PROFILE=  3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO=      5.100  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=      5.100  PROFILE=  4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=      5.100  PROFILE=  4  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING  SECNO=      5.200  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=      5.200  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING  SECNO=      5.400  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=      5.400  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=      5.400  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=      5.400  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

NOTE     SECNO=      5.500  PROFILE=  1  WSEL BASED ON X5 CARD
NOTE     SECNO=      5.500  PROFILE=  2  WSEL BASED ON X5 CARD
NOTE     SECNO=      5.500  PROFILE=  3  WSEL BASED ON X5 CARD
NOTE     SECNO=      5.500  PROFILE=  4  WSEL BASED ON X5 CARD

WARNING  SECNO=      5.800  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=      5.800  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING  SECNO=     28.990  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=     28.990  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=     28.990  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=     28.990  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
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00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: KALAMAZOO, CITY OF

3) WATERCOURSE: ARCADIA CREEK

4) DOCUMENT TYPE: MULTI PROFILE INPUT DATA
1977

00BREAK00

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**********
  HEC2 RELEASE DATED 'OV 76 UPDATED F . 1977
  67307 CORR - 01
  MODIFICATION -  50,51,52
**********
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4 PROFILES

RECEIVED
JUL 6 1981
WATER MANAGEMENT

CAUTION
SEE
ATTACHED COMMENTS

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C
T1OVER.AND FLOW FROM SOUTH TO D/S END
TESTAIRING WATER DEPTH IS CRITICAL? ROAD ELEVS. HIGHER THAN TEAR WATER AT SOUTH
TS       ARCADIA CREEK KALAMAZOO

CT  ICTYPE     NPT        NINV       IDIR       STRT       METRC      HVINS      Q          WSEL       FQ
              0.         3.         0.         3. -1.20E-02  1.00       0.0        7.      768.700    0.000

J2  NPROF      IPLOT      PRFVS      XSECV      XSECK      BX         ALLDC      IBW        CHNIM      ITRACE
            1.000      3.000     -1.000      0.300      3.700      0.300      0.300      5.000      3.000      9.000

J3  ESAAT      ESMAX                    ***********MODIFIED SECTION 30**********

          -10.000    -10.000      0.000      0.000      3.000      0.300      0.300      0.000      3.000      0.000
ET          4.000    321.000    573.300    672.000    935.000      0.300      0.300      3.000      6.000      6.000
ET          0.035      3.000      0.300      0.300      0.300      0.300      0.300      3.000      3.000      1.000
ET          5.130     10.000    130.300      0.016    210.000     10.000    370.000      0.016    460.000     10.000
ET        500.750      3.000      0.300      0.300      0.300      0.200      0.100      3.000      5.000      0.000

VALLEY SECTION AT THE MOUTH TAKEN FROM 2 FT CONTOUR MAP

X1          1.000      4.000    370.300    440.300      0.000      0.300      0.300      3.000      3.000      0.000
GR        770.000      3.000    760.300    710.000    760.300    210.000    760.000    370.000    760.470    400.000
GR        770.000    600.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000
MH          7.000     10.000    130.000      0.016    210.000     10.000    370.000      0.016    460.000     10.000
MH        530.000      3.016    530.000     10.000    700.000      0.300      0.300      0.000      0.130      0.000

VALLEY SECTION ALONG W.ARCADIA ST TAKEN FROM 2 FT CONTOUR MAP

X1          2.000      3.000    370.000    600.000    750.000    760.000    790.000      0.300      0.300      0.000
GR        773.000      0.300    760.000    700.000    760.000    210.000    767.200    370.300    767.200    400.000
GR        797.000    600.300    767.000    600.000    770.000    700.000      0.000      0.000      0.000      0.000
MH          7.000     10.000    160.000      3.016    210.000     10.000    470.000      0.016    460.000     10.000
MH        790.000      0.316    710.000     10.000     90.000      .000      3.000      0.300      0.000      0.000

VALLEY SECTION BETWEEN PORTER AND DALRIDGE FROM 2 FT CONTOUR MAP

X1          3.000      4.000    370.000    440.000    735.000    285.000    375.000      3.000      0.000      0.000
GR        772.000      0.300    760.000    700.000    760.000    210.000    760.000    370.000    760.000    400.000
GR        750.300    710.000    760.000    750.300    772.300      0.000      3.000      3.000      3.000      1.000
MH          7.000     10.000    225.000      0.016    230.000     10.000    455.000      0.016    530.000     10.000
MH        830.000      0.016    900.000     10.300   1030.000      0.300      0.030      0.000      0.000      0.000

X1          1.500      4.000    325.000    440.000    725.000    440.000    335.000      3.000      3.000      1.000
GR        774.300      0.300    770.000    740.300    770.500    450.000    770.200    365.000    770.200    530.000
GR        769.100    630.000    760.000    740.300    776.000     10.000      0.300      3.000      3.000      0.000
MH          7.000     10.000    220.000      0.016    450.000     10.000    540.000      0.016    640.000     10.000
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NH	950.000	0.016	1020.000	10.000	1100.000	0.000	0.000	0.000	0.000	0.000

VALLEY SECTION ALONG PENNSYLVANIA RAILROAD FROM 2 FT CONTOUR MAP

X1	4.000	8.000	370.000	460.000	220.000	215.200	220.000	0.000	0.000	0.000
GR	775.000	0.000	772.200	370.000	772.200	460.000	771.400	540.000	771.400	620.000
GR	770.200	950.000	770.200	1020.000	775.000	1100.000	0.000	0.000	0.000	0.000
NH	7.000	10.000	370.000	0.016	460.000	10.000	510.000	0.016	570.000	10.000
NH	720.000	0.016	790.000	10.000	900.000	0.000	0.000	0.000	0.000	0.000

VALLEY SECTION ALONG PITCHER STREET TUNNEL FROM 2 FT CONTOUR MAP

X1	5.000	8.000	370.000	460.000	150.000	145.200	150.000	0.000	0.000	0.000
GR	775.000	0.000	770.000	370.000	770.000	460.000	770.200	510.000	770.200	570.000
GR	770.600	775.000	770.600	790.000	775.000	830.000	0.000	0.000	0.000	0.000
NH	5.000	10.000	370.000	0.016	460.000	10.000	550.000	0.016	560.000	10.000
NH	900.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SECTION BETWEEN PITCHER AND EDWARDS FROM 2 FT CONTOUR MAP

X1	6.000	4.000	370.000	460.000	210.000	225.000	210.000	0.000	0.000	0.000
GR	775.000	0.000	772.000	370.000	772.000	460.000	771.800	300.000	771.200	860.000
GR	775.000	900.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NH	5.000	10.000	1596.000	0.016	1606.000	10.000	2074.000	0.016	2130.000	10.000
NH	2190.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SECTION ALONG EDWARDS ST FROM 2 FT CONTOUR MAP & SECTION 74

X1	7.000	7.000	1596.000	1606.000	150.000	145.200	150.000	0.000	0.000	0.000
GR	776.000	1222.000	773.900	1596.000	773.300	1652.000	773.800	1606.000	773.200	2078.000
GR	773.200	2130.000	772.000	2190.000	0.000	0.000	0.000	0.000	0.000	0.000
NH	5.000	10.000	370.000	0.016	460.000	10.000	510.000	0.016	1020.000	10.000
NH	1100.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SECTION 125 FT U/S OF EDWARDS ST FROM 2 FT CONTOUR MAP

X1	8.000	6.000	370.000	460.000	125.000	215.000	125.000	0.000	0.000	0.000
GR	773.000	0.000	775.000	370.000	775.000	460.000	774.000	450.000	775.000	1020.000
GR	772.000	1150.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NH	5.000	10.000	370.000	0.016	460.000	10.000	1030.000	0.016	1090.000	10.000
NH	1200.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SECTION 235 FT U/S OF EDWARDS ST FROM 2 FT CONTOUR MAP

X1	9.000	6.000	370.000	460.000	110.000	130.000	110.000	0.000	0.000	0.000
GR	778.000	0.000	775.600	370.000	775.600	460.000	776.000	1030.000	776.000	1090.000
GR	775.000	1200.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	9.500	0.000	0.000	0.000	55.000	55.000	55.000	0.000	0.000	0.000
NH	5.000	10.000	370.000	0.016	460.000	10.000	1070.000	0.016	1130.000	10.000
NH	1200.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SECTION 350 FT U/S OF EDWARDS ST FROM 2 FT CONTOUR MAP

X1	10.000	6.000	370.000	460.000	60.000	65.000	60.000	0.000	0.000	0.000
GR	780.000	0.000	777.000	370.000	777.000	460.000	777.000	0.000	777.000	1150.000

GR	780.000	1210.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	10.500	0.000	0.000	0.000	55.000	55.000	55.000	0.000	0.500	0.000
NH	5.000	10.000	372.000	0.016	462.000	10.000	1030.000	0.016	1140.000	10.000
NH	1200.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SECTION ALONG BURDICK STREET FROM 2 FT CONTOUR MAP

X1	11.000	0.000	372.000	462.000	55.000	55.000	55.000	0.000	0.000	0.000
GR	710.000	0.000	773.000	962.000	778.000	462.000	772.000	1030.000	778.000	1140.000
GR	780.000	1200.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NH	7.000	10.000	372.000	0.016	462.000	10.000	720.000	0.016	993.000	10.000
NH	1030.000	0.016	1142.000	10.000	1202.000	0.000	0.000	0.000	0.000	0.000

VALLEY SECTION 150 FT U/S OF BURDICK/D/S OF ENCL.10-2'CONTOUR MAP

X1	12.000	0.000	370.000	460.000	150.000	150.000	150.000	0.000	0.000	0.000
GR	782.000	0.000	779.000	970.000	779.000	462.000	777.400	720.000	777.400	796.000
GR	779.200	1080.000	779.200	1140.000	782.000	1200.000	0.000	0.000	0.000	0.000
CT	4.000	454.000	713.000	894.000	150.000	0.000	0.000	0.000	0.000	0.000
NH	7.000	10.000	372.000	0.016	462.000	10.000	720.000	0.016	993.000	10.000
NH	1030.000	0.016	1142.000	10.000	1202.000	0.000	0.000	0.000	0.000	0.000

VALLEY SEC 200 FT U/S OF BURDICK/D/S END OF ENCL 10-2'CONTOUR MAP

X1	12.000	0.000	372.000	462.000	55.000	55.000	55.000	0.000	0.000	0.000
GR	779.500	0.000	779.300	970.000	779.300	462.000	777.600	720.000	777.600	796.000
GR	779.400	1080.000	779.400	1140.000	779.500	1206.000	0.000	0.000	0.000	0.000
CH	7.000	10.000	1748.000	0.016	1838.000	10.000	2298.000	0.016	2360.000	10.000
NH	2652.000	0.016	2712.000	10.000	2748.000	0.000	0.000	0.000	0.000	0.000

VALLEY SEC ALONG ROSE STATION AVE'S SLOVE'S SECTION 74

X1	14.000	0.000	1748.000	1838.000	220.000	220.000	220.000	0.000	0.000	0.000
GR	780.500	1412.000	780.000	1748.000	780.000	1838.000	779.500	2298.000	779.500	2360.000
GR	760.000	2652.000	780.000	2712.000	782.000	2751.000	0.000	0.000	0.000	0.000
NH	7.000	10.000	1748.000	0.016	1838.000	10.000	2298.000	0.016	2360.000	10.000
NH	2652.000	0.016	2712.000	10.000	2748.000	0.000	0.000	0.000	0.000	0.000

VALLEY SEC ALONG CHURCH/INTERPOLATED FROM ADAM'S SECS 75 AND 76

X1	15.000	0.000	1741.000	1831.000	352.000	352.000	351.000	0.000	0.000	0.000
GR	781.800	1412.000	780.900	1743.000	780.900	1838.000	780.000	2298.000	780.000	2360.000
GR	782.200	2652.000	782.200	2712.000	783.500	2749.000	0.000	0.000	0.000	0.000
NH	7.000	10.000	1650.000	0.016	1540.000	10.000	1845.000	0.016	1916.000	10.000
NH	2198.000	0.016	2258.000	10.000	2292.000	0.000	0.000	0.000	0.000	0.000

VALLEY SEC ALONG PARKDALE END OF ENCL 10-2'CONTOUR SEC 76

X1	16.000	0.000	1650.000	1540.000	365.000	365.000	365.000	0.000	0.000	0.000
GR	782.500	1394.000	781.300	1450.000	781.000	1540.000	780.600	1846.000	780.650	1916.000
GR	783.600	2198.000	783.600	2258.000	785.000	2292.000	0.000	0.000	0.000	0.000
NH	5.000	10.000	1428.000	0.016	1512.000	10.000	1912.000	0.016	1972.000	10.000
NH	2028.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SEC BETWEEN PARK AND DOOLEY STREETS FROM SEC 77

X1	17.000	6.000	1422.000	1512.000	146.000	140.500	149.000	0.000	0.000	0.000
GR	782.800	1502.000	782.600	1422.000	782.600	1512.000	751.400	1902.000	781.400	1972.000
GR	782.800	2029.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NH	5.000	10.000	1508.000	0.016	1592.000	10.000	7022.000	0.316	1092.000	10.000
NH	1916.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SEC ALONG COOLEY;D/S END OF ENCL 1C ABRAMS SEC 78

X1	15.000	4.000	1902.000	1592.000	117.000	117.000	117.000	0.000	0.000	0.000
GR	783.600	1436.000	783.700	1502.000	783.700	1592.000	762.200	1922.000	782.200	1992.000
GR	783.500	1916.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OT	4.000	435.000	692.000	792.000	1056.000	0.000	0.000	0.000	0.000	0.000
NH	5.000	10.000	200.000	0.016	270.000	10.000	415.000	0.316	485.000	10.000
NH	600.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SEC; INTERPOLATED FROM ABRAMS SECS 78 AND 79

X1	19.000	6.000	290.000	290.000	230.000	220.000	230.000	0.000	0.000	0.000
GR	784.900	0.000	784.700	200.000	784.700	290.000	703.500	415.000	783.500	485.000
GR	784.900	600.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NH	5.000	10.000	170.000	0.016	250.000	10.000	400.000	0.316	470.000	10.000
NH	600.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SEC; INTERPOLATED FROM ABRAMS SECS 78 AND 79

X1	20.000	6.000	170.000	290.000	230.000	200.000	230.000	0.000	0.000	0.000
GR	786.700	0.000	785.700	170.000	785.700	290.000	705.000	400.000	785.000	470.000
GR	786.500	600.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NH	5.000	10.000	100.000	0.016	250.000	10.000	320.000	0.316	390.000	10.000
NH	450.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SEC; INTERPOLATED FROM ABRAMS SECS 78 AND 79

X1	21.000	6.000	100.000	250.000	220.000	171.000	220.000	0.000	0.000	0.000
GR	787.500	0.000	786.600	100.000	786.600	250.000	786.300	320.000	786.300	390.000
GR	787.500	450.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NH	5.000	10.000	100.000	0.016	350.000	10.000	270.000	0.016	340.000	10.000
NH	400.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SEC; INTERPOLATED FRO ABRAMS SECS 78 AND 79

X1	22.000	6.000	100.000	250.000	235.000	190.000	235.000	0.000	0.000	0.000
GR	788.500	0.000	787.500	100.000	787.500	250.000	787.500	270.000	787.500	340.000
GR	788.500	400.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NH	3.000	10.000	100.000	0.016	230.000	10.000	400.000	0.000	0.000	0.000

VALLEY SEC; INTERPOLATED FROM ABRAMS SECS 78 AND 79

X1	23.000	6.000	100.000	240.000	225.000	215.000	215.000	0.000	0.000	0.000
GR	789.400	0.000	788.400	100.000	788.400	300.000	788.400	400.000	0.000	0.000
NH	5.000	10.000	100.000	0.016	150.000	10.000	235.000	0.016	380.000	10.000
NH	400.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SEC; INTERPOLATED FROM ABRAMS SECS 78 AND 79

X1	24.000	6.000	250.000	240.000	225.000	221.000	225.000	0.000	0.000	0.000

NH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
GR	790.300	400.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NH	5.000	10.000	100.000	0.016	160.000	10.000	340.000	0.016	490.000	10.000
NH	500.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SEC: INTERPOLATED FROM ABRAMS SECS TO AND 79

X1	25.000	6.000	340.000	490.000	100.000	190.000	190.000	0.000	0.000	0.000
GR	791.400	0.000	790.400	100.000	790.400	160.300	790.100	340.000	790.100	490.000
GR	791.100	510.000	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	7.000	40.000	1319.000	0.016	1378.000	10.000	1692.000	0.016	1758.000	10.000
NH	1978.000	0.016	2038.000	10.000	2098.000	0.000	0.000	0.000	0.000	0.000

VALLEY SEC ALONG ELM ST: ABRAMS SECTION 79

X1	26.000	3.000	1652.000	1752.000	100.000	400.000	130.000	0.000	0.000	0.000
GR	791.500	974.200	791.230	1311.130	791.200	1370.000	790.800	1652.000	790.800	1752.000
GR	790.300	1970.000	790.800	2050.000	792.700	2098.000	0.000	0.000	0.000	0.000
QT	4.000	663.000	923.000	1023.000	1265.000	0.000	0.000	0.000	0.000	0.000
NH	6.000	10.000	25.000	0.060	95.500	0.035	104.600	0.050	143.500	0.050
NH	300.000	10.000	350.000	1.000	5.000	0.000	0.000	0.000	0.000	0.000

VALLEY SEC D/S OF PROP ICE CHANNEL SEC ABOUT .7 FT LOWER THAN SEC 81

X1	27.000	10.000	95.500	104.600	270.000	100.000	270.000	0.000	0.000	3.000
GR	791.000	0.000	791.300	95.300	791.300	95.500	790.900	95.600	790.200	101.000
GR	787.100	104.500	791.100	157.500	791.000	195.000	791.600	370.000	790.500	551.000
NC	0.030	0.060	0.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000

D/S FACE OF CULVERT AT WEST MAIN STREET

X1	27.000	3.000	96.000	104.000	45.000	65.300	93.000	0.000	0.000	0.000
X2	16.000	0.500	0.000	0.000	0.000	0.000	0.000	791.100	791.100	0.000
GT	794.000	0.300	792.000	1.000	791.100	96.000	786.300	96.500	786.300	100.000
GR	787.200	103.500	791.100	104.000	792.000	295.000	794.000	300.000	0.000	0.000
SB	0.000	2.400	2.600	0.000	5.750	6.000	27.000	0.000	786.700	786.300

U/S FACE OF CULVERT AT WEST MAIN STREET CROSS SEC 1

X1	29.000	12.000	146.000	152.000	82.000	82.000	52.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	791.400	792.300	0.300	0.000	0.000	0.000	0.000
X3	15.000	0.000	0.000	0.000	0.000	0.000	0.000	792.600	792.000	0.000
GT	10.300	110.000	793.700	0.000	793.000	793.700	0.000	146.000	792.000	0.000
BT	146.300	792.600	791.400	148.600	792.300	791.400	151.300	792.800	792.400	152.000
GT	792.800	0.000	276.000	792.000	0.000	277.000	794.500	0.000	520.000	794.400
BT	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	794.500	0.000	793.200	100.000	793.000	110.000	793.000	123.000	791.400	146.000
GR	787.100	146.300	794.700	148.000	787.700	195.500	791.400	152.000	791.400	276.000
GR	791.400	277.000	794.400	320.000	0.000	0.000	0.000	0.300	0.000	0.000
NH	5.000	10.000	100.300	0.000	100.700	0.035	140.000	0.015	200.000	10.000
NH	350.000	0.000	0.000	0.000	0.700	0.000	0.000	0.000	0.000	0.300

VALLEY SEC 55 FT U/S OF WEST MAIN CULVERTS CROSS SECTION 81

X1	30.300	12.000	134.000	140.000	55.000	55.000	33.300	3.000	0.000	0.000
GR	794.700	0.000	793.700	0.000	793.000	103.000	792.300	104.000	792.000	151.000
GR	787.600	134.100	786.900	155.500	787.800	194.900	792.500	140.000	792.700	314.000
GR	792.700	300.000	794.700	350.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SEC 300 FT U/S OF SECTION 30

X1	31.000	0.000	0.000	0.000	300.000	300.000	300.000	0.000	0.000	0.000
NC	0.030	0.030	0.035	0.050	0.000	0.000	0.300	0.000	0.000	0.000

D/S FACE OF ACADEMY ST CULVERT; SECTION 82

X1	32.000	14.300	198.000	795.000	357.000	150.000	330.000	0.300	0.000	0.000
X3	10.000	0.200	0.000	0.000	0.000	0.000	0.000	796.400	796.400	0.000
GR	797.000	0.300	796.000	198.000	796.000	140.000	796.000	150.300	796.400	198.000
GR	790.400	191.200	788.900	191.300	788.900	194.500	789.000	197.700	790.400	197.800
GR	796.400	199.300	796.400	360.000	796.400	300.500	797.300	400.300	0.000	0.000
GB	0.000	2.100	2.600	3.000	5.520	5.000	42.000	0.300	788.500	788.800

U/S FACE OF ACADEMY ST CULVERT; SECTION 82

X1	33.000	0.000	0.000	0.000	92.000	92.000	92.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	796.400	795.300	0.000	0.000	0.000	0.000	0.000
X3	12.000	0.100	0.000	0.000	0.000	0.000	0.000	795.300	795.300	0.300
GT	0.000	140.300	200.200	0.000	141.200	795.300	0.000	790.000	795.500	0.300
GT	191.200	795.000	795.400	197.000	795.300	794.400	195.000	795.500	0.000	360.001
GT	795.300	0.000	360.500	600.000	0.000	400.000	800.000	0.000	0.000	0.000
NH	5.000	10.000	8.000	0.050	35.000	0.035	62.000	0.050	256.000	10.000
NR	300.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SEC 75 FT U/S OF ACADEMY ST CULVERT; ABEAMS SEC 83

X1	34.000	15.000	35.000	82.300	75.000	75.000	75.000	0.000	0.000	0.000
GR	797.100	0.000	796.100	8.000	796.100	12.300	796.100	35.000	795.700	47.000
GR	799.300	52.000	799.300	59.700	795.300	92.300	795.900	77.000	794.000	86.000
GT	797.300	158.000	796.000	114.000	795.100	217.300	796.100	299.000	795.000	300.000

VALLEY SEC BETWEEN ABAM'S SECTIONS 83 AND 84

X1	35.000	0.000	5.000	5.000	407.000	205.000	500.000	0.300	0.000	0.000
UH	5.000	10.000	7.000	0.050	35.000	0.035	58.000	0.050	95.300	10.300
NH	97.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SEC 50 FT D/S OF LOVELL STREET; ABEAMS SEC 84

X1	36.000	11.000	30.300	55.000	310.300	240.300	513.000	0.000	0.000	0.000
GR	800.900	0.000	799.700	7.300	799.200	10.300	799.300	30.000	791.100	35.000
GT	791.000	46.000	791.200	93.000	790.600	55.000	870.000	89.000	807.000	93.000
GR	801.100	97.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

D/S OF LOVELL STREET; U/S END OF ENCLOSURE 2

X1	37.000	0.000	0.000	0.000	50.000	50.000	50.300	0.300	0.300	0.000
GT	4.000	540.000	796.000	796.000	1161.000	0.000	0.000	0.000	0.000	0.000
NH	3.000	10.000	324.000	0.035	462.000	10.000	504.000	0.000	0.000	0.000

SECTION AT LOVELL STREET FOR OVERFLOW FLOWS A 'S S-C 85

X1	38.000	0.300	324.000	462.000	170.300	170.300	193.000	0.000	0.000	0.000
GR	803.000	392.300	802.800	324.500	801.400	387.300	802.000	462.000	801.100	470.000

GR	800.100	470.000	800.600	482.000	802.400	504.000	0.000	0.000	0.000	0.000
NH	3.000	10.000	50.000	0.035	200.000	10.000	250.000	0.000	0.000	0.000

APPROX. 100 FT U/S OF LOWELL STREET

X1	39.000	4.000	50.000	200.000	100.000	100.000	100.000	0.000	0.000	0.000
GR	304.000	0.000	802.000	50.000	802.000	200.000	304.000	250.000	0.000	0.000
NH	3.000	10.000	50.000	0.035	150.000	10.000	200.000	0.000	0.000	0.000

APPROX. 225 FT U/S OF LOWELL STREET

X1	40.000	4.000	50.000	150.000	125.000	125.000	125.000	0.000	0.000	0.000
GR	305.000	0.000	803.000	50.000	803.000	150.000	305.000	200.000	0.000	0.000
NH	3.000	10.000	50.000	0.035	130.000	10.000	200.000	0.000	0.000	0.000

APPROX. 325 FT U/S OF LOWELL STREET

X1	41.000	4.000	50.000	130.000	100.000	100.000	100.000	0.000	0.000	0.000
GR	306.500	0.000	804.000	50.000	804.000	130.000	306.500	200.000	0.000	0.000

APPROX. 450 FT U/S OF LOWELL STREET AT [illegible] AVE

X1	42.000	0.000	0.000	0.000	125.000	125.000	125.000	0.000	1.000	0.000

APPROX. 625 FT U/S OF LOWELL STREET

X1	43.000	5.000	0.000	0.000	175.000	175.000	175.000	0.000	1.500	0.000
NH	3.000	10.000	50.000	0.035	150.000	10.000	200.000	0.000	0.000	0.000

APPROX. 800 FT U/S OF LOWELL STREET

X1	44.000	4.000	50.000	150.000	175.000	175.000	175.000	0.000	0.000	0.000
GR	810.000	0.000	808.000	50.000	808.000	150.000	810.000	200.000	0.000	0.000
NH	3.000	10.000	50.000	0.035	200.000	10.000	250.000	0.000	0.000	0.000

APPROX. 1275 FT U/S OF LOWELL STREET

X1	45.000	4.000	50.000	200.000	475.000	475.000	475.000	0.000	0.000	0.000
GR	811.500	0.000	808.500	50.000	808.500	200.000	811.500	250.000	0.000	0.000

APPROX. 1725 FT U/S OF LOWELL STREET

X1	46.000	0.000	0.000	0.000	450.000	450.000	450.000	0.000	1.250	0.000
QT	4.000	665.000	920.000	1020.000	1285.000	0.000	0.000	0.000	0.000	0.000
NC	0.060	0.000	0.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000

APPROX. 2175 FT U/S OF LOWELL U/S END OF ENCL. VALLEY SEC #8

X1	47.000	15.000	650.000	706.000	450.000	450.000	450.000	0.000	0.000	0.000
GR	814.200	594.000	813.500	322.000	813.400	532.000	812.000	530.000	830.800	552.000
GR	810.400	581.000	810.000	598.000	809.000	630.000	809.600	650.000	804.800	664.000
GR	804.700	674.000	804.600	680.000	805.200	603.000	806.900	706.000	805.900	725.000

VALLEY SEC APPROX. 125 FT U/S OF ENCLOSURE

X1	48.000	0.000	0.000	0.000	125.000	125.000	125.000	0.000	.1.300	0.000

INTERPOLATED GEC FROM ABRAM'S SECTIONS 89 AND 90

X1	49.000	9.000	120.000	152.000	230.000	230.000	233.000	0.000	0.000	0.000
GR	814.000	3.000	814.000	50.000	311.000	90.000	611.000	102.000	806.500	120.000
GR	806.500	132.000	810.000	142.000	312.000	165.000	820.000	203.000	0.000	0.000
GT	4.000	315.000	435.000	485.000	745.000	0.000	0.000	0.000	0.000	0.000

D/S FACE OF CULVERT AT OLIVER STREET

X1	50.000	0.000	0.000	3.000	95.000	95.000	95.000	0.000	0.700	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	812.000	812.000	0.000
SB	0.000	2.300	2.600	3.000	3.400	5.000	10.000	0.000	807.700	807.200

U/S FACE OF CULVERT AT OLIVER STREET

X1	51.000	12.000	200.000	240.000	126.000	126.000	126.000	0.000	0.000	0.000
X2	0.000	0.000	0.000	812.700	813.400	0.000	0.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.300	0.000	0.000	0.000	830.400	830.400	0.000
ST	0.000	0.000	830.000	0.300	1.300	803.100	0.000	0.000	805.300	0.000
GT	100.000	319.600	0.000	232.000	921.600	832.700	235.930	821.400	812.700	276.000
GT	821.600	0.000	279.000	825.000	0.000	0.300	0.000	0.000	0.000	0.300
GR	825.000	0.000	812.500	1.000	814.500	80.000	819.000	103.000	811.000	200.000
GT	811.000	217.000	807.700	242.000	302.700	255.250	841.000	240.000	812.000	240.000
GT	821.600	274.000	815.000	275.000	0.000	0.300	0.000	0.000	0.000	0.000

VALLEY SECTION; ABRAM'S SEC 90

X1	52.000	9.500	27.000	113.000	58.000	0.000	0.000	0.300	0.500	0.000
GR	822.500	0.300	811.400	0.000	811.200	57.000	708.100	99.000	807.000	102.000
GR	807.500	105.000	813.100	110.300	814.400	187.000	822.500	200.000	0.300	0.000

VALLEY SECTION; ABRAM'S SEC-91

X1	53.000	13.000	530.000	346.000	195.000	195.000	193.300	0.100	0.000	0.000
GT	825.000	602.000	813.600	547.000	313.200	716.000	812.300	734.500	813.100	700.000
GR	813.000	771.000	813.600	300.000	308.600	822.000	808.400	850.000	808.700	838.000
GR	813.800	846.000	815.000	867.000	825.000	802.000	0.000	0.000	0.000	0.000

VALLEY SECTION;150 FT U/S OF ABRAM'S SEC 91

X1	54.000	0.000	0.000	0.000	160.000	160.000	160.000	0.000	1.000	0.000

D/S FACE OF CULVERT AT RAILROAD;FIRST CROSSING WEST OF OLIVET ST

X1	55.000	0.000	0.000	0.000	151.000	121.000	125.000	0.000	0.200	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	815.500	815.400	0.000
SB	0.000	2.300	2.600	0.000	5.400	0.000	27.000	0.000	810.400	809.600

U/S FACE OF CULVERT AT RAILROAD

X1	56.000	8.000	220.000	270.000	66.000	66.000	66.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	815.400	324.400	0.000	0.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	824.400	824.400	0.000

BT	9.000	90.000	826.200	0.000	72.000	324.400	0.000	227.500	824.400	815.400
BT	232.500	826.400	815.400	262.000	824.400	0.000	375.000	830.200	0.000	0.000
GR	826.200	50.000	824.400	70.000	816.000	225.000	810.400	227.500	810.400	232.500
GR	816.000	240.000	824.400	282.000	830.000	379.000	0.000	0.000	0.000	0.000

VALLEY SECTION BETWEEN CULVERTS AT RAILROAD AND STADIUM DRIVE/FIRST CROSSING WEST OF

X1	57.000	9.000	172.300	192.000	40.000	30.000	60.000	0.000	0.000	0.000
GR	826.000	0.000	822.300	30.000	822.500	150.000	822.400	172.000	821.400	177.000
GR	824.300	192.000	821.300	192.700	822.000	240.300	824.000	270.000	0.000	0.000

D/S FACE OF CULVERT AT STADIUM DRIVE/FIRST CROSSING WEST OF OLIVER ST

X1	50.000	0.000	0.000	0.000	70.000	30.300	48.300	0.000	1.200	0.000
X3	10.300	0.000	0.000	0.000	0.000	0.000	0.000	817.600	817.600	0.000
SR	0.000	2.400	2.400	0.000	3.950	0.300	29.900	0.000	814.400	812.600

U/S FACE OF CULVERT AT STADIUM DRIVE

X1	59.000	10.000	310.000	925.000	134.000	192.000	915.000	0.000	0.000	0.000
X2	0.000	1.000	1.000	117.600	824.400	0.000	0.000	0.000	1.000	0.000
X3	10.000	1.000	0.000	0.000	0.000	0.000	0.000	826.400	824.400	0.000
BT	9.000	0.000	826.000	0.000	162.000	328.000	0.000	246.500	826.200	0.000
BT	316.000	826.200	819.400	319.930	824.200	819.400	366.000	825.700	0.000	595.000
BT	525.400	0.200	435.000	328.000	0.000	460.000	328.000	0.200	0.000	0.000
GT	525.000	0.000	322.000	192.000	323.000	272.000	122.000	170.300	814.400	316.000
GR	814.400	319.430	323.000	325.000	327.000	361.000	324.000	326.300	628.200	630.000
GR	328.000	460.200	0.000	0.000	0.000	0.000	0.000	0.300	0.200	0.000

VALLEY SEC APPROX. 100 FT U/S OF STADIUM DRIVE CULVERT

X1	60.000	10.000	120.000	130.000	30.000	120.000	110.000	0.000	0.000	0.000
SR	827.000	0.000	816.000	10.000	816.000	130.000	814.000	121.000	814.000	114.000
GR	816.000	120.000	816.000	190.000	827.000	210.000	0.000	0.000	0.000	0.000

SECTION AT TOE OF TAIL BAR APPROX. 150 FT U/S OF STADIUM DR.CULVERT

X1	61.000	10.000	100.000	120.000	40.000	87.000	57.000	0.000	0.000	0.000
GR	827.000	0.000	816.000	10.000	816.000	100.000	815.000	113.000	814.000	114.000
GR	814.000	119.000	815.000	120.000	815.000	125.000	816.000	200.000	827.000	210.000

VALLEY SECTION BETWEEN TAIL BAR S

X1	62.000	8.000	100.000	120.000	120.000	80.000	100.000	0.000	0.000	0.000
GR	827.000	0.000	816.500	10.000	816.000	100.000	814.500	121.000	814.500	119.000
GR	816.000	120.000	816.500	200.000	827.000	210.000	0.000	0.000	0.000	0.000

SECTION AT TOE OF TAIL BAR APPROX. 200' U/S OF PIPE LINE CROSSING

X1	63.000	10.000	100.000	120.000	130.000	130.000	120.000	0.000	0.000	0.000
GR	827.000	0.000	817.000	10.000	816.100	120.000	816.100	113.000	815.000	114.000
GR	815.500	119.500	816.000	120.000	827.100	135.000	827.100	200.000	827.000	210.000

SECTION AT THE PIPE LINE/MAIN PIPES DO NOT OBSTRUCT FLOW/ARE DELECTED

X1	64.000	9.000	100.000	121.000	20.000	21.000	20.000	0.000	0.000	0.000

GR	827.000	0.000	817.000	10.000	817.000	100.000	815.100	131.000	815.900	115.500
GR	814.700	130.000	817.000	131.000	817.000	200.000	827.000	210.000	0.000	0.000

D/S FACE OF THE FOOT BRIDGE

X1	65.000	7.000	100.000	116.000	180.000	166.000	166.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	817.800	817.800	0.000
GR	827.000	0.000	817.800	100.000	814.900	106.000	814.600	108.000	815.000	110.000
GR	817.800	116.000	827.000	200.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	65.100	9.000	106.000	100.000	1.000	1.000	1.000	0.000	0.000	0.000
X2	0.000	0.000	0.000	817.800	810.000	0.000	0.000	0.000	0.000	0.000
GR	827.000	0.000	817.800	100.000	817.800	106.000	814.900	106.100	814.600	108.000
GR	815.000	109.900	817.300	110.000	817.800	116.000	827.000	200.000	0.000	0.000

X1	65.700	0.000	0.000	0.000	3.000	3.000	3.000	0.000	0.000	0.000
X2	0.000	0.000	0.000	817.800	816.300	0.000	0.000	0.000	0.000	0.000

U/S FACE OF THE FOOT BRIDGE

X1	66.000	7.000	100.000	116.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	816.300	818.300	0.000
GR	827.000	0.000	817.800	100.000	814.900	106.000	815.100	108.000	815.200	110.000
GR	817.800	116.000	827.000	200.000	0.000	0.000	0.000	0.000	0.000	0.000

D/S FACE OF CULVERT AT ABRAMS SECTION 95

X1	67.000	16.000	178.000	186.000	189.000	189.000	189.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	818.400	818.400	0.000
GR	827.500	0.000	821.000	96.000	817.400	0.000	817.200	95.000	817.400	134.000
GR	818.300	140.000	818.400	178.000	814.000	138.100	815.900	182.000	815.600	185.900
GR	818.400	186.000	820.300	226.000	822.200	230.000	827.000	324.000	0.000	0.000

X1	67.100	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X2	0.000	0.000	0.000	818.400	819.700	0.000	0.000	0.000	0.000	0.000

X1	67.900	0.000	0.000	0.000	10.000	10.000	10.000	0.000	0.000	0.000
X2	0.000	0.000	0.000	818.400	819.700	0.000	0.000	0.000	0.000	0.000

U/S FACE OF CULVERT AT ABRAMS SECTION 95

X1	68.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	819.700	819.700	0.000

INTERPOLATED SECTION BETWEEN ABRAMS SECTIONS 95 AND 96

X1	69.000	0.000	0.000	0.000	120.000	130.000	125.000	0.000	1.200	0.000

125 FT D/S OF ABRAMS SEC 95;INTERPOLATED FROM ABRAMS SEC 96

X1	70.000	9.000	104.000	123.000	123.000	123.000	123.000	0.000	0.000	0.000
GR	832.300	0.000	821.600	37.500	820.400	101.000	818.200	105.000	818.000	111.000
GR	817.400	116.000	823.800	123.000	824.900	253.000	828.400	277.000	0.000	0.000

D/S FACE OF DIVERSION FROM ABRAMS SECS 96 TO 99 ABRAMS SEC 96

X1	71.000	0.000	0.000	0.000	125.000	125.000	125.000	0.000	1.200	0.000
ST	4.000	190.300	303.200	355.200	605.000	4.000	0.000	0.300	0.300	0.000
VC	0.000	0.000	0.300	0.300	1.500	0.000	0.000	0.000	0.500	0.000

DIVERSION FROM ABRAMS SECS 96 TO 99 ALONG RIGHT SIDE OF STADIUM DRIVE

X1	71.000	6.000	57.000	93.300	130.000	130.000	130.000	0.000	0.000	0.000
GR	626.500	0.000	625.300	57.000	622.400	71.000	624.000	93.000	327.000	295.000
GR	630.600	217.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	71.200	0.000	0.000	0.000	130.000	130.000	130.000	0.000	1.000	0.000

X1	71.300	0.000	0.000	0.000	130.000	130.000	130.000	0.000	0.000	0.000

X1	71.400	0.000	0.000	0.000	130.000	130.000	130.000	0.000	0.000	0.000

X1	71.500	0.100	0.000	0.000	130.000	130.000	130.000	0.000	1.500	0.000

X1	71.600	6.000	29.000	63.000	130.000	130.000	130.000	0.000	0.000	0.000
CP	339.400	0.000	323.000	29.000	327.000	44.000	325.500	53.000	277.000	14.000
CP	335.100	101.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	71.700	0.000	0.000	0.000	130.000	130.000	130.000	0.000	1.000	0.000
ST	4.000	315.000	635.000	495.000	745.000	0.000	0.000	0.000	0.000	0.000
VC	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000

U/S END OF DIVERSION ABRAMS SEC 99

X1	72.000	10.000	44.000	63.000	130.000	130.000	130.000	0.000	0.000	0.000
GR	341.400	0.000	356.000	42.000	336.400	44.000	325.300	50.100	277.700	31.000
GR	327.500	54.000	327.700	52.000	331.500	63.000	326.000	65.000	317.100	101.000
VC	0.100	0.400	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000

D/S END AT HOWARD; ALSO D/S END OF DIVERSION BETWEEN ABRAMS SECS 100 & 157

X1	73.000	0.000	0.000	0.000	420.000	420.000	419.000	0.000	1.500	0.000
ST	4.000	170.000	134.500	192.000	320.000	0.000	0.000	0.000	0.000	0.000

D/S END OF HOWARD ST CULVERT

X1	73.500	6.000	30.000	56.000	32.000	30.000	30.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	351.000	351.000	0.000
GR	343.000	0.100	353.000	30.000	329.000	31.000	329.000	33.000	303.000	34.000
GR	343.000	120.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SR	0.000	6.200	2.600	106.000	3.900	0.000	19.600	0.000	822.000	823.000

U/S END OF HOWARD ST CULVERT INTERSECTION WITH CHRISTIANA HIGH SCHOOL ROAD

X1	74.000	0.000	0.100	0.300	291.300	293.300	293.300	0.300	0.300	0.000
X2	0.000	0.000	1.300	853.900	740.400	0.300	0.000	0.300	0.000	0.000

X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	835.000	835.000	0.000

VALLEY SECTION; ABRAMS SECTION 101

X1	75.000	12.000	75.000	141.000	101.000	101.000	101.000	0.000	0.000	0.000
GR	843.700	0.000	839.200	84.500	839.900	49.000	834.100	74.000	832.400	79.000
GR	831.500	93.000	831.700	100.300	831.500	116.000	832.200	128.000	833.500	141.000
GR	835.200	151.000	843.800	158.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SECTION; ABRAMS SECTION 102

X1	76.000	13.000	843.000	843.000	560.300	560.000	540.000	0.000	0.000	0.000
GR	853.200	733.000	837.400	736.000	836.300	834.000	836.600	825.000	834.700	843.000
GR	833.300	849.000	833.500	854.000	833.300	859.000	835.900	863.000	837.200	880.000
GR	830.700	924.000	838.700	872.700	843.700	1016.700	0.000	0.000	0.000	0.000

VALLEY SECTION; ABRAMS SECTION 103

X1	77.000	10.000	75.000	95.000	265.000	265.300	265.000	0.000	0.000	0.000
GR	845.800	37.000	839.300	50.700	838.700	78.700	833.500	11.700	832.170	85.000
GR	837.300	91.000	835.500	95.300	837.100	112.000	839.900	120.500	843.510	140.770

X1	77.500	6.000	55.000	65.000	60.000	70.000	65.000	0.000	0.000	0.000
GR	843.000	0.000	837.000	50.000	834.200	55.000	834.200	65.000	838.000	70.000
GR	843.000	120.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

60 INCH CMP CONSIDERED AS VALLEY SECTION; ABRAMS SEC 104

X1	75.000	6.000	55.000	65.000	60.000	70.000	65.000	0.000	0.000	0.000
GR	843.000	0.000	837.000	50.000	834.200	55.000	834.200	65.000	838.000	70.000
GR	843.000	120.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

42 INCH CMP CONSIDERED AS VALLEY SECTION; ABRAMS SEC 105

X1	79.000	12.000	839.300	179.300	150.300	130.300	120.300	0.000	0.000	0.000
GR	846.200	836.000	846.300	826.300	848.300	720.300	840.300	776.300	846.000	794.300
GR	846.000	812.000	836.300	832.300	834.300	836.000	836.300	849.300	838.400	820.300
GR	836.900	876.000	840.000	895.000	841.000	890.000	840.300	930.300	840.300	874.000
GR	846.000	1029.000	0.000	0.300	0.000	0.000	0.000	0.000	0.300	0.000

X1	79.100	8.000	52.000	72.000	210.000	210.000	210.000	0.000	0.000	0.000
GR	846.000	37.300	844.000	42.000	842.000	52.000	837.500	62.000	837.500	64.000
GR	840.000	72.300	844.000	84.000	846.000	94.000	0.000	0.000	0.000	0.000

X1	79.120	6.300	24.000	50.000	150.300	140.300	150.000	0.000	0.000	0.000
GR	849.300	0.000	846.300	8.000	840.500	34.300	833.300	28.300	830.300	32.300
GR	840.500	36.000	846.300	52.100	849.300	60.300	0.000	0.000	0.000	0.000

X1	79.190	6.000	26.000	54.300	150.000	150.300	130.000	0.000	0.000	0.000
GR	849.000	0.000	841.000	26.300	839.100	20.000	835.100	32.000	841.000	34.000
GR	849.000	60.000	0.000	0.300	0.000	0.000	0.000	0.000	0.000	0.000

X1	79.190	6.000	26.000	54.000	70.000	70.000	70.000	0.000	0.000	0.000
GR	849.000	0.000	844.000	26.000	839.500	20.000	838.100	32.000	844.000	34.000

GR	447.000	0.000	0.300	0.000	0.000	0.300	0.300	0.000	0.000	0.000

D/S FACE OF CULVERT AT STADIUM DRIVE WEST OF HOWARD; ABRAMS SEC 106

X1	79.200	0.000	30.000	94.000	30.000	30.300	30.300	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	930.000	900.000	0.000
GR	854.100	0.000	843.900	50.000	839.900	50.000	839.900	53.950	843.930	54.020
GR	854.100	100.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SB	0.000	4.200	2.600	0.000	4.000	0.000	10.000	0.000	840.500	839.900

U/S FACE OF CULVERT AT STADIUM DRIVE WEST OF HOWARD

X1	79.500	0.000	0.000	0.000	123.000	123.000	123.000	0.300	0.000	0.000
X2	0.000	0.300	1.000	844.530	900.000	0.000	0.000	0.000	0.300	0.300
X3	10.000	0.300	0.000	0.000	1.000	0.000	0.000	900.000	930.300	0.300
DT	0.000	170.300	365.000	475.000	720.000	0.000	0.000	0.000	0.000	0.000

U/S END OF DIVERSION; ABRAMS SEC 107

X1	30.000	14.000	234.000	252.000	61.000	42.000	50.000	0.000	0.000	0.000
GR	393.400	30.300	838.870	110.200	660.000	120.000	359.000	374.000	487.000	200.000
GR	346.200	214.300	245.870	252.200	645.510	214.000	141.000	325.000	220.000	249.000
GR	341.600	252.300	644.100	262.000	645.100	279.000	856.000	504.000	0.000	0.000
X1	30.200	0.000	1.500	0.300	220.000	220.000	220.000	1.000	1.000	0.000
X1	30.400	0.000	0.300	0.300	230.000	230.000	220.000	0.000	1.000	0.000
X1	30.600	0.000	0.000	0.000	220.000	220.000	220.000	0.000	1.000	0.000
X1	30.800	0.000	0.000	0.000	220.000	220.000	220.000	0.000	1.000	0.000

VALLEY SECTION; ABRAMS SECTION 108

X1	31.000	13.000	40.300	46.300	220.300	220.000	220.000	0.000	0.000	0.000
GR	855.200	0.000	853.300	2.300	852.000	2.000	852.000	10.300	849.700	17.000
GR	849.400	46.000	846.300	49.000	845.900	52.000	846.400	50.300	847.300	40.000
GR	843.600	66.000	849.400	125.000	835.000	177.300	0.000	0.000	0.000	0.000
X1	31.200	7.000	0.000	0.000	200.000	200.000	200.000	0.000	1.000	0.000
X1	31.400	0.000	0.000	0.000	200.000	200.000	200.000	0.000	1.000	0.000

VALLEY SECTION; ABRAMS SECTION 109

X1	32.000	10.000	43.000	50.100	210.300	200.000	200.000	0.300	0.000	0.000
GR	855.900	0.000	855.300	2.000	853.700	4.300	854.300	7.000	851.600	16.000
GR	851.400	41.000	849.300	45.000	844.900	77.300	845.200	49.000	850.000	40.000
GR	850.500	56.000	851.700	60.000	841.600	84.300	851.500	76.000	851.200	104.000
GR	852.410	132.000	857.000	153.000	847.000	202.000	0.000	0.000	0.000	0.000

VALLEY SECTION; INTERPOLATED FROM ABRAMS SECTIONS 108 AND 110

X1	82.100	7.000	37.000	58.000	160.000	160.000	160.000	0.000	0.000	0.000
GR	856.000	0.000	853.000	6.000	853.000	37.000	850.000	46.000	852.500	58.000
GR	853.000	96.000	850.000	102.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	82.200	0.000	0.000	0.000	160.000	160.000	160.000	0.000	1.000	0.000
X1	82.300	0.000	0.000	0.000	160.000	160.000	160.000	0.000	1.000	0.000
X1	82.400	0.000	0.000	0.000	160.000	160.000	160.000	0.000	1.000	0.000

VALLEY SECTION; INTERPOLATED FROM ABRAMS SECTIONS 109 AND 110

X1	82.500	7.000	47.000	60.000	160.000	160.000	160.000	0.000	0.000	0.000
GR	860.000	0.000	858.000	10.000	857.000	47.000	854.000	58.000	856.000	68.000
GR	859.000	94.000	861.000	96.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	82.600	0.000	0.000	0.000	160.000	160.000	160.000	0.000	1.000	0.000

VALLEY SECTION; ABRAMS SECTION 110

X1	83.000	14.000	55.000	76.000	170.000	170.000	170.000	0.000	0.000	0.000
GR	864.200	0.000	859.600	14.000	859.200	34.000	859.600	36.500	859.600	41.500
GR	859.400	50.000	859.300	55.000	859.600	57.000	856.400	63.000	855.900	66.000
GR	856.500	69.000	857.300	76.000	857.600	80.000	862.400	96.000	0.000	0.000
X1	83.200	0.000	0.000	0.000	230.000	230.000	230.000	0.000	1.000	0.000
X1	83.400	0.000	0.000	0.000	230.000	230.000	230.000	0.000	1.000	0.000

VALLEY SECTION; ABRAMS SECTION 111

X1	84.000	16.000	48.000	72.000	250.000	250.000	250.000	0.000	0.000	0.000
GR	867.600	0.000	862.500	12.000	862.500	36.500	862.500	31.500	862.700	40.000
GR	862.700	45.000	861.700	48.000	859.900	54.000	859.400	58.000	859.600	62.000
GR	860.000	64.000	859.000	69.000	861.000	72.000	863.600	83.000	865.800	91.000
X1	84.500	0.000	0.000	0.000	370.000	370.000	370.000	0.000	1.000	0.000

VALLEY SECTION; ABRAMS SECTION 112

X1	85.000	14.000	57.000	76.000	370.000	370.000	370.000	0.000	0.000	0.000
GR	871.600	0.000	865.300	36.500	865.200	41.500	865.300	50.000	865.500	55.000
GR	864.700	52.000	862.400	62.000	862.200	63.000	862.000	65.000	861.600	68.000
GR	862.300	74.000	863.300	78.000	863.300	83.000	871.700	98.000	0.000	0.000
X1	85.500	0.000	0.000	0.000	415.000	415.000	415.000	0.000	1.000	0.000

VALLEY SECTION; ABRAMS SECTION 113

X1	86.000	16.000	58.000	86.000	415.000	415.000	415.000	0.000	0.000	0.000

GR	874.200	0.000	871.300	12.300	863.700	29.500	868.200	34.500	868.700	65.000
GR	868.300	48.000	857.600	50.000	865.300	53.000	864.800	57.000	864.700	62.000
GR	864.200	70.000	864.700	78.000	866.900	84.000	868.000	95.000	869.500	98.000
GR	870.600	150.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
EJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: KALAMAZOO, CITY OF

3) WATERCOURSE: ARCADIA CREEK

4) DOCUMENT TYPE: MULTI PROFILE RUN

EXISTING BYPASS DIVERSION

100-YR

00BREAK00

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*******************************************
*  HEC-2 WATER SURFACE PROFILES           *
*                                         *
*  Version   4.6.0;  February 1991        *
*                                         *
*  RUN DATE    28JUL92    TIME   13:58:00  *
*******************************************
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*************************************
*  U.S. ARMY CORPS OF ENGINEERS
*  HYDROLOGIC ENGINEERING CENTER
*  609 SECOND STREET, SUITE D
*  DAVIS, CALIFORNIA 95616-4687
*          (916) 756-1104
*************************************
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X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X            X     X
X     X  X        X                        X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                   X
X     X  X        X     X             X
X     X  XXXXXXX   XXXXX              XXXXXXX
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THIS RUN EXECUTED 28JUL92 13:58:0(

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**************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.0;  February 1991
**************************************


T1         ARCADIA CREEK HYDRAULIC ANALYSIS
T2         EXISTING BYPASS DIVERSION (POND-JUNCTION) 100-YEAR
T3         JTP 10/30/86 [RATINGEE2.HEC] REVISED DEH 9/22/89, 7/17/92 BAS

J1   ICHECK     INQ        NINV       IDIR       STRT       METRIC     HVINS      Q          WSEL       FQ

           2.0                                                                              768.65

J2   NPROF      IPLOT      PRFVS      XSECV      XSECH      FN         ALLDC      IBW        CHNIM      ITRACE

   1.0               -1.0


J3   VARIABLE CODES FOR SUMMARY PRINTOUT

 150.0

NC    0.015     0.015      0.015
QT      4.0      1020.      1020.      1020.      1020.
X1    23.62         8.       150.     170.01         0.         0.         0.
BT       4.       150.      771.5       769.      159.5      771.5       769.       160.5      771.5      769.
BT   170.01     771.5        769.
GR    771.5       100.      771.5       150.      760.7     150.01      760.7       159.5      760.7     160.5
GR    760.7       170.      771.5     170.01      771.5       200.

X1    23.63                                       .1         .1         .1
X2                                                                      1.
X5       -4.       .25        .25        .25        .25

QT       4.       150.       200.       300.       400.
X1    23.93         4.       100.      108.2         30.        30.        30.
BT       2.       100.       780.     771.67      108.2       780.     771.67
GR    771.1       100.      760.7      100.1      760.7      108.1      771.1       108.2

X1       5.0        11.       100.      108.5        1.0        1.0        1.0                   .57
BT       2.0       100.      780.0     771.67      108.5       780.     771.67
GR    771.1        100.      766.1      100.5      766.1        101.      765.1       101.1      763.85     102.5
GR   763.56      104.25     763.85        106.     765.1        107.5     766.1       107.51     766.1      108.0
GR    771.1       108.5

X1       5.1                                      100.       100.       100.                  .51
X2                                                                      1.
```

X1	5.2				300.	300.	300.		.60	
X2							1.			
X1	5.3				60.	60.	60.		.23	
X2							1.			
X1	5.4	6.0	100.25	108.25	1.	1.	1.			
BT	2.	100.25	775.0	771.9	108.25	775.0	771.9			
GR	778.0	100.	771.9	100.01	764.9	100.02	764.9	108.02	771.9	108.03
GR	780.0	108.04								
X1	5.5				25.	25.	25.		.80	
X2							1.			
X5	-4.	.08	.09	.11	.14					
X1	5.6	4.	100.	109.2	2.	2.	2.			
BT	2.	100.	775.	771.	109.2	775.	771.			
GR	771.0	100.	765.	100.1	765.	109.1	771.	109.2		
X1	5.7				20.	20.	20.			
X2							1.			
NC	.04	.04	.035	.1	.3					
X1	5.8	4.	100.	109.2	1.	1.	1.			
GR	771.	100.	763.	100.1	763.	109.1	771.	109.2		
QT	4.	1015.	1015.	1015.	1015.					
X1	28.99	8.	128.	148.1	20.	20.	20.			
GR	774.	100.	772.	150.	765.	175.	760.	185.	760.	205.
GR	765.	215.	772.	240.	774.	295.				

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 22.500

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.50 MAX ELLC= 768.49

22.50	6.78	767.24	0.00	0.00	768.77	1.53	0.38	0.06	777.31
807.	0.	807.	0.	0.	81.	0.	4.	1.	777.31
0.06	0.00	9.92	0.00	0.000	0.013	0.000	0.000	760.46	150.01
0.001607	250.	250.	250.	2	0	0	0.00	12.00	162.00

*SECNO 22.510
WATER EL=X5 LINE= 767.310

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.50 MAX ELLC= 768.49

22.51	6.85	767.31	0.00	0.00	768.81	1.50	0.00	0.01	777.31
807.	0.	807.	0.	0.	82.	0.	4.	1.	777.31
0.06	0.00	9.82	0.00	0.000	0.013	0.000	0.000	760.46	150.01
0.001565	0.	0.	0.	0	0	0	0.00	12.00	162.00

CCHV= 0.300 CEHV= 0.500
*SECNO 22.700

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.50 MAX ELLC= 768.50

22.70	6.84	767.34	0.00	0.00	768.84	1.50	0.03	0.00	771.50
807.	0.	807.	0.	0.	82.	0.	4.	1.	771.50
0.06	0.00	9.82	0.00	0.000	0.013	0.000	0.000	760.50	150.00
0.001564	20.	20.	20.	0	0	0	0.00	12.00	162.01

*SECNO 23.000

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.50 MAX ELLC= 768.56

23.00	6.82	767.38	0.00	0.00	768.89	1.51	0.05	0.01	771.56
807.	0.	807.	0.	0.	82.	0.	4.	1.	771.56
0.06	0.00	9.86	0.00	0.000	0.013	0.000	0.000	760.56	150.00
0.001584	30.	30.	30.	2	0	0	0.00	12.00	162.01

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 23.100
WATER EL=X5 LINE= 767.472

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.50 MAX ELLC= 768.56

23.10	6.91	767.47	0.00	0.00	768.94	1.47	0.00	0.01	771.56
807.	0.	807.	0.	0.	83.	0.	4.	1.	771.56
0.06	0.00	9.73	0.00	0.000	0.013	0.000	0.000	760.56	150.00
0.001530	0.	0.	0.	0	0	0	0.00	12.00	162.01

*SECNO 23.500

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.50 MAX ELLC= 768.68

23.50	6.85	767.54	0.00	0.00	769.03	1.50	0.08	0.01	771.68
807.	0.	807.	0.	0.	82.	0.	4.	1.	771.68
0.06	0.00	9.81	0.00	0.000	0.013	0.000	0.000	760.68	150.00
0.001564	50.	50.	50.	2	0	0	0.00	12.00	162.01

*SECNO 23.520

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.10 MAX ELLC= 769.00

23.52	7.64	768.34	0.00	0.00	769.22	0.88	0.00	0.18	771.50
807.	0.	807.	0.	0.	107.	0.	4.	1.	771.50
0.06	0.00	7.53	0.00	0.000	0.013	0.000	0.000	760.70	150.00
0.000769	2.	2.	2.	3	0	0	0.00	14.07	164.07

*SECNO 23.620

3370 NORMAL BRIDGE,NRD= 4 MIN ELTRD= 771.50 MAX ELLC= 769.00

23.62	7.96	768.66	0.00	0.00	769.30	0.64	0.01	0.07	771.50
1020.	0.	1020.	0.	0.	159.	0.	4.	1.	771.50
0.06	0.00	6.41	0.00	0.000	0.013	0.000	0.000	760.70	150.00
0.000431	10.	10.	10.	2	0	0	0.00	20.00	170.01

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 23.630
WATER EL=X5 LINE= 768.911

3370 NORMAL BRIDGE,NRD= 4 MIN ELTRD= 771.50 MAX ELLC= 769.00

23.63	8.21	768.91	0.00	0.00	769.51	0.60	0.00	0.01	771.50
1020.	0.	1020.	0.	0.	164.	0.	4.	1.	771.50
0.06	0.00	6.21	0.00	0.000	0.013	0.000	0.000	760.70	150.00
0.000396	0.	0.	0.	0	0	0	0.00	20.01	170.01

*SECNO 23.770

3370 NORMAL BRIDGE,NRD= 6 MIN ELTRD= 771.20 MAX ELLC= 769.00

23.77	8.18	768.91	0.00	0.00	769.52	0.60	0.01	0.00	771.54
1020.	0.	1020.	0.	0.	164.	0.	4.	1.	771.54
0.06	0.00	6.24	0.00	0.000	0.013	0.000	0.000	760.74	150.00
0.000401	15.	15.	15.	2	0	0	0.00	20.01	170.01

*SECNO 23.930

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.50 MAX ELLC= 768.80

23.93	7.98	768.75	0.00	0.00	769.70	0.95	0.01	0.17	771.57
749.	0.	749.	0.	0.	96.	0.	4.	1.	771.57
0.06	0.00	7.82	0.00	0.000	0.013	0.000	0.000	760.77	150.00
0.000906	16.	16.	16.	2	0	0	0.00	12.00	162.01

*SECNO 24.000

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.50 MAX ELLC= 768.82

24.00	7.96	768.76	0.00	0.00	769.71	0.95	0.01	0.00	771.59
749.	0.	749.	0.	0.	96.	0.	4.	1.	771.59
0.06	0.00	7.83	0.00	0.000	0.013	0.000	0.000	760.79	150.00
0.000909	7.	7.	7.	1	0	0	0.00	12.00	162.01

*SECNO 24.100

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

WATER EL=XS LINE= 768.795

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.50 MAX ELLC= 768.82

24.10	8.00	768.80	0.00	0.00	769.74	0.94	0.00	0.00	771.59
749.	0.	749.	0.	0.	96.	0.	4.	1.	771.59
0.06	0.00	7.80	0.00	0.000	0.013	0.000	0.000	760.79	150.00
0.000900	0.	0.	0.	0	0	0	0.00	12.00	162.01

*SECNO 25.000

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.50 MAX ELLC= 769.06

25.00	7.83	768.87	0.00	0.00	769.85	0.99	0.09	0.02	771.84
749.	0.	749.	0.	0.	94.	0.	5.	1.	771.84
0.07	0.00	7.97	0.00	0.000	0.013	0.000	0.000	761.04	150.00
0.000952	100.	100.	100.	2	0	0	0.00	12.00	162.01

*SECNO 27.500

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 773.00 MAX ELLC= 769.62

27.50	7.42	769.07	0.00	0.00	770.16	1.10	0.25	0.06	772.45
749.	0.	749.	0.	0.	89.	0.	5.	1.	772.45
0.08	0.00	8.41	0.00	0.000	0.013	0.000	0.000	761.65	150.00
0.001094	250.	250.	250.	2	0	0	0.00	12.00	162.01

*SECNO 28.560

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 773.50 MAX ELLC= 769.93

28.56	7.25	769.16	0.00	0.00	770.31	1.15	0.12	0.03	772.71
749.	0.	749.	0.	0.	87.	0.	5.	1.	772.71
0.08	0.00	8.61	0.00	0.000	0.013	0.000	0.000	761.91	150.00
0.001161	106.	106.	106.	2	0	0	0.00	12.00	162.01

*SECNO 28.570

28.57	7.25	769.16	0.00	0.00	770.31	1.15	0.00	0.00	772.71
749.	0.	749.	0.	0.	87.	0.	5.	1.	772.71
0.08	0.00	8.61	0.00	0.000	0.013	0.000	0.000	761.91	150.00
0.001161	1.	1.	1.	0	0	0	0.00	12.00	162.01

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 28.650

3301 HV CHANGED MORE THAN HVINS

28.65	8.50	770.50	0.00	0.00	770.62	0.12	0.00	0.31	773.00
749.	0.	749.	0.	0.	273.	0.	5.	1.	773.00
0.08	0.00	2.74	0.00	0.000	0.013	0.000	0.000	762.00	100.02
0.000058	8.	8.	8.	2	0	0	0.00	32.15	132.18

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.00	3.30	32.00	0.00	0.00	0.00	0.00	762.00	762.00

*SECNO 28.660
PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
*********	770.62	0.00	1019.	0.	0.	0.	762.00	765.00

28.66	8.94	770.94	0.00	0.00	771.14	0.20	0.51	0.00	775.00
1015.	0.	1015.	0.	0.	286.	0.	5.	1.	775.00
0.08	0.00	3.55	0.00	0.000	0.013	0.000	0.000	762.00	100.00
0.000094	1.	1.	1.	2	0	8	0.00	32.00	132.01

CCHV= 0.100 CEHV= 0.300
*SECNO 28.990

28.99	11.09	771.09	0.00	0.00	771.15	0.06	0.00	0.01	772.00
1015.	0.	949.	66.	0.	460.	66.	6.	1.	765.00
0.09	0.00	2.06	1.00	0.000	0.035	0.040	0.000	760.00	153.25
0.000174	44.	33.	50.	3	0	0	0.00	83.50	236.75

*SECNO 29.310

29.31	11.14	771.14	0.00	0.00	771.16	0.02	0.00	0.00	765.00
1015.	34.	952.	29.	73.	785.	63.	6.	1.	765.00
0.09	0.47	1.21	0.46	0.040	0.035	0.040	0.000	760.00	151.13
0.000037	45.	32.	60.	2	0	0	0.00	119.33	270.46

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 30.130									
30.13	11.10	771.10	0.00	0.00	771.19	0.09	0.01	0.02	765.00
1015.	157.	763.	95.	135.	283.	83.	8.	1.	765.00
0.10	1.16	2.70	1.15	0.040	0.035	0.040	0.000	760.00	135.67
0.000224	72.	82.	72.	2	0	0	0.00	101.42	237.09
*SECNO 30.630									
30.63	11.11	771.11	0.00	0.00	771.20	0.09	0.01	0.00	765.00
1015.	157.	763.	95.	135.	283.	83.	8.	1.	765.00
0.11	1.16	2.70	1.15	0.040	0.035	0.040	0.000	760.00	135.63
0.000224	22.	50.	71.	1	0	0	0.00	101.48	237.11
*SECNO 31.670									
31.67	6.09	771.09	0.00	0.00	771.26	0.17	0.04	0.02	776.00
1015.	0.	1015.	0.	0.	304.	0.	9.	1.	776.00
0.12	0.00	3.33	0.00	0.000	0.035	0.000	0.000	765.00	100.00
0.000742	124.	104.	136.	3	0	0	0.00	50.00	150.01

CCHV= 0.300 CEHV= 0.500
*SECNO 31.770

3301 HV CHANGED MORE THAN HVINS

31.77	5.78	770.78	0.00	0.00	771.59	0.81	0.01	0.32	776.50
1015.	0.	1015.	0.	0.	140.	0.	9.	1.	776.50
0.12	0.00	7.23	0.00	0.000	0.013	0.000	0.000	765.00	100.01
0.000642	10.	10.	10.	2	0	0	0.00	25.00	125.01

*SECNO 32.060

3301 HV CHANGED MORE THAN HVINS

32.06	5.47	770.47	0.00	0.00	771.91	1.44	0.01	0.31	778.00
1015.	0.	1015.	0.	0.	105.	0.	9.	1.	778.00
0.12	0.00	9.63	0.00	0.000	0.013	0.000	0.000	765.00	100.01
0.001326	9.	9.	9.	2	0	0	0.00	20.00	120.01

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 32.070

3370 NORMAL BRIDGE,NRD= 8 MIN ELTRD= 778.00 MAX ELLC= 773.00

32.07	5.47	770.47	0.00	0.00	771.91	1.44	0.00	0.00	778.00
1015.	0.	1015.	0.	0.	105.	0.	9.	1.	778.00
0.12	0.00	9.64	0.00	0.000	0.013	0.000	0.000	765.00	100.01
0.001329	1.	1.	1.	0	0	0	0.00	20.00	120.01

*SECNO 33.150

3370 NORMAL BRIDGE,NRD= 8 MIN ELTRD= 778.00 MAX ELLC= 773.33

33.15	5.22	770.55	0.00	0.00	772.14	1.59	0.15	0.07	778.33
1015.	0.	1015.	0.	0.	100.	0.	9.	2.	778.33
0.12	0.00	10.11	0.00	0.000	0.013	0.000	0.000	765.33	100.01
0.001524	108.	108.	108.	2	0	0	0.00	19.99	120.01

*SECNO 33.160

33.16	5.22	770.55	0.00	0.00	772.14	1.59	0.00	0.00	778.33
1015.	0.	1015.	0.	0.	100.	0.	9.	2.	778.33
0.12	0.00	10.11	0.00	0.000	0.013	0.000	0.000	765.33	100.01
0.001527	1.	1.	1.	0	0	0	0.00	19.99	120.01

*SECNO 33.260

33.26	5.19	770.56	0.00	0.00	772.16	1.61	0.02	0.01	778.36
1015.	0.	1015.	0.	0.	100.	0.	9.	2.	778.36
0.12	0.00	10.17	0.00	0.000	0.013	0.000	0.000	765.36	100.01
0.001550	10.	10.	10.	2	0	0	0.00	19.99	120.01

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.00	3.30	20.00	0.00	0.00	0.00	0.00	765.20	765.20

*SECNO 33.270

3301 HV CHANGED MORE THAN HVINS

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
*********	772.00	0.00	1017.	0.	0.	0.	765.20	767.80
33.27	8.08	773.45	0.00	0.00	774.09	0.64	1.93	0.00	778.37
1015.	0.	1015.	0.	0.	158.	0.	9.	2.	778.37
0.12	0.00	6.44	0.00	0.000	0.013	0.000	0.000	765.37	100.01
0.000429	1.	1.	1.	2	0	7	0.00	20.00	120.01

*SECNO 33.740

33.74	7.94	773.46	0.00	0.00	774.13	0.67	0.02	0.01	778.51
1015.	0.	1015.	0.	0.	155.	0.	10.	2.	778.51
0.12	0.00	6.56	0.00	0.000	0.013	0.000	0.000	765.51	100.01
0.000451	48.	48.	48.	2	0	0	0.00	20.00	120.01

*SECNO 33.750

3370 NORMAL BRIDGE,NRD= 8 MIN ELTRD= 780.00 MAX ELLC= 773.52

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 778.51 ELREA= 778.51

33.75	7.94	773.46	0.00	0.00	774.13	0.67	0.00	0.00	778.51
1015.	0.	1015.	0.	0.	155.	0.	10.	2.	778.51
0.12	0.00	6.56	0.00	0.000	0.013	0.000	0.000	765.51	100.01
0.000437	1.	1.	1.	0	0	0	-0.09	20.00	120.01

*SECNO 34.710

3370 NORMAL BRIDGE,NRD= 8 MIN ELTRD= 780.00 MAX ELLC= 773.81

34.71	7.68	773.48	0.00	0.00	774.19	0.70	0.04	0.02	778.81
1005.	0.	1005.	0.	0.	149.	0.	10.	2.	778.81
0.13	0.00	6.73	0.00	0.000	0.013	0.000	0.000	765.81	100.01
0.000482	96.	96.	96.	3	0	0	-0.08	20.00	120.01

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 34.720									
34.72	7.68	773.49	0.00	0.00	774.19	0.70	0.00	0.00	778.81
1005.	0.	1005.	0.	0.	149.	0.	10.	2.	778.81
0.13	0.00	6.72	0.00	0.000	0.013	0.000	0.000	765.81	100.01
0.000487	1.	1.	1.	0	0	0	0.00	20.00	120.01
*SECNO 34.800									
34.80	7.66	773.49	0.00	0.00	774.19	0.71	0.00	0.00	778.83
1005.	0.	1005.	0.	0.	149.	0.	10.	2.	778.83
0.13	0.00	6.74	0.00	0.000	0.013	0.000	0.000	765.83	100.01
0.000491	8.	8.	8.	2	0	0	0.00	20.00	120.01

SPECIAL BRIDGE

SB	KK	KKOR	COPQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.00	3.30	20.00	0.00	0.00	0.00	0.00	765.80	765.80

*SECNO 34.810
PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
*********	774.16	0.00	1006.	0.	0.	0.	765.77	768.67
34.81	8.85	774.68	0.00	0.00	775.21	0.52	1.01	0.00	778.83
1005.	0.	1005.	0.	0.	173.	0.	10.	2.	778.83
0.13	0.00	5.81	0.00	0.000	0.013	0.000	0.000	765.83	100.01
0.000327	1.	1.	1.	2	0	7	0.00	20.01	120.01
*SECNO 36.210									
36.21	8.44	774.70	0.00	0.00	775.28	0.58	0.05	0.03	779.26
1005.	0.	1005.	0.	0.	165.	0.	11.	2.	779.26
0.13	0.00	6.10	0.00	0.000	0.013	0.000	0.000	766.26	100.01
0.000373	140.	140.	140.	2	0	0	0.00	20.00	120.01
*SECNO 38.050									
38.05	7.93	774.74	0.00	0.00	775.40	0.66	0.07	0.04	779.81
1005.	0.	1005.	0.	0.	155.	0.	11.	2.	779.81
0.14	0.00	6.50	0.00	0.000	0.013	0.000	0.000	766.81	100.01
0.000444	184.	184.	184.	2	0	0	0.00	20.00	120.01

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 38.060

3370 NORMAL BRIDGE,NRD= 8 MIN ELTRD= 780.00 MAX ELLC= 774.82

38.06	7.92	774.73	0.00	0.00	775.41	0.68	0.00	0.01	779.81
1005.	0.	1005.	0.	0.	152.	0.	11.	2.	779.81
0.14	0.00	6.63	0.00	0.000	0.013	0.000	0.000	766.81	100.01
0.000710	1.	1.	1.	1	0	0	-2.80	20.00	120.01

*SECNO 39.760

3370 NORMAL BRIDGE,NRD= 8 MIN ELTRD= 780.00 MAX ELLC= 775.34

39.76	7.47	774.80	0.00	0.00	775.54	0.74	0.10	0.03	780.33
1005.	0.	1005.	0.	0.	145.	0.	12.	2.	780.33
0.15	0.00	6.91	0.00	0.000	0.013	0.000	0.000	767.33	100.01
0.000525	170.	170.	170.	2	0	0	0.00	20.00	120.01

*SECNO 39.770

39.77	7.47	774.80	0.00	0.00	775.54	0.74	0.00	0.00	780.33
1005.	0.	1005.	0.	0.	145.	0.	12.	2.	780.33
0.15	0.00	6.91	0.00	0.000	0.013	0.000	0.000	767.33	100.01
0.000526	1.	1.	1.	0	0	0	0.00	20.00	120.01

*SECNO 39.860

39.86	7.45	774.80	0.00	0.00	775.55	0.75	0.00	0.00	780.36
1005.	0.	1005.	0.	0.	145.	0.	12.	2.	780.36
0.15	0.00	6.94	0.00	0.000	0.013	0.000	0.000	767.36	100.01
0.000531	9.	9.	9.	2	0	0	0.00	20.00	120.01

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.00	3.30	20.00	0.00	0.00	0.00	0.00	767.40	767.40

*SECNO 39.870
PRESSURE AND WEIR FLOW

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
*********	775.59	0.00	1005.	0.	0.	0.	767.40	770.30
39.87	8.89	776.24	0.00	0.00	776.76	0.52	1.21	0.00	780.36
1005.	0.	1005.	0.	0.	174.	0.	12.	2.	780.36
0.15	0.00	5.78	0.00	0.000	0.013	0.000	0.000	767.36	100.01
0.000323	1.	1.	1.	2	0	7	0.00	20.01	120.01
*SECNO 41.590									
41.59	8.42	776.28	0.00	0.00	776.85	0.57	0.06	0.03	780.86
995.	0.	995.	0.	0.	164.	0.	13.	2.	780.86
0.16	0.00	6.06	0.00	0.000	0.013	0.000	0.000	767.86	100.01
0.000370	172.	172.	172.	2	0	0	0.00	20.00	120.01
*SECNO 43.350									
43.35	7.91	776.31	0.00	0.00	776.96	0.65	0.07	0.04	781.40
995.	0.	995.	0.	0.	154.	0.	13.	2.	781.40
0.17	0.00	6.45	0.00	0.000	0.013	0.000	0.000	768.40	100.01
0.000439	176.	176.	176.	2	0	0	0.00	20.00	120.01
*SECNO 43.360									
3370 NORMAL BRIDGE,NRD= 8 MIN ELTRD= 780.20 MAX ELLC= 776.41									
43.36	7.90	776.30	0.00	0.00	776.97	0.67	0.00	0.01	781.40
995.	0.	995.	0.	0.	152.	0.	13.	2.	781.40
0.17	0.00	6.57	0.00	0.000	0.013	0.000	0.000	768.40	100.01
0.000686	1.	1.	1.	1	0	0	-2.57	20.00	120.01
*SECNO 45.860									
3370 NORMAL BRIDGE,NRD= 8 MIN ELTRD= 780.20 MAX ELLC= 777.17									
45.86	7.24	776.40	0.00	0.00	777.18	0.78	0.16	0.05	782.16
995.	0.	995.	0.	0.	141.	0.	14.	2.	782.16
0.18	0.00	7.07	0.00	0.000	0.013	0.000	0.000	769.16	100.01
0.000564	250.	250.	250.	3	0	0	0.00	20.00	120.01

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 45.870									
45.87	7.25	776.41	0.00	0.00	777.18	0.77	0.00	0.00	782.16
990.	0.	990.	0.	0.	141.	0.	14.	2.	782.16
0.18	0.00	7.03	0.00	0.000	0.013	0.000	0.000	769.16	100.01
0.000558	1.	1.	1.	1	0	0	0.00	20.00	120.01
*SECNO 45.970									
45.97	7.22	776.42	0.00	0.00	777.19	0.77	0.01	0.00	782.19
990.	0.	990.	0.	0.	140.	0.	14.	2.	782.19
0.18	0.00	7.05	0.00	0.000	0.013	0.000	0.000	769.19	100.01
0.000563	10.	10.	10.	2	0	0	0.00	20.00	120.01

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.00	3.30	20.00	0.00	0.00	0.00	0.00	769.20	769.20

*SECNO 45.980
PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
*********	777.20	0.00	990.	0.	0.	0.	769.20	771.90
45.98	8.58	777.77	0.00	0.00	778.31	0.54	1.12	0.00	782.19
990.	0.	990.	0.	0.	168.	0.	14.	2.	782.19
0.18	0.00	5.91	0.00	0.000	0.013	0.000	0.000	769.19	100.01
0.000346	1.	1.	1.	2	0	7	0.00	20.01	120.01
*SECNO 48.330									
48.33	7.90	777.81	0.00	0.00	778.45	0.64	0.09	0.05	782.91
990.	0.	990.	0.	0.	154.	0.	15.	2.	782.91
0.19	0.00	6.43	0.00	0.000	0.013	0.000	0.000	769.91	100.01
0.000436	235.	235.	235.	2	0	0	0.00	20.00	120.01

*SECNO 48.340

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3370 NORMAL BRIDGE,NRD= 8 MIN ELTRD= 784.70 MAX ELLC= 777.92

48.34	7.89	777.80	0.00	0.00	778.46	0.66	0.00	0.01	782.91
990.	0.	990.	0.	0.	151.	0.	15.	2.	782.91
0.19	0.00	6.54	0.00	0.000	0.013	0.000	0.000	769.91	100.01
0.000676	1.	1.	1.	1	0	0	-2.46	20.00	120.01

*SECNO 49.240

3370 NORMAL BRIDGE,NRD= 8 MIN ELTRD= 784.70 MAX ELLC= 778.20

49.24	7.66	777.84	0.00	0.00	778.53	0.69	0.06	0.01	783.19
990.	0.	990.	0.	0.	149.	0.	15.	2.	783.19
0.19	0.00	6.66	0.00	0.000	0.013	0.000	0.000	770.19	100.01
0.000567	90.	90.	90.	2	0	0	-0.44	20.00	120.01

*SECNO 49.250

49.25	7.66	777.85	0.00	0.00	778.53	0.68	0.00	0.00	783.19
990.	0.	990.	0.	0.	149.	0.	15.	2.	783.19
0.19	0.00	6.64	0.00	0.000	0.013	0.000	0.000	770.19	100.01
0.000476	1.	1.	1.	0	0	0	0.00	20.00	120.01

*SECNO 49.340

49.34	7.64	777.85	0.00	0.00	778.54	0.69	0.00	0.00	783.21
990.	0.	990.	0.	0.	149.	0.	15.	2.	783.21
0.19	0.00	6.66	0.00	0.000	0.013	0.000	0.000	770.21	100.01
0.000480	9.	9.	9.	2	0	0	0.00	20.00	120.01

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.00	3.30	20.00	0.00	0.00	0.00	0.00	769.70	769.70

*SECNO 49.350
PRESSURE AND WEIR FLOW

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
*********	778.03	0.00	991.	0.	0.	0.	770.20	773.10
49.35	8.84	779.06	0.00	0.00	779.57	0.51	1.03	0.00	783.21
990.	0.	990.	0.	0.	173.	0.	15.	2.	783.21
0.19	0.00	5.73	0.00	0.000	0.013	0.000	0.000	770.21	100.01
0.000318	1.	1.	1.	2	0	7	0.00	20.01	120.01
*SECNO 50.410									
50.41	8.56	779.07	0.00	0.00	779.62	0.55	0.04	0.02	783.52
990.	0.	990.	0.	0.	167.	0.	16.	2.	783.52
0.20	0.00	5.93	0.00	0.000	0.013	0.000	0.000	770.52	100.01
0.000349	106.	106.	106.	2	0	0	0.00	20.01	120.01
*SECNO 51.550									
51.55	8.17	779.09	0.00	0.00	779.69	0.60	0.04	0.03	783.92
990.	0.	990.	0.	0.	159.	0.	16.	2.	783.92
0.20	0.00	6.21	0.00	0.000	0.013	0.000	0.000	770.92	100.01
0.000396	114.	114.	114.	2	0	0	0.00	20.00	120.01

TC POND DIVERSION:RATING CURVE METHOD FOR EVALUATING THE DIVERSION

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	DSWS	USWS	DSSNO	USSNO
266.17	264.71	0.55	266.17	264.71	0.55	6	770.940	770.940	28.660	28.660

TC JUNCTION BOX DIVERSION:RATING CURVE METHOD FOR EVALUATING THE DIVERSION

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	DSWS	USWS	DSSNO	USSNO
213.32	213.32	0.00	479.49	478.04	0.30	6	768.661	768.661	23.620	23.620

THIS RUN EXECUTED 17-DEC-90 17:07:01

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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55
**************************************************

T1
T2
T3        500-YEAR FLOW

J1  ICHECK     INQ        NINV       IDIR       STRT       METRIC     HVINS      Q          WSEL       FQ

      0.        5.         0.         0.  0.000000       0.00       0.0          0.    757.500      0.000

J2  NPROF      IPLOT      PRFVS      XSECV      XSECH      FN         ALLDC      IBW        CHNIM      ITRACE

    15.000     0.000     -1.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000
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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*PROF 4

CCHV=   0.500 CEHV=   0.700
*SECNO 0.000
          STA: 0+00: D/S LIMIT OF RIPRAP EXIT CHANNEL(20' D/S OF BAFFLED APRON)
     0.00      9.50    757.50      0.00    757.50    757.88      0.38      0.00      0.00    765.00
     941.       0.      941.       0.       0.       190.       0.        0.        0.      765.00
     0.00      0.00     4.95       0.00     0.000    0.035      0.000     0.000   748.00    100.00
 0.001646       0.       0.        0.       0        0          0         0.00     20.01    120.02


CCHV=   0.100 CEHV=   0.300
*SECNO 0.100
     0.10      9.50    757.50      0.00      0.00    757.88      0.38      0.00      0.00    765.00
     941.       0.      941.       0.        0.      190.       0.        0.        0.      765.00
     0.00      0.00     4.95       0.00     0.000    0.013      0.000     0.000   748.00    100.00
 0.000227       9.       9.        9.        0        0          0         0.00     20.01    120.02


*SECNO 0.170
     0.17      9.51    757.51      0.00      0.00    757.89      0.38      0.00      0.00    765.00
     941.       0.      941.       0.        0.      190.       0.        0.        0.      765.00
     0.00      0.00     4.95       0.00     0.000    0.013      0.000     0.000   748.00    100.00
 0.000227       8.       8.        8.        0        0          0         0.00     20.01    120.02


*SECNO 0.180
          STA. 0+18: U/S LIMIT OF RIPRAP EXIT CHANNEL-BEGIN ENEGY DISSIPATOR
     0.18      9.39    757.39      0.00      0.00    757.94      0.55      0.00      0.05    759.00
     941.       0.      941.       0.        0.      158.       0.        0.        0.      759.00
     0.00      0.00     5.95       0.00     0.000    0.013      0.000     0.000   748.00    100.00
 0.000594       1.       1.        1.        2        0          0         0.00     20.07    120.07


*SECNO 0.330

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
     0.33      5.56    760.56    760.56      0.00    762.63      2.07      0.02      0.46    766.00
     941.       0.      941.       0.        0.       81.       0.        0.        0.      766.00
     0.00      0.00    11.55       0.00     0.000    0.013      0.000     0.000   755.00    100.01
 0.004375      14.      14.       14.       20       14          0         0.00     20.06    120.07
```

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 0.340

3301 HV CHANGED MORE THAN HVINS

STA. 0+34: U/S LIMIT OF ENERGY DISSIPATOR

0.34	7.09	762.09	0.00	0.00	762.77	0.68	0.00	0.14	766.00
941.	0.	941.	0.	0.	142.	0.	0.	0.	766.00
0.00	0.00	6.63	0.00	0.000	0.013	0.000	0.000	755.00	100.00
0.000505	1.	1.	1.	4	0	0	0.00	20.01	120.02

*SECNO 0.380

0.38	6.96	761.96	0.00	0.00	762.83	0.88	0.00	0.06	766.00
941.	0.	941.	0.	0.	125.	0.	0.	0.	766.00
0.00	0.00	7.51	0.00	0.000	0.013	0.000	0.000	755.00	100.00
0.000697	4.	4.	4.	2	0	0	0.00	18.01	118.02

*SECNO 0.420

0.42	6.75	761.75	0.00	0.00	762.93	1.18	0.00	0.09	766.00
941.	0.	941.	0.	0.	108.	0.	0.	0.	766.00
0.00	0.00	8.71	0.00	0.000	0.013	0.000	0.000	755.00	100.00
0.001027	4.	4.	4.	2	0	0	0.00	16.01	116.02

*SECNO 0.460

3301 HV CHANGED MORE THAN HVINS

0.46	6.38	761.38	0.00	0.00	763.10	1.72	0.01	0.16	766.00
941.	0.	941.	0.	0.	89.	0.	0.	0.	766.00
0.00	0.00	10.53	0.00	0.000	0.013	0.000	0.000	755.00	100.00
0.001698	4.	4.	4.	2	0	0	0.00	14.01	114.02

*SECNO 0.500

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 763.00 MAX ELLC= 762.00

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
STA. 0+50:NOTE XSEC. #'S REFLECT STA.

0.50	5.74	760.74	760.74	0.00	763.63	2.90	0.01	0.35	765.00
941.	0.	941.	0.	0.	69.	0.	0.	0.	765.00
0.00	0.00	13.66	0.00	0.000	0.013	0.000	0.000	755.00	100.00
0.003402	4.	4.	4.	20	12	0	0.00	12.01	112.02

*SECNO 1.000

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 764.20 MAX ELLC= 762.09

STA. 1+00

1.00	6.44	761.53	0.00	0.00	763.84	2.31	0.15	0.06	765.09
941.	0.	941.	0.	0.	77.	0.	0.	0.	765.09
0.00	0.00	12.18	0.00	0.000	0.013	0.000	0.000	755.09	100.00
0.002507	50.	50.	50.	8	0	0	0.00	12.01	112.02

*SECNO 1.250

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 765.90 MAX ELLC= 762.14

1.25	6.53	761.67	0.00	0.00	763.91	2.24	0.06	0.01	765.14
941.	0.	941.	0.	0.	78.	0.	0.	0.	765.14
0.00	0.00	12.00	0.00	0.000	0.013	0.000	0.000	755.14	100.00
0.002407	25.	25.	25.	2	0	0	0.00	12.01	112.02

*SECNO 2.500

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 767.00 MAX ELLC= 762.52

2.50	6.72	762.10	0.00	0.00	764.21	2.11	0.29	0.01	765.38
941.	0.	941.	0.	0.	81.	0.	1.	0.	765.38
0.01	0.00	11.65	0.00	0.000	0.013	0.000	0.000	755.38	100.00
0.002230	125.	125.	125.	2	0	0	0.00	12.01	112.02

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 3.500

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 767.00 MAX ELLC= 762.71

3.50	6.80	762.37	0.00	0.00	764.43	2.06	0.22	0.00	765.57
941.	0.	941.	0.	0.	82.	0.	1.	0.	765.57
0.01	0.00	11.53	0.00	0.000	0.013	0.000	0.000	755.57	100.00
0.002169	100.	100.	100.	2	0	0	0.00	12.01	112.02

*SECNO 4.300

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 767.00 MAX ELLC= 762.86

4.30	6.86	762.58	0.00	0.00	764.61	2.03	0.17	0.00	765.72
941.	0.	941.	0.	0.	82.	0.	1.	0.	765.72
0.01	0.00	11.43	0.00	0.000	0.013	0.000	0.000	755.72	100.00
0.002117	80.	80.	80.	2	0	0	0.00	12.01	112.02

*SECNO 4.550

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 767.00 MAX ELLC= 762.99

4.55	6.48	762.47	0.00	0.00	764.74	2.27	0.06	0.07	773.00
941.	0.	941.	0.	0.	78.	0.	1.	0.	773.00
0.01	0.00	12.09	0.00	0.000	0.013	0.000	0.000	755.99	150.01
0.002457	25.	25.	25.	2	0	0	0.00	12.00	162.00

*SECNO 5.000

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 767.00 MAX ELLC= 763.08

5.00	6.53	762.60	0.00	0.00	764.85	2.25	0.11	0.00	773.09
941.	0.	941.	0.	0.	78.	0.	1.	0.	773.09
0.01	0.00	12.04	0.00	0.000	0.013	0.000	0.000	756.08	150.01
0.002427	45.	45.	45.	2	0	0	0.00	12.00	162.00

*SECNO 7.500

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 768.00 MAX ELLC= 763.55									
7.50	6.85	763.40	0.00	0.00	765.44	2.04	0.57	0.02	773.56
941.	0.	941.	0.	0.	82.	0.	1.	0.	773.56
0.02	0.00	11.46	0.00	0.000	0.013	0.000	0.000	756.55	150.01
0.002131	250.	250.	250.	3	0	0	0.00	12.00	162.00
*SECNO 10.000									
3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 769.00 MAX ELLC= 764.03									
10.00	6.97	764.00	0.00	0.00	765.97	1.96	0.52	0.01	774.04
941.	0.	941.	0.	0.	84.	0.	2.	0.	774.04
0.02	0.00	11.25	0.00	0.000	0.013	0.000	0.000	757.03	150.01
0.002032	250.	250.	250.	2	0	0	0.00	12.00	162.00
*SECNO 12.500									
3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.25 MAX ELLC= 764.51									
12.50	7.15	764.66	0.00	0.00	766.61	1.95	0.64	0.00	774.52
941.	0.	941.	0.	0.	84.	0.	2.	0.	774.52
0.03	0.00	11.21	0.00	0.000	0.013	0.000	0.000	757.51	150.01
0.003337	250.	250.	250.	12	0	0	-1.83	12.00	162.00
*SECNO 15.000									
3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 772.90 MAX ELLC= 764.98									
15.00	7.51	765.49	0.00	0.00	767.45	1.95	0.84	0.00	774.99
941.	0.	941.	0.	0.	84.	0.	3.	0.	774.99
0.04	0.00	11.22	0.00	0.000	0.013	0.000	0.000	757.98	150.01
0.003347	250.	250.	250.	2	0	0	-6.19	12.00	162.00
*SECNO 17.500									
3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 772.80 MAX ELLC= 765.46									

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
17.50	7.87	766.33	0.00	0.00	768.28	1.95	0.84	0.00	775.47
941.	0.	941.	0.	0.	84.	0.	3.	0.	775.47
0.04	0.00	11.21	0.00	0.000	0.013	0.000	0.000	758.46	150.01
0.003343	250.	250.	250.	2	0	0	-10.48	12.00	162.00

CCHV= 0.300 CEHV= 0.500
*SECNO 18.280

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 772.80 MAX ELLC= 765.61

18.28	7.98	766.59	0.00	0.00	768.54	1.95	0.26	0.00	775.62
941.	0.	941.	0.	0.	84.	0.	4.	1.	775.62
0.05	0.00	11.21	0.00	0.000	0.013	0.000	0.000	758.61	150.01
0.003342	78.	78.	78.	2	0	0	-11.82	12.00	162.00

*SECNO 18.330

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 774.00 MAX ELLC= 767.10

18.33	9.16	767.76	0.00	0.00	768.82	1.06	0.01	0.27	774.00
941.	0.	941.	0.	0.	114.	0.	4.	1.	774.00
0.05	0.00	8.28	0.00	0.000	0.013	0.000	0.000	758.60	100.04
0.001221	5.	5.	5.	3	0	0	-4.91	13.02	113.06

*SECNO 18.380

3265 DIVIDED FLOW

3370 NORMAL BRIDGE,NRD= 4 MIN ELTRD= 774.00 MAX ELLC= 767.10

18.38	9.46	768.06	0.00	0.00	768.90	0.83	0.01	0.07	774.00
941.	0.	941.	0.	0.	128.	0.	4.	1.	774.00
0.05	0.00	7.33	0.00	0.000	0.013	0.000	0.000	758.60	100.04
0.001630	5.	5.	5.	2	0	0	-14.67	15.25	116.36

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 18.390
WATER EL=X5 LINE= 768.213

3265 DIVIDED FLOW

18.39	9.61	768.21	0.00	0.00	768.86	0.65	0.00	0.05	774.00
941.	0.	941.	0.	0.	145.	0.	4.	1.	774.00
0.05	0.00	6.47	0.00	0.000	0.013	0.000	0.000	758.60	100.04
0.000844	0.	0.	0.	0	0	0	0.00	15.25	116.36

*SECNO 18.540

3265 DIVIDED FLOW

3370 NORMAL BRIDGE,NRD= 4 MIN ELTRD= 774.00 MAX ELLC= 767.10

18.54	9.49	768.14	0.00	0.00	768.98	0.84	0.02	0.09	774.00
941.	0.	941.	0.	0.	128.	0.	4.	1.	774.00
0.05	0.00	7.36	0.00	0.000	0.013	0.000	0.000	758.65	100.04
0.001648	16.	16.	16.	2	0	0	-15.85	15.31	125.42

*SECNO 18.541
WATER EL=X5 LINE= 768.296

3265 DIVIDED FLOW

18.54	9.65	768.30	0.00	0.00	768.94	0.64	0.00	0.06	774.00
941.	0.	941.	0.	0.	146.	0.	4.	1.	774.00
0.05	0.00	6.44	0.00	0.000	0.013	0.000	0.000	758.65	100.04
0.000831	0.	0.	0.	0	0	0	0.00	15.31	125.43

*SECNO 18.550

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3370 NORMAL BRIDGE,NRD= 12 MIN ELTRD= 774.00 MAX ELLC= 766.30

18.55	8.97	767.77	0.00	0.00	769.47	1.70	0.00	0.53	762.55
941.	0.	941.	0.	0.	90.	0.	4.	1.	762.55
0.05	0.00	10.46	0.00	0.000	0.013	0.000	0.000	758.80	109.95
0.003786	1.	1.	1.	2	0	0	-33.58	15.12	134.99

*SECNO 19.150

3265 DIVIDED FLOW

3370 NORMAL BRIDGE,NRD= 12 MIN ELTRD= 774.15 MAX ELLC= 766.80

19.15	8.70	768.00	0.00	0.00	769.70	1.69	0.23	0.00	763.05
941.	0.	941.	0.	0.	90.	0.	4.	1.	762.70
0.05	0.00	10.44	0.00	0.000	0.013	0.000	0.000	759.30	109.96
0.003728	60.	60.	60.	2	0	0	-29.58	15.12	134.99

*SECNO 19.160

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE,NRD= 4 MIN ELTRD= 774.00 MAX ELLC= 767.40

19.16	9.70	769.00	0.00	0.00	769.93	0.93	0.00	0.23	770.24
941.	0.	941.	0.	0.	122.	0.	4.	1.	770.24
0.05	0.00	7.74	0.00	0.000	0.013	0.000	0.000	759.30	100.00
0.001950	1.	1.	1.	2	0	0	-24.09	15.04	125.04

*SECNO 19.280

3265 DIVIDED FLOW

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
19.28	9.34	768.98	0.00	0.00	769.99	1.01	0.02	0.04	770.39
941.	0.	941.	0.	0.	116.	0.	4.	1.	770.39
0.05	0.00	8.08	0.00	0.000	0.013	0.000	0.000	759.64	100.00
0.002115	12.	12.	12.	2	0	0	-23.86	15.03	117.04

3370 NORMAL BRIDGE,NRD= 4 MIN ELTRD= 774.00 MAX ELLC= 767.40

*SECNO 19.290

3370 NORMAL BRIDGE,NRD= 4 MIN ELTRD= 774.00 MAX ELLC= 767.40

19.29	9.34	768.98	0.00	0.00	770.00	1.01	0.00	0.00	770.39
941.	0.	941.	0.	0.	116.	0.	4.	1.	770.39
0.05	0.00	8.08	0.00	0.000	0.013	0.000	0.000	759.64	100.00
0.001431	1.	1.	1.	0	0	0	-23.78	15.02	115.02

*SECNO 19.390

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 774.00 MAX ELLC= 767.70

19.39	9.06	768.76	0.00	0.00	770.25	1.49	0.02	0.24	776.55
941.	0.	941.	0.	0.	96.	0.	4.	1.	776.55
0.05	0.00	9.81	0.00	0.000	0.013	0.000	0.000	759.70	150.00
0.002292	10.	10.	10.	2	0	0	-12.76	12.00	162.01

*SECNO 19.400

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 774.00 MAX ELLC= 767.70

19.40	9.06	768.76	0.00	0.00	770.26	1.49	0.00	0.00	776.55
941.	0.	941.	0.	0.	96.	0.	4.	1.	776.55
0.05	0.00	9.81	0.00	0.000	0.013	0.000	0.000	759.70	150.00
0.002292	1.	1.	1.	0	0	0	-12.76	12.00	162.01

*SECNO 20.000

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.50 MAX ELLC= 767.90

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
20.00	9.08	768.92	0.00	0.00	770.40	1.47	0.14	0.01	776.70
941.	0.	941.	0.	0.	97.	0.	4.	1.	776.70
0.05	0.00	9.74	0.00	0.000	0.013	0.000	0.000	759.85	150.00
0.002250	60.	60.	60.	1	0	0	-12.24	12.00	162.01

*SECNO 22.500

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.50 MAX ELLC= 768.49

22.50	9.03	769.48	0.00	0.00	770.97	1.48	0.56	0.00	777.31
941.	0.	941.	0.	0.	96.	0.	4.	1.	777.31
0.06	0.00	9.77	0.00	0.000	0.013	0.000	0.000	760.46	150.00
0.002268	250.	250.	250.	2	0	0	-11.98	12.00	162.01

*SECNO 22.510
WATER EL=X5 LINE= 769.565

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.50 MAX ELLC= 768.49

22.51	9.11	769.56	0.00	0.00	771.05	1.48	0.00	0.00	777.31
941.	0.	941.	0.	0.	96.	0.	4.	1.	777.31
0.06	0.00	9.77	0.00	0.000	0.013	0.000	0.000	760.46	150.00
0.002268	0.	0.	0.	0	0	0	-12.94	12.00	162.01

CCHV= 0.300 CEHV= 0.500
*SECNO 22.700

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.50 MAX ELLC= 768.50

22.70	9.10	769.60	0.00	0.00	771.10	1.49	0.05	0.01	771.50
941.	0.	941.	0.	0.	96.	0.	5.	1.	771.50
0.06	0.00	9.81	0.00	0.000	0.013	0.000	0.000	760.50	150.00
0.002293	20.	20.	20.	0	0	0	-13.33	12.01	162.01

*SECNO 23.000

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.50 MAX ELLC= 768.56

23.00	9.11	769.67	0.00	0.00	771.17	1.49	0.07	0.00	771.56
941.	0.	941.	0.	0.	96.	0.	5.	1.	771.56
0.06	0.00	9.81	0.00	0.000	0.013	0.000	0.000	760.56	150.00
0.002293	30.	30.	30.	0	0	0	-13.32	12.01	162.01

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 23.100
WATER EL=X5 LINE= 769.773

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.50 MAX ELLC= 768.56

23.10	9.21	769.77	0.00	0.00	771.27	1.49	0.00	0.00	771.56
941.	0.	941.	0.	0.	96.	0.	5.	1.	771.56
0.06	0.00	9.81	0.00	0.000	0.013	0.000	0.000	760.56	150.00
0.002293	0.	0.	0.	0	0	0	-14.59	12.01	162.01

*SECNO 23.500

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.50 MAX ELLC= 768.68

23.50	9.20	769.89	0.00	0.00	771.38	1.49	0.11	0.00	771.68
941.	0.	941.	0.	0.	96.	0.	5.	1.	771.68
0.06	0.00	9.81	0.00	0.000	0.013	0.000	0.000	760.68	150.00
0.002293	50.	50.	50.	0	0	0	-14.59	12.01	162.01

*SECNO 23.520

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.10 MAX ELLC= 769.00

23.52	9.82	770.52	0.00	0.00	771.53	1.01	0.00	0.14	771.50
941.	0.	941.	0.	0.	116.	0.	5.	1.	771.50
0.06	0.00	8.08	0.00	0.000	0.013	0.000	0.000	760.70	150.00
0.001393	2.	2.	2.	2	0	0	-21.38	14.09	164.09

*SECNO 23.620

3370 NORMAL BRIDGE,NRD= 4 MIN ELTRD= 771.50 MAX ELLC= 769.00

23.62	9.88	770.58	0.00	0.00	771.55	0.98	0.01	0.01	771.50
1315.	0.	1315.	0.	0.	166.	0.	5.	1.	771.50
0.06	0.00	7.93	0.00	0.000	0.013	0.000	0.000	760.70	150.00
0.001145	10.	10.	10.	2	0	0	-31.64	20.01	170.01

*SECNO 23.630

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
WATER EL=X5 LINE=	770.828								
3370 NORMAL BRIDGE,NRD=	4	MIN ELTRD=	771.50	MAX ELLC=	769.00				
23.63	10.13	770.83	0.00	0.00	771.80	0.98	0.00	0.00	771.50
1315.	0.	1315.	0.	0.	166.	0.	5.	1.	771.50
0.06	0.00	7.93	0.00	0.000	0.013	0.000	0.000	760.70	150.00
0.001145	0.	0.	0.	0	0	0	-36.64	20.01	170.01
*SECNO 23.770									
3370 NORMAL BRIDGE,NRD=	6	MIN ELTRD=	771.20	MAX ELLC=	769.00				
23.77	10.10	770.84	0.00	0.00	771.83	0.98	0.02	0.00	771.54
1315.	0.	1315.	0.	0.	165.	0.	5.	1.	771.54
0.06	0.00	7.96	0.00	0.000	0.013	0.000	0.000	760.74	150.00
0.001159	15.	15.	15.	2	0	0	-36.87	20.01	170.01
*SECNO 23.930									
3370 NORMAL BRIDGE,NRD=	2	MIN ELTRD=	771.50	MAX ELLC=	768.80				
23.93	10.01	770.78	0.00	0.00	771.93	1.15	0.02	0.08	771.57
827.	0.	827.	0.	0.	96.	0.	5.	1.	771.57
0.06	0.00	8.60	0.00	0.000	0.013	0.000	0.000	760.77	150.00
0.001756	16.	16.	16.	2	0	0	-23.85	12.01	162.01
*SECNO 24.000									
3370 NORMAL BRIDGE,NRD=	2	MIN ELTRD=	771.50	MAX ELLC=	768.82				
24.00	10.00	770.79	0.00	0.00	771.94	1.15	0.01	0.00	771.59
827.	0.	827.	0.	0.	96.	0.	5.	1.	771.59
0.06	0.00	8.60	0.00	0.000	0.013	0.000	0.000	760.79	150.00
0.001756	7.	7.	7.	0	0	0	-23.85	12.01	162.01
*SECNO 24.100									
WATER EL=X5 LINE=	770.834								

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.50 MAX ELLC= 768.82									
24.10	10.04	770.83	0.00	0.00	771.98	1.15	0.00	0.00	771.59
827.	0.	827.	0.	0.	96.	0.	5.	1.	771.59
0.06	0.00	8.60	0.00	0.000	0.013	0.000	0.000	760.79	150.00
0.001756	0.	0.	0.	0	0	0	-24.27	12.01	162.01
*SECNO 25.000									
3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.50 MAX ELLC= 769.06									
25.00	9.97	771.01	0.00	0.00	772.16	1.15	0.18	0.00	771.84
827.	0.	827.	0.	0.	96.	0.	5.	1.	771.84
0.07	0.00	8.60	0.00	0.000	0.013	0.000	0.000	761.04	150.00
0.001756	100.	100.	100.	2	0	0	-23.44	12.01	162.01
*SECNO 27.500									
3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 773.00 MAX ELLC= 769.62									
27.50	9.80	771.44	0.00	0.00	772.61	1.16	0.44	0.01	772.45
827.	0.	827.	0.	0.	96.	0.	6.	1.	772.45
0.07	0.00	8.65	0.00	0.000	0.013	0.000	0.000	761.65	150.00
0.001788	250.	250.	250.	2	0	0	-21.97	12.01	162.01
*SECNO 28.560									
3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 773.50 MAX ELLC= 769.93									
28.56	9.75	771.65	0.00	0.00	772.80	1.15	0.19	0.00	772.71
827.	0.	827.	0.	0.	96.	0.	6.	1.	772.71
0.08	0.00	8.60	0.00	0.000	0.013	0.000	0.000	761.91	150.00
0.001757	106.	106.	106.	2	0	0	-20.73	12.01	162.01
*SECNO 28.570									
28.57	10.34	772.25	0.00	0.00	772.94	0.69	0.00	0.14	772.71
827.	0.	827.	0.	0.	124.	0.	6.	1.	772.71
0.08	0.00	6.66	0.00	0.000	0.013	0.000	0.000	761.91	150.00
0.000573	1.	1.	1.	2	0	0	0.00	12.01	162.01

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 28.650
3280 CROSS SECTION 28.65 EXTENDED 0.04 FEET

3301 HV CHANGED MORE THAN HVINS

28.65	11.03	773.03	0.00	0.00	773.12	0.08	0.00	0.18	773.00
827.	0.	827.	0.	0.	354.	0.	6.	1.	773.00
0.08	0.00	2.33	0.00	0.000	0.013	0.000	0.000	762.00	100.00
0.000034	8.	8.	8.	2	0	0	0.00	32.20	132.20

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.00	3.30	32.00	0.00	0.00	0.00	0.00	762.00	762.00

*SECNO 28.660
PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
*********	773.12	0.00	1308.	0.	0.	0.	762.00	765.00

28.66	11.41	773.41	0.00	0.00	773.61	0.20	0.49	0.00	775.00
1310.	0.	1310.	0.	0.	365.	0.	6.	1.	775.00
0.08	0.00	3.59	0.00	0.000	0.013	0.000	0.000	762.00	100.00
0.000079	1.	1.	1.	2	0	9	0.00	32.01	132.01

CCHV= 0.100 CEHV= 0.300
*SECNO 28.990

28.99	13.58	773.58	0.00	0.00	773.63	0.05	0.00	0.02	772.00
1310.	10.	1152.	148.	32.	621.	162.	6.	1.	765.00
0.08	0.32	1.85	0.91	0.040	0.035	0.040	0.000	760.00	110.21
0.000101	44.	33.	50.	2	0	0	0.00	173.56	283.77

*SECNO 29.310

29.31	13.62	773.62	0.00	0.00	773.64	0.02	0.00	0.00	765.00
1310.	73.	1174.	62.	144.	971.	124.	7.	1.	765.00
0.09	0.51	1.21	0.50	0.040	0.035	0.040	0.000	760.00	141.49
0.000028	45.	32.	60.	2	0	0	0.00	137.23	278.72

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 30.130									
30.13	13.59	773.59	0.00	0.00	773.65	0.06	0.00	0.01	765.00
1310.	292.	841.	177.	268.	358.	164.	9.	1.	765.00
0.10	1.09	2.35	1.08	0.040	0.035	0.040	0.000	760.00	117.51
0.000124	72.	82.	72.	2	0	0	0.00	130.67	248.19
*SECNO 30.630									
30.63	13.60	773.60	0.00	0.00	773.66	0.06	0.01	0.00	765.00
1310.	292.	841.	177.	268.	358.	164.	10.	1.	765.00
0.11	1.09	2.35	1.08	0.040	0.035	0.040	0.000	760.00	117.52
0.000124	22.	50.	71.	0	0	0	0.00	130.67	248.19
*SECNO 31.670									
31.67	8.56	773.56	0.00	0.00	773.71	0.15	0.02	0.03	776.00
1310.	0.	1310.	0.	0.	428.	0.	11.	2.	776.00
0.12	0.00	3.06	0.00	0.000	0.035	0.000	0.000	765.00	100.00
0.000439	124.	104.	136.	3	0	0	0.00	50.01	150.01
CCHV= 0.300 CEHV= 0.500									
*SECNO 31.770									
31.77	8.32	773.32	0.00	0.00	773.96	0.64	0.00	0.25	776.50
1310.	0.	1310.	0.	0.	204.	0.	12.	2.	776.50
0.12	0.00	6.42	0.00	0.000	0.013	0.000	0.000	765.00	100.01
0.000368	10.	10.	10.	2	0	0	0.00	25.01	125.01
*SECNO 32.060									
32.06	8.11	773.11	0.00	0.00	774.18	1.07	0.00	0.21	778.00
1310.	0.	1310.	0.	0.	158.	0.	12.	2.	778.00
0.12	0.00	8.28	0.00	0.000	0.013	0.000	0.000	765.00	100.01
0.000709	9.	9.	9.	2	0	0	0.00	20.00	120.01
*SECNO 32.070									
3370 NORMAL BRIDGE,NRD= 8 MIN ELTRD= 778.00 MAX ELLC= 773.00									
32.07	8.07	773.07	0.00	0.00	774.22	1.16	0.00	0.05	778.00
1310.	0.	1310.	0.	0.	152.	0.	12.	2.	778.00
0.12	0.00	8.63	0.00	0.000	0.013	0.000	0.000	765.00	100.01
0.001400	1.	1.	1.	2	0	0	-5.40	20.00	120.01

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 33.150

3370 NORMAL BRIDGE,NRD= 8 MIN ELTRD= 778.00 MAX ELLC= 773.33

33.15	7.87	773.20	0.00	0.00	774.36	1.17	0.14	0.01	778.33
1310.	0.	1310.	0.	0.	151.	0.	12.	2.	778.33
0.12	0.00	8.67	0.00	0.000	0.013	0.000	0.000	765.33	100.01
0.001136	108.	108.	108.	2	0	0	-2.21	20.00	120.01

*SECNO 33.160

33.16	7.93	773.27	0.00	0.00	774.38	1.12	0.00	0.02	778.33
1310.	0.	1310.	0.	0.	155.	0.	12.	2.	778.33
0.12	0.00	8.47	0.00	0.000	0.013	0.000	0.000	765.33	100.01
0.000755	1.	1.	1.	2	0	0	0.00	20.00	120.01

*SECNO 33.260

33.26	7.91	773.27	0.00	0.00	774.39	1.12	0.01	0.00	778.36
1310.	0.	1310.	0.	0.	154.	0.	12.	2.	778.36
0.12	0.00	8.50	0.00	0.000	0.013	0.000	0.000	765.36	100.01
0.000762	10.	10.	10.	2	0	0	0.00	20.00	120.01

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.00	3.30	20.00	0.00	0.00	0.00	0.00	765.20	765.20

*SECNO 33.270
PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
*********	774.23	0.00	1310.	0.	0.	0.	765.20	767.80

33.27	9.38	774.74	0 00	0.00	775.53	0.79	1.14	0.00	778.37
1310.	0.	1310.	0.	0.	184.	0.	12.	2.	778.37
0.12	0.00	7.13	0.00	0.000	0.013	0.000	0.000	765.37	100.01
0.000473	1.	1.	1.	2	0	7	0.00	20.01	120.01

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 33.740									
33.74	9.24	774.75	0.00	0.00	775.57	0.82	0.02	0.01	778.51
1310.	0.	1310.	0.	0.	181.	0.	12.	2.	778.51
0.13	0.00	7.25	0.00	0.000	0.013	0.000	0.000	765.51	100.01
0.000494	48.	48.	48.	2	0	0	0.00	20.01	120.01
*SECNO 33.750									
3370 NORMAL BRIDGE,NRD= 8 MIN ELTRD= 780.00 MAX ELLC= 773.52									
3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 778.51 ELREA= 778.51									
33.75	9.10	774.62	0.00	0.00	775.71	1.10	0.00	0.14	778.51
1310.	0.	1310.	0.	0.	156.	0.	12.	2.	778.51
0.13	0.00	8.40	0.00	0.000	0.013	0.000	0.000	765.51	100.01
0.001313	1.	1.	1.	2	0	0	-22.00	20.01	120.01
*SECNO 34.710									
3370 NORMAL BRIDGE,NRD= 8 MIN ELTRD= 780.00 MAX ELLC= 773.81									
34.71	8.95	774.76	0.00	0.00	775.84	1.08	0.13	0.00	778.81
1300.	0.	1300.	0.	0.	156.	0.	13.	2.	778.81
0.13	0.00	8.34	0.00	0.000	0.013	0.000	0.000	765.81	100.01
0.001293	96.	96.	96.	2	0	0	-19.07	20.01	120.01
*SECNO 34.720									
34.72	9.34	775.14	0.00	0.00	775.93	0.79	0.00	0.09	778.81
1300.	0.	1300.	0.	0.	183.	0.	13.	2.	778.81
0.13	0.00	7.11	0.00	0.000	0.013	0.000	0.000	765.81	100.01
0.000472	1.	1.	1.	2	0	0	0.00	20.01	120.01
*SECNO 34.800									
34.80	9.31	775.15	0.00	0.00	775.94	0.79	0.00	0.00	778.83
1300.	0.	1300.	0.	0.	182.	0.	13.	2.	778.83
0.13	0.00	7.13	0.00	0.000	0.013	0.000	0.000	765.83	100.01
0.000476	8.	8.	8.	2	0	0	0.00	20.01	120.01

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.00	3.30	20.00	0.00	0.00	0.00	0.00	765.80	765.80

*SECNO 34.810
PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
*********	775.90	0.00	1300.	0.	0.	0.	765.77	768.67
34.81	10.34	776.18	0.00	0.00	776.81	0.64	0.88	0.00	778.83
1300.	0.	1300.	0.	0.	203.	0.	13.	2.	778.83
0.13	0.00	6.41	0.00	0.000	0.013	0.000	0.000	765.83	100.00
0.000357	1.	1.	1.	2	0	8	0.00	20.01	120.02

*SECNO 36.210

36.21	9.94	776.20	0.00	0.00	776.89	0.69	0.05	0.03	779.26
1300.	0.	1300.	0.	0.	195.	0.	13.	2.	779.26
0.14	0.00	6.67	0.00	0.000	0.013	0.000	0.000	766.26	100.01
0.000398	140.	140.	140.	2	0	0	0.00	20.01	120.01

*SECNO 38.050

38.05	9.43	776.24	0.00	0.00	777.01	0.77	0.08	0.04	779.81
1300.	0.	1300.	0.	0.	185.	0.	14.	2.	779.81
0.14	0.00	7.04	0.00	0.000	0.013	0.000	0.000	766.81	100.01
0.000459	184.	184.	184.	2	0	0	0.00	20.01	120.01

*SECNO 38.060

3370 NORMAL BRIDGE,NRD= 8 MIN ELTRD= 780.00 MAX ELLC= 774.82

38.06	9.25	776.06	0.00	0.00	777.19	1.13	0.00	0.18	779.81
1300.	0.	1300.	0.	0.	152.	0.	14.	2.	779.81
0.14	0.00	8.55	0.00	0.000	0.013	0.000	0.000	766.81	100.01
0.001408	1.	1.	1.	2	0	0	-28.87	20.01	120.01

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 39.760

3370 NORMAL BRIDGE,NRD= 8 MIN ELTRD= 780.00 MAX ELLC= 775.34

39.76	8.97	776.30	0.00	0.00	777.43	1.13	0.24	0.00	780.33
1300.	0.	1300.	0.	0.	152.	0.	15.	2.	780.33
0.15	0.00	8.55	0.00	0.000	0.013	0.000	0.000	767.33	100.01
0.001408	170.	170.	170.	2	0	0	-23.27	20.01	120.01

*SECNO 39.770

39.77	9.45	776.78	0.00	0.00	777.54	0.77	0.00	0.11	780.33
1300.	0.	1300.	0.	0.	185.	0.	15.	2.	780.33
0.15	0.00	7.03	0.00	0.000	0.013	0.000	0.000	767.33	100.01
0.000456	1.	1.	1.	2	0	0	0.00	20.01	120.01

*SECNO 39.860

39.86	9.42	776.78	0.00	0.00	777.55	0.77	0.00	0.00	780.36
1300.	0.	1300.	0.	0.	184.	0.	15.	2.	780.36
0.15	0.00	7.05	0.00	0.000	0.013	0.000	0.000	767.36	100.01
0.000460	9.	9.	9.	2	0	0	0.00	20.01	120.01

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.00	3.30	20.00	0.00	0.00	0.00	0.00	767.40	767.40

*SECNO 39.870
PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
*********	777.60	0.00	1300.	0.	0.	0.	767.40	770.30

39.87	10.47	777.82	0.00	0.00	778.45	0.62	0.90	0.00	780.36
1300.	0.	1300.	0.	0.	205.	0.	15.	2.	780.36
0.15	0.00	6.33	0.00	0.000	0.013	0.000	0.000	767.36	100.00
0.000346	1.	1.	1.	2	0	8	0.00	20.01	120.02

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 41.590									
41.59	10.00	777.86	0.00	0.00	778.53	0.67	0.06	0.03	780.86
1290.	0.	1290.	0.	0.	196.	0.	15.	2.	780.86
0.16	0.00	6.59	0.00	0.000	0.013	0.000	0.000	767.86	100.01
0.000386	172.	172.	172.	2	0	0	0.00	20.01	120.01
*SECNO 43.350									
43.35	9.50	777.90	0.00	0.00	778.64	0.75	0.07	0.04	781.40
1290.	0.	1290.	0.	0.	186.	0.	16.	2.	781.40
0.16	0.00	6.94	0.00	0.000	0.013	0.000	0.000	768.40	100.01
0.000444	176.	176.	176.	2	0	0	0.00	20.01	120.01
*SECNO 43.360									
3370 NORMAL BRIDGE,NRD= 8 MIN ELTRD= 780.20 MAX ELLC= 776.41									
43.36	9.32	777.71	0.00	0.00	778.83	1.12	0.00	0.18	781.40
1290.	0.	1290.	0.	0.	152.	0.	16.	2.	781.40
0.16	0.00	8.48	0.00	0.000	0.013	0.000	0.000	768.40	100.01
0.001385	1.	1.	1.	2	0	0	-30.15	20.01	120.01
*SECNO 45.860									
3370 NORMAL BRIDGE,NRD= 8 MIN ELTRD= 780.20 MAX ELLC= 777.17									
45.86	8.90	778.06	0.00	0.00	779.18	1.12	0.35	0.00	782.16
1290.	0.	1290.	0.	0.	152.	0.	17.	2.	782.16
0.17	0.00	8.48	0.00	0.000	0.013	0.000	0.000	769.16	100.01
0.001385	250.	250.	250.	2	0	0	-21.79	20.01	120.01
*SECNO 45.870									
45.87	9.36	778.52	0.00	0.00	779.28	0.76	0.00	0.11	782.16
1285.	0.	1285.	0.	0.	183.	0.	17.	2.	782.16
0.17	0.00	7.01	0.00	0.000	0.013	0.000	0.000	769.16	100.01
0.000458	1.	1.	1.	2	0	0	0.00	20.01	120.01
*SECNO 45.970									
45.97	9.33	778.52	0.00	0.00	779.29	0.77	0.00	0.00	782.19
1285.	0.	1285.	0.	0.	183.	0.	17.	2.	782.19
0.17	0.00	7.04	0.00	0.000	0.013	0.000	0.000	769.19	100.01
0.000463	10.	10.	10.	2	0	0	0.00	20.01	120.01

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.00	3.30	20.00	0.00	0.00	0.00	0.00	769.20	769.20

*SECNO 45.980
PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
*********	779.30	0.00	1287.	0.	0.	0.	769.20	771.90
45.98	10.30	779.49	0.00	0.00	780.12	0.63	0.83	0.00	782.19
1285.	0.	1285.	0.	0.	202.	0.	17.	2.	782.19
0.17	0.00	6.36	0.00	0.000	0.013	0.000	0.000	769.19	100.00
0.000353	1.	1.	1.	2	0	7	0.00	20.01	120.02

*SECNO 48.330

48.33	9.63	779.54	0.00	0.00	780.26	0.72	0.09	0.05	782.91
1285.	0.	1285.	0.	0.	189.	0.	18.	2.	782.91
0.18	0.00	6.81	0.00	0.000	0.013	0.000	0.000	769.91	100.01
0.000424	235.	235.	235.	2	0	0	0.00	20.01	120.01

*SECNO 48.340

3370 NORMAL BRIDGE,NRD= 8 MIN ELTRD= 784.70 MAX ELLC= 777.92

48.34	9.44	779.35	0.00	0.00	780.45	1.11	0.00	0.19	782.91
1285.	0.	1285.	0.	0.	152.	0.	18.	2.	782.91
0.18	0.00	8.45	0.00	0.000	0.013	0.000	0.000	769.91	100.01
0.001376	1.	1.	1.	2	0	0	-32.60	20.01	120.01

*SECNO 49.240

3370 NORMAL BRIDGE,NRD= 8 MIN ELTRD= 784.70 MAX ELLC= 778.20

49.24	9.28	779.47	0.00	0 00	780.58	1.11	0.12	0.00	783.19
1285.	0.	1285.	0.	0.	152.	0.	19.	2.	783.19
0.18	0.00	8.45	0.00	0.000	0.013	0.000	0.000	770.19	100.01
0.001376	90.	90.	90.	2	0	0	-29.58	20.01	120.01

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 49.250									
49.25	9.83	780.01	0.00	0.00	780.70	0.69	0.00	0.13	783.19
1285.	0.	1285.	0.	0.	193.	0.	19.	2.	783.19
0.18	0.00	6.67	0.00	0.000	0.013	0.000	0.000	770.19	100.01
0.000400	1.	1.	1.	2	0	0	0.00	20.01	120.01
*SECNO 49.340									
49.34	9.80	780.02	0.00	0.00	780.71	0.70	0.00	0.00	783.21
1285.	0.	1285.	0.	0.	192.	0.	19.	2.	783.21
0.19	0.00	6.69	0.00	0.000	0.013	0.000	0.000	770.21	100.01
0.000404	9.	9.	9.	2	0	0	0.00	20.01	120.01

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.00	3.30	20.00	0.00	0.00	0.00	0.00	769.70	769.70

*SECNO 49.350
PRESSURE AND WEIR FLOW

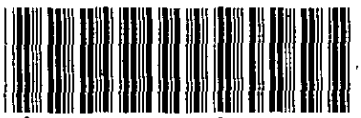
EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
*********	780.20	0.00	1284.	0.	0.	0.	770.20	773.10
49.35	10.74	780.95	0.00	0.00	781.53	0.58	0.82	0.00	783.21
1285.	0.	1285.	0.	0.	211.	0.	19.	2.	783.21
0.19	0.00	6.10	0.00	0.000	0.013	0.000	0.000	770.21	100.00
0.000315	1.	1.	1.	2	0	7	0.00	20.01	120.02
*SECNO 50.410									
50.41	10.45	780.97	0.00	0.00	781.58	0.61	0.03	0.02	783.52
1285.	0.	1285.	0.	0.	205.	0.	19.	3.	783.52
0.19	0.00	6.27	0.00	0.000	0.013	0.000	0.000	770.52	100.00
0.000339	106.	106.	106.	2	0	0	0.00	20.01	120.02
*SECNO 51.550									
51.55	10.07	780.99	0.00	0.00	781.64	0.66	0.04	0.02	783.92
1285.	0.	1285.	0.	0.	197.	0.	20.	3.	783.92
0.19	0.00	6.51	0.00	0.000	0.013	0.000	0.000	770.92	100.00
0.000375	114.	114.	114.	2	0	0	0.00	20.01	120.02

TC POND DIVERSION:RATING CURVE METHOD FOR EVALUATING THE DIVERSION

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	DSWS	USWS	DSSNO	USSNO
482.88	488.47	1.15	482.88	488.47	1.15	12	773.415	773.415	28.660	28.660

TC JUNCTION BOX DIVERSION:RATING CURVE METHOD FOR EVALUATING THE DIVERSION

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	DSWS	USWS	DSSNO	USSNO
374.07	378.70	1.23	856.94	867.16	1.19	12	770.578	770.578	23.620	23.620



1) COUNTY: KALAMAZOO

2) STUDY NAME: KALAMAZOO, CITY OF

3) WATERCOURSE: ARCADIA CREEK

4) DOCUMENT TYPE: MULTI PROFILE RUN

EXISTING BYPASS DIVERSION

500-YR



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**********************************************
*  HEC-2 WATER SURFACE PROFILES              *
*                                            *
*  Version   4.6.0;  February 1991           *
*                                            *
*  RUN DATE    28JUL92     TIME    14:06:28  *
**********************************************
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**************************************
*  U.S. ARMY CORPS OF ENGINEERS      *
*  HYDROLOGIC ENGINEERING CENTER     *
*  609 SECOND STREET, SUITE D        *
*  DAVIS, CALIFORNIA 95616-4687      *
*       (916) 756-1104               *
**************************************
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X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X           X     X
X     X  X        X                       X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                  X
X     X  X        X     X            X
X     X  XXXXXXX   XXXXX             XXXXXX
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THIS RUN EXECUTED 28JUL92 14:06:3(

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**********************************
 HEC-2 WATER SURFACE PROFILES

 Version  4.6.0; February 1991
**********************************


T1        ARCADIA CREEK HYDRAULIC ANALYSIS
T2        EXISTING BYPASS DIVERSION (POND-JUNCTION) 500-YEAR
T3        JTP 10/30/86 [RATINGEE2.HEC] REVISED DEH 9/22/89, 7/17/92 BAS

J1  ICHECK     INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

          2.0                                                                 770.44

J2  NPROF      IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

  1.0             -1.0

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

 150.0

NC   0.015     0.015     0.015
QT      4.0      1315.     1315.     1315.     1315.
X1    23.62         8.      150.    170.01        0.        0.        0.
BT       4.      150.     771.5      769.     159.5     771.5      769.     160.5     771.5      769.
BT  170.01     771.5      769.
GR   771.5      100.     771.5      150.     760.7    150.01     760.7     159.5     760.7     160.5
GR   760.7      170.     771.5    170.01     771.5      200.

X1    23.63                                    .1        .1        .1
X2                                                                1.
X5       -4.       .25       .25       .25       .25

QT       4.      200.      300.      400.      600.
X1    23.93         4.      100.     108.2        30.       30.       30.
BT       2.      100.      780.    771.67     108.2      780.   771.67
GR   771.1      100.     760.7      100.1     760.7     108.1     771.1     108.2

X1       5.0       11.      100.     108.5       1.0       1.0       1.0                .57
BT       2.0     100.      780.0    771.67     108.5      780.   771.67
GR   771.1      100.     766.1      100.5     766.1      101.     765.1     101.1     763.85    102.5
GR  763.56     104.25    763.85      106.     765.1     107.5     766.1     107.51    766.1     108.0
GR   771.1      108.5

X1       5.1                                  100.      100.      100.                .51
X2                                                                1.
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X1	5.2				300.	300.	300.		.60	
X2							1.			
X1	5.3				60.	60.	60.		.23	
X2							1.			
X1	5.4	6.0	100.25	108.25	1.	1.	1.			
BT	2.	100.25	775.0	771.9	108.25	775.0	771.9			
GR	778.0	100.	771.9	100.01	764.9	100.02	764.9	108.02	771.9	108.03
GR	780.0	108.04								
X1	5.5				25.	25.	25.		.80	
X2							1.			
X5	-4.	.08	.09	.11	.14					
X1	5.6	4.	100.	109.2	2.	2.	2.			
BT	2.	100.	775.	771.	109.2	775.	771.			
GR	771.0	100.	765.	100.1	765.	109.1	771.	109.2		
X1	5.7				20.	20.	20.			
X2							1.			
NC	.04	.04	.035	.1	.3					
X1	5.8	4.	100.	109.2	1.	1.	1.			
GR	771.	100.	763.	100.1	763.	109.1	771.	109.2		
QT	4.	1310.	1310.	1310.	1310.					
X1	28.99	8.	128.	148.1	20.	20.	20.			
GR	774.	100.	772.	150.	765.	175.	760.	185.	760.	205.
GR	765.	215.	772.	240.	774.	295.				

THIS RUN EXECUTED 28JUL92 14:06:4(

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HEC-2 WATER SURFACE PROFILES

Version 4.6.0; February 1991
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

JTP 10/30/86 [RATINGEE

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	23.620	0.00	771.50	769.00	760.70	1315.00	770.44	0.00	771.42	15.25	7.93	165.92	336.76
	23.620	0.00	771.50	769.00	760.70	1315.00	770.44	0.00	771.42	15.25	7.93	165.92	336.76
	23.620	0.00	771.50	769.00	760.70	1315.00	770.44	0.00	771 42	15.25	7.93	165.92	336.76
	23.620	0.00	771.50	769.00	760.70	1315.00	770.44	0.00	771.42	15.25	7.93	165.92	336.76
*	23.630	0.10	771.50	769.00	760.70	1315 00	770.69	0.00	771.67	15.25	7.93	165.92	336.76
*	23.630	0.10	771.50	769.00	760.70	1315.00	770.69	0.00	771.67	15.25	7.93	165.92	336.76
*	23.630	0.10	771.50	769.00	760.70	1315.00	770.69	0.00	771.67	15.25	7.93	165.92	336.76
*	23.630	0.10	771.50	769.00	760.70	1315.00	770.69	0.00	771.67	15.25	7.93	165.92	336.76
*	23.930	30.00	780.00	771.67	760.70	200.00	771.61	0.00	771.69	1.22	2.26	88.44	180.85
*	23.930	30.00	780.00	771.67	760.70	300.00	771.51	0.00	771.69	2.81	3.42	87.64	178.90
*	23.930	30.00	780.00	771.67	760.70	400.00	771.37	0.00	771.70	5.16	4.63	86.44	176.01
*	23.930	30.00	780.00	771.67	760.70	600.00	770.89	0.00	771.71	12.99	7.27	82.50	166.50
*	5.000	1.00	780.00	771.67	764.13	200.00	771.46	0.00	771.69	4.40	3.90	51.33	95.36
*	5.000	1.00	780.00	771.67	764.13	300.00	771.10	0.00	771.70	11.51	6.20	48.36	88.43
*	5.000	1.00	780.00	771.67	764.13	400.00	770.23	0.00	771.70	30.89	9.72	41.14	71.97
*	5.000	1.00	780.00	771.67	764.13	600.00	770.73	770.73	773.46	54.55	13.27	45.23	81.23
	5.100	100.00	780.00	772.18	764.64	200.00	771.46	0.00	771.74	5.47	4.25	47.08	85.49
	5.100	100.00	780.00	772.18	764.64	300.00	771.11	0.00	771.82	14.51	6.80	44.15	78.77
	5.100	100.00	780.00	772.18	764.64	400.00	770.25	0.00	772.05	40.12	10.76	37.18	63.15
	5.100	100.00	780.00	772.18	764.64	600.00	771.44	0.00	773.98	49.78	12.80	46.89	85.04
	5.200	300.00	780.00	772.78	765.24	200.00	771.59	0.00	771.92	6.79	4.62	43.26	76.74
	5.200	300.00	780.00	772.78	765.24	300.00	771.50	0.00	772.28	16.07	7.07	42.41	74.83
	5.200	300.00	780.00	772.78	765.24	400.00	771.74	0.00	773.00	25.45	9.01	44.37	79.29
	5.200	300.00	780.00	772.78	765.24	600.00	773.61	0.00	775.59	57.86	11.30	53.09	78.88
	5.300	60.00	780.00	773.01	765.47	200.00	771.60	0.00	771.97	7.60	4.83	41.39	72.53
	5.300	60.00	780.00	773.01	765.47	300.00	771.55	0.00	772.38	17.59	7.33	40.95	71.54
	5.300	60.00	780.00	773.01	765.47	400.00	771.83	0.00	773.15	27.21	9.25	43.23	76.68
	5.300	60.00	780.00	773.01	765.47	600.00	773.95	0.00	775.94	57.86	11.30	53.09	78.88

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	5.400	1.00	775.00	771.90	764.90	200.00	771.76	0.00	771.97	2.37	3.64	54.95	130.04
*	5.400	1.00	775.00	771.90	764.90	300.00	771.94	0.00	772.38	4.94	5.32	56.41	135.02
*	5.400	1.00	775.00	771.90	764.90	400.00	772.48	0.00	773 16	6.85	6.59	60.78	152.87
*	5.400	1.00	775.00	771.90	764.90	600.00	775.10	0.00	775.94	5.81	7.36	81.65	248.85
*	5.500	25.00	775.00	772.70	765.70	200.00	771.84	0.00	772.10	3.20	4.07	49.17	111.72
*	5.500	25.00	775.00	772.70	765.70	300.00	772.03	0.00	772.58	6.62	5.92	50.73	116.60
*	5.500	25.00	775.00	772.70	765.70	400.00	772.59	0.00	773.41	9.34	7.25	55.21	130.87
*	5.500	25.00	775.00	772.70	765.70	600.00	775.24	0.00	776.20	7.35	7.86	76.36	221.25
	5.600	2.00	775.00	771.00	765.00	200.00	771.89	0.00	772.10	6.21	3.66	54.60	80.27
*	5.600	2.00	775.00	771.00	765.00	300.00	772.11	0.00	772.58	13.97	5.49	54.60	80.27
*	5.600	2.00	775.00	771.00	765.00	400.00	772.58	0.00	773.41	24.83	7.33	54.60	80.27
*	5.600	2.00	775.00	771.00	765.00	600.00	774.33	0.00	776.20	55.87	10.99	54.60	80.27
	5.700	20.00	775.00	771.00	765.00	200.00	771.90	0.00	772.11	6.21	3.66	54.60	80.27
	5.700	20.00	775.00	771.00	765.00	300.00	772.14	0.00	772.61	13.97	5.49	54.60	80.27
	5.700	20.00	775.00	771.00	765.00	400.00	772.63	0.00	773.46	24.83	7.33	54.60	80.27
	5.700	20.00	775.00	771.00	765.00	600.00	774.44	0.00	776.31	55.87	10.99	54.60	80.27
	5.800	1.00	0.00	0.00	763.00	200.00	772.03	0.00	772 12	7.44	2.43	82.29	73.33
	5.800	1.00	0.00	0.00	763.00	300.00	772.45	0.00	772.64	14.97	3.48	86.13	77.54
	5.800	1.00	0.00	0.00	763.00	400.00	773.23	0.00	773.52	21.88	4.28	93.36	85.51
*	5.800	1.00	0.00	0.00	763.00	600.00	776.07	0.00	776.46	27.37	5.02	119.47	114.68
*	28.990	20.00	0.00	0.00	760.00	1310.00	772.06	0.00	772.13	2.04	0.00	609.68	917.01
*	28.990	20.00	0.00	0.00	760.00	1310.00	772.59	0.00	772.65	1.64	0.00	667.75	1023.13
*	28.990	20.00	0.00	0.00	760.00	1310.00	773.50	0.00	773 55	1.14	0.00	799.83	1228.10
*	28.990	20.00	0.00	0.00	760.00	1310.00	776.49	0.00	776.50	0.34	0.00	1375.49	2236.04

JTP 10/30/86 [RATINGEE

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	23.620	1315.00	770.44	0.00	0.00	0.00	20.01	0.00
	23.620	1315.00	770.44	0.00	0.00	0.00	20.01	0.00
	23.620	1315.00	770.44	0.00	0.00	0.00	20.01	0.00
	23.620	1315.00	770.44	0.00	0.00	0.00	20.01	0.00
*	23.630	1315.00	770.69	0.00	0.25	0.00	20.01	0.10
*	23.630	1315.00	770.69	0.00	0.25	0.00	20.01	0.10
*	23.630	1315.00	770.69	0.00	0.25	0.00	20.01	0.10
*	23.630	1315.00	770.69	0.00	0.25	0.00	20.01	0.10
*	23.930	200.00	771.61	0.00	0.92	0.00	8.20	30.00
*	23.930	300.00	771.51	-0.10	0.82	0.00	8.20	30.00
*	23.930	400.00	771.37	-0.15	0.68	0.00	8.20	30.00
*	23.930	600.00	770.89	-0.48	0.20	0.00	8.20	30.00
*	5.000	200 00	771.46	0.00	-0.16	0.00	8.46	1.00
*	5.000	300.00	771.10	-0.36	-0.42	0.00	8.39	1.00
*	5.000	400.00	770.23	-0.87	-1.13	0.00	8.21	1.00
*	5.000	600.00	770.73	0.50	-0.16	0.00	8.31	1.00
	5.100	200.00	771.46	0.00	0.00	0.00	8.36	100.00
	5.100	300.00	771.11	-0.35	0.01	0.00	8.29	100.00
	5.100	400.00	770.25	-0.85	0.02	0.00	8.12	100.00
	5.100	600.00	771.44	1.19	0.71	0.00	8.35	100.00
	5.200	200.00	771.59	0.00	0.13	0.00	8.26	300.00
	5.200	300.00	771.50	-0.09	0.40	0.00	8.24	300.00
	5.200	400.00	771.74	0.23	1.48	0.00	8.29	300.00
	5.200	600.00	773.61	1.87	2.17	0.00	8.50	300.00
	5.300	200.00	771.60	0.00	0.01	0.00	8.22	60.00
	5.300	300.00	771.55	-0.05	0.04	0.00	8.21	60.00
	5.300	400.00	771.83	0.28	0.09	0.00	8.26	60.00
	5.300	600.00	773.95	2.13	0.35	0.00	8.50	60.00
*	5.400	200.00	771.76	0.00	0.16	0.00	8.02	1.00
*	5.400	300.00	771.94	0.18	0.39	0.00	8.02	1.00
*	5.400	400.00	772.48	0.54	0.66	0.00	8.02	1.00
*	5.400	600.00	775.10	2.61	1.14	0.00	8.03	1.00
*	5.500	200.00	771.84	0.00	0.08	0.00	8.02	25.00
*	5.500	300.00	772.03	0.19	0.09	0.00	8.02	25.00
*	5.500	400.00	772.59	0.56	0.11	0.00	8.02	25.00
*	5.500	600.00	775.24	2.64	0.14	0.00	8.03	25.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	5.600	200.00	771.89	0.00	0.05	0.00	9.20	2.00
*	5.600	300.00	772.11	0.22	0.08	0.00	9.20	2.00
*	5.600	400.00	772.58	0.47	-0.01	0.00	9.20	2.00
*	5.600	600.00	774.33	1.75	-0.91	0.00	9.20	2.00
	5.700	200.00	771.90	0.00	0.01	0.00	9.20	20.00
	5.700	300.00	772.14	0.24	0.03	0.00	9.20	20.00
	5.700	400.00	772.63	0.49	0.05	0.00	9.20	20.00
	5.700	600.00	774.44	1.81	0.11	0.00	9.20	20.00
	5.800	200.00	772.03	0.00	0.13	0.00	9.20	1.00
	5.800	300.00	772.45	0.42	0.31	0.00	9.20	1.00
	5.800	400.00	773.23	0.78	0.61	0.00	9.20	1.00
*	5.800	600.00	776.07	2.84	1.64	0.00	9.20	1.00
*	28.990	1310.00	772.06	0.00	0.03	0.00	92.69	20.00
*	28.990	1310.00	772.59	0.54	0.15	0.00	121.20	20.00
*	28.990	1310.00	773.50	0.91	0.27	0.00	168.99	20.00
*	28.990	1310.00	776.49	2.99	0.42	0.00	195.00	20.00

SUMMARY OF ERRORS AND SPECIAL NOTES

```
NOTE     SECNO=     23.630  PROFILE=  1  WSEL BASED ON X5 CARD
NOTE     SECNO=     23.630  PROFILE=  2  WSEL BASED ON X5 CARD
NOTE     SECNO=     23.630  PROFILE=  3  WSEL BASED ON X5 CARD
NOTE     SECNO=     23.630  PROFILE=  4  WSEL BASED ON X5 CARD

WARNING  SECNO=     23.930  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=     23.930  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=     23.930  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=     23.930  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING  SECNO=      5.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=      5.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=      5.000  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
CAUTION  SECNO=      5.000  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=      5.000  PROFILE=  4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=      5.000  PROFILE=  4  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING  SECNO=      5.400  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=      5.400  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=      5.400  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=      5.400  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

NOTE     SECNO=      5.500  PROFILE=  1  WSEL BASED ON X5 CARD
NOTE     SECNO=      5.500  PROFILE=  2  WSEL BASED ON X5 CARD
NOTE     SECNO=      5.500  PROFILE=  3  WSEL BASED ON X5 CARD
NOTE     SECNO=      5.500  PROFILE=  4  WSEL BASED ON X5 CARD

WARNING  SECNO=      5.600  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=      5.600  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=      5.600  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING  SECNO=      5.800  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING  SECNO=     28.990  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=     28.990  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=     28.990  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=     28.990  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
```

00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: KALAMAZOO, CITY OF

3) WATERCOURSE: ARCADIA CREEK

4) DOCUMENT TYPE: MULTI-PROFILE RUN

PROPOSED CULVERT DIVERSION

50-YR

00BREAK00

```
*********************************************
*  HEC-2 WATER SURFACE PROFILES             *
*                                           *
*  Version   4.6.0;  February 1991          *
*                                           *
*  RUN DATE     28JUL92     TIME    12:20:50 *
*********************************************
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**************************************
*  U.S. ARMY CORPS OF ENGINEERS
*  HYDROLOGIC ENGINEERING CENTER
*  609 SECOND STREET, SUITE D
*  DAVIS, CALIFORNIA 95616-4687
*         (916) 756-1104
**************************************
```


```
X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X            X     X
X     X  X        X                        X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                   X
X     X  X        X     X             X
X     X  XXXXXXX   XXXXX              XXXXXXX
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THIS RUN EXECUTED 28JUL92 12:20:51

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**************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.0;  February 1991
**************************************

T1 ARCADIA CREEK HYDRAULIC ANALYSIS
T2 PROPOSED CULVERT DIVERSION (JUNCTION-POND) 50-YEAR
T3       [PR50.HEC2]

J1  ICHECK     INQ        NINV       IDIR       STRT       METRIC     HVINS      Q          WSEL       FQ

                2.                                                                          768.1

J2  NPROF      IPLOT      PRFVS      XSECV      XSECH      FN         ALLDC      IBW        CHNIM      ITRACE

   1.0              -1.0


J3  VARIABLE CODES FOR SUMMARY PRINTOUT

  150.0         38.         66.          8.          1.         39.         43.          3.

QT     4.0         890.        890.        890.        890.
NC      .013        .013        .013         .3          .5
          STA. 23+62: JUNCTION BOX (DIVERSION POINT)
X1    23.62          8.        150.      170.01         10.         10.         10.
BT        4.        150.       771.5      769.00       159.5       771.5       769.0       160.5       771.5       769.0
BT   170.01        771.5       769.0
GR    771.5         100.       771.5        150.      760.70      150.01      760.70       159.5       760.7       160.5
GR    760.7      170.00        771.5      170.01       771.5       200.

          STA. 23+63: X5 CARD MODELS JUNCTION LOSS
X1    23.63                                             .1          .1          .1
X2                                                                              1.
X5       -4.         .25         .25         .25         .25

X1    23.77          10.        150.      170.01         15.         15.         15.                     .037
BT        6.        150.       771.2      769.00       159.5       771.2       769.0       159.51      771.2       769.0
BT    160.5        771.2       769.0      160.51       771.2       769.0      170.01       771.2       769.0
GR    771.5         100.       771.5        150.      760.70      150.01      760.70       159.5       760.7      159.51
GR    760.7        160.5       760.7      160.51       760.7      170.00       771.5      170.01       771.5       200.

QT     4.0          500.        600.        700.        800.
X1    23.93            6.        150.      162.01         16.         16.         16.                     .074
BT        2.        150.       771.5      768.80       162.01      771.5       768.80
GR    771.5         100.       771.5        150.      760.70      150.01      760.70       162.00      771.5       162.01
GR    771.5         200.
```

```
X1     24.0                                          7.          7.          7.                      .017
X2                                                                          1.

X1     24.1                                         .01         .01         .01
X2                                                                          1.
X5      -4.        .04        .04        .04        .04

          STA. 25+00
X1     25.0                                        100.        100.        100.                      .245
X2                                                                          1.

          STA. 27+50
X1     27.5                                        250.        250.        250.                      .610
BT       2.       150.      773.0     769.62      162.01       773.0      769.62

          STA. 28+56: U/S FACE OF THE 12'X7' CULVERT JUST U/S OF EDWARDS ST.
X1    28.56                                        106.        106.        106.                      .260
BT       2.       150.      773.5     769.93      162.01       773.5      769.93

          STA. 28+57: 1' U/S OF THE 12'X7' CULVERT
X1    28.57                                          1.          1.          1.

X1    28.65         4.      100.0      132.2          8.          8.          8.
GR    773.0       100.      762.0      100.1       762.0       132.1        773.       132.2

SB                  1.        3.3        32.      .00001          0.      .00001          0.       762.0       762.0
          STA. 28+66: POND OUTLET WEIR ON THE D/S END OF POND(H=3.0',C=3.5)
X1    28.66         4.       100.     132.01          1.          1.          1.
X2                            1.      762.0       765.0
GR    775.0       100.      762.0     100.01       762.0        132.        775.     132.01

NC      .04        .04       .035        0.1         0.3
QT       4.       885.       885.       885.        885.
          STA. 28+99: FIRST XSEC OF POND
X1    28.99        8.0      150.0      215.0         44.         50.         33.
GR     774.       100.       772.       150.        765.        175.        760.        185.        760.        205.
GR     765.       215.       772.       240.        774.        295.
```

THIS RUN EXECUTED 28JUL92 12:21:06

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.0; February 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

[PR50.HEC2]

SUMMARY PRINTOUT

	SECNO	CUMDS	DEPTH	CWSEL	XLCH	Q	EG
	23.620	0.00	7.40	768.10	0.00	890.00	768.66
	23.620	0.00	7.40	768.10	0.00	890.00	768.66
	23.620	0.00	7.40	768.10	0.00	890.00	768.66
	23.620	0.00	7.40	768.10	0.00	890.00	768.66
*	23.630	0.10	7.65	768.35	0.10	890 00	768.88
*	23.630	0.10	7.65	768.35	0.10	890.00	768.88
*	23.630	0.10	7.65	768.35	0.10	890.00	768.88
*	23.630	0.10	7.65	768.35	0.10	890.00	768.88
	23.770	15.10	7.62	768.35	15.00	890.00	768.88
	23.770	15.10	7.62	768.35	15.00	890.00	768.88
	23.770	15.10	7.62	768.35	15.00	890.00	768.88
	23.770	15.10	7.62	768.35	15.00	890.00	768.88
*	23.930	31.10	7.68	768.45	16.00	500.00	768.91
*	23.930	31.10	7.51	768.28	16.00	600.00	768.97
*	23.930	31.10	7.37	768.14	16.00	700.00	769.11
*	23.930	31.10	7.19	767.96	16.00	800.00	769.30
	24.000	38.10	7.67	768.46	7.00	500.00	768.92
	24.000	38.10	7.49	768.28	7.00	600.00	768.98
	24.000	38.10	7.35	768.14	7.00	700.00	769.12
	24.000	38.10	7.18	767.97	7.00	800.00	769.31
*	24.100	38.11	7.71	768.50	0.01	500.00	768.95
*	24.100	38.11	7.53	768.32	0.01	600.00	769.01
*	24.100	38.11	7.39	768.18	0.01	700.00	769.15
*	24.100	38.11	7.22	768.01	0.01	800.00	769.33
	25.000	138.11	7.49	768.53	100.00	500.00	769.01
	25.000	138.11	7.34	768.38	100.00	600.00	769.10
	25.000	138.11	7.23	768.26	100.00	700.00	769.27
	25.000	138.11	7.08	768.12	100.00	800.00	769.50

	SECNO	CUMDS	DEPTH	CWSEL	XLCH	Q	EG
	27.500	388.11	6.98	768.62	250.00	500.00	769.18
	27.500	388.11	6.88	768.52	250.00	600.00	769.34
	27.500	388.11	6.83	768.48	250.00	700.00	769.61
	27.500	388.11	6.78	768.43	250.00	800.00	769.93
	28.560	494.11	6.76	768.67	106.00	500.00	769.26
	28.560	494.11	6.69	768.59	106.00	600.00	769.46
	28.560	494.11	6.67	768.58	106.00	700.00	769.76
	28.560	494.11	6.67	768.58	106.00	800.00	770.13
	28.570	495.11	6.76	768.67	1.00	500.00	769.26
	28.570	495.11	6.69	768.59	1.00	600.00	769.46
	28.570	495.11	6.67	768.58	1.00	700.00	769.77
	28.570	495.11	6.67	768.58	1.00	800.00	770.13
*	28.650	503.11	7.34	769.34	8.00	500.00	769.41
*	28.650	503.11	7.60	769.60	8.00	600.00	769.70
*	28.650	503.11	7.97	769.97	8.00	700.00	770.09
*	28.650	503.11	8.42	770.42	8.00	800.00	770.55
	28.660	504.11	7.34	769.34	1.00	500.00	769.41
	28.660	504.11	7.60	769.60	1.00	600.00	769.70
	28.660	504.11	7.97	769.97	1.00	700.00	770.09
	28.660	504.11	8.42	770.42	1.00	800.00	770.55
*	28.990	537.11	9.34	769.34	33.00	885.00	769.42
*	28.990	537.11	9.62	769.62	33.00	885.00	769.70
*	28.990	537.11	10.03	770.03	33.00	885.00	770.10
	28.990	537.11	10.51	770.51	33.00	885.00	770.57

[PR50.HEC2]

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	23.620	0.00	771.50	769.00	760.70	890.00	768.10	0.00	768.66	4.02	6.01	147.98	444.06
	23.620	0.00	771.50	769.00	760.70	890.00	768.10	0.00	768.66	4.02	6.01	147.98	444.06
	23.620	0.00	771.50	769.00	760.70	890.00	768.10	0.00	768.66	4.02	6.01	147.98	444.06
	23.620	0.00	771.50	769.00	760.70	890.00	768.10	0.00	768.66	4.02	6.01	147.98	444.06
*	23.630	0.10	771.50	769.00	760.70	890.00	768.35	0.00	768.88	3.66	5.82	152.98	464.91
*	23.630	0.10	771.50	769.00	760.70	890.00	768.35	0.00	768.88	3.66	5.82	152.98	464.91
*	23.630	0.10	771.50	769.00	760.70	890.00	768.35	0.00	768.88	3.66	5.82	152.98	464.91
*	23.630	0.10	771.50	769.00	760.70	890.00	768.35	0.00	768.88	3.66	5.82	152.98	464.91
	23.770	15.00	771.20	769.00	760.74	890.00	768.35	0.00	768.88	3.71	5.84	152.35	462.30
	23.770	15.00	771.20	769.00	760.74	890.00	768.35	0.00	768.88	3.71	5.84	152.35	462.30
	23.770	15.00	771.20	769.00	760.74	890.00	768.35	0.00	768.88	3.71	5.84	152.35	462.30
	23.770	15.00	771.20	769.00	760.74	890.00	768.35	0.00	768.88	3.71	5.84	152.35	462.30
*	23.930	16.00	771.50	768.80	760.77	500.00	768.45	0.00	768.91	4.46	5.43	92.14	236.70
*	23.930	16.00	771.50	768.80	760.77	600.00	768.28	0.00	768.97	6.82	6.66	90.06	229.82
*	23.930	16.00	771.50	768.80	760.77	700.00	768.14	0.00	769.11	9.74	7.92	88.38	224.24
*	23.930	16.00	771.50	768.80	760.77	800.00	767.96	0.00	769.30	13.56	9.28	86.25	217.24
	24.000	7.00	771.50	768.82	760.79	500.00	768.46	0.00	768.92	4.48	5.44	91.97	236.14
	24.000	7.00	771.50	768.82	760.79	600.00	768.28	0.00	768.98	6.85	6.67	89.90	229.29
	24.000	7.00	771.50	768.82	760.79	700.00	768.14	0.00	769.12	9.79	7.93	88.22	223.72
	24.000	7.00	771.50	768.82	760.79	800.00	767.97	0.00	769.31	13.63	9.29	86.08	216.69
*	24.100	0.01	771.50	768.82	760.79	500.00	768.50	0.00	768.95	4.42	5.41	92.44	237.70
*	24.100	0.01	771.50	768.82	760.79	600.00	768.32	0.00	769.01	6.75	6.64	90.38	230.87
*	24.100	0.01	771.50	768.82	760.79	700.00	768.18	0.00	769.15	9.65	7.89	88.70	225.32
*	24.100	0.01	771.50	768.82	760.79	800.00	768.01	0.00	769.33	13.43	9.24	86.57	218.30
	25.000	100.00	771.50	769.06	761.04	500.00	768.53	0.00	769.01	4.75	5.56	89.97	229.51
	25.000	100.00	771.50	769.06	761.04	600.00	768.38	0.00	769.10	7.20	6.81	88.17	223.59
	25.000	100.00	771.50	769.06	761.04	700.00	768.26	0.00	769.27	10.25	8.08	86.68	218.67
	25.000	100.00	771.50	769.06	761.04	800.00	768.12	0.00	769.50	14.10	9.41	84.98	213.07
	27.500	250.00	773.00	769.62	761.65	500.00	768.62	0.00	769.18	5.73	5.97	83.69	208.86
	27.500	250.00	773.00	769.62	761.65	600.00	768.52	0.00	769.34	8.57	7.27	82.48	204.94
	27.500	250.00	773.00	769.62	761.65	700.00	768.48	0.00	769.61	11.87	8.54	81.94	203.17
	27.500	250.00	773.00	769.62	761.65	800.00	768.43	0.00	769.93	15.78	9.83	81.38	201.36
	28.560	106.00	773.50	769.93	761.91	500.00	768.67	0.00	769.26	6.20	6.15	81.24	200.88
	28.560	106.00	773.50	769.93	761.91	600.00	768.59	0.00	769.46	9.20	7.47	80.30	197.84
	28.560	106.00	773.50	769.93	761.91	700.00	768.58	0.00	769.76	12.58	8.73	80.15	197.37
	28.560	106.00	773.50	769.93	761.91	800.00	768.58	0.00	770.13	16.46	9.99	80.10	197.19

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	28.570	1.00	0.00	0.00	761.91	500.00	768.67	0.00	769.26	6.22	6.16	81.13	200.54
	28.570	1.00	0.00	0.00	761.91	600.00	768.59	0.00	769.46	9.22	7.48	80.23	197.62
	28.570	1.00	0.00	0.00	761.91	700.00	768.58	0.00	769.77	12.61	8.74	80.08	197.14
	28.570	1.00	0.00	0.00	761.91	800.00	768.58	0.00	770.13	16.49	9.99	80.04	197.00
*	28.650	8.00	0.00	0.00	762.00	500.00	769.34	0.00	769.41	0.40	2.12	235.57	792.14
*	28.650	8.00	0.00	0.00	762.00	600.00	769.60	0.00	769.70	0.52	2.46	243.91	833.24
*	28.650	8.00	0.00	0.00	762.00	700.00	769.97	0.00	770.09	0.62	2.74	255.71	892.32
*	28.650	8.00	0.00	0.00	762.00	800.00	770.42	0.00	770.55	0.69	2.96	270.02	965.13
	28.660	1.00	765.00	762.00	762.00	500.00	769.34	0.00	769.41	0.40	2.13	235.00	789.07
	28.660	1.00	765.00	762.00	762.00	600.00	769.60	0.00	769.70	0.52	2.47	243.19	829.42
	28.660	1.00	765.00	762.00	762.00	700.00	769.97	0.00	770.09	0.62	2.74	255.09	888.82
	28.660	1.00	765.00	762.00	762.00	800.00	770.42	0.00	770.55	0.69	2.97	269.33	961.18
*	28.990	33.00	0.00	0.00	760.00	885.00	769.34	0.00	769.42	2.81	2.38	391.31	523.19
*	28.990	33.00	0.00	0.00	760.00	885.00	769.62	0.00	769.70	2.47	2.27	411.29	562.86
*	28.990	33.00	0.00	0.00	760.00	885.00	770.03	0.00	770.10	2.06	2.12	441.62	616.34
	28.990	33.00	0.00	0.00	760.00	885.00	770.51	0.00	770.57	1.68	1.97	478.70	683.05

[PR50.HEC2]

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	OIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	23.620	890.00	768.10	0.00	0.00	0.00	20.00	0.00
	23.620	890.00	768.10	0.00	0.00	0.00	20.00	0.00
	23.620	890.00	768.10	0.00	0.00	0.00	20.00	0.00
	23.620	890.00	768.10	0.00	0.00	0.00	20.00	0.00
*	23.630	890.00	768.35	0.00	0.25	0.00	20.00	0.10
*	23.630	890.00	768.35	0.00	0.25	0.00	20.00	0.10
*	23.630	890.00	768.35	0.00	0.25	0.00	20.00	0.10
*	23.630	890.00	768.35	0.00	0.25	0.00	20.00	0.10
	23.770	890.00	768.35	0.00	0.00	0.00	20.00	15.00
	23.770	890.00	768.35	0.00	0.00	0.00	20.00	15.00
	23.770	890.00	768.35	0.00	0.00	0.00	20.00	15.00
	23.770	890.00	768.35	0.00	0.00	0.00	20.00	15.00
*	23.930	500.00	768.45	0.00	0.10	0.00	12.00	16.00
*	23.930	600.00	768.28	-0.17	-0.07	0.00	12.00	16.00
*	23.930	700.00	768.14	-0.14	-0.21	0.00	12.00	16.00
*	23.930	800.00	767.96	-0.18	-0.39	0.00	12.00	16.00
	24.000	500.00	768.46	0.00	0.00	0.00	12.00	7.00
	24.000	600.00	768.28	-0.17	0.00	0.00	12.00	7.00
	24.000	700.00	768.14	-0.14	0.01	0.00	12.00	7.00
	24.000	800.00	767.97	-0.18	0.01	0.00	12.00	7.00
*	24.100	500.00	768.50	0.00	0.04	0.00	12.00	0.01
*	24.100	600.00	768.32	-0.17	0.04	0.00	12.00	0.01
*	24.100	700.00	768.18	-0.14	0.04	0.00	12.00	0.01
*	24.100	800.00	768.01	-0.18	0.04	0.00	12.00	0.01
	25.000	500.00	768.53	0.00	0.03	0.00	12.00	100.00
	25.000	600.00	768.38	-0.15	0.05	0.00	12.00	100.00
	25.000	700.00	768.26	-0.12	0.08	0.00	12.00	100.00
	25.000	800.00	768.12	-0.14	0.11	0.00	12.00	100.00
	27.500	500.00	768.62	0.00	0.09	0.00	12.00	250.00
	27.500	600.00	768.52	-0.10	0.14	0.00	12.00	250.00
	27.500	700.00	768.48	-0.05	0.22	0.00	12.00	250.00
	27.500	800.00	768.43	-0.05	0.31	0.00	12.00	250.00
	28.560	500.00	768.67	0.00	0.05	0.00	12.00	106.00
	28.560	600.00	768.59	-0.08	0.07	0.00	12.00	106.00
	28.560	700.00	768.58	-0.01	0.10	0.00	12.00	106.00
	28.560	800.00	768.58	0.00	0.15	0.00	12.00	106.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	28.570	500.00	768.67	0.00	0.00	0.00	12.00	1.00
	28.570	600.00	768.59	-0.07	0.00	0.00	12.00	1.00
	28.570	700.00	768.58	-0.01	0.00	0.00	12.00	1.00
	28.570	800.00	768.58	0.00	0.00	0.00	12.00	1.00
*	28.650	500.00	769.34	0.00	0.68	0.00	32.13	8.00
*	28.650	600.00	769.60	0.26	1.01	0.00	32.14	8.00
*	28.650	700.00	769.97	0.37	1.39	0.00	32.14	8.00
*	28.650	800.00	770.42	0.44	1.84	0.00	32.15	8.00
	28.660	500.00	769.34	0.00	0.00	0.00	32.00	1.00
	28.660	600.00	769.60	0.26	0.00	0.00	32.00	1.00
	28.660	700.00	769.97	0.37	0.00	0.00	32.00	1.00
	28.660	800.00	770.42	0.44	0.00	0.00	32.00	1.00
*	28.990	885.00	769.34	0.00	-0.01	0.00	71.04	33.00
*	28.990	885.00	769.62	0.29	0.02	0.00	73.03	33.00
*	28.990	885.00	770.03	0.41	0.06	0.00	75.93	33.00
	28.990	885.00	770.51	0.48	0.09	0.00	79.35	33.00

SUMMARY OF ERRORS AND SPECIAL NOTES

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NOTE     SECNO=     23.630  PROFILE=  1  WSEL BASED ON X5 CARD
NOTE     SECNO=     23.630  PROFILE=  2  WSEL BASED ON X5 CARD
NOTE     SECNO=     23.630  PROFILE=  3  WSEL BASED ON X5 CARD
NOTE     SECNO=     23.630  PROFILE=  4  WSEL BASED ON X5 CARD

WARNING  SECNO=     23.930  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=     23.930  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=     23.930  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=     23.930  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

NOTE     SECNO=     24.100  PROFILE=  1  WSEL BASED ON X5 CARD
NOTE     SECNO=     24.100  PROFILE=  2  WSEL BASED ON X5 CARD
NOTE     SECNO=     24.100  PROFILE=  3  WSEL BASED ON X5 CARD
NOTE     SECNO=     24.100  PROFILE=  4  WSEL BASED ON X5 CARD

WARNING  SECNO=     28.650  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=     28.650  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=     28.650  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=     28.650  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING  SECNO=     28.990  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=     28.990  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=     28.990  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
```

00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: KALAMAZOO, CITY OF

3) WATERCOURSE: ARCADIA CREEK

4) DOCUMENT TYPE: MULTI-PROFILE RUN

PROPOSED CULVERT DIVERSION

100-YR

00BREAK00

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**********************************************
*  HEC-2 WATER SURFACE PROFILES              *
*                                            *
*  Version   4.6.0;  February 1991           *
*                                            *
*  RUN DATE    28JUL92    TIME    14:02:13   *
**********************************************
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**************************************
*  U.S. ARMY CORPS OF ENGINEERS      *
*  HYDROLOGIC ENGINEERING CENTER     *
*  609 SECOND STREET, SUITE D        *
*  DAVIS, CALIFORNIA 95616-4687      *
*          (916) 756-1104            *
**************************************
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X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X           X     X
X     X  X        X                 X     X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                 X
X     X  X        X     X           X
X     X  XXXXXXX   XXXXX            XXXXXXX
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THIS RUN EXECUTED 28JUL92 14:02:14

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*************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.0;  February 1991
*************************************

T1 ARCADIA CREEK HYDRAULIC ANALYSIS
T2 PROPOSED CULVERT DIVERSION (JUNCTION-POND) 100-YEAR
T3       [PR50.HEC2]

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

               2.                                                                  768.65

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

   1.0              -1.0

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

  150.0        38.        66.         8.         1.        39.        43.        3.

QT    4.0        1020.       1020   .   1020    .   1020    .
NC     .013       .013       .013        .3          .5
          STA. 23+62: JUNCTION BOX (DIVERSION POINT)
X1    23.62         8.       150.     170.01        10.        10.        10.
BT       4.       150.      771.5     769.00      159.5      771.5      769.0      160.5      771.5      769.0
BT   170.01      771.5      769.0
GR    771.5       100.      771.5       150.     760.70     150.01     760.70      159.5      760.7      160.5
GR    760.7     170.00      771.5     170.01      771.5       200.

          STA. 23+63: X5 CARD MODELS JUNCTION LOSS
X1    23.63                                          .1         .1         .1
X2                                                                        1.
X5      -4.        .25        .25        .25        .25

X1    23.77        10.       150.     170.01        15.        15.        15.                   .037
BT       6.       150.      771.2     769.00      159.5      771.2      769.0     159.51      771.2      769.0
BT    160.5      771.2      769.0     160.51      771.2      769.0     170.01      771.2      769.0
GR    771.5       100.      771.5       150.     760.70     150.01     760.70      159.5      760.7     159.51
GR    760.7      160.5      760.7     160.51      760.7     170.00      771.5     170.01      771.5       200.

QT    4.0         400.       600.       800.      1000.
X1    23.93         6.       150.     162.01        16.        16.        16.                   .074
BT       2.       150.      771.5     768.80     162.01      771.5     768.80
GR    771.5       100.      771.5       150.     760.70     150.01     760.70     162.00      771.5     162.01
GR    771.5       200.
```

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X1     24.0                                          7.          7.          7.                    .017
X2                                                                           1.

X1     24.1                                         .01         .01         .01
X2                                                                           1.
X5      -4.        .04        .04        .04        .04

          STA. 25+00
X1     25.0                                        100.        100.        100.                    .245
X2                                                                           1.

          STA. 27+50
X1     27.5                                        250.        250.        250.                    .610
BT       2.       150.      773.0     769.62      162.01       773.0      769.62

          STA. 28+56: U/S FACE OF THE 12'X7' CULVERT JUST U/S OF EDWARDS ST.
X1    28.56                                        106.        106.        106.                    .260
BT       2.       150.      773.5     769.93      162.01       773 5      769.93

          STA. 28+57: 1' U/S OF THE 12'X7' CULVERT
X1    28.57                                          1.          1.          1.

X1    28.65         4.      100.0      132.2          8.          8.          8.
GR    773.0       100.      762.0      100.1       762.0       132.1        773.       132.2

SB                  1.        3.3        32.      .00001          0.      .00001          0.       762.0       762.0
          STA. 28+66: POND OUTLET WEIR ON THE D/S END OF POND(H=3.0',C=3.5)
X1    28.66         4.       100.     132.01          1.          1.          1.
X2                            1.      762.0       765.0
GR    775.0       100.      762.0     100.01       762.0        132.        775.     132.01

NC      .04        .04       .035        0.1         0.3
QT       4.      1015.      1015.      1015.       1015.
          STA. 28+99: FIRST XSEC OF POND
X1    28.99        8.0      150.0      215.0         44.         50.         33.
GR     774.       100.       772.       150.        765.        175.        760.        185.        760.        205.
GR     765.       215.       772.       240.        774.        295.
```

THIS RUN EXECUTED 28JUL92 14:02:30

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.0; February 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

[PR50.HEC2]

SUMMARY PRINTOUT

	SECNO	CUMDS	DEPTH	CWSEL	XLCH	Q	EG
	23.620	0.00	7.95	768.65	0.00	1020.00	769.29
	23.620	0.00	7.95	768.65	0.00	1020.00	769.29
	23.620	0.00	7.95	768.65	0.00	0.00	768.65
	23.620	0.00	7.95	768.65	0.00	0.00	768.65
*	23.630	0.10	8.20	768.90	0.10	1020.00	769.50
*	23.630	0.10	8.20	768.90	0.10	1020.00	769.50
*	23.630	0.10	8.20	768.90	0.10	0.00	768.90
*	23.630	0.10	8.20	768.90	0.10	0.00	768.90
	23.770	15.10	8.17	768.90	15.00	1020.00	769.51
	23.770	15.10	8.17	768.90	15.00	1020.00	769.51
	23.770	15.10	8.16	768.90	15.00	0.00	768.90
	23.770	15.10	8.16	768.90	15.00	0.00	768.90
*	23.930	31.10	8.57	769.35	16.00	400.00	769.62
*	23.930	31.10	8.14	768.91	16.00	600.00	769.52
*	23.930	31.10	7.52	768.29	16.00	800.00	769.51
*	23.930	31.10	7.04	767.82	16.00	1000.00	769.99
	24.000	38.10	8.56	769.35	7.00	400.00	769.62
	24.000	38.10	8.13	768.92	7.00	600.00	769.52
	24.000	38.10	7.51	768.30	7.00	800.00	769.52
	24.000	38.10	7.04	767.83	7.00	1000.00	770.01
*	24.100	38.11	8.60	769.39	0.01	400.00	769.66
*	24.100	38.11	8.17	768.96	0.01	600.00	769.56
*	24.100	38.11	7.55	768.34	0.01	800.00	769.55
*	24.100	38.11	7.08	767.87	0.01	1000.00	770.02
	25.000	138.11	8.40	769.43	100.00	400.00	769.70
	25.000	138.11	7.99	769.03	100.00	600.00	769.64
	25.000	138.11	7.40	768.44	100.00	800.00	769.70
	25.000	138.11	7.05	768.08	100.00	1000.00	770.25

	SECNO	CUMDS	DEPTH	CWSEL	XLCH	Q	EG
	27.500	388.11	7.86	769.51	250.00	400.00	769.79
	27.500	388.11	7.50	769.15	250.00	600.00	769.84
	27.500	388.11	7.06	768.71	250.00	800.00	770.09
	27.500	388.11	6.98	768.63	250.00	1000.00	770.84
	28.560	494.11	7.62	769.53	106.00	400.00	769.83
	28.560	494.11	7.30	769.20	106.00	600.00	769.93
	28.560	494.11	6.93	768.84	106.00	800.00	770.27
	28.560	494.11	6.95	768.86	106.00	1000.00	771.09
	28.570	495.11	7.62	769.53	1.00	400.00	769.83
	28.570	495.11	7.30	769.20	1.00	600.00	769.93
	28.570	495.11	6.93	768.84	1.00	800.00	770.27
	28.570	495.11	6.96	768.86	1.00	1000.00	771.09
*	28.650	503.11	7.87	769.87	8.00	400.00	769.90
*	28.650	503.11	8.04	770.04	8.00	600.00	770.13
*	28.650	503.11	8.53	770.53	8.00	800.00	770.67
*	28.650	503.11	9.55	771.55	8.00	1000.00	771.71
	28.660	504.11	7.87	769.87	1.00	400.00	769.90
	28.660	504.11	8.04	770.04	1.00	600.00	770.13
	28.660	504.11	8.53	770.53	1.00	800.00	770.67
	28.660	504.11	9.55	771.55	1.00	1000.00	771.71
*	28.990	537.11	9.83	769.83	33.00	1015.00	769.92
*	28.990	537.11	10.04	770.04	33.00	1015.00	770.13
	28.990	537.11	10.60	770.60	33.00	1015.00	770.68
	28.990	537.11	11.67	771.67	33.00	1015.00	771.73

[PR50.HEC2]

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	23.620	0.00	771.50	769.00	760.70	1020.00	768.65	0.00	769.29	4.33	6.42	158.98	490.17
	23.620	0.00	771.50	769.00	760.70	1020.00	768.65	0.00	769.29	4.33	6.42	158.98	490.17
	23.620	0.00	771.50	769.00	760.70	0.00	768.65	0.00	768 65	0.00	0.00	158.98	490.17
	23.620	0.00	771.50	769.00	760.70	0.00	768.65	0.00	768.65	0.00	0.00	158.98	490.17
*	23.630	0.10	771.50	769.00	760.70	1020.00	768.90	0.00	769.50	3.98	6.22	163.98	511.40
*	23.630	0.10	771.50	769.00	760.70	1020.00	768.90	0.00	769.50	3.98	6.22	163.98	511.40
*	23.630	0.10	771.50	769.00	760.70	0.00	768.90	0.00	768.90	0.00	0.00	163.98	511.40
*	23.630	0.10	771.50	769.00	760.70	0.00	768.90	0.00	768.90	0.00	0.00	163.98	511.40
	23.770	15.00	771.20	769.00	760.74	1020.00	768.90	0.00	769.51	4.02	6.24	163.37	508.78
	23.770	15.00	771.20	769.00	760.74	1020.00	768.90	0.00	769.51	4.02	6.24	163.37	508.78
	23.770	15.00	771.20	769.00	760.74	0.00	768.90	0.00	768.90	0.00	0.00	163.24	508.25
	23.770	15.00	771.20	769.00	760.74	0.00	768.90	0.00	768.90	0.00	0.00	163.24	508.25
*	23.930	16.00	771.50	768.80	760.77	400.00	769.35	0.00	769.62	4.11	4.16	96.23	197.40
*	23.930	16.00	771.50	768.80	760.77	600.00	768.91	0.00	769.57	9.24	6.23	96.23	197.40
*	23.930	16.00	771.50	768.80	760.77	800.00	768.29	0.00	769.51	12.08	8.87	90.18	230.22
*	23.930	16.00	771.50	768.80	760.77	1000.00	767.82	0.00	769.99	22.34	11.83	84.52	211.58
	24.000	7.00	771.50	768.82	760.79	400.00	769.35	0.00	769.62	4.11	4.16	96.23	197.40
	24.000	7.00	771.50	768.82	760.79	600.00	768.92	0.00	769.52	9.24	6.23	96.23	197.40
	24.000	7.00	771.50	768.82	760.79	800.00	768.30	0.00	769.52	12.13	8.89	90.03	229.70
	24.000	7.00	771.50	768.82	760.79	1000.00	767.83	0.00	770.01	22.44	11.85	84.37	211.10
*	24.100	0.01	771.50	768.82	760.79	400.00	769.39	0.00	769.66	4.11	4.16	96.23	197.40
*	24.100	0.01	771.50	768.82	760.79	600.00	768.96	0.00	769.56	9.24	6.23	96.23	197.40
*	24.100	0.01	771.50	768.82	760.79	800.00	768.34	0.00	769.55	11.96	8.84	90.53	231.37
*	24.100	0.01	771.50	768.82	760.79	1000.00	767.87	0.00	770.02	22.08	11.78	84.90	212.83
	25.000	100.00	771.50	769.06	761.04	400.00	769.43	0.00	769.70	4.11	4.16	96.23	197.40
	25.000	100.00	771.50	769.06	761.04	600.00	769.03	0.00	769.64	5.79	6.26	95.92	249.30
	25.000	100.00	771.50	769.06	761.04	800.00	768.44	0.00	769.70	12.58	9.01	88.77	225.59
	25.000	100.00	771.50	769.06	761.04	1000.00	768.08	0.00	770.25	22.26	11.82	84.63	211.95
	27.500	250.00	773.00	769.62	761.65	400.00	769.51	0.00	769.79	2.69	4.24	94.34	244.00
	27.500	250.00	773.00	769.62	761.65	600.00	769.15	0.00	769.84	6.83	6.67	89.98	229.56
	27.500	250.00	773.00	769.62	761.65	800.00	768.71	0.00	770.09	14.21	9.44	84.72	212.21
	27.500	250.00	773.00	769.62	761.65	1000.00	768.63	0.00	770.84	22.84	11.93	83.80	209.24
	28.560	106.00	773.50	769.93	761.91	400.00	769.53	0.00	769.83	2.90	4.37	91.56	234.77
	28.560	106.00	773.50	769.93	761.91	600.00	769.20	0.00	769.93	7.32	6.85	87.60	221.70
	28.560	106.00	773.50	769.93	761.91	800.00	768.84	0.00	770.27	14.88	9.61	83.23	207.37
	28.560	106.00	773.50	769.93	761.91	1000.00	768.86	0.00	771.09	23.08	11.98	83.47	208.10

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	28.570	1.00	0.00	0.00	761.91	400.00	769.53	0.00	769.83	2.91	4.37	91.47	234.47
	28.570	1.00	0.00	0.00	761.91	600.00	769.20	0.00	769.93	7.34	6.85	87.54	221.50
	28.570	1.00	0.00	0.00	761.91	800.00	768.84	0.00	770.27	14.91	9.62	83.16	207.15
	28.570	1.00	0.00	0.00	761.91	1000.00	768.86	0.00	771.09	23.10	11.98	83.45	208.08
*	28.650	8.00	0.00	0.00	762.00	400.00	769.87	0.00	769.90	0.21	1.59	252.27	874.98
*	28.650	8.00	0.00	0.00	762.00	600.00	770.04	0.00	770.13	0.44	2.33	258.03	904.00
*	28.650	8.00	0.00	0.00	762.00	800.00	770.53	0.00	770.67	0.66	2.92	273.75	984.38
*	28.650	8.00	0.00	0.00	762.00	1000.00	771.55	0.00	771.71	0.75	3.26	306.30	1155.52
	28.660	1.00	765.00	762.00	762.00	400.00	769.87	0.00	769.90	0.21	1.59	251.66	871.61
	28.660	1.00	765.00	762.00	762.00	600.00	770.04	0.00	770.13	0.44	2.33	257.32	900.10
	28.660	1.00	765.00	762.00	762.00	800.00	770.53	0.00	770.67	0.67	2.93	273.04	980.29
	28.660	1.00	765.00	762.00	762.00	1000.00	771.55	0.00	771.71	0.76	3.27	305.44	1150.28
*	28.990	33.00	0.00	0.00	760.00	1015.00	769.83	0.00	769.92	2.96	2.52	426.51	589.57
*	28.990	33.00	0.00	0.00	760.00	1015.00	770.04	0.00	770.13	2.70	2.43	442.64	618.15
	28.990	33.00	0.00	0.00	760.00	1015.00	770.60	0.00	770.68	2.12	2.22	486.28	696.87
	28.990	33.00	0.00	0.00	760.00	1015.00	771.67	0.00	771.73	1.38	1.89	576.09	864.84

[PR50.HEC2]

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	23.620	1020.00	768.65	0.00	0.00	0.00	20.00	0.00
	23.620	1020.00	768.65	0.00	0.00	0.00	20.00	0.00
	23.620	0.00	768.65	0.00	0.00	0.00	20.00	0.00
	23.620	0.00	768.65	0.00	0.00	0.00	20.00	0.00
*	23.630	1020.00	768.90	0.00	0.25	0.00	20.01	0.10
*	23.630	1020.00	768.90	0.00	0.25	0.00	20.01	0.10
*	23.630	0.00	768.90	0.00	0.25	0.00	20.01	0.10
*	23.630	0.00	768.90	0.00	0.25	0.00	20.01	0.10
	23.770	1020.00	768.90	0.00	0.00	0.00	20.01	15.00
	23.770	1020.00	768.90	0.00	0.00	0.00	20.01	15.00
	23.770	0.00	768.90	0.00	0.00	0.00	20.01	15.00
	23.770	0.00	768.90	0.00	0.00	0.00	20.01	15.00
*	23.930	400.00	769.35	0.00	0.44	0.00	12.01	16.00
*	23.930	600.00	768.91	-0.43	0.01	0.00	12.01	16.00
*	23.930	800.00	768.29	-0.62	-0.61	0.00	12.00	16.00
*	23.930	1000.00	767.82	-0.47	-1.08	0.00	12.00	16.00
	24.000	400.00	769.35	0.00	0.00	0.00	12.01	7.00
	24.000	600.00	768.92	-0.43	0.01	0.00	12.01	7.00
	24.000	800.00	768.30	-0.62	0.01	0.00	12.00	7.00
	24.000	1000.00	767.83	-0.47	0.01	0.00	12.00	7.00
*	24.100	400.00	769.39	0.00	0.04	0.00	12.01	0.01
*	24.100	600.00	768.96	-0.43	0.04	0.00	12.01	0.01
*	24.100	800.00	768.34	-0.62	0.04	0.00	12.00	0.01
*	24.100	1000.00	767.87	-0.47	0.04	0.00	12.00	0.01
	25.000	400.00	769.43	0.00	0.04	0.00	12.01	100.00
	25.000	600.00	769.03	-0.40	0.07	0.00	12.00	100.00
	25.000	800.00	768.44	-0.60	0.10	0.00	12.00	100.00
	25.000	1000.00	768.08	-0.35	0.21	0.00	12.00	100.00
	27.500	400.00	769.51	0.00	0.08	0.00	12.00	250.00
	27.500	600.00	769.15	-0.36	0.12	0.00	12.00	250.00
	27.500	800.00	768.71	-0.44	0.27	0.00	12.00	250.00
	27.500	1000.00	768.63	-0.08	0.54	0.00	12.00	250.00
	28.560	400.00	769.53	0.00	0.02	0.00	12.00	106.00
	28.560	600.00	769.20	-0.33	0.06	0.00	12.00	106.00
	28.560	800.00	768.84	-0.37	0.13	0.00	12.00	106.00
	28.560	1000.00	768.86	0.02	0.23	0.00	12.00	106.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	28.570	400.00	769.53	0.00	0.00	0.00	12.00	1.00
	28.570	600.00	769.20	-0.33	0.00	0.00	12.00	1.00
	28.570	800.00	768.84	-0.37	0.00	0.00	12.00	1.00
	28.570	1000.00	768.86	0.02	0.00	0.00	12.00	1.00
*	28.650	400.00	769.87	0.00	0.34	0.00	32.14	8.00
*	28.650	600.00	770.04	0.18	0.84	0.00	32.15	8.00
*	28.650	800.00	770.53	0.49	1.70	0.00	32.16	8.00
*	28.650	1000.00	771.55	1.01	2.69	0.00	32.17	8.00
	28.660	400.00	769.87	0.00	0.00	0.00	32.00	1.00
	28.660	600.00	770.04	0.18	0.00	0.00	32.00	1.00
	28.660	800.00	770.53	0.49	0.00	0.00	32.00	1.00
	28.660	1000.00	771.55	1.01	0.00	0.00	32.00	1.00
*	28.990	1015.00	769.83	0.00	-0.04	0.00	74.50	33.00
*	28.990	1015.00	770.04	0.21	0.00	0.00	76.03	33.00
	28.990	1015.00	770.60	0.56	0.07	0.00	80.03	33.00
	28.990	1015.00	771.67	1.07	0.13	0.00	87.68	33.00

SUMMARY OF ERRORS AND SPECIAL NOTES

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NOTE     SECNO=     23.630  PROFILE=  1  WSEL BASED ON X5 CARD
NOTE     SECNO=     23.630  PROFILE=  2  WSEL BASED ON X5 CARD
NOTE     SECNO=     23.630  PROFILE=  3  WSEL BASED ON X5 CARD
NOTE     SECNO=     23.630  PROFILE=  4  WSEL BASED ON X5 CARD

WARNING  SECNO=     23.930  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=     23.930  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=     23.930  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=     23.930  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

NOTE     SECNO=     24.100  PROFILE=  1  WSEL BASED ON X5 CARD
NOTE     SECNO=     24.100  PROFILE=  2  WSEL BASED ON X5 CARD
NOTE     SECNO=     24.100  PROFILE=  3  WSEL BASED ON X5 CARD
NOTE     SECNO=     24.100  PROFILE=  4  WSEL BASED ON X5 CARD

WARNING  SECNO=     28.650  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=     28.650  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=     28.650  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=     28.650  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING  SECNO=     28.990  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=     28.990  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
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00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: KALAMAZOO, CITY OF

3) WATERCOURSE: ARCADIA CREEK

4) DOCUMENT TYPE: MULTI PROFILE RUN

PROPOSED CULVERT DIVERSION

500-YR

00BREAK00

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**********************************************
*  HEC-2 WATER SURFACE PROFILES              *
*                                            *
*  Version   4.6.0;  February 1991           *
*                                            *
*  RUN DATE    28JUL92     TIME    14:12:34  *
**********************************************
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**********************************************
*  U.S. ARMY CORPS OF ENGINEERS              *
*  HYDROLOGIC ENGINEERING CENTER             *
*  609 SECOND STREET, SUITE D                *
*  DAVIS, CALIFORNIA 95616-4687              *
*           (916) 756-1104                   *
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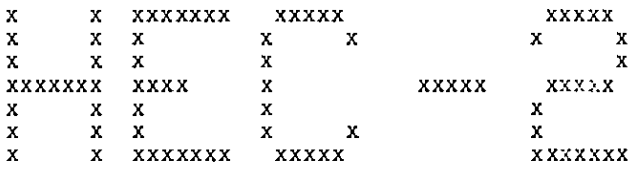

THIS RUN EXECUTED 28JUL92 14:12:35

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 HEC-2 WATER SURFACE PROFILES

 Version   4.6.0;  February 1991
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T1 ARCADIA CREEK HYDRAULIC ANALYSIS
T2 PROPOSED CULVERT DIVERSION (JUNCTION-POND) 500-YEAR
T3       [PR500.HEC2]

J1  ICHECK     INQ        NINV       IDIR       STRT       METRIC     HVINS      Q          WSEL       FQ

                2.                                                                          770.44

J2  NPROF      IPLOT      PRFVS      XSECV      XSECH      FN         ALLDC      IBW        CHNIM      ITRACE

   1.0              -1.0


J3  VARIABLE CODES FOR SUMMARY PRINTOUT

  150.0         38.         66.          8.          1.         39.         43.          3.

QT    4.0         1315.       1315   .    1315   .    1315   .
NC     .013        .013        .013         .3           .5
          STA. 23+62: JUNCTION BOX (DIVERSION POINT)
X1   23.62          8.        150.      170.01          10.         10.         10.
BT      4.        150.       771.5      769.00        159.5        771.5       769.0       160.5       771.5       769.0
BT  170.01        771.5       769.0
GR   771.5         100.       771.5       150.       760.70       150.01      760.70       159.5       760.7       160.5
GR   760.7        170.00      771.5      170.01       771.5        200.

          STA. 23+63: X5 CARD MODELS JUNCTION LOSS
X1   23.63                                              .1           .1          .1
X2                                                                              1.
X5     -4.          .25         .25         .25          .25

X1   23.77          10.        150.      170.01          15.         15.         15.                     .037
BT      6.        150.       771.2      769.00        159.5        771.2       769.0       159.51      771.2       769.0
BT  160.5         771.2       769.0      160.51        771.2        769.0       170.01      771.2       769.0
GR   771.5         100.       771.5       150.       760.70       150.01      760.70       159.5       760.7       159.51
GR   760.7        160.5       760.7      160.51        760.7        170.00      771.5       170.01      771.5        200.

QT    4.0          600.        800.       1000.        1200.
X1   23.93           6.        150.      162.01          16.         16.         16.                     .074
BT      2.        150.       771.5      768.80        162.01       771.5       768.80
GR   771.5         100.       771.5       150.       760.70       150.01      760.70       162.00      771.5       162.01
GR   771.5         200.
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X1     24.0                                          7.          7.          7.                    .017
X2                                                                          1.

X1     24.1                                         .01         .01         .01
X2                                                                          1.
X5      -4.        .04        .04        .04        .04

          STA. 25+00
X1     25.0                                        100.        100.        100.                    .245
X2                                                                          1.

          STA. 27+50
X1     27.5                                        250.        250.        250.                    .610
BT       2.       150.      773.0     769.62      162.01       773.0      769.62

          STA. 28+56: U/S FACE OF THE 12'X7' CULVERT JUST U/S OF EDWARDS ST.
X1    28.56                                        106.        106.        106.                    .260
BT       2.       150.      773.5     769.93      162.01       773.5      769.93

          STA. 28+57: 1' U/S OF THE 12'X7' CULVERT
X1    28.57                                          1.          1.          1.

X1    28.65         4.      100.0      132.2          8.          8.          8.
GR    773.0       100.      762.0      100.1       762.0       132.1        773.       132.2

SB                  1.        3.3        32.      .00001          0.      .00001          0.       762.0       762.0
          STA. 28+66: POND OUTLET WEIR ON THE D/S END OF POND(H=3.0',C=3.5)
X1    28.66         4.       100.     132.01          1.          1.          1.
X2                            1.      762.0       765.0
GR    775.0       100.      762.0     100.01       762.0        132.        775.     132.01

NC      .04        .04       .035        0.1         0.3
QT       4.      1310.      1310.      1310.       1310.
          STA. 28+99: FIRST XSEC OF POND
X1    28.99        8.0      150.0      215.0         44.         50.         33.
GR     774.       100.       772.       150.        765.        175.        760.        185.        760.        205.
GR     765.       215.       772.       240.        774.        295.
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THIS RUN EXECUTED 28JUL92 14:12:50

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HEC-2 WATER SURFACE PROFILES

Version 4.6.0; February 1991
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

(PR500.HEC2)

SUMMARY PRINTOUT

	SECNO	CUMDS	DEPTH	CWSEL	XLCH	Q	EG
	23.620	0.00	9.74	770.44	0.00	1315.00	771.42
	23.620	0.00	9.74	770.44	0.00	1315.00	771.42
	23.620	0.00	9.74	770.44	0.00	0.00	770.44
	23.620	0.00	9.74	770.44	0.00	0.00	770.44
*	23.630	0.10	9.99	770.69	0.10	1315.00	771.67
*	23.630	0.10	9.99	770.69	0.10	1315.00	771.67
*	23.630	0.10	9.99	770.69	0.10	0.00	770.69
*	23.630	0.10	9.99	770.69	0.10	0.00	770.69
	23.770	15.10	9.97	770.70	15.00	1315.00	771.69
	23.770	15.10	9.97	770.70	15.00	1315.00	771.69
	23.770	15.10	9.95	770.69	15.00	0.00	770.69
	23.770	15.10	9.95	770.69	15.00	0.00	770.69
*	23.930	31.10	10.44	771.21	16.00	600.00	771.82
*	23.930	31.10	9.91	770.68	16.00	800.00	771.75
*	23.930	31.10	9.08	769.86	16.00	1000.00	771.53
*	23.930	31.10	8.72	769.49	16.00	1200.00	771.90
	24.000	38.10	10.43	771.22	7.00	600.00	771.82
	24.000	38.10	9.90	770.69	7.00	800.00	771.76
	24.000	38.10	9.08	769.87	7.00	1000.00	771.55
	24.000	38.10	8.72	769.52	7.00	1200.00	771.93
*	24.100	38.11	10.47	771.26	0.01	600.00	771.86
*	24.100	38.11	9.94	770.73	0.01	800.00	771.80
*	24.100	38.11	9.12	769.91	0.01	1000.00	771.59
*	24.100	38.11	8.76	769.56	0.01	1200.00	771.97
	25.000	138.11	10.32	771.35	100.00	600.00	771.96
	25.000	138.11	9.86	770.90	100.00	800.00	771.97
	25.000	138.11	9.13	770.17	100.00	1000.00	771.85
	25.000	138.11	8.89	769.92	100.00	1200.00	772.34

	SECNO	CUMDS	DEPTH	CWSEL	XLCH	Q	EG
	27.500	388.11	9.94	771.58	250.00	600.00	772.19
	27.500	388.11	9 66	771.30	250.00	800.00	772.39
	27.500	388.11	9.16	770 81	250.00	1000.00	772.51
	27.500	388.11	9.20	770.84	250.00	1200.00	773.29
	28.560	494.11	9.79	771.69	106.00	600.00	772.30
	28.560	494.11	9.59	771.50	106.00	800.00	772.57
	28.560	494.11	9.20	771.11	106.00	1000.00	772.79
	28.560	494.11	9.37	771.28	106.00	1200.00	773.69
*	28.570	495.11	10.07	771.98	1.00	600.00	772.36
*	28.570	495.11	10.11	772.02	1.00	800.00	772.69
*	28.570	495.11	9.98	771.88	1.00	1000.00	772.97
*	28.570	495.11	10 77	772.68	1.00	1200.00	774.02
*	28.650	503.11	10 41	772.41	8.00	600.00	772.46
*	28.650	503.11	10.79	772.79	8.00	800.00	772.87
*	28.650	503.11	11.13	773.13	8.00	1000.00	773.26
*	28.650	503.11	12.23	774.23	8.00	1200.00	774.38
	28.660	504.11	10 41	772.41	1.00	600.00	772.46
	28.660	504.11	10.78	772.78	1.00	800.00	772.87
	28.660	504.11	11.13	773.13	1.00	1000.00	773.26
	28.660	504.11	12.23	774.23	1.00	1200.00	774.38
	28.990	537.11	12.40	772.40	33.00	1310.00	772.47
	28.990	537.11	12.81	772.81	33.00	1310.00	772.87
	28.990	537.11	13.21	773.21	33.00	1310.00	773.27
	28.990	537.11	14.35	774.35	33.00	1310.00	774.39

[PR500.HEC2]

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	23.620	0.00	771.50	769.00	760.70	1315.00	770.44	0.00	771.42	11.45	7.93	165.92	388.57
	23.620	0.00	771.50	769.00	760.70	1315.00	770.44	0.00	771.42	11.45	7.93	165.92	388.57
	23.620	0.00	771.50	769.00	760.70	0.00	770.44	0.00	770.44	0.00	0.00	165.92	388.57
	23.620	0.00	771.50	769.00	760.70	0.00	770.44	0.00	770.44	0.00	0.00	165.92	388.57
*	23.630	0.10	771.50	769.00	760.70	1315.00	770.69	0.00	771.67	11.45	7.93	165.92	388.57
*	23.630	0.10	771.50	769.00	760.70	1315.00	770.69	0.00	771.67	11.45	7.93	165.92	388.57
*	23.630	0.10	771.50	769.00	760.70	0.00	770.69	0.00	770.69	0.00	0.00	165.92	388.57
*	23.630	0.10	771.50	769.00	760.70	0.00	770.69	0.00	770.69	0.00	0.00	165.92	388.57
	23.770	15.00	771.20	769.00	760.74	1315.00	770.70	0.00	771.69	11.59	7.96	165.21	386.25
	23.770	15.00	771.20	769.00	760.74	1315.00	770.70	0.00	771.69	11.59	7.96	165.21	386.25
	23.770	15.00	771.20	769.00	760.74	0.00	770.69	0.00	770.69	0.00	0.00	165.21	386.25
	23.770	15.00	771.20	769.00	760.74	0.00	770.69	0.00	770.69	0.00	0.00	165.21	386.25
*	23.930	16.00	771.50	768.80	760.77	600.00	771.21	0.00	771.82	9.24	6.23	96.23	197.40
*	23.930	16.00	771.50	768.80	760.77	800.00	770.68	0.00	771.75	16.42	8.31	96.23	197.40
*	23.930	16.00	771.50	768.80	760.77	1000.00	769.86	0.00	771.53	25.66	10.39	96.23	197.40
*	23.930	16.00	771.50	768.80	760.77	1200.00	769.49	0.00	771.90	36.95	12.47	96.23	197.40
	24.000	7.00	771.50	768.82	760.79	600.00	771.22	0.00	771.82	9.24	6.23	96.23	197.40
	24.000	7.00	771.50	768.82	760.79	800.00	770.69	0.00	771.76	16.42	8.31	96.23	197.40
	24.000	7.00	771.50	768.82	760.79	1000.00	769.87	0.00	771.55	25.66	10.39	96.23	197.40
	24.000	7.00	771.50	768.82	760.79	1200.00	769.52	0.00	771.93	36.95	12.47	96.23	197.40
*	24.100	0.01	771.50	768.82	760.79	600.00	771.26	0.00	771.86	9.24	6.23	96.23	197.40
*	24.100	0.01	771.50	768.82	760.79	800.00	770.73	0.00	771.80	16.42	8.31	96.23	197.40
*	24.100	0.01	771.50	768.82	760.79	1000.00	769.91	0.00	771.59	25.66	10.39	96.23	197.40
*	24.100	0.01	771.50	768.82	760.79	1200.00	769.56	0.00	771.97	36.95	12.47	96.23	197.40
	25.000	100.00	771.50	769.06	761.04	600.00	771.35	0.00	771.96	9.24	6.23	96.23	197.40
	25.000	100.00	771.50	769.06	761.04	800.00	770.90	0.00	771.97	16.42	8.31	96.23	197.40
	25.000	100.00	771.50	769.06	761.04	1000.00	770.17	0.00	771.85	25.66	10.39	96.23	197.40
	25.000	100.00	771.50	769.06	761.04	1200.00	769.92	0.00	772.34	36.95	12.47	96.23	197.40
	27.500	250.00	773.00	769.62	761.65	600.00	771.58	0.00	772.19	9.41	6.28	95.61	195.61
	27.500	250.00	773.00	769.62	761.65	800.00	771.30	0.00	772.39	16.73	8.37	95.61	195.61
	27.500	250.00	773.00	769.62	761.65	1000.00	770.81	0.00	772.51	26.13	10.46	95.61	195.61
	27.500	250.00	773.00	769.62	761.65	1200.00	770.84	0.00	773.29	37.63	12.55	95.61	195.61
	28.560	106.00	773.50	769.93	761.91	600.00	771.69	0.00	772.30	9.25	6.24	96.21	197.33
	28.560	106.00	773.50	769.93	761.91	800.00	771.50	0.00	772.57	16.44	8.32	96.21	197.33
	28.560	106.00	773.50	769.93	761.91	1000.00	771.11	0.00	772.79	25.68	10.39	96.21	197.33
	28.560	106.00	773.50	769.93	761.91	1200.00	771.28	0.00	773.69	36.98	12.47	96.21	197.33

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	28.570	1.00	0.00	0.00	761.91	600.00	771.98	0.00	772.36	3.22	4.96	120.88	334.2
*	28.570	1.00	0.00	0.00	761.91	800.00	772.02	0.00	772.69	5.67	6.59	121.36	335.8
*	28.570	1.00	0.00	0.00	761.91	1000.00	771.88	0.00	772.97	9.17	8.35	119.71	330.1
*	28.570	1.00	0.00	0.00	761.91	1200.00	772.68	0.00	774.02	10.90	9.28	129.31	363.4
*	28.650	8.00	0.00	0.00	762.00	600.00	772.41	0.00	772.46	0.21	1.80	334.18	1306.7
*	28.650	8.00	0.00	0.00	762.00	800.00	772.79	0.00	772.87	0.34	2.31	346.22	1373.1
*	28.650	8.00	0.00	0.00	762.00	1000.00	773.13	0.00	773.26	0.48	2.80	357.57	1436.4
*	28.650	8.00	0.00	0.00	762.00	1200.00	774.23	0.00	774.38	0.54	3.05	392.95	1637.1
	28.660	1.00	765.00	762.00	762.00	600.00	772.41	0.00	772.46	0.21	1.80	333.16	1300.2
	28.660	1.00	765.00	762.00	762.00	800.00	772.78	0.00	772.87	0.34	2.32	345.10	1365.9
	28.660	1.00	765.00	762.00	762.00	1000.00	773.13	0.00	773.26	0.49	2.81	356.27	1428.0
	28.660	1.00	765.00	762.00	762.00	1200.00	774.23	0.00	774.38	0.54	3.07	391.36	1626.6
	28.990	33.00	0.00	0.00	760.00	1310.00	772.40	0.00	772.47	1.69	2.20	645.94	1009.1
	28.990	33.00	0.00	0.00	760.00	1310.00	772.81	0.00	772 87	1.41	2.07	695.23	1103.0
	28.990	33.00	0.00	0.00	760.00	1310.00	773.21	0.00	773.27	1.19	1.96	752.48	1203.1
	28.990	33.00	0.00	0.00	760.00	1310.00	774.35	0.00	774.39	0.72	1.65	958.64	1540.8

[PR500.HEC2]

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	23.620	1315.00	770.44	0.00	0.00	0.00	20.01	0.00
	23.620	1315.00	770.44	0.00	0.00	0.00	20.01	0.00
	23.620	0.00	770.44	0.00	0.00	0.00	20.01	0.00
	23.620	0.00	770.44	0.00	0.00	0.00	20.01	0.00
*	23.630	1315.00	770.69	0.00	0.25	0.00	20.01	0.10
*	23.630	1315.00	770.69	0.00	0.25	0.00	20.01	0.10
*	23.630	0.00	770.69	0.00	0.25	0.00	20.01	0.10
*	23.630	0.00	770.69	0.00	0.25	0.00	20.01	0.10
	23.770	1315.00	770.70	0.00	0.01	0.00	20.01	15.00
	23.770	1315.00	770.70	0.00	0.01	0.00	20.01	15.00
	23.770	0.00	770.69	-0.01	0.00	0.00	20.01	15.00
	23.770	0.00	770.69	0.00	0.00	0.00	20.01	15.00
*	23.930	600.00	771.21	0.00	0.51	0.00	12.01	16.00
*	23.930	800.00	770.68	-0.54	-0.02	0.00	12.01	16.00
*	23.930	1000.00	769.86	-0.82	-0.83	0.00	12.01	16.00
*	23.930	1200.00	769.49	-0.37	-1.20	0.00	12.01	16.00
	24.000	600.00	771.22	0.00	0.01	0.00	12.01	7.00
	24.000	800.00	770.69	-0.53	0.01	0.00	12.01	7 00
	24.000	1000.00	769.87	-0.82	0.02	0.00	12.01	7.00
	24.000	1200.00	769.52	-0.36	0.03	0.00	12.01	7.00
*	24.100	600.00	771.26	0.00	0.04	0.00	12.01	0.01
*	24.100	800.00	770.73	-0.53	0.04	0.00	12.01	0.01
*	24.100	1000.00	769.91	-0.82	0.04	0.00	12.01	0.01
*	24.100	1200.00	769.56	-0.36	0.04	0.00	12.01	0.01
	25.000	600.00	771.35	0.00	0.09	0.00	12.01	100.00
	25.000	800.00	770.90	-0.46	0.16	0.00	12.01	100.00
	25.000	1000.00	770.17	-0.72	0.26	0.00	12.01	100.00
	25.000	1200.00	769.92	-0.25	0.37	0.00	12.01	100.00
	27.500	600.00	771.58	0.00	0.23	0.00	12.01	250.00
	27.500	800.00	771.30	-0.28	0.41	0.00	12.01	250.00
	27.500	1000.00	770.81	-0.50	0.64	0.00	12.01	250.00
	27.500	1200.00	770.84	0.03	0.92	0.00	12.01	250.00
	28.560	600.00	771.69	0.00	0.11	0.00	12.01	106.00
	28.560	800.00	771.50	-0.20	0.19	0.00	12.01	106.00
	28.560	1000.00	771.11	-0.39	0.30	0.00	12.01	106.00
	28.560	1200.00	771.28	0.17	0.43	0.00	12.01	106.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	28.570	600.00	771.98	0.00	0.29	0.00	12.01	1.00
*	28.570	800.00	772.02	0.04	0.52	0.00	12.01	1.00
*	28.570	1000.00	771.88	-0.13	0.77	0.00	12.01	1.00
*	28.570	1200.00	772.68	0.80	1.40	0.00	12.01	1.00
*	28.650	600.00	772.41	0.00	0.43	0.00	32.19	8.00
*	28.650	800.00	772.79	0.37	0.77	0.00	32.20	8.00
*	28.650	1000.00	773.13	0.35	1.25	0.00	32.20	8.00
*	28.650	1200.00	774.23	1.10	1.55	0.00	32.20	8.00
	28.660	600.00	772.41	0.00	0.00	0.00	32.01	1.00
	28.660	800.00	772.78	0.37	0.00	0.00	32.01	1.00
	28.660	1000.00	773.13	0.35	0.00	0.00	32.01	1.00
	28.660	1200.00	774.23	1.10	0.00	0.00	32.01	1.00
	28.990	1310.00	772.40	0.00	-0.01	0.00	111.35	33.00
	28.990	1310.00	772.81	0.41	0.03	0.00	132.57	33.00
	28.990	1310.00	773.21	0.40	0.08	0.00	153.57	33.00
	28.990	1310.00	774.35	1.14	0.12	0.00	195.00	33.00

SUMMARY OF ERRORS AND SPECIAL NOTES

NOTE	SECNO=	23.630	PROFILE=	1	WSEL BASED ON X5 CARD
NOTE	SECNO=	23.630	PROFILE=	2	WSEL BASED ON X5 CARD
NOTE	SECNO=	23.630	PROFILE=	3	WSEL BASED ON X5 CARD
NOTE	SECNO=	23.630	PROFILE=	4	WSEL BASED ON X5 CARD
WARNING	SECNO=	23.930	PROFILE=	1	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO=	23.930	PROFILE=	2	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO=	23.930	PROFILE=	3	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO=	23.930	PROFILE=	4	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
NOTE	SECNO=	24.100	PROFILE=	1	WSEL BASED ON X5 CARD
NOTE	SECNO=	24.100	PROFILE=	2	WSEL BASED ON X5 CARD
NOTE	SECNO=	24.100	PROFILE=	3	WSEL BASED ON X5 CARD
NOTE	SECNO=	24.100	PROFILE=	4	WSEL BASED ON X5 CARD
WARNING	SECNO=	28.570	PROFILE=	1	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO=	28.570	PROFILE=	2	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO=	28.570	PROFILE=	3	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO=	28.570	PROFILE=	4	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO=	28.650	PROFILE=	1	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO=	28.650	PROFILE=	2	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO=	28.650	PROFILE=	3	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO=	28.650	PROFILE=	4	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: KALAMAZOO, CITY OF

3) WATERCOURSE: ARCADIA CREEK

4) DOCUMENT TYPE: MULTI-PROFILE RUN

PROPOSED CULVERT
DIVERSION 10-YR

00BREAK00

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**********************************************
*  HEC-2 WATER SURFACE PROFILES              *
*                                            *
*  Version   4.6.0;  February 1991           *
*                                            *
*  RUN DATE    28JUL92    TIME   12:03:12    *
**********************************************
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**************************************
*  U.S. ARMY CORPS OF ENGINEERS
*  HYDROLOGIC ENGINEERING CENTER
*  609 SECOND STREET, SUITE D
*  DAVIS, CALIFORNIA 95616-4687
*          (916) 756-1104
**************************************
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X      X  XXXXXXX   XXXXX              XXXXX
X      X  X        X     X            X     X
X      X  X        X                        X
XXXXXXXX  XXXX     X          XXXXX     XXXXX
X      X  X        X                   X
X      X  X        X     X             X
X      X  XXXXXXX   XXXXX              XXXXXXX
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THIS RUN EXECUTED 28JUL92 12:03:12

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**************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.0;  February 1991
**************************************

T1 ARCADIA CREEK HYDRAULIC ANALYSIS
T2 PROPOSED CULVERT DIVERSION (JUNCTION-POND) 10-YEAR
T3       (AC7.HEC2)

J1   ICHECK     INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                 2.                                                           766.8

J2   NPROF      IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     1.0                 -1.0

J3   VARIABLE CODES FOR SUMMARY PRINTOUT

   150.0        38.       66.       8.        1.        39.       43.       3.

QT     4.0       620.      620.      620.      620.
NC      .013      .013      .013       .3        .5
           STA. 23+62: JUNCTION BOX (DIVERSION POINT)
X1    23.62        8.      150.    170.01       10.       10.       10.
BT      4.       150.     771.5    769.00     159.5     771.5     769.0     160.5     771.5     769.0
BT   170.01      771.5     769.0
GR    771.5       100.     771.5     150.     760.70    150.01    760.70     159.5     760.7     160.5
GR    760.7     170.00     771.5    170.01     771.5     200.

           STA. 23+63: X5 CARD MODELS JUNCTION LOSS
X1    23.63                                    .1        .1        .1
X2                                                               1.
X5      -4.       .25       .25       .25       .25

X1    23.77       10.      150.    170.01       15.       15.       15.                 .037
BT      6.       150.     771.2    769.00     159.5     771.2     769.0     159.51    771.2     769.0
BT    160.5      771.2     769.0    160.51     771.2     769.0    170.01     771.2     769.0
GR    771.5       100.     771.5     150.     760.70    150.01    760.70     159.5     760.7    159.51
GR    760.7      160.5     760.7    160.51     760.7     170.00    771.5     170.01    771.5      200.

QT     4.0       300.      400.      500.      600.
X1    23.93        6.      150.    162.01       16.       16.       16.                 .074
BT      2.       150.     771.5    768.80     162.01    771.5     768.80
GR    771.5       100.     771.5     150.     760.70    150.01    760.70     162.00    771.5     162.01
GR    771.5       200.
```

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X1     24.0                                          7.          7.          7.                    .017
X2                                                                          1.

X1     24.1                                         .01         .01         .01
X2                                                                          1.
X5      -4.        .04         .04         .04        .04

          STA. 25+00
X1     25.0                                        100.        100.        100.                    .245
X2                                                                          1.

          STA. 27+50
X1     27.5                                        250.        250.        250.                    .610
BT       2.       150.       773.0      769.62     162.01       773.0      769.62

          STA. 28+56: U/S FACE OF THE 12'X7' CULVERT JUST U/S OF EDWARDS ST.
X1    28.56                                        106.        106.        106.                    .260
BT       2.       150.       773.5      769.93     162.01       773.5      769.93

          STA. 28+57: 1' U/S OF THE 12'X7' CULVERT
X1    28.57                                          1.          1.          1.

X1    28.65         4.       100.0       132.2         8.          8.          8.
GR    773.0       100.       762.0       100.1      762.0       132.1        773.       132.2

SB                  1.         3.3         32.     .00001          0.     .00001          0.       762.0       762.0
          STA. 28+66: POND OUTLET WEIR ON THE D/S END OF POND(H=3.0',C=3.5)
X1    28.66         4.        100.      132.01         1.          1.          1.
X2                              1.       762.0      765.0
GR    775.0       100.       762.0      100.01      762.0        132.        775.     132.01

NC      .04        .04        .035         0.1        0.3
QT       4.       615.        615.        615.       615.
          STA. 28+99: FIRST XSEC OF POND
X1    28.99        8.0       150.0       215.0        44.         50.         33.
GR     774.       100.        772.        150.       765.        175.        760.        185.        760.        205.
GR     765.       215.        772.        240.       774.        295.
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THIS RUN EXECUTED 28JUL92 12:03:29

HEC-2 WATER SURFACE PROFILES

Version 4.6.0; February 1991

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

[AC7.HEC2]

SUMMARY PRINTOUT

	SECNO	CUMDS	DEPTH	CWSEL	XLCH	Q	EG
	23.620	0.00	6.10	766.80	0.00	620.00	767.20
	23.620	0.00	6.10	766.80	0.00	620.00	767.20
	23.620	0.00	6.10	766.80	0.00	620.00	767.20
	23.620	0.00	6.10	766.80	0.00	620.00	767.20
*	23.630	0.10	6.35	767.05	0.10	620.00	767.42
*	23.630	0.10	6.35	767.05	0.10	620.00	767.42
*	23.630	0.10	6.35	767.05	0.10	620.00	767.42
*	23 630	0.10	6.35	767.05	0.10	620.00	767.42
	23.770	15.10	6.32	767.05	15.00	620.00	767.43
	23.770	15.10	6.32	767.05	15.00	620.00	767.43
	23.770	15.10	6.32	767.05	15.00	620.00	767.43
	23.770	15.10	6.32	767.05	15.00	620.00	767.43
*	23.930	31.10	6.47	767.24	16.00	300.00	767.47
*	23.930	31.10	6 25	767.02	16.00	400.00	767.47
*	23.930	31.10	6.11	766.89	16.00	500.00	767.61
*	23.930	31.10	5.92	766.69	16.00	600.00	767.80
	24.000	38.10	6.45	767.24	7.00	300.00	767.48
	24.000	38.10	6.24	767.03	7.00	400.00	767.47
	24.000	38.10	6.10	766.89	7.00	500.00	767.62
	24.000	38.10	5.91	766.70	7.00	600.00	767.81
*	24.100	38.11	6.49	767.28	0.01	300.00	767.51
*	24.100	38.11	6.28	767.07	0.01	400.00	767.51
*	24.100	38.11	6.14	766.93	0.01	500.00	767.65
*	24.100	38.11	5.95	766.74	0.01	600.00	767.84
	25.000	138.11	6 26	767.30	100.00	300.00	767.55
	25.000	138.11	6.07	767.10	100.00	400.00	767.57
	25.000	138.11	5.96	766.99	100.00	500.00	767.75
	25.000	138.11	5.81	766.84	100.00	600.00	768.00

	SECNO	CUMDS	DEPTH	CWSEL	XLCH	Q	EG
	27.500	388.11	5.71	767.35	250.00	300.00	767.65
	27.500	388.11	5.56	767.21	250.00	400.00	767.76
	27.500	388.11	5.52	767.17	250.00	500.00	768.05
	27.500	388.11	5.49	767.14	250.00	600.00	768.43
	28.560	494.11	5.47	767.38	106.00	300.00	767.70
	28.560	494.11	5.35	767.26	106.00	400.00	767.86
	28.560	494.11	5.35	767.26	106.00	500.00	768.20
	28.560	494 11	5.37	767.28	106.00	600.00	768.62
	28.570	495 11	5.47	767.38	1.00	300.00	767.70
	28.570	495.11	5.35	767.26	1.00	400.00	767.86
	28.570	495 11	5.35	767.26	1.00	500.00	768.20
	28.570	495.11	5.37	767.28	1.00	600.00	768.62
*	28.650	503.11	5.75	767.75	8.00	300.00	767.79
*	28.650	503.11	5.95	767.95	8.00	400.00	768.02
*	28.650	503.11	6.36	768.36	8.00	500.00	768.46
*	28.650	503.11	6.88	768.88	8.00	600.00	768.99
	28.660	504.11	5.77	767.77	1.00	300.00	767.81
	28.660	504 11	6.00	768.00	1.00	400.00	768.07
	28.660	504.11	6.41	768.41	1.00	500.00	768.50
	28.660	504 11	6.92	768.92	1.00	600.00	769.03
*	28.990	537.11	7.75	767.75	33.00	615.00	767.83
*	28.990	537.11	8.01	768.01	33.00	615.00	768.07
*	28.990	537.11	8.45	768.45	33.00	615.00	768.51
*	28.990	537.11	9.00	769.00	33.00	615.00	769.04

[AC7.HEC2]

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	23.620	0.00	771.50	769.00	760.70	620.00	766.80	0.00	767.20	3.35	5.08	121.97	338.89
	23.620	0.00	771.50	769.00	760.70	620.00	766.80	0.00	767.20	3.35	5.08	121.97	338.89
	23.620	0.00	771.50	769.00	760.70	620.00	766.80	0.00	767.20	3.35	5.08	121.97	338.89
	23.620	0.00	771.50	769.00	760.70	620.00	766.80	0.00	767.20	3.35	5.08	121.97	338.89
*	23.630	0.10	771.50	769.00	760.70	620.00	767.05	0.00	767.42	2.99	4.88	126.97	358.65
*	23.630	0.10	771.50	769.00	760.70	620.00	767.05	0.00	767.42	2.99	4.88	126.97	358.65
*	23.630	0.10	771.50	769.00	760.70	620.00	767.05	0.00	767.42	2.99	4.88	126.97	358.65
*	23.630	0.10	771.50	769.00	760.70	620.00	767.05	0.00	767.42	2.99	4.88	126.97	358.65
	23.770	15.00	771.20	769.00	760.74	620.00	767.05	0.00	767.43	3.03	4.91	126.33	356.09
	23.770	15.00	771.20	769.00	760.74	620.00	767.05	0.00	767.43	3.03	4.91	126.33	356.09
	23.770	15.00	771.20	769.00	760.74	620.00	767.05	0.00	767.43	3.03	4.91	126.33	356.09
	23.770	15.00	771.20	769.00	760.74	620.00	767.05	0.00	767.43	3.03	4.91	126.33	356.09
*	23.930	16.00	771.50	768.80	760.77	300.00	767.24	0.00	767.47	2.52	3.87	77.59	189.09
*	23.930	16.00	771.50	768.80	760.77	400.00	767.02	0.00	767.47	4.90	5.33	74.98	180.71
*	23.930	16.00	771.50	768.80	760.77	500.00	766.89	0.00	767.61	8.12	6.82	73.32	175.42
*	23.930	16.00	771.50	768.80	760.77	600.00	766.69	0.00	767.80	12.72	8.44	71.06	168.25
	24.000	7.00	771.50	768.82	760.79	300.00	767.24	0.00	767.48	2.53	3.88	77.40	188.49
	24.000	7.00	771.50	768.82	760.79	400.00	767.03	0.00	767.47	4.93	5.35	74.81	180.16
	24.000	7.00	771.50	768.82	760.79	500.00	766.89	0.00	767.62	8.17	6.83	73.16	174.90
	24.000	7.00	771.50	768.82	760.79	600.00	766.70	0.00	767.81	12.80	8.46	70.88	167.70
*	24.100	0.01	771.50	768.82	760.79	300.00	767.28	0.00	767.51	2.49	3.85	77.88	190.01
*	24.100	0.01	771.50	768.82	760.79	400.00	767.07	0.00	767.51	4.85	5.31	75.28	181.69
*	24.100	0.01	771.50	768.82	760.79	500.00	766.93	0.00	767.65	8.03	6.79	73.64	176.43
*	24.100	0.01	771.50	768.82	760.79	600.00	766.74	0.00	767.84	12.57	8.41	71.37	169.24
	25.000	100.00	771.50	769.06	761.04	300.00	767.30	0.00	767.55	2.73	3.99	75.24	181.54
	25.000	100.00	771.50	769.06	761.04	400.00	767.10	0.00	767.57	5.29	5.49	72.85	173.94
	25.000	100.00	771.50	769.06	761.04	500.00	766.99	0.00	767.75	8.67	6.99	71.56	169.85
	25.000	100.00	771.50	769.06	761.04	600.00	766.84	0.00	768.00	13.41	8.61	69.66	163.84
	27.500	250.00	773.00	769.62	761.65	300.00	767.35	0.00	767.65	3.50	4.38	68.53	160.29
	27.500	250.00	773.00	769.62	761.65	400.00	767.21	0.00	767.76	6.70	6.00	66.69	154.52
	27.500	250.00	773.00	769.62	761.65	500.00	767.17	0.00	768.05	10.66	7.55	66.24	153.13
	27.500	250.00	773.00	769.62	761.65	600.00	767.14	0.00	768.43	15.60	9.11	65.85	151.92
	28.560	106.00	773.50	769.93	761.91	300.00	767.38	0.00	767.70	3.92	4.56	65.73	151.52
	28.560	106.00	773.50	769.93	761.91	400.00	767.26	0.00	767.86	7.38	6.22	64.33	147.20
	28.560	106.00	773.50	769.93	761.91	500.00	767.26	0.00	768.20	11.56	7.78	64.28	147.05
	28.560	106.00	773.50	769.93	761.91	600.00	767.28	0.00	768.62	16.44	9.29	64.58	147.96

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	28.570	1.00	0.00	0.00	761.91	300.00	767.38	0.00	767.70	3.93	4.57	65.65	151.28
	28.570	1.00	0.00	0.00	761.91	400.00	767.26	0.00	767.86	7.42	6.23	64.22	146.86
	28.570	1.00	0.00	0.00	761.91	500.00	767.26	0.00	768.20	11.59	7.79	64.22	146.85
	28.570	1.00	0.00	0.00	761.91	600.00	767.28	0.00	768.62	16.51	9.31	64.48	147.66
*	28.650	8.00	0.00	0.00	762.00	300.00	767.75	0.00	767.79	0.30	1.63	184.23	551.29
*	28.650	8.00	0.00	0.00	762.00	400.00	767.95	0.00	768.02	0.47	2.09	190.94	581.48
*	28.650	8.00	0.00	0.00	762.00	500.00	768.36	0.00	768.46	0.61	2.45	204.25	642.52
*	28.650	8.00	0.00	0.00	762.00	600.00	768.88	0.00	768.99	0.70	2.72	220.57	719.49
	28.660	1.00	765.00	762.00	762.00	300.00	767.77	0.00	767.81	0.29	1.62	184.71	553.37
	28.660	1.00	765.00	762.00	762.00	400.00	768.00	0.00	768.07	0.47	2.08	192.07	586.48
	28.660	1.00	765.00	762.00	762.00	500.00	768.41	0.00	768.50	0.60	2.44	205.07	646.17
	28.660	1.00	765.00	762.00	762.00	600.00	768.92	0.00	769.03	0.69	2.71	221.34	722.99
*	28.990	33.00	0.00	0.00	760.00	615.00	767.75	0.00	767.83	3.00	2.21	287.18	355.04
*	28.990	33.00	0.00	0.00	760.00	615.00	768.01	0.00	768.07	2.62	2.10	302.47	379.63
*	28.990	33.00	0.00	0.00	760.00	615.00	768.45	0.00	768.51	2.09	1.94	330.62	425.68
*	28.990	33.00	0.00	0.00	760.00	615.00	769.00	0.00	769.04	1.60	1.76	366.84	486.33

[AC7.HEC2]

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	23.620	620.00	766.80	0.00	0.00	0.00	20.00	0.00
	23.620	620.00	766.80	0.00	0.00	0.00	20.00	0.00
	23.620	620.00	766.80	0.00	0.00	0.00	20.00	0.00
	23.620	620.00	766.80	0.00	0.00	0.00	20.00	0.00
*	23.630	620.00	767.05	0.00	0.25	0.00	20.00	0.10
*	23.630	620.00	767.05	0.00	0.25	0.00	20.00	0.10
*	23.630	620.00	767.05	0.00	0.25	0.00	20.00	0.10
*	23.630	620.00	767.05	0.00	0.25	0.00	20.00	0.10
	23.770	620.00	767.05	0.00	0.00	0.00	20.00	15.00
	23.770	620.00	767.05	0.00	0.00	0.00	20.00	15.00
	23.770	620.00	767.05	0.00	0.00	0.00	20.00	15.00
	23.770	620.00	767.05	0.00	0.00	0.00	20.00	15.00
*	23.930	300.00	767.24	0.00	0.19	0.00	12.00	16.00
*	23.930	400.00	767.02	-0.22	-0.03	0.00	12.00	16.00
*	23.930	500.00	766.89	-0.14	-0.17	0.00	12.00	16.00
*	23.930	600.00	766.69	-0.19	-0.36	0.00	12.00	16.00
	24.000	300.00	767.24	0.00	0.00	0.00	12.00	7.00
	24.000	400.00	767.03	-0.22	0.00	0.00	12.00	7.00
	24.000	500.00	766.89	-0.14	0.00	0.00	12.00	7.00
	24.000	600.00	766.70	-0.19	0.01	0.00	12.00	7.00
*	24.100	300.00	767.28	0.00	0.04	0.00	12.00	0.01
*	24.100	400.00	767.07	-0.22	0.04	0.00	12.00	0.01
*	24.100	500.00	766.93	-0.14	0.04	0.00	12.00	0.01
*	24.100	600.00	766.74	-0.19	0.04	0.00	12.00	0.01
	25.000	300.00	767.30	0.00	0.02	0.00	12.00	100.00
	25.000	400.00	767.10	-0.20	0.04	0.00	12.00	100.00
	25.000	500.00	766.99	-0.11	0.06	0.00	12.00	100.00
	25.000	600.00	766.84	-0.15	0.10	0.00	12.00	100.00
	27.500	300.00	767.35	0.00	0.05	0.00	12.00	250.00
	27.500	400.00	767.21	-0.15	0.10	0.00	12.00	250.00
	27.500	500.00	767.17	-0.04	0.18	0.00	12.00	250.00
	27.500	600.00	767.14	-0.03	0.29	0.00	12.00	250.00
	28.560	300.00	767.38	0.00	0.03	0.00	12.00	106.00
	28.560	400.00	767.26	-0.12	0.05	0.00	12.00	106.00
	28.560	500.00	767.26	0.00	0.09	0.00	12.00	106.00
	28.560	600.00	767.28	0.02	0.14	0.00	12.00	106.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	28.570	300.00	767.38	0.00	0.00	0.00	12.00	1.00
	28.570	400.00	767.26	-0.12	0.00	0.00	12.00	1.00
	28.570	500.00	767.26	0.00	0.00	0.00	12.00	1.00
	28.570	600.00	767.28	0.02	0.00	0.00	12.00	1.00
*	28.650	300.00	767.75	0.00	0.37	0.00	32.10	8.00
*	28.650	400.00	767.95	0.21	0.70	0.00	32.11	8.00
*	28.650	500.00	768.36	0.41	1.10	0.00	32.12	8.00
*	28.650	600.00	768.88	0.52	1.60	0.00	32.13	8.00
	28.660	300.00	767.77	0.00	0.03	0.00	32.00	1.00
	28.660	400.00	768.00	0.23	0.05	0.00	32.00	1.00
	28.660	500.00	768.41	0.41	0.05	0.00	32.00	1.00
	28.660	600.00	768.92	0.51	0.04	0.00	32.00	1.00
*	28.990	615.00	767.75	0.00	-0.02	0.00	59.66	33.00
*	28.990	615.00	768.01	0.25	0.00	0.00	61.47	33.00
*	28.990	615.00	768.45	0.45	0.04	0.00	64.66	33.00
*	28.990	615.00	769.00	0.54	0.08	0.00	68.54	33.00

SUMMARY OF ERRORS AND SPECIAL NOTES

```
NOTE     SECNO=     23.630  PROFILE=  1  WSEL BASED ON X5 CARD
NOTE     SECNO=     23.630  PROFILE=  2  WSEL BASED ON X5 CARD
NOTE     SECNO=     23.630  PROFILE=  3  WSEL BASED ON X5 CARD
NOTE     SECNO=     23.630  PROFILE=  4  WSEL BASED ON X5 CARD

WARNING  SECNO=     23.930  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=     23.930  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=     23.930  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=     23.930  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

NOTE     SECNO=     24.100  PROFILE=  1  WSEL BASED ON X5 CARD
NOTE     SECNO=     24.100  PROFILE=  2  WSEL BASED ON X5 CARD
NOTE     SECNO=     24.100  PROFILE=  3  WSEL BASED ON X5 CARD
NOTE     SECNO=     24.100  PROFILE=  4  WSEL BASED ON X5 CARD

WARNING  SECNO=     28.650  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=     28.650  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=     28.650  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=     28.650  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING  SECNO=     28.990  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=     28.990  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=     28.990  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=     28.990  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
```



1) COUNTY: KALAMAZOO

2) STUDY NAME: KALAMAZOO, CITY OF

3) WATERCOURSE: ARCADIA CREEK

4) DOCUMENT TYPE: MULTI-PROFILE
SPLIT FLOW RUN
100-YR



```
*******************************************
*  HEC-2 WATER SURFACE PROFILES           *
*                                         *
*  Version   4.6.0;  February 1991        *
*                                         *
*  RUN DATE    28JUL92    TIME   15:28:24  *
*******************************************
```


```
*************************************
*  U.S. ARMY CORPS OF ENGINEERS
*  HYDROLOGIC ENGINEERING CENTER
*  609 SECOND STREET, SUITE D
*  DAVIS, CALIFORNIA 95616-4687
*          (916) 756-1104
*************************************
```


```
X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X            X     X
X     X  X        X                        X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                   X
X     X  X        X     X             X
X     X  XXXXXXX   XXXXX              XXXXXXX
```

THIS RUN EXECUTED 28JUL92 15:28:25

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**************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.0;  February 1991
**************************************



SPLIT FLOW BEING PERFORMED

SF     UTILIZE THE SPLIT-FLOW OPTION TO MODEL THE DIVERSION AT EDWARDS ST.


JC     DIVERSION
JP              5.      50.

TC     JUNCTION BOX DIVERSION:RATING CURVE METHOD FOR EVALUATING THE DIVERSION
CS    11.    23.62    23.62      -1.
CR     0.   763.60      25.   765.43      50.   766.17      75.   766.79     100.   767.34
CR   150.   768.21     200.   768.99     250.   769.71     300.   770.36     350.   770.97
CR   400.   771.59
```

```
T1 ARCADIA CREEK HYDRAULIC ANALYSIS
T2 100-YR FLOOD MEAN ANNUAL START
T3       [AC7.HEC2]

J1   ICHECK     INQ        NINV       IDIR       STRT       METRIC     HVINS      Q          WSEL       FQ
                 2.                                                                            757.5

J2   NPROF      IPLOT      PRFVS      XSECV      XSECH      FN         ALLDC      IBW        CHNIM      ITRACE
   1.0                -1.0

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

  150.0         38.          66.          8.           1.          39.          43.          3.

QT     4.0         620.         890.        1020.        1315.
NC      .035        .035         .035          .5           .7
          STA: 0+00: D/S LIMIT OF RIPRAP EXIT CHANNEL(20' D/S OF BAFFLED APRON)
X1      .00          4.         100.       120.02
GR     765.         100.         748.       100.01         748.       120.01         765.       120.02

NC      .013        .013         .013          .1           .3
X1      .10                                                9.           9.           9.

X1      .17                                                8.           8.           8.

          STA. 0+18: U/S LIMIT OF RIPRAP EXIT CHANNEL-BEGIN ENEGY DISSIPATOR
X1      .18          14.         100.       120.07          1.           1.           1.                      -7.
GR     766.         100.         758.       100.01         758.       102.01         755.       102.02      755.       106.02
GR     758.       106.03         758.       110.03         755.       110.04         755.       114.04      758.       114.05
GR     758.       118.05         755.       118.06         755.       120.06         766.       120.07

X1      .33          14.         100.       120.07          14.          14.          14.
GR     766.         100.         758.       100.01         758.       102.01         755.       102.02      755.       106.02
GR     758.       106.03         758.       110.03         755.       110.04         755.       114.04      758.       114.05
GR     758.       118.05         755.       118.06         755.       120.06         766.       120.07

          STA. 0+34: U/S LIMIT OF ENERGY DISSIPATOR
X1      .34          4.          100.       120.02          1.           1.           1.
GR     766.         100.       755.00       100.01       755.         120.01         766.0      120.02

X1      .38          4.          100.       118.02          4.           4.           4.
GR     766.         100.       755.00       100.01       755.         118.01         766.0      118.02

X1      .42          4.          100.       116.02          4.           4.           4.
GR     766.         100.       755.00       100.01       755.         116.01         766.0      116.02

X1      .46          4.          100.       114.02          4.           4.           4.
GR     766.         100.       755.00       100.01       755.         114.01         766.0      114.02
```

STA. 0+50:NOTE XSEC. #'S REFLECT STA.

X1	.5	4.	100.	112.02	4.	4.	4.			
BT	2.	100.	763.	762.000	112.01	763.	762.000			
GR	765.	100.	755.00	100.01	755.	112.01	765.0	112.02		

STA. 1+00

X1	1.0				50.	50.	50.		.095	
BT	2.	100.	764.2	762.085	112.01	764.2	762.095			

STA. 1+25: U/S LIMIT OF ENERGY DISSIPATION DROP

X1	1.25				25.	25.	25.		.047	
BT	2.	100.	765.9	762.141	112.01	765.9	762.142			

STA. 2+50

X1	2.5				125.	125.	125.		.238	
BT	2.	100.	767.0	762.52	112.01	767.0	762.52			

STA. 3+50

X1	3.5				100.	100.	100.		.191	
BT	2.	100.	767.0	762.71	112.01	767.0	762.71			

STA. 4+30-4.34: HARRISON ST.

X1	4.3				80.	80.	80.		.153	
BT	2.	100.	767.	762.861	112.01	767.	762.861			
X1	4.55	6.	150.	162.01	25.	25.	25.			
BT	2.	150.	767.	762.99	162.01	767.	762.99			
GR	773.	100.	773.	150.	755.99	150.01	755.99	162.00	773.	162.01
GR	773.	200.								

STA. 5+00

X1	5.				45.	45.	45.		.086	
BT	2.	150.	767.	763.080	162.01	767.	763.080			

STA. 7+50

X1	7.5				250.	250.	250.		.477	
BT	2.	150.	768.	763.550	162.01	768.	763.550			

STA. 10+00

X1	10.				250.	250.	250.		.477	
BT	2.	150.	769.	764.030	162.01	769.	764.030			

STA. 12+50

X1	12.5				250.	250.	250.		.477	
BT	2.	150.	771.25	764.510	162.01	771.25	764.510			

STA. 15+00

X1	15.				250.	250.	250.		.477	
BT	2.	150.	772.9	764.980	162.01	772.9	764.980			

```
          STA. 17+50
X1     17.5                                          250.        250.        250.                    .477
BT       2.        150.       772.8     765.460      162.01       772.8     765.460

NC     .013       .013       .013         .3           .5
          STA. 18+28: 12' D/S OF THE 90 DEGREE BEND D/S OF RAILROAD
X1    18.28         6.        150.      162.01         78.         78.         78.
BT       2.        150.       772.8     765.540      162.01       772.8     765.540
GR   772.8       100.0       772.8      150.0       758.54       150.1     758.54       162.0        772.8      162.01
GR   772.8       200.

          STA. 18+40: D/S SIDE OF 90 DEGREE BEND
X1    18.40                                           12.         12.         12.                    0.05
X2                                                                            1.0

NC     .013       .013       .013         .3           .5
          STA. 18+49: U/S SIDE OF 90 DEGREE BEND
X1    18.49                                          18.90         0.0         9.4                    0.04
X2                                                                            1.0

          STA. 18+49: X5 CARD FOR HEADLOSS IN BEND
X1    18.50                                           0.01        0.01        0.01
X2                                                                            1.0
X5     -4.0       0.20        0.20        0.20        0.20

X1    18.61                                            12.         12.         12.                    0.05
X2                                                                            1.0

          STA. 19+00: U/S OF RAILROAD, 51' U/S OF BEND
X1    19.00                                            38.         38.         38.                    0.16
BT       2.       100.0       772.8     766.84       162.01       772.8     766.84

X1    19.20                                            20.         20.         20.                    0.08
X2                                                                            1.0

X1    19.25                                            5.0         5.0         5.0                    0.02
X2                                                                            1.0

X1    19.30                                            5.0         5.0         5.0                    0.02
X2                                                                            1.0

X1    19.35                                            5.0         5.0         5.0                    0.02
X2                                                                            1.0

X1    19.40         6.        150.      162.01         5.          5.          5.
BT       2.        150.       774.      767.00       162.01        774.      767.00
GR     773.        100.       773.        150.       759.00      150.01      759.00       162.00        773.      162.01
GR     773.        200.
```

```
          STA. 20+00
X1      20.                                        60.        60.        60.                    .25
BT       2.       150.      771.5     767.25      162.01      771.5     767.25

          STA. 22+50: NOTE MIN. GROUND ELEV. OF 770.5 AT 22+00
X1     22.5                                       250.       250.       250.                   1.04
BT       2.       150.      771.5    768.290      162.01      771.5     768.29

          STA. 22+51
X1    22.51                                        .01        .01        .01
X2                                                                        1.
X5      -4.        .05        .06        .07        .08

NC     .013       .013       .013         .3         .5
          STA. 22+70
X1     22.7         6.       150.     162.01        20.        20.        20.
BT       2.       150.      771.5     768.38      162.01      771.5     768.38
GR    771.5       100.      771.5       150.      760.38     150.01     760.38     162.00      771.5     162.01
GR    771.5       200.

X1     23.0                                        30.        30.        30.                    .120
X2                                                                        1.

X1     23.1                                        .01        .01        .01
X2                                                                        1.
X5      -4.        .07        .08        .09        .10

          STA. 23+50: U/S FACE OF JUNCTION BOX
X1     23.5                                        50.        50.        50.                    .210
X2                                                                        1.

X1    23.52         6.       150.      164.1         2.         2.         2.
BT       2.       150.      771.1     769.00       164.1      771.1     769.00
GR    771.5       100.      771.5       150.      760.70     150.01     760.70     164.00      771.5      164.1
GR    771.5       200.

          STA. 23+62: JUNCTION BOX (DIVERSION POINT)
X1    23.62         8.       150.     170.01        10.        10.        10.
BT       4.       150.      771.5     769.00       159.5      771.5      769.0      160.5      771.5      769.0
BT   170.01      771.5      769.0
GR    771.5       100.      771.5       150.      760.70     150.01     760.70      159.5      760.7      160.5
GR    760.7     170.00      771.5     170.01       771.5       200.

          STA. 23+63: X5 CARD MODELS JUNCTION LOSS
X1    23.63                                         .1         .1         .1
X2                                                                        1.
X5      -4.        .25        .25        .25        .25
```

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X1    23.77       10.       150.     170.01        15.        15.        15.                  .037
BT       6.      150.      771.2     769.00      159.5      771.2      769.0     159.51      771.2      769.0
BT    160.5     771.2      769.0     160.51      771.2      769.0     170.01      771.2      769.0
GR    771.5      100.      771.5       150.     760.70     150.01     760.70      159.5      760.7     159.51
GR    760.7     160.5      760.7     160.51      760.7     170.00      771.5     170.01      771.5       200.

QT    4.0       540.       720.       830.       950.
X1    23.93        6.       150.     162.01        16.        16.        16.                  .074
BT       2.      150.      771.5     768.80     162.01      771.5     768.80
GR    771.5      100.      771.5       150.     760.70     150.01     760.70     162.00      771.5     162.01
GR    771.5      200.

X1     24.0                                        7.         7.         7.                  .017
X2                                                                       1.

X1     24.1                                       .01        .01        .01
X2                                                                       1.
X5      -4.       .04        .04        .04        .04

          STA. 25+00
X1     25.0                                      100.       100.       100.                  .245
X2                                                                       1.

          STA. 27+50
X1     27.5                                      250.       250.       250.                  .610
BT       2.      150.      773.0     769.62     162.01      773.0     769.62

          STA. 28+56: U/S FACE OF THE 12'X7' CULVERT JUST U/S OF EDWARDS ST.
X1    28.56                                      106.       106.       106.                  .260
BT       2.      150.      773.5     769.93     162.01      773.5     769.93

          STA. 28+57: 1' U/S OF THE 12'X7' CULVERT
X1    28.57                                        1.         1.         1.

X1    28.65        4.      100.0      132.2         8.         8.         8.
GR    773.0      100.      762.0      100.1      762.0      132.1       773.      132.2

SB                 1.        3.3        32.     .00001        .0.     .00001         0.      762.0      762.0
          STA. 28+66: POND OUTLET WEIR ON THE D/S END OF POND(H=3.0',C=3.5)
X1    28.66        4.       100.     132.01         1.         1.         1.
X2                            1.      762.0      765.0
GR    775.0      100.      762.0     100.01      762.0       132.       775.     132.01

NC      .04       .04       .035        0.1        0.3
QT       4.      615.       885.      1015.      1310.
          STA. 28+99: FIRST XSEC OF POND
X1    28.99        8.0      150.0      215.0        44.        50.        33.
GR     774.      100.       772.       150.       765.       175.       760.       185.       760.       205.
GR     765.      215.       772.       240.       774.       295.
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        STA. 29+31
X1    29.31        8.       175.       250.        45.        60.        32.
GR     775.      100.       774.       140.       765.       175.       760.       185.       760.       240.
GR     765.      250.       774.       280.       776.       330.

        STA. 30+13
X1    30.13        7.       180.       210.        72.        72.        82.
GR     776.      100.       765.       180.       760.       190.       760.       200.       765.       210.
GR     774.      250.       776.       290.

        STA. 30+63
X1    30.63        7.       180.       210.        22.        71.        50.
GR     776.      100.       765.       180.       760.       190.       760.       200.       765.       210.
GR     774.      250.       776.       290.

X1    31.67        4.       100.     150.01       124.       136.       104.
GR     776.      100.      765.0     100.01      765.0       150.       776.     150.01

NC     .013      .013       .013         .3         .5
X1    31.77      10.0       100.     125.02        10.        10.        10.
GR    776.5       90.      776.5       100.       772.     100.01      765.5     100.02      765.0       108.
GR    765.0      117.      765.5       125.       772.     125.01      776.5     125.02      776.5       135.

X1    32.06       10.       100.     120.02         9.         9.         9.
GR    778.0       90.      778.0       100.       772.     100.01      765.5     100.02      765.0       108.
GR    765.0      112.      765.5       120.       772.     120.01      778.0     120.02      778.0       130.

        STA. 32+07: FIRST XSEC OF 20X7 BOX CULVERT
X1    32.07       10.       100.     120.02         1.         1.         1.
BT      -8.      100.      778.0      760.0     100.01      778.0      772.5     100.02      778.0      772.5
BT               108.      778.0      773.0       112.      778.0      773.0       120.      778.0      772.5
BT             120.01      778.0      772.5     120.02      778.0       760.
GR    778.0       90.      778.0       100.       772.     100.01      765.5     100.02      765.0       108.
GR    765.0      112.      765.5       120.       772.     120.01      778.0     120.02      778.0       130.

        STA. 33+15: U/S END OF 20X7 CULVERT IN MALL(108' LONG).
X1    33.15                                     108.       108.       108.                   .330
X2                                                                     1.

        STA. 33+16: 60' OF 10' WIDE OPEN FLUME
X1    33.16       0.0         0.         0.         1.         1.         1.                  .0031

X1    33.26       0.0         0.         0.        10.        10.        10.                   .031

SB                 1.        3.3        20.     .00001         0.     .00001         0.      765.2      765.2
X1    33.27       0.0         0.         0.         1.         1.         1.                  .0031
X2                            1.      765.2      767.8
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        STA. 33+74: U/S LIMIT OF OPEN FLUME
X1    33.74        0.0         0.         0.         48.        48.        48.                    .147

        STA. 33+75: 96' OF 20X7 CLOSED CULVERT
X1    33.75        0.0         0.         0.          1.         1.         1.
X3      10.
BT      -8.        90.      780.0       760.      100.01      780.0     773.02     100.02      780.0     773.52
BT                108.      780.0     773.52        112.      780.0     773.52       120.      780.0     773.52
BT              120.01      780.0     773.02        130.      780.0       760.

QT    4.0         610.       880.      1005.       1300.
        STA. 34+71: U/S END OF 20X7 CULVERT
X1    34.71        0.0         0.         0.         96.        96.        96.                    .293
X2                                                                        1.

        STA. 34+72: 1' U/S OF 20X7 CULVERT, 10' WIDE CONCRETE FLUME
X1    34.72        0.0         0.         0.          1.         1.         1.

X1    34.80        0.0         0.         0.          8.         8.         8.                    .024

SB                  1.        3.3        20.      .00001         0.     .00001         0.      765.8      765.8
        STA. 34+81: WEIR U/S OF MALL(H=2.0', C=3.3)
X1    34.81                                         1.         1.         1.
X2                            1.     765.77      768.67

        STA. 36+21
X1    36.21        0.0         0.         0.        140.       140.       140.                    .428

        STA. 38+05: U/S END OF OPEN FLUME
X1    38.05        0.0         0.         0.        184.       184.       184.                    .550

        STA. 38+06: D/S FACE OF 170' LONG 20X7 CULVERT
X1    38.06        0.0         0.         0.          1.         1.         1.
BT      -8.        90.      780.0       760.      100.01      780.0     774.32     100.02      780.0     774.32
BT                108.      780.0     774.82        112.      780.0     774.82       120.      780.0     774.32
BT              120.01      780.0     774.32        130.      780.0       760.

        STA. 39+76: U/S FACE OF 170' LONG 20X7 CULVERT
X1    39.76         0.         0.         0.        170.       170.       170.                    .519
X2                                                                        1.

        STA. 39+77: 1' U/S OF CULVERT, 10' WIDE FLUME
X1    39.77         0.         0.         0.          1.         1.         1.

X1    39.86         0.         0.         0.          9.         9.         9.                    .027

SB                  1.        3.3        20.      .00001         0.     .00001         0.      767.4      767.4
        STA. 39+87: WEIR U/S OF ROSE ST. (H=2.0',C=3.3)
X1    39.87                                         1.         1.         1.
X2                            1.      767.4       770.3
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QT    4.0          605.        870.        995.        1290.
          STA. 41+59
X1    41.59          0.          0.          0.         172.        172.        172.                    .504
          STA. 43+35: U/S END OF 10' WIDE FLUME
X1    43.35          0.          0.          0.         176.        176.        176.                    .538
          STA. 43+36: D/S FACE OF 250' LONG 20X7 CULVERT
X1    43.36          0.          0.          0.           1.          1.          1.
BT      -8.         90.       780.2        760.      100.01       780.2      775.91      100.02       780.2      775.91
BT                 108.       780.2      776.41         112.       780.2      776.41         120.       780.2      775.91
BT                120.01       780.2      775.91         130.       780.2         760.
          STA. 45+86: U/S FACE OF 250' LONG 20X7 CULVERT
X1    45.86          0.          0.          0.         250.        250.        250.                    .764
X2                                                                                1.
QT    4.0          600.        865.        990.        1285.
          STA. 45+87: 1' U/S OF CULVERT, 10' WIDE OPEN FLUME
X1    45.87          0.          0.          0.           1.          1.          1.
X1    45.97          0.          0.          0.          10.         10.         10.                    .031
SB                   1.         3.3         20.       .00001          0.       .00001          0.       769.2      769.2
          STA. 45+98: WEIR U/S OF CHURCH ST. (H=2.0',C=3.3)
X1    45.98                                              1.          1.          1.
X2                                 1.       769.2       771.9
          STA. 48+33: U/S LIMIT OF FLUME
X1    48.33          0.          0.          0.         235.        235.        235.                    .718
X2                                                                                1.
          STA. 48+34: D/S FACE OF 90' LONG 20X7 CULVERT UNDER COOLEY ST.
X1    48.34          0.          0.          0.           1.          1.          1.
BT      -8.         90.       785.2        760.      100.01       784.7      777.42      100.02       784.7      777.42
BT                 108.       784.7      777.92         112.       784.7      777.92         120.       784.7      777.42
BT                120.01       784.7      777.42         130.       784.7         760.
          STA. 49+24: U/S FACE OF COOLEY ST. CULVERT
X1    49.24          0.          0.          0.          90.         90.         90.                    .275
X2                                                                                1.
          STA. 49+25: 1' U/S OF COOLEY ST. CUVLERT, 10'WIDE OPEN FLUME
X1    49.25          0.          0.          0.           1.          1.          1.
X1    49.34          0.          0.          0.           9.          9.          9.                    .027
SB                   1.         3.3         20.       .00001          0.       .00001          0.       769.7      769.7
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STA. 49+35: WEIR U/S OF COOLEY ST.

X1	49.35				1.	1.	1.	
X2			1.	770.2	773.1			

STA. 50+41

X1	50.41	0.	0.	0.	106.	106.	106.	.306

STA. 51+55 END OF THE ARCADIA CREEK SYSTEM

X1	51.55	0.	0.	0.	114.	114.	114.	.397

THIS RUN EXECUTED 28JUL92 15:33:59

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.0; February 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

[AC7.HEC2]

SUMMARY PRINTOUT

	SECNO	CUMDS	DEPTH	CWSEL	XLCH	Q	EG
	0.000	0.00	9.50	757.50	0.00	544.53	757.63
	0.000	0.00	9.50	757.50	0.00	746.15	757.74
	0.000	0.00	9.50	757.50	0.00	841.54	757.80
	0.000	0.00	9.50	757.50	0.00	976.33	757.91
*	0.100	9.00	9.50	757.50	9.00	544.53	757.63
*	0.100	9.00	9.50	757.50	9.00	746.15	757.74
*	0.100	9.00	9.50	757.50	9.00	841.54	757.81
*	0.100	9.00	9.50	757.50	9.00	976.33	757.91
	0.170	17.00	9.50	757.50	8.00	544.53	757.63
	0.170	17.00	9.50	757.50	8.00	746.15	757.74
	0.170	17.00	9.51	757.51	8.00	841.54	757.81
	0.170	17.00	9.51	757.51	8.00	976.33	757.92
*	0.180	18.00	9.47	757.47	1.00	544.53	757.65
*	0.180	18.00	9.43	757.43	1.00	746.15	757.77
*	0.180	18.00	9.41	757.41	1.00	841.54	757.85
*	0.180	18.00	9.38	757.38	1.00	976.33	757.97
*	0.330	32.00	4.32	759.32	14.00	544.53	760.76
*	0.330	32.00	4.98	759.98	14.00	746.15	761.76
*	0.330	32.00	5.29	760.29	14.00	841.54	762.19
*	0.330	32.00	5.66	760.66	14.00	976.33	762.79
*	0.340	33.00	5.48	760.48	1.00	544.53	760.87
*	0.340	33.00	6.34	761.34	1.00	746.15	761.88
*	0.340	33.00	6.71	761.71	1.00	841.54	762.32
*	0.340	33.00	7.22	762.22	1.00	976.33	762.93
	0.380	37.00	5.41	760.41	4.00	544.53	760.90
	0.380	37.00	6.24	761.24	4.00	746.15	761.93
	0.380	37.00	6.60	761.60	4.00	841.54	762.38
	0.380	37.00	7.08	762.08	4.00	976.33	762.99

SECNO	CUMDS	DEPTH	CWSEL	XLCH	Q	EG
0.420	41.00	5.31	760.31	4.00	544.53	760.95
0.420	41.00	6.09	761.09	4.00	746.15	762.00
0.420	41.00	6.42	761.42	4.00	841.54	762.46
0.420	41.00	6.86	761.86	4.00	976.33	763.09
0.460	45.00	5.14	760.14	4.00	544.53	761.03
0.460	45.00	5.82	760.82	4.00	746.15	762.12
0.460	45.00	6.10	761.10	4.00	841.54	762.60
0.460	45.00	6.47	761.47	4.00	976.33	763.27
0.500	49.00	4.79	759.79	4.00	544.53	761.18
0.500	49.00	5.16	760.16	4.00	746.15	762.41
0.500	49.00	5.34	760.34	4.00	841.54	763.02
0.500	49.00	5.88	760.88	4.00	976.33	763.85
1.000	99.00	4.79	759.88	50.00	544.53	761.27
1.000	99.00	5.44	760.53	50.00	746.15	762.56
1.000	99.00	5.99	761.08	50.00	841.54	763.21
1.000	99.00	6.63	761.73	50.00	976.33	764.06
1.250	124.00	4.79	759.93	25.00	544.53	761.32
1.250	124.00	5.52	760.66	25.00	746.15	762.63
1.250	124.00	6.05	761.19	25.00	841.54	763.28
1.250	124.00	6.67	761.81	25.00	976.33	764.12
2.500	249.00	4.78	760.16	125.00	544.53	761.55
2.500	249.00	5.71	761.09	125.00	746.15	762.93
2.500	249.00	6.22	761.60	125.00	841.54	763.57
2.500	249.00	6.90	762.28	125.00	976.33	764.43
3.500	349.00	4.77	760.34	100.00	544.53	761.74
3.500	349.00	5.77	761.34	100.00	746.15	763.14
3.500	349.00	6.29	761.86	100.00	841.54	763.79
3.500	349.00	6.97	762.54	100.00	976.33	764.66
4.300	429.00	4.77	760.49	80.00	544.53	761.89
4.300	429.00	5.82	761.54	80.00	746.15	763.31
4.300	429.00	6.34	762.07	80.00	841.54	763.96
4.300	429.00	7.04	762.76	80.00	976.33	764.83
4.550	454.00	4.35	760.34	25.00	544.53	762.03
4.550	454.00	5.41	761.40	25.00	746.15	763.45
4.550	454.00	5.95	761.94	25.00	841.54	764.10
4.550	454.00	6.65	762.64	25.00	976.33	764.97
5.000	499.00	4.45	760.53	45.00	544.53	762.14
5.000	499.00	5.53	761.61	45.00	746.15	763.57
5.000	499.00	6.05	762.13	45.00	841.54	764.21
5.000	499.00	6.75	762.82	45.00	976.33	765.08

	SECNO	CUMDS	DEPTH	CWSEL	XLCH	Q	EG
	7.500	749.00	4.68	761.24	250.00	544.53	762.69
	7.500	749.00	5.81	762.36	250.00	746.15	764.14
	7.500	749.00	6.34	762.89	250.00	841.54	764.79
*	7.500	749.00	7.00	763.55	250.00	976.33	765.65
	10.000	999.00	4.70	761.73	250.00	544.53	763.18
	10.000	999.00	5.90	762.93	250.00	746.15	764.66
	10.000	999.00	6.41	763.44	250.00	841.54	765.31
	10.000	999.00	7.21	764.24	250.00	976.33	766.34
	12.500	1249.00	4.74	762.25	250.00	544.53	763.67
	12.500	1249.00	5.94	763.45	250.00	746.15	765.15
	12.500	1249.00	6.49	763.99	250.00	841.54	765.81
	12.500	1249.00	7.63	765.14	250.00	976.33	767.24
	15.000	1499.00	4.74	762.73	250.00	544.53	764.15
	15.000	1499.00	5.96	763.94	250.00	746.15	765.64
	15.000	1499.00	6.52	764.50	250.00	841.54	766.30
	15.000	1499.00	8.05	766.03	250.00	976.33	768.14
	17.500	1749.00	4.75	763.21	250.00	544.53	764.63
	17.500	1749.00	5.99	764.45	250.00	746.15	766.12
	17.500	1749.00	6.52	764.99	250.00	841.54	766.79
	17.500	1749.00	8.48	766.94	250.00	976.33	769.04
	18.280	1827.00	4.92	763.46	78.00	544.53	764.80
	18.280	1827.00	6.13	764.67	78.00	746.15	766.29
	18.280	1827.00	6.69	765.23	78.00	841.54	766.96
	18.280	1827.00	8.67	767.21	78.00	976.33	769.33
	18.400	1839.00	4.88	763.47	12.00	544.53	764.83
	18.400	1839.00	6.09	764.68	12.00	746.15	766.32
	18.400	1839.00	6.65	765.24	12.00	841.54	767.99
	18.400	1839.00	8.66	767.25	12.00	976.33	769.38
	18.490	1848.40	4.85	763.48	9.40	544.53	764.86
	18.490	1848.40	6.06	764.69	9.40	746.15	766.34
	18.490	1848.40	6.62	765.25	9.40	841.54	767.01
	18.490	1848.40	8.66	767.29	9.40	976.33	769.41
*	18.500	1848.41	5.05	763.68	0.01	544.53	764.95
*	18.500	1848.41	6.26	764.89	0.01	746.15	766.44
*	18.500	1848.41	6.82	765.45	0.01	841.54	767.11
*	18.500	1848.41	8.86	767.49	0.01	976.33	769.61
	18.610	1860.41	5.01	763.69	12.00	544.53	764.98
	18.610	1860.41	6.22	764.90	12.00	746.15	766.47
	18.610	1860.41	6.78	765.46	12.00	841.54	767.14
	18.610	1860.41	8.85	767.53	12.00	976.33	769.65

	SECNO	CUMDS	DEPTH	CWSEL	XLCH	Q	EG
	19.000	1898.41	4.88	763.72	38.00	544.53	765.08
	19.000	1898.41	6.09	764.93	38.00	746.15	766.57
	19.000	1898.41	6.66	765.50	38.00	841.54	767.24
	19.000	1898.41	9.45	768.29	38.00	976.33	769.92
	19.200	1918.41	4.82	763.74	20.00	544.53	765.13
	19.200	1918.41	6.04	764.96	20.00	746.15	766.62
	19.200	1918.41	6.60	765.52	20.00	841.54	767.30
	19.200	1918.41	9.42	768.34	20.00	976.33	769.97
	19.250	1923.41	4.81	763.75	5.00	544.53	765.15
	19.250	1923.41	6.02	764.96	5.00	746.15	766.64
	19.250	1923.41	6.59	765.53	5.00	841.54	767.31
	19.250	1923.41	9.42	768.36	5.00	976.33	769.98
	19.300	1928.41	4.79	763.75	5.00	544.53	765.16
	19.300	1928.41	6.01	764.97	5.00	746.15	766.65
	19.300	1928.41	6.57	765.53	5.00	841.54	767.32
	19.300	1928.41	9.41	768.37	5.00	976.33	769.99
	19.350	1933.41	4.78	763.76	5.00	544.53	765.17
	19.350	1933.41	5.99	764.97	5.00	746.15	766.66
	19.350	1933.41	6.56	765.54	5.00	841.54	767.33
	19.350	1933.41	9.40	768.38	5.00	976.33	770.01
	19.400	1938.41	4.78	763.78	5.00	544.53	765.19
	19.400	1938.41	6.00	765.00	5.00	746.15	766.68
	19.400	1938.41	6.57	765.57	5.00	841.54	767.35
	19.400	1938.41	9.41	768.41	5.00	976.33	770.02
	20.000	1998.41	4.59	763.84	60.00	544.53	765.36
	20.000	1998.41	5.82	765.07	60.00	746.15	766.85
	20.000	1998.41	6.39	765.64	60.00	841.54	767.52
	20.000	1998.41	9.31	768.56	60.00	976.33	770.17
*	22.500	2248.41	3.99	764.28	250.00	544.53	766.29
	22.500	2248.41	5.14	765.43	250.00	746.15	767.70
	22.500	2248.41	5.71	766.00	250.00	841.54	768.34
	22.500	2248.41	8.89	769.18	250.00	976.33	770.79
*	22.510	2248.42	4.04	764.33	0.01	544.53	766.29
*	22.510	2248.42	5.20	765.49	0.01	746.15	767.71
*	22.510	2248.42	5.78	766.07	0.01	841.54	768.36
*	22.510	2248.42	8.97	769.26	0.01	976.33	770.87
*	22.700	2268.42	3.99	764.37	20.00	544.53	766.38
	22.700	2268.42	5.14	765.52	20.00	746.15	767.79
	22.700	2268.42	5.72	766.10	20.00	841.54	768.44
	22.700	2268.42	8.93	769.31	20.00	976.33	770.92

	SECNO	CUMDS	DEPTH	CWSEL	XLCH	Q	EG
*	23.000	2298.42	3.99	764.49	30.00	544.53	766.50
	23.000	2298.42	5.08	765.58	30.00	746.15	767.91
	23.000	2298.42	5.66	766.16	30.00	841.54	768.55
	23.000	2298.42	8.88	769.38	30.00	976.33	770.99
*	23.100	2298.43	4.06	764.56	0.01	544.53	766.50
*	23.100	2298.43	5.16	765.66	0.01	746.15	767.92
*	23.100	2298.43	5.75	766.25	0.01	841.54	768.56
*	23.100	2298.43	8.98	769.48	0.01	976.33	771.09
*	23.500	2348.43	3.99	764.70	50.00	544.53	766.71
	23.500	2348.43	5.05	765.76	50.00	746.15	768.12
	23.500	2348.43	5.63	766.34	50.00	841.54	768.75
	23.500	2348.43	8.90	769.61	50.00	976.33	771.22
*	23.520	2350.43	5.67	766.37	2.00	544.53	767.10
*	23.520	2350.43	6.94	767.64	2.00	746.15	768.55
*	23.520	2350.43	7.48	768.18	2.00	841.54	769.18
	23.520	2350.43	9.58	770.28	2.00	976.33	771.37
*	23.620	2360.43	6.10	766.80	10.00	620.00	767.20
*	23.620	2360.43	7.40	768.10	10.00	890.00	768.66
*	23.620	2360.43	7.95	768.65	10.00	1020.00	769.29
*	23.620	2360.43	9.75	770.45	10.00	1315.00	771.42
*	23.630	2360.53	6.35	767.05	0.10	620.00	767.42
*	23.630	2360.53	7.65	768.35	0.10	890.00	768.88
*	23.630	2360.53	8.20	768.90	0.10	1020.00	769.50
*	23.630	2360.53	10.00	770.70	0.10	1315.00	771.67
	23.770	2375.53	6.32	767.05	15.00	620.00	767.43
	23.770	2375.53	7.62	768.36	15.00	890.00	768.89
	23.770	2375.53	8.17	768.91	15.00	1020.00	769.51
	23.770	2375.53	9.97	770.71	15.00	1315.00	771.69
*	23.930	2391.53	6.04	766.82	16.00	540.00	767.68
*	23.930	2391.53	7.34	768.11	16.00	720.00	769.15
*	23.930	2391.53	7.84	768.62	16.00	830.00	769.82
*	23.930	2391.53	9.70	770.47	16.00	950.00	771.98
	24.000	2398.53	6.03	766.82	7.00	540.00	767.69
	24.000	2398.53	7.33	768.12	7.00	720.00	769.16
	24.000	2398.53	7.83	768.62	7.00	830.00	769.83
	24.000	2398.53	9.69	770.49	7.00	950.00	772.00
*	24.100	2398.54	6.07	766.86	0.01	540.00	767.72
*	24.100	2398.54	7.37	768.16	0.01	720.00	769.19
*	24.100	2398.54	7.87	768.66	0.01	830.00	769.86
*	24.100	2398.54	9.73	770.53	0.01	950.00	772.04

	SECNO	CUMDS	DEPTH	CWSEL	XLCH	Q	EG
	25.000	2498.54	5.90	766.94	100.00	540.00	767.84
	25.000	2498.54	7.20	768.24	100.00	720.00	769.32
	25.000	2498.54	7.72	768.76	100.00	830.00	770.00
	25.000	2498.54	9.72	770.76	100.00	950.00	772.27
	27.500	2748.54	5.51	767.16	250.00	540.00	768.19
	27.500	2748.54	6.83	768.47	250.00	720.00	769.67
	27.500	2748.54	7.37	769.02	250.00	830.00	770.39
	27.500	2748.54	9.69	771.33	250.00	950.00	772.86
	28.560	2854.54	5.36	767.26	106.00	540.00	768.36
	28.560	2854.54	6.67	768.58	106.00	720.00	769.84
	28.560	2854.54	7.24	769.14	106.00	830.00	770.56
	28.560	2854.54	9.70	771.60	106.00	950.00	773.12
	28.570	2855.54	5.36	767.26	1.00	540.00	768.36
	28.570	2855.54	6.68	768.58	1.00	720.00	769.84
	28.570	2855.54	7.24	769.14	1.00	830.00	770.56
*	28.570	2855.54	10.53	772.43	1.00	950.00	773.31
*	28.650	2863.54	6.56	768.56	8.00	540.00	768.66
*	28.650	2863.54	8.06	770.06	8.00	720.00	770.18
*	28.650	2863.54	8.82	770.82	8.00	830.00	770.95
*	28.650	2863.54	11.44	773.44	8.00	950.00	773.54
	28.660	2864.54	6.61	768.61	1.00	540.00	768.71
	28.660	2864.54	8.06	770.06	1.00	720.00	770.18
	28.660	2864.54	8.82	770.82	1.00	830.00	770.95
	28.660	2864.54	11.44	773.44	1.00	950.00	773.54
*	28.990	2897.54	8.66	768.66	33.00	615.00	768.72
*	28.990	2897.54	10.12	770.12	33.00	885.00	770.19
	28.990	2897.54	10.89	770.89	33.00	1015.00	770.96
	28.990	2897.54	13.50	773.50	33.00	1310.00	773.55
*	29.310	2929.54	8.71	768.71	32.00	615.00	768.72
*	29.310	2929.54	10.17	770.17	32.00	885.00	770.20
*	29.310	2929.54	10.94	770.94	32.00	1015.00	770.97
*	29.310	2929.54	13.53	773.53	32.00	1310.00	773.56
*	30.130	3011.54	8.66	768.66	82.00	615.00	768.75
*	30.130	3011.54	10.13	770.13	82.00	885.00	770.23
*	30.130	3011.54	10.90	770.90	82.00	1015.00	771.00
*	30.130	3011.54	13.51	773.51	82.00	1310.00	773.57
	30.630	3061.54	8.67	768.67	50.00	615.00	768.77
	30.630	3061.54	10.14	770.14	50.00	885.00	770.24
	30.630	3061.54	10.91	770.91	50.00	1015.00	771.01
	30.630	3061.54	13.51	773.51	50.00	1310.00	773.58

	SECNO	CUMDS	DEPTH	CWSEL	XLCH	Q	EG
*	31.670	3165.54	3.68	768.68	104.00	615.00	768.85
*	31.670	3165.54	5.13	770.13	104.00	885.00	770.31
*	31.670	3165.54	5.89	770.89	104.00	1015.00	771.08
*	31.670	3165.54	8.48	773.48	104.00	1310.00	773.63
	31.770	3175.54	3.30	768.30	10.00	615.00	769.25
	31.770	3175.54	4.78	769.78	10.00	885.00	770.69
	31.770	3175.54	5.55	770.55	10.00	1015.00	771.43
	31.770	3175.54	8.23	773.23	10.00	1310.00	773.88
*	32.060	3184.54	3.27	768.27	9.00	615.00	769.83
*	32.060	3184.54	4.37	769.37	9.00	885.00	771.12
*	32.060	3184.54	5.21	770.21	9.00	1015.00	771.80
	32.060	3184.54	8.02	773.02	9.00	1310.00	774.11
	32.070	3185.54	3.28	768.28	1.00	615.00	769.83
	32.070	3185.54	4.37	769.37	1.00	885.00	771.12
	32.070	3185.54	5.20	770.20	1.00	1015.00	771.80
	32.070	3185.54	7.98	772.98	1.00	1310.00	774.14
*	33.150	3293.54	3.27	768.60	108.00	615.00	770.16
	33.150	3293.54	4.19	769.52	108.00	885.00	771.43
	33.150	3293.54	4.97	770.30	108.00	1015.00	772.06
	33.150	3293.54	7.76	773.09	108.00	1310.00	774.28
	33.160	3294.54	3.28	768.62	1.00	615.00	770.16
	33.160	3294.54	4.19	769.52	1.00	885.00	771.43
	33.160	3294.54	4.97	770.31	1.00	1015.00	772.06
	33.160	3294.54	7.80	773.13	1.00	1310.00	774.29
*	33.260	3304.54	3.28	768.64	10.00	615.00	770.19
	33.260	3304.54	4.18	769.54	10.00	885.00	771.46
	33.260	3304.54	4.96	770.32	10.00	1015.00	772.08
	33.260	3304.54	7.77	773.14	10.00	1310.00	774.30
*	33.270	3305.54	6.52	771.89	1.00	615.00	772.26
*	33.270	3305.54	7.52	772.89	1.00	885.00	773.46
*	33.270	3305.54	7.96	773.33	1.00	1015.00	773.99
	33.270	3305.54	8.88	774.25	1.00	1310.00	775.13
	33.740	3353.54	6.38	771.89	48.00	615.00	772.28
	33.740	3353.54	7.38	772.90	48.00	885.00	773.49
	33.740	3353.54	7.82	773.34	48.00	1015.00	774.03
	33.740	3353.54	8.75	774.26	48.00	1310.00	775.18
	33.750	3354.54	6.38	771.89	1.00	615.00	772.28
	33.750	3354.54	7.38	772.90	1.00	885.00	773.49
	33.750	3354.54	7.82	773.34	1.00	1015.00	774.03
*	33.750	3354.54	8.66	774.17	1.00	1310.00	775.27

	SECNO	CUMDS	DEPTH	CWSEL	XLCH	Q	EG
	34.710	3450.54	6.10	771.91	96.00	610.00	772.33
	34.710	3450.54	7.11	772.92	96.00	880.00	773.55
	34.710	3450.54	7.56	773.37	96.00	1005.00	774.09
	34.710	3450.54	8.51	774.32	96.00	1300.00	775.40
	34.720	3451.54	6.10	771.91	1.00	610.00	772.33
	34.720	3451.54	7.11	772.92	1.00	880.00	773.55
	34.720	3451.54	7.56	773.37	1.00	1005.00	774.09
*	34.720	3451.54	8.75	774.56	1.00	1300.00	775.45
	34.800	3459.54	6.08	771.91	8.00	610.00	772.33
	34.800	3459.54	7.09	772.92	8.00	880.00	773.56
	34.800	3459.54	7.54	773.37	8.00	1005.00	774.10
	34.800	3459.54	8.73	774.56	8.00	1300.00	775.46
	34.810	3460.54	6.95	772.79	1.00	610.00	773.10
	34.810	3460.54	7.98	773.81	1.00	880.00	774.31
	34.810	3460.54	8.41	774.24	1.00	1005.00	774.82
	34.810	3460.54	9.39	775.23	1.00	1300.00	776.00
	36.210	3600.54	6.54	772.80	140.00	610.00	773.16
	36.210	3600.54	7.57	773.83	140.00	880.00	774.38
	36.210	3600.54	8.01	774.27	140.00	1005.00	774.91
	36.210	3600.54	9.00	775.26	140.00	1300.00	776.11
	38.050	3784.54	6.02	772.83	184.00	610.00	773.25
	38.050	3784.54	7.06	773.87	184.00	880.00	774.51
	38.050	3784.54	7.50	774.31	184.00	1005.00	775.04
	38.050	3784.54	8.50	775.31	184.00	1300.00	776.26
	38.060	3785.54	6.02	772.83	1.00	610.00	773.25
	38.060	3785.54	7.06	773.87	1.00	880.00	774.51
	38.060	3785.54	7.50	774.31	1.00	1005.00	775.04
*	38.060	3785.54	8.41	775.22	1.00	1300.00	776.35
	39.760	3955.54	5.53	772.85	170.00	610.00	773.36
	39.760	3955.54	6.58	773.91	170.00	880.00	774.64
	39.760	3955.54	7.02	774.35	170.00	1005.00	775.19
	39.760	3955.54	8.13	775.46	170.00	1300.00	776.59
	39.770	3956.54	5.53	772.85	1.00	610.00	773.36
	39.770	3956.54	6.58	773.91	1.00	880.00	774.65
	39.770	3956.54	7.02	774.35	1.00	1005.00	775.19
*	39.770	3956.54	8.31	775.64	1.00	1300.00	776.64
	39.860	3965.54	5.50	772.86	9.00	610.00	773.37
	39.860	3965.54	6.55	773.91	9.00	880.00	774.65
	39.860	3965.54	7.00	774.35	9.00	1005.00	775.20
	39.860	3965.54	8.29	775.64	9.00	1300.00	776.64

	SECNO	CUMDS	DEPTH	CWSEL	XLCH	Q	EG
*	39.870	3966.54	7.07	774.43	1.00	610.00	774.73
	39.870	3966.54	8.10	775.45	1.00	880.00	775.93
	39.870	3966.54	8.53	775.89	1.00	1005.00	776.45
	39.870	3966.54	9.48	776.84	1.00	1300.00	777.60
	41.590	4138.54	6.59	774.45	172.00	605.00	774.80
	41.590	4138.54	7.63	775.49	172.00	870.00	776.02
	41.590	4138.54	8.07	775.92	172.00	995.00	776.55
	41.590	4138.54	9.02	776.88	172.00	1290.00	777.72
	43.350	4314.54	6.07	774.47	176.00	605.00	774.88
	43.350	4314.54	7.12	775.52	176.00	870.00	776.13
	43.350	4314.54	7.56	775.96	176.00	995.00	776.67
	43.350	4314.54	8.53	776.93	176.00	1290.00	777.86
	43.360	4315.54	6.07	774.47	1.00	605.00	774.88
	43.360	4315.54	7.12	775.52	1.00	870.00	776.13
	43.360	4315.54	7.56	775.96	1.00	995.00	776.67
*	43.360	4315.54	8.44	776.84	1.00	1290.00	777.96
	45.860	4565.54	5.35	774.51	250.00	605.00	775.05
	45.860	4565.54	6.42	775.58	250.00	870.00	776.34
	45.860	4565.54	6.87	776.03	250.00	995.00	776.90
	45.860	4565.54	8.02	777.19	250.00	1290.00	778.30
	45.870	4566.54	5.36	774.52	1.00	600.00	775.05
	45.870	4566.54	6.43	775.59	1.00	865.00	776.34
	45.870	4566.54	6.88	776.05	1.00	990.00	776.90
*	45.870	4566.54	8.16	777.32	1.00	1285.00	778.33
	45.970	4576.54	5.33	774.53	10.00	600.00	775.06
	45.970	4576.54	6.40	775.59	10.00	865.00	776.35
	45.970	4576.54	6.86	776.05	10.00	990.00	776.91
	45.970	4576.54	8.13	777.33	10.00	1285.00	778.35
*	45.980	4577.54	6.74	775.93	1.00	600.00	776.26
	45.980	4577.54	7.77	776.97	1.00	865.00	777.47
	45.980	4577.54	8.21	777.40	1.00	990.00	777.99
	45.980	4577.54	9.15	778.34	1.00	1285.00	779.14
	48.330	4812.54	6.05	775.96	235.00	600.00	776.37
	48.330	4812.54	7.10	777.01	235.00	865.00	777.62
	48.330	4812.54	7.53	777.44	235.00	990.00	778.15
	48.330	4812.54	8.49	778.40	235.00	1285.00	779.33
	48.340	4813.54	6.05	775.96	1.00	600.00	776.37
	48.340	4813.54	7.10	777.01	1.00	865.00	777.62
	48.340	4813.54	7.53	777.44	1.00	990.00	778.15
*	48.340	4813.54	8.40	778.31	1.00	1285.00	779.42

SECNO	CUMDS	DEPTH	CWSEL	XLCH	Q	EG
49.240	4903.54	5.79	775.97	90.00	600.00	776.42
49.240	4903.54	6.84	777.02	90.00	865.00	777.68
49.240	4903.54	7.28	777.47	90.00	990.00	778.23
49.240	4903.54	8.25	778.44	90.00	1285.00	779.55
49.250	4904.54	5.79	775.97	1.00	600.00	776.42
49.250	4904.54	6.84	777.03	1.00	865.00	777.68
49.250	4904.54	7.28	777.47	1.00	990.00	778.23
49.250	4904.54	8.48	778.67	1.00	1285.00	779.60
49.340	4913.54	5.76	775.97	9.00	600.00	776.43
49.340	4913.54	6.81	777.03	9.00	865.00	777.69
49.340	4913.54	7.26	777.47	9.00	990.00	778.23
49.340	4913.54	8.46	778.67	9.00	1285.00	779.61
49.350	4914.54	6.94	777.15	1.00	600.00	777.46
49.350	4914.54	7.98	778.19	1.00	865.00	778.67
49.350	4914.54	8.42	778.63	1.00	990.00	779.19
49.350	4914.54	9.37	779.58	1.00	1285.00	780.34
50.410	5020.54	6.64	777.16	106.00	600.00	777.50
50.410	5020.54	7.69	778.21	106.00	865.00	778.73
50.410	5020.54	8.13	778.65	106.00	990.00	779.25
50.410	5020.54	9.09	779.60	106.00	1285.00	780.42
51.550	5134.54	6.26	777.17	114.00	600.00	777.55
51.550	5134.54	7.31	778.22	114.00	865.00	778.80
51.550	5134.54	7.75	778.66	114.00	990.00	779.33
51.550	5134.54	8.71	779.63	114.00	1285.00	780.51

{AC7.HEC2}

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	0.000	0.00	0.00	0.00	748.00	544.53	757.50	0.00	757.63	5.51	2.87	190.05	231.95
	0.000	0.00	0.00	0.00	748.00	746.15	757.50	0.00	757.74	10.35	3.93	190.05	231.95
	0.000	0.00	0.00	0.00	748.00	841.54	757.50	0.00	757.80	13.16	4.43	190.05	231.95
	0.000	0.00	0.00	0.00	748.00	976.33	757.50	0.00	757.91	17.72	5.14	190.05	231.95
*	0.100	9.00	0.00	0.00	748.00	544.53	757.50	0.00	757.63	0.76	2.87	190.05	624.47
*	0.100	9.00	0.00	0.00	748.00	746.15	757.50	0.00	757.74	1.43	3.93	190.05	624.47
*	0.100	9.00	0.00	0.00	748.00	841.54	757.50	0.00	757.81	1.82	4.43	190.05	624.47
*	0.100	9.00	0.00	0.00	748.00	976.33	757.50	0.00	757.91	2.44	5.14	190.05	624.47
	0.170	8.00	0.00	0.00	748.00	544.53	757.50	0.00	757.63	0.76	2.86	190.08	624.60
	0.170	8.00	0.00	0.00	748.00	746.15	757.50	0.00	757.74	1.43	3.92	190.11	624.72
	0.170	8.00	0.00	0.00	748.00	841.54	757.51	0.00	757.81	1.81	4.43	190.12	624.79
	0.170	8.00	0.00	0.00	748.00	976.33	757.51	0.00	757.92	2.44	5.13	190.15	624.89
*	0.180	1.00	0.00	0.00	748.00	544.53	757.47	0.00	757.65	1.94	3.41	159.77	391.37
*	0.180	1.00	0.00	0.00	748.00	746.15	757.43	0.00	757.77	3.68	4.69	159.12	389.04
*	0.180	1.00	0.00	0.00	748.00	841.54	757.41	0.00	757.85	4.71	5.30	158.72	387.63
*	0.180	1.00	0.00	0.00	748.00	976.33	757.38	0.00	757.97	6.42	6.18	158.05	385.25
*	0.330	14.00	0.00	0.00	755.00	544.53	759.32	759.32	760.76	45.82	9.64	56.49	80.44
*	0.330	14.00	0.00	0.00	755.00	746.15	759.98	759.98	761.76	44.53	10.70	69.72	111.82
*	0.330	14.00	0.00	0.00	755.00	841.54	760.29	760.29	762.19	43.50	11.09	75.91	127.59
*	0.330	14.00	0.00	0.00	755.00	976.33	760.66	760.66	762.79	43.71	11.70	83.45	147.67
*	0.340	1.00	0.00	0.00	755.00	544.53	760.48	0.00	760.87	3.50	4.97	109.64	291.18
*	0.340	1.00	0.00	0.00	755.00	746.15	761.34	0.00	761.88	4.35	5.89	126.75	357.74
*	0.340	1.00	0.00	0.00	755.00	841.54	761.71	0.00	762.32	4.72	6.27	134.15	387.40
*	0.340	1.00	0.00	0.00	755.00	976.33	762.22	0.00	762.93	5.17	6.76	144.44	429.42
	0.380	4.00	0.00	0.00	755.00	544.53	760.41	0.00	760.90	4.70	5.59	97.48	251.05
	0.380	4.00	0.00	0.00	755.00	746.15	761.24	0.00	761.93	5.92	6.64	112.39	306.63
	0.380	4.00	0.00	0.00	755.00	841.54	761.60	0.00	762.38	6.46	7.08	118.81	331.20
	0.380	4.00	0.00	0.00	755.00	976.33	762.08	0.00	762.99	7.15	7.66	127.53	365.19
	0.420	4.00	0.00	0.00	755.00	544.53	760.31	0.00	760.95	6.68	6.41	84.98	210.61
	0.420	4.00	0.00	0.00	755.00	746.15	761.09	0.00	762.00	8.59	7.66	97.42	254.65
	0.420	4.00	0.00	0.00	755.00	841.54	761.42	0.00	762.46	9.44	8.19	102.73	273.91
	0.420	4.00	0.00	0.00	755.00	976.33	761.86	0.00	763.09	10.57	8.88	109.90	300.34
	0.460	4.00	0.00	0.00	755.00	544.53	760.14	0.00	761.03	10.30	7.57	71.95	169.70
	0.460	4.00	0.00	0.00	755.00	746.15	760.82	0.00	762.12	13.72	9.15	81.52	201.48
	0.460	4.00	0.00	0.00	755.00	841.54	761.10	0.00	762.60	15.34	9.85	85.46	214.86
	0.460	4.00	0.00	0.00	755.00	976.33	761.47	0.00	763.27	17.58	10.76	90.71	232.87

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3370 NORMAL BRIDGE,NRD= 4 MIN ELTRD= 774.00 MAX ELLC= 767.40

19.16	5.87	765.17	0.00	0.00	765.76	0.59	0.00	0.13	770.24
544.	0.	544.	0.	0.	88.	0.	3.	1.	770.24
0.06	0.00	6.18	0.00	0.000	0.013	0.000	0.000	759.30	100.00
0.000968	1.	1.	1.	3	0	0	0.00	15.02	125.04

*SECNO 19.280

3265 DIVIDED FLOW

3370 NORMAL BRIDGE,NRD= 4 MIN ELTRD= 774.00 MAX ELLC= 767.40

19.28	5.50	765.14	0.00	0.00	765.81	0.67	0.01	0.04	770.39
544.	0.	544.	0.	0.	83.	0.	3.	1.	770.39
0.06	0.00	6.59	0.00	0.000	0.013	0.000	0.000	759.64	100.00
0.001140	12.	12.	12.	2	0	0	0.00	15.02	117.04

*SECNO 19.290

3370 NORMAL BRIDGE,NRD= 4 MIN ELTRD= 774.00 MAX ELLC= 767.40

19.29	5.50	765.14	0.00	0.00	765.81	0.68	0.00	0.00	770.39
544.	0.	544.	0.	0.	82.	0.	3.	1.	770.39
0.06	0.00	6.59	0.00	0.000	0.013	0.000	0.000	759.64	100.00
0.000714	1.	1.	1.	0	0	0	0.00	15.01	115.02

*SECNO 19.390

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 774.00 MAX ELLC= 767.70

19.39	5.20	764.89	0.00	0.00	766.08	1.18	0.01	0.25	776.55
544.	0.	544.	0.	0.	62.	0.	3.	1.	776.55
0.06	0.00	8.72	0.00	0.000	0.013	0.000	0.000	759.70	150.01
0.001486	10.	10.	10.	2	0	0	0.00	12.00	162.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	QLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 19.400

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 774.00 MAX ELLC= 767.70

19.40	5.20	764.90	0.00	0.00	766.08	1.18	0.00	0.00	776.55
544.	0.	544.	0.	0.	62.	0.	3.	1.	776.55
0.06	0.00	8.73	0.00	0.000	0.013	0.000	0.000	759.70	150.01
0.001489	1.	1.	1.	0	0	0	0.00	12.00	162.00

*SECNO 20.000

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.50 MAX ELLC= 767.90

20.00	5.12	764.97	0.00	0.00	766.19	1.22	0.09	0.02	776.70
544.	0.	544.	0.	0.	61.	0.	3.	1.	776.70
0.06	0.00	8.85	0.00	0.000	0.013	0.000	0.000	759.85	150.01
0.001546	60.	60.	60.	2	0	0	0.00	12.00	162.00

*SECNO 22.500

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.50 MAX ELLC= 768.49

22.50	4.86	765.32	0.00	0.00	766.67	1.35	0.41	0.07	777.31
544.	0.	544.	0.	0.	58.	0.	3.	1.	777.31
0.07	0.00	9.33	0.00	0.000	0.013	0.000	0.000	760.46	150.01
0.001786	250.	250.	250.	2	0	0	0.00	12.00	162.00

*SECNO 22.510
WATER EL=X5 LINE= 765.367

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.50 MAX ELLC= 768.49

22.51	4.91	765.37	0.00	0.00	766.69	1.33	0.00	0.01	777.31
544.	0.	544.	0.	0.	59.	0.	3.	1.	777.31
0.07	0.00	9.24	0.00	0.000	0.013	0.000	0.000	760.46	150.01
0.001739	0.	0.	0.	0	0	0	0.00	12.00	162.00

CCHV= 0.300 CEHV= 0.500

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 22.700

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.50 MAX ELLC= 768.50

22.70	4.90	765.40	0.00	0.00	766.73	1.33	0.03	0.00	771.50
544.	0.	544.	0.	0.	59.	0.	3.	1.	771.50
0.07	0.00	9.24	0.00	0.000	0.013	0.000	0.000	760.50	150.01
0.001738	20.	20.	20.	0	0	0	0.00	12.00	162.00

*SECNO 23.000

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.50 MAX ELLC= 768.56

23.00	4.89	765.45	0.00	0.00	766.78	1.33	0.05	0.00	771.56
544.	0.	544.	0.	0.	59.	0.	3.	1.	771.56
0.07	0.00	9.26	0.00	0.000	0.013	0.000	0.000	760.56	150.01
0.001750	30.	30.	30.	1	0	0	0.00	12.00	162.00

*SECNO 23.100
WATER EL=XS LINE= 765.521

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.50 MAX ELLC= 768.56

23.10	4.96	765.52	0.00	0.00	766.82	1.30	0.00	0.01	771.56
544.	0.	544.	0.	0.	59.	0.	3.	1.	771.56
0.07	0.00	9.15	0.00	0.000	0.013	0.000	0.000	760.56	150.01
0.001690	0.	0.	0.	0	0	0	0.00	12.00	162.00

*SECNO 23.500

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.50 MAX ELLC= 768.68

23.50	4.91	765.59	0.00	0.00	766.92	1.33	0.09	0.01	771.68
544.	0.	544.	0.	0.	59.	0.	3.	1.	771.68
0.07	0.00	9.24	0.00	0.000	0.013	0.000	0.000	760.68	150.01
0.001737	50.	50.	50.	2	0	0	0.00	12.00	162.00

*SECNO 23.520

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.10 MAX ELLC= 769.00

23.52	5.67	766.37	0.00	0.00	767.10	0.73	0.00	0.18	771.50
544.	0.	544.	0.	0.	79.	0.	3.	1.	771.50
0.07	0.00	6.85	0.00	0.000	0.013	0.000	0.000	760.70	150.00
0.000781	2.	2.	2.	3	0	0	0.00	14.05	164.05

*SECNO 23.620

3370 NORMAL BRIDGE,NRD= 4 MIN ELTRD= 771.50 MAX ELLC= 769.00

23.62	6.10	766.80	0.00	0.00	767.20	0.40	0.00	0.10	771.50
620.	0.	620.	0.	0.	122.	0.	3.	1.	771.50
0.07	0.00	5.08	0.00	0.000	0.013	0.000	0.000	760.70	150.00
0.000333	10.	10.	10.	2	0	0	0.00	20.00	170.01

*SECNO 23.630
WATER EL=X5 LINE= 767.053

3370 NORMAL BRIDGE,NRD= 4 MIN ELTRD= 771.50 MAX ELLC= 769.00

23.63	6.35	767.05	0.00	0.00	767.42	0.37	0.00	0.01	771.50
620.	0.	620.	0.	0.	127.	0.	3.	1.	771.50
0.07	0.00	4.88	0.00	0.000	0.013	0.000	0.000	760.70	150.00
0.000298	0.	0.	0.	0	0	0	0.00	20.00	170.01

*SECNO 23.770

3370 NORMAL BRIDGE,NRD= 6 MIN ELTRD= 771.20 MAX ELLC= 769.00

23.77	6.32	767.06	0.00	0.00	767.43	0.37	0.00	0.00	771.54
620.	0.	620.	0.	0.	126.	0.	3.	1.	771.54
0.07	0.00	4.91	0.00	0.000	0.013	0.000	0.000	760.74	150.00
0.000303	15.	15.	15.	2	0	0	0.00	20.00	170.01

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 23.930

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.50 MAX ELLC= 768.80

23.93	6.12	766.89	0.00	0.00	767.61	0.71	0.01	0.17	771.57
497.	0.	497.	0.	0.	73.	0.	3.	1.	771.57
0.07	0.00	6.77	0.00	0.000	0.013	0.000	0.000	760.77	150.00
0.000799	16.	16.	16.	2	0	0	0.00	12.00	162.01

*SECNO 24.000

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.50 MAX ELLC= 768.82

24.00	6.11	766.90	0.00	0.00	767.61	0.71	0.01	0.00	771.59
497.	0.	497.	0.	0.	73.	0.	3.	1.	771.59
0.07	0.00	6.77	0.00	0.000	0.013	0.000	0.000	760.79	150.00
0.000801	7.	7.	7.	1	0	0	0.00	12.00	162.01

*SECNO 24.100
WATER EL=X5 LINE= 766.939

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.50 MAX ELLC= 768.82

24.10	6.15	766.94	0.00	0.00	767.64	0.70	0.00	0.00	771.59
497.	0.	497.	0.	0.	74.	0.	3.	1.	771.59
0.07	0.00	6.74	0.00	0.000	0.013	0.000	0.000	760.79	150.00
0.000790	0.	0.	0.	0	0	0	0.00	12.00	162.01

*SECNO 25.000

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.50 MAX ELLC= 769.06

25.00	5.96	767.00	0.00	0.00	767.75	0.75	0.08	0.02	771.84
497.	0.	497.	0.	0.	72.	0.	3.	1.	771.84
0.08	0.00	6.94	0.00	0.000	0.013	0.000	0.000	761.04	150.00
0.000856	100.	100.	100.	2	0	0	0.00	12.00	162.01

*SECNO 27.500

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 773.00 MAX ELLC= 769.62

27.50	5.53	767.17	0.00	0.00	768.05	0.87	0.24	0.06	772.45
497.	0.	497.	0.	0.	66.	0.	4.	1.	772.45
0.09	0.00	7.49	0.00	0.000	0.013	0.000	0.000	761.65	150.00
0.001048	250.	250.	250.	2	0	0	0.00	12.00	162.01

*SECNO 28.560

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 773.50 MAX ELLC= 769.93

28.56	5.36	767.26	0.00	0.00	768.19	0.93	0.12	0.03	772.71
497.	0.	497.	0.	0.	64.	0.	4.	1.	772.71
0.09	0.00	7.73	0.00	0.000	0.013	0.000	0.000	761.91	150.01
0.001143	106.	106.	106.	2	0	0	0.00	12.00	162.00

*SECNO 28.570

28.57	5.36	767.26	0.00	0.00	768.19	0.93	0.00	0.00	772.71
497.	0.	497.	0.	0.	64.	0.	4.	1.	772.71
0.09	0.00	7.73	0.00	0.000	0.013	0.000	0.000	761.91	150.01
0.001143	1.	1.	1.	0	0	0	0.00	12.00	162.00

*SECNO 28.650

3301 HV CHANGED MORE THAN HVINS

28.65	6.35	768.35	0.00	0.00	768.44	0.09	0.00	0.25	773.00
497.	0.	497.	0.	0.	204.	0.	4.	1.	773.00
0.09	0.00	2.44	0.00	0.000	0.013	0.000	0.000	762.00	100.04
0.000060	8.	8.	8.	2	0	0	0.00	32.12	132.16

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.00	3.30	32.00	0.00	0.00	0.00	0.00	762.00	762.00

*SECNO 28.660

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
*********	768.44	0.00	612.	0.	0.	0.	762.00	765.00
28.66	6.83	768.83	0.00	0.00	768.95	0.12	0.51	0.00	775.00
615.	0.	615.	0.	0.	218.	0.	4.	1.	775.00
0.09	0.00	2.81	0.00	0.000	0.013	0.000	0.000	762.00	100.00
0.000075	1.	1.	1.	2	0	6	0.00	32.00	132.01

CCHV= 0.100 CEHV= 0.300

*SECNO 28.990

28.99	8.92	768.92	0.00	0.00	768.96	0.05	0.00	0.01	772.00
615.	0.	595.	20.	0.	334.	27.	4.	1.	765.00
0.10	0.00	1.78	0.73	0.000	0.035	0.040	0.000	760.00	161.02
0.000166	44.	33.	50.	3	0	0	0.00	67.97	228.98

*SECNO 29.310

29.31	8.95	768.95	0.00	0.00	768.97	0.01	0.00	0.00	765.00
615.	10.	597.	8.	30.	622.	26.	5.	1.	765.00
0.11	0.32	0.96	0.32	0.040	0.035	0.040	0.000	760.00	159.62
0.000032	45.	32.	60.	2	0	0	0.00	103.56	263.18

*SECNO 30.130

30.13	8.91	768.91	0.00	0.00	768.99	0.08	0.01	0.02	765.00
615.	52.	532.	31.	56.	217.	34.	6.	1.	765.00
0.12	0.93	2.45	0.92	0.040	0.035	0.040	0.000	760.00	151.54
0.000262	72.	82.	72.	2	0	0	0.00	75.85	227.39

*SECNO 30.630

30.63	8.93	768.93	0.00	0.00	769.01	0.08	0.01	0.00	765.00
615.	52.	531.	32.	56.	218.	34.	6.	1.	765.00
0.12	0.93	2.44	0.92	0.040	0.035	0.040	0.000	760.00	151.50
0.000261	22.	50.	71.	1	0	0	0.00	75.92	227.42

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 31.670

31.67	3.93	768.93	0.00	0.00	769.08	0.15	0.05	0.02	776.00
615.	0.	615.	0.	0.	196.	0.	7.	1.	776.00
0.13	0.00	3.13	0.00	0.000	0.035	0.000	0.000	765.00	100.01
0.001068	124.	104.	136.	3	0	0	0.00	50.00	150.00

CCHV= 0.300 CEHV= 0.500
*SECNO 31.770

3301 HV CHANGED MORE THAN HVINS

31.77	3.62	768.62	0.00	0.00	769.40	0.78	0.01	0.32	776.50
615.	0.	615.	0.	0.	87.	0.	7.	1.	776.50
0.13	0.00	7.10	0.00	0.000	0.013	0.000	0.000	765.00	100.02
0.000993	10.	10.	10.	2	0	0	0.00	24.99	125.00

*SECNO 32.060

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

32.06	3.27	768.27	768.27	0.00	769.83	1.56	0.01	0.39	778.00
615.	0.	615.	0.	0.	61.	0.	7.	1.	778.00
0.13	0.00	10.01	0.00	0.000	0.013	0.000	0.000	765.00	100.02
0.002383	9.	9.	9.	3	11	0	0.00	19.99	120.00

*SECNO 32.070

3370 NORMAL BRIDGE,NRD= 8 MIN ELTRD= 778.00 MAX ELLC= 773.00

32.07	3.28	768.28	768.27	0.00	769.83	1.55	0.00	0.00	778.00
615.	0.	615.	0.	0.	62.	0.	7.	1.	778.00
0.13	0.00	10.00	0.00	0.000	0.013	0.000	0.000	765.00	100.02
0.002374	1.	1.	1.	0	15	0	0.00	19.99	120.00

*SECNO 33.150

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3370 NORMAL BRIDGE,NRD= 8 MIN ELTRD= 778.00 MAX ELLC= 773.33

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

33.15	3.27	768.60	768.60	0.00	770.16	1.56	0.26	0.00	778.33
615.	0.	615.	0.	0.	61.	0.	7.	1.	778.33
0.14	0.00	10.01	0.00	0.000	0.013	0.000	0.000	765.33	100.02
0.002382	108.	108.	108.	2	15	0	0.00	19.99	120.00

*SECNO 33.160

33.16	3.28	768.62	768.61	0.00	770.16	1.55	0.00	0.00	778.33
615.	0.	615.	0.	0.	62.	0.	7.	1.	778.33
0.14	0.00	9.99	0.00	0.000	0.013	0.000	0.000	765.33	100.02
0.002366	1.	1.	1.	0	5	0	0.00	19.99	120.00

*SECNO 33.260
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

33.26	3.28	768.64	768.64	0.00	770.19	1.55	0.02	0.00	778.36
615.	0.	615.	0.	0.	61.	0.	7.	1.	778.36
0.14	0.00	10.01	0.00	0.000	0.013	0.000	0.000	765.36	100.02
0.002378	10.	10.	10.	0	5	0	0.00	19.99	120.00

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.00	3.30	20.00	0.00	0.00	0.00	0.00	765.20	765.20

*SECNO 33.270

3301 HV CHANGED MORE THAN HVINS

PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
*********	770.03	0.00	621.	0.	0.	0.	765.20	767.80

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
33.27	6.53	771.90	0.00	0.00	772.26	0.37	2.07	0.00	778.37
615.	0.	615.	0.	0.	127.	0.	7.	1.	778.37
0.14	0.00	4.86	0.00	0.000	0.013	0.000	0.000	765.37	100.01
0.000290	1.	1.	1.	2	0	7	0.00	20.00	120.01

*SECNO 33.740

33.74	6.39	771.90	0.00	0.00	772.29	0.38	0.01	0.01	778.51
615.	0.	615.	0.	0.	124.	0.	7.	1.	778.51
0.14	0.00	4.97	0.00	0.000	0.013	0.000	0.000	765.51	100.01
0.000309	48.	48.	48.	2	0	0	0.00	20.00	120.01

*SECNO 33.750

3370 NORMAL BRIDGE,NRD= 8 MIN ELTRD= 780.00 MAX ELLC= 773.52

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 778.51 ELREA= 778.51

33.75	6.39	771.90	0.00	0.00	772.29	0.38	0.00	0.00	778.51
615.	0.	615.	0.	0.	124.	0.	7.	1.	778.51
0.14	0.00	4.97	0.00	0.000	0.013	0.000	0.000	765.51	100.01
0.000309	1.	1.	1.	0	0	0	0.00	20.00	120.01

*SECNO 34.710

3370 NORMAL BRIDGE,NRD= 8 MIN ELTRD= 780.00 MAX ELLC= 773.81

34.71	6.11	771.92	0.00	0.00	772.33	0.41	0.03	0.02	778.81
610.	0.	610.	0.	0.	118.	0.	7.	1.	778.81
0.14	0.00	5.17	0.00	0.000	0.013	0.000	0.000	765.81	100.01
0.000347	96.	96.	96.	2	0	0	0.00	20.00	120.01

*SECNO 34.720

34.72	6.11	771.92	0.00	0.00	772.33	0.41	0.00	0.00	778.81
610.	0.	610.	0.	0.	118.	0.	7.	1.	778.81
0.14	0.00	5.16	0.00	0.000	0.013	0.000	0.000	765.81	100.01
0.000346	1.	1.	1.	0	0	0	0.00	20.00	120.01

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 34.800

34.80	6.09	771.92	0.00	0.00	772.34	0.42	0.00	0.00	778.83
610.	0.	610.	0.	0.	118.	0.	7.	1.	778.83
0.14	0.00	5.18	0.00	0.000	0.013	0.000	0.000	765.83	100.01
0.000350	8.	8.	8.	2	0	0	0.00	20.00	120.01

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.00	3.30	20.00	0.00	0.00	0.00	0.00	765.80	765.80

*SECNO 34.810
PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
*********	772.31	0.00	611.	0.	0.	0.	765.77	768.67

34.81	7.18	773.02	0.00	0.00	773.31	0.30	0.97	0.00	778.83
610.	0.	610.	0.	0.	140.	0.	7.	1.	778.83
0.14	0.00	4 37	0.00	0.000	0.013	0.000	0.000	765.83	100.01
0.000217	1.	1.	1.	2	0	7	0.00	20.00	120.01

*SECNO 36.210

36.21	6.77	773.03	0.00	0.00	773.36	0.33	0.03	0.02	779.26
610.	0.	610.	0.	0.	131.	0.	8.	2.	779.26
0.15	0.00	4.64	0.00	0.000	0.013	0.000	0.000	766.26	100.01
0.000257	140.	140.	140.	2	0	0	0.00	20.00	120.01

*SECNO 38.050

38.05	6.24	773.05	0.00	0.00	773.45	0.40	0.05	0.03	779.81
610.	0.	610.	0.	0.	121.	0.	8.	2.	779.81
0.16	0.00	5.05	0.00	0.000	0.013	0.000	0.000	766.81	100.01
0.000325	184.	184.	184.	2	0	0	0.00	20.00	120.01

*SECNO 38.060

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3370 NORMAL BRIDGE,NRD= 8 MIN ELTRD= 780.00 MAX ELLC= 774.82

38.06	6.24	773.05	0.00	0.00	773.45	0.40	0.00	0.00	779.81
610.	0.	610.	0.	0.	121.	0.	8.	2.	779.81
0.16	0.00	5.05	0.00	0.000	0.013	0.000	0.000	766.81	100.01
0.000325	1.	1.	1.	0	0	0	0.00	20.00	120.01

*SECNO 39.760

3370 NORMAL BRIDGE,NRD= 8 MIN ELTRD= 780.00 MAX ELLC= 775.34

39.76	5.75	773.08	0.00	0.00	773.55	0.47	0.06	0.04	780.33
610.	0.	610.	0.	0.	111.	0.	9.	2.	780.33
0.17	0.00	5.50	0.00	0.000	0.013	0.000	0.000	767.33	100.01
0.000413	170.	170.	170.	2	0	0	0.00	20.00	120.01

*SECNO 39.770

39.77	5.75	773.08	0.00	0.00	773.55	0.47	0.00	0.00	780.33
610.	0.	610.	0.	0.	111.	0.	9.	2.	780.33
0.17	0.00	5.50	0.00	0.000	0.013	0.000	0.000	767.33	100.01
0.000414	1.	1.	1.	0	0	0	0.00	20.00	120.01

*SECNO 39.860

39.86	5.72	773.08	0.00	0.00	773.55	0.47	0.00	0.00	780.36
610.	0.	610.	0.	0.	110.	0.	9.	2.	780.36
0.17	0.00	5.52	0.00	0.000	0.013	0.000	0.000	767.36	100.01
0.000419	9.	9.	9.	2	0	0	0.00	20.00	120.01

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.00	3.30	20.00	0.00	0.00	0.00	0.00	767.40	767.40

*SECNO 39.870
PRESSURE AND WEIR FLOW

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
*********	773.60	0.00	614.	0.	0.	0.	767.40	770.30
39.87	7.23	774.58	0.00	0.00	774.88	0.29	1.32	0.00	780.36
610.	0.	610.	0.	0.	141.	0.	9.	2.	780.36
0.17	0.00	4.34	0.00	0.000	0.013	0.000	0.000	767.36	100.01
0.000213	1.	1.	1.	2	0	7	0.00	20.00	120.01

*SECNO 41.590

41.59	6.75	774.61	0.00	0.00	774.94	0.33	0.04	0.02	780.86
605.	0.	605.	0.	0.	131.	0.	9.	2.	780.86
0.18	0.00	4.63	0.00	0.000	0.013	0.000	0.000	767.86	100.01
0.000256	172.	172.	172.	2	0	0	0.00	20.00	120.01

*SECNO 43.350

43.35	6.23	774.63	0.00	0.00	775.02	0.39	0.05	0.03	781.40
605.	0.	605.	0.	0.	121.	0.	10.	2.	781.40
0.19	0.00	5.02	0.00	0.000	0.013	0.000	0.000	768.40	100.01
0.000322	176.	176.	176.	2	0	0	0.00	20.00	120.01

*SECNO 43.360

3370 NORMAL BRIDGE,NRD= 8 MIN ELTRD= 780.20 MAX ELLC= 776.41

43.36	6.23	774.63	0.00	0.00	775.02	0.39	0.00	0.00	781.40
605.	0.	605.	0.	0.	121.	0.	10.	2.	781.40
0.19	0.00	5.02	0.00	0.000	0.013	0.000	0.000	768.40	100.01
0.000322	1.	1.	1.	0	0	0	0.00	20.00	120.01

*SECNO 45.860

3370 NORMAL BRIDGE,NRD= 8 MIN ELTRD= 780.20 MAX ELLC= 777.17

45.86	5.50	774.67	0.00	0.00	775.17	0.50	0.10	0.06	782.16
605.	0.	605.	0.	0.	106.	0.	10.	2.	782.16
0.20	0.00	5.70	0.00	0.000	0.013	0.000	0.000	769.16	100.01
0.000462	250.	250.	250.	2	0	0	0.00	20.00	120.01

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 45.870									
45.87	5.52	774.68	0.00	0.00	775.17	0.50	0.00	0.00	782.16
600.	0.	600.	0.	0.	106.	0.	10.	2.	782.16
0.20	0.00	5.65	0.00	0.000	0.013	0.000	0.000	769.16	100.01
0.000455	1.	1.	1.	1	0	0	0.00	20.00	120.01
*SECNO 45.970									
45.97	5.49	774.68	0.00	0.00	775.18	0.50	0.00	0.00	782.19
600.	0.	600.	0.	0.	106.	0.	10.	2.	782.19
0.20	0.00	5.68	0.00	0.000	0.013	0.000	0.000	769.19	100.01
0.000460	10.	10.	10.	2	0	0	0.00	20.00	120.01

SPECIAL BRIDGE

SB	XK	XKOR	COPQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.00	3.30	20.00	0.00	0.00	0.00	0.00	769.20	769.20

*SECNO 45.980
PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
*********	775.19	0.00	604.	0.	0.	0.	769.20	771.90
45.98	6.93	776.12	0.00	0.00	776.43	0.31	1.25	0.00	782.19
600.	0.	600.	0.	0.	135.	0.	10.	2.	782.19
0.20	0.00	4.46	0.00	0.000	0.013	0.000	0.000	769.19	100.01
0.000232	1.	1.	1.	2	0	7	0.00	20.00	120.01
*SECNO 48.330									
48.33	6.24	776.15	0.00	0.00	776.53	0.38	0.06	0.04	782.91
600.	0.	600.	0.	0.	121.	0.	11.	2.	782.91
0.22	0.00	4.97	0.00	0.000	0.013	0.000	0.000	769.91	100.01
0.000315	235.	235.	235.	2	0	0	0.00	20.00	120.01

*SECNO 48.340

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3370 NORMAL BRIDGE,NRD= 8 MIN ELTRD= 784.70 MAX ELLC= 777.92

48.34	6.24	776.15	0.00	0.00	776.53	0.38	0.00	0.00	782.91
600.	0.	600.	0.	0.	121.	0.	11.	2.	782.91
0.22	0.00	4.97	0.00	0.000	0.013	0.000	0.000	769.91	100.01
0.000315	1.	1.	1.	0	0	0	0.00	20.00	120.01

*SECNO 49.240

3370 NORMAL BRIDGE,NRD= 8 MIN ELTRD= 784.70 MAX ELLC= 778.20

49.24	5.98	776.16	0.00	0.00	776.58	0.42	0.03	0.02	783.19
600.	0.	600.	0.	0.	115.	0.	11.	2.	783.19
0.22	0.00	5.20	0.00	0.000	0.013	0.000	0.000	770.19	100.01
0.000357	90.	90.	90.	2	0	0	0.00	20.00	120.01

*SECNO 49.250

49.25	5.98	776.16	0.00	0.00	776.58	0.42	0.00	0.00	783.19
600.	0.	600.	0.	0.	115.	0.	11.	2.	783.19
0.22	0.00	5.20	0.00	0.000	0.013	0.000	0.000	770.19	100.01
0.000357	1.	1.	1.	0	0	0	0.00	20.00	120.01

*SECNO 49.340

49.34	5.95	776.16	0.00	0.00	776.59	0.42	0.00	0.00	783.21
600.	0.	600.	0.	0.	115.	0.	11.	2.	783.21
0.22	0.00	5.22	0.00	0.000	0.013	0.000	0.000	770.21	100.01
0.000362	9.	9.	9.	2	0	0	0.00	20.00	120.01

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.00	3.30	20.00	0.00	0.00	0.00	0.00	769.70	769.70

*SECNO 49.350
PRESSURE AND WEIR FLOW

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
*********	776.07	0.00	604.	0.	0.	0.	770.20	773.10
49.35	7.17	777.38	0.00	0.00	777.67	0.29	1.08	0.00	783.21
600.	0.	600.	0.	0.	139.	0.	11.	2.	783.21
0.22	0.00	4.31	0.00	0.000	0.013	0.000	0.000	770.21	100.01
0.000211	1.	1.	1.	2	0	7	0.00	20.00	120.01
*SECNO 50.410									
50.41	6.87	777.39	0.00	0.00	777.71	0.31	0.02	0.01	783.52
600.	0.	600.	0.	0.	133.	0.	12.	2.	783.52
0.23	0.00	4.50	0.00	0.000	0.013	0.000	0.000	770.52	100.01
0.000238	106.	106.	106.	2	0	0	0.00	20.00	120.01
*SECNO 51.550									
51.55	6.49	777.40	0.00	0.00	777.76	0.35	0.03	0.02	783.92
600.	0.	600.	0.	0.	126.	0.	12.	2.	783.92
0.24	0.00	4.77	0.00	0.000	0.013	0.000	0.000	770.92	100.01
0.000281	114.	114.	114.	2	0	0	0.00	20.00	120.01

TC POND DIVERSION:RATING CURVE METHOD FOR EVALUATING THE DIVERSION

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	DSWS	USWS	DSSNO	USSNO
118.22	118.23	0.01	118.22	118.23	0.01	5	768.829	768.829	28.660	28.660

TC JUNCTION BOX DIVERSION:RATING CURVE METHOD FOR EVALUATING THE DIVERSION

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	DSWS	USWS	DSSNO	USSNO
76.08	76.08	0.01	194.31	194.31	0.00	5	766.803	766.803	23.620	23.620

THIS RUN EXECUTED 17-DEC-90 17:05:50

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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55
**************************************************

T1
T2
T3        50-YEAR FLOW

J1  ICHECK     INQ        NINV       IDIR       STRT       METRIC     HVINS      Q          WSEL       FQ

       0.        3.         0.         0.  0.000000       0.00       0.0         0.    757.500      0.000

J2  NPROF      IPLOT      PRFVS      XSECV      XSECH      FN         ALLDC      IBW        CHNIM      ITRACE

     2.000      0.000     -1.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 2

CCHV= 0.500 CEHV= 0.700
*SECNO 0.000
STA: 0+00: D/S LIMIT OF RIPRAP EXIT CHANNEL(20' D/S OF BAFFLED APRON)

0.00	9.50	757.50	0.00	757.50	757.73	0.23	0.00	0.00	765.00
738.	0.	738.	0.	0.	190.	0.	0.	0.	765.00
0.00	0.00	3.88	0.00	0.000	0.035	0.000	0.000	748.00	100.00
0.001011	0.	0.	0.	0	0	0	0.00	20.01	120.02

CCHV= 0.100 CEHV= 0.300
*SECNO 0.100

0.10	9.50	757.50	0.00	0.00	757.74	0.23	0.00	0.00	765.00
738.	0.	738.	0.	0.	190.	0.	0.	0.	765.00
0.00	0.00	3.88	0.00	0.000	0.013	0.000	0.000	748.00	100.00
0.000140	9.	9.	9.	0	0	0	0.00	20.01	120.02

*SECNO 0.170

0.17	9.50	757.50	0.00	0.00	757.74	0.23	0.00	0.00	765.00
738.	0.	738.	0.	0.	190.	0.	0.	0.	765.00
0.00	0.00	3.88	0.00	0.000	0.013	0.000	0.000	748.00	100.00
0.000139	8.	8.	8.	0	0	0	0.00	20.01	120.02

*SECNO 0.180
STA. 0+18: U/S LIMIT OF RIPRAP EXIT CHANNEL-BEGIN ENEGY DISSIPATOR

0.18	9.43	757.43	0.00	0.00	757.77	0.33	0.00	0.03	759.00
738.	0.	738.	0.	0.	159.	0.	0.	0.	759.00
0.00	0.00	4.63	0.00	0.000	0.013	0.000	0.000	748.00	100.00
0.000359	1.	1.	1.	2	0	0	0.00	20.07	120.07

*SECNO 0.330

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

0.33	4.95	759.95	759.95	0.00	761.71	1.77	0.01	0.43	766.00
738.	0.	738.	0.	0.	69.	0.	0.	0.	766.00
0.00	0.00	10.66	0.00	0.000	0.013	0.000	0.000	755.00	100.01
0.004460	14.	14.	14.	20	11	0	0.00	20.06	120.06

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 0.340

3301 HV CHANGED MORE THAN HVINS

STA. 0+34: U/S LIMIT OF ENERGY DISSIPATOR

0.34	6.31	761.31	0.00	0.00	761.84	0.53	0.00	0.12	766.00
738.	0.	738.	0.	0.	126.	0.	0.	0.	766.00
0.00	0.00	5.85	0.00	0.000	0.013	0.000	0.000	755.00	100.00
0.000432	1.	1.	1.	3	0	0	0.00	20.01	120.02

*SECNO 0.380

0.38	6.21	761.21	0.00	0.00	761.88	0.68	0.00	0.04	766.00
738.	0.	738.	0.	0.	112.	0.	0.	0.	766.00
0.00	0.00	6.60	0.00	0.000	0.013	0.000	0.000	755.00	100.00
0.000587	4.	4.	4.	2	0	0	0.00	18.01	118.02

*SECNO 0.420

0.42	6.06	761.06	0.00	0.00	761.95	0.90	0.00	0.07	766.00
738.	0.	738.	0.	0.	97.	0.	0.	0.	766.00
0.00	0.00	7.61	0.00	0.000	0.013	0.000	0.000	755.00	100.00
0.000851	4.	4.	4.	2	0	0	0.00	16.01	116.02

*SECNO 0.460

0.46	5.79	760.79	0.00	0.00	762.07	1.28	0.00	0.12	766.00
738.	0.	738.	0.	0.	81.	0.	0.	0.	766.00
0.00	0.00	9.09	0.00	0.000	0.013	0.000	0.000	755.00	100.00
0.001357	4.	4.	4.	2	0	0	0.00	14.01	114.02

*SECNO 0.500

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 763.00 MAX ELLC= 762.00

STA. 0+50:NOTE XSEC. #'S REFLECT STA.

0.50	5.16	760.16	0.00	0.00	762.36	2.20	0.01	0.28	765.00
738.	0.	738.	0.	0.	62.	0.	0.	0.	765.00
0.00	0.00	11.91	0.00	0.000	0.013	0.000	0.000	755.00	100.00
0.002782	4.	4.	4.	3	0	0	0.00	12.01	112.02

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 1.000

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 764.20 MAX ELLC= 762.09

STA. 1+00

1.00	5.40	760.49	0.00	0.00	762.51	2.01	0.13	0.02	765.09
738.	0.	738.	0.	0.	65.	0.	0.	0.	765.09
0.00	0.00	11.39	0.00	0.000	0.013	0.000	0.000	755.09	100.00
0.002464	50.	50.	50.	2	0	0	0.00	12.01	112.02

*SECNO 1.250

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 765.90 MAX ELLC= 762.14

1.25	5.48	760.62	0.00	0.00	762.57	1.95	0.06	0.01	765.14
738.	0.	738.	0.	0.	66.	0.	0.	0.	765.14
0.00	0.00	11.21	0.00	0.000	0.013	0.000	0.000	755.14	100.00
0.002360	25.	25.	25.	2	0	0	0.00	12.01	112.02

*SECNO 2.500

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 767.00 MAX ELLC= 762.52

2.50	5.66	761.04	0.00	0.00	762.87	1.83	0.28	0.01	765.38
738.	0.	738.	0.	0.	68.	0.	0.	0.	765.38
0.01	0.00	10.85	0.00	0.000	0.013	0.000	0.000	755.38	100.00
0.002163	125.	125.	125.	2	0	0	0.00	12.01	112.02

*SECNO 3.500

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 767.00 MAX ELLC= 762.71

3.50	5.72	761.29	0.00	0.00	763.08	1.79	0.21	0.00	765.57
738.	0.	738.	0.	0.	69.	0.	1.	0.	765.57
0.01	0.00	10.74	0.00	0.000	0.013	0.000	0.000	755.57	100.00
0.002106	100.	100.	100.	2	0	0	0.00	12.01	112.02

*SECNO 4.300

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 767.00 MAX ELLC= 762.86

4.30	5.77	761.49	0.00	0.00	763.25	1.76	0.17	0.00	765.72
738.	0.	738.	0.	0.	69.	0.	1.	0.	765.72
0.01	0.00	10.65	0.00	0.000	0.013	0.000	0.000	755.72	100.00
0.002057	80.	80.	80.	2	0	0	0.00	12.01	112.02

*SECNO 4.550

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 767.00 MAX ELLC= 762.99

4.55	5.37	761.36	0.00	0.00	763.39	2.04	0.06	0.08	773.00
738.	0.	738.	0.	0.	64.	0.	1.	0.	773.00
0.01	0.00	11.46	0.00	0.000	0.013	0.000	0.000	755.99	150.01
0.002508	25.	25.	25.	3	0	0	0.00	12.00	162.00

*SECNO 5.000

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 767.00 MAX ELLC= 763.08

5.00	5.49	761.56	0.00	0.00	763.51	1.95	0.11	0.01	773.09
738.	0.	738.	0.	0.	66.	0.	1.	0.	773.09
0.01	0.00	11.21	0.00	0.000	0.013	0.000	0.000	756.08	150.01
0.002363	45.	45.	45.	2	0	0	0.00	12.00	162.00

*SECNO 7.500

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 768.00 MAX ELLC= 763.55

7.50	5.76	762.31	0.00	0.00	764.08	1.77	0.55	0.02	773.56
738.	0.	738.	0.	0.	69.	0.	1.	0.	773.56
0.02	0.00	10.68	0.00	0.000	0.013	0.000	0.000	756.55	150.01
0.002073	250.	250.	250.	3	0	0	0.00	12.00	162.00

*SECNO 10.000

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 769.00 MAX ELLC= 764.03

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
10.00	5.85	762.88	0.00	0.00	764.60	1.71	0.51	0.01	774.04
738.	0.	738.	0.	0.	70.	0.	2.	0.	774.04
0.03	0.00	10.50	0.00	0.000	0.013	0.000	0.000	757.03	150.01
0.001985	250.	250.	250.	2	0	0	0.00	12.00	162.00

*SECNO 12.500

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.25 MAX ELLC= 764.51

12.50	5.89	763.40	0.00	0.00	765.09	1.69	0.49	0.00	774.52
738.	0.	738.	0.	0.	71.	0.	2.	0.	774.52
0.03	0.00	10.44	0.00	0.000	0.013	0.000	0.000	757.51	150.01
0.001952	250.	250.	250.	2	0	0	0.00	12.00	162.00

*SECNO 15.000

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 772.90 MAX ELLC= 764.98

15.00	5.91	763.89	0.00	0.00	765.58	1.69	0.49	0.00	774.99
738.	0.	738.	0.	0.	71.	0.	2.	0.	774.99
0.04	0.00	10.43	0.00	0.000	0.013	0.000	0.000	757.98	150.01
0.001946	250.	250.	250.	1	0	0	0.00	12.00	162.00

*SECNO 17.500

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 772.80 MAX ELLC= 765.46

17.50	5.93	764.40	0.00	0.00	766.06	1.67	0.48	0.00	775.47
738.	0.	738.	0.	0.	71.	0.	3.	0.	775.47
0.05	0.00	10.36	0.00	0.000	0.013	0.000	0.000	758.46	150.01
0.001913	250.	250.	250.	2	0	0	0.00	12.00	162.00

CCHV= 0.300 CEHV= 0.500
*SECNO 18.280

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 772.80 MAX ELLC= 765.61

18.28	5.94	764.55	0.00	0.00	766.21	1.67	0.15	0.00	775.62
738.	0.	738.	0.	0.	71.	0.	3.	1.	775.62
0.05	0.00	10.36	0.00	0.000	0.013	0.000	0.000	758.61	150.01
0.001913	78.	78.	78.	0	0	0	0.00	12.00	162.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 18.330

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 774.00 MAX ELLC= 767.10

18.33	6.62	765.22	0.00	0.00	766.37	1.15	0.01	0.15	774.00
738.	0.	738.	0.	0.	86.	0.	3.	1.	774.00
0.05	0.00	8.62	0.00	0.000	0.013	0.000	0.000	758.60	100.06
0.001168	5.	5.	5.	3	0	0	0.00	12.99	113.04

*SECNO 18.380

3265 DIVIDED FLOW

3370 NORMAL BRIDGE,NRD= 4 MIN ELTRD= 774.00 MAX ELLC= 767.10

18.38	7.19	765.79	0.00	0.00	766.51	0.72	0.01	0.13	774.00
738.	0.	738.	0.	0.	109.	0.	3.	1.	774.00
0.05	0.00	6.79	0.00	0.000	0.013	0.000	0.000	758.60	100.05
0.001052	5.	5.	5.	3	0	0	0.00	15.19	116.35

*SECNO 18.390
WATER EL=X5 LINE= 765.944

3265 DIVIDED FLOW

18.39	7.34	765.94	0.00	0.00	766.63	0.69	0.00	0.01	774.00
738.	0.	738.	0.	0.	111.	0.	3.	1.	774.00
0.05	0.00	6.65	0.00	0.000	0.013	0.000	0.000	758.60	100.05
0.000999	0.	0.	0.	0	0	0	0.00	15.19	116.35

*SECNO 18.540

3265 DIVIDED FLOW

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3370 NORMAL BRIDGE,NRD= 4 MIN ELTRD= 774.00 MAX ELLC= 767.10

18.54	7.31	765.96	0.00	0.00	766.65	0.69	0.02	0.00	774.00
738.	0.	738.	0.	0.	110.	0.	3.	1.	774.00
0.05	0.00	6.68	0.00	0.000	0.013	0.000	0.000	758.65	100.05
0.001007	16.	16.	16.	2	0	0	0.00	15.24	125.40

*SECNO 18.541
WATER EL=XS LINE= 766.097

3265 DIVIDED FLOW

18.54	7.45	766.10	0.00	0.00	766.76	0.67	0.00	0.01	774.00
738.	0.	738.	0.	0.	113.	0.	3.	1.	774.00
0.05	0.00	6.55	0.00	0.000	0.013	0.000	0.000	758.65	100.05
0.000960	0.	0.	0.	0	0	0	0.00	15.24	125.40

*SECNO 18.550

3265 DIVIDED FLOW

3370 NORMAL BRIDGE,NRD= 12 MIN ELTRD= 774.00 MAX ELLC= 766.30

18.55	7.09	765.89	0.00	0.00	766.98	1.09	0.00	0.21	762.55
738.	0.	738.	0.	0.	88.	0.	3.	1.	762.55
0.05	0.00	8.37	0.00	0.000	0.013	0.000	0.000	758.80	109.97
0.001903	1.	1.	1.	2	0	0	-7.11	15.07	134.98

*SECNO 19.150

3265 DIVIDED FLOW

3370 NORMAL BRIDGE,NRD= 12 MIN ELTRD= 774.15 MAX ELLC= 766.80

19.15	6.64	765.94	0.00	0.00	767.16	1.22	0.12	0.07	763.05
738.	0.	738.	0.	0.	83.	0.	3.	1.	762.70
0.05	0.00	8.86	0.00	0.000	0.013	0.000	0.000	759.30	109.97
0.002000	60.	60.	60.	2	0	0	-5.23	15.06	134.98

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 19.160

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE,NRD= 4 MIN ELTRD= 774.00 MAX ELLC= 767.40

19.16	7.31	766.61	0.00	0.00	767.31	0.70	0.00	0.16	770.24
738.	0.	738.	0.	0.	110.	0.	3.	1.	770.24
0.05	0.00	6.72	0.00	0.000	0.013	0.000	0.000	759.30	100.00
0.001028	1.	1.	1.	3	0	0	0.00	15.03	125.04

*SECNO 19.280

3265 DIVIDED FLOW

3370 NORMAL BRIDGE,NRD= 4 MIN ELTRD= 774.00 MAX ELLC= 767.40

19.28	6.95	766.59	0.00	0.00	767.37	0.78	0.01	0.04	770.39
738.	0.	738.	0.	0.	104.	0.	3.	1.	770.39
0.05	0.00	7.07	0.00	0.000	0.013	0.000	0.000	759.64	100.00
0.001166	12.	12.	12.	2	0	0	0.00	15.03	117.04

*SECNO 19.290

3370 NORMAL BRIDGE,NRD= 4 MIN ELTRD= 774.00 MAX ELLC= 767.40

19.29	6.95	766.59	0.00	0.00	767.37	0.78	0.00	0.00	770.39
738.	0.	738.	0.	0.	104.	0.	3.	1.	770.39
0.05	0.00	7.07	0.00	0.000	0.013	0.000	0.000	759.64	100.00
0.000692	1.	1.	1.	0	0	0	0.00	15.01	115.02

*SECNO 19.390

3301 HV CHANGED MORE THAN HVINS

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 774.00 MAX ELLC= 767.70

19.39	6.62	766.32	0.00	0.00	767.66	1.34	0.01	0.28	776.55
738.	0.	738.	0.	0.	79.	0.	3.	1.	776.55
0.05	0.00	9.29	0.00	0.000	0.013	0.000	0.000	759.70	150.01
0.001431	10.	10.	10.	2	0	0	0.00	12.00	162.00

*SECNO 19.400

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 774.00 MAX ELLC= 767.70

19.40	6.62	766.32	0.00	0.00	767.66	1.34	0.00	0.00	776.55
738.	0.	738.	0.	0.	79.	0.	3.	1.	776.55
0.05	0.00	9.29	0.00	0.000	0.013	0.000	0.000	759.70	150.01
0.001433	1.	1.	1.	0	0	0	0.00	12.00	162.00

*SECNO 20.000

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.50 MAX ELLC= 767.90

20.00	6.54	766.39	0.00	0.00	767.76	1.37	0.09	0.02	776.70
738.	0.	738.	0.	0.	78.	0.	3.	1.	776.70
0.05	0.00	9.40	0.00	0.000	0.013	0.000	0.000	759.85	150.01
0.001476	60.	60.	60.	2	0	0	0.00	12.00	162.00

*SECNO 22.500

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.50 MAX ELLC= 768.49

22.50	6.26	766.72	0.00	0.00	768.22	1.50	0.39	0.06	777.31
738.	0.	738.	0.	0.	75.	0.	4.	1.	777.31
0.06	0.00	9.82	0.00	0.000	0.013	0.000	0.000	760.46	150.01
0.001659	250.	250.	250.	2	0	0	0.00	12.00	162.00

*SECNO 22.510
WATER EL=X5 LINE= 766.778

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.50 MAX ELLC= 768.49

22.51	6.32	766.78	0.00	0.00	768.25	1.47	0.00	0.01	777.31
738.	0.	738.	0.	0.	76.	0.	4.	1.	777.31
0.06	0.00	9.73	0.00	0.000	0.013	0.000	0.000	760.46	150.01
0.001619	0.	0.	0.	0	0	0	0.00	12.00	162.00

CCHV= 0.300 CEHV= 0.500
*SECNO 22.700

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.50 MAX ELLC= 768.50

22.70	6.31	766.81	0.00	0.00	768.28	1.47	0.03	0.00	771.50
738.	0.	738.	0.	0.	76.	0.	4.	1.	771.50
0.06	0.00	9.73	0.00	0.000	0.013	0.000	0.000	760.50	150.00
0.001618	20.	20.	20.	0	0	0	0.00	12.00	162.01

*SECNO 23.000

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.50 MAX ELLC= 768.56

23.00	6.29	766.86	0.00	0.00	768.33	1.48	0.05	0.00	771.56
738.	0.	738.	0.	0.	76.	0.	4.	1.	771.56
0.06	0.00	9.76	0.00	0.000	0.013	0.000	0.000	760.56	150.00
0.001629	30.	30.	30.	1	0	0	0.00	12.00	162.01

*SECNO 23.100
WATER EL=X5 LINE= 766.936

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.50 MAX ELLC= 768.56

23.10	6.37	766.94	0.00	0.00	768.38	1.45	0.00	0.01	771.56
738.	0.	738.	0.	0.	76.	0.	4.	1.	771.56
0.06	0.00	9.65	0.00	0.000	0.013	0.000	0.000	760.56	150.00
0.001582	0.	0.	0.	0	0	0	0.00	12.00	162.01

*SECNO 23.500

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.50 MAX ELLC= 768.68

23.50	6.32	767.00	0.00	0.00	768.47	1.47	0.08	0.01	771.68
738.	0.	738.	0.	0.	76.	0.	4.	1.	771.68
0.06	0.00	9.73	0.00	0.000	0.013	0.000	0.000	760.68	150.00
0.001619	50.	50.	50.	2	0	0	0.00	12.00	162.01

*SECNO 23.520

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.10 MAX ELLC= 769.00

23.52	7.11	767.81	0.00	0.00	768.66	0.85	0.00	0.19	771.50
738.	0.	738.	0.	0.	100.	0.	4.	1.	771.50
0.06	0.00	7.40	0.00	0.000	0.013	0.000	0.000	760.70	150.00
0.000777	2.	2.	2.	3	0	0	0.00	14.06	164.07

*SECNO 23.620

3370 NORMAL BRIDGE,NRD= 4 MIN ELTRD= 771.50 MAX ELLC= 769.00

23.62	7.52	768.22	0.00	0.00	768.76	0.54	0.01	0.09	771.50
890.	0.	890.	0.	0.	150.	0.	4.	1.	771.50
0.06	0.00	5.92	0.00	0.000	0.013	0.000	0.000	760.70	150.00
0.000384	10.	10.	10.	2	0	0	0.00	20.00	170.01

*SECNO 23.630
WATER EL=X5 LINE= 768.465

3370 NORMAL BRIDGE,NRD= 4 MIN ELTRD= 771.50 MAX ELLC= 769.00

23.63	7.77	768.47	0.00	0.00	768.98	0.51	0.00	0.01	771.50
890.	0.	890.	0.	0.	155.	0.	4.	1.	771.50
0.06	0.00	5.73	0.00	0.000	0.013	0.000	0.000	760.70	150.00
0.000352	0.	0.	0.	0	0	0	0.00	20.00	170.01

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 23.770

3370 NORMAL BRIDGE,NRD= 6 MIN ELTRD= 771.20 MAX ELLC= 769.00

23.77	7.73	768.47	0.00	0.00	768.98	0.51	0.01	0.00	771.54
890.	0.	890.	0.	0.	155.	0.	4.	1.	771.54
0.07	0.00	5.76	0.00	0.000	0.013	0.000	0.000	760.74	150.00
0.000356	15.	15.	15.	2	0	0	0.00	20.00	170.01

*SECNO 23.930

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.50 MAX ELLC= 768.80

23.93	7.54	768.31	0.00	0.00	769.16	0.84	0.01	0.16	771.57
667.	0.	667.	0.	0.	90.	0.	4.	1.	771.57
0.07	0.00	7.37	0.00	0.000	0.013	0.000	0.000	760.77	150.00
0.000832	16.	16.	16.	2	0	0	0.00	12.00	162.01

*SECNO 24.000

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.50 MAX ELLC= 768.82

24.00	7.53	768.32	0.00	0.00	769.16	0.84	0.01	0.00	771.59
667.	0.	667.	0.	0.	90.	0.	4.	1.	771.59
0.07	0.00	7.38	0.00	0.000	0.013	0.000	0.000	760.79	150.00
0.000834	7.	7.	7.	1	0	0	0.00	12.00	162.01

*SECNO 24.100
WATER EL=X5 LINE= 768.357

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.50 MAX ELLC= 768.82

24.10	7.57	768.36	0.00	0.00	769.19	0.84	0.00	0.00	771.59
667.	0.	667.	0.	0.	91.	0.	4.	1.	771.59
0.07	0.00	7.34	0.00	0.000	0.013	0.000	0.000	760.79	150.00
0.000824	0.	0.	0.	0	0	0	0.00	12.00	162.01

*SECNO 25.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.50 MAX ELLC= 769.06									
25.00	7.39	768.42	0.00	0.00	769.30	0.88	0.09	0.02	771.84
667.	0.	667.	0.	0.	89.	0.	4.	1.	771.84
0.07	0.00	7.52	0.00	0.000	0.013	0.000	0.000	761.04	150.00
0.000878	100.	100.	100.	2	0	0	0.00	12.00	162.01
*SECNO 27.500									
3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 773.00 MAX ELLC= 769.62									
27.50	6.96	768.60	0.00	0.00	769.59	0.99	0.24	0.06	772.45
667.	0.	667.	0.	0.	83.	0.	5.	1.	772.45
0.08	0.00	7.98	0.00	0.000	0.013	0.000	0.000	761.65	150.00
0.001025	250.	250.	250.	2	0	0	0.00	12.00	162.01
*SECNO 28.560									
3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 773.50 MAX ELLC= 769.93									
28.56	6.78	768.69	0.00	0.00	769.73	1.04	0.11	0.03	772.71
667.	0.	667.	0.	0.	81.	0.	5.	1.	772.71
0.08	0.00	8.19	0.00	0.000	0.013	0.000	0.000	761.91	150.00
0.001096	106.	106.	106.	2	0	0	0.00	12.00	162.01
*SECNO 28.570									
28.57	6.78	768.69	0.00	0.00	769.73	1.04	0.00	0.00	772.71
667.	0.	667.	0.	0.	81.	0.	5.	1.	772.71
0.08	0.00	8.19	0.00	0.000	0.013	0.000	0.000	761.91	150.00
0.001096	1.	1.	1.	0	0	0	0.00	12.00	162.01
*SECNO 28.650									
3301 HV CHANGED MORE THAN HVINS									
28.65	7.91	769.91	0.00	0.00	770.01	0.11	0.00	0.28	773.00
667.	0.	667.	0.	0.	254.	0.	5.	1.	773.00
0.08	0.00	2.63	0.00	0.000	0.013	0.000	0.000	762.00	100.03
0.000057	8.	8.	8.	2	0	0	0.00	32.14	132.17

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SPECIAL BRIDGE

SB	KK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.00	3.30	32.00	0.00	0.00	0.00	0.00	762.00	762.00

*SECNO 28.660
PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
*********	770.01	0.00	885.	0.	0.	0.	762.00	765.00
28.66	8.34	770.34	0.00	0.00	770.51	0.17	0.49	0.00	775.00
885.	0.	885.	0.	0.	267.	0.	5.	1.	775.00
0.08	0.00	3.32	0.00	0.000	0.013	0.000	0.000	762.00	100.00
0.000087	1.	1.	1.	2	0	9	0.00	32.00	132.01

CCHV= 0.100 CEHV= 0.300
*SECNO 28.990

28.99	10.47	770.47	0.00	0.00	770.52	0.06	0.00	0.01	772.00
885.	0.	836.	49.	0.	422.	53.	5.	1.	765.00
0.09	0.00	1.98	0.93	0.000	0.035	0.040	0.000	760.00	155.48
0.000171	44.	33.	50.	3	0	0	0.00	79.04	234.52

*SECNO 29.310

29.31	10.51	770.51	0.00	0.00	770.53	0.02	0.00	0.00	765.00
885.	25.	839.	21.	59.	738.	51.	6.	1.	765.00
0.10	0.42	1.14	0.42	0.040	0.035	0.040	0.000	760.00	153.57
0.000035	45.	32.	60.	2	0	0	0.00	114.80	268.37

*SECNO 30.130

30.13	10.47	770.47	0.00	0.00	770.56	0.09	0.01	0.02	765.00
885.	120.	693.	72.	109.	264.	66.	7.	1.	765.00
0.11	1.10	2.62	1.09	0.040	0.035	0.040	0.000	760.00	140.23
0.000233	72.	82.	72.	2	0	0	0.00	94.07	234.30

*SECNO 30.630

30.63	10.48	770.48	0.00	0.00	770.57	0.09	0.01	0.00	765.00
885.	120.	693.	72.	109.	264.	67.	7.	1.	765.00
0.11	1.10	2.62	1.09	0.040	0.035	0.040	0.000	760.00	140.19
0.000232	22.	50.	71.	1	0	0	0.00	94.14	234.33

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 31.670									
31.67	5.47	770.47	0.00	0.00	770.63	0.16	0.04	0.02	776.00
885.	0.	885.	0.	0.	273.	0.	8.	1.	776.00
0.12	0.00	3.24	0.00	0.000	0.035	0.000	0.000	765.00	100.01
0.000785	124.	104.	136.	3	0	0	0.00	50.00	150.00
CCHV= 0.300 CEHV= 0.500									
*SECNO 31.770									
3301 HV CHANGED MORE THAN HVINS									
31.77	5.17	770.17	0.00	0.00	770.95	0.78	0.01	0.31	776.50
885.	0.	885.	0.	0.	125.	0.	8.	1.	776.50
0.12	0.00	7.07	0.00	0.000	0.013	0.000	0.000	765.00	100.01
0.000681	10.	10.	10.	2	0	0	0.00	24.99	125.01
*SECNO 32.060									
3301 HV CHANGED MORE THAN HVINS									
32.06	4.87	769.87	0.00	0.00	771.26	1.39	0.01	0.31	778.00
885.	0.	885.	0.	0.	93.	0.	8.	1.	778.00
0.12	0.00	9.47	0.00	0.000	0.013	0.000	0.000	765.00	100.01
0.001428	9.	9.	9.	2	0	0	0.00	19.99	120.01
*SECNO 32.070									
3370 NORMAL BRIDGE,NRD= 8 MIN ELTRD= 778.00 MAX ELLC= 773.00									
32.07	4.87	769.87	0.00	0.00	771.27	1.40	0.00	0.00	778.00
885.	0.	885.	0.	0.	93.	0.	8.	1.	778.00
0.12	0.00	9.48	0.00	0.000	0.013	0.000	0.000	765.00	100.01
0.001432	1.	1.	1.	0	0	0	0.00	19.99	120.01
*SECNO 33.150									
3370 NORMAL BRIDGE,NRD= 8 MIN ELTRD= 778.00 MAX ELLC= 773.33									
33.15	4.63	769.96	0.00	0.00	771.51	1.55	0.17	0.08	778.33
885.	0.	885.	0.	0.	89.	0.	9.	1.	778.33
0.13	0.00	9.99	0.00	0.000	0.013	0.000	0.000	765.33	100.01
0.001666	108.	108.	108.	2	0	0	0.00	19.99	120 01

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 33.160									
33.16	4.63	769.96	0.00	0.00	771.51	1.55	0.00	0.00	778.33
885.	0.	885.	0.	0.	89.	0.	9.	1.	778.33
0.13	0.00	10.00	0.00	0.000	0.013	0.000	0.000	765.33	100.01
0.001670	1.	1.	1.	0	0	0	0.00	19.99	120.01
*SECNO 33.260									
33.26	4.60	769.97	0.00	0.00	771.54	1.57	0.02	0.01	778.36
885.	0.	885.	0.	0.	88.	0.	9.	1.	778.36
0.13	0.00	10.06	0.00	0.000	0.013	0.000	0.000	765.36	100.01
0.001699	10.	10.	10.	2	0	0	0.00	19.99	120.01

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.00	3.30	20.00	0.00	0.00	0.00	0.00	765.20	765.20

*SECNO 33.270

3301 HV CHANGED MORE THAN HVINS

PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
*********	771.37	0.00	888.	0.	0.	0.	765.20	767.80
33.27	7.60	772.97	0.00	0.00	773.52	0.55	1.99	0.00	778.37
885.	0.	885.	0.	0.	148.	0.	9.	1.	778.37
0.13	0.00	5.98	0.00	0.000	0.013	0.000	0.000	765.37	100.01
0.000388	1.	1.	1.	2	0	7	0.00	20.00	120.01
*SECNO 33.740									
33.74	7.46	772.98	0.00	0.00	773.55	0.58	0.02	0.01	778.51
885.	0.	885.	0.	0.	145.	0.	9.	2.	778.51
0.13	0.00	6.09	0.00	0.000	0.013	0.000	0.000	765.51	100.01
0.000409	48.	48.	48.	2	0	0	0.00	20.00	120.01

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 33.750

3370 NORMAL BRIDGE,NRD= 8 MIN ELTRD= 780.00 MAX ELLC= 773.52

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 778.51 ELREA= 778.51

33.75	7.46	772.98	0.00	0.00	773.55	0.58	0.00	0.00	778.51
885.	0.	885.	0.	0.	145.	0.	9.	2.	778.51
0.13	0.00	6.10	0.00	0.000	0.013	0.000	0.000	765.51	100.01
0.000409	1.	1.	1.	0	0	0	0.00	20.00	120.01

*SECNO 34.710

3370 NORMAL BRIDGE,NRD= 8 MIN ELTRD= 780.00 MAX ELLC= 773.81

34.71	7.19	773.00	0.00	0.00	773.62	0.62	0.04	0.02	778.81
880.	0.	880.	0.	0.	140.	0.	9.	2.	778.81
0.13	0.00	6.30	0.00	0.000	0.013	0.000	0.000	765.81	100.01
0.000451	96.	96.	96.	2	0	0	0.00	20.00	120.01

*SECNO 34.720

34.72	7.19	773.00	0.00	0.00	773.62	0.62	0.00	0.00	778.81
880.	0.	880.	0.	0.	140.	0.	9.	2.	778.81
0.13	0.00	6.30	0.00	0.000	0.013	0.000	0.000	765.81	100.01
0.000450	1.	1.	1.	0	0	0	0.00	20.00	120.01

*SECNO 34.800

34.80	7.17	773.00	0.00	0.00	773.62	0.62	0.00	0.00	778.83
880.	0.	880.	0.	0.	139.	0.	9.	2.	778.83
0.13	0.00	6.31	0.00	0.000	0.013	0.000	0.000	765.83	100.01
0.000453	8.	8.	8.	2	0	0	0.00	20.00	120.01

SPECIAL BRIDGE

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.00	3.30	20.00	0.00	0.00	0.00	0.00	765.80	765.80

*SECNO 34.810
PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
*********	773.59	0.00	880.	0.	0.	0.	765.77	768.67
34.81	8.35	774.18	0.00	0.00	774.63	0.45	1.01	0.00	778.83
880.	0.	880.	0.	0.	163.	0.	9.	2.	778.83
0.13	0.00	5.40	0.00	0.000	0.013	0.000	0.000	765.83	100.01
0.000295	1.	1.	1.	2	0	7	0.00	20.00	120.01

*SECNO 36.210

36.21	7.94	774.20	0.00	0.00	774.70	0.50	0.04	0.02	779.26
880.	0.	880.	0.	0.	155.	0.	10.	2.	779.26
0.14	0.00	5.68	0.00	0.000	0.013	0.000	0.000	766.26	100.01
0.000339	140.	140.	140.	2	0	0	0.00	20.00	120.01

*SECNO 38.050

38.05	7.42	774.23	0.00	0.00	774.81	0.58	0.07	0.04	779.81
880.	0.	880.	0.	0.	144.	0.	10.	2.	779.81
0.15	0.00	6.09	0.00	0.000	0.013	0.000	0.000	766.81	100.01
0.000411	184.	184.	184.	2	0	0	0.00	20.00	120.01

*SECNO 38.060

3370 NORMAL BRIDGE,NRD= 8 MIN ELTRD= 780.00 MAX ELLC= 774.82

38.06	7.42	774.23	0.00	0.00	774.81	0.58	0.00	0.00	779.81
880.	0.	880.	0.	0.	144.	0.	10.	2.	779.81
0.15	0.00	6.09	0.00	0.000	0.013	0.000	0.000	766.81	100.01
0.000411	1.	1.	1.	0	0	0	0.00	20.00	120.01

*SECNO 39.760

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3370 NORMAL BRIDGE,NRD= 8 MIN ELTRD= 780.00 MAX ELLC= 775.34

39.76	6.94	774.27	0.00	0.00	774.93	0.66	0.08	0.04	780.33
880.	0.	880.	0.	0.	135.	0.	11.	2.	780.33
0.15	0.00	6.53	0.00	0.000	0.013	0.000	0.000	767.33	100.01
0.000498	170.	170.	170.	2	0	0	0.00	20.00	120.01

*SECNO 39.770

39.77	6.94	774.27	0.00	0.00	774.93	0.66	0.00	0.00	780.33
880.	0.	880.	0.	0.	135.	0.	11.	2.	780.33
0.15	0.00	6.53	0.00	0.000	0.013	0.000	0.000	767.33	100.01
0.000498	1.	1.	1.	0	0	0	0.00	20.00	120.01

*SECNO 39.860

39.86	6.91	774.27	0.00	0.00	774.94	0.67	0.00	0.00	780.36
880.	0.	880.	0.	0.	134.	0.	11.	2.	780.36
0.16	0.00	6.56	0.00	0.000	0.013	0.000	0.000	767.36	100.01
0.000504	9.	9.	9.	2	0	0	0.00	20.00	120.01

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.00	3.30	20.00	0.00	0.00	0.00	0.00	767.40	767.40

*SECNO 39.870
PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
*********	774.98	0.00	880.	0.	0.	0.	767.40	770.30

39.87	8.38	775.73	0.00	0.00	776.18	0.45	1.24	0.00	780.36
880.	0.	880.	0.	0.	164.	0.	11.	2.	780.36
0.16	0.00	5.38	0.00	0.000	0.013	0.000	0.000	767.36	100.01
0.000292	1.	1.	1.	2	0	7	0.00	20.00	120.01

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 41.590

41.59	7.90	775.76	0.00	0.00	776.26	0.50	0.05	0.02	780.86
870.	0.	870.	0.	0.	154.	0.	12.	2.	780.86
0.16	0.00	5.66	0.00	0.000	0.013	0.000	0.000	767.86	100.01
0.000337	172.	172.	172.	2	0	0	0.00	20.00	120.01

*SECNO 43.350

43.35	7.39	775.79	0.00	0.00	776.36	0.57	0.07	0.04	781.40
870.	0.	870.	0.	0.	144.	0.	12.	2.	781.40
0.17	0.00	6.05	0.00	0.000	0.013	0.000	0.000	768.40	100.01
0.000406	176.	176.	176.	2	0	0	0.00	20.00	120.01

*SECNO 43.360

3370 NORMAL BRIDGE,NRD= 8 MIN ELTRD= 780.20 MAX ELLC= 776.41

43.36	7.39	775.79	0.00	0.00	776.36	0.57	0.00	0.00	781.40
870.	0.	870.	0.	0.	144.	0.	12.	2.	781.40
0.17	0.00	6.05	0.00	0.000	0.013	0.000	0.000	768.40	100.01
0.000406	1.	1.	1.	0	0	0	0.00	20.00	120.01

*SECNO 45.860

3370 NORMAL BRIDGE,NRD= 8 MIN ELTRD= 780.20 MAX ELLC= 777.17

45.86	6.68	775.84	0.00	0.00	776.54	0.70	0.12	0.07	782.16
870.	0.	870.	0.	0.	130.	0.	13.	2.	782.16
0.18	0.00	6.71	0.00	0.000	0.013	0.000	0.000	769.16	100.01
0.000542	250.	250.	250.	2	0	0	0.00	20.00	120.01

*SECNO 45.870

45.87	6.69	775.85	0.00	0.00	776.54	0.69	0.00	0.00	782.16
865.	0.	865.	0.	0.	130.	0.	13.	2.	782.16
0.18	0.00	6.68	0.00	0.000	0.013	0.000	0.000	769.16	100.01
0.000537	1.	1.	1.	0	0	0	0.00	20.00	120.01

*SECNO 45.970

45.97	6.66	775.86	0.00	0.00	776.55	0.70	0.01	0.00	782.19
865.	0.	865.	0.	0.	129	0.	13.	2.	782.19
0.18	0.00	6.70	0.00	0.000	0.013	0.000	0.000	769.19	100.01
0.000542	10.	10.	10.	2	0	0	0.00	20.00	120.01

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.00	3.30	20.00	0.00	0.00	0.00	0.00	769.20	769.20

*SECNO 45.980
PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
*********	776.56	0.00	864.	0.	0.	0.	769.20	771.90
45.98	8.06	777.25	0.00	0.00	777.72	0.47	1.17	0.00	782.19
865.	0.	865.	0.	0.	157.	0.	13.	2.	782.19
0.18	0.00	5.51	0.00	0.000	0.013	0.000	0.000	769.19	100.01
0.000315	1.	1.	1.	2	0	7	0.00	20.00	120.01

*SECNO 48.330

48.33	7.38	777.29	0.00	0.00	777.85	0.56	0.08	0.05	782.91
865.	0.	865.	0.	0.	144.	0.	14.	2.	782.91
0.19	0.00	6.03	0.00	0.000	0.013	0.000	0.000	769.91	100.01
0.000404	235.	235.	235.	2	0	0	0.00	20.00	120.01

*SECNO 48.340

3370 NORMAL BRIDGE,NRD= 8 MIN ELTRD= 784.70 MAX ELLC= 777.92

48.34	7.38	777.29	0.00	0.00	777.85	0.56	0.00	0.00	782.91
865.	0.	865.	0.	0.	143.	0.	14.	2.	782.91
0.19	0.00	6.03	0.00	0.000	0.013	0.000	0.000	769.91	100.01
0.000404	1.	1.	1.	0	0	0	0.00	20.00	120.01

*SECNO 49.240

3370 NORMAL BRIDGE,NRD= 8 MIN ELTRD= 784.70 MAX ELLC= 778.20

49.24	7.12	777.30	0.00	0.00	777.91	0.61	0.04	0.02	783.19
865.	0.	865.	0.	0.	138.	0.	14.	2.	783.19
0.20	0.00	6.25	0.00	0.000	0.013	0.000	0.000	770.19	100.01
0.000447	90.	90.	90.	2	0	0	0.00	20.00	120.01

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 49.250									
49.25	7.12	777.30	0.00	0.00	777.91	0.61	0.00	0.00	783.19
865.	0.	865.	0.	0.	138.	0.	14.	2.	783.19
0.20	0.00	6.26	0.00	0.000	0.013	0.000	0.000	770.19	100.01
0.000448	1.	1.	1.	0	0	0	0.00	20.00	120.01
*SECNO 49.340									
49.34	7.09	777.31	0.00	0.00	777.92	0.61	0.00	0.00	783.21
865.	0.	865.	0.	0.	138.	0.	14.	2.	783.21
0.20	0.00	6.28	0.00	0.000	0.013	0.000	0.000	770.21	100.01
0.000452	9.	9.	9.	2	0	0	0.00	20.00	120.01

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.00	3.30	20.00	0.00	0.00	0.00	0.00	769.70	769.70

*SECNO 49.350
PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
*********	777.41	0.00	865.	0.	0.	0.	770.20	773.10
49.35	8.33	778.54	0.00	0.00	778.98	0.44	1.06	0.00	783.21
865.	0.	865.	0.	0.	162.	0.	14.	2.	783.21
0.20	0.00	5.32	0.00	0.000	0.013	0.000	0.000	770.21	100.01
0.000287	1.	1.	1.	2	0	7	0.00	20.00	120.01
*SECNO 50.410									
50.41	8.04	778.55	0.00	0.00	779.03	0.47	0.03	0.02	783.52
865.	0.	865.	0.	0.	157.	0.	15.	2.	783.52
0.20	0.00	5.52	0.00	0.000	0.013	0.000	0.000	770.52	100.01
0.000317	106.	106.	106.	2	0	0	0.00	20.00	120.01
*SECNO 51.550									
51.55	7.65	778.57	0.00	0.00	779.09	0.52	0.04	0.02	783.92
865.	0.	865.	0.	0.	149.	0.	15.	2.	783.92
0.21	0.00	5.81	0.00	0 000	0.013	0.000	0.000	770.92	100.01
0.000364	114.	114.	114.	2	0	0	0.00	20.00	120.01

TC POND DIVERSION:RATING CURVE METHOD FOR EVALUATING THE DIVERSION

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	DSWS	USWS	DSSNO	USSNO
218.47	218.45	0.01	218.47	218.45	0.01	5	770.337	770.337	28.660	28.660

TC JUNCTION BOX DIVERSION:RATING CURVE METHOD FOR EVALUATING THE DIVERSION

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	DSWS	USWS	DSSNO	USSNO
152.39	152.66	0.17	370.86	371.11	0.07	5	768.215	768.215	23.620	23.620

THIS RUN EXECUTED 17-DEC-90 17:06:24

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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55
**************************************************

T1
T2
T3        100-YEAR FLOW

J1  ICHECK     INQ        NINV       IDIR       STRT       METRIC     HVINS      Q          WSEL       FQ
      0.         4.         0.         0.  0.000000        0.00       0.0          0.    757.500      0.000
J2  NPROF      IPLOT      PRFVS      XSECV      XSECH      FN         ALLDC      IBW        CHNIM      ITRACE
    3.000      0.000     -1.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000
```

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 3

CCHV= 0.500 CEHV= 0.700
*SECNO 0.000
STA: 0+00: D/S LIMIT OF RIPRAP EXIT CHANNEL(20' D/S OF BAFFLED APRON)

0.00	9.50	757.50	0.00	757.50	757.78	0.28	0.00	0.00	765.00
807.	0.	807.	0.	0.	190.	0.	0.	0.	765.00
0.00	0.00	4.24	0.00	0.000	0.035	0.000	0.000	748.00	100.00
0.001210	0.	0.	0.	0	0	0	0.00	20.01	120.02

CCHV= 0.100 CEHV= 0.300
*SECNO 0.100

0.10	9.50	757.50	0.00	0.00	757.78	0.28	0.00	0.00	765.00
807.	0.	807.	0.	0.	190.	0.	0.	0.	765.00
0.00	0.00	4.24	0.00	0.000	0.013	0.000	0.000	748.00	100.00
0.000167	9.	9.	9.	0	0	0	0.00	20.01	120.02

*SECNO 0.170

0.17	9.50	757.50	0.00	0.00	757.78	0.28	0.00	0.00	765.00
807.	0.	807.	0.	0.	190.	0.	0.	0.	765.00
0.00	0.00	4.24	0.00	0.000	0.013	0.000	0.000	748.00	100.00
0.000167	8.	8.	8.	0	0	0	0.00	20.01	120.02

*SECNO 0.180
STA. 0+18: U/S LIMIT OF RIPRAP EXIT CHANNEL-BEGIN ENEGY DISSIPATOR

0.18	9.42	757.42	0.00	0.00	757.82	0.40	0.00	0.04	759.00
807.	0.	807.	0.	0.	159.	0.	0.	0.	759.00
0.00	0.00	5.08	0.00	0.000	0.013	0.000	0.000	748.00	100.00
0.000432	1.	1.	1.	2	0	0	0.00	20.07	120.07

*SECNO 0.330

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

0.33	5.17	760.17	760.17	0.00	762.04	1.86	0.01	0.44	766.00
807.	0.	807.	0.	0.	74.	0.	0.	0.	766.00
0.00	0.00	10.95	0.00	0.000	0.013	0.000	0.000	755.00	100.01
0.004391	14.	14.	14.	20	11	0	0.00	20.06	120.06

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 0.340

3301 HV CHANGED MORE THAN HVINS

STA. 0+34: U/S LIMIT OF ENERGY DISSIPATOR

0.34	6.58	761.58	0.00	0.00	762.16	0.58	0.00	0.13	766.00
807.	0.	807.	0.	0.	131.	0.	0.	0.	766.00
0.00	0.00	6.13	0.00	0.000	0.013	0.000	0.000	755.00	100.00
0.000459	1.	1.	1.	3	0	0	0.00	20.01	120.02

*SECNO 0.380

0.38	6.47	761.47	0.00	0.00	762.21	0.74	0.00	0.05	766.00
807.	0.	807.	0.	0.	117.	0.	0.	0.	766.00
0.00	0.00	6.92	0.00	0.000	0.013	0.000	0.000	755.00	100.00
0.000626	4.	4.	4.	2	0	0	0.00	18.01	118.02

*SECNO 0.420

0.42	6.30	761.30	0.00	0.00	762.29	0.99	0.00	0.07	766.00
807.	0.	807.	0.	0.	101.	0.	0.	0.	766.00
0.00	0.00	8.00	0.00	0.000	0.013	0.000	0.000	755.00	100.00
0.000913	4.	4.	4.	2	0	0	0.00	16.01	116.02

*SECNO 0.460

0.46	6.00	761.00	0.00	0.00	762.43	1.43	0.00	0.13	766.00
807.	0.	807.	0.	0.	84.	0.	0.	0.	766.00
0.00	0.00	9.60	0.00	0.000	0.013	0.000	0.000	755.00	100.00
0.001474	4.	4.	4.	2	0	0	0.00	14.01	114.02

*SECNO 0.500

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 763.00 MAX ELLC= 762.00

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

STA. 0+50:NOTE XSEC. #'S REFLECT STA.

0.50	5.18	760.18	760.18	0.00	762.79	2.62	0.01	0.36	765.00
807.	0.	807.	0.	0.	62.	0.	0.	0.	765.00
0.00	0.00	12.98	0.00	0.000	0.013	0.000	0.000	755.00	100.00
0.003297	4.	4.	4.	4	16	0	0.00	12.01	112.02

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 1.000

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 764.20 MAX ELLC= 762.09

STA. 1+00

1.00	5.82	760.91	760.27	0.00	762.99	2.08	0.14	0.05	765.09
807.	0.	807.	0.	0.	70.	0.	0.	0.	765.09
0.00	0.00	11.56	0.00	0.000	0.013	0.000	0.000	755.09	100.00
0.002414	50.	50.	50.	19	16	0	0.00	12.01	112.02

*SECNO 1.250

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 765.90 MAX ELLC= 762.14

1.25	5.89	761.03	0.00	0.00	763.05	2.02	0.06	0.01	765.14
807.	0.	807.	0.	0.	71.	0.	0.	0.	765.14
0.00	0.00	11.41	0.00	0.000	0.013	0.000	0.000	755.14	100.00
0.002328	25.	25.	25.	2	0	0	0.00	12.01	112.02

*SECNO 2.500

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 767.00 MAX ELLC= 762.52

2.50	6.05	761.43	0.00	0.00	763.34	1.91	0.28	0.01	765.38
807.	0.	807.	0.	0.	73.	0.	0.	0.	765.38
0.01	0.00	11.10	0.00	0.000	0.013	0.000	0.000	755.38	100.00
0.002167	125.	125.	125.	2	0	0	0.00	12.01	112.02

*SECNO 3.500

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 767.00 MAX ELLC= 762.71

3.50	6.11	761.68	0.00	0.00	763.56	1.88	0.21	0.00	765.57
807.	0.	807.	0.	0.	73.	0.	1.	0.	765.57
0.01	0.00	10.99	0.00	0.000	0.013	0.000	0.000	755.57	100.00
0.002110	100.	100.	100.	2	0	0	0.00	12.01	112.02

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 4.300

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 767.00 MAX ELLC= 762.86

4.30	6.16	761.88	0.00	0.00	763.73	1.85	0.17	0.00	765.72
807.	0.	807.	0.	0.	74.	0.	1.	0.	765.72
0.01	0.00	10.91	0.00	0.000	0.013	0.000	0.000	755.72	100.00
0.002066	80.	80.	80.	2	0	0	0.00	12.01	112.02

*SECNO 4.550

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 767.00 MAX ELLC= 762.99

4.55	5.76	761.75	0.00	0.00	763.87	2.11	0.06	0.08	773.00
807.	0.	807.	0.	0.	69.	0.	1.	0.	773.00
0.01	0.00	11.67	0.00	0.000	0.013	0.000	0.000	755.99	150.01
0.002475	25.	25.	25.	3	0	0	0.00	12.00	162.00

*SECNO 5.000

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 767.00 MAX ELLC= 763.08

5.00	5.87	761.94	0.00	0.00	763.98	2.04	0.11	0.01	773.09
807.	0.	807.	0.	0.	70.	0.	1.	0.	773.09
0.01	0.00	11.46	0.00	0.000	0.013	0.000	0.000	756.08	150.01
0.002360	45.	45.	45.	2	0	0	0.00	12.00	162.00

*SECNO 7.500

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 768.00 MAX ELLC= 763.55

7.50	6.14	762.69	0.00	0.00	764.56	1.86	0.56	0.02	773.56
807.	0.	807.	0.	0.	74.	0.	1.	0.	773.56
0.02	0.00	10.96	0.00	0.000	0.013	0.000	0.000	756.55	150.01
0.002093	250.	250.	250.	3	0	0	0.00	12.00	162.00

*SECNO 10.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 769.00 MAX ELLC= 764.03									
10.00	6.24	763.27	0.00	0.00	765.07	1.80	0.51	0.01	774.04
807.	0.	807.	0.	0.	75.	0.	2.	0.	774.04
0.03	0.00	10.77	0.00	0.000	0.013	0.000	0.000	757.03	150.01
0.002001	250.	250.	250.	2	0	0	0.00	12.00	162.00
*SECNO 12.500									
3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.25 MAX ELLC= 764.51									
12.50	6.29	763.79	0.00	0.00	765.57	1.78	0.50	0.00	774.52
807.	0.	807.	0.	0.	75.	0.	2.	0.	774.52
0.03	0.00	10.70	0.00	0.000	0.013	0.000	0.000	757.51	150.01
0.001963	250.	250.	250.	2	0	0	0.00	12.00	162.00
*SECNO 15.000									
3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 772.90 MAX ELLC= 764.98									
15.00	6.32	764.30	0.00	0.00	766.06	1.76	0.49	0.00	774.99
807.	0.	807.	0.	0.	76.	0.	3.	0.	774.99
0.04	0.00	10.65	0.00	0.000	0.013	0.000	0.000	757.98	150.01
0.001939	250.	250.	250.	2	0	0	0.00	12.00	162.00
*SECNO 17.500									
3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 772.80 MAX ELLC= 765.46									
17.50	6.32	764.79	0.00	0.00	766.55	1.76	0.48	0.00	775.47
807.	0.	807.	0.	0.	76.	0.	3.	0.	775.47
0.05	0.00	10.65	0.00	0.000	0.013	0.000	0.000	758.46	150.01
0.001939	250.	250.	250.	0	0	0	0.00	12.00	162.00
CCHV= 0.300 CEHV= 0.500									
*SECNO 18.280									

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 772.80 MAX ELLC= 765.61

18.28	6.33	764.94	0.00	0.00	766.70	1.76	0.15	0.00	775.62
807.	0.	807.	0.	0.	76.	0.	3.	1.	775.62
0.05	0.00	10.63	0.00	0.000	0.013	0.000	0.000	758.61	150.01
0.001932	78.	78.	78.	0	0	0	0.00	12.00	162.00

*SECNO 18.330

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 774.00 MAX ELLC= 767.10

18.33	7.05	765.65	0.00	0.00	766.87	1.21	0.01	0.16	774.00
807.	0.	807.	0.	0.	91.	0.	3.	1.	774.00
0.05	0.00	8.84	0.00	0.000	0.013	0.000	0.000	758.60	100.05
0.001180	5.	5.	5.	3	0	0	0.00	12.99	113.05

*SECNO 18.380

3265 DIVIDED FLOW

3370 NORMAL BRIDGE,NRD= 4 MIN ELTRD= 774.00 MAX ELLC= 767.10

18.38	7.65	766.25	0.00	0.00	767.01	0.76	0.01	0.14	774.00
807.	0.	807.	0.	0.	116.	0.	3.	1.	774.00
0.05	0.00	6.98	0.00	0.000	0.013	0.000	0.000	758.60	100.05
0.001079	5.	5.	5.	3	0	0	0.00	15.20	116.35

*SECNO 18.390
WATER EL=X5 LINE= 766.405

3265 DIVIDED FLOW

18.39	7.80	766.40	0.00	0.00	767.13	0.73	0.00	0.01	774.00
807.	0.	807.	0.	0.	118.	0.	3.	1.	774.00
0.05	0.00	6.84	0.00	0.000	0.013	0.000	0.000	758.60	100.05
0.001029	0.	0.	0.	0	0	0	0.00	15.20	116.35

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 18.540

3265 DIVIDED FLOW

3370 NORMAL BRIDGE,NRD= 4 MIN ELTRD= 774.00 MAX ELLC= 767.10

18.54	7.77	766.42	0.00	0.00	767.15	0.73	0.02	0.00	774.00
807.	0.	807.	0.	0.	117.	0.	3.	1.	774.00
0.05	0.00	6.87	0.00	0.000	0.013	0.000	0.000	758.65	100.05
0.001036	16.	16.	16.	2	0	0	0.00	15.25	125.40

*SECNO 18.541
WATER EL=X5 LINE= 766.559

3265 DIVIDED FLOW

18.54	7.91	766.56	0.00	0.00	767.26	0.71	0.00	0.01	774.00
807.	0.	807.	0.	0.	120.	0.	3.	1.	774.00
0.05	0.00	6.74	0.00	0.000	0.013	0.000	0.000	758.65	100.05
0.000990	0.	0.	0.	0	0	0	0.00	15.26	125.40

*SECNO 18.550

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE,NRD= 12 MIN ELTRD= 774.00 MAX ELLC= 766.30

18.55	7.49	766.29	0.00	0.00	767.54	1.25	0.00	0.27	762.55
807.	0.	807.	0.	0.	90.	0.	3.	1.	762.55
0.05	0.00	8.97	0.00	0.000	0.013	0.000	0.000	758.80	109.97
0.002763	1.	1.	1.	2	0	0	-11.22	15.08	134.98

*SECNO 19.150

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3265 DIVIDED FLOW

3370 NORMAL BRIDGE,NRD= 12 MIN ELTRD= 774.15 MAX ELLC= 766.80

19.15	7.12	766.42	0.00	0.00	767.71	1.29	0.15	0.02	763.05
807.	0.	807.	0.	0.	89.	0.	3.	1.	762.70
0.05	0.00	9.11	0.00	0.000	0.013	0.000	0.000	759.30	109.97
0.002261	60.	60.	60.	2	0	0	-7.29	15.07	134.98

*SECNO 19.160

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE,NRD= 4 MIN ELTRD= 774.00 MAX ELLC= 767.40

19.16	7.85	767.15	0.00	0.00	767.88	0.73	0.00	0.17	770.24
807.	0.	807.	0.	0.	118.	0.	3.	1.	770.24
0.05	0.00	6.85	0.00	0.000	0.013	0.000	0.000	759.30	100.00
0.001035	1.	1.	1.	3	0	0	0.00	15.03	125.04

*SECNO 19.280

3265 DIVIDED FLOW

3370 NORMAL BRIDGE,NRD= 4 MIN ELTRD= 774.00 MAX ELLC= 767.40

19.28	7.49	767.13	0.00	0.00	767.93	0.80	0.01	0.04	770.39
807.	0.	807.	0.	0.	113.	0.	3.	1.	770.39
0.05	0.00	7.17	0.00	0.000	0.013	0.000	0.000	759.64	100.00
0.001158	12.	12.	12.	2	0	0	0.00	15.03	117.04

*SECNO 19.290

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3370 NORMAL BRIDGE,NRD= 4 MIN ELTRD= 774.00 MAX ELLC= 767.40

19.29	7.49	767.13	0.00	0.00	767.93	0.80	0.00	0.00	770.39
807.	0.	807.	0.	0.	112.	0.	3.	1.	770.39
0.05	0.00	7.18	0.00	0.000	0.013	0.000	0.000	759.64	100.00
0.000678	1.	1.	1.	0	0	0	0.00	15.01	115.02

*SECNO 19.390

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 774.00 MAX ELLC= 767.70

19.39	7.15	766.85	0.00	0.00	768.22	1.37	0.01	0.29	776.55
807.	0.	807.	0.	0.	86.	0.	3.	1.	776.55
0.05	0.00	9.40	0.00	0.000	0.013	0.000	0.000	759.70	150.01
0.001398	10.	10.	10.	2	0	0	0.00	12.00	162.00

*SECNO 19.400

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 774.00 MAX ELLC= 767.70

19 40	7.15	766.85	0.00	0.00	768.22	1.37	0.00	0.00	776.55
807.	0.	807.	0.	0.	86.	0.	3.	1.	776.55
0.05	0.00	9.40	0.00	0.000	0.013	0.000	0.000	759.70	150.01
0.001399	1.	1.	1.	0	0	0	0.00	12.00	162.00

*SECNO 20.000

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.50 MAX ELLC= 767.90

20.00	7.08	766.92	0.00	0.00	768.32	1.40	0.09	0.01	776.70
807.	0.	807.	0.	0.	85.	0.	4.	1.	776.70
0.05	0.00	9.51	0.00	0.000	0.013	0.000	0.000	759.85	150.01
0.001438	60.	60.	60.	2	0	0	0.00	12.00	162.00

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**********************************************************
*  WATER SURFACE PROFILES                                *
*  VERSION OF NOVEMBER 1976                              *
*  UPDATED MAY 1984                                      *
*                                                        *
*  RUN DATE 17-DEC-90 TIME 14:12:58                      *
**********************************************************
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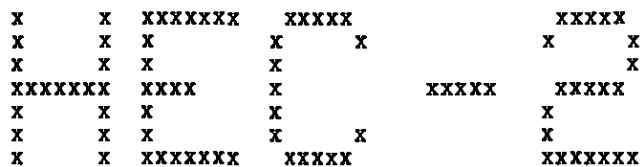
****************************************
*  U.S. ARMY CORPS OF ENGINEERS        *
*  THE HYDROLOGIC ENGINEERING CENTER   *
*  609 SECOND STREET, SUITE D          *
*  DAVIS, CALIFORNIA 95616             *
*  (916) 440-2105 (FTS) 448-2105       *
****************************************
```

RATING CURVE FOR FLOW BETWEEN POND AND JUNCTION BOX

THIS RUN EXECUTED 17-DEC-90 14:12:59

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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55
**************************************************
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C
T1        ARCADIA CREEK HYDRAULIC ANALYSIS
T2        RATING CURVE FOR THE DIVERSION AT EDWARDS ST.-100 CFS
T3        JTP 10/30/86 [RATINGEE.HEC] REVISED DEH 9/22/89

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      0.        2.        0.        0.  0.000000      0.00       0.0        0.   766.530     0.000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     1.000     0 000    -1.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    150.000     0 000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000


NC      0 015        015      0.015      0.000      0.000      0.000      0.000      0.000      0.000      0.000
QT     11 000         00     50.000    100.000    150.000    200.000    250.000    300.000    350.000    400.000
QT    500 000         00      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000
        BEGIN SE [illegible] (470' LONG)
X1      5.000        0     100.000    108.500      0.000      0.000      0.000      0.000      0.570      0.000
BT      2.000        0     780.000    771.670    108.500    780.000    771.670      0.000      0.000      0.000
GR    771.100        00    766.100    100.500    766.100    101.000    765.100    101.100    763.850    102.500
GR    763 500        50    763.850    106.000    765.100    107.500    766.100    107.510    766.100    108.000
GR    771 100        00      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000

        SECTION [illegible]
X1      5 100         00      0.000      0.000    300.000    300.000    300.000      0.000      0.600      0.000
X2      0.000         00      0.000      0.000      0.000      0.000      1.000      0.000      0.000      0.000

        END SECTION [illegible]
X1      5.200        000      0.000      0.000    100.000    100.000    100.000      0.000      0.330      0.000
X2      0 000        000      0.000      0.000      0.000      0.000      1.000      0.000      0.000      0.000
X5      0 000         00      0.070      0.100      0.140      0.180      0.230      0.290      0.350      0.400

X1      5 400         00    100.250    108.250      1.000      1.000      1.000      0.000      0.000      0.000
BT      2 000        30     775.000    772.700    108.250    775.000    772.700      0.000      0.000      0.000
GR    778 000        [illegible]  772.700    100.010    765.700    100.020    765.700    108.020    772.700    108.030
GR    780 00[illegible]      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000
```

X1	5.500	0.000	0.000	0.000	25.000	25.000	25.000	0.000	0.220	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
	FIRST SECTION OF POND									
X1	8.000	8.000	128.000	148.100	20.000	20.000	20.000	0.000	0.000	0.000
GR	776.000	84.000	772.000	100.000	765.000	128.000	762.000	128.100	762.000	148.000
GR	765.000	148.100	772.000	176.000	776.000	192.000	0.000	0.000	0.000	0.000
EJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

THIS RUN EXECUTED 17-DEC-90 14:13:16

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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55
**************************************************
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

JTP 10/30/86 [RATINGEE

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
	5.000	0.00	780.00	771.67	764.07	25.00	766.53	0.00	766.59	2.79	2.03	12.34	14.96
	5.000	0.00	780.00	771.67	764.07	50.00	766.53	0.00	766.78	11.17	4.05	12.34	14.96
	5.000	0.00	780.00	771.67	764.07	100.00	767.24	0.00	767.74	18.87	5.69	17.56	23.02
	5.000	0.00	780.00	771.67	764.07	150.00	767.24	767.21	768.37	42.46	8.54	17.56	23.02
*	5.000	0.00	780.00	771.67	764.07	200.00	767.70	767.70	769.10	45.34	9.47	21.11	29.70
*	5.000	0.00	780.00	771.67	764.07	250.00	768.15	768.15	769.76	46.73	10.17	24.59	36.57
*	5.000	0.00	780.00	771.67	764.07	300.00	768.58	768.58	770.37	47.92	10.75	27.91	43.34
	5.000	0.00	780.00	771.67	764.07	350.00	773.25	0.00	773.92	19.58	6.58	53.20	79.10
	5.000	0.00	780.00	771.67	764.07	400.00	773.25	0.00	774.13	25.57	7.52	53.20	79.10
	5.000		780.00	771.67	764.07	500.00	773.25	0.00	774.62	39.95	9.40	53.20	79.10
	5.100	[illegible]	780.00	772.27	764.67	25.00	766.60	0.00	766.72	6.91	2.79	8.96	9.51
	5.100	[illegible]	780.00	772.27	764.67	50.00	766.85	0.00	767.20	17.21	4.73	10.58	12.05
	5.100	[illegible]	780.00	772.27	764.67	100.00	767.80	0.00	768.32	19.67	5.78	17.30	22.55
	5.100	[illegible]	780.00	772.27	764.67	150.00	768.56	0.00	769.22	19.94	6.49	23.10	33.59
	5.100		780.00	772.27	764.67	200.00	769.20	0.00	769.99	20.89	7.11	28.11	43.76
	5.100		780.00	772.27	764.67	250.00	769.78	0.00	770.68	21.91	7.65	32.69	53.41
	5.100	[illegible]	780.00	772.27	764.67	300.00	770.31	0.00	771.33	22.84	8.11	37.00	62.77
	5.100	[illegible]	780.00	772.27	764.67	350.00	773.84	0.00	774.51	19.58	6.58	53.20	79.10
	5.100	[illegible]	780.00	772.27	764.67	400.00	774.02	0.00	774.89	25.57	7.52	53.20	79.10
	5.100	[illegible]	780.00	772.27	764.67	500.00	774.45	0.00	775.82	39.95	9.40	53.20	79.10
*	5.200	[illegible]	780.00	772.60	765.00	25.00	766.26	766.26	766.69	41.58	5.26	4.75	3.88
*	5.200	[illegible]	780.00	772.60	765.00	50.00	766.77	766.77	767.39	40.06	6.35	7.88	7.90
*	5.200	[illegible]	780.00	772.60	765.00	100.00	767.48	767.48	768.48	43.14	8.00	12.50	15.23
*	5.200	[illegible]	780.00	772.60	765.00	150.00	768.14	768.14	769.30	43.87	8.64	17.36	22.65
*	5.200	[illegible]	780.00	772.60	765.00	200.00	768.64	768.63	770.03	45.17	9.46	21.14	29.76
*	5.200	[illegible]	780.00	772.60	765.00	250.00	769.09	769.08	770.69	46.57	10.15	24.63	36.64
*	5.200	[illegible]	780.00	772.60	765.00	300.00	769.51	769.51	771.30	47.76	10.73	27.95	43.41
*	5.200	[illegible]	780.00	772.60	765.00	350.00	769.90	769.90	771.88	49.22	11.28	31.04	49.89
*	5.200	[illegible]	780.00	772.60	765.00	400.00	770.28	770.27	772.42	50.45	11.75	34.04	56.32
*	5.200		780.00	772.60	765.00	500.00	770.99	770.98	773.44	52.47	12.56	39.82	69.03

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
*	5.400	1.00	775.00	772.70	765.70	25.00	766.37	766.37	766.71	46.24	0.00	5.37	3.68
	5.400	1.00	775.00	772.70	765.70	50.00	767.07	0.00	767.40	21.06	0.00	10.89	10.89
	5.400	1.00	775.00	772.70	765.70	100.00	768.03	0.00	768.48	17.63	0.00	18.60	23.82
	5.400	1.00	775.00	772.70	765.70	150.00	768.70	0.00	769.31	19.47	0.00	23.98	33.99
	5.400	1.00	775.00	772.70	765.70	200.00	769.27	0.00	770.03	21.53	0.00	28.53	43.10
	5.400	1.00	775.00	772.70	765.70	250.00	769.78	0.00	770.69	23.49	0.00	32.62	51.58
	5.400	1.00	775.00	772.70	765.70	300.00	770.25	0.00	771.30	25.38	0.00	36.37	59.54
	5.400	1.00	775.00	772.70	765.70	350.00	770.68	0.00	771.88	27.25	0.00	39.84	67.05
	5.400	1.00	775.00	772.70	765.70	400.00	771.08	0.00	772.42	29.09	0.00	43.08	74.16
	5.400	1.00	775.00	772.70	765.70	500.00	771.82	0.00	773.44	32.74	0.00	49.01	87.39
*	5.500	25.00	775.00	772.92	765.92	25.00	766.59	766.59	766.93	46.24	0.00	5.37	3.68
*	5.500	25.00	775.00	772.92	765.92	50.00	766.98	766.98	767.52	44.47	0.00	8.50	7.50
	5.500	25.00	775.00	772.92	765.92	100.00	767.95	0.00	768.53	25.90	0.00	16.26	19.65
	5.500	25.00	775.00	772.92	765.92	150.00	768.61	0.00	769.36	26.09	0.00	21.58	29.37
	5.500	25.00	775.00	772.92	765.92	200.00	769.18	0.00	770.09	27.31	0.00	26.14	38.27
	5.500	25.00	775.00	772.92	765.92	250.00	769.69	0.00	770.76	28.75	0.00	30.24	46.62
	5.500	25.00	775.00	772.92	765.92	300.00	770.16	0.00	771.37	30.29	0.00	34.01	54.51
	5.500	25.00	775.00	772.92	765.92	350.00	770.60	0.00	771.95	31.90	0.00	37.50	61.97
	5.500	25.00	775.00	772.92	765.92	400.00	771.01	0.00	772.50	33.56	0.00	40.75	69.05
	5.500	25.00	775.00	772.92	765.92	500.00	771.75	0.00	773.53	36.97	0.00	46.71	82.23
	8.000	20.00	0.00	0.00	762.00	25.00	766.93	0.00	766.93	0.01	0.24	113.55	252.70
	8.000	20.00	0.00	0.00	762.00	50.00	767.52	0.00	767.52	0.02	0.41	135.90	317.02
	8.000	20.00	0.00	0.00	762.00	100.00	768.53	0.00	768.53	0.05	0.64	180.61	452.40
	8.000	20.00	0.00	0.00	762.00	150.00	769.35	0.00	769.36	0.06	0.80	223.19	589.45
	8.000	20.00	0.00	0.00	762.00	200.00	770.08	0.00	770.09	0.07	0.92	265.18	731.75
	8.000	20.00	0.00	0.00	762.00	250.00	770.74	0.00	770.76	0.08	1.01	307.19	880.67
	8.000	20.00	0.00	0.00	762.00	300.00	771.36	0.00	771.37	0.08	1.07	349.34	1036.25
	8.000	20.00	0.00	0.00	762.00	350.00	771.94	0.00	771.95	0.09	1.13	391.76	1198.52
	8.000	20.00	0.00	0.00	762.00	400.00	772.49	0.00	772.50	0.08	1.15	434.42	1387.77
	8.000	20.00	0.00	0.00	762.00	500.00	773.51	0.00	773.53	0.08	1.19	520.72	1790.28

JTP 10/30/86 [RATINGEE

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	5.000	25.00	766.53	0.00	0.00	0.00	6.49	0.00
	5.000	50.00	766.53	0.00	0.00	0.00	6.49	0.00
	5.000	100.00	767.24	0.71	0.00	0.00	7.61	0.00
	5.000	150.00	767.24	0.00	0.00	0.00	7.61	0.00
*	5.000	200.00	767.70	0.46	0.00	0.24	7.71	0.00
*	5.000	250.00	768.15	0.45	0.00	0.69	7.80	0.00
*	5.000	300.00	768.58	0.42	0.00	1.12	7.88	0.00
	5.000	350.00	773.25	4.67	0.00	0.00	8.50	0.00
	5.000	400.00	773.25	0.00	0.00	0.00	8.50	0.00
	5.000	500.00	773.25	0.00	0.00	0.00	8.50	0.00
	5.100	25.00	766.60	0.00	0.07	0.00	6.44	300.00
	5.100	50.00	766.85	0.25	0.32	0.00	6.46	300.00
	5.100	100.00	767.80	0.95	0.56	0.00	7.61	300.00
	5.100	150.00	768.56	0.76	1.32	0.00	7.76	300.00
	5.100	200.00	769.20	0.64	1.50	0.00	7.89	300.00
	5.100	250.00	769.78	0.57	1.62	0.00	8.00	300.00
	5.100	300.00	770.31	0.53	1.73	0.00	8.11	300.00
	5.100	350.00	773.84	3.53	0.59	0.00	8.50	300.00
	5.100	400.00	774.02	0.18	0.77	0.00	8.50	300.00
	5.100	500.00	774.45	0.43	1.20	0.00	8.50	300.00
*	5.200		766.26	0.00	-0.34	0.00	5.61	100.00
*	5.200		766.77	0.51	-0.08	0.00	6.42	100.00
*	5.200		767.48	0.72	-0.32	0.00	6.50	100.00
*	5.200		768.14	0.66	-0.42	0.00	7.61	100.00
*	5.200		768.64	0.49	-0.56	0.00	7.71	100.00
*	5.200		769.09	0.45	-0.69	0.00	7.80	100.00
*	5.200		769.51	0.42	-0.80	0.00	7.88	100.00
*	5.200		769.90	0.39	-3.94	0.00	7.96	100.00
*	5.200		770.28	0.38	-3.74	0.00	8.04	100.00
*	5.200		770.99	0.71	-3.46	0.00	8.18	100.00
*	5.400		766.37	0.00	0.11	0.00	8.00	1.00
	5.400		767.07	0.70	0.30	0.00	8.00	1.00
	5.400		768.03	0.96	0.55	0.00	8.01	1.00
	5.400		768.70	0.67	0.55	0.00	8.01	1.00
	5.400		769.27	0.57	0.63	0.00	8.01	1.00
	5.400		769.78	0.51	0.69	0.00	8.01	1.00
	5.400		770.25	0.47	0.74	0.00	8.01	1.00
	5.400		770.68	0.43	0.78	0.00	8.01	1.00
	5.400		771.08	0.40	0.81	0.00	8.02	1.00
	5.400		771.82	0.74	0.84	0.00	8.02	1.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	5.500	25.00	766.59	0.00	0.22	0.00	8.00	25.00
*	5.500	50.00	766.98	0.39	-0.09	0.00	8.00	25.00
	5.500	100.00	767.95	0.96	-0.09	0.00	8.01	25.00
	5.500	150.00	768.61	0.67	-0.09	0.00	8.01	25.00
	5.500	200.00	769.18	0.57	-0.09	0.00	8.01	25.00
	5.500	250.00	769.69	0.51	-0.08	0.00	8.01	25.00
	5.500	300.00	770.16	0.47	-0.08	0.00	8.01	25.00
	5.500	350.00	770.60	0.44	-0.08	0.00	8.01	25.00
	5.500	400.00	771.01	0.41	-0.08	0.00	8.01	25.00
	5.500	500.00	771.75	0.74	-0.08	0.00	8.02	25.00
	8.000	25.00	766.93	0.00	0.34	0.00	35.49	20.00
	8.000	50.00	767.52	0.59	0.53	0.00	40.20	20.00
	8.000	100.00	768.53	1.01	0.58	0.00	48.27	20.00
	8.000	150.00	769.35	0.83	0.74	0.00	54.87	20.00
	8.000	200.00	770.08	0.73	0.90	0.00	60.67	20.00
	8.000	250.00	770.74	0.66	1.05	0.00	65.97	20.00
	8.000	300.00	771.36	0.62	1.19	0.00	70.89	20.00
	8.000	350.00	771.94	0.58	1.34	0.00	75.52	20.00
	8.000	400.00	772.49	0.55	1.48	0.00	79.91	20.00
	8.000	500.00	773.51	1.03	1.76	0.00	88.12	20.00

SUMMARY OF ERRORS AND SPECIAL NOTES

```
CAUTION  SECNO=    5.000  PROFILE= 5  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    5.000  PROFILE= 6  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    5.000  PROFILE= 7  CRITICAL DEPTH ASSUMED

NOTE     SECNO=    5.200  PROFILE= 1  WSEL BASED ON X5 LINE
NOTE     SECNO=    5.200  PROFILE= 2  WSEL BASED ON X5 LINE
NOTE     SECNO=    5.200  PROFILE= 3  WSEL BASED ON X5 LINE
NOTE     SECNO=    5.200  PROFILE= 4  WSEL BASED ON X5 LINE
NOTE     SECNO=    5.200  PROFILE= 5  WSEL BASED ON X5 LINE
NOTE     SECNO=    5.200  PROFILE= 6  WSEL BASED ON X5 LINE
NOTE     SECNO=    5.200  PROFILE= 7  WSEL BASED ON X5 LINE
NOTE     SECNO=    5.200  PROFILE= 8  WSEL BASED ON X5 LINE
NOTE     SECNO=    5.200  PROFILE= 9  WSEL BASED ON X5 LINE
NOTE     SECNO=    5.200  PROFILE=10  WSEL BASED ON X5 LINE

CAUTION  SECNO=    5.400  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    5.400  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=    5.400  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO=    5.500  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    5.500  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=    5.500  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO=    5.500  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    5.500  PROFILE= 2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=    5.500  PROFILE= 2  20 TRIALS ATTEMPTED TO BALANCE WSEL
```

1) COUNTY: KALAMAZOO

2) STUDY NAME: KALAMAZOO, CITY OF

3) WATERCOURSE: ARCADIA CREEK

4) DOCUMENT TYPE: MULTI-PROFILE SUMMARY

1977

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**********************************************
  HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
  ERROR CODE =  04
  DOCUMENTATION =  50,51,52
**********************************************


C
T  STATION ROUTING COMPUTATIONS FOR FLOW IN THE CHANNEL FOR RETURN PERIOD OF 50 YEARS
T  STARTING WATER DEPTH TAKEN FROM 4 D/S RUN
T1      ARCADIA CREEK CULVERT
J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ
          0.        2.        0.        0.  3.000000    0.00      .00       0.   326.00     0.001
J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     SW        ALLDC     IDC       CHNIM     ITRACE
        1.000     0.000    -1.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
J5  LPRNT     JUMPTO                    ********** ICE TABLE SELECTION FLAGS **********
      -10.000   -10.000     0.000     0.000     0.000     0.000     0.00      0.000     0.000     0.000
J3  VARIABLE CODES FOR SUMMARY PRINTOUT
      150.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
QT      12.000   315.000   315.000   315.000   435.000   435.000   435.000   435.000   435.000   435.000
QT     745.000   745.000   745.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
NC       0.032     0.080     0.035     0.500     0.500     0.050     0.050     0.000     0.500     0.070

        D/S FACE OF D'WERSTON ROAD CULVERTS & CHANNEL TO D/S OF ROAD CULVERTS

X1     71.000     0.000    81.000   123.000     0.00      0.00      0.00      0.00      0.00      0.00
GR    835.500     0.000   822.000    37.000   321.600   121.300   849.400   105.000   319.200    11.000
GR    810.600   116.200   825.000   123.000   826.000   255.000   829.600   277.000     0.000     0.000
QT     12.000    90.000   315.000   160.000    65.000   110.000   135.000    55.000   110.000    35.000
QT     95.000   120.000   145.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

        D/S FACE OF STADIUM DRIVE CULVERT

X1     71.050     0.000     0.000     0.000    50.000    30.000    50.000     0.500     0.000     0.000
X3     10.000     0.000     0.000     0.000     0.000     0.000     0.000    20.000    90.000     0.000
SB      0.000     2.900     2.600     0.000     0.000     0.000    20.000     0.000   647.000     0.000

        U/S FACE OF STADIUM DR CULVERT;SECOND CROSSING NORTH EAST OF HOWARD

X1     71.100     0.000     0.000    15.000   130.000   120.000   130.000     0.500     0.500     0.000
X2      0.000     0.000     1.000   621.800   630.000     0.000     0.000     0.000     0.500     0.000
X3     10.000     0.000     0.000     0.000     0.000     0.000     0.000   300.000   620.500     0.000
GR    822.000     0.000   621.400    10.000   617.600    10.000   617.600    14.900   621.300    15.000
GR    822.000    25.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

        D/S FACE OF RAILROAD CULVERTS SECOND CROSSING NORTH EAST OF HOWARD

X1     71.200     0.000     0.000     0.000    97.000   120.000   150.000     0.000     0.000     0.000
X3     10.000     0.000     0.000     0.000     0.000     0.000     0.000   900.000   900.000     0.000
```

CAUTION

SEE

ATTACHED COMMENTS

SB	0.000	1.900	0.600	0.000	[illegible]	0.000	[illegible]	0.000	819.200	818.600

U/S FACE OF RAILROAD CULVERTS SECOND CROSSING NORTH EAST OF HOLARD

X1	77.300	6.300	12.050	14.050	76.000	70.300	73.050	0.010	0.000	0.000
X2	0.000	0.300	1.050	324.200	200.000	0.200	1.050	0.000	0.000	0.000
X3	10.000	0.200	0.000	0.000	0.000	0.200	1.050	200.000	200.000	0.300
GR	825.000	0.000	324.200	10.000	819.200	10.050	819.200	13.950	824.200	14.000
GR	825.000	25.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VALLEY SECTIONS ACROSS SEC 97

X1	71.400	0.000	17.300	56.000	100.000	70.000	85.000	0.200	0.000	0.030
GR	832.000	0.000	630.200	17.000	822.500	31.000	822.300	36.000	823.300	44.030
GR	826.300	36.000	826.900	71.000	834.600	105.000	0.000	0.000	0.000	0.000
X1	71.500	0.000	0.000	0.000	130.000	130.000	130.000	0.000	0.000	0.000
X1	71.600	0.000	0.000	0.000	130.000	130.000	130.000	0.000	1.000	0.000
X1	71.700	0.000	0.000	0.000	130.200	130.000	130.000	0.000	1.000	0.000

VALLEY SECTIONS ACROSS SEC 96

X1	71.300	6.000	17.300	36.300	150.000	100.000	140.000	0.200	0.200	0.200
GR	833.900	0.000	633.900	3.000	833.300	11.000	827.300	21.000	833.300	22.000
GR	826.900	33.000	827.500	38.000	829.000	45.000	739.100	46.000	0.000	0.000

U/S FACE OF RAILROAD CULVERTS FIRST CROSSING [illegible] OF HOLARD

X1	71.900	6.000	0.300	14.300	340.000	322.000	330.000	0.200	1.000	1.200
X3	10.000	0.000	0.300	0.300	0.000	0.000	0.000	930.300	930.300	0.000
GR	830.000	0.000	820.700	10.300	823.700	13.050	723.700	13.950	823.700	14.000
GR	830.000	25.000	0.300	0.300	0.000	0.000	0.000	0.000	0.000	0.000
SB	0.000	1.900	2.300	0.300	5.000	0.000	19.300	0.200	[illegible]	[illegible]

U/S FACE OF RAILROAD CULVERTS FIRST CROSSING NORTH EAST OF HOLARD

X1	71.920	0.000	0.300	0.300	87.000	82.000	87.000	0.000	0.300	0.000
X2	0.000	0.000	1.200	329.200	200.000	0.000	0.000	0.000	[illegible]	[illegible]
X3	10.000	0.000	0.200	0.200	0.000	0.000	0.000	[illegible]	[illegible]	[illegible]

U/S FACE OF STADIUM DR CULVERTS FIRST CROSSING NORTH EAST OF HOLARD

X1	71.920	6.000	17.000	35.000	55.250	45.500	52.500	[illegible]	[illegible]	[illegible]
X3	10.000	0.000	0.000	0.300	0.000	[illegible]	0.300	[illegible]	[illegible]	[illegible]
GR	833.300	0.000	[illegible]	10.300	826.230	[illegible]	24.900	[illegible]	[illegible]	15.000
GR	832.000	25.000	0.000	0.300	0.000	0.000	0.000	0.000	0.000	0.000
SB	0.000	2.000	2.600	0.300	5.000	0.000	19.300	0.200	826.900	826.900

U/S FACE OF STADIUM DRIVE CULVERTS FIRST CROSSING [illegible] EAST OF HOLARD

X1	72.000	0.000	0.000	0.000	122.500	122.500	122.300	0.000	0.000	0.000
X2	0.000	0.000	1.000	830.900	900.000	0.000	0.300	0.000	0.000	0.000

X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	900.000	900.000	0.000
EJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

****
HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
ERROR CODE = 0
MODIFICATION = 50,51,52
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

ARCADIA CREEK KALAMAZOO

SUMMARY PRINTOUT TABLE 150

	SECNO	XLOB	ELTRD	ELLOC	ELMIN	Q	CWSEL	CRIWS	EG	VCH	AREA	TOPWID
	71.000	0.00	0.00	0.00	818.60	315.00	826.53	0.00	826.54	0.80	1.19	575.55	351.26
	71.000	0.00	0.00	0.00	818.60	385.00	826.53	0.00	826.54	0.80	1.19	575.55	351.26
	71.000	0.00	0.00	0.00	818.60	385.00	826.53	0.00	826.54	0.80	1.19	575.55	351.26
	71.000	0.00	0.00	0.00	818.60	435.00	826.86	0.00	826.88	0.85	1.63	633.36	402.39
	71.000	0.00	0.00	0.00	818.60	485.00	826.86	0.00	826.88	0.85	1.63	633.36	402.39
	71.000	0.00	0.00	0.00	818.60	485.00	826.86	0.00	826.88	0.85	1.63	633.36	402.39
	71.050	50.00	0.00	0.00	818.60	90.00	826.54	0.00	826.55	0.29	0.65	137.65	160.03
	71.050	50.00	0.00	0.00	818.60	115.00	826.54	0.00	826.55	0.37	0.76	137.65	160.03
	71.050	50.00	0.00	0.00	818.60	135.00	826.70	0.00	826.80	0.57	0.94	142.98	170.16
	71.050	50.00	0.00	0.00	818.60	85.00	826.39	0.00	826.40	0.22	0.59	140.43	202.90
	71.050	50.00	0.00	0.00	818.60	110.00	826.98	0.00	826.09	0.36	0.75	140.77	202.59
	71.050	50.00	0.00	0.00	818.60	145.00	827.30	0.00	827.31	0.52	0.94	154.50	200.50
	71.100	136.00	900.00	821.30	817.60	90.00	827.30	0.00	827.30	5.47	1.17	90.23	56.47
	71.100	136.00	900.00	821.30	817.60	115.00	827.30	0.00	827.31	7.68	2.47	90.23	64.15
	71.100	136.00	900.00	821.30	817.60	140.00	828.47	0.00	828.47	9.67	3.03	90.23	68.59
	71.100	136.00	900.00	821.30	817.60	85.00	827.30	0.00	827.35	5.66	1.03	90.23	56.06
	71.100	136.00	900.00	821.30	817.60	110.00	827.98	0.00	828.05	6.89	2.14	51.46	64.91
	71.100	136.00	900.00	821.30	817.60	135.00	828.58	0.00	828.66	8.03	2.43	54.50	65.13
	71.100	136.00	900.00	821.30	817.60	85.00	827.59	0.00	827.64	4.55	1.72	49.35	59.67
	71.100	136.00	900.00	821.30	817.60	110.00	828.17	0.00	828.24	5.77	2.11	51.46	62.76
	71.100	136.00	900.00	821.30	817.60	135.00	828.73	0.00	828.76	6.73	2.45	54.50	65.07
	71.100	136.00	900.00	821.30	817.60	85.00	827.59	0.00	827.64	4.55	1.72	49.35	59.67
	71.100	136.00	900.00	821.30	817.60	120.00	828.73	0.00	828.80	6.62	2.17	55.21	65.94
	71.100	136.00	900.00	821.30	817.60	145.00	829.39	0.00	829.46	7.57	2.48	58.52	69.54

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CHSEL	CRCHS	EG	10K*S	VCH	ARBA	.01R
71.200	34.50	0.00	0.00	818.60	90.00	827.35	0.00	827.41	7.31	2.08	43.28	33.30
71.200	34.50	0.00	0.00	818.60	115.00	827.85	0.00	827.93	10.26	2.51	45.61	35.93
71.200	34.50	0.00	0.00	818.60	140.00	828.49	0.00	828.62	2.70	2.86	48.07	38.27
71.200	34.50	0.00	0.00	818.60	35.00	827.31	0.00	827.57	5.19	1.93	44.11	33.16
71.200	34.50	0.00	0.00	818.60	170.00	828.00	0.00	828.08	3.99	2.36	46.53	36.60
71.200	34.50	0.00	0.00	818.60	135.00	828.61	0.00	828.72	11.45	2.72	49.36	39.05
71.200	34.50	0.00	0.00	818.60	85.00	827.61	0.00	827.68	6.01	1.91	44.59	34.63
71.200	34.50	0.00	0.00	818.60	110.00	828.09	0.00	828.16	8.75	2.34	47.01	37.16
71.200	34.50	0.00	0.00	818.60	160.00	828.91	0.00	828.97	11.16	3.20	50.97	41.73
71.200	34.50	0.00	0.00	818.60	95.00	828.21	0.00	828.27	6.38	2.00	47.50	37.79
71.200	34.50	0.00	0.00	818.60	130.00	828.91	0.00	828.98	8.72	2.59	50.27	40.15
71.200	34.50	0.00	0.00	818.60	145.00	829.43	0.00	829.55	10.76	2.71	53.60	44.20
71.300	78.00	900.00	824.20	819.20	90.00	827.86	0.00	827.97	15.50	2.62	36.39	22.36
71.300	78.00	900.00	824.20	819.20	115.00	828.32	0.00	828.37	15.00	3.04	37.19	23.78
71.300	78.00	900.00	824.20	819.20	140.00	829.03	0.00	829.20	21.73	3.54	42.27	30.13
71.300	78.00	900.00	824.20	819.20	35.00	827.22	0.00	827.27	15.35	2.64	34.56	21.26
71.300	78.00	900.00	824.20	819.20	170.00	829.00	0.00	829.93	17.59	2.08	38.13	26.23
71.300	78.00	900.00	824.20	819.20	135.00	829.05	0.00	830.01	20.10	3.19	42.36	30.11
71.300	78.00	900.00	824.20	819.20	85.00	828.07	0.00	828.16	12.96	2.41	35.24	23.67
71.300	78.00	900.00	824.20	819.20	110.00	828.90	0.00	828.99	7.41	2.85	39.23	27.51
71.300	78.00	900.00	824.20	819.20	160.00	829.80	0.00	829.87	12.82	3.70	43.73	33.83
71.300	78.00	900.00	824.20	819.20	95.00	828.00	0.00	828.05	14.22	2.55	37.44	25.44
71.300	78.00	900.00	824.20	819.20	120.00	829.72	0.00	829.85	14.40	2.97	41.84	29.65
71.300	78.00	900.00	824.20	819.20	145.00	830.36	0.00	831.03	18.25	3.42	46.56	35.05
71.400	35.00	0.00	0.00	822.50	90.00	828.31	0.00	828.41	6.35	0.62	179.37	97.10
71.400	35.00	0.00	0.00	822.50	115.00	828.92	0.00	828.98	8.39	0.67	211.39	120.30
71.400	35.00	0.00	0.00	822.50	140.00	829.56	0.00	829.66	5.26	0.82	244.21	144.56
71.400	35.00	0.00	0.00	822.50	65.00	828.10	0.00	828.10	0.61	0.62	153.52	153.46
71.400	35.00	0.00	0.00	822.50	110.00	828.97	0.00	828.97	0.33	0.64	205.03	190.29
71.400	35.00	0.00	0.00	822.50	135.00	829.05	0.00	830.06	0.24	0.60	275.19	276.15
71.400	35.00	0.00	0.00	822.50	75.00	828.19	0.00	828.20	0.35	0.61	159.71	149.92
71.400	35.00	0.00	0.00	822.50	100.00	828.93	0.00	828.97	0.34	0.63	210.17	179.41
71.400	35.00	0.00	0.00	822.50	125.00	829.70	0.00	829.76	0.23	0.59	261.51	211.01
71.400	35.00	0.00	0.00	822.50	95.00	828.93	0.00	828.95	0.20	0.55	202.96	187.70
71.400	35.00	0.00	0.00	822.50	120.00	829.89	0.00	829.89	0.21	0.56	265.93	251.89
71.400	35.00	0.00	0.00	822.50	145.00	831.07	0.00	831.05	0.15	0.53	349.97	378.06
71.500	130.00	0.00	0.00	823.50	90.00	828.07	0.00	828.12	1.39	0.96	97.11	76.76
71.500	130.00	0.00	0.00	823.50	115.00	828.92	0.00	828.98	0.97	0.80	166.22	125.33
71.500	130.00	0.00	0.00	823.50	140.00	830.05	0.00	830.06	0.51	0.75	210.45	196.66
71.500	130.00	0.00	0.00	823.50	65.00	828.10	0.00	828.11	1.10	0.80	102.39	90.94
71.500	130.00	0.00	0.00	823.50	110.00	828.97	0.00	828.98	0.76	0.86	147.47	133.35
71.500	130.00	0.00	0.00	823.50	135.00	830.05	0.00	830.17	0.72	0.76	211.17	197.41
71.500	130.00	0.00	0.00	823.50	85.00	828.21	0.00	828.21	0.39	0.85	107.05	94.36
71.500	130.00	0.00	0.00	823.50	110.00	828.97	0.00	828.97	0.70	0.92	152.01	137.12
71.500	130.00	0.00	0.00	823.50	135.00	830.15	0.00	830.16	0.54	0.74	218.64	205.30
71.500	130.00	0.00	0.00	823.50	95.00	828.93	0.00	828.96	0.59	0.74	145.52	128.29
71.500	130.00	0.00	0.00	823.50	120.00	829.69	0.00	829.90	0.62	0.71	200.58	186.37
71.500	130.00	0.00	0.00	823.50	145.00	831.07	0.00	831.03	0.37	0.62	279.17	277.15

SECNO	XLOC	ELTRO	ELLO	ELMI	Q	CHSEL	CRILS	EG	TOXPE	VCH	AREA	.01
71.600	130.00	0.00	0.00	824.50	90.00	828.03	0.00	828.06	4.55	1.46	61.83	62.13
71.600	130.00	0.00	0.00	824.50	105.00	829.95	0.00	829.98	2.67	1.27	93.86	73.15
71.600	130.00	0.00	0.00	824.50	140.00	830.06	0.00	830.08	1.14	.64	152.47	131.20
71.600	130.00	0.00	0.00	824.50	85.00	828.19	0.00	828.22	3.03	1.32	65.53	44.90
71.600	130.00	0.00	0.00	824.50	110.00	829.98	0.00	829.00	2.13	1.10	95.27	73.35
71.600	130.00	0.00	0.00	824.50	135.00	830.06	0.00	830.08	1.05	1.00	152.68	131.49
71.600	130.00	0.00	0.00	824.50	85.00	828.21	0.00	828.23	3.24	1.26	67.29	47.22
71.600	130.00	0.00	0.00	824.50	110.00	829.07	0.00	829.09	1.91	1.15	100.88	79.56
71.600	130.00	0.00	0.00	824.50	135.00	830.12	0.00	830.14	0.95	1.00	157.97	137.18
71.600	130.00	0.00	0.00	824.50	85.00	828.34	0.00	828.36	1.66	1.06	69.62	77.53
71.600	130.00	0.00	0.00	824.50	110.00	829.91	0.00	829.93	0.97	1.03	103.21	101.1
71.600	130.00	0.00	0.00	824.50	135.00	831.09	0.00	831.09	0.53	0.81	217.62	198.23
71.700	130.00	0.00	0.00	825.50	90.00	828.11	0.00	828.19	17.99	2.36	37.66	27.79
71.700	130.00	0.00	0.00	825.50	105.00	829.03	0.00	829.09	9.77	1.90	50.07	42.87
71.700	130.00	0.00	0.00	825.50	140.00	830.07	0.00	830.13	3.40	1.16	90.67	76.54
71.700	130.00	0.00	0.00	825.50	85.00	828.16	0.00	828.25	19.21	2.15	39.36	27.04
71.700	130.00	0.00	0.00	825.50	110.00	829.01	0.00	829.06	6.96	1.79	61.35	41.69
71.700	130.00	0.00	0.00	825.50	135.00	830.06	0.00	830.11	2.87	1.41	101.07	75.72
71.700	130.00	0.00	0.00	825.50	85.00	828.26	0.00	828.33	11.87	2.24	41.60	24.67
71.700	130.00	0.00	0.00	825.50	110.00	829.10	0.00	829.15	5.87	1.79	54.38	41.15
71.700	130.00	0.00	0.00	825.50	135.00	830.17	0.00	830.21	2.21	1.36	133.72	101.07
71.700	130.00	0.00	0.00	825.50	85.00	828.37	0.00	828.40	5.57	.83	80.17	60.34
71.700	130.00	0.00	0.00	825.50	120.00	829.91	0.00	829.96	2.76	4.33	92.87	72.26
71.700	130.00	0.00	0.00	825.50	145.00	831.09	0.00	831.10	1.20	1.07	153.09	132.56
71.800	160.00	0.00	0.00	826.70	85.00	828.21	0.00	828.28	17.99	.76	37.91	27.65
71.800	160.00	0.00	0.00	826.70	110.00	829.13	0.00	829.20	9.35	2.64	59.44	39.37
71.800	160.00	0.00	0.00	826.70	145.00	830.13	0.00	830.18	3.37	2.01	97.55	77.46
71.800	160.00	0.00	0.00	826.70	85.00	828.47	0.00	828.60	33.76	2.95	31.32	15.76
71.800	160.00	0.00	0.00	826.70	110.00	829.14	0.00	829.23	13.46	2.76	52.25	30.01
71.800	160.00	0.00	0.00	826.70	145.00	830.13	0.00	830.18	4.37	1.93	86.31	62.12
71.800	160.00	0.00	0.00	826.70	85.00	828.44	0.00	828.54	25.67	.76	33.85	21.85
71.800	160.00	0.00	0.00	826.70	110.00	829.28	0.00	829.50	11.30	2.57	54.95	34.07
71.800	160.00	0.00	0.00	826.70	145.00	830.21	0.00	830.31	3.30	1.95	90.41	67.54

SECNO	XLOC	ELTRD	ELLOC	ELMIN	Q	CHSEL	CUS	ES	TOK*S	VCH	AREA	.DPK
71.920	87.00	900.00	829.00	826.90	90.00	830.15	0.00	830.36	39.86	3.69	24.36	14.26
71.920	87.00	900.00	829.00	826.90	115.00	830.63	0.00	830.92	52.83	4.30	26.25	15.02
71.920	87.00	900.00	829.00	826.90	140.00	831.34	0.00	831.59	66.77	4.95	30.90	16.98
71.920	87.00	900.00	829.00	826.90	15.00	829.96	0.00	830.16	21.49	3.59	23.65	13.70
71.920	87.00	900.00	829.00	826.90	110.00	830.52	0.00	830.77	51.25	4.23	25.71	15.37
71.920	87.00	900.00	829.00	826.90	135.00	831.43	0.00	831.75	53.03	4.58	29.46	16.54
71.920	87.00	900.00	829.00	826.90	85.00	829.96	0.00	830.16	38.98	3.69	23.57	13.61
71.920	87.00	900.00	829.00	826.90	110.00	830.49	0.00	830.77	51.20	4.28	25.71	15.37
71.920	87.00	900.00	829.00	826.90	135.00	831.41	0.00	831.71	64.87	4.88	29.45	16.53
71.920	87.00	900.00	829.00	826.90	90.00	830.12	0.00	830.36	40.10	3.92	24.22	14.19
71.920	87.00	900.00	829.00	826.90	115.00	830.60	0.00	830.81	52.76	4.51	27.02	15.84
71.920	87.00	900.00	829.00	826.90	140.00	831.32	0.00	831.57	66.70	5.15	30.67	17.80
71.940	35.50	0.00	0.00	826.90	90.00	830.24	0.00	830.71	125.82	5.52	16.31	8.75
71.940	35.50	0.00	0.00	826.90	115.00	830.72	0.00	830.93	161.23	6.20	18.09	10.25
71.940	35.50	0.00	0.00	826.90	140.00	831.47	0.00	831.72	196.68	6.96	20.11	11.54
71.940	35.50	0.00	0.00	826.90	90.00	830.20	0.00	830.53	125.58	5.51	15.62	8.76
71.940	35.50	0.00	0.00	826.90	110.00	830.61	0.00	831.16	123.02	6.06	20.16	10.04
71.940	35.50	0.00	0.00	826.90	135.00	831.37	0.00	832.10	94.51	5.89	22.96	13.39
71.940	35.50	0.00	0.00	826.90	85.00	830.03	0.00	830.51	111.43	5.54	15.29	8.05
71.940	35.50	0.00	0.00	826.90	110.00	830.61	0.00	831.16	123.02	6.06	20.16	10.04
71.940	35.50	0.00	0.00	826.90	135.00	831.37	0.00	832.10	94.51	5.89	22.96	13.39
71.940	35.50	0.00	0.00	826.90	85.00	830.03	0.00	830.51	111.43	5.54	15.29	8.05
71.940	35.50	0.00	0.00	826.90	120.00	831.14	0.00	831.63	99.26	5.77	20.79	12.04
71.940	35.50	0.00	0.00	826.90	145.00	832.56	0.00	832.98	62.46	5.20	27.69	11.25
72.000	122.50	900.00	830.90	826.90	90.00	831.79	0.00	832.05	127.25	4.38	15.65	9.67
72.000	122.50	900.00	830.90	826.90	115.00	831.82	0.00	832.22	56.62	4.69	24.28	17.23
72.000	122.50	900.00	830.90	826.90	140.00	832.56	0.00	832.80	36.42	5.25	32.01	21.11
72.000	122.50	900.00	830.90	826.90	110.00	831.60	0.00	831.85	69.25	4.76	25.13	16.05
72.000	122.50	900.00	830.90	826.90	135.00	832.31	0.00	832.59	52.05	5.27	31.63	21.06
72.000	122.50	900.00	830.90	826.90	85.00	831.43	0.00	831.72	93.97	4.33	19.93	11.77
72.000	122.50	900.00	830.90	826.90	110.00	831.60	0.00	831.85	69.25	4.76	25.13	16.05
72.000	122.50	900.00	830.90	826.90	135.00	832.31	0.00	832.59	52.05	5.27	31.63	21.06
72.000	122.50	900.00	830.90	826.90	95.00	831.92	0.00	832.26	121.53	4.63	19.65	11.62
72.000	122.50	900.00	830.90	826.90	120.00	832.43	0.00	832.73	45.55	4.40	27.27	17.76
72.000	122.50	900.00	830.90	826.90	145.00	834.67	0.00	834.89	25.69	3.77	30.46	20.61

ARCADIA CREEK KALAMAZOO

SUMMARY PRINTOUT TABLE 150

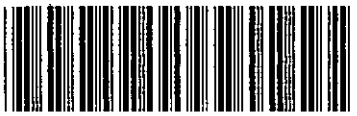
SECNO	A	CHSEL	DEPMIN	DIFLSW	DIFSWR	TOPWID	XLOC
71.000	315.00	826.53	0.00	0.00	0.00	234.14	0.00
71.000	315.00	826.53	0.00	0.00	0.00	234.14	0.00
71.000	315.00	826.53	0.00	0.00	0.00	234.14	0.00
71.000	435.00	826.77	0.00	0.00	0.00	236.43	0.00
71.000	435.00	826.77	0.00	0.00	0.00	236.43	0.00
71.000	435.00	826.77	0.00	0.00	0.00	236.43	0.00
71.000	465.00	826.86	0.00	0.00	0.00	237.30	0.00
71.000	465.00	826.86	0.00	0.00	0.00	237.30	0.00
71.000	465.00	826.86	0.00	0.00	0.00	237.30	0.00
71.000	765.00	827.25	0.00	0.00	0.00	241.23	0.00
71.000	765.00	827.25	0.00	0.00	0.00	241.23	0.00
71.000	765.00	827.25	0.00	0.00	0.00	241.23	0.00
71.050	90.00	826.54	0.00	0.01	0.03	22.00	50.00
71.050	115.00	826.54	0.00	0.01	0.02	22.00	50.00
71.050	140.00	826.55	0.00	0.00	0.01	22.00	50.00
71.050	38.00	826.79	0.00	0.02	0.05	22.00	50.00
71.050	110.00	826.79	0.00	0.01	0.03	22.00	50.00
71.050	135.00	826.79	0.00	0.01	0.00	22.00	50.00
71.050	85.00	826.09	0.00	0.03	0.00	22.00	50.00
71.050	110.00	826.06	0.00	0.02	0.00	22.00	50.00
71.050	135.00	826.00	0.00	0.02	0.00	22.00	50.00
71.050	85.00	827.90	0.00	0.05	0.00	22.00	50.00
71.050	110.00	827.90	0.00	0.05	0.00	22.00	50.00
71.050	135.00	827.90	0.00	0.05	0.00	22.00	50.00
71.100	90.00	827.33	0.00	0.79	0.00	5.00	136.00
71.100	115.00	827.35	0.00	1.00	0.00	5.00	136.00
71.100	140.00	827.37	0.00	1.21	0.00	5.00	136.00
71.100	63.00	827.60	0.00	0.58	0.00	5.00	136.00
71.100	110.00	827.90	0.00	1.19	0.00	5.00	136.00
71.100	135.00	828.38	0.00	1.00	0.00	5.00	136.00
71.100	85.00	827.39	0.00	0.79	0.00	5.00	136.00
71.100	110.00	828.07	0.00	1.00	0.00	5.00	136.00
71.100	135.00	828.68	0.00	1.20	0.00	5.00	136.00
71.100	85.00	828.19	0.00	0.99	0.00	5.00	136.00
71.100	120.00	828.75	0.00	1.43	0.00	5.00	136.00
71.100	145.00	829.39	0.00	2.09	0.00	5.00	136.00
71.200	90.00	827.35	0.00	0.02	0.00	5.00	34.50
71.200	115.00	827.35	0.00	0.02	0.00	5.00	34.50
71.200	140.00	827.49	0.00	0.02	0.00	5.00	34.50
71.200	63.00	827.51	0.00	0.01	0.00	5.00	34.50
71.200	110.00	828.00	0.00	0.02	0.00	5.00	34.50
71.200	135.00	828.61	0.00	0.02	0.00	5.00	34.50
71.200	85.00	827.51	0.00	0.01	0.00	5.00	34.50
71.200	110.00	828.29	0.00	0.02	0.00	5.00	34.50
71.200	135.00	828.71	0.00	0.02	0.00	5.00	34.50
71.200	95.00	828.21	0.00	0.01	0.00	5.00	34.50
71.200	120.00	828.75	0.00	0.02	0.00	5.00	34.50
71.200	145.00	829.41	0.00	0.02	0.00	5.00	34.50

SECNO	Q	CASEL	DIFMSP	DIFMSX	DIFMUS	TOPWID	KLCH
71.300	90.00	827.86	0.00	0.52	0.00	4.00	78.00
71.300	115.00	828.73	0.00	0.37	0.00	4.00	78.00
71.300	140.00	829.03	0.00	1.33	0.00	4.00	78.00
71.300	85.00	827.97	0.00	0.46	0.00	4.00	78.00
71.300	110.00	828.80	0.00	0.80	0.00	4.00	78.00
71.300	135.00	829.85	0.00	1.24	0.00	4.00	78.00
71.300	85.00	828.07	0.00	0.46	0.00	4.00	78.00
71.300	110.00	828.90	0.00	0.80	0.00	4.00	78.00
71.300	135.00	829.95	0.00	[illegible]	[illegible]	4.00	78.00
71.300	95.00	828.80	0.00	0.60	0.00	4.00	78.00
71.300	120.00	829.72	0.00	0.96	0.00	4.00	78.00
71.300	145.00	830.88	0.00	1.46	0.00	4.00	78.00
71.400	90.00	828.00	0.00	0.16	0.00	54.07	85.00
71.400	115.00	828.91	0.00	0.19	0.00	[illegible]	85.00
71.400	140.00	830.05	0.00	0.22	0.00	67.64	85.00
71.400	85.00	828.10	0.00	0.12	0.00	55.42	85.00
71.400	110.00	828.97	0.00	0.17	0.00	60.88	85.00
71.400	135.00	830.06	0.00	0.20	0.00	67.68	85.00
71.400	85.00	828.19	0.00	0.12	0.00	56.05	85.00
71.400	110.00	829.06	0.00	0.17	[illegible]	[illegible]	85.00
71.400	135.00	830.15	0.00	[illegible]	[illegible]	[illegible]	85.00
71.400	95.00	828.93	0.00	0.13	[illegible]	50.63	85.00
71.400	120.00	829.89	0.00	0.17	0.00	66.63	85.00
71.400	145.00	831.07	0.00	0.20	0.00	83.65	85.00
71.500	90.00	828.01	0.00	0.01	0.00	[illegible]	130.00
71.500	115.00	828.92	0.00	0.00	0.00	54.35	130.00
71.500	140.00	830.05	0.00	0.00	0.00	61.47	130.00
71.500	85.00	828.10	0.00	0.01	0.00	49.26	130.00
71.500	110.00	828.97	0.00	0.00	0.00	54.66	130.00
71.500	135.00	830.06	0.00	0.00	0.00	61.46	130.00
71.500	85.00	828.20	0.00	0.00	0.00	[illegible]	130.00
71.500	110.00	829.09	0.00	0.00	0.00	55.25	130.00
71.500	135.00	830.15	0.00	0.00	0.00	[illegible]	130.00
71.500	95.00	828.93	0.00	0.00	0.00	54.44	130.00
71.500	120.00	829.89	0.00	0.00	0.00	60.42	130.00
71.500	145.00	831.07	0.00	0.00	0.00	67.78	130.00
71.600	90.00	828.03	0.00	0.02	0.00	29.[illegible]	130.00
71.600	115.00	828.95	0.00	0.0[illegible]	0.00	48.[illegible]	130.00
71.600	140.00	830.06	0.00	0.09	0.00	55.22	130.00
71.600	85.00	828.12	0.00	0.02	0.00	29.75	130.00
71.600	110.00	828.95	0.00	0.01	0.00	48.47	130.00
71.600	135.00	830.06	0.00	0.0[illegible]	0.00	[illegible]	130.00
71.600	85.00	828.21	0.00	0.0[illegible]	0.00	30.35	130.00
71.600	110.00	829.07	0.00	0.0[illegible]	0.00	49.36	130.00
71.600	135.00	830.16	0.00	0.09	0.00	55.85	130.00
71.600	95.00	828.94	0.00	0.01	0.00	48.2[illegible]	130.00
71.600	120.00	829.90	0.00	0.00	0.00	54.21	130.00
71.600	145.00	831.08	0.00	0.00	0.00	61.97	130.00

SECNO	S	CHSEL	DIF.SP	DIFHSX	DIFKJS	TOPWID	XLCH
71.700	90.00	828.11	0.00	0.08	0.00	23.20	130.00
71.700	115.00	829.97	0.00	0.04	0.00	20.75	130.00
71.700	140.00	830.07	0.00	0.01	0.00	49.06	130.00
71.700	[illegible]	[illegible]	0.00	0.03	0.00	[illegible]	[illegible]
71.700	110.00	829.01	0.00	0.03	0.00	29.09	130.00
71.700	135.00	830.06	0.00	0.01	0.00	49.09	130.00
71.700	85.00	828.26	0.00	0.05	0.00	26.22	130.00
71.700	110.00	829.90	0.00	0.03	0.00	29.66	130.00
71.700	[illegible]	[illegible]	0.00	0.01	[illegible]	[illegible]	[illegible]
71.700	95.00	828.97	0.00	0.03	[illegible]	[illegible]	[illegible]
71.700	120.00	829.91	0.00	0.01	[illegible]	[illegible]	[illegible]
71.700	165.00	831.08	0.00	0.01	0.00	55.37	130.00
71.800	90.00	828.47	0.00	0.36	0.00	23.10	160.00
71.800	[illegible]	[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]
71.800	[illegible]	[illegible]	0.00	0.35	0.00	[illegible]	[illegible]
71.800	35.00	828.67	0.00	0.29	0.00	[illegible]	[illegible]
71.800	110.00	829.14	0.00	0.13	0.00	33.89	160.00
71.800	135.00	830.13	0.00	0.05	0.00	40.00	160.00
71.800	85.00	828.52	0.00	0.26	0.00	28.58	160.00
71.800	[illegible]	[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]
71.800	[illegible]	[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]
71.800	95.00	[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]
71.800	120.00	829.96	0.00	0.05	0.00	30.94	160.00
71.800	165.00	831.10	0.00	0.02	0.00	46.13	160.00
71.900	90.00	[illegible]	0.00	[illegible]	[illegible]	[illegible]	330.00
71.900	[illegible]	[illegible]	0.00	[illegible]	[illegible]	[illegible]	330.00
71.900	[illegible]	[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]
71.900	[illegible]	[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]
71.900	[illegible]	[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]
71.900	95.00	829.66	0.00	0.39	0.00	6.30	330.00
71.900	120.00	830.19	0.00	0.24	0.00	6.30	330.00
71.900	165.00	831.12	0.00	0.02	0.00	6.30	330.00
71.920	90.00	[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]
71.920	[illegible]	[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]
71.920	[illegible]	831.54	0.00	1.17	0.00	6.30	87.00
71.920	85.00	829.98	0.00	0.35	0.00	6.30	87.00
71.920	110.00	830.49	0.00	0.66	0.00	6.30	87.00
71.920	[illegible]	[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]
71.920	35.00	829.56	0.00	0.35	0.00	[illegible]	[illegible]
71.920	[illegible]	[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]
71.920	135.00	831.49	0.00	1.00	0.00	6.30	87.00
71.920	95.00	830.12	0.00	0.45	0.00	6.30	87.00
71.920	120.00	831.01	0.00	0.02	0.00	6.30	87.00
71.920	[illegible]	[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]

SECNO	Q	CHSEL	DIF.SP	DIFUSX	DIFKPS	TOPWID	XLOA
71.940	90.00	830.24	0.00	0.09	0.00	4.97	35.50
71.940	115.00	830.76	0.00	0.13	0.00	6.99	35.50
71.940	140.00	831.60	0.00	0.18	0.00	5.00	35.50
71.940	85.00	830.06	0.00	0.08	0.00	4.96	35.50
71.940	110.00	830.51	0.00	0.12	0.00	6.99	35.50
71.940	135.00	831.57	0.00	0.14	0.00	5.00	35.50
71.940	85.00	830.03	0.00	0.08	0.00	6.96	35.50
71.940	110.00	830.51	0.00	0.12	0.00	6.99	35.50
71.940	135.00	831.52	0.00	0.14	0.00	5.00	35.50
71.940	85.00	830.22	0.00	0.12	0.00	4.97	35.50
71.940	110.00	831.55	0.00	0.13	0.00	6.99	35.50
71.940	145.00	832.56	0.00	0.12	0.00	5.00	35.50
72.000	90.00	831.74	0.00	1.50	0.00	5.00	122.50
72.000	115.00	831.88	0.00	1.12	0.00	5.00	122.50
72.000	140.00	833.50	0.00	1.89	0.00	5.00	122.50
72.000	85.00	831.54	0.00	1.40	0.00	5.00	122.50
72.000	110.00	831.69	0.00	0.99	0.00	5.00	122.50
72.000	135.00	833.31	0.00	1.74	0.00	5.00	122.50
72.000	85.00	831.54	0.00	1.30	0.00	5.00	122.50
72.000	110.00	831.69	0.00	0.99	0.00	5.00	122.50
72.000	135.00	833.37	0.00	1.74	0.00	5.00	122.50
72.000	85.00	831.92	0.00	1.30	0.00	5.00	122.50
72.000	110.00	832.43	0.00	1.30	0.00	5.00	122.50
72.000	135.00	834.67	0.00	2.11	0.00	5.00	122.50

SUMMARY OF ERRORS



1) COUNTY: KALAMAZOO

2) STUDY NAME: KALAMAZOO, CITY OF

3) WATERCOURSE: ARCADIA CREEK

4) DOCUMENT TYPE: MULTI PROFILES INPUT DATA



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*****************************************************
*  WATER SURFACE PROFILES                           *
*  VERSION OF NOVEMBER 1976                         *
*  UPDATED MAY 1984                                 *
*                                                   *
*  RUN DATE 17-DEC-90 TIME 13:12:06                 *
*****************************************************
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*****************************************
*  U.S. ARMY CORPS OF ENGINEERS         *
*  THE HYDROLOGIC ENGINEERING CENTER    *
*  609 SECOND STREET, SUITE D           *
*  DAVIS, CALIFORNIA 95616              *
*  (916) 440-2105 (FTS) 448-2105        *
*****************************************
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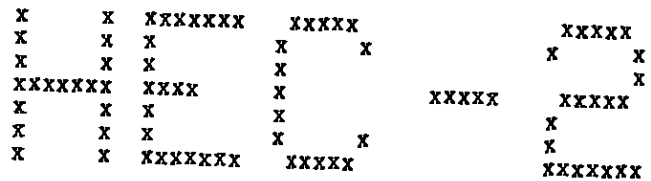

10-,50-,100- AND 500-YEAR FLOOD PROFILES

SPLIT FLOW ANALYSIS USED FOR DIVERSIONS

THIS RUN EXECUTED 17-DEC-90 17:05:07

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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55
**************************************************


SPLIT FLOW BEING PERFORMED

SF    UTILIZE THE SPLIT-FLOW OPTION TO MODEL THE DIVERSION AT EDWARDS ST.

JC    DIVERSION
JP                  200.

TC    POND DIVERSION:RATING CURVE METHOD FOR EVALUATING THE DIVERSION
CS   15.   28.66   28.66   23.77
CR    0.  765.90     25.  766.93     50.  767.52    100.  768.53    150.  769.35
CR  200.  770.09    250.  770.76    300.  771.37    350.  771.95    400.  772.50
CR  450.  773.03    500.  773.53    550.  774.01    600.  774.48   1500.  786.00

JC    DIVERSION
JP             5.     50.

TC    JUNCTION BOX DIVERSION:RATING CURVE METHOD FOR EVALUATING THE DIVERSION
CS   16.   23.62   23.62     -1.
CR    0.  763.60     25.  765.48     50.  766.16     75.  766.78    100.  767.32
CR  150.  768.20    200.  768.49    250.  769.13    300.  769.72    350.  770.28
CR  400.  770.80    450.  771.34    500.  772.58    550.  775.43    600.  778.13
CR 1000.  786.00
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C
T1 ARCADIA CREEK HYDRAULIC ANALYSIS
T2 10-YR FLOOD MEAN ANNUAL START
T3       [AC6.HEC2]

J1  ICHECK     INQ        NINV       IDIR       STRT       METRIC     HVINS      Q          WSEL       FQ

       0.         2.         0.         0.  0.000000       0.00       0.0         0.    757.500      0.000

J2  NPROF      IPLOT      PRFVS      XSECV      XSECH      FN         ALLDC      IBW        CHNIM      ITRACE

     1.000      0.000     -1.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    150.000     38.000     66.000      8.000      1.000     39.000     43.000      3.000      0.000      0.000


QT      4.000    620.000    890.000   1020.000   1315.000      0.000      0.000      0.000      0.000      0.000
NC      0.035      0.035      0.035      0.500      0.700      0.000      0.000      0.000      0.000      0.000
          STA: 0+00: D/S LIMIT OF RIPRAP EXIT CHANNEL(20' D/S OF BAFFLED APRON)
X1      0.000      4.000    100.000    120.020      0.000      0.000      0.000      0.000      0.000      0.000
GR    765.000    100.000    748.000    100.010    748.000    120.010    765.000    120.020      0.000      0.000

NC      0.013      0.013      0.013      0.100      0.300      0.000      0.000      0.000      0.000      0.000
X1      0.100      0.000      0.000      0.000      9.000      9.000      9.000      0.000      0.000      0.000

X1      0.170      0.000      0.000      0.000      8.000      8.000      8.000      0.000      0.000      0.000

          STA. 0+18: U/S LIMIT OF RIPRAP EXIT CHANNEL-BEGIN ENEGY DISSIPATOR
X1      0.180     14.000    100.000    120.070      1.000      1.000      1.000      0.000     -7.000      0.000
GR    766.000    100.000    758.000    100.010    758.000    102.010    755.000    102.020    755.000    106.020
GR    758.000    106.030    758.000    110.030    755.000    110.040    755.000    114.040    758.000    114.050
GR    758.000    118.050    755.000    118.060    755.000    120.060    766.000    120.070      0.000      0.000

X1      0.330     14.000    100.000    120.070     14.000     14.000     14.000      0.000      0.000      0.000
GR    766.000    100.000    758.000    100.010    758.000    102.010    755.000    102.020    755.000    106.020
GR    758.000    106.030    758.000    110.030    755.000    110.040    755.000    114.040    758.000    114.050
GR    758.000    118.050    755.000    118.060    755.000    120.060    766.000    120.070      0.000      0.000

          STA. 0+34: U/S LIMIT OF ENERGY DISSIPATOR
X1      0.340      4.000    100.000    120.020      1.000      1.000      1.000      0.000      0.000      0.000
GR    766.000    100.000    755.000    100.010    755.000    120.010    766.000    120.020      0.000      0.000

X1      0.380      4.000    100.000    118.020      4.000      4.000      4.000      0.000      0.000      0.000
GR    766.000    100.000    755.000    100.010    755.000    118.010    766.000    118.020      0.000      0.000

X1      0.420      4.000    100.000    116.020      4.000      4.000      4.000      0.000      0.000      0.000
GR    766.000    100 000    755.000    100.010    755.000    116.010    766.000    116.020      0.000      0.000
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X1	0.460	4.000	100.000	114.020	4.000	4.000	4.000	0.000	0.000	0.000
GR	766.000	100.000	755.000	100.010	755.000	114.010	766.000	114.020	0.000	0.000
	STA. 0+50:NOTE XSEC. #'S REFLECT STA.									
X1	0.500	4.000	100.000	112.020	4.000	4.000	4.000	0.000	0.000	0.000
BT	2.000	150.000	763.000	762.000	162.010	763.000	762.000	0.000	0.000	0.000
GR	765.000	100.000	755.000	100.010	755.000	112.010	765.000	112.020	0.000	0.000
	STA. 1+00									
X1	1.000	0.000	0.000	0.000	50.000	50.000	50.000	0.000	0.095	0.000
BT	2.000	150.000	764.200	762.085	162.010	764.200	762.095	0.000	0.000	0.000
X1	1.250	0.000	0.000	0.000	25.000	25.000	25.000	0.000	0.047	0.000
BT	2.000	150.000	765.900	762.141	162.010	765.900	762.142	0.000	0.000	0.000
X1	2.500	0.000	0.000	0.000	125.000	125.000	125.000	0.000	0.238	0.000
BT	2.000	150.000	767.000	762.520	162.010	767.000	762.520	0.000	0.000	0.000
X1	3.500	0.000	0.000	0.000	100.000	100.000	100.000	0.000	0.191	0.000
BT	2.000	150.000	767.000	762.710	162.010	767.000	762.710	0.000	0.000	0.000
X1	4.300	0.000	0.000	0.000	80.000	80.000	80.000	0.000	0.153	0.000
BT	2.000	150.000	767.000	762.861	162.010	767.000	762.861	0.000	0.000	0.000
X1	4.550	6.000	150.000	162.010	25.000	25.000	25.000	0.000	0.000	0.000
BT	2.000	150.000	767.000	762.990	162.010	767.000	762.990	0.000	0.000	0.000
GR	773.000	100.000	773.000	150.000	755.990	150.010	755.990	162.000	773.000	162.010
GR	773.000	200.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	5.000	0.000	0.000	0.000	45.000	45.000	45.000	0.000	0.086	0.000
BT	2.000	150.000	767.000	763.080	162.010	767.000	763.080	0.000	0.000	0.000
X1	7.500	0.000	0.000	0.000	250.000	250.000	250.000	0.000	0.477	0.000
BT	2.000	150.000	768.000	763.550	162.010	768.000	763.550	0.000	0.000	0.000
X1	10.000	0.000	0.000	0.000	250.000	250.000	250.000	0.000	0.477	0.000
BT	2.000	150.000	769.000	764.030	162.010	769.000	764.030	0.000	0.000	0.000
X1	12.500	0.000	0.000	0.000	250.000	250.000	250.000	0.000	0.477	0.000
BT	2.000	150.000	771.250	764.510	162.010	771.250	764.510	0.000	0.000	0.000
X1	15.000	0.000	0.000	0.000	250.000	250.000	250.000	0.000	0.477	0.000
BT	2.000	150.000	772.900	764.980	162.010	772.900	764.980	0.000	0.000	0.000
X1	17.500	0.000	0.000	0.000	250.000	250.000	250.000	0.000	0.477	0.000
BT	2.000	150.000	772.800	765.460	162.010	772.800	765.460	0.000	0.000	0.000
NC	0.013	0.013	0.013	0.300	0.500	0.000	0.000	0.000	0.000	0.000
X1	18.280	0.000	0.000	0.000	78.000	78.000	78.000	0.000	0.149	0.000
BT	2.000	150.000	772.800	765.610	162.010	772.800	765.610	0.000	0.000	0.000

X1	18.330	5.000	100.000	113.100	5.000	5.000	5.000	0.000	0.000	0.000
BT	2.000	100.000	774.000	767.100	112.600	774.000	767.100	0.000	0.000	0.000
GR	774.000	100.000	758.600	100.100	758.600	107.600	758.600	113.000	774.000	113.100
X1	18.380	8.000	100.000	116.400	5.000	5.000	5.000	0.000	0.000	0.000
BT	-4.000	100.000	774.000	767.100	107.700	774.000	767.100	108.700	774.000	767.100
BT	0.000	116.400	774.000	767.100	0.000	0.000	0.000	0.000	0.000	0.000
GR	774.000	100.000	758.600	100.100	758.600	107.600	774.000	107.700	774.000	108.700
GR	758.600	108.800	758.600	116.300	774.000	116.400	0.000	0.000	0.000	0.000
X1	18.390	8.000	100.000	116.400	0.100	0.100	0.100	0.000	0.000	0.000
X5	-4.000	0.150	0.150	0.150	0.150	0.000	0.000	0.000	0.000	0.000
GR	774.000	100.000	758.600	100.100	758.600	107.600	774.000	107.700	774.000	108.700
GR	758.600	108.800	758.600	116.300	774.000	116.400	0.000	0.000	0.000	0.000
X1	18.540	8.000	100.000	125.500	16.000	16.000	16.000	0.000	0.000	0.000
BT	-4.000	100.000	774.000	767.100	107.700	774.000	767.100	107.700	774.000	767.100
BT	0.000	125.500	774.000	767.100	0.000	0.000	0.000	0.000	0.000	0.000
GR	774.000	100.000	758.650	100.100	758.650	107.600	774.000	107.700	774.000	117.700
GR	758.650	117.800	758.650	125.300	774.000	125.500	0.000	0.000	0.000	0.000
X1	18.541	8.000	100.000	125.500	0.100	0.100	0.100	0.000	0.000	0.000
X5	-4.000	0.140	0.140	0.140	0.160	0.000	0.000	0.000	0.000	0.000
GR	774.000	100.000	758.650	100.100	758.650	107.600	774.000	107.700	774.000	117.700
GR	758.650	117.800	758.650	125.300	774.000	125.500	0.000	0.000	0.000	0.000
X1	18.550	14.000	110.000	134.975	1.000	1.000	1.000	0.000	0.000	0.000
BT	-12.000	109.900	774.000	759.000	110.000	774.000	762.550	111.000	774.000	765.800
BT	0.000	113.750	774.000	766.300	116.500	774.000	765.800	117.500	774.000	762.550
BT	0.000	127.500	774.000	762.550	128.475	774.000	765.800	131.225	774.000	766.300
BT	0.000	133.975	774.000	765.800	134.975	774.000	762.550	135.000	774.000	759.000
GR	774.000	109.900	762.550	110.000	759.300	111.000	758.800	113.750	759.300	116.500
GR	762.550	117.500	774.000	117.600	774.000	127.400	762.550	127.500	759.300	128.475
GR	758.800	131.225	759.300	133.975	762.550	134.975	774.000	135.000	0.000	0.000
X1	19.150	14.000	110.000	134.975	60.000	60.000	60.000	0.000	0.000	0.000
BT	-12.000	109.900	774.150	759.150	110.000	774.150	763.050	111.000	774.150	766.300
BT	0.000	113.750	774.150	766.800	116.500	774.150	766.300	117.500	774.150	763.050
BT	0.000	127.500	774.150	763.050	128.475	774.150	766.300	131.225	774.150	766.800
BT	0.000	133.975	774.150	766.300	134.975	774.150	763.050	135.000	774.150	759.150
GR	774.150	109.900	763.050	110.000	759.800	111.000	759.300	113.750	759.800	116.500
GR	763.050	117.500	774.150	117.600	774.150	127.400	763.050	127.500	759.800	128.475
GR	759.300	131.225	759.800	133.975	762.700	134.975	774.150	135.000	0.000	0.000
X1	19 160	8.000	100.000	125.040	1.000	1.000	1.000	0.000	0.000	0.000
BT	-4.000	100.010	774.000	767.400	107.520	774.000	767.400	117.520	774.000	767.400
BT	0.000	125.040	774.000	767.400	0.000	0.000	0.000	0.000	0.000	0.000
GR	770.240	100.000	759.300	100.010	759.300	107.510	770.230	107.520	770.230	117.520
GR	759.300	117.530	759.300	125.030	770 240	125.040	0.000	0.000	0.000	0.000

X1	19.280	8.000	100.000	117.040	12.000	12.000	12.000	0.000	0.191	0.000
BT	-4.000	100.000	774.000	767.400	107.520	774.000	767.400	109.520	774.000	767.400
BT	0.000	117.400	774.000	767.400	0.000	0.000	0.000	0.000	0.000	0.000
GR	770.200	100.000	759.450	100.010	759.450	107.510	770.200	107.520	770.200	109.520
GR	759.450	109.530	759.450	117.030	770.200	117.040	0.000	0.000	0.000	0.000
X1	19.290	6.000	100.000	115.020	1.000	1.000	1.000	0.000	0.191	0.000
BT	-4.000	100.000	774.000	767.400	107.600	774.000	767.400	109.800	774.000	767.400
BT	0.000	115.500	774.000	767.400	0.000	0.000	0.000	0.000	0.000	0.000
GR	770.200	100.000	759.450	100.010	759.450	107.510	759.450	109.510	759.450	115.010
GR	770.200	115.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	19.390	6.000	150.000	162.010	10.000	10.000	10.000	0.000	3.549	0.000
BT	2.000	150.000	774.000	767.700	162.010	774.000	767.700	0.000	0.000	0.000
GR	773.000	100.000	773.000	150.000	756.150	150.010	756.150	162.000	773.000	162.010
GR	773.000	200.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	19.400	6.000	150.000	162.010	1.000	1.000	1.000	0.000	3.549	0.000
BT	2.000	150.000	774.000	767.700	162.010	774.000	767.700	0.000	0.000	0.000
GR	773.000	100.000	773.000	150.000	756.150	150.010	756.150	162.000	773.000	162.010
GR	773.000	200.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	20.000	0.000	0.000	0.000	60.000	60.000	60.000	0.000	0.147	0.000
BT	2.000	150.000	771.500	767.900	162.010	771.500	767.900	0.000	0.000	0.000
X1	22.500	0.000	0.000	0.000	250.000	250.000	250.000	0.000	0.613	0.000
BT	2.000	150.000	771.500	768.490	162.010	771.500	768.490	0.000	0.000	0.000
X1	22.510	0.000	0.000	0.000	0.010	0.010	0.010	0.000	0.000	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X5	-4.000	0.050	0.060	0.070	0.080	0.000	0.000	0.000	0.000	0.000
NC	0.013	0.013	0.013	0.300	0.500	0.000	0.000	0.000	0.000	0.000
X1	22.700	6.000	150.000	162.010	20.000	20.000	20.000	0.000	0.000	0.000
BT	2.000	150.000	771.500	768.500	162.010	771.500	768.500	0.000	0.000	0.000
GR	771.500	100.000	771.500	150.000	760.500	150.010	760.500	162.000	771.500	162.010
GR	771.500	200.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	23.000	0.000	0.000	0.000	30.000	30.000	30.000	0.000	0.063	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X1	23.100	0.000	0.000	0.000	0.010	0.010	0.010	0.000	0.000	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X5	-4.000	0.070	0.080	0.090	0.100	0.000	0.000	0.000	0.000	0.000
X1	23.500	0.000	0.000	0.000	50.000	50.000	50.000	0.000	0.122	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000

X1	23.520	6.000	150.000	164.100	2.000	2.000	2.000	0.000	0.000	0.000
BT	2.000	150.000	771.100	769.000	164.100	771.100	769.000	0.000	0.000	0.000
GR	771.500	100.000	771.500	150.000	760.700	150.010	760.700	164.000	771.500	164.100
GR	771.500	200.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	23.620	8.000	150.000	170.010	10.000	10.000	10.000	0.000	0.000	0.000
BT	4.000	150.000	771.500	769.000	159.500	771.500	769.000	160.500	771.500	769.000
BT	170.010	771.500	769.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	771.500	100.000	771.500	150.000	760.700	150.010	760.700	159.500	760.700	160.500
GR	760.700	170.000	771.500	170.010	771.500	200.000	0.000	0.000	0.000	0.000
X1	23.630	0.000	0.000	0.000	0.100	0.100	0.100	0.000	0.000	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X5	-4.000	0.250	0.250	0.250	0.250	0.000	0.000	0.000	0.000	0.000
X1	23.770	10.000	150.000	170.010	15.000	15.000	15.000	0.000	0.037	0.000
BT	6.000	150.000	771.200	769.000	159.500	771.200	769.000	159.510	771.200	769.000
BT	160.500	771.200	769.000	160.510	771.200	769.000	170.010	771.200	769.000	0.000
GR	771.500	100.000	771.500	150.000	760.700	150.010	760.700	159.500	760.700	159.510
GR	760.700	160.500	760.700	160.510	760.700	170.000	771.500	170.010	771.500	200.000
QT	4.000	615.000	885.000	1015.000	1310.000	0.000	0.000	0.000	0.000	0.000
X1	23.930	6.000	150.000	162.010	16.000	16.000	16.000	0.000	0.074	0.000
BT	2.000	150.000	771.500	768.800	162.010	771.500	768.800	0.000	0.000	0.000
GR	771.500	100.000	771.500	150.000	760.700	150.010	760.700	162.000	771.500	162.010
GR	771.500	200.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	24.000	0.000	0.000	0.000	7.000	7.000	7.000	0.000	0.017	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X1	24.100	0.000	0.000	0.000	0.010	0.010	0.010	0.000	0.000	0.000
X2	0.000	0.000	0.000	0.000	0 000	0.000	1.000	0.000	0.000	0.000
X5	-4.000	0.040	0.040	0.040	0.040	0.000	0.000	0.000	0.000	0.000
X1	25.000	0.000	0.000	0.000	100.000	100.000	100.000	0.000	0.245	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
QT	4.000	615.000	885.000	1015.000	1310.000	0.000	0.000	0.000	0.000	0.000
X1	27.500	0.000	0.000	0.000	250.000	250.000	250.000	0.000	0.610	0.000
BT	2.000	150.000	773.000	769.620	162.010	773.000	769.620	0.000	0.000	0.000
X1	28.560	0.000	0.000	0.000	106.000	106.000	106.000	0.000	0.260	0.000
BT	2.000	150.000	773.500	769.930	162.010	773.500	769.930	0.000	0.000	0.000
X1	28.570	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X1	28.650	4.000	100.000	132.200	8.000	8.000	8.000	0.000	0.000	0.000
GR	773.000	100.000	762.000	100.100	762.000	132.100	773.000	132.200	0.000	0.000

SB	0.000	1.000	3.300	32.000	0.000	0.000	0.000	0.000	762.000	762.000
X1	28.660	4.000	100.000	132.010	1.000	1.000	1.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	762.000	765.000	0.000	0.000	0.000	0.000	0.000
GR	775.000	100.000	762.000	100.010	762.000	132.000	775.000	132.010	0.000	0.000
NC	0.040	0.040	0.035	0.100	0.300	0.000	0.000	0.000	0.000	0.000
X1	28.990	8.000	150.000	215.000	44.000	50.000	33.000	0.000	0.000	0.000
GR	774.000	100.000	772.000	150.000	765.000	175.000	760.000	185.000	760.000	205.000
GR	765.000	215.000	772.000	240.000	774.000	295.000	0.000	0.000	0.000	0.000
X1	29.310	8.000	175.000	250.000	45.000	60.000	32.000	0.000	0.000	0.000
GR	775.000	100.000	774.000	140.000	765.000	175.000	760.000	185.000	760.000	240.000
GR	765.000	250.000	774.000	280.000	776.000	330.000	0.000	0.000	0.000	0.000
X1	30.130	7.000	180.000	210.000	72.000	72.000	82.000	0.000	0.000	0.000
GR	776.000	100.000	765.000	180.000	760.000	190.000	760.000	200.000	765.000	210.000
GR	774.000	250.000	776.000	290.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	30.630	7.000	180.000	210.000	22.000	71.000	50.000	0.000	0.000	0.000
GR	776.000	100.000	765.000	180.000	760.000	190.000	760.000	200.000	765.000	210.000
GR	774.000	250.000	776.000	290.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	31.670	4.000	100.000	150.010	124.000	136.000	104.000	0.000	0.000	0.000
GR	776.000	100.000	765.000	100.010	765.000	150.000	776.000	150.010	0.000	0.000
NC	0.013	0.013	0.013	0.300	0.500	0.000	0.000	0.000	0.000	0.000
X1	31.770	10.000	100.000	125.020	10.000	10.000	10.000	0.000	0.000	0.000
GR	776.500	90.000	776.500	100.000	772.000	100.010	765.500	100.020	765.000	108.000
GR	765.000	117.000	765.500	125.000	772.000	125.010	776.500	125.020	776.500	135.000
X1	32.060	10.000	100.000	120.020	9.000	9.000	9.000	0.000	0.000	0.000
GR	778.000	90.000	778.000	100.000	772.000	100.010	765.500	100.020	765.000	108.000
GR	765.000	112.000	765.500	120.000	772.000	120.010	778.000	120.020	778.000	130.000
X1	32.070	10.000	100.000	120.020	1.000	1.000	1 000	0.000	0.000	0.000
BT	-8.000	100.000	778.000	760.000	100.010	778.000	772.500	100.020	778.000	772.500
BT	0.000	108.000	778.000	773.000	112.000	778.000	773.000	120.000	778.000	772.500
BT	0.000	120.010	778.000	772.500	120.020	778.000	760.000	0.000	0.000	0.000
GR	778.000	90.000	778.000	100.000	772.000	100.010	765.500	100.020	765.000	108.000
GR	765.000	112.000	765.500	120.000	772.000	120.010	778.000	120.020	778.000	130.000
X1	33.150	0.000	0.000	0.000	108.000	108.000	108.000	0.000	0.330	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X1	33.160	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.003	0.000
X1	33.260	0.000	0.000	0.000	10.000	10.000	10.000	0.000	0.031	0.000

SB	0.000	1.000	3.300	20.000	0.000	0.000	0.000	0.000	765.200	765.200
X1	33.270	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.003	0.000
X2	0.000	0.000	1.000	765.200	767.800	0.000	0.000	0.000	0.000	0.000
X1	33.740	0.000	0.000	0.000	48.000	48.000	48.000	0.000	0.147	0.000
X1	33.750	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
BT	-8.000	90.000	780.000	760.000	100.010	780.000	773.020	100.020	780.000	773.520
BT	0.000	108.000	780.000	773.520	112.000	780.000	773.520	120.000	780.000	773.520
BT	0.000	120.010	780.000	773.020	130.000	780.000	760.000	0.000	0.000	0.000
QT	4.000	610.000	880.000	1005.000	1300.000	0.000	0.000	0.000	0.000	0.000
X1	34.710	0.000	0.000	0.000	96.000	96.000	96.000	0.000	0.293	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X1	34.720	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X1	34.800	0.000	0.000	0.000	8.000	8.000	8.000	0.000	0.024	0.000
SB	0.000	1.000	3.300	20.000	0.000	0.000	0.000	0.000	765.800	765.800
X1	34.810	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	765.770	768.670	0.000	0.000	0.000	0.000	0.000
X1	36.210	0.000	0.000	0.000	140.000	140.000	140.000	0.000	0.428	0.000
X1	38.050	0.000	0.000	0.000	184.000	184.000	184.000	0.000	0.550	0.000
X1	38.060	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
BT	-8.000	90.000	780.000	760.000	100.010	780.000	774.320	100.020	780.000	774.320
BT	0.000	108.000	780.000	774.820	112.000	780.000	774.820	120.000	780.000	774.320
BT	0.000	120.010	780.000	774.320	130.000	780.000	760.000	0.000	0.000	0.000
X1	39.760	0.000	0.000	0.000	170.000	170.000	170.000	0 000	0.519	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X1	39.770	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X1	39.860	0.000	0.000	0.000	9.000	9.000	9.000	0.000	0.027	0.000
SB	0.000	1.000	3.300	20.000	0.000	0.000	0.000	0.000	767.400	767.400
X1	39.870	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	767.400	770.300	0.000	0.000	0.000	0.000	0.000
QT	4 000	605.000	870.000	995.000	1290.000	0.000	0.000	0.000	0.000	0.000
X1	41.590	0.000	0.000	0.000	172.000	172.000	172.000	0.000	0.504	0.000
X1	43.350	0.000	0.000	0.000	176.000	176.000	176.000	0.000	0.538	0.000

X1	43.360	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
BT	-8.000	90.000	780.200	760.000	100.010	780.200	775.910	100.020	780.200	775.910
BT	0.000	108.000	780.200	776.410	112.000	780.200	776.410	120.000	780.200	775.910
BT	0.000	120.010	780.200	775.910	130.000	780.200	760.000	0.000	0.000	0.000
X1	45.860	0.000	0.000	0.000	250.000	250.000	250.000	0.000	0.764	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
QT	4.000	600.000	865.000	990.000	1285.000	0.000	0.000	0.000	0.000	0.000
X1	45.870	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X1	45.970	0.000	0.000	0.000	10.000	10.000	10.000	0.000	0.031	0.000
SB	0.000	1.000	3.300	20.000	0.000	0.000	0.000	0.000	769.200	769.200
X1	45.980	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	769.200	771.900	0.000	0.000	0.000	0.000	0.000
X1	48.330	0.000	0.000	0.000	235.000	235.000	235.000	0.000	0.718	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X1	48.340	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
BT	-8.000	90.000	785.200	760.000	100.010	784.700	777.420	100.020	784.700	777.420
BT	0.000	108.000	784.700	777.920	112.000	784.700	777.920	120.000	784.700	777.420
BT	0.000	120.010	784.700	777.420	130.000	784.700	760.000	0.000	0.000	0.000
X1	49.240	0.000	0.000	0.000	90.000	90.000	90.000	0.000	0.275	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X1	49.250	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X1	49.340	0.000	0.000	0.000	9.000	9.000	9.000	0.000	0.027	0.000
SB	0.000	1.000	3.300	20.000	0.000	0.000	0.000	0.000	769.700	769.700
X1	49.350	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	770.200	773.100	0.000	0.000	0.000	0.000	0.000
X1	50.410	0.000	0.000	0.000	106.000	106.000	106.000	0.000	0.306	0.000
X1	51.550	0.000	0.000	0.000	114.000	114.000	114.000	0.000	0.397	0.000
EJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: KALAMAZOO, CITY OF

3) WATERCOURSE: ARCADIA CREEK

4) DOCUMENT TYPE: MULTI-PROFILES RUN BETWEEN ELM AND WESTNEDGE

00BREAK00

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**************************************************
*  WATER SURFACE PROFILES                        *
*  VERSION OF NOVEMBER 1976                      *
*  UPDATED MAY 1984                              *
*                                                *
*  RUN DATE  1-AUG-90 TIME 14:49:05              *
**************************************************
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**************************************
*  U.S. ARMY CORPS OF ENGINEERS      *
*  THE HYDROLOGIC ENGINEERING CENTER *
*  609 SECOND STREET, SUITE D        *
*  DAVIS, CALIFORNIA 95616           *
*  (916) 440-2105 (FTS) 448-2105     *
**************************************
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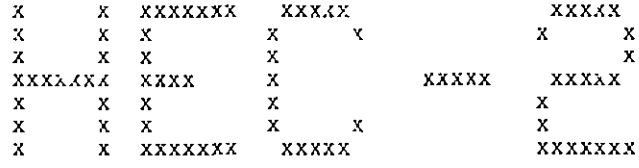

THIS RUN EXECUTED 1-AUG-90 14:49:06

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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55
**************************************************

C
T1 OVERLAND FLOW FROM WESTNEDGE TO ELM ST.
T2 STARTING WATER DEPTH IS CRITICAL; ROAD ELEVN. HIGHER THAN MEAN WATER AT MOUTH
T3      [OVERATE2 HEC2] 11/19/89-FROM FIS, REVISED BY DEH

J1   ICHECK     INQ        NINV       IDIR       STRT       METRIC     HVINS      Q          WSEL       FQ

       0.         2.         0.         0. -1.000000       0.00       0 0        0.     784.500       0.000

J2   NPROF      IPLOT      PRFVS      XSECV      XSECH      FN         ALLDC      IBW        CHNIM      ITRACE

     1 000      0 000     -1 000      0.000      0 000      0.000      0.000      0.000      0.000      0.000

J3   VARIABLE CODES FOR SUMMARY PRINTOUT

     150 000    0.000      0 000      0.000      0.000      0.000      0.000      0.000      0.000      0.000


QT      14.000    100.000    150.000    200.000    250.000    300.000    350.000    400.000    450.000    500.000
QT     600.000    700 000    800.000    900.000   1000.000   1100.000      0.000      0.000      0.000      0.000
NC       0.000      0 000      0.000      0.300      0.500      0 000      0.000      0.000      0.000      0.000
NH      15 000      0 016    305.000      0.016    374.000      0.016    439.000      0.016    500.000      0.016
NH     535 000      0.016    571.000      0.016    629.000      0.016    692.000      0.016    806.000      0.016
NH     832.000      0 016    851.000      0.016    880.000      0.016    881.000      0.016    931.000      0.016
NH    1002 000      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000
          INTERPOLATED SECTION FROM ABRAMS-DEH 4/2/90 (JUST E. OF WESTNEDGE )
X1      19 010     18.000    571 000    629 000      0.000      0.000      0.000      0.000      0.000      0.000
X2       0.000      0.000      0.000      0 000      0.000      0.000      0.000      0.000      0.000     15.000
GR     784.900    329 000    784.000    439.000    783.500    500.000    783.500    501.000    783.800    535.000
GR     783 500    570 000    783.500    571.000    783.100    629.000    783.000    692.000    783.000    806.000
GR     783.500    832 000    783 200    851.000    782.500    852.000    783.200    866.000    783.000    880.000
GR     783.500    881.000    784 000    931.000    785.000   1002.000      0.000      0.000      0.000      0.000

NH       6 000      0.016    364.000      0.016    446.000      0.016    708.000      0.016    824.000      0.016
NH     980.000      0.016   1010.000      0.000      0.000      0.000      0 000      0.000      0.000      0.000
          INTERPOLATED SECTION FROM ABRAMS-DEH 4/2/90 (CENT. LINE WESTNEDGE)
X1      19 020      7.000    364 000    446.000     50.000     50.000     50.000      0 000      0.000      0.000
X2       0 000      0.000      0 000      0.000      0.000      0.000      0.000      0.000      0.000     15.000
GR     784.900    300.000    784.000    364.000    783 800    446.000    783.500    708 000    783.500    824.000
GR     784 000    880.000    785 000   1010.000      0.000      0.000      0.000      0.000      0.000      0.000
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NH	16 000	0.016	345.000	0.016	346.000	0.016	385.000	0 016	386.000	0.016
NH	420 000	0 016	421.000	0.016	460.000	0.016	461.000	0.016	535.000	0.016
NH	600.000	0 016	700.000	0.016	701.000	0.016	731.000	0.016	732.000	0.016
NH	750.000	0.016	820.000	0 000	0.000	0.000	0.000	0.000	0.000	0.000
	INTERPOLATED SECTION FROM ABRAMS-DEH 12/14/89									
X1	19.100	17.000	700 000	732 000	100.000	60.000	60.000	0.000	0.000	0.000
AZ	0.000	0 000	0 000	0.000	0.000	0.000	0.000	0.000	0.000	15.000
GR	785 000	300.000	785 000	345.000	784.500	346.000	784.500	385.000	785.000	386.000
GR	735.000	420 000	784 500	421.000	784.500	460.000	785.000	461.000	784.400	535.000
GR	734 000	600 000	783 800	700.000	783.500	701.000	783.500	731.000	783.800	732.000
GR	784.000	750 000	785.000	820 000	0.000	0.000	0.000	0.000	0.000	0.000
NH	5 000	10 000	100.000	0.016	250.000	10.000	400.000	0.016	470.000	10.000
NH	600 000	0 000	0.000	0 000	0.000	0.000	0.000	0.000	0.000	0.000
	VALLEY SEC; INTERPOLATED FROM ABRAMS SECS 78 AND 79									
X1	20.000	6 000	100.000	250.000	130.000	145.000	170.000	0.000	0.000	0.000
GR	786 700	0 000	785.700	100.000	785.700	250.000	785.000	400.000	785.000	470.000
GR	786 500	600 000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NH	5 000	10 000	100.000	0.016	250.000	10.000	320.000	0.016	390.000	10.000
NH	450 000	0.000	0 000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	VALLEY SEC; INTERPOLATED FROM ABRAMS SECS 78 AND 79									
X1	21.000	6 000	100 000	250.000	220.000	175.000	220.000	0.000	0.000	0.000
GR	787 500	0 000	786.600	100 000	786.600	250.000	786.300	320.000	786.300	390.000
GR	787 500	450 000	0.000	0 000	0.000	0.000	0.000	0.000	0.000	0.000
NH	5 000	10 000	100 000	0 016	250.000	10.000	270.000	0.016	340.000	10.000
NH	400.000	0.000	0.000	0 000	0.000	0.000	0.000	0.000	0.000	0.000
	VALLEY SEC; INTERPOLATED FROM ABRAMS SECS 78 AND 79									
X1	22 000	6 000	100 000	250.000	235.000	170.000	235.000	0.000	0.000	0.000
GR	788 500	0.000	787 500	100.000	787.500	250.000	787.500	270.000	787.500	340.000
GR	738 500	400.000	0 000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NH	3.000	10 000	100.000	0 016	300.000	10.000	400.000	0 000	0.000	0.000
	VALLEY SEC, INTERPOLATED FROM ABRAMS SECS 78 AND 79									
X1	23 000	4.000	100.000	300 000	215.000	215.000	215.000	0.000	0.000	0.000
GR	789 400	0.000	788 400	100 000	788.400	300.000	789.400	400.000	0.000	0.000
NH	5 000	10 000	100.000	0.016	160.000	10.000	230.000	0.016	380.000	10.000
NH	400.000	0 000	0 000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	VALLEY SEC, INTERPOLATED FROM ABRAMS SECS 78 AND 79									
X1	24.000	6 000	230 000	380 000	225.000	225.000	225.000	0 000	0.000	0.000
GR	790.500	0 000	789.500	100.000	789.500	160.000	789.300	230 000	789.300	380.000
GR	790 300	400 000	0 000	0 000	0.000	0.000	0.000	0.000	0.000	0.000
NH	5 000	10 000	100 000	0 016	160.000	10.000	340 000	0.016	490.000	10.000
NH	500 000	0 000	0 000	0 000	0.000	0.000	0.000	0.000	0.000	0.000
	VALLEY SEC, INTERPOLATED FROM ABRAMS SECS 78 AND 79									
X1	25 000	6 000	340.000	490.000	180.000	190.000	190.000	0.000	0.000	0.000
GR	791 400	0 000	790 400	100.000	790.400	160.000	790.100	340.000	790.100	490.000
GR	791 100	500 000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

NH	7.000	10 000	1318.000	0.016	1378.000	10.000	1652.000	0.016	1752.000	10.000
NH	1978.000	0.016	2058 000	10.000	2088.000	0.000	0.000	0.000	0.000	0.000
	VALLEY SEC ALONG ELM ST; ADRAMS SECTION 79									
A1	26.000	8 000	1652.000	1752.000	180.000	400.000	180.000	0.000	0.000	0.000
GR	791.900	974 000	791.200	1318.000	791.200	1378.000	790.800	1652.000	790.800	1752.000
GR	790.800	1978 000	790.800	2058.000	792.700	2088.000	0.000	0.000	0.000	0.000
EJ	0 000	0 000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

THIS RUN EXECUTED 1-AUG-90 14:50:07

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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

(OVERATE2 HEC2) 11/19/89

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
*	19.010	0.00	0.00	0.00	782.50	100.00	783.21	783.21	783.30	54.23	0.98	42.55	13.58
*	19.010	0.00	0.00	0.00	782.50	150.00	783.27	783.27	783.38	52.30	1.27	56.33	20.74
*	19.010	0.00	0.00	0.00	782.50	200.00	783.32	783.32	783.45	48.21	1.48	70.06	28.80
*	19.010	0.00	0.00	0.00	782.50	250.00	783.37	783.37	783.51	45.01	1.63	83.28	37.27
*	19.010	0.00	0.00	0.00	782.50	300.00	783.42	783.42	783.57	41.62	1.75	96.72	46.50
*	19.010	0.00	0.00	0.00	782.50	350.00	783.43	783.43	783.62	48.99	1.97	101.61	50.00
*	19.010	0.00	0.00	0.00	782.50	400.00	783.48	783.48	783.67	43.66	2.03	115.76	60.54
*	19.010	0.00	0.00	0.00	782.50	450.00	783.52	783.52	783.72	40.84	2.16	128.22	70.47
*	19.010	0.00	0.00	0.00	782.50	500.00	783.54	783.54	783.76	42.22	2.36	136.17	76.95
*	19.010	0.00	0.00	0.00	782.50	600.00	783.61	783.61	783.84	38.50	2.65	159.57	96.70
*	19 010	0.00	0.00	0.00	782.50	700.00	783.66	783.66	783.92	38.03	2.92	178.91	113.52
*	19.010	0.00	0.00	0.00	782.50	800.00	783.71	783.71	783.98	36.94	3.14	199.19	131.62
*	19.010	0.00	0.00	0.00	782.50	900.00	783.77	783.77	784.04	34.06	3.29	223.79	154.21
*	19.010	0.00	0.00	0.00	782.50	1000.00	783.82	783.82	784.10	33.35	3.46	243.76	173.16
*	19.020	50.00	0.00	0.00	783.50	100.00	783.71	783.71	783.78	64.16	0.00	46.09	12.48
*	19.020	50.00	0.00	0.00	783.50	150.00	783.76	783.76	783.85	59.98	0.00	63.51	19.37
*	19.020	50.00	0.00	0.00	783.50	200.00	783.80	783.80	783.90	58.65	0.00	79.15	26.12
*	19.020	50.00	0.00	0.00	783.50	250.00	783.83	783.83	783.95	55.88	0.45	93.19	33.44
*	19.020	50.00	0.00	0.00	783.50	300.00	783.86	783.86	783.99	54.68	0.68	105.95	40.57
*	19.020	50.00	0.00	0.00	783.50	350.00	783.89	783.89	784.03	52.56	0.86	119.03	48.28
*	19.020	50.00	0.00	0.00	783.50	400.00	783.92	783.92	784.07	50.93	1 01	131.61	56.05
*	19.020	50.00	0.00	0.00	783.50	450.00	783.95	783.95	784.10	48.82	1.13	144.57	64.40
*	19.020	50.00	0.00	0.00	783.50	500.00	783.97	783.97	784.13	48.89	1.24	155.23	71 51
*	19.020	50.00	0.00	0.00	783.50	600.00	784.02	784.02	784.20	44.78	1.49	180.87	89 67
*	19.020	50.00	0.00	0.00	783.50	700.00	784.06	784.06	784.25	42.47	1.79	203.66	107.41
*	19.020	50.00	0.00	0.00	783.50	800.00	784.09	784.09	784.31	43.54	2.04	220.46	121.24
*	19.020	50.00	0 00	0.00	783.50	900.00	784.13	784.13	784.36	41.93	2.26	241.04	139.00
*	19.020	50.00	0.00	0.00	783.50	1000.00	784.17	784.17	784.40	40.45	2.45	261.20	157.22

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
*	19.100	60.00	0.00	0.00	783.50	100.00	784.10	784.10	784.22	24.33	3.24	44.11	20.27
*	19.100	60.00	0.00	0.00	783.50	150.00	784.18	784.18	784.32	27.31	3.71	57.64	28.70
*	19.100	60.00	0.00	0.00	783.50	200.00	784.24	784.24	784.40	28.16	4.01	70.77	37.69
*	19.100	60.00	0.00	0.00	783.50	250.00	784.30	784.30	784.48	28.54	4.25	83.18	46.80
*	19.100	60.00	0.00	0.00	783.50	300.00	784.35	784.35	784.54	29.48	4.49	94.13	55.26
*	19.100	60.00	0.00	0.00	783.50	350.00	784.40	784.40	784.60	29.80	4.68	105.13	64.12
*	19.100	60.00	0.00	0.00	783.50	400.00	784.43	784.43	784.66	30.60	4.88	114.64	72.31
*	19.100	60.00	0.00	0.00	783.50	450.00	784.51	784.51	784.71	25.72	4.69	133.15	88.72
*	19.100	60.00	0.00	0.00	783.50	500.00	784.54	784.54	784.75	26.60	4.87	144.05	96.95
*	19 100	60.00	0.00	0.00	783.50	600.00	784.60	784.60	784.83	27.36	5.14	165.82	114.70
*	19 100	60.00	0.00	0.00	783.50	700.00	784.65	784.65	784.91	27.76	5.35	186.47	132.85
*	19 100	60.00	0.00	0.00	783.50	800.00	784.70	784.70	784.97	28.52	5.58	204.71	149.79
*	19.100	60.00	0.00	0.00	783.50	900.00	784.76	784.76	785.04	27.97	5.69	225.65	170.19
*	19.100	60.00	0.00	0.00	783.50	1000.00	784.80	784.80	785.10	28.71	5.89	241.88	186.63
*	20.000	170.00	0.00	0.00	785.00	100.00	785.31	785.31	785.43	112.40	0.00	36.80	9.43
*	20.000	170.00	0.00	0.00	785.00	150.00	785.39	785.39	785.53	118.85	0.00	50.88	13.76
*	20.000	170.00	0.00	0.00	785.00	200.00	785.46	785.46	785.61	129.31	0.00	63.23	17.59
*	20.000	170.00	0.00	0.00	785.00	250.00	785.51	785.51	785.68	136.74	0.00	75.45	21.38
*	20.000	170.00	0.00	0.00	785.00	300.00	785.56	785.56	785.75	143.96	0.00	87.16	25.00
*	20.000	170.00	0.00	0.00	785.00	350.00	785.61	785.61	785.81	153.74	0.00	97.61	28.23
*	20.000	170.00	0.00	0.00	785.00	400.00	785.65	785.65	785.86	160.92	0.00	108.35	31.53
*	20.000	170.00	0.00	0.00	785.00	450.00	785.74	785.74	785.91	125.38	1.24	140.53	40.19
*	20.000	170.00	0.00	0.00	785.00	500.00	785.77	785.77	785.94	126.60	1.86	155.53	44.44
*	20.000	170.00	0.00	0.00	785.00	600.00	785.82	785.82	786.01	138.22	2.67	176.28	51.03
*	20.000	170.00	0.00	0.00	785.00	700.00	785.86	785.86	786.07	147.09	3.36	195.36	57.72
*	20.000	170.00	0.00	0.00	785.00	800.00	785.88	785.88	786.12	174.24	3.91	203.18	60.61
*	20.000	170.00	0.00	0.00	785.00	900.00	785.91	785.91	786.18	184.49	4.48	217.93	66.26
*	20.000	170.00	0.00	0.00	785.00	1000.00	785.94	785.94	786.24	196.63	5.00	230.56	71.31
	21.000	220.00	0.00	0.00	786.30	100.00	786.68	0.00	786.73	50.45	1.12	55.54	14.08
	21.000	220.00	0.00	0.00	786.30	150.00	786.74	0.00	786.80	45.22	1.71	79.28	22.31
	21.000	220.00	0.00	0.00	786.30	200.00	786.81	0.00	786.87	41.47	2.09	100.30	31.06
	21.000	220.00	0.00	0.00	786.30	250.00	786.86	0.00	786.94	39.37	2.39	119.16	39.84
	21.000	220.00	0.00	0.00	786.30	300.00	786.91	0.00	787.00	37.85	2.63	136.85	48.76
	21.000	220.00	0.00	0.00	786.30	350.00	786.96	0.00	787.06	36.55	2.84	153.88	57.89
	21.000	220.00	0.00	0.00	786.30	400.00	787.01	0.00	787.11	35.58	3.03	170.16	67.06
	21.000	220.00	0.00	0.00	786.30	450.00	787.02	0.00	787.15	40.78	3.33	176.05	70.47
	21 000	220.00	0.00	0.00	786.30	500.00	787.06	0.00	787.19	40.96	3.51	188.98	78.13
	21.000	220.00	0.00	0.00	786.30	600.00	787.13	0.00	787.29	40.41	3.83	215.33	94.38
	21.000	220.00	0.00	0.00	786.30	700.00	787.19	0.00	787.37	39.64	4.11	241.34	111.18
	21.000	220.00	0.00	0.00	786.30	800.00	787.26	0.00	787.46	37.20	4.30	271.04	131.16
	21.000	220.00	0.00	0.00	786.30	900.00	787.32	0.00	787.54	36.85	4.53	295.60	148.25
	21.000	220.00	0.00	0.00	786.30	1000.00	787.38	0.00	787.62	36.28	4.71	320.51	166.03

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
	22.000	235.00	0.00	0.00	787.50	100.00	787.69	0.00	787.76	53.80	2.31	50.39	13.63
	22.000	235.00	0.00	0.00	787.50	150.00	787.75	0.00	787.85	58.32	2.78	63.68	19.64
	22.000	235.00	0.00	0.00	787.50	200.00	787.79	787.78	787.92	61.45	3.17	75.46	25.51
	22.000	235.00	0.00	0.00	787.50	250.00	787.83	787.82	787.98	63.31	3.49	86.49	31.42
*	22.000	235.00	0.00	0.00	787.50	300.00	787.87	787.87	788.05	61.84	3.73	98.34	38.15
*	22.000	235.00	0.00	0.00	787.50	350.00	787.90	787.90	788.10	60.20	3.94	110.00	45.11
*	22.000	235.00	0.00	0.00	787.50	400.00	787.94	787.94	788.16	58.82	4.12	121.30	52.16
*	22.000	235.00	0.00	0.00	787.50	450.00	787.98	787.98	788.21	56.93	4.28	132.87	59.64
*	22.000	235.00	0.00	0.00	787.50	500.00	788.01	788.01	788.26	55.64	4.44	143.94	67.03
*	22.000	235.00	0.00	0.00	787.50	600.00	788.08	788.08	788.36	54.14	4.73	164.84	81.54
*	22.000	235.00	0.00	0.00	787.50	700.00	788.14	788.14	788.45	51.96	4.97	186.31	97.11
*	22.000	235.00	0.00	0.00	787.50	800.00	788.20	788.20	788.54	50.68	5.20	206.64	112.38
*	22.000	235.00	0.00	0.00	787.50	900.00	788.25	788.25	788.62	49.79	5.43	226.28	127.55
*	22.000	235.00	0.00	0.00	787.50	1000.00	788.31	788.31	788.70	49.17	5.64	245.31	142.61
	23.000	215.00	0.00	0.00	788.40	100.00	788.64	0.00	788.71	36.72	2.14	52.26	16.50
	23.000	215.00	0.00	0.00	788.40	150.00	788.71	0.00	788.80	34.99	2.48	69.72	25.36
	23.000	215.00	0.00	0.00	788.40	200.00	788.76	0.00	788.88	33.85	2.75	85.88	34.38
	23.000	215.00	0.00	0.00	788.40	250.00	788.82	0.00	788.96	33.65	3.00	100.55	43.09
	23.000	215.00	0.00	0.00	788.40	300.00	788.86	0.00	789.03	34.76	3.26	113.09	50.88
	23.000	215.00	0.00	0.00	788.40	350.00	788.90	0.00	789.09	36.09	3.51	124.60	58.26
	23.000	215.00	0.00	0.00	788.40	400.00	788.94	788.90	789.15	37.16	3.73	135.79	65.62
	23.000	215.00	0.00	0.00	788.40	450.00	788.97	788.94	789.21	38.14	3.94	146.57	72.86
	23.000	215.00	0.00	0.00	788.40	500.00	789.00	788.98	789.27	39.25	4.15	156.72	79.80
	23.000	215.00	0.00	0.00	788.40	600.00	789.06	789.05	789.38	40.71	4.51	177.07	94.03
*	23.000	215.00	0.00	0.00	788.40	700.00	789.12	789.12	789.49	41.82	4.84	196.90	108.24
*	23.000	215.00	0.00	0.00	788.40	800.00	789.19	789.19	789.59	40.59	5.06	220.57	125.58
*	23.000	215.00	0.00	0.00	788.40	900.00	789.25	789.25	789.68	39.61	5.26	243.93	143.00
*	23.000	215.00	0.00	0.00	788.40	1000.00	789.32	789.32	789.78	38.59	5.45	267.67	160.99
	24.000	225.00	0.00	0.00	789.30	100.00	789.55	789.55	789.65	46.45	2.54	53.04	14.67
*	24.000	225.00	0.00	0.00	789.30	150.00	789.62	789.62	789.74	46.00	2.93	71.49	22.12
*	24.000	225.00	0.00	0.00	789.30	200.00	789.67	789.67	789.82	44.85	3.22	88.19	29.87
*	24.000	225.00	0.00	0.00	789.30	250.00	789.72	789.72	789.89	44.88	3.49	102.81	37.32
*	24.000	225.00	0.00	0.00	789.30	300.00	789.76	789.76	789.95	44.77	3.72	116.59	44.84
*	24.000	225.00	0.00	0.00	789.30	350.00	789.81	789.81	790.01	44.56	3.93	129.76	52.43
*	24.000	225.00	0.00	0.00	789.30	400.00	789.85	789.85	790.07	44.07	4.12	142.69	60.25
	24.000	225.00	0.00	0.00	789.30	450.00	789.89	789.88	790.13	44.43	4.31	154.25	67.51
	24.000	225.00	0.00	0.00	789.30	500.00	789.93	789.92	790.18	40.95	4.87	170.52	78.13
	24.000	225.00	0.00	0.00	789.30	600.00	790.01	0.00	790.28	38.37	4.58	197.77	96.87
	24.000	225.00	0.00	0.00	789.30	700.00	790.09	0.00	790.38	35.61	4.74	225.91	117.30
	24.000	225.00	0.00	0.00	789.30	800.00	790.15	0.00	790.47	35.42	4.97	248.52	134.43
	24.000	225.00	0.00	0.00	789.30	900.00	790.21	0.00	790.55	35.12	5.18	270.85	151.88
	24.000	225.00	0.00	0.00	789.30	1000.00	790.27	0.00	790.63	34.97	5.39	292.30	169.11

[OVERATE2.HEC2] 11/19/89

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	19.010	100.00	783.21	0.00	0.00	-1.29	233.39	0.00
*	19.010	150.00	783.27	0.06	0.00	-1.23	248.39	0.00
*	19.010	200.00	783.32	0.05	0.00	-1.18	262.49	0.00
*	19.010	250.00	783.37	0.05	0.00	-1.13	275.38	0.00
*	19.010	300.00	783.42	0.05	0.00	-1.08	287.90	0.00
*	19.010	350.00	783.43	0.02	0.00	-1.07	292.32	0.00
*	19.010	400.00	783.48	0.05	0.00	-1.02	304.76	0.00
*	19.010	450.00	783.52	0.04	0.00	-0.98	321.02	0.00
*	19.010	500.00	783.54	0.02	0.00	-0.96	332.03	0.00
*	19.010	600.00	783.61	0.07	0.00	-0.89	362.49	0.00
*	19.010	700.00	783.66	0.05	0.00	-0.84	385.85	0.00
*	19.010	800.00	783.71	0.05	0.00	-0.79	408.92	0.00
*	19.010	900.00	783.77	0.06	0.00	-0.73	435.27	0.00
*	19.010	1000.00	783.82	0.04	0.00	-0.68	451.51	0.00
*	19.020	100.00	783.71	0.00	0.50	0.00	322.95	50.00
*	19.020	150.00	783.76	0.05	0.49	0.00	372.33	50.00
*	19.020	200.00	783.80	0.04	0.48	0.00	411.63	50.00
*	19.020	250.00	783.83	0.03	0.47	0.00	429.06	50.00
*	19.020	300.00	783.86	0.03	0.45	0.00	444.32	50.00
*	19.020	350.00	783.89	0.03	0.46	0.00	459.42	50.00
*	19.020	400.00	783.92	0.03	0.44	0.00	473.50	50.00
*	19.020	450.00	783.95	0.03	0.43	0.00	487.58	50.00
*	19.020	500.00	783.97	0.02	0.42	0.00	498.86	50.00
*	19.020	600.00	784.02	0.05	0.41	0.00	519.49	50.00
*	19.020	700.00	784.06	0.04	0.40	0.00	528.24	50.00
*	19.020	800.00	784.09	0.03	0.38	0.00	534.60	50.00
*	19.020	900.00	784.13	0.04	0.36	0.00	542.28	50.00
*	19.020	1000.00	784.17	0.04	0.35	0.00	549.71	50.00
*	19.100	100.00	784.10	0.00	0.39	0.00	173.85	60.00
*	19.100	150.00	784.18	0.07	0.42	0.00	191.09	60.00
*	19.100	200.00	784.24	0.07	0.44	0.00	206.45	60.00
*	19.100	250.00	784.30	0.06	0.47	0.00	219.99	60.00
*	19.100	300.00	784.35	0.05	0.49	0.00	231.27	60.00
*	19.100	350.00	784.40	0.05	0.50	0.00	242.07	60.00
*	19.100	400.00	784.43	0.04	0.52	0.00	249.70	60.00
*	19.100	450.00	784.51	0.07	0.56	0.00	341.39	60.00
*	19.100	500.00	784.54	0.03	0.57	0.00	347.75	60.00
*	19.100	600.00	784.60	0.06	0.58	0.00	360.14	60.00
*	19.100	700.00	784.65	0.06	0.59	0.00	371.51	60.00
*	19.100	800.00	784.70	0.05	0.61	0.00	381.26	60.00
*	19.100	900.00	784.76	0.05	0.63	0.00	392.16	60.00
*	19.100	1000.00	784.80	0.04	0.63	0.00	400.41	60.00

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
	25.000	190.00	0.00	0.00	790.10	100.00	790.38	790.34	790.47	40.56	2.47	62.67	15.70
	25.000	190.00	0.00	0.00	790.10	150.00	790.43	790.43	790.56	40.54	2.89	88.92	23.56
*	25.000	190.00	0.00	0.00	790.10	200.00	790.50	790.50	790.65	41.45	3.23	111.14	31.06
*	25.000	190.00	0.00	0.00	790.10	250.00	790.55	790.55	790.73	40.24	3.47	133.13	39.41
*	25.000	190.00	0.00	0.00	790.10	300.00	790.60	790.60	790.79	39.97	3.69	152.58	47.45
*	25.000	190.00	0.00	0.00	790.10	350.00	790.64	790.64	790.86	39.77	3.89	170.79	55.50
*	25.000	190.00	0.00	0.00	790.10	400.00	790.68	790.68	790.91	39.67	4.08	187.99	63.51
*	25.000	190.00	0.00	0.00	790.10	450.00	790.72	790.72	790.97	39.76	4.26	204.12	71.36
*	25.000	190.00	0.00	0.00	790.10	500.00	790.76	790.76	791.02	39.50	4.42	220.30	79.55
*	25.000	190.00	0.00	0.00	790.10	600.00	790.83	790.83	791.12	38.72	4.69	251.99	96.43
*	25.000	190.00	0.00	0.00	790.10	700.00	790.89	790.89	791.22	39.03	4.97	279.76	112.04
*	25.000	190.00	0.00	0.00	790.10	800.00	790.95	790.95	791.31	38.88	5.22	307.43	128.31
*	25.000	190.00	0.00	0.00	790.10	900.00	791.01	791.01	791.40	38.78	5.44	334.00	144.53
*	25.000	190.00	0.00	0.00	790.10	1000.00	791.07	791.07	791.48	38.69	5.66	359.74	160.77
	26.000	180.00	0.00	0.00	790.80	100.00	791.09	0.00	791.13	20.22	1.86	151.87	22.24
	26.000	180.00	0.00	0.00	790.80	150.00	791.18	0.00	791.22	20.18	2.19	204.72	33.39
	26.000	180.00	0.00	0.00	790.80	200.00	791.25	0.00	791.30	18.94	2.40	261.92	45.99
	26.000	180.00	0.00	0.00	790.80	250.00	791.31	0.00	791.37	19.20	2.62	307.84	57.05
	26.000	180.00	0.00	0.00	790.80	300.00	791.37	0.00	791.44	19.08	2.79	352.89	68.69
	26.000	180.00	0.00	0.00	790.80	350.00	791.42	0.00	791.50	18.87	2.94	396.69	80.57
	26.000	180.00	0.00	0.00	790.80	400.00	791.47	0.00	791.55	18.37	3.06	441.83	93.37
	26.000	180.00	0.00	0.00	790.80	450.00	791.52	0.00	791.61	18.67	3.21	479.08	104.15
	26.000	180.00	0.00	0.00	790.80	500.00	791.56	0.00	791.65	17.96	3.29	525.43	117.99
	26.000	180.00	0.00	0.00	790.80	600.00	791.65	0.00	791.75	17.89	3.52	602.92	141.86
	26.000	180.00	0.00	0.00	790.80	700.00	791.73	0.00	791.84	17.32	3.68	685.62	168.18
	26.000	180.00	0.00	0.00	790.80	800.00	791.81	0.00	791.93	16.89	3.84	766.77	194.69
	26.000	180.00	0.00	0.00	790.80	900.00	791.89	0.00	792.01	16.46	3.98	848.10	221.86
	26.000	180.00	0.00	0.00	790.80	1000.00	791.96	0.00	792.09	16.11	4.11	927.89	249.11

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	20.000	100.00	785.31	0.00	1.21	0.00	164.47	170.00
*	20.000	150.00	785.39	0.08	1.22	0.00	188.48	170 00
*	20.000	200.00	785.46	0.06	1.21	0.00	207.27	170.00
*	20.000	250.00	785.51	0.06	1.21	0.00	224.31	170 00
*	20.000	300.00	785.56	0.05	1.21	0.00	239.50	170.00
*	20.000	350.00	785.61	0.04	1.21	0.00	252.29	170.00
*	20.000	400.00	785.65	0.04	1.21	0.00	264.80	170.00
*	20.000	450.00	785.74	0.09	1.24	0.00	438.31	170.00
*	20.000	500.00	785.77	0.03	1.24	0.00	444.66	170.00
*	20.000	600.00	785.82	0.05	1.22	0.00	453.28	170 00
*	20.000	700.00	785.86	0.04	1.21	0.00	461.08	170.00
*	20.000	800.00	785.88	0.02	1.18	0.00	464.23	170.00
*	20.000	900.00	785.91	0.03	1.15	0.00	470.12	170.00
*	20.000	1000.00	785.94	0.03	1.14	0.00	475.11	170.00
	21 000	100.00	786.68	0.00	1.36	0.00	316.30	220.00
	21.000	150.00	786.74	0.07	1.35	0.00	328.17	220.00
	21.000	200.00	786.81	0.06	1.35	0.00	338.33	220.00
	21.000	250.00	786.86	0.06	1.35	0.00	347.20	220.00
	21 000	300.00	786 91	0.05	1.35	0.00	355.31	220.00
	21.000	350.00	786.96	0.05	1.36	0.00	362.95	220.00
	21.000	400.00	787.01	0.04	1.36	0.00	370.11	220.00
	21 000	450.00	787.02	0.02	1.28	0.00	372.66	220.00
	21.000	500.00	787.06	0.03	1.28	0.00	378.21	220.00
	21.000	600.00	787.13	0.08	1.31	0.00	389.27	220.00
	21.000	700.00	787.19	0.06	1.33	0.00	399.89	220.00
	21.000	800.00	787.26	0.07	1.38	0.00	411.68	220.00
	21.000	900.00	787.32	0.06	1.41	0.00	421.19	220.00
	21.000	1000.00	787.38	0.06	1.44	0.00	430.61	220.00
	22.000	100.00	787.69	0.00	1.01	0.00	271.52	235.00
	22.000	150.00	787.75	0.06	1.00	0.00	279.25	235.00
	22.000	200.00	787.79	0.04	0.98	0.00	285.91	235.00
	22.000	250.00	787.83	0.04	0.96	0.00	292.02	235.00
*	22 000	300.00	787.87	0.04	0.95	0.00	298.45	235.00
*	22.000	350 00	787.90	0.04	0.94	0.00	304.63	235.00
*	22.000	400.00	787.94	0.04	0.93	0.00	310.51	235.00
*	22.000	450.00	787.98	0.04	0.95	0.00	316.42	235.00
*	22.000	500.00	788.01	0.03	0.96	0.00	321.96	235.00
*	22.000	600.00	788.08	0.06	0.94	0.00	332.19	235.00
*	22.000	700.00	788.14	0.06	0.95	0.00	342.37	235.00
*	22.000	800.00	788 20	0.06	0.94	0.00	351.75	235.00
*	22.000	900.00	788.25	0.06	0.93	0.00	360.57	235 00
*	22.000	1000.00	788.31	0.05	0.93	0.00	368.92	235.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	23.000	100.00	788.64	0.00	0.95	0.00	246.79	215.00
	23.000	150.00	788.71	0.07	0.96	0.00	260.55	215.00
	23.000	200.00	788.76	0.05	0.98	0.00	272.68	215.00
	23.000	250.00	788.82	0.05	0.99	0.00	283.23	215.00
	23.000	300.00	788.86	0.04	1.00	0.00	291.95	215.00
	23.000	350.00	788.90	0.04	1.00	0.00	299.73	215.00
	23.000	400.00	788.94	0.03	1.00	0.00	307.11	215.00
	23.000	450.00	788.97	0.03	0.99	0.00	314.05	215.00
	23.000	500.00	789.00	0.04	0.99	0.00	320.45	215.00
	23.000	600.00	789.06	0.06	0.99	0.00	332.91	215.00
*	23.000	700.00	789.12	0.06	0.98	0.00	344.62	215.00
*	23.000	800.00	789.19	0.07	0.99	0.00	358.09	215.00
*	23.000	900.00	789.25	0.06	1.00	0.00	370.91	215.00
*	23.000	1000.00	789.32	0.06	1.01	0.00	383.50	215.00
	24.000	100.00	789.55	0.00	0.91	0.00	290.53	225.00
*	24.000	150.00	789.62	0.07	0.91	0.00	298.06	225.00
*	24.000	200.00	789.67	0.06	0.91	0.00	304.71	225.00
*	24.000	250.00	789.72	0.05	0.90	0.00	310.41	225.00
*	24.000	300.00	789.76	0.04	0.90	0.00	315.69	225.00
*	24.000	350.00	789.81	0.04	0.90	0.00	320.66	225.00
*	24.000	400.00	789.85	0.04	0.91	0.00	325.46	225.00
	24.000	450.00	789.89	0.04	0.92	0.00	329.70	225.00
	24.000	500.00	789.93	0.04	0.93	0.00	335.57	225.00
	24.000	600.00	790.01	0.09	0.95	0.00	345.17	225.00
	24.000	700.00	790.09	0.08	0.97	0.00	354.82	225.00
	24.000	800.00	790.15	0.06	0.96	0.00	362.39	225.00
	24.000	900.00	790.21	0.06	0.96	0.00	369.71	225.00
	24.000	1000.00	790.27	0.06	0.95	0.00	376.61	225.00
	25.000	100.00	790.38	0.00	0.83	0.00	314.55	190.00
	25.000	150.00	790.43	0.06	0.82	0.00	397.58	190.00
*	25.000	200.00	790.50	0.06	0.82	0.00	403.68	190.00
*	25.000	250.00	790.55	0.05	0.83	0.00	409.63	190.00
*	25.000	300.00	790.60	0.05	0.83	0.00	414.82	190.00
*	25.000	350.00	790.64	0.04	0.84	0.00	419.62	190.00
*	25.000	400.00	790.68	0.04	0.84	0.00	424.11	190.00
*	25.000	450.00	790.72	0.04	0.83	0.00	428.27	190.00
*	25.000	500.00	790.76	0.04	0.83	0.00	432.40	190.00
*	25.000	600.00	790.83	0.07	0.82	0.00	440.39	190.00
*	25.000	700.00	790.89	0.06	0.80	0.00	447.28	190.00
*	25.000	800.00	790.95	0.06	0.80	0.00	454.03	190.00
*	25.000	900.00	791.01	0.06	0.80	0.00	460.42	190.00
*	25.000	1000.00	791.07	0.06	0.80	0.00	466.53	190.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
26.000	100.00	791.09	0.00	0.72	0.00	614.57	180.00
26.000	150.00	791.18	0.08	0.75	0.00	672.14	180.00
26.000	200.00	791.25	0.07	0.75	0.00	775.28	180.00
26.000	250.00	791.31	0.06	0.76	0.00	804.76	180.00
26.000	300.00	791.37	0.06	0.77	0.00	832.67	180.00
26.000	350.00	791.42	0.05	0.78	0.00	858.94	180.00
26.000	400.00	791.47	0.05	0.78	0.00	885.19	180.00
26.000	450.00	791.52	0.06	0.80	0.00	906.28	180.00
26.000	500.00	791.56	0.04	0.80	0.00	931.86	180.00
26.000	600.00	791.65	0.09	0.82	0.00	973.13	180.00
26.000	700.00	791.73	0.08	0.84	0.00	1015.32	180.00
26.000	800.00	791.81	0.08	0.86	0.00	1055.08	180.00
26.000	900.00	791.89	0.08	0.87	0.00	1093.48	180.00
26.000	1000.00	791.96	0.07	0.89	0.00	1102.27	180.00

SUMMARY OF ERRORS AND SPECIAL NOTES

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THIS RUN EXECUTED 1-AUG-90 14:50:11

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*****************************************************
 HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55
*****************************************************
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00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: KALAMAZOO, CITY OF

3) WATERCOURSE: ARCADIA CREEK

4) DOCUMENT TYPE: MULTI-PROFILES RUN

EXISTING BYPASS DIVERSION
10 YR

00BREAK00

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*******************************************
*  HEC-2 WATER SURFACE PROFILES           *
*                                         *
*  Version   4.6.0;  February 1991        *
*                                         *
*  RUN DATE    28JUL92    TIME   11:50:48  *
*******************************************
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*****************************************
*  U.S. ARMY CORPS OF ENGINEERS
*  HYDROLOGIC ENGINEERING CENTER
*  609 SECOND STREET, SUITE D
*  DAVIS, CALIFORNIA 95616-4687
*          (916) 756-1104
*****************************************
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X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X            X     X
X     X  X        X                  X     X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                  X
X     X  X        X     X            X
X     X  XXXXXXX   XXXXX              XXXXXX
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THIS RUN EXECUTED 28JUL92 11:50:5C

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**************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.0;  February 1991
**************************************


T1         ARCADIA CREEK HYDRAULIC ANALYSIS
T2         EXISTING BYPASS DIVERSION (POND-JUNCTION) 10-YEAR
T3         JTP 10/30/86 [RATINGEE2.HEC] REVISED DEH 9/22/89, 7/17/92 BAS

J1   ICHECK     INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

           2.0                                                                  766.80

J2   NPROF      IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

  1.0               -1.0


J3   VARIABLE CODES FOR SUMMARY PRINTOUT

 150.0

NC    0.015     0.015     0.015
QT      4.0       620.      620.      620.      620.
X1    23.62         8.      150.    170.01        0.        0.        0.
BT       4.      150.     771.5      769.     159.5     771.5      769.     160.5     771.5      769.
BT   170.01     771.5      769.
GR    771.5      100.     771.5      150.     760.7    150.01     760.7     159.5     760.7     160.5
GR    760.7      170.     771.5    170.01     771.5      200.

X1    23.63                                     .1        .1        .1
X2                                                                  1.
X5       -4.       .25       .25       .25       .25

QT       4.        50.      100.      150.      200.
X1    23.93         4.      100.     108.2        30.       30.
BT       2.      100.      780.    771.67     108.2      780.    771.67
GR    771.1      100.     760.7      100.1     760.7     108.1     771.1     108.2

X1       5.0       11.      100.     108.5       1.0       1.0       1.0                 .57
BT       2.0     100.      780.0    771.67     108.5      780.    771.67
GR    771.1      100.     766.1      100.5     766.1       101.     765.1     101.1     763.85     102.5
GR   763.56    104.25     763.85       106.     765.1     107.5     766.1    107.51     766.1      108.0
GR    771.1      108.5

X1       5.1                                    100.      100.      100.                 .51
X2                                                                  1.
```

X1	5.2				300.	300.	300.		.60	
X2							1.			
X1	5.3				60.	60.	60.		.23	
X2							1.			
X1	5.4	6.0	100.25	108.25	1.	1.	1.			
BT	2.	100.25	775.0	771.9	108.25	775.0	771.9			
GR	778.0	100.	771.9	100.01	764.9	100.02	764.9	108.02	771.9	108.03
GR	780.0	108.04								
X1	5.5				25.	25.	25.		.80	
X2							1.			
X5	-4.	.08	.09	.11	.14					
X1	5.6	4.	100.	109.2	2.	2.	2.			
BT	2.	100.	775.	771.	109.2	775.	771.			
GR	771.0	100.	765.	100.1	765.	109.1	771.	109.2		
X1	5.7				20.	20.	20.			
X2							1.			
NC	.04	.04	.035	.1	.3					
X1	5.8	4.	100.	109.2	1.	1.	1.			
GR	771.	100.	763.	100.1	763.	109.1	771.	109.2		
QT	4.	615.	615.	615.	615.					
X1	28.99	8.	128.	148.1	20.	20.	20.			
GR	774.	100.	772.	150.	765.	175.	760.	185.	760.	205.
GR	765.	215.	772.	240.	774.	295.				

THIS RUN EXECUTED 28JUL92 11:51:07

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.0; February 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

JTP 10/30/86 [RATINGEE

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	23.620	0.00	771.50	769.00	760.70	620.00	766.80	0.00	767.20	4.46	5.08	121.97	293.70
	23.620	0.00	771.50	769.00	760.70	620.00	766.80	0.00	767.20	4.46	5.08	121.97	293.70
	23.620	0.00	771.50	769.00	760.70	620.00	766.80	0.00	767.20	4.46	5.08	121.97	293.70
	23.620	0.00	771.50	769.00	760.70	620.00	766.80	0.00	767.20	4.46	5.08	121.97	293.70
*	23.630	0.10	771.50	769.00	760.70	620.00	767.05	0.00	767.42	3.98	4.88	126.97	310.83
*	23.630	0.10	771.50	769.00	760.70	620.00	767.05	0.00	767.42	3.98	4.88	126.97	310.83
*	23.630	0.10	771.50	769.00	760.70	620.00	767.05	0.00	767.42	3.98	4.88	126.97	310.83
*	23.630	0.10	771.50	769.00	760.70	620.00	767.05	0.00	767.42	3.98	4.88	126.97	310.83
*	23.930	30.00	780.00	771.67	760.70	50.00	767.41	0.00	767.43	0.25	0.92	54.15	99.53
*	23.930	30.00	780.00	771.67	760.70	100.00	767.38	0.00	767.43	1.02	1.86	53.84	98.80
*	23.930	30.00	780.00	771.67	760.70	150.00	767.31	0.00	767.43	2.37	2.82	53.28	97.53
*	23.930	30.00	780.00	771.67	760.70	200.00	767.21	0.00	767.43	4.37	3.81	52.46	95.65
*	5.000	1.00	780.00	771.67	764.13	50.00	767.31	0.00	767.43	4.42	2.78	17.98	23.78
*	5.000	1.00	780.00	771.67	764.13	100.00	766.60	766.60	767.56	41.50	7.88	12.68	15.52
*	5.000	1.00	780.00	771.67	764.13	150.00	767.22	767.22	768.39	44.01	8.65	17.34	22.61
*	5.000	1.00	780.00	771.67	764.13	200.00	767.72	767.72	769.11	45.39	9.48	21.10	29.68
	5.100	100.00	780.00	772.18	764.64	50.00	767.29	0.00	767.49	9.00	3.58	13.98	16.67
*	5.100	100.00	780.00	772.18	764.64	100.00	767.11	767.11	768.07	41.50	7.88	12.68	15.52
*	5.100	100.00	780.00	772.18	764.64	150.00	767.73	767.73	768.90	44.01	8.65	17.34	22.61
*	5.100	100.00	780.00	772.18	764.64	200.00	768.23	768.23	769.62	45.39	9.48	21.10	29.68
	5.200	300.00	780.00	772.78	765.24	50.00	767.52	0.00	767.82	13.66	4.35	11.49	13.53
*	5.200	300.00	780.00	772.78	765.24	100.00	768.38	0.00	768.87	18.60	5.66	17.66	23.19
*	5.200	300.00	780.00	772.78	765.24	150.00	769.10	0.00	769.75	19.72	6.47	23.20	33.78
*	5.200	300.00	780.00	772.78	765.24	200.00	769.72	0.00	770.51	20.89	7.11	28.12	43.76
	5.300	60.00	780.00	773.01	765.47	50.00	767.53	0.00	767.92	19.85	4.97	10.07	11.22
	5.300	60.00	780.00	773.01	765.47	100.00	768.41	0.00	769.00	23.80	6.18	16.17	20.50
	5.300	60.00	780.00	773.01	765.47	150.00	769.14	0.00	769.87	23.50	6.90	21.75	30.94
	5.300	60.00	780.00	773.01	765.47	200.00	769.77	0.00	770.64	23.95	7.49	26.72	40.87

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	5.400	1.00	775.00	771.90	764.90	50.00	767.85	0.00	767.92	1.64	2.12	23.60	39.00
*	5.400	1.00	775.00	771.90	764.90	100.00	768.85	0.00	769.00	2.79	3.16	31.62	59.89
*	5.400	1.00	775.00	771.90	764.90	150.00	769.63	0.00	769.88	3.72	3.96	37.94	77.75
*	5.400	1.00	775.00	771.90	764.90	200.00	770.32	0.00	770.65	4.52	4.61	43.42	94.03
*	5.500	25.00	775.00	772.70	765.70	50.00	767.93	0.00	768.05	3.83	2.81	17.82	25.56
*	5.500	25.00	775.00	772.70	765.70	100.00	768.94	0.00	769.17	4.99	3.86	25.90	44.75
*	5.500	25.00	775.00	772.70	765.70	150.00	769.74	0.00	770.08	5.87	4.64	32.36	61.94
*	5.500	25.00	775.00	772.70	765.70	200.00	770.46	0.00	770.88	6.55	5.25	38.08	78.15
*	5.600	2.00	775.00	771.00	765.00	50.00	768.00	0.00	768.05	1.57	1.84	27.12	39.89
	5.600	2.00	775.00	771.00	765.00	100.00	769.05	0.00	769.17	2.72	2.72	36.75	60.61
	5.600	2.00	775.00	771.00	765.00	150.00	769.90	0.00	770.08	3.67	3.37	44.51	78.32
	5.600	2.00	775.00	771.00	765.00	200.00	770.65	0.00	770 89	4.47	3.89	51.39	94.55
	5.700	20.00	775.00	771.00	765.00	50.00	768.00	0.00	768.05	1.56	1.84	27.17	39.99
	5.700	20.00	775.00	771.00	765.00	100.00	769.06	0.00	769.17	2.71	2.72	36.82	60.77
	5.700	20.00	775.00	771.00	765.00	150.00	769.91	0.00	770.08	3.65	3.36	44.59	78.52
	5.700	20.00	775.00	771.00	765.00	200.00	770.66	0.00	770.89	4.45	3.88	51.49	94.79
	5.800	1.00	0.00	0.00	763.00	50.00	768.04	0.00	768.06	2.08	1.10	45.66	34.69
	5.800	1.00	0.00	0.00	763.00	100.00	769.13	0.00	769.18	4.97	1.80	55.64	44.86
*	5.800	1.00	0.00	0.00	763.00	150.00	770.01	0.00	770.09	7.92	2.36	63.68	53.29
*	5.800	1.00	0.00	0.00	763.00	200.00	770.78	0.00	770.91	10.79	2.82	70.80	60.87
*	28.990	20.00	0.00	0.00	760.00	615.00	768.01	0.00	768.08	2.73	0.00	302.84	372.37
*	28.990	20.00	0.00	0.00	760.00	615.00	769.14	0.00	769.18	1.55	0.00	376.63	494.41
*	28.990	20.00	0.00	0.00	760.00	615.00	770.07	0.00	770.10	1.01	0.00	444.79	612.41
*	28.990	20.00	0.00	0.00	760.00	615.00	770.90	0.00	770.92	0.71	0.00	509.97	729.60

JTP 10/30/86 [RATINGEE

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	23.620	620.00	766.80	0.00	0.00	0.00	20.00	0.00
	23.620	620.00	766.80	0.00	0.00	0.00	20.00	0.00
	23.620	620.00	766.80	0.00	0.00	0.00	20.00	0.00
	23.620	620.00	766.80	0.00	0.00	0.00	20.00	0.00
*	23.630	620.00	767.05	0.00	0.25	0.00	20.00	0.10
*	23.630	620.00	767.05	0.00	0.25	0.00	20.00	0.10
*	23.630	620.00	767.05	0.00	0.25	0.00	20.00	0.10
*	23.630	620.00	767.05	0.00	0.25	0.00	20.00	0.10
*	23.930	50.00	767.41	0.00	0.36	0.00	8.13	30.00
*	23.930	100.00	767.38	-0.04	0.33	0.00	8.13	30.00
*	23.930	150.00	767.31	-0.07	0.26	0.00	8.13	30.00
*	23.930	200.00	767.21	-0.10	0.16	0.00	8.13	30.00
*	5.000	50.00	767.31	0.00	-0.11	0.00	7.63	1.00
*	5.000	100.00	766.60	-0.71	-0.78	0.00	6.50	1.00
*	5.000	150.00	767.22	0.63	-0.08	0.00	7.61	1.00
*	5.000	200.00	767.72	0.49	0.51	0.00	7.71	1.00
	5.100	50.00	767.29	0.00	-0.02	0.00	7.52	100.00
*	5.100	100.00	767.11	-0.18	0.51	0.00	6.50	100.00
*	5.100	150.00	767.73	0.63	0.51	0.00	7.61	100.00
*	5.100	200.00	768.23	0.49	0.51	0.00	7.71	100.00
	5.200	50.00	767.52	0.00	0.23	0.00	6.48	300.00
*	5.200	100.00	768.38	0.85	1.27	0.00	7.62	300.00
*	5.200	150.00	769.10	0.72	1.36	0.00	7.76	300.00
*	5.200	200.00	769.72	0.63	1.50	0.00	7.89	300.00
	5.300	50.00	767.53	0.00	0.01	0.00	6.46	60.00
	5.300	100.00	768.41	0.87	0.03	0.00	7.58	60.00
	5.300	150.00	769.14	0.73	0.04	0.00	7.73	60.00
	5.300	200.00	769.77	0.64	0.05	0.00	7.85	60.00
*	5.400	50.00	767.85	0.00	0.31	0.00	8.01	1.00
*	5.400	100.00	768.85	1.00	0.44	0.00	8.01	1.00
*	5.400	150.00	769.63	0.79	0.50	0.00	8.01	1.00
*	5.400	200.00	770.32	0.68	0.54	0.00	8.02	1.00
*	5.500	50.00	767.93	0.00	0.08	0.00	8.01	25.00
*	5.500	100.00	768.94	1.01	0.09	0.00	8.01	25.00
*	5.500	150.00	769.74	0.81	0.11	0.00	8.01	25.00
*	5.500	200.00	770.46	0.71	0.14	0.00	8.01	25.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	5.600	50.00	768.00	0.00	0.07	0.00	9.10	2.00
	5.600	100.00	769.05	1.06	0.12	0.00	9.14	2.00
	5.600	150.00	769.90	0.85	0.16	0.00	9.16	2.00
	5.600	200.00	770.65	0.75	0.19	0.00	9.19	2.00
	5.700	50.00	768.00	0.00	0.00	0.00	9.10	20.00
	5.700	100.00	769.06	1.06	0.01	0.00	9.14	20.00
	5.700	150.00	769.91	0.85	0.01	0.00	9.16	20.00
	5.700	200.00	770.66	0.75	0.01	0.00	9.19	20.00
	5.800	50.00	768.04	0.00	0.04	0.00	9.13	1.00
	5.800	100.00	769.13	1.09	0.07	0.00	9.15	1.00
*	5.800	150.00	770.01	0.88	0.10	0.00	9.18	1.00
*	5.800	200.00	770.78	0.77	0.12	0.00	9.19	1.00
*	28.990	615.00	768.01	0.00	-0.03	0.00	61.51	20.00
*	28.990	615.00	769.14	1.13	0.01	0.00	69.55	20.00
*	28.990	615.00	770.07	0.93	0.06	0.00	76.23	20.00
*	28.990	615.00	770.90	0.82	0.11	0.00	82.11	20.00

SUMMARY OF ERRORS AND SPECIAL NOTES

NOTE	SECNO=	23.630	PROFILE=	1	WSEL BASED ON X5 CARD
NOTE	SECNO=	23.630	PROFILE=	2	WSEL BASED ON X5 CARD
NOTE	SECNO=	23.630	PROFILE=	3	WSEL BASED ON X5 CARD
NOTE	SECNO=	23.630	PROFILE=	4	WSEL BASED ON X5 CARD
WARNING	SECNO=	23.930	PROFILE=	1	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO=	23.930	PROFILE=	2	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO=	23.930	PROFILE=	3	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO=	23.930	PROFILE=	4	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO=	5.000	PROFILE=	1	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
CAUTION	SECNO=	5.000	PROFILE=	2	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	5.000	PROFILE=	2	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	5.000	PROFILE=	2	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	5.000	PROFILE=	3	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	5.000	PROFILE=	3	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	5.000	PROFILE=	3	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	5.000	PROFILE=	4	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	5.000	PROFILE=	4	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	5.000	PROFILE=	4	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	5.100	PROFILE=	2	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	5.100	PROFILE=	2	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	5.100	PROFILE=	2	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	5.100	PROFILE=	3	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	5.100	PROFILE=	3	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	5.100	PROFILE=	3	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	5.100	PROFILE=	4	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	5.100	PROFILE=	4	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	5.100	PROFILE=	4	20 TRIALS ATTEMPTED TO BALANCE WSEL
WARNING	SECNO=	5.200	PROFILE=	2	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO=	5.200	PROFILE=	3	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO=	5.200	PROFILE=	4	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO=	5.400	PROFILE=	1	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO=	5.400	PROFILE=	2	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO=	5.400	PROFILE=	3	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO=	5.400	PROFILE=	4	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
NOTE	SECNO=	5.500	PROFILE=	1	WSEL BASED ON X5 CARD
WARNING	SECNO=	5.500	PROFILE=	1	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
NOTE	SECNO=	5.500	PROFILE=	2	WSEL BASED ON X5 CARD
NOTE	SECNO=	5.500	PROFILE=	3	WSEL BASED ON X5 CARD
NOTE	SECNO=	5.500	PROFILE=	4	WSEL BASED ON X5 CARD
WARNING	SECNO=	5.600	PROFILE=	1	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO=	5.800	PROFILE=	3	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO=	5.800	PROFILE=	4	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

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WARNING SECNO=     28.990  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     28.990  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     28.990  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     28.990  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
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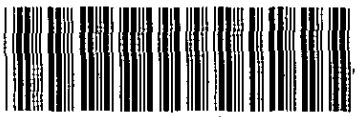

1) COUNTY: KALAMAZOO

2) STUDY NAME: KALAMAZOO, CITY OF

3) WATERCOURSE: ARCADIA CREEK

4) DOCUMENT TYPE: MULTI-PROFILE RUN

WEST END DIVERSION



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*****************************************************
*  WATER SURFACE PROFILES                           *
*  VERSION OF NOVEMBER 1976                         *
*  UPDATED MAY 1984                                 *
*                                                   *
*  RUN DATE  1-AUG-90 TIME 16:25:09                 *
*****************************************************
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*****************************************
*  U.S. ARMY CORPS OF ENGINEERS         *
*  THE HYDROLOGIC ENGINEERING CENTER    *
*  609 SECOND STREET, SUITE D           *
*  DAVIS, CALIFORNIA 95616              *
*  (916) 440-2105 (FTS) 448-2105        *
*****************************************
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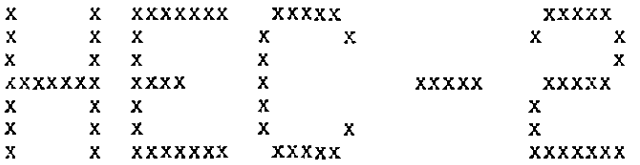

THIS RUN EXECUTED 1-AUG-90 16:25:12

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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55
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SPLIT FLOW BEING PERFORMED

SF

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JC   SPLIT FLOW OPTION WILL BE UTILIZED TO ANALYSE DIVERSION AT ELM ST.
JP                   200.       1.

TC    RATING CURVE METHOD
CS    16       7.7       7.7       -1.
CR     0.     779.0     100.    792.13     150.   792.24     200.   792.33     250.   792.39
CR   350.   792 50      400.    792.55     450.   792.60     500.   792.64     550.   792.68
CR   600.   792.72      700.    792.80     800.   792.87     900.   792.94    1000.     793.
CR20000.    800.0
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C
T1 ARCADIA CREEK HYDRAULIC ANALYSIS
T2 WEST END DIVERSION ANALYSIS AND HYDRAULICS
T3 [WE.HEC2] DEH 3/13/90

J1  ICHECK     INQ        NINV       IDIR       STRT       METRIC     HVINS      Q          WSEL       FQ
       0.        2.         0.         0.   0.000000       0.00       0.0        0.    782.200    0.000
J2  NPROF      IPLOT      PRFVS      XSECV      XSECH      FN         ALLDC      IBW        CHNIM      ITRACE
    1.000      0.000     -1.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000
J3  VARIABLE CODES FOR SUMMARY PRINTOUT
    150.000    0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000

NC      0.015      0.015      0.015      0.100      0.300      0.000      0.000      0.000      0.000      0.000
QT      4 000    595.000    860.000    985.000   1275.000    100.000    200.000    300.000    400.000      0.000
        BEGIN SECTION 'O'
X1      1.000      4.000    200.000    207.200      0.000      0.000      0.000      0.000      0.000      0.000
BT      4.000    200.000    786.000    783.600    200.100    786.000    783.600    207.100    786.000    783.600
BT    207.200    786.000    783.600      0.000      0.000      0.000      0.000      0.000      0.000      0.000
GR    786.000    200.000    778.100    200.100    778.100    207.100    786.000    207.200      0.000      0.000

        END SECTION 'O'
X1      1 100      0.000      0.000      0.000     65.000     65.000     65.000      0.000      0.000      0.000
X2      0.000      0 000      0.000      0.000      0.000      0.000      1.000      0.000      0.000      0.000

        BEGIN SECTION 'P'
X1      2.000      4.000    200.000    207.000      1.000      1.000      1.000      0.000      0.000      0.000
X2      0.000      0.000      0.000    783.600    787.000      0.000      0.000      0.000      0.000      0.000
BT      4.000    200.000    787.000    783.100    200.100    787.000    783.100    206.900    787.000    783.100
BT    207 000    787.000    783.100      0.000      0.000      0.000      0.000      0.000      0.000      0.000
GR    787.000    200.000    778.100    200.100    778.100    206.900    787.000    207.000      0.000      0.000

        END SECTION 'P'
X1      2.100      0.000      0.000      0.000    177.000    177.000    177.000      0.000      1.400      0.000
X2      0 000      0.000      0.000      0.000      0.000      0.000      1.000      0.000      0.000      0.000

        BEGIN SECTION 'Q'
X1      3.000      9 000    100.000    116.400      1.000      1.000      1.000      0.000      0.000      0.000
X2      0.000      0.000      0.000      0.000      0.000      0.000      1.000      0.000      0.000      0.000
BT      7 000    100.000    790 000    779.000    105.000    790.000    782.900    106.600    790.000    785.600
BT    108.200    790.000    786.100    109.700    790.000    785.600    111.400    790.000    782.900    116.400
BT    790.000    779.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000
GR    799 000    100 000    782.900    105.000    779.900    105.100    779.900    106.600    779.400    108.200
GR    779 600    109 700    779.900    111.300    782.900    111.400    790.000    116.400      0.000      0.000
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X1	3.100	0.000	0.000	0.000	86.000	86.000	86.000	0.000	0.560	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X1	3.200	0.000	0.000	0.000	86.000	86.000	86.000	0.000	0.560	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X5	-4.000	0.630	0.630	0.630	0.630	0.000	0.000	0.000	0.000	0.000
X1	3.300	0.000	0.000	0.000	86.000	86.000	86.000	0.000	0.560	0.000
X2	0 000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X1	3.400	0.000	0.000	0.000	86.000	86.000	86.000	0.000	0.560	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
	END SECTION 'Q'									
X1	3.500	0.000	0.000	0.000	86.000	86.000	86.000	0.000	0.560	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
NC	0 015	0.015	0.015	0.100	0.300	0.000	0.000	0.000	0.000	0.000
	BEGIN SECTION 'R'									
X1	4.000	9.000	100.000	106.020	1.000	1.000	1.000	0.000	0.000	0.000
BT	-7.000	100.000	795.000	782.900	100.010	795.000	785.900	101.500	795.000	787.900
BT	0.000	103.000	795.000	788.250	104.500	795.000	787.900	106.000	795.000	785.900
BT	0.000	106.010	795.000	782.900	0.000	0.000	0.000	0.000	0.000	0.000
GR	795 000	100.000	785.900	100.010	782.400	100.020	782.200	101.500	782.400	103.000
GR	782.400	104.500	782.200	106.000	785.900	106.010	795.000	106.020	0.000	0.000
X1	4.100	0.000	0.000	0.000	90.000	90.000	90.000	0.000	-1.000	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X5	-4.000	0.400	0.450	0.450	0.500	0.000	0.000	0.000	0.000	0.000
X1	4 200	0.000	0.000	0.000	100.000	100.000	100.000	0.000	0.500	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X5	-4 000	0.330	0.330	0.370	0.400	0.000	0.000	0.000	0.000	0.000
	END SECTION 'R'									
X1	4.300	0.000	0.000	0.000	137.000	137.000	137.000	0.000	0.500	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X5	-4.000	0.290	0.300	0.320	0.320	0.000	0.000	0.000	0.000	0.000
NC	0.015	0 015	0.015	0.100	0.300	0.000	0.000	0.000	0.000	0.000
	BEGIN UNNAMED SECTION									
X1	5.000	5.000	200.000	206.900	1.000	1.000	1.000	0.000	0.000	0.000
X2	0.000	0.000	0.000	788.800	795.000	0.000	0.000	0.000	0.000	0.000
GR	795.000	200.000	782.600	200.100	782.200	203.500	782.600	206.800	795.000	206.900
	END UNNAMED SECTION									
X1	5.100	0.000	0.000	0.000	185.000	185.000	185.000	0.000	0.800	0.000
X2	0.000	0.000	0.000	791.000	795.000	0.000	0.000	0.000	0.000	0.000

	BEGIN SECTION 'R-R'									
X1	6.000	4.000	200.000	210.000	1.000	1.000	1.000	0.000	0.000	0.000
GR	795.000	200.000	783.000	200.100	783.000	209.900	795.000	210.000	0.000	0.000
SB	0.000	0.730	3.000	0.000	10.000	0.000	50.000	0.000	784.000	783.000
	MODEL SECTION 'R-R' AS SPECIAL BRIDGE									
X1	6.100	0.000	0.000	0.000	110.000	110.000	110.000	0.000	1.000	0.000
X2	0.000	0.000	1.000	789.000	795.000	0.000	0.000	0.000	0.000	0.000
	BEGIN UNAMED SECTION									
X1	7.000	11.000	100.000	106.420	1.000	1.000	1.000	0.000	0.000	0.000
BT	2.000	100.010	795.000	792.300	106.410	795.000	792.300	0.000	0.000	0.000
GR	795.000	100.000	792.300	100.010	787.700	100.020	787.700	100.400	786.400	100.410
GR	784.000	103.200	786.400	105.900	787.700	106.000	787.700	106.400	792.300	106.410
GR	795.000	106.420	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	7.100	0.000	0.000	0.000	90.000	90.000	90.000	0.000	0.500	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X1	7.500	6.000	100.000	106.010	1.000	1.000	1.000	0.000	0.000	0.000
BT	2.000	100.000	795.000	791.400	106.000	795.000	791.400	0.000	0.000	0.000
GR	795.000	100.000	791.400	100.010	784.500	100.500	784.500	105.500	791.400	106.000
GR	795.000	106.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	7.600	6.000	100.000	106.010	70.000	70.000	70.000	0.000	0.000	0.000
BT	2.000	100.000	795.000	791.400	106.000	795.000	791.400	0.000	0.000	0.000
GR	795.000	100.000	791.000	100.010	785.000	100.500	785.000	105.500	791.400	106.000
GR	795.000	106.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
QT	0.000	0.000	0.000	0.000	0.000	985.000	985.000	985.000	985.000	0.000
NC	0.064	0.064	0.028	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	7.700	10.000	395.500	404.600	10.000	10.000	10.000	0.000	-1.300	0.000
GR	794.000	300.000	791.800	325.000	791.800	395.500	786.900	395.600	786.200	400.000
GR	787.100	404.500	791.800	404.600	791.800	448.500	791.800	600.000	794.000	650.000
X1	8.000	10.000	395.500	404.600	50.000	50.000	50.000	0.000	0.000	0.000
GR	794.000	300.000	791.800	325.000	791.800	395.500	786.900	395.600	786.200	400.000
GR	787.100	404.500	791.800	404.600	791.800	448.500	791.800	600.000	794.000	650.000
EJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

THIS RUN EXECUTED 1-AUG-90 16:33:33

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**********************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

EC2] DEH 3/13/90

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
	1.000	0.00	786.00	783.60	778.10	287.47	782.20	0.00	783.73	42.74	9.94	28.91	43.97
	1 000	0 00	786.00	783.60	778.10	300.73	782.40	0.00	783.93	41.26	9.91	30.33	46.82
	1 000	0.00	786.00	783.60	778.10	306.35	782.40	0.00	783.98	42.82	10.10	30.33	46.82
	1.000	0 00	786.00	783.60	778.10	314.45	782.40	0.00	784.07	45.11	10.37	30.33	46.82
	1.100	65.00	786 00	783.60	778.10	287.47	782.87	0.00	784.00	28.83	8.54	33.65	53.54
	1 100	65.00	786.00	783.60	778.10	300.73	783.02	0.00	784.19	29.01	8.65	34.77	55.84
	1.100	65 00	786.00	783 60	778.10	306.35	783.07	0.00	784.25	29.42	8.73	35.08	56.48
	1 100	65.00	786.00	783 60	778.10	314.45	783.14	0.00	784.35	29.97	8.85	35.55	57.44
	2.000	1 00	787.00	783.60	778.10	287.47	782.80	0.00	784.04	32.50	8.93	32.19	50.42
	2 000	1.00	787.00	783.60	778.10	300.73	782.95	0.00	784.22	32.73	9.04	33.26	52.57
	2 000	1.00	787.00	783 60	778.10	306.35	782.99	0.00	784.29	33.21	9.13	33.55	53.16
	2 000	1.00	787.00	783.60	778.10	314.45	783.07	0.00	784.38	33.55	9.22	34.11	54.29
*	2 100	177.00	787.00	785.00	779.50	287.47	783.29	783.29	785.20	56.95	11.08	25.95	38.09
*	2 100	177.00	787 00	785.00	779.50	300.73	783.41	783.41	785.37	57.55	11.24	26.75	39.64
*	2.100	177.00	787.00	785.00	779.50	306.35	783.46	783.46	785.44	57.81	11.31	27.08	40.29
*	2 100	177 00	787.00	785.00	779.50	314.45	783.53	783.53	785.55	58.21	11.41	27.55	41.21
*	3 000	1 00	790 00	786 10	779.40	287.47	783.58	783.58	785.77	68.65	11.87	24.21	34.70
*	3 000	1 00	790.00	786 10	779.40	300 73	783.69	783.69	785.97	70.93	12.12	24.81	35.71
*	3 000	1 00	790.00	786.10	779.40	306.35	783.71	783.71	786.06	72.76	12.29	24.94	35.91
*	3.000	1.00	790.00	786.10	779.40	314.45	783.77	783.77	786.18	74.44	12.45	25.25	36.45
	3 100	86 00	790.00	786 66	779.96	287.47	784.33	784.14	786.35	62.37	11.40	25.23	36.40
	3 100	86 00	790.00	786.66	779.96	300 73	784.52	784.25	786.57	62.81	11.49	26.16	37.95
	3.100	86.00	790.00	786 66	779.96	306.35	784.65	784.27	786.66	61.08	11.37	26.94	39.20
	3 100	86 00	790.00	786 66	779.96	314.45	784.77	784 33	786.80	61.50	11.43	27.50	40.10
*	3 200	86.00	790 00	787.22	780.52	287.47	784.96	784.70	786.92	60.14	11.22	25.63	37.07
*	3 200	86.00	790 00	787.22	780 52	300.73	785.15	784.81	787.13	60.68	11.32	26.57	38.61
*	3 200	86 00	790.00	787.22	780.52	306.35	785.28	784.83	787.25	59.55	11.24	27.25	39.70
*	3 200	86 00	790.00	787 22	780.52	314 45	785.40	784.89	787.38	60.11	11.31	27.80	40.56

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
3.300	86 00	790.00	787.78	781.08	287.47	785.45	785.26	787.46	62.39	11.40	25.22	36.39
3 300	86.00	790.00	787.78	781.08	300.73	785.64	785.37	787.68	62.42	11.46	26.24	38.07
3.300	86.00	790 00	787.78	781.08	306.35	785.76	785.39	787.78	61.45	11.40	26.86	39.08
3.300	86.00	790.00	787.78	781.08	314.45	785.89	785.45	787.92	61.68	11.45	27.46	40.04
3.400	86.00	790.00	788 34	781.64	287.47	785.96	785.82	788.02	63.82	11.51	24.98	35.99
3 400	86.00	790.00	788.34	781.64	300.73	786.16	785.93	788.23	63.60	11.56	26.02	37.71
3.400	86.00	790.00	788.34	781.64	306.35	786.27	785.95	788.33	62.87	11.52	26.59	38.64
3.400	86.00	790 00	788.34	781.64	314.45	786.40	786.01	788.47	62.89	11.55	27.22	39.65
3.500	86.00	790.00	788.90	782.20	287.47	786.51	786.38	788.57	64.01	11.52	24.94	35.93
3.500	86 00	790.00	788.90	782.20	300.73	786.70	786.49	788.78	63.80	11.57	25.98	37.65
3 500	86.00	790.00	788.90	782.20	306.35	786.79	786.51	788.88	63.80	11.60	26.41	38.35
3.500	86.00	790.00	788.90	782.20	314.45	786.92	786.57	789.02	63.71	11.62	27.06	39.39
4.000	1 00	795.00	788.25	782.20	287.47	786.46	786.35	788.60	51.86	11.74	24.48	39.92
4.000	1.00	795 00	788.25	782.20	300.73	786.64	786.42	788.82	52.85	11.84	25.40	41.37
4.000	1.00	795.00	788.25	782.20	306.35	786.74	786.46	788.91	52.94	11.84	25.88	42.11
4.000	1.00	795 00	788.25	782.20	314 45	786.86	786.52	789.06	53.62	11.89	26.45	42.94
* 4.100	90.00	795 00	787 25	781.20	287.47	786.86	0 00	788.26	36.46	9.51	30.23	47.61
* 4.100	90.00	795.00	787.25	781.20	300.73	787.09	0.00	788.57	43 59	9.77	30.78	45.55
* 4.100	90.00	795.00	787.25	781.20	306.35	787.19	0.00	788.72	47.93	9.92	30.88	44.25
* 4.100	90.00	795.00	787.25	781.20	314.45	787.36	0.00	788.97	52.43	10.18	30.89	43.43
* 4 200	100.00	795 00	787.75	781.70	287 47	787.19	0.00	788.64	37.28	9.68	29.69	47.08
* 4.200	100.00	795 00	787.75	781.70	300.73	787.42	0.00	788.94	40.04	9.88	30.42	47.52
* 4 200	100.00	795.00	787.75	781.70	306.35	787.56	0.00	789.10	44.53	9.97	30.74	45.91
* 4 200	100.00	795.00	787.75	781.70	314.45	787.76	0.00	789.37	52.43	10.18	30.89	43.43
* 4.300	137.00	795 00	788.25	782.20	287.47	787.48	0.00	789.01	38.59	9.93	28.96	46.28
* 4.300	137.00	795.00	788.25	782.20	300.73	787.72	0.00	789.30	40.61	10.09	29.80	47.19
* 4 300	137.00	795.00	788.25	782.20	306.35	787.88	0.00	789.47	41.29	10.11	30.31	47.68
* 4.300	137.00	795.00	788.25	782.20	314.45	788.08	0.00	789.70	47.45	10.22	30.77	45.65
5.000	1 00	795.00	788.80	782.20	287.47	788.25	0.00	789.08	19.06	7.29	39.46	65.84
5.000	1 00	795.00	788.80	782.20	300.73	788.57	0.00	789.38	18.33	7.23	41.58	70.25
5.000	1.00	795 00	788.80	782.20	306.35	788.76	0.00	789.55	17.64	7.14	42.88	72.95
5.000	1 00	795.00	788.80	782.20	314.45	788.96	0.00	789.79	27.38	7.28	43.19	60.09
5 100	185 00	795.00	791 00	783.00	287.47	788.53	0.00	789.52	23.98	7.99	35.98	58.71
5.100	185 00	795.00	791.00	783.00	300.73	788.83	0.00	789.81	22.86	7.91	38.03	62.90
5.100	185.00	795.00	791.00	783 00	306.35	789.01	0.00	789.96	21.96	7.81	39.23	65.37
5.100	185.00	795.00	791.00	783 00	314.45	789.35	0.00	790.24	20.18	7.58	41.47	70.00
6 000	1 00	0 00	0.00	783.00	287.47	789.25	0.00	789.59	5.73	4.67	61.59	120.09
6 000	1.00	0 00	0.00	783.00	300.73	789.53	0.00	789.87	5.57	4.67	64.46	127.37
6.000	1.00	0.00	0 00	783.00	306 35	789.69	0.00	790.02	5.45	4.64	65.97	131.22
6.000	1 00	0.00	0 00	783.00	314 45	789.97	0.00	790.30	5.16	4.57	68.80	138.48

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
	6.100	110.00	795.00	789.00	784.00	287 47	789.22	0.00	789.75	17.72	5.84	49.21	68.28
	6.100	110.00	795.00	789.00	784.00	300.73	789.47	0.00	790.05	19.40	6.11	49.21	68.28
	6.100	110.00	795.00	789.00	784.00	306.35	789.60	0.00	790.20	20.13	6.23	49.21	68.28
	6.100	110 00	795 00	789.00	784.00	314.45	789.86	0.00	790.49	21.21	6.39	49.21	68.28
*	7.000	1.00	795.00	792.30	784.00	287.47	789.49	789.49	791.51	61.90	11.40	25.22	36.54
*	7.000	1.00	795.00	792.30	784.00	300.73	789.61	789.61	791.69	62.61	11.57	25.99	38.01
*	7.000	1.00	795.00	792.30	784.00	306.35	789.67	789.67	791.77	62.57	11.61	26.38	38.73
*	7.000	1.00	795.00	792.30	784.00	314.45	789.74	789.74	791.87	63.26	11.73	26.80	39.53
	7.100	90.00	795 00	792.80	784.50	287.47	790.32	0.00	792.04	50.08	10.50	27.37	40.62
	7 100	90.00	795.00	792.80	784.50	300.73	790.48	0.00	792.22	50.05	10.60	28.36	42.51
	7.100	90.00	795.00	792.80	784.50	306.35	790.53	0.00	792.30	50.36	10.67	28.70	43.17
	7.100	90.00	795.00	792.80	784.50	314.45	790.63	0.00	792.42	50.13	10.71	29.35	44.41
	7.500	1.00	795.00	791.40	784.50	287.47	791.14	0.00	792.11	25.54	7.91	36.35	56.88
	7.500	1.00	795.00	791.40	784.50	300.73	791.29	0.00	792.30	26.42	8.08	37.20	58.51
	7 500	1.00	795.00	791.40	784.50	306.35	791.35	0.00	792.38	26.76	8.15	37.57	59.22
	7.500	1.00	795 00	791.40	784.50	314.45	791.42	0.00	792.49	39.84	8.29	37.92	49.82
	7.600	70.00	795.00	791.40	785.00	287.47	791.25	0.00	792.34	29.15	8.37	34.33	53.24
	7.600	70 00	795 00	791.40	785.00	300.73	791.44	0 00	792.57	43.93	8.53	35.27	45.37
	7.600	70.00	795 00	791.40	785.00	306.35	791.49	0.00	792.66	45.59	8.69	35.27	45.37
	7 600	70.00	795.00	791.40	785.00	314.45	791.61	0.00	792.85	48.03	8.92	35.27	45.37
	7 700	10.00	0.00	0.00	784.90	595.00	792.42	0.00	792.45	4.74	2.63	634.61	273.32
	7 700	10.00	0.00	0.00	784.90	860 00	792.63	791.49	792.69	7.33	3.34	709.16	317.63
	7.700	10 00	0 00	0.00	784.90	985.00	792.72	791.59	792.78	8.59	3.65	738.86	336.04
	7 700	10.00	0.00	0.00	784.90	1275.00	792.89	791.79	792.98	11.58	4.30	797.63	374.73
*	8 000	50.00	0.00	0.00	786.20	595.00	792.54	792.54	792.96	38.44	6.64	260.06	95.97
*	8.000	50.00	0.00	0.00	786.20	860.00	792.77	792.77	793.26	49.95	7.77	328.56	121.68
*	8 000	50.00	0.00	0 00	786.20	985.00	792.89	792.89	793.37	51.64	8.00	365.70	137.07
*	8 000	50.00	0.00	0.00	786.20	1275.00	793.12	793.12	793.60	56.23	8.55	438.81	170.03

EC2] DEH 3/13/90

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	1.000	287.47	782.20	0.00	0.00	0.00	7.10	0.00
	1.000	300.73	782.40	0.20	0.00	0.00	7.11	0.00
	1.000	306.35	782.40	0.00	0.00	0.00	7.11	0.00
	1 000	314.45	782.40	0.00	0.00	0.00	7.11	0.00
	1.100	287.47	782.87	0.00	0.67	0.00	7.12	65.00
	1.100	300.73	783.02	0.16	0.62	0.00	7.12	65.00
	1.100	306.35	783.07	0.04	0.67	0.00	7.13	65.00
	1.100	314.45	783.14	0.07	0.74	0.00	7.13	65.00
	2.000	287 47	782 80	0.00	-0.07	0.00	6.91	1.00
	2.000	300 73	782.95	0.15	-0.07	0.00	6.91	1.00
	2 000	306.35	782.99	0.04	-0.07	0.00	6.91	1.00
	2.000	314.45	783.07	0.07	-0.07	0.00	6.91	1.00
*	2.100	287.47	783.29	0.00	0.49	0.00	6.89	177.00
*	2 100	300 73	783.41	0.12	0.46	0 00	6.89	177.00
*	2.100	306 35	783.46	0.05	0.46	0.00	6.89	177.00
*	2.100	314.45	783.53	0.07	0.46	0.00	6.89	177.00
*	3.000	287 47	783.58	0.00	0.29	0.00	7.09	1.00
*	3.000	300 73	783.69	0.11	0.28	0.00	7.20	1.00
*	3.000	306.35	783 71	0.02	0.26	0.00	7.22	1.00
*	3.000	314.45	783.77	0.06	0.25	0.00	7.28	1.00
	3.100	287.47	784.33	0.00	0.75	0.00	7.28	86.00
	3.100	300.73	784.52	0.18	0.83	0.00	7.46	86.00
	3 100	306.35	784.65	0.14	0.94	0.00	7.62	86.00
	3 100	314 45	784.77	0.11	1.00	0.00	7.73	86.00
*	3.200	287.47	784.96	0.00	0.63	0.00	7.36	86.00
*	3.200	300 73	785.15	0.18	0.63	0.00	7.54	86.00
*	3.200	306.35	785.28	0.14	0.63	0.00	7.68	86.00
*	3.200	314 45	785.40	0.11	0.63	0.00	7.80	86.00
	3.300	287 47	785 45	0.00	0.48	0.00	7.28	86.00
	3.300	300 73	785.64	0.19	0.49	0.00	7.48	86.00
	3.300	306.35	785 76	0.12	0.48	0.00	7.60	86.00
	3.300	314.45	785.89	0.12	0.49	0.00	7.73	86.00
	3 400	287.47	785.96	0.00	0.51	0.00	7.23	86.00
	3.400	300.73	786.16	0.20	0.52	0.00	7.43	86.00
	3 400	306.35	786 27	0.11	0.51	0.00	7.55	86.00
	3.400	314.45	786 40	0.13	0.51	0 00	7.68	86.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
3.500	287.47	786.51	0.00	0.55	0.00	7.23	86.00
3.500	300.73	786.70	0.20	0.54	0.00	7.43	86.00
3.500	306.35	786.79	0.09	0.53	0.00	7.51	86.00
3.500	314.45	786.92	0.13	0.53	0.00	7.64	86.00
4.000	287.47	786.46	0.00	-0.05	0.00	6.00	1.00
4.000	300.73	786.64	0.18	-0.06	0.00	6.00	1.00
4.000	306.35	786.74	0.10	-0.05	0.00	6.00	1.00
4.000	314.45	786.86	0.12	-0.06	0.00	6.00	1.00
4.100	287.47	786.86	0.00	0.40	0.00	6.00	90.00
4.100	300.73	787.09	0.23	0.45	0.00	6.00	90.00
4.100	306.35	787.19	0.10	0.45	0.00	6.01	90.00
4.100	314.45	787.36	0.17	0.50	0.00	6.01	90.00
4.200	287.47	787.19	0.00	0.33	0.00	6.00	100.00
4.200	300.73	787.42	0.23	0.33	0.00	6.00	100.00
4.200	306.35	787.56	0.14	0.37	0.00	6.00	100.00
4.200	314.45	787.76	0.20	0.40	0.00	6.01	100.00
4.300	287.47	787.48	0.00	0.29	0.00	6.00	137.00
4.300	300.73	787.72	0.24	0.30	0.00	6.00	137.00
4.300	306.35	787.88	0.16	0.32	0.00	6.00	137.00
4.300	314.45	788.08	0.20	0.32	0.00	6.00	137.00
5.000	287.47	788.25	0.00	0.78	0.00	6.79	1.00
5.000	300.73	788.57	0.31	0.85	0.00	6.80	1.00
5.000	306.35	788.76	0.19	0.88	0.00	6.80	1.00
5.000	314.45	788.96	0.21	0.88	0.00	6.80	1.00
5.100	287.47	788.53	0.00	0.28	0.00	6.78	185.00
5.100	300.73	788.83	0.30	0.27	0.00	6.79	185.00
5.100	306.35	789.01	0.18	0.25	0.00	6.79	185.00
5.100	314.45	789.35	0.34	0.38	0.00	6.80	185.00
6.000	287.47	789.25	0.00	0.72	0.00	9.90	1.00
6.000	300.73	789.53	0.28	0.70	0.00	9.91	1.00
6.000	306.35	789.69	0.15	0.67	0.00	9.91	1.00
6.000	314.45	789.97	0.29	0.63	0.00	9.92	1.00
6.100	287.47	789.22	0.00	-0.03	0.00	9.89	110.00
6.100	300.73	789.47	0.25	-0.07	0.00	9.89	110.00
6.100	306.35	789.60	0.14	-0.08	0.00	9.89	110.00
6.100	314.45	789.86	0.26	-0.12	0.00	9.90	110.00
7.000	287.47	789.49	0.00	0.27	0.00	6.39	1.00
7.000	300.73	789.61	0.12	0.14	0.00	6.39	1.00
7.000	306.35	789.67	0.06	0.07	0.00	6.39	1.00
7.000	314.45	789.71	0.07	-0.12	0.00	6.39	1.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
7.100	287.47	790.32	0.00	0.84	0.00	6.39	90.00
7 100	300.73	790 48	0.15	0.87	0.00	6 39	90.00
7.100	306.35	790.53	0.05	0.86	0.00	6.39	90.00
7 100	314.45	790 63	0.10	0.90	0 00	6 39	90.00
7 500	287.47	791.14	0.00	0.82	0.00	5.95	1.00
7 500	300.73	791.29	0.14	0.81	0.00	5.97	1.00
7 500	306.35	791.35	0.06	0.81	0.00	5 98	1.00
7 500	314.45	791.42	0.08	0.79	0.00	5.99	1.00
7 600	287.47	791.25	0.00	0.11	0.00	5.98	70.00
7.600	300.73	791.44	0.19	0.15	0.00	5.99	70.00
7 600	306.35	791.49	0 05	0.14	0.00	5 99	70.00
7.600	314.45	791.61	0.12	0.19	0.00	5.99	70.00
7.700	595.00	792.42	0.00	1.16	0.00	340.16	10.00
7.700	860.00	792.63	0.22	1.19	0.00	347.55	10.00
7.700	985.00	792.72	0.09	1.23	0.00	350.00	10.00
7.700	1275.00	792 89	0.17	1.28	0.00	350.00	10.00
8.000	595.00	792.54	0.00	0.13	0.00	300.28	50.00
8 000	860.00	792.77	0.23	0.14	0.00	307 96	50.00
8.000	985.00	792.89	0.12	0.17	0.00	312.04	50.00
8 000	1275.00	793.12	0.23	0.23	0.00	319.93	50.00

SUMMARY OF ERRORS AND SPECIAL NOTES

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CAUTION   SECNO=     2.100   PROFILE= 1   CRITICAL DEPTH ASSUMED
CAUTION   SECNO=     2.100   PROFILE= 1   PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION   SECNO=     2.100   PROFILE= 1   20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION   SECNO=     2.100   PROFILE= 2   CRITICAL DEPTH ASSUMED
CAUTION   SECNO=     2.100   PROFILE= 2   MINIMUM SPECIFIC ENERGY
CAUTION   SECNO=     2.100   PROFILE= 3   CRITICAL DEPTH ASSUMED
CAUTION   SECNO=     2.100   PROFILE= 3   MINIMUM SPECIFIC ENERGY
CAUTION   SECNO=     2.100   PROFILE= 4   CRITICAL DEPTH ASSUMED
CAUTION   SECNO=     2.100   PROFILE= 4   MINIMUM SPECIFIC ENERGY

CAUTION   SECNO=     3.000   PROFILE= 1   CRITICAL DEPTH ASSUMED
CAUTION   SECNO=     3.000   PROFILE= 1   PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION   SECNO=     3.000   PROFILE= 1   20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION   SECNO=     3.000   PROFILE= 2   CRITICAL DEPTH ASSUMED
CAUTION   SECNO=     3.000   PROFILE= 2   PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION   SECNO=     3.000   PROFILE= 2   20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION   SECNO=     3.000   PROFILE= 3   CRITICAL DEPTH ASSUMED
CAUTION   SECNO=     3.000   PROFILE= 3   PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION   SECNO=     3.000   PROFILE= 3   20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION   SECNO=     3.000   PROFILE= 4   CRITICAL DEPTH ASSUMED
CAUTION   SECNO=     3.000   PROFILE= 4   PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION   SECNO=     3.000   PROFILE= 4   20 TRIALS ATTEMPTED TO BALANCE WSEL

NOTE      SECNO=     3.200   PROFILE= 1   WSEL BASED ON X5 LINE
NOTE      SECNO=     3.200   PROFILE= 2   WSEL BASED ON X5 LINE
NOTE      SECNO=     3.200   PROFILE= 3   WSEL BASED ON X5 LINE
NOTE      SECNO=     3.200   PROFILE= 4   WSEL BASED ON X5 LINE

NOTE      SECNO=     4.100   PROFILE= 1   WSEL BASED ON X5 LINE
NOTE      SECNO=     4.100   PROFILE= 2   WSEL BASED ON X5 LINE
NOTE      SECNO=     4.100   PROFILE= 3   WSEL BASED ON X5 LINE
NOTE      SECNO=     4.100   PROFILE= 4   WSEL BASED ON X5 LINE

NOTE      SECNO=     4.200   PROFILE= 1   WSEL BASED ON X5 LINE
NOTE      SECNO=     4.200   PROFILE= 2   WSEL BASED ON X5 LINE
NOTE      SECNO=     4.200   PROFILE= 3   WSEL BASED ON X5 LINE
NOTE      SECNO=     4.200   PROFILE= 4   WSEL BASED ON X5 LINE

NOTE      SECNO=     4.300   PROFILE= 1   WSEL BASED ON X5 LINE
NOTE      SECNO=     4.300   PROFILE= 2   WSEL BASED ON X5 LINE
NOTE      SECNO=     4.300   PROFILE= 3   WSEL BASED ON X5 LINE
NOTE      SECNO=     4.300   PROFILE= 4   WSEL BASED ON X5 LINE

CAUTION   SECNO=     7.000   PROFILE= 1   CRITICAL DEPTH ASSUMED
CAUTION   SECNO=     7.000   PROFILE= 1   PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION   SECNO=     7.000   PROFILE= 1   20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION   SECNO=     7.000   PROFILE= 2   CRITICAL DEPTH ASSUMED
CAUTION   SECNO=     7.000   PROFILE= 2   PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION   SECNO=     7.000   PROFILE= 2   20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION   SECNO=     7.000   PROFILE= 3   CRITICAL DEPTH ASSUMED
CAUTION   SECNO=     7.000   PROFILE= 3   PROBABLE MINIMUM SPECIFIC ENERGY
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CAUTION  SECNO=     7.000  PROFILE= 3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO=     7.000  PROFILE= 4  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=     7.000  PROFILE= 4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=     7.000  PROFILE= 4  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO=     8.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=     8.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=     8.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO=     8.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=     8.000  PROFILE= 2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=     8.000  PROFILE= 2  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO=     8.000  PROFILE= 3  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=     8.000  PROFILE= 3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=     8.000  PROFILE= 3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO=     8.000  PROFILE= 4  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=     8.000  PROFILE= 4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=     8.000  PROFILE= 4  20 TRIALS ATTEMPTED TO BALANCE WSEL
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THIS RUN EXECUTED 1-AUG-90 16:33:39

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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55
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00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: KALAMAZOO, CITY OF

3) WATERCOURSE: ARCADIA CREEK

4) DOCUMENT TYPE: MULTI PROFILES RUNS

00BREAK00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

CCHV= 0.500 CEHV= 0.700
*SECNO 0.000
STA: 0+00: D/S LIMIT OF RIPRAP EXIT CHANNEL(20' D/S OF BAFFLED APRON)

0.00	9.50	757.50	0.00	757.50	757.63	0.13	0.00	0.00	765.00
544.	0.	544.	0.	0.	190.	0.	0.	0.	765.00
0.00	0.00	2.86	0.00	0.000	0.035	0.000	0.000	748.00	100.00
0.000550	0.	0.	0.	0	0	0	0.00	20.01	120.02

CCHV= 0.100 CEHV= 0.300
*SECNO 0.100

0.10	9.50	757.50	0.00	0.00	757.63	0.13	0.00	0.00	765.00
544.	0.	544.	0.	0.	190.	0.	0.	0.	765.00
0.00	0.00	2.86	0.00	0.000	0.013	0.000	0.000	748.00	100.00
0.000076	9.	9.	9.	0	0	0	0.00	20.01	120.02

*SECNO 0.170

0.17	9.50	757.50	0.00	0.00	757.63	0.13	0.00	0.00	765.00
544.	0.	544.	0.	0.	190.	0.	0.	0.	765.00
0.00	0.00	2.86	0.00	0.000	0.013	0.000	0.000	748.00	100.00
0.000076	8.	8.	8.	0	0	0	0.00	20.01	120.02

*SECNO 0.180
STA. 0+18: U/S LIMIT OF RIPRAP EXIT CHANNEL-BEGIN ENEGY DISSIPATOR

0.18	9.47	757.47	0.00	0.00	757.65	0.18	0.00	0.02	759.00
544.	0.	544.	0.	0.	160.	0.	0.	0.	759.00
0.00	0.00	3.40	0.00	0.000	0.013	0.000	0.000	748.00	100.00
0.000193	1.	1.	1.	2	0	0	0.00	20.07	120.07

*SECNO 0.330

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

0.33	4.31	759.31	759.31	0.00	760.76	1.44	0.01	0.38	766.00
544.	0.	544.	0.	0.	56.	0.	0.	0.	766.00
0.00	0.00	9.64	0.00	0.000	0.013	0.000	0.000	755.00	100.01
0.004585	14.	14.	14.	20	14	0	0.00	20.06	120.06

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 0.340

3301 HV CHANGED MORE THAN HVINS

STA. 0+34: U/S LIMIT OF ENERGY DISSIPATOR

0.34	5.48	760.48	0.00	0.00	760.86	0.38	0.00	0.11	766.00
544.	0.	544.	0.	0.	110.	0.	0.	0.	766.00
0.00	0.00	4.96	0.00	0.000	0.013	0.000	0.000	755.00	100.01
0.000349	1.	1.	1.	3	0	0	0.00	20.01	120.01

*SECNO 0.380

0.38	5.41	760.41	0.00	0.00	760.90	0.48	0.00	0.03	766.00
544.	0.	544.	0.	0.	97.	0.	0.	0.	766.00
0.00	0.00	5.58	0.00	0.000	0.013	0.000	0.000	755.00	100.01
0.000470	4.	4.	4.	2	0	0	0.00	18.01	118.01

*SECNO 0.420

0.42	5.31	760.31	0.00	0.00	760.94	0.64	0.00	0.05	766.00
544.	0.	544.	0.	0.	85.	0.	0.	0.	766.00
0.00	0.00	6.40	0.00	0.000	0.013	0.000	0.000	755.00	100.01
0.000668	4.	4.	4.	2	0	0	0.00	16.01	116.01

*SECNO 0.460

0.46	5.13	760.13	0.00	0.00	761.02	0.89	0.00	0.08	766.00
544.	0.	544.	0.	0.	72.	0.	0.	0.	766.00
0.00	0.00	7.56	0.00	0.000	0.013	0.000	0.000	755.00	100.01
0.001029	4.	4.	4.	2	0	0	0.00	14.01	114.01

*SECNO 0.500

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 763.00 MAX ELLC= 762.00

STA. 0+50:NOTE XSEC. #'S REFLECT STA.

0.50	4.79	759.79	0.00	0.00	761.18	1.38	0.01	0.15	765.00
544.	0.	544.	0.	0.	58.	0.	0.	0.	765.00
0.00	0.00	9.44	0.00	0.000	0.013	0.000	0.000	755.00	100.01
0.001841	4.	4.	4.	2	0	0	0.00	12.01	112.01

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 1.000

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 764.20 MAX ELLC= 762.09

STA. 1+00

1.00	4.79	759.88	0.00	0.00	761.27	1.39	0.09	0.00	765.09
544.	0.	544.	0.	0.	58.	0.	0.	0.	765.09
0.00	0.00	9.45	0.00	0.000	0.013	0.000	0.000	755.09	100.01
0.001850	50.	50.	50.	0	0	0	0.00	12.01	112.01

*SECNO 1.250

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 765.90 MAX ELLC= 762.14

1.25	4.78	759.93	0.00	0.00	761.32	1.39	0.05	0.00	765.14
544.	0.	544.	0.	0.	57.	0.	0.	0.	765.14
0.01	0.00	9.46	0.00	0.000	0.013	0.000	0.000	755.14	100.01
0.001856	25.	25.	25.	0	0	0	0.00	12.01	112.01

*SECNO 2.500

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 767.00 MAX ELLC= 762.52

2.50	4.78	760.16	0.00	0.00	761.55	1.39	0.23	0.00	765.38
544.	0.	544.	0.	0.	57.	0.	0.	0.	765.38
0.01	0.00	9.47	0.00	0.000	0.013	0.000	0.000	755.38	100.01
0.001860	125.	125.	125.	0	0	0	0.00	12.01	112.01

*SECNO 3.500

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 767.00 MAX ELLC= 762.71

3.50	4.77	760.34	0.00	0.00	761.74	1.40	0.19	0.00	765.57
544.	0.	544.	0.	0.	57.	0.	1.	0.	765.57
0.01	0.00	9.48	0.00	0.000	0.013	0.000	0.000	755.57	100.01
0.001867	100.	100.	100.	0	0	0	0.00	12.01	112.01

*SECNO 4.300

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 767.00 MAX ELLC= 762.86

4.30	4.76	760.49	0.00	0.00	761.89	1.40	0.15	0.00	765.72
544.	0.	544.	0.	0.	57.	0.	1.	0.	765.72
0.01	0.00	9.50	0.00	0.000	0.013	0.000	0.000	755.72	100.01
0.001875	80.	80.	80.	0	0	0	0.00	12.01	112.01

*SECNO 4.550

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 767.00 MAX ELLC= 762.99

4.55	4.35	760.34	0.00	0.00	762.03	1.69	0.05	0.09	773.00
544.	0.	544.	0.	0.	52.	0.	1.	0.	773.00
0.01	0.00	10.42	0.00	0.000	0.013	0.000	0.000	755.99	150.01
0.002421	25.	25.	25.	3	0	0	0.00	12.00	162.00

*SECNO 5.000

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 767.00 MAX ELLC= 763.08

5.00	4.45	760.53	0.00	0.00	762.14	1.61	0.11	0.01	773.09
544.	0.	544.	0.	0.	53.	0.	1.	0.	773.09
0.02	0.00	10.19	0.00	0.000	0.013	0.000	0.000	756.08	150.01
0.002275	45.	45.	45.	2	0	0	0.00	12.00	162.00

*SECNO 7.500

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 768.00 MAX ELLC= 763.55

7.50	4.68	761.23	0.00	0.00	762.68	1.45	0.53	0.02	773.56
544.	0.	544.	0.	0.	56.	0.	1.	0.	773.56
0.02	0.00	9.68	0.00	0.000	0.013	0.000	0.000	756.55	150.01
0.001972	250.	250.	250.	2	0	0	0.00	12.00	162.00

*SECNO 10.000

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 769.00 MAX ELLC= 764.03

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
10.00	4.69	761.72	0.00	0.00	763.18	1.46	0.49	0.00	774.04
544.	0.	544.	0.	0.	56.	0.	1.	0.	774.04
0.03	0.00	9.68	0.00	0.000	0.013	0.000	0.000	757.03	150.01
0.001975	250.	250.	250.	1	0	0	0.00	12.00	162.00

*SECNO 12.500

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 771.25 MAX ELLC= 764.51

12.50	4.74	762.25	0.00	0.00	763.67	1.42	0.49	0.00	774.52
544.	0.	544.	0.	0.	57.	0.	2.	0.	774.52
0.04	0.00	9.57	0.00	0.000	0.013	0.000	0.000	757.51	150.01
0.001913	250.	250.	250.	2	0	0	0.00	12.00	162.00

*SECNO 15.000

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 772.90 MAX ELLC= 764.98

15.00	4.74	762.72	0.00	0.00	764.15	1.42	0.48	0.00	774.99
544.	0.	544.	0.	0.	57.	0.	2.	0.	774.99
0.04	0.00	9.57	0.00	0.000	0.013	0.000	0.000	757.98	150.01
0.001914	250.	250.	250.	0	0	0	0.00	12.00	162.00

*SECNO 17.500

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 772.80 MAX ELLC= 765.46

17.50	4.74	763.20	0.00	0.00	764.62	1.42	0.48	0.00	775.47
544.	0.	544.	0.	0.	57.	0.	2.	0.	775.47
0.05	0.00	9.57	0.00	0.000	0.013	0.000	0.000	758.46	150.01
0.001912	250.	250.	250.	0	0	0	0.00	12.00	162.00

CCHV= 0.300 CEHV= 0.500
*SECNO 18.280

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 772.80 MAX ELLC= 765.61

18.28	4.74	763.35	0.00	0.00	764.77	1.42	0.15	0.00	775.62
544.	0.	544.	0.	0.	57.	0.	2.	1.	775.62
0.05	0.00	9.56	0.00	0.000	0.013	0.000	0.000	758.61	150.01
0.001910	78.	78.	78.	0	0	0	0.00	12.00	162.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 18.330

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 774.00 MAX ELLC= 767.10

18.33	5.37	763.97	0.00	0.00	764.92	0.95	0.01	0.14	774.00
544.	0.	544.	0.	0.	69.	0.	2.	1.	774.00
0.05	0.00	7.83	0.00	0.000	0.013	0.000	0.000	758.60	100.07
0.001116	5.	5.	5.	4	0	0	0.00	12.97	113.03

*SECNO 18.380

3265 DIVIDED FLOW

3370 NORMAL BRIDGE,NRD= 4 MIN ELTRD= 774.00 MAX ELLC= 767.10

18.38	5.84	764.44	0.00	0.00	765.03	0.59	0.01	0.11	774.00
544.	0.	544.	0.	0.	88.	0.	2.	1.	774.00
0.05	0.00	6.18	0.00	0.000	0.013	0.000	0.000	758.60	100.06
0.000964	5.	5.	5.	3	0	0	0.00	15.15	116.34

*SECNO 18.390
WATER EL=X5 LINE= 764.593

3265 DIVIDED FLOW

18.39	5.99	764.59	0.00	0.00	765.16	0.56	0.00	0.01	774.00
544.	0.	544.	0.	0.	90.	0.	2.	1.	774.00
0.05	0.00	6.02	0.00	0.000	0.013	0.000	0.000	758.60	100.06
0.000904	0.	0.	0.	0	0	0	0.00	15.16	116.34

*SECNO 18.540

3265 DIVIDED FLOW

3370 NORMAL BRIDGE,NRD= 4 MIN ELTRD= 774.00 MAX ELLC= 767.10

18.54	5.95	764.60	0.00	0.00	765.17	0.57	0.01	0.00	774.00
544.	0.	544.	0.	0.	90.	0.	2.	1.	774.00
0.06	0.00	6.05	0.00	0.000	0.013	0.000	0.000	758.65	100.06
0.000915	16.	16.	16.	2	0	0	0.00	15.19	125.38

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 18.541
WATER EL=X5 LINE= 764.744

3265 DIVIDED FLOW

18.54	6.09	764.74	0.00	0.00	765.29	0.54	0.00	0.01	774.00
544.	0.	544.	0.	0.	92.	0.	2.	1.	774.00
0.06	0.00	5.91	0.00	0.000	0.013	0.000	0.000	758.65	100.06
0.000862	0.	0.	0.	0	0	0	0.00	15.20	125.38

*SECNO 18.550

3265 DIVIDED FLOW

3370 NORMAL BRIDGE,NRD= 12 MIN ELTRD= 774.00 MAX ELLC= 766.30

18.55	5.78	764.58	0.00	0.00	765.45	0.86	0.00	0.16	762.55
544.	0.	544.	0.	0.	73.	0.	3.	1.	762.55
0.06	0.00	7.46	0.00	0.000	0.013	0.000	0.000	758.80	109.98
0.001497	1.	1.	1.	2	0	0	-2.60	15.03	134.98

*SECNO 19.150

3265 DIVIDED FLOW

3370 NORMAL BRIDGE,NRD= 12 MIN ELTRD= 774.15 MAX ELLC= 766.80

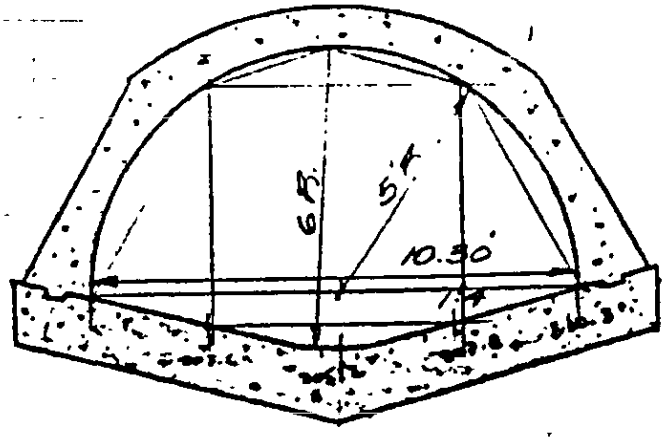
19.15	5.30	764.60	0.00	0.00	765.63	1.03	0.10	0.08	763.05
544.	0.	544.	0.	0.	67.	0.	3.	1.	762.70
0.06	0.00	8.12	0.00	0.000	0.013	0.000	0.000	759.30	109.99
0.001806	60.	60.	60.	2	0	0	-1.52	15.02	134.98

*SECNO 19.160

3265 DIVIDED FLOW

STS Consultants Ltd. CALCULATION SHEET	PROJECT: Arcadia Cree			STS JOB NO. 1-69
	SUBJECT: X-Section Summary			CALC NO
	DATE: 3/1/90	BY: DEH	CHECKED BY	REV. NO.

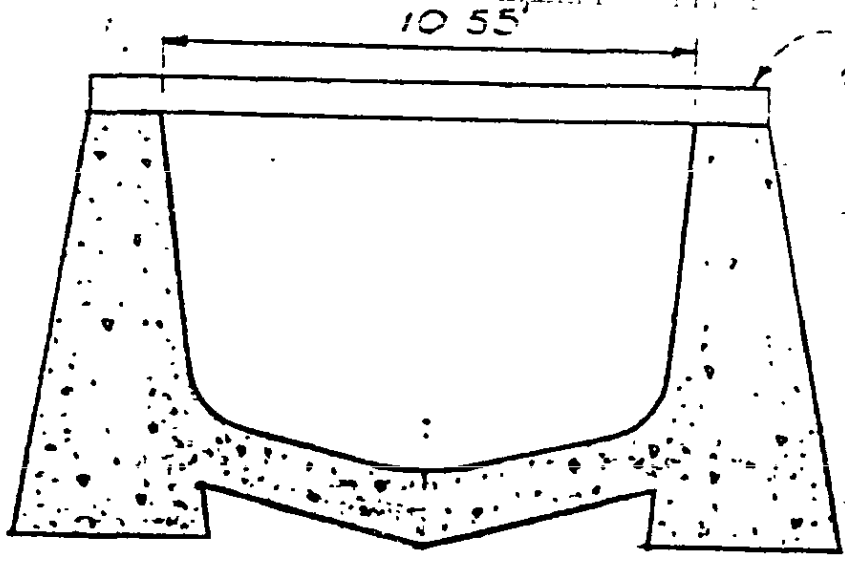
Existing Culvert Cross-Section Summary



Reach 1&2

SECTION-A

Typical Section From River To Po[illegible] Of Kalamazoo Ave. & Water St 165[illegible]



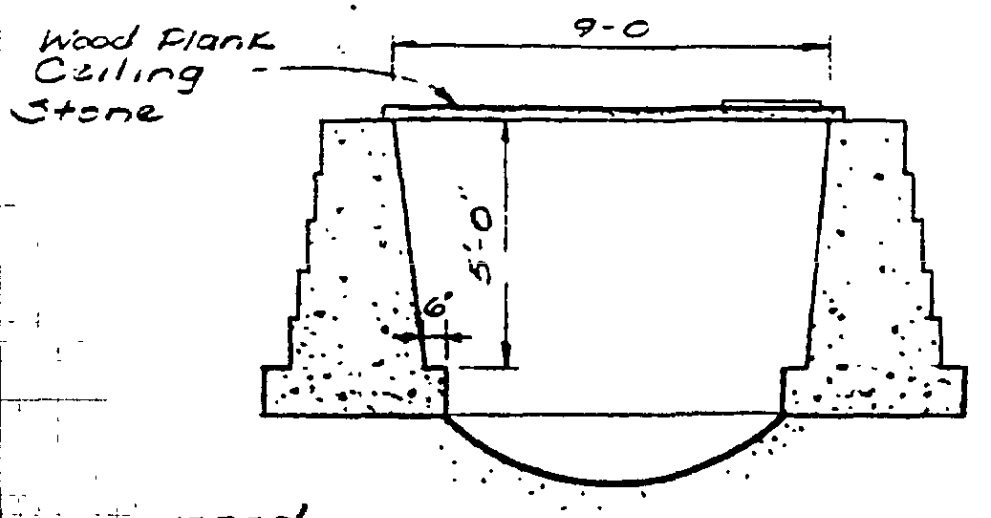
Reach 2

SECTION-B

Special Section Under Old Railroad East Of Walbridge 34 Feet Thus

STS Consultants Ltd.
CALCULATION SHEET

PROJECT	STS JOB NO
Arcadia Creek	1064
SUBJECT	**CALC. NO**
X-section Summary	
DATE 3/1/90	**BY** DEH	**CHECKED BY**	**REV NO.**



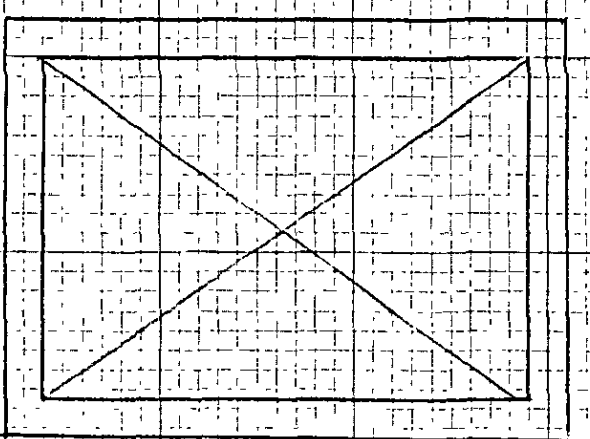
Reach 4

vered -
Have Been Used

SECTION-D

Typical Section Aprox. 250 Ft.

Tie-in Connection 10'x7'



STS Consultants Ltd.
CALCULATION SHEET

PROJECT	STS JOB NO.
Arcadia [illegible]	[illegible]
SUBJECT	CALC NO
Critical Depth Calcs.	
DATE 9/25/09 / BY DEH / CHECKED BY	REV. NO

Critical Depth Calculations

Critical Depth results when the Froude Number equals 1. (Ref 3)

$$Fr = \frac{V^2}{g\,D} = 1$$

V = Velocity (fps)

g = gravity (32.2 ft/sec²)

D = Hydraulic Depth = A/T

A = Area (ft²)

T = Top width (ft)

$$\frac{V^2}{g\,D} = 1 \;\;\therefore\;\; \frac{A^2 V^2 \cdot T}{A^2 g\, A} = 1 \;\;\therefore\;\; \frac{Q^2 T}{g A^3} = 1$$

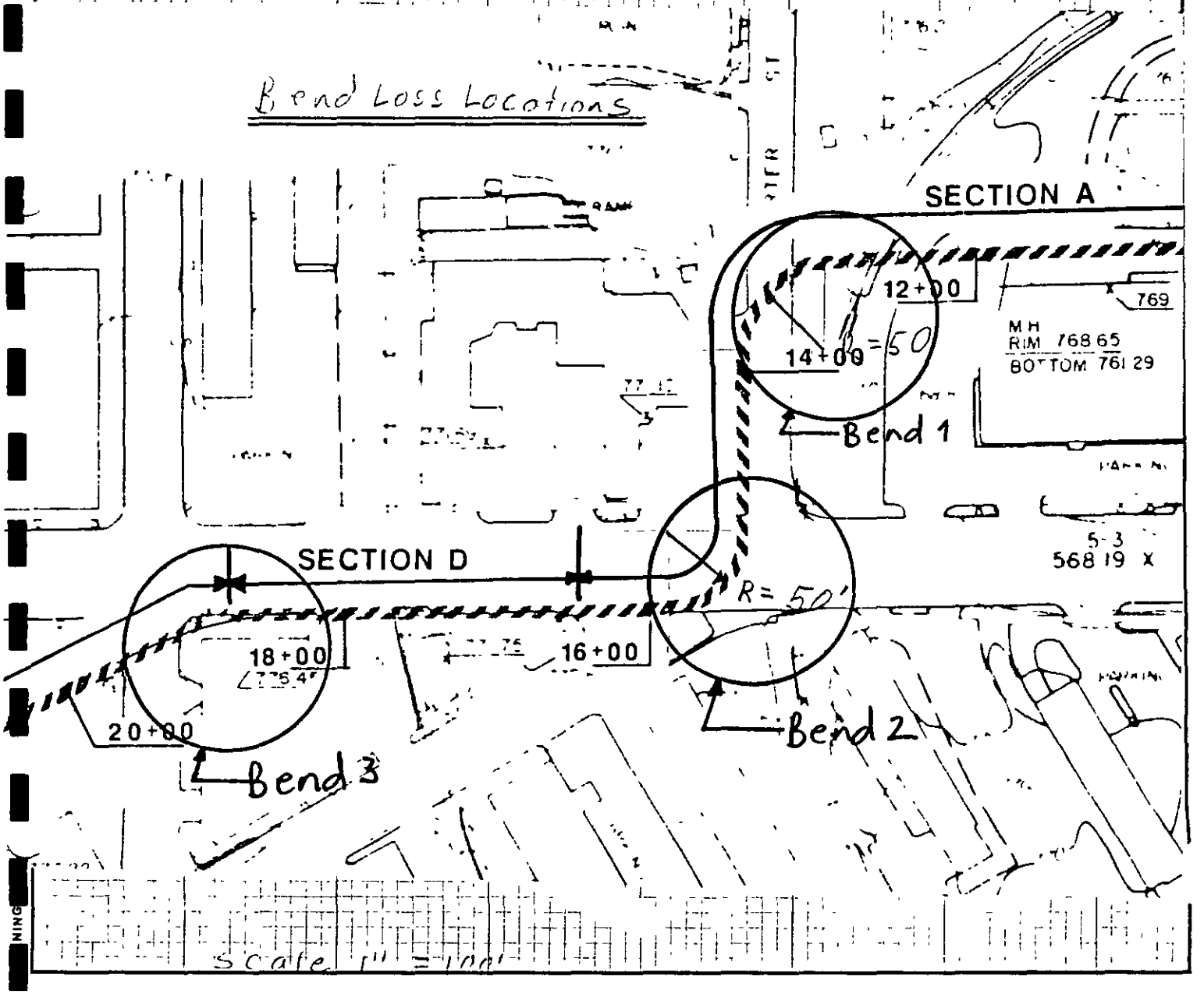
STS Consultants Ltd.
CALCULATION SHEET

PROJECT	STS JOB NO.
Arcadia Creek	1064AT
SUBJECT	CALC NO
Existing System Bend Losses	
DATE 9/26/89 · BY DEH · CHECKED BY	REV. NO.

Existing Bend Losses

3 bends in the system from parlage creek to Edwards St. These bends will be evaluated and losses will be added accordingly.

Bend Loss Locations



STS Consultants Ltd. CALCULATION SHEET	PROJECT: Arcadia Creek		STS JOB NO.: 10-9AT
	SUBJECT: Bend losses Existing System		CALC. NO.
	DATE: 9/26/99	BY: DEH	CHECKED BY	REV NO.

Existing System: Bend Losses

$$H_b = K_b \frac{V^2}{2g}$$

H_b = Head due to bend (ft)

K_b = Bend loss coefficient

V = velocity (fps)

g = gravity (ft/s²)

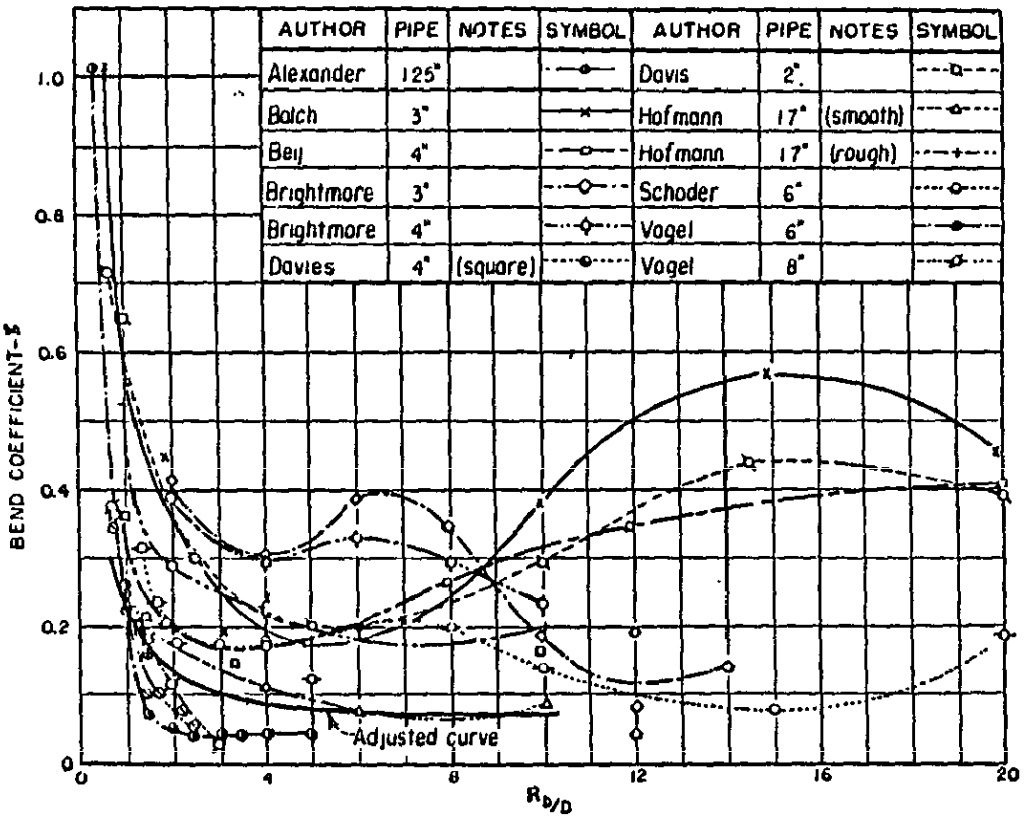
Note: Losses will be added using the X5 Card in HEC-2.

$K_{b_1} = K_{b_2} = .15$ (Ref 4, Table 11-2, C, $\frac{R_b}{D} = 8$, $\theta = 90°$)

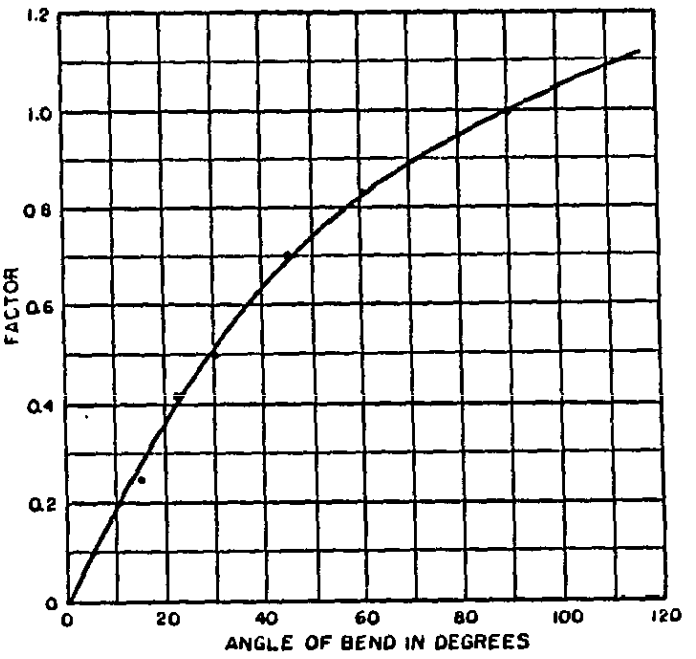
$K_{b_3} = .1$ (Ref 4, Table 11-2, C, $\frac{R_b}{D} = 5$, $\theta = 225°$)

Discharge (cfs)	Head losses (ft) Bend 1* $K_{b_1}\left(\frac{V_1^2}{2g}\right)$ (Hec2 sec no. 3.3)	Bend 2* $K_{b_2}\left(\frac{V_2^2}{2g}\right)$ (Hec-2 sec 4.0)	Bend 3* $K_{b_3}\left(\frac{V_3^2}{2g}\right)$ (HEC-2 sec no 5)
100	.8	.12	.14
150	.09	.16	.17
200	.10	.19	.21
250	.12	.22	.24
300	.14	.20	.27
350	.15	.20	.30
400	.17	.20	.32
450	.22	.20	.32
500	.27	.20	.32

* Velocities from computer model [illegible] out



A-VARIATION OF BEND COEFFICIENT WITH RELATIVE RADIUS FOR 90° BENDS OF CIRCULAR CROSS SECTION, AS MEASURED BY VARIOUS INVESTIGATORS



B-FACTORS FOR OTHER THAN 90° BENDS

FIGURE 19.—*Bend loss coefficients as observed are tabulated in A, and a multiplying factor for bends other than 90° can be obtained from B.*

REF.- FRICTION FACTORS FOR LARGE CONDUITS FLOWING FULL,

UNITED STATES EPARTMENT OF THE INTERIOR BUREAU OF RECLAMATION 1965 ,

STS Consultants Ltd.
CALCULATION SHEET

PROJECT	STS JOB NO.
Arcadia Creek	
SUBJECT	CALC NO
Bend Losses	
DATE 1/14/90 BY DEH	CHECKED BY / REV NO

New System

Bend Losses - Bend Losses will be evaluated using Fig 19. $\left[H_b = K_b \frac{V^2}{2g}\right]$

R_b = radius of the bend = $4.R = 4\left(\frac{70}{36}\right) = 7.8'$

D = Diameter of Pipe

Bend Designation	Rb/D	Angle (deg)	Kb
Sta. 18+26	1.5	90	0.2
Sta. 22+50	1.5	17	0.045
Sta. 23+00	1.5	20	0.06
Sta 23+50	1.5	13	0.02
Sta. 24+00	1.5	14	0.02

STS Consultants Ltd. CALCULATION SHEET	PROJECT Arcadia Creek		STS JOB NO 1069
	SUBJECT Junction Loss		CALC. NO.
	DATE 11/14/90	BY DEH	CHECKED BY	REV NO.

Junction Loss

use fig 5.5 for junction Losses.

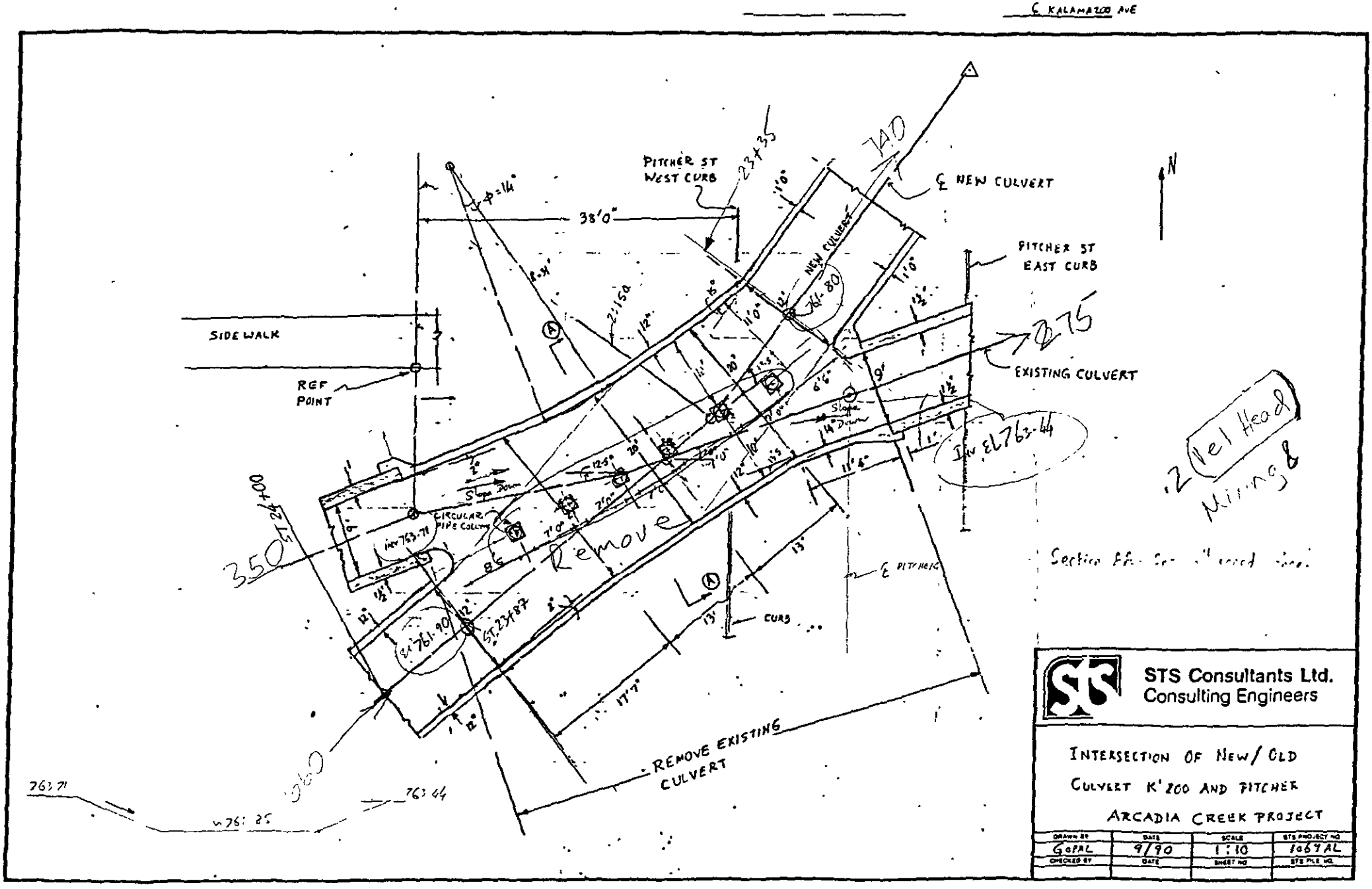
Total Flow = 1015 cfs (Q_3)

(Q_1) Old	New	K_j
250	765	.2
300	715	.2
350	665	.2

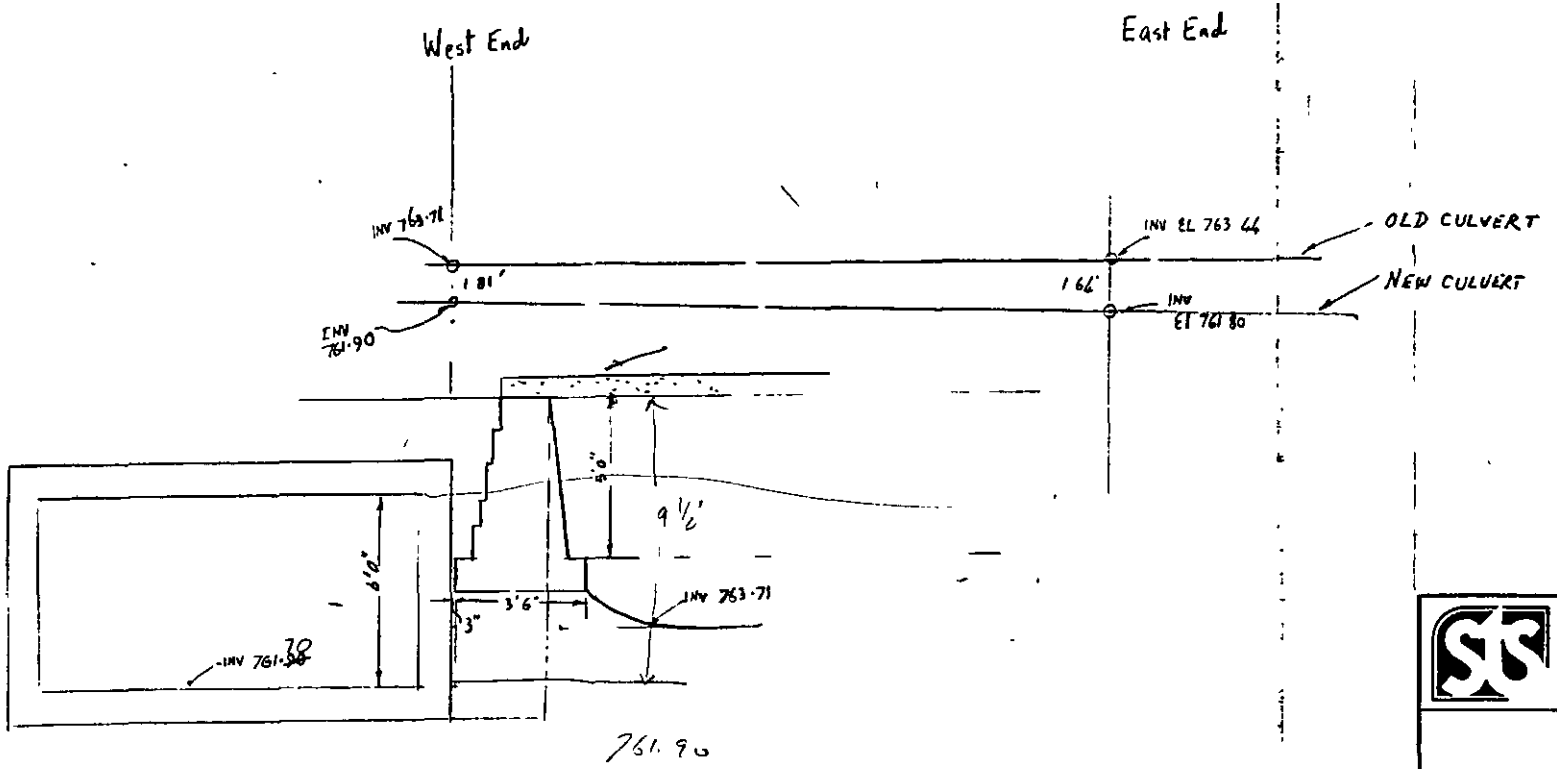
Assume a worst case scenario of

$K_j = 0.2$

	Head Loss (ft)				
V\kb	0.2	0.045	0.06	0.02	kj = .2
1	0.0031	0.0007	0.0009	0.0003	0.0031
1.5	0.0070	0.0016	0.0021	0.0007	0.0070
2	0.0124	0.0028	0.0037	0.0012	0.0124
2.5	0.0194	0.0044	0.0058	0.0019	0.0194
3	0.0280	0.0063	0.0084	0.0028	0.0280
3.5	0.0380	0.0086	0.0114	0.0038	0.0380
4	0.0497	0.0112	0.0149	0.0050	0.0497
4.5	0.0629	0.0141	0.0189	0.0063	0.0629
5	0.0776	0.0175	0.0233	0.0078	0.0776
5.5	0.0939	0.0211	0.0282	0.0094	0.0939
6	0.1118	0.0252	0.0335	0.0112	0.1118
6.5	0.1312	0.0295	0.0394	0.0131	0.1312
7	0.1522	0.0342	0.0457	0.0152	0.1522
7.5	0.1747	0.0393	0.0524	0.0175	0.1747
8	0.1988	0.0447	0.0596	0.0199	0.1988
8.5	0.2244	0.0505	0.0673	0.0224	0.2244
9	0.2516	0.0566	0.0755	0.0252	0.2516
9.5	0.2803	0.0631	0.0841	0.0280	0.2803
10	0.3106	0.0699	0.0932	0.0311	0.3106
10.5	0.3424	0.0770	0.1027	0.0342	0.3424
11	0.3758	0.0845	0.1127	0.0376	0.3758
11.5	0.4107	0.0924	0.1232	0.0411	0.4107
12	0.4472	0.1006	0.1342	0.0447	0.4472
12.5	0.4852	0.1092	0.1456	0.0485	0.4852



℄ KALAMAZOO AVE
PITCHER ST WEST CURB
23+35
740
℄ NEW CULVERT
38'0"
NEW CULVERT
PITCHER ST EAST CURB
SIDE WALK
REF POINT
EXISTING CULVERT
Slope Down
CIRCULAR PIPE COLUMN
Remove
350
ST 24+00
ST 23+87
℄ PITCHER
CURB
REMOVE EXISTING CULVERT
N
STS Consultants Ltd.
Consulting Engineers
INTERSECTION OF NEW/OLD CULVERT K'200 AND PITCHER
ARCADIA CREEK PROJECT
DRAWN BY GOPAL
DATE 9/90
SCALE 1:10
STS PROJECT NO 1069AL
CHECKED BY
DATE
SHEET NO
STS FILE NO



STS Consultants Ltd.
Consulting Engineers

DRAWN BY	DATE	SCALE	STS PROJECT NO
CHECKED BY	DATE	SHEET NO	STS FILE NO.

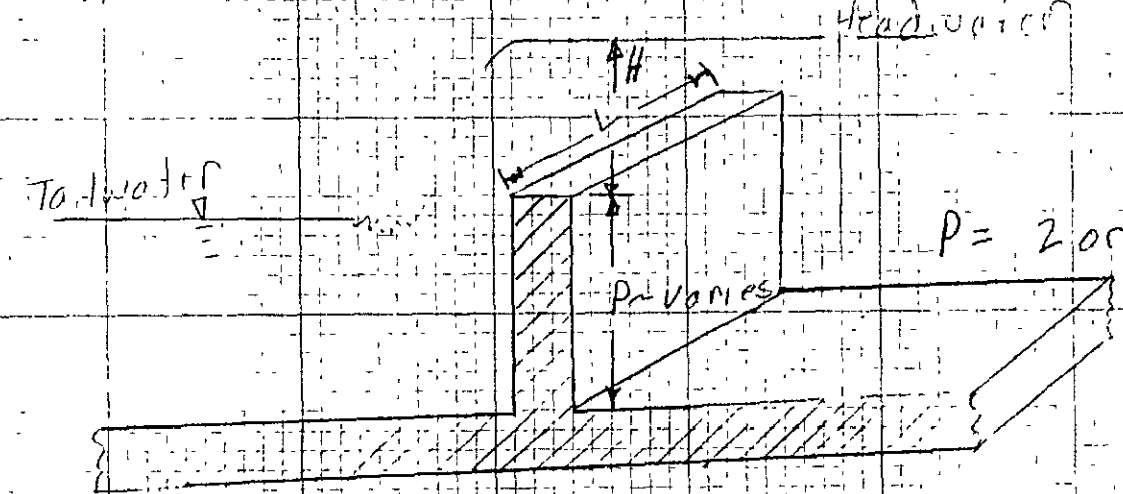
STS Consultants Ltd.
CALCULATION SHEET

PROJECT	STS JOB NO.
Arcadia Creek	1069
SUBJECT	CALC NO
Weir Coefficient	
DATE 9/6/90 BY DEH	CHECKED BY / REV NO

- Estimate a coefficient for the weirs in the open section of the Arcadia Creek.

Q ~ 1000 cfs

L = 20 ft



Proposed Weir Cross Section

Note: Weir submergence calculations will be accomplished within the HEC-2 calculations.

STS Consultants Ltd.
CALCULATION SHEET

PROJECT	STS JOB NO
Arcadia	1069
SUBJECT	**CALC NO**
Weir Coefficients	
DATE 11/20/90 **BY** DEH	**CHECKED BY** **REV. NO**

Weir Coefficients

Table 5-3. Values of C in the Formula $Q = CLH^{3/2}$ for Broad-crested Weirs

Measured head in feet, H	Breadth of crest of weir in feet										
	0.50	0.75	1.00	1.50	2.00	2.50	3.00	4.00	5.00	10.00	15.00
0.2	2.80	2.75	2.69	2.62	2.54	2.48	2.44	2.38	2.34	2.49	2.68
0.4	2.92	2.80	2.72	2.64	2.61	2.60	2.58	2.54	2.50	2.56	2.76
0.6	3.08	2.89	2.75	2.64	2.61	2.60	2.68	2.69	2.70	2.70	2.76
0.8	3.30	3.04	2.85	2.68	2.60	2.60	2.67	2.68	2.68	2.69	2.64
1.0	3.32	3.14	2.98	2.73	2.66	2.64	2.65	2.67	2.68	2.68	2.63
1.2	3.32	3.20	3.08	2.86	2.70	2.65	2.64	2.67	2.66	2.69	2.64
1.4	3.32	3.26	3.20	2.92	2.77	2.68	2.64	2.65	2.65	2.67	2.64
1.6	3.32	3.29	3.28	3.07	2.89	2.75	2.68	2.66	2.65	2.64	2.63
1.8	3.32	3.32	3.31	3.07	2.88	2.74	2.68	2.66	2.65	2.64	2.63
2.0	3.32	3.31	3.30	3.03	2.85	2.76	2.72	2.68	2.65	2.64	2.63
2.5	3.32	3.32	3.31	3.28	3.07	2.89	2.81	2.72	2.67	2.64	2.63
3.0	3.32	3.32	3.32	3.32	3.20	3.05	2.92	2.73	2.66	2.64	2.63
3.5	3.32	3.32	3.32	3.32	3.32	3.19	2.97	2.76	2.68	2.64	2.63
4.0	3.32	3.32	3.32	3.32	3.32	3.32	3.07	2.79	2.70	2.64	2.63
4.5	3.32	3.32	3.32	3.32	3.32	3.32	3.32	2.88	2.74	2.64	2.63
5.0	3.32	3.32	3.32	3.32	3.32	3.32	3.32	3.07	2.79	2.64	2.63
5.5	3.32	3.32	3.32	3.32	3.32	3.32	3.32	3.32	2.88	2.64	2.63

H varies between 3' and 7'.

100 H is about 5.5'

Breadth = 1.0'

TDA-5/9

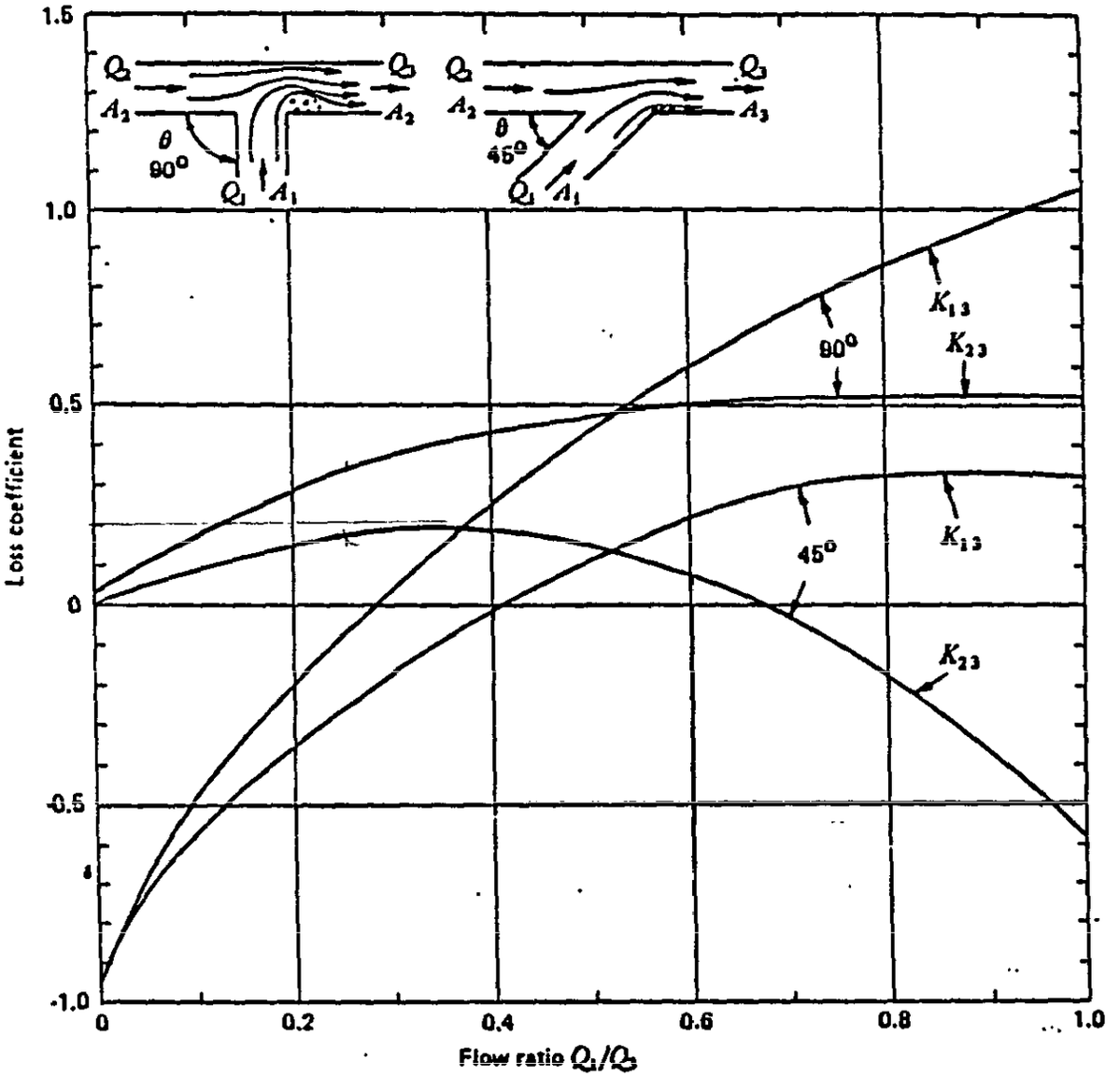


Fig. 5.55. Loss coefficients for sharp-edged 45° and 90° combining 'T's

REF- "INTERNAL FLOW SYSTEMS", D.S. MILLER, BHRA FLUID ENGINEERING, 1978.

APPENDIX E

FEMA LOMR Request Forms

Federal Emergency Management Agency

Washington, D.C. 20472

COMMUNITY ACKNOWLEDGEMENT OF REQUEST
FOR LETTER OF MAP REVISION

City of Kalamazoo
Community Name

Arcadia Creek
Property

We hereby acknowledge receipt and review of this Letter of Map Revision request and have found that the project meets all of our community's applicable floodplain management regulations. We understand that this request is being forwarded to FEMA for a possible map revision.

William Nelson
Community Official's Signature

July 1, 1991
Date

City Engineer
Community Official's Title

Federal Emergency Management Agency

Washington, D.C. 20472

REQUEST FOR LETTER OF MAP REVISION (218-65)

This is to request that a determination be made as to whether or not a certain land area or structure is within a Special Flood Hazard Area.

All documents submitted in support of this appeal are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

July 1, 1991
Date

Signature of Applicant

APPENDIX F

HEC-2 Computer Print-outs

00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: KALAMAZOO, CITY OF

3) WATERCOURSE: ARCADIA CREEK

4) DOCUMENT TYPE: MULTI-PROFILES SUMMARY

00BREAK00

THIS RUN EXECUTED 17-DEC-90 17:08:10

```
**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55
**************************************************
```

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

[AC6.HEC2]

SUMMARY PRINTOUT

	SECNO	XSTAB1	DEPTH	CWSEL	XLCH	Q	EG
	0.000	0.00	9.50	757.50	0.00	543.92	757.63
	0.000	0.00	9.50	757.50	0.00	737.61	757.73
	0.000	0.00	9.50	757.50	0.00	806.68	757.78
	0.000	0.00	9.50	757.50	0.00	940.93	757.88
	0.100	0.00	9.50	757.50	9.00	543.92	757.63
	0.100	0.00	9.50	757.50	9.00	737.61	757.74
	0.100	0.00	9.50	757.50	9.00	806.68	757.78
	0.100	0.00	9.50	757.50	9.00	940.93	757.88
	0.170	0.00	9.50	757.50	8.00	543.92	757.63
	0.170	0.00	9.50	757.50	8.00	737.61	757.74
	0.170	0.00	9.50	757.50	8.00	806.68	757.78
	0.170	0.00	9.51	757.51	8.00	940.93	757.89
	0.180	0.00	9.47	757.47	1.00	543.92	757.65
	0.180	0.00	9.43	757.43	1.00	737.61	757.77
	0.180	0.00	9.42	757.42	1.00	806.68	757.82
	0.180	0.00	9.39	757.39	1.00	940.93	757.94
*	0.330	0.00	4.31	759.31	14.00	543.92	760.76
*	0.330	0.00	4.95	759.95	14.00	737.61	761.71
*	0.330	0.00	5.17	760.17	14.00	806.68	762.04
*	0.330	0.00	5.56	760.56	14.00	940.93	762.63
	0.340	0.00	5.48	760.48	1.00	543.92	760.86
	0.340	0.00	6.31	761.31	1.00	737.61	761.84
	0.340	0.00	6.58	761.58	1.00	806.68	762.16
	0.340	0.00	7.09	762.09	1.00	940.93	762.77
	0.380	0.00	5.41	760.41	4.00	543.92	760.90
	0.380	0.00	6.21	761.21	4.00	737.61	761.88
	0.380	0.00	6.47	761.47	4.00	806.68	762.21
	0.380	0.00	6.96	761.96	4.00	940.93	762.83

	SECNO	XSTAB1	DEPTH	CWSEL	XLCH	Q	EG
	0.420	0.00	5.31	760.31	4.00	543.92	760.94
	0.420	0.00	6.06	761.06	4.00	737.61	761.95
	0.420	0.00	6.30	761.30	4.00	806.68	762.29
	0.420	0.00	6.75	761.75	4.00	940.93	762.93
	0.460	0.00	5.13	760.13	4.00	543.92	761.02
	0.460	0.00	5.79	760.79	4.00	737.61	762.07
	0.460	0.00	6.00	761.00	4.00	806.68	762.43
	0.460	0.00	6.38	761.38	4.00	940.93	763.10
	0.500	0.00	4.79	759.79	4.00	543.92	761.18
	0.500	0.00	5.16	760.16	4.00	737.61	762.36
*	0.500	0.00	5.18	760.18	4.00	806.68	762.79
*	0.500	0.00	5.74	760.74	4.00	940.93	763.63
	1.000	0.00	4.79	759.88	50.00	543.92	761.27
	1.000	0.00	5.40	760.49	50.00	737.61	762.51
	1.000	0.00	5.82	760.91	50.00	806.68	762.99
	1.000	0.00	6.44	761.53	50.00	940.93	763.84
	1.250	0.00	4.78	759.93	25.00	543.92	761.32
	1.250	0.00	5.48	760.62	25.00	737.61	762.57
	1.250	0.00	5.89	761.03	25.00	806.68	763.05
	1.250	0.00	6.53	761.67	25.00	940.93	763.91
	2.500	0.00	4.78	760.16	125.00	543.92	761.55
	2.500	0.00	5.66	761.04	125.00	737.61	762.87
	2.500	0.00	6.05	761.43	125.00	806.68	763.34
	2.500	0.00	6.72	762.10	125.00	940.93	764.21
	3.500	0.00	4.77	760.34	100.00	543.92	761.74
	3.500	0.00	5.72	761.29	100.00	737.61	763.08
	3.500	0.00	6.11	761.68	100.00	806.68	763.56
	3.500	0.00	6.80	762.37	100.00	940.93	764.43
	4.300	0.00	4.76	760.49	80.00	543.92	761.89
	4.300	0.00	5.77	761.49	80.00	737.61	763.25
	4.300	0.00	6.16	761.88	80.00	806.68	763.73
	4.300	0.00	6.86	762.58	80.00	940.93	764.61
	4.550	0.00	4.35	760.34	25.00	543.92	762.03
	4.550	0.00	5.37	761.36	25.00	737.61	763.39
	4.550	0.00	5.76	761.75	25.00	806.68	763.87
	4.550	0.00	6.48	762.47	25.00	940.93	764.74
	5.000	0.00	4.45	760.53	45.00	543.92	762.14
	5.000	0.00	5.49	761.56	45.00	737.61	763.51
	5.000	0.00	5.87	761.94	45.00	806.68	763.98
	5.000	0.00	6.53	762.60	45.00	940.93	764.85

	SECNO	XSTAB1	DEPTH	CWSEL	XLCH	Q	EG
	7.500	0.00	4.68	761.23	250.00	543.92	762.68
	7.500	0.00	5.76	762.31	250.00	737.61	764.08
	7.500	0.00	6.14	762.69	250.00	806.68	764.56
	7.500	0.00	6.85	763.40	250.00	940.93	765.44
	10.000	0.00	4.69	761.72	250.00	543.92	763.18
	10.000	0.00	5.85	762.88	250.00	737.61	764.60
	10.000	0.00	6.24	763.27	250.00	806.68	765.07
	10.000	0.00	6.97	764.00	250.00	940.93	765.97
	12.500	0.00	4.74	762.25	250.00	543.92	763.67
	12.500	0.00	5.89	763.40	250.00	737.61	765.09
	12.500	0.00	6.29	763.79	250.00	806.68	765.57
	12.500	0.00	7.15	764.66	250.00	940.93	766.61
	15.000	0.00	4.74	762.72	250.00	543.92	764.15
	15.000	0.00	5.91	763.89	250.00	737.61	765.58
	15.000	0.00	6.32	764.30	250.00	806.68	766.06
	15.000	0.00	7.51	765.49	250.00	940.93	767.45
	17.500	0.00	4.74	763.20	250.00	543.92	764.62
	17.500	0.00	5.93	764.40	250.00	737.61	766.06
	17.500	0.00	6.32	764.79	250.00	806.68	766.55
	17.500	0.00	7.87	766.33	250.00	940.93	768.28
	18.280	0.00	4.74	763.35	78.00	543.92	764.77
	18.280	0.00	5.94	764.55	78.00	737.61	766.21
	18.280	0.00	6.33	764.94	78.00	806.68	766.70
	18.280	0.00	7.98	766.59	78.00	940.93	768.54
	18.330	0.00	5.37	763.97	5.00	543.92	764.92
	18.330	0.00	6.62	765.22	5.00	737.61	766.37
	18.330	0.00	7.05	765.65	5.00	806.68	766.87
	18.330	0.00	9.16	767.76	5.00	940.93	768.82
	18.380	0.00	5.84	764.44	5.00	543.92	765.03
	18.380	0.00	7.19	765.79	5.00	737.61	766.51
	18.380	0.00	7.65	766.25	5.00	806.68	767.01
	18.380	0.00	9.46	768.06	5.00	940.93	768.90
*	18.390	0.00	5.99	764.59	0.10	543.92	765.16
*	18.390	0.00	7.34	765.94	0.10	737.61	766.63
*	18.390	0.00	7.80	766.40	0.10	806.68	767.13
*	18.390	0.00	9.61	768.21	0.10	940.93	768.86
	18.540	0.00	5.95	764.60	16.00	543.92	765.17
	18.540	0.00	7.31	765.96	16.00	737.61	766.65
	18.540	0.00	7.77	766.42	16.00	806.68	767.15
	18.540	0.00	9.49	768.14	16.00	940.93	768.98

	SECNO	XSTAB1	DEPTH	CWSEL	XLCH	Q	EG
*	18.541	0.00	6.09	764.74	0.10	543.92	765.29
*	18.541	0.00	7.45	766.10	0.10	737.61	766.76
*	18.541	0.00	7.91	766.56	0.10	806.68	767.26
*	18.541	0.00	9.65	768.30	0.10	940.93	768.94
	18.550	0.00	5.78	764.58	1.00	543.92	765.45
	18.550	0.00	7.09	765.89	1.00	737.61	766.98
	18.550	0.00	7.49	766.29	1.00	806.68	767.54
	18.550	0.00	8.97	767.77	1.00	940.93	769.47
	19.150	0.00	5.30	764.60	60.00	543.92	765.63
	19.150	0.00	6.64	765.94	60.00	737.61	767.16
	19.150	0.00	7.12	766.42	60.00	806.68	767.71
	19.150	0.00	8.70	768.00	60.00	940.93	769.70
	19.160	0.00	5.87	765.17	1.00	543.92	765.76
	19.160	0.00	7.31	766.61	1.00	737.61	767.31
	19.160	0.00	7.85	767.15	1.00	806.68	767.88
	19.160	0.00	9.70	769.00	1.00	940.93	769.93
	19.280	0.00	5.50	765.14	12.00	543.92	765.81
	19.280	0.00	6.95	766.59	12.00	737.61	767.37
	19.280	0.00	7.49	767.13	12.00	806.68	767.93
	19.280	0.00	9.34	768.98	12.00	940.93	769.99
	19.290	0.00	5.50	765.14	1.00	543.92	765.81
	19.290	0.00	6.95	766.59	1.00	737.61	767.37
	19.290	0.00	7.49	767.13	1.00	806.68	767.93
	19.290	0.00	9.34	768.98	1.00	940.93	770.00
	19.390	0.00	5.20	764.89	10.00	543.92	766.08
	19.390	0.00	6.62	766.32	10.00	737.61	767.66
	19.390	0.00	7.15	766.85	10.00	806.68	768.22
	19.390	0.00	9.06	768.76	10.00	940.93	770.25
	19.400	0.00	5.20	764.90	1.00	543.92	766.08
	19.400	0.00	6.62	766.32	1.00	737.61	767.66
	19.400	0.00	7.15	766.85	1.00	806.68	768.22
	19.400	0.00	9.06	768.76	1.00	940.93	770.26
	20.000	0.00	5.12	764.97	60.00	543.92	766.19
	20.000	0.00	6.54	766.39	60.00	737.61	767.76
	20.000	0.00	7.08	766.92	60.00	806.68	768.32
	20.000	0.00	9.08	768.92	60.00	940.93	770.40
	22.500	0.00	4.86	765.32	250.00	543.92	766.67
	22.500	0.00	6.26	766.72	250.00	737.61	768.22
	22.500	0.00	6.78	767.24	250.00	806.68	768.77
	22.500	0.00	9.03	769.48	250.00	940.93	770.97

	SECNO	XSTAB1	DEPTH	CWSEL	XLCH	Q	EG
*	22.510	0.00	4.91	765.37	0.01	543.92	766.69
*	22.510	0.00	6.32	766.78	0.01	737.61	768.25
*	22.510	0.00	6.85	767.31	0.01	806.68	768.81
*	22.510	0.00	9.11	769.56	0.01	940.93	771.05
	22.700	0.00	4.90	765.40	20.00	543.92	766.73
	22.700	0.00	6.31	766.81	20.00	737.61	768.28
	22.700	0.00	6.84	767.34	20.00	806.68	768.84
	22.700	0.00	9.10	769.60	20.00	940.93	771.10
	23.000	0.00	4.89	765.45	30.00	543.92	766.78
	23.000	0.00	6.29	766.86	30.00	737.61	768.33
	23.000	0.00	6.82	767.38	30.00	806.68	768.89
	23.000	0.00	9.11	769.67	30.00	940.93	771.17
*	23.100	0.00	4.96	765.52	0.01	543.92	766.82
*	23.100	0.00	6.37	766.94	0.01	737.61	768.38
*	23.100	0.00	6.91	767.47	0.01	806.68	768.94
*	23.100	0.00	9.21	769.77	0.01	940.93	771.27
	23.500	0.00	4.91	765.59	50.00	543.92	766.92
	23.500	0.00	6.32	767.00	50.00	737.61	768.47
	23.500	0.00	6.85	767.54	50.00	806.68	769.03
	23.500	0.00	9.20	769.89	50.00	940.93	771.38
	23.520	0.00	5.67	766.37	2.00	543.92	767.10
	23.520	0.00	7.11	767.81	2.00	737.61	768.66
	23.520	0.00	7.64	768.34	2.00	806.68	769.22
	23.520	0.00	9.82	770.52	2.00	940.93	771.53
	23.620	0.00	6.10	766.80	10.00	620.00	767.20
	23.620	0.00	7.52	768.22	10.00	890.00	768.76
	23.620	0.00	7.96	768.66	10.00	1020.00	769.30
	23.620	0.00	9.88	770.58	10.00	1315.00	771.55
*	23.630	0.00	6.35	767.05	0.10	620.00	767.42
*	23.630	0.00	7.77	768.47	0.10	890.00	768.98
*	23.630	0.00	8.21	768.91	0.10	1020.00	769.51
*	23.630	0.00	10.13	770.83	0.10	1315.00	771.80
	23.770	0.00	6.32	767.06	15.00	620.00	767.43
	23.770	0.00	7.73	768.47	15.00	890.00	768.98
	23.770	0.00	8.18	768.91	15.00	1020.00	769.52
	23 770	0.00	10.10	770.84	15.00	1315.00	771.83
	23.930	0.00	6.12	766.89	16.00	496.78	767.61
	23.930	0 00	7.54	768.31	16.00	666.53	769.16
	23.930	0 00	7.98	768.75	16.00	748.83	769.70
	23.930	0.00	10.01	770.78	16.00	827.13	771.93

	SECNO	XSTABI	DEPTH	CWSEL	XLCH	Q	EG
	24.000	0.00	6.11	766.90	7.00	496.78	767.61
	24.000	0.00	7.53	768.32	7.00	666.53	769.16
	24.000	0.00	7.96	768.76	7.00	748.83	769.71
	24.000	0.00	10.00	770.79	7.00	827.13	771.94
*	24.100	0.00	6.15	766.94	0.01	496.78	767.64
*	24.100	0.00	7.57	768.36	0.01	666.53	769.19
*	24.100	0.00	8.00	768.80	0.01	748.83	769.74
*	24.100	0.00	10.04	770.83	0.01	827.13	771.98
	25.000	0.00	5.96	767.00	100.00	496.78	767.75
	25.000	0.00	7.39	768.42	100.00	666.53	769.30
	25.000	0.00	7.83	768.87	100.00	748.83	769.85
	25.000	0.00	9.97	771.01	100.00	827.13	772.16
	27.500	0.00	5.53	767.17	250.00	496.78	768.05
	27.500	0.00	6.96	768.60	250.00	666.53	769.59
	27.500	0.00	7.42	769.07	250.00	748.83	770.16
	27.500	0.00	9.80	771.44	250.00	827.13	772.61
	28.560	0.00	5.36	767.26	106.00	496.78	768.19
	28.560	0.00	6.78	768.69	106.00	666.53	769.73
	28.560	0.00	7.25	769.16	106.00	748.83	770.31
	28.560	0.00	9.75	771.65	106.00	827.13	772.80
	28.570	0.00	5.36	767.26	1.00	496.78	768.19
	28.570	0.00	6.78	768.69	1.00	666.53	769.73
	28.570	0.00	7.25	769.16	1.00	748.83	770.31
	28.570	0.00	10.34	772.25	1.00	827.13	772.94
	28.650	0.00	6.35	768.35	8.00	496.78	768.44
	28.650	0.00	7.91	769.91	8.00	666.53	770.01
	28.650	0.00	8.50	770.50	8.00	748.83	770.62
	28.650	0.00	11.03	773.03	8.00	827.13	773.12
	28.660	0.00	6.83	768.83	1.00	615.00	768.95
	28.660	0.00	8.34	770.34	1.00	885.00	770.51
	28.660	0.00	8.94	770.94	1.00	1015.00	771.14
	28.660	0.00	11.41	773.41	1.00	1310.00	773.61
	28.990	0.00	8.92	768.92	33.00	615.00	768.96
	28.990	0.00	10.47	770.47	33.00	885.00	770.52
	28.990	0.00	11.09	771.09	33.00	1015.00	771.15
	28.990	0.00	13.58	773.58	33.00	1310.00	773.63
	29.310	0.00	8.95	768.95	32.00	615.00	768.97
	29.310	0.00	10.51	770.51	32.00	885.00	770.53
	29.310	0.00	11.14	771.14	32.00	1015.00	771.16
	29.310	0.00	13.62	773.62	32.00	1310.00	773.64

	SECNO	XSTAB1	DEPTH	CWSEL	XLCH	Q	EG
	30.130	0.00	8.91	768.91	82.00	615.00	768.99
	30.130	0.00	10.47	770.47	82.00	885.00	770.56
	30.130	0.00	11.10	771.10	82.00	1015.00	771.19
	30.130	0.00	13.59	773.59	82.00	1310.00	773.65
	30.630	0.00	8.93	768.93	50.00	615.00	769.01
	30.630	0.00	10.48	770.48	50.00	885.00	770.57
	30.630	0.00	11.11	771.11	50.00	1015.00	771.20
	30.630	0.00	13.60	773.60	50.00	1310.00	773.66
	31.670	0.00	3.93	768.93	104.00	615.00	769.08
	31.670	0.00	5.47	770.47	104.00	885.00	770.63
	31.670	0.00	6.09	771.09	104.00	1015.00	771.26
	31.670	0.00	8.56	773.56	104.00	1310.00	773.71
	31.770	0.00	3.62	768.62	10.00	615.00	769.40
	31.770	0.00	5.17	770.17	10.00	885.00	770.95
	31.770	0.00	5.78	770.78	10.00	1015.00	771.59
	31.770	0.00	8.32	773.32	10.00	1310.00	773.96
*	32.060	0.00	3.27	768.27	9.00	615.00	769.83
	32.060	0.00	4.87	769.87	9.00	885.00	771.26
	32.060	0.00	5.47	770.47	9.00	1015.00	771.91
	32.060	0.00	8.11	773.11	9.00	1310.00	774.18
	32.070	0.00	3.28	768.28	1.00	615.00	769.83
	32.070	0.00	4.87	769.87	1.00	885.00	771.27
	32.070	0.00	5.47	770.47	1.00	1015.00	771.91
	32.070	0.00	8.07	773.07	1.00	1310.00	774.22
*	33.150	0.00	3.27	768.60	108.00	615.00	770.16
	33.150	0.00	4.63	769.96	108.00	885.00	771.51
	33.150	0.00	5.22	770.55	108.00	1015.00	772.14
	33.150	0.00	7.87	773.20	108.00	1310.00	774.36
	33.160	0.00	3.28	768.62	1.00	615.00	770.16
	33.160	0.00	4.63	769.96	1.00	885.00	771.51
	33.160	0.00	5.22	770.55	1.00	1015.00	772.14
	33.160	0.00	7.93	773.27	1.00	1310.00	774.38
*	33.260	0.00	3.28	768.64	10.00	615.00	770.19
	33.260	0.00	4.60	769.97	10.00	885.00	771.54
	33.260	0.00	5.19	770.56	10.00	1015.00	772.16
	33.260	0.00	7.91	773.27	10.00	1310.00	774.39
	33.270	0.00	6.53	771.90	1.00	615.00	772.26
	33.270	0.00	7.60	772.97	1.00	885.00	773.52
	33.270	0.00	8.08	773.45	1.00	1015.00	774.09
	33.270	0.00	9.38	774.74	1.00	1310.00	775.53

SECNO	XSTAB1	DEPTH	CWSEL	XLCH	Q	EG
33.740	0.00	6.39	771.90	48.00	615.00	772.29
33.740	0.00	7.46	772.98	48.00	885.00	773.55
33.740	0.00	7.94	773.46	48.00	1015.00	774.13
33.740	0.00	9.24	774.75	48.00	1310.00	775.57
33.750	0.00	6.39	771.90	1.00	615.00	772.29
33.750	0.00	7.46	772.98	1.00	885.00	773.55
33.750	0.00	7.94	773.46	1.00	1015.00	774.13
33.750	0.00	9.10	774.62	1.00	1310.00	775.71
34.710	0.00	6.11	771.92	96.00	610.00	772.33
34.710	0.00	7.19	773.00	96.00	880.00	773.62
34.710	0.00	7.68	773.48	96.00	1005.00	774.19
34.710	0.00	8.95	774.76	96.00	1300.00	775.84
34.720	0.00	6.11	771.92	1.00	610.00	772.33
34.720	0.00	7.19	773.00	1.00	880.00	773.62
34.720	0.00	7.68	773.49	1.00	1005.00	774.19
34.720	0.00	9.34	775.14	1.00	1300.00	775.93
34.800	0.00	6.09	771.92	8.00	610.00	772.34
34.800	0.00	7.17	773.00	8.00	880.00	773.62
34.800	0.00	7.66	773.49	8.00	1005.00	774.19
34.800	0.00	9.31	775.15	8.00	1300.00	775.94
34.810	0.00	7.18	773.02	1.00	610.00	773.31
34.810	0.00	8.35	774.18	1.00	880.00	774.63
34.810	0.00	8.85	774.68	1.00	1005.00	775.21
34.810	0.00	10.34	776.18	1.00	1300.00	776.81
36.210	0.00	6.77	773.03	140.00	610.00	773.36
36.210	0.00	7.94	774.20	140.00	880.00	774.70
36.210	0.00	8.44	774.70	140.00	1005.00	775.28
36.210	0.00	9.94	776.20	140.00	1300.00	776.89
38.050	0.00	6.24	773.05	184.00	610.00	773.45
38.050	0.00	7.42	774.23	184.00	880.00	774.81
38.050	0.00	7.93	774.74	184.00	1005.00	775.40
38.050	0.00	9.43	776.24	184.00	1300.00	777.01
38.060	0.00	6.24	773.05	1.00	610.00	773.45
38.060	0.00	7.42	774.23	1.00	880.00	774.81
38.060	0.00	7.92	774.73	1.00	1005.00	775.41
38.060	0.00	9.25	776.06	1.00	1300.00	777.19
39.760	0.00	5.75	773.08	170.00	610.00	773.55
39.760	0.00	6.94	774.27	170.00	880.00	774.93
39.760	0.00	7.47	774.80	170.00	1005.00	775.54
39.760	0.00	8.97	776.30	170.00	1300.00	777.43

SECNO	XSTAB1	DEPTH	CWSEL	XLCH	Q	EG
39.770	0.00	5.75	773.08	1.00	610.00	773.55
39.770	0.00	6.94	774.27	1.00	880.00	774.93
39.770	0.00	7.47	774.80	1.00	1005.00	775.54
39.770	0.00	9.45	776.78	1.00	1300.00	777.54
39.860	0.00	5.72	773.08	9.00	610.00	773.55
39.860	0.00	6.91	774.27	9.00	880.00	774.94
39.860	0.00	7.45	774.80	9.00	1005.00	775.55
39.860	0.00	9.42	776.78	9.00	1300.00	777.55
39.870	0.00	7.23	774.58	1.00	610.00	774.88
39.870	0.00	8.38	775.73	1.00	880.00	776.18
39.870	0.00	8.89	776.24	1.00	1005.00	776.76
39.870	0.00	10.47	777.82	1.00	1300.00	778.45
41.590	0.00	6.75	774.61	172.00	605.00	774.94
41.590	0.00	7.90	775.76	172.00	870.00	776.26
41.590	0.00	8.42	776.28	172.00	995.00	776.85
41.590	0.00	10.00	777.86	172.00	1290.00	778.53
43.350	0.00	6.23	774.63	176.00	605.00	775.02
43.350	0.00	7.39	775.79	176.00	870.00	776.36
43.350	0.00	7.91	776.31	176.00	995.00	776.96
43.350	0.00	9.50	777.90	176.00	1290.00	778.64
43.360	0.00	6.23	774.63	1.00	605.00	775.02
43.360	0.00	7.39	775.79	1.00	870.00	776.36
43.360	0.00	7.90	776.30	1.00	995.00	776.97
43.360	0.00	9.32	777.71	1.00	1290.00	778.83
45.860	0.00	5.50	774.67	250.00	605.00	775.17
45.860	0.00	6.68	775.84	250.00	870.00	776.54
45.860	0.00	7.24	776.40	250.00	995.00	777.18
45.860	0.00	8.90	778.06	250.00	1290.00	779.18
45.870	0.00	5.52	774.68	1.00	600.00	775.17
45.870	0.00	6.69	775.85	1.00	865.00	776.54
45.870	0.00	7.25	776.41	1.00	990.00	777.18
45.870	0.00	9.36	778.52	1.00	1285.00	779.28
45.970	0.00	5.49	774.68	10.00	600.00	775.18
45.970	0.00	6.66	775.86	10.00	865.00	776.55
45.970	0.00	7.22	776.42	10.00	990.00	777.19
45.970	0.00	9.33	778.52	10.00	1285.00	779.29
45.980	0.00	6.93	776.12	1.00	600.00	776.43
45.980	0.00	8.06	777.25	1.00	865.00	777.72
45.980	0.00	8.58	777.77	1.00	990.00	778.31
45.980	0.00	10.30	779.49	1.00	1285.00	780.12

SECNO	XSTAB1	DEPTH	CWSEL	XLCH	Q	EG
48.330	0.00	6.24	776.15	235.00	600.00	776.53
48.330	0.00	7.38	777.29	235.00	865.00	777.85
48.330	0.00	7.90	777.81	235.00	990.00	778.45
48.330	0.00	9.63	779.54	235.00	1285.00	780.26
48.340	0.00	6.24	776.15	1.00	600.00	776.53
48.340	0.00	7.38	777.29	1.00	865.00	777.85
48.340	0.00	7.89	777.80	1.00	990.00	778.46
48.340	0.00	9.44	779.35	1.00	1285.00	780.45
49.240	0.00	5.98	776.16	90.00	600.00	776.58
49.240	0.00	7.12	777.30	90.00	865.00	777.91
49.240	0.00	7.66	777.84	90.00	990.00	778.53
49.240	0.00	9.28	779.47	90.00	1285.00	780.58
49.250	0.00	5.98	776.16	1.00	600.00	776.58
49.250	0.00	7.12	777.30	1.00	865.00	777.91
49.250	0.00	7.66	777.85	1.00	990.00	778.53
49.250	0.00	9.83	780.01	1.00	1285.00	780.70
49.340	0.00	5.95	776.16	9.00	600.00	776.59
49.340	0.00	7.09	777.31	9.00	865.00	777.92
49.340	0.00	7.64	777.85	9.00	990.00	778.54
49.340	0.00	9.80	780.02	9.00	1285.00	780.71
49.350	0.00	7.17	777.38	1.00	600.00	777.67
49.350	0.00	8.33	778.54	1.00	865.00	778.98
49.350	0.00	8.84	779.06	1.00	990.00	779.57
49.350	0.00	10.74	780.95	1.00	1285.00	781.53
50.410	0.00	6.87	777.39	106.00	600.00	777.71
50.410	0.00	8.04	778.55	106.00	865.00	779.03
50.410	0.00	8.56	779.07	106.00	990.00	779.62
50.410	0.00	10.45	780.97	106.00	1285.00	781.58
51.550	0.00	6.49	777.40	114.00	600.00	777.76
51.550	0.00	7.65	778.57	114.00	865.00	779.09
51.550	0.00	8.17	779.09	114.00	990.00	779.69
51.550	0.00	10.07	780.99	114.00	1285.00	781.64

[AC6.HEC2]

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
	0.000	0.00	0.00	0.00	748.00	543.92	757.50	0.00	757.63	5.50	2.86	190.05	231.95
	0.000	0.00	0.00	0.00	748.00	737.61	757.50	0.00	757.73	10.11	3.88	190.05	231.95
	0.000	0.00	0.00	0.00	748.00	806.68	757.50	0.00	757.78	12.10	4.24	190.05	231.95
	0.000	0.00	0.00	0.00	748.00	940.93	757.50	0.00	757.88	16.46	4.95	190.05	231.95
	0.100	9.00	0.00	0.00	748.00	543.92	757.50	0.00	757.63	0.76	2.86	190.05	624.47
	0.100	9.00	0.00	0.00	748.00	737.61	757.50	0.00	757.74	1.40	3.88	190.05	624.47
	0.100	9.00	0.00	0.00	748.00	806.68	757.50	0.00	757.78	1.67	4.24	190.05	624.47
	0.100	9.00	0.00	0.00	748.00	940.93	757.50	0.00	757.88	2.27	4.95	190.05	624.47
	0.170	8.00	0.00	0.00	748.00	543.92	757.50	0.00	757.63	0.76	2.86	190.08	624.60
	0.170	8.00	0.00	0.00	748.00	737.61	757.50	0.00	757.74	1.39	3.88	190.11	624.71
	0.170	8.00	0.00	0.00	748.00	806.68	757.50	0.00	757.78	1.67	4.24	190.12	624.75
	0.170	8.00	0.00	0.00	748.00	940.93	757.51	0.00	757.89	2.27	4.95	190.14	624.86
	0.180	1.00	0.00	0.00	748.00	543.92	757.47	0.00	757.65	1.93	3.40	159.77	391.38
	0.180	1.00	0.00	0.00	748.00	737.61	757.43	0.00	757.77	3.59	4.63	159.15	389.16
	0.180	1.00	0.00	0.00	748.00	806.68	757.42	0.00	757.82	4.32	5.08	158.87	388.17
	0.180	1.00	0.00	0.00	748.00	940.93	757.39	0.00	757.94	5.94	5.95	158.24	385.92
*	0.330	14.00	0.00	0.00	755.00	543.92	759.31	759.31	760.76	45.85	9.64	56.44	80.33
*	0.330	14.00	0.00	0.00	755.00	737.61	759.95	759.95	761.71	44.60	10.66	69.17	110.45
*	0.330	14.00	0.00	0.00	755.00	806.68	760.17	760.17	762.04	43.91	10.95	73.64	121.73
*	0.330	14.00	0.00	0.00	755.00	940.93	760.56	760.56	762.63	43.75	11.55	81.45	142.26
	0.340	1.00	0.00	0.00	755.00	543.92	760.48	0.00	760.86	3.49	4.96	109.59	290.98
	0.340	1.00	0.00	0.00	755.00	737.61	761.31	0.00	761.84	4.32	5.85	126.07	355.04
	0.340	1.00	0.00	0.00	755.00	806.68	761.58	0.00	762.16	4.59	6.13	131.49	376.68
	0.340	1.00	0.00	0.00	755.00	940.93	762.09	0.00	762.77	5.05	6.63	141.85	418.77
	0.380	4.00	0.00	0.00	755.00	543.92	760.41	0.00	760.90	4.70	5.58	97.44	250.89
	0.380	4.00	0.00	0.00	755.00	737.61	761.21	0.00	761.88	5.87	6.60	111.80	304.36
	0.380	4.00	0.00	0.00	755.00	806.68	761.47	0.00	762.21	6.26	6.92	116.50	322.34
	0.380	4.00	0.00	0.00	755.00	940.93	761.96	0.00	762.83	6.97	7.51	125.30	356.43
	0.420	4.00	0.00	0.00	755.00	543.92	760.31	0.00	760.94	6.68	6.40	84.94	210.47
	0.420	4.00	0.00	0.00	755.00	737.61	761.06	0.00	761.95	8.51	7.61	96.93	252.89
	0.420	4.00	0.00	0.00	755.00	806.68	761.30	0.00	762.29	9.13	8.00	100.83	266.98
	0.420	4.00	0.00	0.00	755.00	940.93	761.75	0.00	762.93	10.27	8.71	108.07	293.56
	0.460	4.00	0.00	0.00	755.00	543.92	760.13	0.00	761.02	10.29	7.56	71.92	169.59
	0.460	4.00	0.00	0.00	755.00	737.61	760.79	0.00	762.07	13.57	9.09	81.15	200.23
	0.460	4.00	0.00	0.00	755.00	806.68	761.00	0.00	762.43	14.74	9.60	84.06	210.09
	0.460	4.00	0.00	0.00	755.00	940.93	761.38	0.00	763.10	16.98	10.53	89.39	228.32

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
	0.500	4.00	763.00	762.00	755.00	543.92	759.79	0.00	761.18	18.41	9.44	57.64	126.75
	0.500	4.00	763.00	762.00	755.00	737.61	760.16	0.00	762.36	27.82	11.91	61.95	139.85
*	0.500	4.00	763.00	762.00	755.00	806.68	760.18	760.18	762.79	32.97	12.98	62.16	140.49
*	0.500	4.00	763.00	762.00	755.00	940.93	760.74	760.74	763.63	34.02	13.66	68.86	161.33
	1.000	50.00	764.20	762.09	755.09	543.92	759.88	0.00	761.27	18.50	9.45	57.54	126.46
	1.000	50.00	764.20	762.09	755.09	737.61	760.49	0.00	762.51	24.64	11.39	64.78	148.60
	1.000	50.00	764.20	762.09	755.09	806.68	760.91	760.27	762.99	24.14	11.56	69.77	164.19
	1.000	50.00	764.20	762.09	755.09	940.93	761.53	0.00	763.84	25.07	12.18	77.23	187.93
	1.250	25.00	765.90	762.14	755.14	543.92	759.93	0.00	761.32	18.56	9.46	57.47	126.24
	1.250	25.00	765.90	762.14	755.14	737.61	760.62	0.00	762.57	23.60	11.21	65.83	151.84
	1.250	25.00	765.90	762.14	755.14	806.68	761.03	0.00	763.05	23.28	11.41	70.72	167.18
	1.250	25.00	765.90	762.14	755.14	940.93	761.67	0.00	763.91	24.07	12.00	78.43	191.79
	2.500	125.00	767.00	762.52	755.38	543.92	760.16	0.00	761.55	18.60	9.47	57.43	126.13
	2.500	125.00	767.00	762.52	755.38	737.61	761.04	0.00	762.87	21.63	10.85	67.99	158.59
	2.500	125.00	767.00	762.52	755.38	806.68	761.43	0.00	763.34	21.67	11.10	72.64	173.28
	2.500	125.00	767.00	762.52	755.38	940.93	762.10	0.00	764.21	22.30	11.65	80.74	199.27
	3.500	100.00	767.00	762.71	755.57	543.92	760.34	0.00	761.74	18.67	9.48	57.35	125.88
	3.500	100.00	767.00	762.71	755.57	737.61	761.29	0.00	763.08	21.06	10.74	68.68	160.75
	3.500	100.00	767.00	762.71	755.57	806.68	761.68	0.00	763.56	21.10	10.99	73.38	175.61
	3.500	100.00	767.00	762.71	755.57	940.93	762.37	0.00	764.43	21.69	11.53	81.60	202.05
	4.300	80.00	767.00	762.86	755.72	543.92	760.49	0.00	761.89	18.75	9.50	57.26	125.61
	4.300	80.00	767.00	762.86	755.72	737.61	761.49	0.00	763.25	20.57	10.65	69.28	162.64
	4.300	80.00	767.00	762.86	755.72	806.68	761.88	0.00	763.73	20.66	10.91	73.96	177.45
	4.300	80.00	767.00	762.86	755.72	940.93	762.58	0.00	764.61	21.17	11.43	82.35	204.52
	4.550	25.00	767.00	762.99	755.99	543.92	760.34	0.00	762.03	24.21	10.42	52.19	110.54
	4.550	25.00	767.00	762.99	755.99	737.61	761.36	0.00	763.39	25.08	11.46	64.36	147.28
	4.550	25.00	767.00	762.99	755.99	806.68	761.75	0.00	763.87	24.75	11.67	69.12	162.13
	4.550	25.00	767.00	762.99	755.99	940.93	762.47	0.00	764.74	24.57	12.09	77.83	189.84
	5.000	45.00	767.00	763.08	756.08	543.92	760.53	0.00	762.14	22.75	10.19	53.37	114.02
	5.000	45.00	767.00	763.08	756.08	737.61	761.56	0.00	763.51	23.63	11.21	65.79	151.72
	5.000	45.00	767.00	763.08	756.08	806.68	761.94	0.00	763.98	23.60	11.46	70.37	166.06
	5.000	45.00	767.00	763.08	756.08	940.93	762.60	0.00	764.85	24.27	12.04	78.18	190.98
	7.500	250.00	768.00	763.55	756.55	543.92	761.23	0.00	762.68	19.72	9.68	56.22	122.48
	7.500	250.00	768.00	763.55	756.55	737.61	762.31	0.00	764.08	20.73	10.68	69.08	161.99
	7.500	250.00	768.00	763.55	756.55	806.68	762.69	0.00	764.56	20.93	10.96	73.61	176.34
	7.500	250.00	768.00	763.55	756.55	940.93	763.40	0.00	765.44	21.31	11.46	82.14	203.81
	10.000	250.00	769.00	764.03	757.03	543.92	761.72	0.00	763.18	19.75	9.68	56.18	122.38
	10.000	250.00	769.00	764.03	757.03	737.61	762.88	0.00	764.60	19.85	10.50	70.22	165.58
	10.000	250.00	769.00	764.03	757.03	806.68	763.27	0.00	765.07	20.01	10.77	74.87	180.36
	10.000	250.00	769.00	764.03	757.03	940.93	764.00	0.00	765.97	20.32	11.25	83.66	208.74

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
	12.500	250.00	771.25	764.51	757.51	543.92	762.25	0.00	763.67	19.13	9.57	56.84	124.35
	12.500	250.00	771.25	764.51	757.51	737.61	763.40	0.00	765.09	19.52	10.44	70.65	166.96
	12.500	250.00	771.25	764.51	757.51	806.68	763.79	0.00	765.57	19.63	10.70	75.41	182.08
	12.500	250.00	771.25	764.51	757.51	940.93	764.66	0.00	766.61	33.37	11.21	83.97	162.87
	15.000	250.00	772.90	764.98	757.98	543.92	762.72	0.00	764.15	19.14	9.57	56.84	124.34
	15.000	250.00	772.90	764.98	757.98	737.61	763.89	0.00	765.58	19.46	10.43	70.73	167.20
	15.000	250.00	772.90	764.98	757.98	806.68	764.30	0.00	766.06	19.39	10.65	75.76	183.21
	15.000	250.00	772.90	764.98	757.98	940.93	765.49	0.00	767.45	33.47	11.22	83.88	162.64
	17.500	250.00	772.80	765.46	758.46	543.92	763.20	0.00	764.62	19.12	9.57	56.85	124.38
	17.500	250.00	772.80	765.46	758.46	737.61	764.40	0.00	766.06	19.13	10.36	71.18	168.63
	17.500	250.00	772.80	765.46	758.46	806.68	764.79	0.00	766.55	19.39	10.65	75.76	183.21
	17.500	250.00	772.80	765.46	758.46	940.93	766.33	0.00	768.28	33.43	11.21	83.92	162.74
	18.280	78.00	772.80	765.61	758.61	543.92	763.35	0.00	764.77	19.10	9.56	56.88	124.46
	18.280	78.00	772.80	765.61	758.61	737.61	764.55	0.00	766.21	19.13	10.36	71.18	168.63
	18.280	78.00	772.80	765.61	758.61	806.68	764.94	0.00	766.70	19.32	10.63	75.85	183.50
	18.280	78.00	772.80	765.61	758.61	940.93	766.59	0.00	768.54	33.42	11.21	83.93	162.77
	18.330	5.00	774.00	767.10	758.60	543.92	763.97	0.00	764.92	11.16	7.83	69.44	162.83
	18.330	5.00	774.00	767.10	758.60	737.61	765.22	0.00	766.37	11.68	8.62	85.59	215.83
	18.330	5.00	774.00	767.10	758.60	806.68	765.65	0.00	766.87	11.80	8.84	91.21	234.81
	18.330	5.00	774.00	767.10	758.60	940.93	767.76	0.00	768.82	12.21	8.28	113.66	269.24
	18.380	5.00	774.00	767.10	758.60	543.92	764.44	0.00	765.03	9.64	6.18	88.08	175.21
	18.380	5.00	774.00	767.10	758.60	737.61	765.79	0.00	766.51	10.52	6.79	108.58	227.42
	18.380	5.00	774.00	767.10	758.60	806.68	766.25	0.00	767.01	10.79	6.98	115.57	245.52
	18.380	5.00	774.00	767.10	758.60	940.93	768.06	0.00	768.90	16.30	7.33	128.44	233.05
*	18.390	0.10	0.00	0.00	758.60	543.92	764.59	0.00	765.16	9.04	6.02	90.36	180.94
*	18.390	0.10	0.00	0.00	758.60	737.61	765.94	0.00	766.63	9.99	6.65	110.86	233.32
*	18.390	0.10	0.00	0.00	758.60	806.68	766.40	0.00	767.13	10.29	6.84	117.86	251.47
*	18.390	0.10	0.00	0.00	758.60	940.93	768.21	0.00	768.86	8.44	6.47	145.39	323.86
	18.540	16.00	774.00	767.10	758.65	543.92	764.60	0.00	765.17	9.15	6.05	89.87	179.79
	18.540	16.00	774.00	767.10	758.65	737.61	765.96	0.00	766.65	10.07	6.68	110.44	232.39
	18.540	16.00	774.00	767.10	758.65	806.68	766.42	0.00	767.15	10.36	6.87	117.47	250.63
	18.540	16.00	774.00	767.10	758.65	940.93	768.14	0.00	768.98	16.48	7.36	127.91	231.81
*	18.541	0.10	0.00	0.00	758.65	543.92	764.74	0.00	765.29	8.62	5.91	92.02	185.23
*	18.541	0.10	0.00	0.00	758.65	737.61	766.10	0.00	766.76	9.60	6.55	112.62	238.03
*	18.541	0.10	0.00	0.00	758.65	806.68	766.56	0.00	767.26	9.90	6.74	119.65	256.32
*	18.541	0.10	0.00	0.00	758.65	940.93	768.30	0.00	768.94	8.31	6.44	146.21	326.34
	18.550	1.00	774.00	766.30	758.80	543.92	764.58	0.00	765.45	14.97	7.46	72.92	140.59
	18.550	1.00	774.00	766.30	758.80	737.61	765.89	0.00	766.98	19.03	8.37	88.13	169.08
	18.550	1.00	774.00	766.30	758.80	806.68	766.29	0.00	767.54	27.63	8.97	89.92	153.46
	18.550	1.00	774.00	766.30	758.80	940.93	767.77	0.00	769.47	37.86	10.46	89.92	152.92

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
	19.150	60.00	774.15	766.80	759.30	543.92	764.60	0.00	765.63	18.06	8.12	66.95	128.00
	19.150	60.00	774.15	766.80	759.30	737.61	765.94	0.00	767.16	20.00	8.86	83.28	164.94
	19.150	60.00	774.15	766.80	759.30	806.68	766.42	0.00	767.71	22.61	9.11	88.53	169.64
	19.150	60.00	774.15	766.80	759.30	940.93	768.00	0.00	769.70	37.28	10.44	90.09	154.11
	19.160	1.00	774.00	767.40	759.30	543.92	765.17	0.00	765.76	9.68	6.18	88.04	174.80
	19.160	1.00	774.00	767.40	759.30	737.61	766.61	0.00	767.31	10.28	6.72	109.79	230.01
	19.160	1.00	774.00	767.40	759.30	806.68	767.15	0.00	767.88	10.35	6.85	117.85	250.79
	19.160	1.00	774.00	767.40	759.30	940.93	769.00	0.00	769.93	19.50	7.74	121.54	213.07
	19.280	12.00	774.00	767.40	759.64	543.92	765.14	0.00	765.81	11.40	6.59	82.53	161.09
	19.280	12.00	774.00	767.40	759.64	737.61	766.59	0.00	767.37	11.66	7.07	104.33	216.03
	19.280	12.00	774.00	767.40	759.64	806.68	767.13	0.00	767.93	11.58	7.17	112.53	237.07
	19.280	12.00	774.00	767.40	759.64	940.93	768.98	0.00	769.99	21.15	8.08	116.39	204.58
	19.290	1.00	774.00	767.40	759.64	543.92	765.14	0.00	765.81	7.14	6.59	82.48	203.59
	19.290	1.00	774.00	767.40	759.64	737.61	766.59	0.00	767.37	6.92	7.07	104.27	280.40
	19.290	1.00	774.00	767.40	759.64	806.68	767.13	0.00	767.93	6.78	7.18	112.35	309.91
	19.290	1.00	774.00	767.40	759.64	940.93	768.98	0.00	770.00	14.31	8.08	116.39	248.77
	19.390	10.00	774.00	767.70	759.70	543.92	764.89	0.00	766.08	14.86	8.72	62.35	141.09
	19.390	10.00	774.00	767.70	759.70	737.61	766.32	0.00	767.66	14.31	9.29	79.42	194.97
	19.390	10.00	774.00	767.70	759.70	806.68	766.85	0.00	768.22	13.98	9.40	85.81	215.78
	19.390	10.00	774.00	767.70	759.70	940.93	768.76	0.00	770.25	22.92	9.81	95.93	196.54
	19.400	1.00	774.00	767.70	759.70	543.92	764.90	0.00	766.08	14.89	8.73	62.31	140.97
	19.400	1.00	774.00	767.70	759.70	737.61	766.32	0.00	767.66	14.33	9.29	79.39	194.88
	19.400	1.00	774.00	767.70	759.70	806.68	766.85	0.00	768.22	13.99	9.40	85.78	215.69
	19.400	1.00	774.00	767.70	759.70	940.93	768.76	0.00	770.26	22.92	9.81	95.93	196.54
	20.000	60.00	771.50	767.90	759.85	543.92	764.97	0.00	766.19	15.46	8.85	61.45	138.32
	20.000	60.00	771.50	767.90	759.85	737.61	766.39	0.00	767.76	14.76	9.40	78.50	191.99
	20.000	60.00	771.50	767.90	759.85	806.68	766.92	0.00	768.32	14.38	9.51	84.87	212.70
	20.000	60.00	771.50	767.90	759.85	940.93	768.92	0.00	770.40	22.50	9.74	96.57	198.36
	22.500	250.00	771.50	768.49	760.46	543.92	765.32	0.00	766.67	17.86	9.33	58.29	128.71
	22.500	250.00	771.50	768.49	760.46	737.61	766.72	0.00	768.22	16.59	9.82	75.09	181.07
	22.500	250.00	771.50	768.49	760.46	806.68	767.24	0.00	768.77	16.07	9.92	81.35	201.23
	22.500	250.00	771.50	768.49	760.46	940.93	769.48	0.00	770.97	22.68	9.77	96.29	197.57
*	22.510	0.01	771.50	768.49	760.46	543.92	765.37	0.00	766.69	17.39	9.24	58.86	130.45
*	22.510	0.01	771.50	768.49	760.46	737.61	766.78	0.00	768.25	16.19	9.73	75.79	183.31
*	22.510	0.01	771.50	768.49	760.46	806.68	767.31	0.00	768.81	15.65	9.82	82.17	203.89
*	22.510	0.01	771.50	768.49	760.46	940.93	769.56	0.00	771.05	22.68	9.77	96.29	197.57
	22.700	20.00	771.50	768.50	760.50	543.92	765.40	0.00	766.73	17.38	9.24	58.87	130.47
	22.700	20.00	771.50	768.50	760.50	737.61	766.81	0.00	768.28	16.18	9.73	75.81	183.36
	22.700	20.00	771.50	768.50	760.50	806.68	767.34	0.00	768.84	15.64	9.82	82.18	203.95
	22.700	20.00	771.50	768.50	760.50	940.93	769.60	0.00	771.10	22.93	9.81	95.92	196.51

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
	23.000	30.00	771.50	768.56	760.56	543.92	765.45	0.00	766.78	17.50	9.26	58.73	130.04
	23.000	30.00	771.50	768.56	760.56	737.61	766.86	0.00	768.33	16.29	9.76	75.61	182.74
	23.000	30.00	771.50	768.56	760.56	806.68	767.38	0.00	768.89	15.84	9.86	81.80	202.71
	23.000	30.00	771.50	768.56	760.56	940.93	769.67	0.00	771.17	22.93	9.81	95.92	196.51
*	23.100	0.01	771.50	768.56	760.56	543.92	765.52	0.00	766.82	16.90	9.15	59.47	132.30
*	23.100	0.01	771.50	768.56	760.56	737.61	766.94	0.00	768.38	15.82	9.65	76.45	185.44
*	23.100	0.01	771.50	768.56	760.56	806.68	767.47	0.00	768.94	15.30	9.73	82.88	206.23
*	23.100	0.01	771.50	768.56	760.56	940.93	769.77	0.00	771.27	22.93	9.81	95.92	196.51
	23.500	50.00	771.50	768.68	760.68	543.92	765.59	0.00	766.92	17.37	9.24	58.88	130.51
	23.500	50.00	771.50	768.68	760.68	737.61	767.00	0.00	768.47	16.19	9.73	75.80	183.34
	23.500	50.00	771.50	768.68	760.68	806.68	767.54	0.00	769.03	15.64	9.81	82.20	204.00
	23.500	50.00	771.50	768.68	760.68	940.93	769.89	0.00	771.38	22.93	9.81	95.92	196.51
	23.520	2.00	771.10	769.00	760.70	543.92	766.37	0.00	767.10	7.81	6.85	79.44	194.60
	23.520	2.00	771.10	769.00	760.70	737.61	767.81	0.00	768.66	7.77	7.40	99.74	264.58
	23.520	2.00	771.10	769.00	760.70	806.68	768.34	0.00	769.22	7.69	7.53	107.14	290.93
	23.520	2.00	771.10	769.00	760.70	940.93	770.52	0.00	771.53	13.93	8.08	116.44	252.14
	23.620	10.00	771.50	769.00	760.70	620.00	766.80	0.00	767.20	3.33	5.08	122.15	339.58
	23.620	10.00	771.50	769.00	760.70	890.00	768.22	0.00	768.76	3.84	5.92	150.37	454.01
	23.620	10.00	771.50	769.00	760.70	1020.00	768.66	0.00	769.30	4.31	6.41	159.25	491.30
	23.620	10.00	771.50	769.00	760.70	1315.00	770.58	0.00	771.55	11.45	7.93	165.92	388.57
*	23.630	0.10	771.50	769.00	760.70	620.00	767.05	0.00	767.42	2.98	4.88	127.04	358.92
*	23.630	0.10	771.50	769.00	760.70	890.00	768.47	0.00	768.98	3.52	5.73	155.29	474.60
*	23.630	0.10	771.50	769.00	760.70	1020.00	768.91	0.00	769.51	3.96	6.21	164.19	512.30
*	23.630	0.10	771.50	769.00	760.70	1315.00	770.83	0.00	771.80	11.45	7.93	165.92	388.57
	23.770	15.00	771.20	769.00	760.74	620.00	767.06	0.00	767.43	3.03	4.91	126.35	356.18
	23.770	15.00	771.20	769.00	760.74	890.00	768.47	0.00	768.98	3.56	5.76	154.61	471.76
	23.770	15.00	771.20	769.00	760.74	1020.00	768.91	0.00	769.52	4.01	6.24	163.52	509.45
	23.770	15.00	771.20	769.00	760.74	1315.00	770.84	0.00	771.83	11.59	7.96	165.21	386.26
	23.930	16.00	771.50	768.80	760.77	496.78	766.89	0.00	767.61	7.99	6.77	73.43	175.76
	23.930	16.00	771.50	768.80	760.77	666.53	768.31	0.00	769.16	8.32	7.37	90.44	231.06
	23.930	16.00	771.50	768.80	760.77	748.83	768.75	0.00	769.70	9.06	7.82	95.76	248.77
	23.930	16.00	771.50	768.80	760.77	827.13	770.78	0.00	771.93	17.56	8.60	96.23	197.40
	24.000	7.00	771.50	768.82	760.79	496.78	766.90	0.00	767.61	8.01	6.77	73.35	175.51
	24.000	7.00	771.50	768.82	760.79	666.53	768.32	0.00	769.16	8.34	7.38	90.36	230.81
	24.000	7.00	771.50	768.82	760.79	748.83	768.76	0.00	769.71	9.09	7.83	95.62	248.31
	24.000	7.00	771.50	768.82	760.79	827.13	770.79	0.00	771.94	17.56	8.60	96.23	197.40
*	24.100	0.01	771.50	768.82	760.79	496.78	766.94	0.00	767.64	7.90	6.74	73.75	176.80
*	24.100	0.01	771.50	768.82	760.79	666.53	768.36	0.00	769.19	8.24	7.34	90.77	232.16
*	24.100	0.01	771.50	768.82	760.79	748.83	768.80	0.00	769.74	9.00	7.80	96.03	249.65
*	24.100	0.01	771.50	768.82	760.79	827.13	770.83	0.00	771.98	17.56	8.60	96.23	197.40

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
25.000	100.00	771.50	769.06	761.04	496.78	767.00	0.00	767.75	8.56	6.94	71.54	169.76
25.000	100.00	771.50	769.06	761.04	666.53	768.42	0.00	769.30	8.78	7.52	88.60	225.00
25.000	100.00	771.50	769.06	761.04	748.83	768.87	0.00	769.85	9.52	7.97	93.95	242.72
25.000	100.00	771.50	769.06	761.04	827.13	771.01	0.00	772.16	17.56	8.60	96.23	197.40
27.500	250.00	773.00	769.62	761.65	496.78	767.17	0.00	768.05	10.48	7.49	66.35	153.47
27.500	250.00	773.00	769.62	761.65	666.53	768.60	0.00	769.59	10.25	7.98	83.48	208.18
27.500	250.00	773.00	769.62	761.65	748.83	769.07	0.00	770.16	10.94	8.41	89.03	226.41
27.500	250.00	773.00	769.62	761.65	827.13	771.44	0.00	772.61	17.88	8.65	95.61	195.61
28.560	106.00	773.50	769.93	761.91	496.78	767.26	0.00	768.19	11.43	7.73	64.25	146.94
28.560	106.00	773.50	769.93	761.91	666.53	768.69	0.00	769.73	10.96	8.19	81.37	201.33
28.560	106.00	773.50	769.93	761.91	748.83	769.16	0.00	770.31	11.61	8.61	87.02	219.77
28.560	106.00	773.50	769.93	761.91	827.13	771.65	0.00	772.80	17.57	8.60	96.21	197.33
28.570	1.00	0.00	0.00	761.91	496.78	767.26	0.00	768.19	11.43	7.73	64.24	146.92
28.570	1.00	0.00	0.00	761.91	666.53	768.69	0.00	769.73	10.96	8.19	81.37	201.31
28.570	1.00	0.00	0.00	761.91	748.83	769.16	0.00	770.31	11.61	8.61	87.01	219.76
28.570	1.00	0.00	0.00	761.91	827.13	772.25	0.00	772.94	5.73	6.66	124.18	345.62
28.650	8.00	0.00	0.00	762.00	496.78	768.35	0.00	768.44	0.60	2.44	203.81	640.49
28.650	8.00	0.00	0.00	762.00	666.53	769.91	0.00	770.01	0.57	2.63	253.77	882.50
28.650	8.00	0.00	0.00	762.00	748.83	770.50	0.00	770.62	0.58	2.74	273.03	980.66
28.650	8.00	0.00	0.00	762.00	827.13	773.03	0.00	773.12	0.34	2.33	354.25	1417.86
28.660	1.00	765.00	762.00	762.00	615.00	768.83	0.00	768.95	0.75	2.81	218.50	709.41
28.660	1.00	765.00	762.00	762.00	885.00	770.34	0.00	770.51	0.87	3.32	266.77	948.07
28.660	1.00	765.00	762.00	762.00	1015.00	770.94	0.00	771.14	0.94	3.55	286.04	1047.75
28.660	1.00	765.00	762.00	762.00	1310.00	773.41	0.00	773.61	0.79	3.59	365.26	1478.47
28.990	33.00	0.00	0.00	760.00	615.00	768.92	0.00	768.96	1.66	1.78	361.35	477.04
28.990	33.00	0.00	0.00	760.00	885.00	770.47	0.00	770.52	1.71	1.98	475.27	676.82
28.990	33.00	0.00	0.00	760.00	1015.00	771.09	0.00	771.15	1.74	2.06	526.02	770.23
28.990	33.00	0.00	0.00	760.00	1310.00	773.58	0.00	773.63	1.01	1.85	814.75	1305.97
29.310	32.00	0.00	0.00	760.00	615.00	768.95	0.00	768.97	0.32	0.96	678.08	1091.06
29.310	32.00	0.00	0.00	760.00	885.00	770.51	0.00	770.53	0.35	1.14	847.94	1488.51
29.310	32.00	0.00	0.00	760.00	1015.00	771.14	0.00	771.16	0.37	1.21	921.32	1667.36
29.310	32.00	0.00	0.00	760.00	1310.00	773.62	0.00	773.64	0.28	1.21	1239.30	2484.83
30.130	82.00	0.00	0.00	760.00	615.00	768.91	0.00	768.99	2.62	2.45	307.07	380.20
30.130	82.00	0.00	0.00	760.00	885.00	770.47	0.00	770.56	2.33	2.62	439.24	580.39
30.130	82.00	0.00	0.00	760.00	1015.00	771.10	0.00	771.19	2.24	2.70	500.54	677.93
30.130	82.00	0.00	0.00	760.00	1310.00	773.59	0.00	773.65	1.24	2.35	790.22	1174.16
30.630	50.00	0.00	0.00	760.00	615.00	768.93	0.00	769.01	2.61	2.44	307.56	380.91
30.630	50.00	0.00	0.00	760.00	885.00	770.48	0.00	770.57	2.32	2.62	439.76	581.21
30.630	50.00	0.00	0.00	760.00	1015.00	771.11	0.00	771.20	2.24	2.70	501.08	678.80
30.630	50.00	0.00	0.00	760.00	1310.00	773.60	0.00	773.66	1.24	2.35	790.21	1174.14

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
	31.670	104.00	0.00	0.00	765.00	615.00	768.93	0.00	769.08	10.68	3.13	196.29	188.20
	31.670	104.00	0.00	0.00	765.00	885.00	770.47	0.00	770.63	7.85	3.24	273.42	315.85
	31.670	104.00	0.00	0.00	765.00	1015.00	771.09	0.00	771.26	7.42	3.33	304.40	372.68
	31.670	104.00	0.00	0.00	765.00	1310.00	773.56	0.00	773.71	4.39	3.06	428.08	625.14
	31.770	10.00	0.00	0.00	765.00	615.00	768.62	0.00	769.40	9.93	7.10	86.56	195.12
	31.770	10.00	0.00	0.00	765.00	885.00	770.17	0.00	770.95	6.81	7.07	125.22	339.04
	31.770	10.00	0.00	0.00	765.00	1015.00	770.78	0.00	771.59	6.42	7.23	140.37	400.73
	31.770	10.00	0.00	0.00	765.00	1310.00	773.32	0.00	773.96	3.68	6.42	203.90	683.00
*	32.060	9.00	0.00	0.00	765.00	615.00	768.27	768.27	769.83	23.83	10.01	61.43	125.99
	32.060	9.00	0.00	0.00	765.00	885.00	769.87	0.00	771.26	14.28	9.47	93.41	234.19
	32.060	9.00	0.00	0.00	765.00	1015.00	770.47	0.00	771.91	13.26	9.63	105.40	278.72
	32.060	9.00	0.00	0.00	765.00	1310.00	773.11	0.00	774.18	7.09	8.28	158.15	491.93
	32.070	1.00	778.00	773.00	765.00	615.00	768.28	768.27	769.83	23.74	10.00	61.50	126.22
	32.070	1.00	778.00	773.00	765.00	885.00	769.87	0.00	771.27	14.32	9.48	93.32	233.85
	32.070	1.00	778.00	773.00	765.00	1015.00	770.47	0.00	771.91	13.29	9.64	105.33	278.43
	32.070	1.00	778.00	773.00	765.00	1310.00	773.07	0.00	774.22	14.00	8.63	151.85	350.06
*	33.150	108.00	778.00	773.33	765.33	615.00	768.60	768.60	770.16	23.82	10.01	61.44	126.02
	33.150	108.00	778.00	773.33	765.33	885.00	769.96	0.00	771.51	16.66	9.99	88.59	216.82
	33.150	108.00	778.00	773.33	765.33	1015.00	770.55	0.00	772.14	15.24	10.11	100.41	259.97
	33.150	108.00	778.00	773.33	765.33	1310.00	773.20	0.00	774.36	11.36	8.67	151.02	388.68
	33.160	1.00	0.00	0.00	765.33	615.00	768.62	768.61	770.16	23.66	9.99	61.58	126.44
	33.160	1.00	0.00	0.00	765.33	885.00	769.96	0.00	771.51	16.70	10.00	88.52	216.58
	33.160	1.00	0.00	0.00	765.33	1015.00	770.55	0.00	772.14	15.27	10.11	100.36	259.76
	33.160	1.00	0.00	0.00	765.33	1310.00	773.27	0.00	774.38	7.55	8.47	154.59	476.85
*	33.260	10.00	0.00	0.00	765.36	615.00	768.64	768.64	770.19	23.78	10.01	61.47	126.11
	33.260	10.00	0.00	0.00	765.36	885.00	769.97	0.00	771.54	16.99	10.06	88.00	214.72
	33.260	10.00	0.00	0.00	765.36	1015.00	770.56	0.00	772.16	15.50	10.17	99 82	257.78
	33.260	10.00	0.00	0.00	765.36	1310.00	773.27	0.00	774.39	7.62	8.50	154.04	474.50
	33.270	1.00	767.80	765.20	765.37	615.00	771.90	0.00	772.26	2.90	4.86	126.54	361.17
	33.270	1.00	767.80	765.20	765.37	885.00	772.97	0.00	773.52	3.88	5.98	148.07	449.40
	33.270	1.00	767.80	765.20	765.37	1015.00	773.45	0.00	774.09	4.29	6.44	157.68	489.92
	33.270	1.00	767.80	765.20	765.37	1310.00	774.74	0.00	775.53	4.73	7.13	183.64	602.36
	33.740	48.00	0.00	0.00	765.51	615.00	771.90	0.00	772.29	3.09	4.97	123.68	349.76
	33.740	48.00	0.00	0.00	765.51	885.00	772.98	0.00	773.55	4.09	6.09	145.21	437.46
	33.740	48.00	0.00	0.00	765.51	1015.00	773.46	0.00	774.13	4.51	6.56	154.80	477.72
	33.740	48.00	0.00	0.00	765.51	1310.00	774.75	0.00	775.57	4.94	7.25	180.75	589.64
	33.750	1.00	780.00	773.52	765.51	615.00	771.90	0.00	772.29	3.09	4.97	123.68	349.77
	33.750	1.00	780.00	773.52	765.51	885.00	772.98	0.00	773.55	4.09	6.10	145.20	437.44
	33.750	1.00	780.00	773.52	765.51	1015.00	773.46	0.00	774.13	4.37	6.56	154.71	485.46
	33.750	1.00	780.00	773.52	765.51	1310.00	774.62	0.00	775.71	13.13	8.40	155.96	361.59

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
34.710	96.00	780.00	773.81	765.81	610.00	771.92	0.00	772.33	3.47	5.17	118.04	327.46
34.710	96.00	780.00	773.81	765.81	880.00	773.00	0.00	773.62	4.51	6.30	139.66	414.49
34.710	96.00	780.00	773.81	765.81	1005.00	773.48	0.00	774.19	4.82	6.73	149.39	457.95
34.710	96.00	780.00	773.81	765.81	1300.00	774.76	0.00	775.84	12.93	8.34	155.96	361.59
34.720	1.00	0.00	0.00	765.81	610.00	771.92	0.00	772.33	3.46	5.16	118.15	327.89
34.720	1.00	0.00	0.00	765.81	880.00	773.00	0.00	773.62	4.50	6.30	139.78	414.97
34.720	1.00	0.00	0.00	765.81	1005.00	773.49	0.00	774.19	4.87	6.72	149.47	455.28
34.720	1.00	0.00	0.00	765.81	1300.00	775.14	0.00	775.93	4.72	7.11	182.74	598.41
34.800	8.00	0.00	0.00	765.83	610.00	771.92	0.00	772.34	3.50	5.18	117.72	326.20
34.800	8.00	0.00	0.00	765.83	880.00	773.00	0.00	773.62	4.53	6.31	139.36	413.27
34.800	8.00	0.00	0.00	765.83	1005.00	773.49	0.00	774.19	4.91	6.74	149.06	453.54
34.800	8.00	0.00	0.00	765.83	1300.00	775.15	0.00	775.94	4.76	7.13	182.22	596.11
34.810	1.00	768.67	765.77	765.83	610.00	773.02	0.00	773.31	2.17	4.37	139.65	414.44
34.810	1.00	768.67	765.77	765.83	880.00	774.18	0.00	774.63	2.95	5.40	162.99	512.59
34.810	1.00	768.67	765.77	765.83	1005.00	774.68	0.00	775.21	3.27	5.81	172.99	555.76
34.810	1.00	768.67	765.77	765.83	1300.00	776.18	0.00	776.81	3.57	6.41	202.91	688.17
36.210	140.00	0.00	0.00	766.26	610.00	773.03	0.00	773.36	2.57	4.64	131.36	380.60
36.210	140.00	0.00	0.00	766.26	880.00	774.20	0.00	774.70	3.39	5.68	154.80	477.71
36.210	140.00	0.00	0.00	766.26	1005.00	774.70	0.00	775.28	3.73	6.10	164.84	520.53
36.210	140.00	0.00	0.00	766.26	1300.00	776.20	0.00	776.89	3.98	6.67	194.80	651.85
38.050	184.00	0.00	0.00	766.81	610.00	773.05	0.00	773.45	3.25	5.05	120.83	338.46
38.050	184.00	0.00	0.00	766.81	880.00	774.23	0.00	774.81	4.11	6.09	144.44	434.26
38.050	184.00	0.00	0.00	766.81	1005.00	774.74	0.00	775.40	4.44	6.50	154.55	476.69
38.050	184.00	0.00	0.00	766.81	1300.00	776.24	0.00	777.01	4.59	7.04	184.60	606.59
38.060	1.00	780.00	774.82	766.81	610.00	773.05	0.00	773.45	3.25	5.05	120.80	338.32
38.060	1.00	780.00	774.82	766.81	880.00	774.23	0.00	774.81	4.11	6.09	144.40	434.12
38.060	1.00	780.00	774.82	766.81	1005.00	774.73	0.00	775.41	7.10	6.63	151.59	377.04
38.060	1.00	780.00	774.82	766.81	1300.00	776.06	0.00	777.19	14.08	8.55	152.07	346.50
39.760	170.00	780.00	775.34	767.33	610.00	773.08	0.00	773.55	4.13	5.50	110.97	300.00
39.760	170.00	780.00	775.34	767.33	880.00	774.27	0.00	774.93	4.98	6.53	134.75	394.36
39.760	170.00	780.00	775.34	767.33	1005.00	774.80	0.00	775.54	5.25	6.91	145.50	438.67
39.760	170.00	780.00	775.34	767.33	1300.00	776.30	0.00	777.43	14.08	8.55	152.07	346.49
39.770	1.00	0.00	0.00	767.33	610.00	773.08	0.00	773.55	4.14	5.50	110.93	299.84
39.770	1.00	0.00	0.00	767.33	880.00	774.27	0.00	774.93	4.98	6.53	134.70	394.19
39.770	1.00	0.00	0.00	767.33	1005.00	774.80	0.00	775.54	5.26	6.91	145.37	438.15
39.770	1.00	0.00	0.00	767.33	1300.00	776.78	0.00	777.54	4.56	7.03	185.05	608.58
39.860	9.00	0.00	0.00	767.36	610.00	773.08	0.00	773.55	4.19	5.52	110.43	297.90
39.860	9.00	0.00	0.00	767.36	880.00	774.27	0.00	774.94	5.04	6.56	134.21	392.17
39.860	9.00	0.00	0.00	767.36	1005.00	774.80	0.00	775.55	5.31	6.94	144.87	436.07
39.860	9.00	0.00	0.00	767.36	1300.00	776.78	0.00	777.55	4.60	7.05	184.43	605.84

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
39.870	1.00	770.30	767.40	767.36	610.00	774.58	0.00	774.88	2.13	4.34	140.54	418.13
39.870	1.00	770.30	767.40	767.36	880.00	775.73	0.00	776.18	2.92	5.38	163.50	514.81
39.870	1.00	770.30	767.40	767.36	1005.00	776.24	0.00	776.76	3.23	5.78	173.75	559.05
39.870	1.00	770.30	767.40	767.36	1300.00	777.82	0.00	778.45	3.46	6.33	205.40	699.36
41.590	172.00	0.00	0.00	767.86	605.00	774.61	0.00	774.94	2.56	4.63	130.79	378.27
41.590	172.00	0.00	0.00	767.86	870.00	775.76	0.00	776.26	3.37	5.66	153.83	473.62
41.590	172.00	0.00	0.00	767.86	995.00	776.28	0.00	776.85	3.70	6.06	164.12	517.44
41.590	172.00	0.00	0.00	767.86	1290.00	777.86	0.00	778.53	3.86	6.59	195.83	656.43
43.350	176.00	0.00	0.00	768.40	605.00	774.63	0.00	775.02	3.22	5.02	120.53	337.28
43.350	176.00	0.00	0.00	768.40	870.00	775.79	0.00	776.36	4.06	6.05	143.83	431.74
43.350	176.00	0.00	0.00	768.40	995.00	776.31	0.00	776.96	4.39	6.45	154.19	475.15
43.350	176.00	0.00	0.00	768.40	1290.00	777.90	0.00	778.64	4.44	6.94	185.95	612.54
43.360	1.00	780.20	776.41	768.40	605.00	774.63	0.00	775.02	3.22	5.02	120.50	337.17
43.360	1.00	780.20	776.41	768.40	870.00	775.79	0.00	776.36	4.06	6.05	143.82	431.68
43.360	1.00	780.20	776.41	768.40	995.00	776.30	0.00	776.97	6.86	6.57	151.50	379.80
43.360	1.00	780.20	776.41	768.40	1290.00	777.71	0.00	778.83	13.85	8.48	152.10	346.64
45.860	250.00	780.20	777.17	769.16	605.00	774.67	0.00	775.17	4.62	5.70	106.11	281.39
45.860	250.00	780.20	777.17	769.16	870.00	775.84	0.00	776.54	5.42	6.71	129.66	373.72
45.860	250.00	780.20	777.17	769.16	995.00	776.40	0.00	777.18	5.64	7.07	140.72	418.85
45.860	250.00	780.20	777.17	769.16	1290.00	778.06	0.00	779.18	13.85	8.48	152.10	346.63
45.870	1.00	0.00	0.00	769.16	600.00	774.68	0.00	775.17	4.55	5.65	106.11	281.41
45.870	1.00	0.00	0.00	769.16	865.00	775.85	0.00	776.54	5.37	6.68	129.57	373.35
45.870	1.00	0.00	0.00	769.16	990.00	776.41	0.00	777.18	5.58	7.03	140.82	419.28
45.870	1.00	0.00	0.00	769.16	1285.00	778.52	0.00	779.28	4.58	7.01	183.20	600.42
45.970	10.00	0.00	0.00	769.19	600.00	774.68	0.00	775.18	4.60	5.68	105.64	279.62
45.970	10.00	0.00	0.00	769.19	865.00	775.86	0.00	776.55	5.42	6.70	129.15	371.66
45.970	10.00	0.00	0.00	769.19	990.00	776.42	0.00	777.19	5.63	7.05	140.36	417.38
45.970	10.00	0.00	0.00	769.19	1285.00	778.52	0.00	779.29	4.63	7.04	182.51	597.37
45.980	1.00	771.90	769.20	769.19	600.00	776.12	0.00	776.43	2.32	4.46	134.58	393.67
45.980	1.00	771.90	769.20	769.19	865.00	777.25	0.00	777.72	3.15	5.51	157.13	487.58
45.980	1.00	771.90	769.20	769.19	990.00	777.77	0.00	778.31	3.46	5.91	167.54	532.18
45.980	1.00	771.90	769.20	769.19	1285.00	779.49	0.00	780.12	3.53	6.36	202.07	684.39
48.330	235.00	0.00	0.00	769.91	600.00	776.15	0.00	776.53	3.15	4.97	120.77	338.23
48.330	235.00	0.00	0.00	769.91	865.00	777.29	0.00	777.85	4.04	6.03	143.51	430.39
48.330	235.00	0.00	0.00	769.91	990.00	777.81	0.00	778.45	4.36	6.43	154.00	474.33
48.330	235.00	0.00	0.00	769.91	1285.00	779.54	0.00	780.26	4.24	6.81	188.56	624.10
48.340	1.00	784.70	777.92	769.91	600.00	776.15	0.00	776.53	3.15	4.97	120.72	338.02
48.340	1.00	784.70	777.92	769.91	865.00	777.29	0.00	777.85	4.04	6.03	143.45	430.16
48.340	1.00	784.70	777.92	769.91	990.00	777.80	0.00	778.46	6.76	6.54	151 38	380.83
48.340	1.00	784.70	777.92	769.91	1285.00	779.35	0.00	780.45	13.76	8.45	152.05	346.44

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
49.240	90.00	784.70	778.20	770.19	600.00	776.16	0.00	776.58	3.57	5.20	115.48	317.45
49.240	90.00	784.70	778.20	770.19	865.00	777.30	0.00	777.91	4.47	6.25	138.30	408.90
49.240	90.00	784.70	778.20	770.19	990.00	777.84	0.00	778.53	5.67	6.66	148.70	415.93
49.240	90.00	784.70	778.20	770.19	1285.00	779.47	0.00	780.58	13.76	8.45	152.05	346.44
49.250	1.00	0.00	0.00	770.19	600.00	776.16	0.00	776.58	3.57	5.20	115.47	317.41
49.250	1.00	0.00	0.00	770.19	865.00	777.30	0.00	777.91	4.48	6.26	138.29	408.86
49.250	1.00	0.00	0.00	770.19	990.00	777.85	0.00	778.53	4.76	6.64	149.09	453.70
49.250	1.00	0.00	0.00	770.19	1285.00	780.01	0.00	780.70	4.00	6.67	192.63	642.18
49.340	9.00	0.00	0.00	770.21	600.00	776.16	0.00	776.59	3.62	5.22	114.96	315.44
49.340	9.00	0.00	0.00	770.21	865.00	777.31	0.00	777.92	4.52	6.28	137.79	406.82
49.340	9.00	0.00	0.00	770.21	990.00	777.85	0.00	778.54	4.80	6.66	148.69	451.99
49.340	9.00	0.00	0.00	770.21	1285.00	780.02	0.00	780.71	4.04	6.69	192.00	639.36
49.350	1.00	773.10	770.20	770.21	600.00	777.38	0.00	777.67	2.11	4.31	139.34	413.19
49.350	1.00	773.10	770.20	770.21	865.00	778.54	0.00	778.98	2.87	5.32	162.49	510.48
49.350	1.00	773.10	770.20	770.21	990.00	779.06	0.00	779.57	3.18	5.73	172.88	555.27
49.350	1.00	773.10	770.20	770.21	1285.00	780.95	0.00	781.53	3.15	6.10	210.80	723.78
50.410	106.00	0.00	0.00	770.52	600.00	777.39	0.00	777.71	2.38	4.50	133.43	388.99
50.410	106.00	0.00	0.00	770.52	865.00	778.55	0.00	779.03	3.17	5.52	156.65	485.56
50.410	106.00	0.00	0.00	770.52	990.00	779.07	0.00	779.62	3.49	5.93	167.06	530.08
50.410	106.00	0.00	0.00	770.52	1285.00	780.97	0.00	781.58	3.39	6.27	204.99	697.54
51.550	114.00	0.00	0.00	770.92	600.00	777.40	0.00	777.76	2.81	4.77	125.69	357.77
51.550	114.00	0.00	0.00	770.92	865.00	778.57	0.00	779.09	3.64	5.81	148.99	453.28
51.550	114.00	0.00	0.00	770.92	990.00	779.09	0.00	779.69	3.96	6.21	159.44	497.42
51.550	114.00	0.00	0.00	770.92	1285.00	780.99	0.00	781.64	3.75	6.51	197.39	663.41

[AC6.HEC2]

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	0.000	543.92	757.50	0.00	0.00	0.00	20.01	0.00
	0.000	737.61	757.50	0.00	0.00	0.00	20.01	0.00
	0.000	806.68	757.50	0.00	0.00	0.00	20.01	0.00
	0.000	940.93	757.50	0.00	0.00	0.00	20.01	0.00
	0.100	543.92	757.50	0.00	0.00	0.00	20.01	9.00
	0.100	737.61	757.50	0.00	0.00	0.00	20.01	9.00
	0.100	806.68	757.50	0.00	0.00	0.00	20.01	9.00
	0.100	940.93	757.50	0.00	0.00	0.00	20.01	9.00
	0.170	543.92	757.50	0.00	0.00	0.00	20.01	8.00
	0.170	737.61	757.50	0.00	0.00	0.00	20.01	8.00
	0.170	806.68	757.50	0.00	0.00	0.00	20.01	8.00
	0.170	940.93	757.51	0.00	0.00	0.00	20.01	8.00
	0.180	543.92	757.47	0.00	-0.04	0.00	20.07	1.00
	0.180	737.61	757.43	-0.03	-0.07	0.00	20.07	1.00
	0.180	806.68	757.42	-0.01	-0.08	0.00	20.07	1.00
	0.180	940.93	757.39	-0.03	-0.12	0.00	20.07	1.00
*	0.330	543.92	759.31	0.00	1.85	0.00	20.06	14.00
*	0.330	737.61	759.95	0.63	2.51	0.00	20.06	14.00
*	0.330	806.68	760.17	0.22	2.75	0.00	20.06	14.00
*	0.330	940.93	760.56	0.39	3.17	0.00	20.06	14.00
	0.340	543.92	760.48	0.00	1.17	0.00	20.01	1.00
	0.340	737.61	761.31	0.83	1.36	0.00	20.01	1.00
	0.340	806.68	761.58	0.27	1.41	0.00	20.01	1.00
	0.340	940.93	762.09	0.51	1.53	0.00	20.01	1.00
	0.380	543.92	760.41	0.00	-0.07	0.00	18.01	4.00
	0.380	737.61	761.21	0.80	-0.10	0.00	18.01	4.00
	0.380	806.68	761.47	0.26	-0.11	0.00	18.01	4.00
	0.380	940.93	761.96	0.49	-0.13	0.00	18.01	4.00
	0.420	543.92	760.31	0.00	-0.10	0.00	16.01	4.00
	0.420	737.61	761.06	0.75	-0.15	0.00	16.01	4.00
	0.420	806.68	761.30	0.24	-0.17	0.00	16.01	4.00
	0.420	940.93	761.75	0.45	-0.21	0.00	16.01	4.00
	0.460	543.92	760.13	0.00	-0.17	0.00	14.01	4.00
	0.460	737.61	760.79	0.66	-0.26	0.00	14.01	4.00
	0.460	806.68	761.00	0.21	-0.30	0.00	14.01	4.00
	0.460	940.93	761.38	0.38	-0.38	0.00	14.01	4.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	0.500	543.92	759.79	0.00	-0.34	0.00	12.01	4.00
	0.500	737.61	760.16	0.36	-0.64	0.00	12.01	4.00
*	0.500	806.68	760.18	0.02	-0.82	0.00	12.01	4.00
*	0.500	940.93	760.74	0.56	-0.64	0.00	12.01	4.00
	1.000	543.92	759.88	0.00	0.09	0.00	12.01	50.00
	1.000	737.61	760.49	0.61	0.34	0.00	12.01	50.00
	1.000	806.68	760.91	0.42	0.73	0.00	12.01	50.00
	1.000	940.93	761.53	0.62	0.80	0.00	12.01	50.00
	1.250	543.92	759.93	0.00	0.04	0.00	12.01	25.00
	1.250	737.61	760.62	0.70	0.13	0.00	12.01	25.00
	1.250	806.68	761.03	0.41	0.12	0.00	12.01	25.00
	1.250	940.93	761.67	0.64	0.14	0.00	12.01	25.00
	2.500	543.92	760.16	0.00	0.23	0.00	12.01	125.00
	2.500	737.61	761.04	0.88	0.42	0.00	12.01	125.00
	2.500	806.68	761.43	0.39	0.40	0.00	12.01	125.00
	2.500	940.93	762.10	0.67	0.43	0.00	12.01	125.00
	3.500	543.92	760.34	0.00	0.18	0.00	12.01	100.00
	3.500	737.61	761.29	0.95	0.25	0.00	12.01	100.00
	3.500	806.68	761.68	0.39	0.26	0.00	12.01	100.00
	3.500	940.93	762.37	0.69	0.27	0.00	12.01	100.00
	4.300	543.92	760.49	0.00	0.15	0.00	12.01	80.00
	4.300	737.61	761.49	1.01	0.20	0.00	12.01	80.00
	4.300	806.68	761.88	0.39	0.20	0.00	12.01	80.00
	4.300	940.93	762.58	0.70	0.21	0.00	12.01	80.00
	4.550	543.92	760.34	0.00	-0.15	0.00	12.00	25.00
	4.550	737.61	761.36	1.01	-0.14	0.00	12.00	25.00
	4.550	806.68	761.75	0.40	-0.13	0.00	12.00	25.00
	4.550	940.93	762.47	0.72	-0.11	0.00	12.00	25.00
	5.000	543.92	760.53	0.00	0.19	0.00	12.00	45.00
	5.000	737.61	761.56	1.03	0.21	0.00	12.00	45.00
	5.000	806.68	761.94	0.38	0.19	0.00	12.00	45.00
	5 000	940.93	762.60	0.66	0.13	0.00	12.00	45.00
	7.500	543.92	761.23	0.00	0.70	0.00	12.00	250.00
	7.500	737.61	762.31	1.08	0.75	0.00	12.00	250.00
	7.500	806.68	762.69	0.38	0.75	0.00	12.00	250.00
	7.500	940.93	763.40	0.71	0.80	0.00	12.00	250.00
	10.000	543.92	761.72	0.00	0.49	0.00	12.00	250.00
	10.000	737.61	762.88	1.16	0.57	0.00	12.00	250.00
	10.000	806.68	763.27	0.39	0.58	0.00	12.00	250.00
	10 000	940.93	764.00	0.73	0.60	0.00	12.00	250.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	12.500	543.92	762.25	0.00	0.52	0.00	12.00	250.00
	12.500	737.61	763.40	1.15	0.52	0.00	12.00	250.00
	12.500	806.68	763.79	0.40	0.52	0.00	12.00	250.00
	12.500	940.93	764.66	0.87	0.66	0.00	12.00	250.00
	15.000	543.92	762.72	0.00	0.48	0.00	12.00	250.00
	15.000	737.61	763.89	1.17	0.49	0.00	12.00	250.00
	15.000	806.68	764.30	0.41	0.51	0.00	12.00	250.00
	15.000	940.93	765.49	1.19	0.83	0.00	12.00	250.00
	17.500	543.92	763.20	0.00	0.48	0.00	12.00	250.00
	17.500	737.61	764.40	1.19	0.51	0.00	12.00	250.00
	17.500	806.68	764.79	0.39	0.48	0.00	12.00	250.00
	17.500	940.93	766.33	1.55	0.84	0.00	12.00	250.00
	18.280	543.92	763.35	0.00	0.15	0.00	12.00	78.00
	18.280	737.61	764.55	1.19	0.15	0.00	12.00	78.00
	18.280	806.68	764.94	0.40	0.16	0.00	12.00	78.00
	18.280	940.93	766.59	1.65	0.26	0.00	12.00	78.00
	18.330	543.92	763.97	0.00	0.61	0.00	12.97	5.00
	18.330	737.61	765.22	1.25	0.68	0.00	12.99	5.00
	18.330	806.68	765.65	0.43	0.71	0.00	12.99	5.00
	18.330	940.93	767.76	2.10	1.16	0.00	13.02	5.00
	18.380	543.92	764.44	0.00	0.47	0.00	15.15	5.00
	18.380	737.61	765.79	1.35	0.57	0.00	15.19	5.00
	18.380	806.68	766.25	0.46	0.60	0.00	15.20	5.00
	18.380	940.93	768.06	1.81	0.31	0.00	15.25	5.00
*	18.390	543.92	764.59	0.00	0.15	0 00	15.16	0.10
*	18.390	737.61	765.94	1.35	0.15	0.00	15.19	0.10
*	18.390	806.68	766.40	0.46	0.15	0.00	15.20	0.10
*	18.390	940.93	768.21	1.81	0.15	0.00	15.25	0.10
	18.540	543.92	764.60	0.00	0.01	0.00	15.19	16.00
	18.540	737.61	765.96	1.35	0.01	0.00	15.24	16.00
	18.540	806.68	766.42	0.46	0.01	0.00	15.25	16.00
	18.540	940.93	768.14	1.72	-0.08	0.00	15.31	16.00
*	18.541	543.92	764.74	0.00	0.14	0.00	15.20	0.10
*	18.541	737.61	766.10	1.35	0.14	0.00	15.24	0.10
*	18.541	806.68	766.56	0.46	0.14	0.00	15.26	0.10
*	18.541	940.93	768.30	1.74	0.16	0.00	15.31	0.10
	18.550	543.92	764.58	0.00	-0.16	0.00	15.03	1.00
	18.550	737.61	765.89	1.30	-0.21	0.00	15.07	1.00
	18.550	806.68	766.29	0.40	-0.27	0.00	15.08	1.00
	18.550	940.93	767.77	1.48	-0.53	0.00	15.12	1.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	19.150	543.92	764.60	0.00	0.02	0.00	15.02	60.00
	19.150	737.61	765.94	1.34	0.05	0.00	15.06	60.00
	19.150	806.68	766.42	0.48	0.13	0.00	15.07	60.00
	19.150	940.93	768.00	1.59	0.23	0.00	15.12	60.00
	19.160	543.92	765.17	0.00	0.56	0.00	15.02	1.00
	19.160	737.61	766.61	1.45	0.67	0.00	15.03	1.00
	19.160	806.68	767.15	0.54	0.73	0.00	15.03	1.00
	19.160	940.93	769.00	1.85	0.99	0.00	15.04	1.00
	19.280	543.92	765.14	0.00	-0.03	0.00	15.02	12.00
	19.280	737.61	766.59	1.45	-0.02	0.00	15.03	12.00
	19.280	806.68	767.13	0.54	-0.02	0.00	15.03	12.00
	19.280	940.93	768.98	1.85	-0.02	0.00	15.03	12.00
	19.290	543.92	765.14	0.00	0.00	0.00	15.01	1.00
	19.290	737.61	766.59	1.45	0.00	0.00	15.01	1.00
	19.290	806.68	767.13	0.54	0.00	0.00	15.01	1.00
	19.290	940.93	768.98	1.85	0.00	0.00	15.02	1.00
	19.390	543.92	764.89	0.00	-0.24	0.00	12.00	10.00
	19.390	737.61	766.32	1.42	-0.27	0.00	12.00	10.00
	19.390	806.68	766.85	0.53	-0.28	0.00	12.00	10.00
	19.390	940.93	768.76	1.91	-0.22	0.00	12.00	10.00
	19.400	543.92	764.90	0.00	0.00	0.00	12.00	1.00
	19.400	737.61	766.32	1.42	0.00	0.00	12.00	1.00
	19.400	806.68	766.85	0.53	0.00	0.00	12.00	1.00
	19.400	940.93	768.76	1.91	0.00	0.00	12.00	1.00
	20.000	543.92	764.97	0.00	0.07	0.00	12.00	60.00
	20.000	737.61	766.39	1.42	0.07	0.00	12.00	60.00
	20.000	806.68	766.92	0.53	0.07	0.00	12.00	60.00
	20 000	940.93	768.92	2.00	0.16	0.00	12.00	60.00
	22.500	543.92	765.32	0.00	0.35	0.00	12.00	250.00
	22.500	737.61	766.72	1.40	0.33	0.00	12.00	250.00
	22.500	806.68	767.24	0.52	0.32	0.00	12.00	250.00
	22.500	940.93	769.48	2.25	0.56	0.00	12.00	250.00
*	22.510	543.92	765.37	0.00	0.05	0.00	12.00	0.01
*	22.510	737.61	766.78	1.41	0.06	0.00	12.00	0.01
*	22.510	806.68	767.31	0.53	0.07	0.00	12.00	0.01
*	22.510	940.93	769.56	2.26	0.08	0.00	12.00	0.01
	22.700	543.92	765.40	0.00	0.04	0.00	12.00	20.00
	22.700	737.61	766.81	1.41	0.03	0.00	12.00	20.00
	22.700	806.68	767.34	0.53	0.03	0.00	12.00	20.00
	22.700	940.93	769.60	2.26	0.04	0.00	12.01	20.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	23.000	543.92	765.45	0.00	0.05	0.00	12.00	30.00
	23.000	737.61	766.86	1.41	0.04	0.00	12.00	30.00
	23.000	806.68	767.38	0.53	0.04	0.00	12.00	30.00
	23.000	940.93	769.67	2.29	0.07	0.00	12.01	30.00
*	23.100	543.92	765.52	0.00	0.07	0.00	12.00	0.01
*	23.100	737.61	766.94	1.42	0.08	0.00	12.00	0.01
*	23.100	806.68	767.47	0.54	0.09	0.00	12.00	0.01
*	23.100	940.93	769.77	2.30	0.10	0.00	12.01	0.01
	23.500	543.92	765.59	0.00	0.07	0.00	12.00	50.00
	23.500	737.61	767.00	1.41	0.07	0.00	12.00	50.00
	23.500	806.68	767.54	0.53	0.07	0.00	12.00	50.00
	23.500	940.93	769.89	2.35	0.11	0.00	12.01	50.00
	23.520	543.92	766.37	0.00	0.78	0.00	14.05	2.00
	23.520	737.61	767.81	1.44	0.81	0.00	14.06	2.00
	23.520	806.68	768.34	0.53	0.80	0.00	14.07	2.00
	23.520	940.93	770.52	2.18	0.63	0.00	14.09	2.00
	23.620	620.00	766.80	0.00	0.43	0.00	20.00	10.00
	23.620	890.00	768.22	1.41	0.40	0.00	20.00	10.00
	23.620	1020.00	768.66	0.45	0.32	0.00	20.00	10.00
	23.620	1315.00	770.58	1.92	0.06	0.00	20.01	10.00
*	23.630	620.00	767.05	0.00	0.25	0.00	20.00	0.10
*	23.630	890.00	768.47	1.41	0.25	0.00	20.00	0.10
*	23.630	1020.00	768.91	0.45	0.25	0.00	20.01	0.10
*	23.630	1315.00	770.83	1.92	0.25	0.00	20.01	0.10
	23.770	620.00	767.06	0.00	0.00	0.00	20.00	15.00
	23.770	890.00	768.47	1.41	0.00	0.00	20.00	15.00
	23.770	1020.00	768.91	0.45	0.00	0.00	20.01	15.00
	23.770	1315.00	770.84	1.93	0.01	0.00	20.01	15.00
	23.930	496.78	766.89	0.00	-0.16	0.00	12.00	16.00
	23.930	666.53	768.31	1.42	-0.16	0.00	12.00	16.00
	23.930	748.83	768.75	0.44	-0.16	0.00	12.00	16.00
	23.930	827.13	770.78	2.03	-0.06	0.00	12.01	16.00
	24.000	496.78	766.90	0.00	0.00	0.00	12.00	7.00
	24.000	666.53	768.32	1.42	0.01	0.00	12.00	7.00
	24.000	748.83	768.76	0.44	0.00	0.00	12.00	7.00
	24.000	827.13	770.79	2.04	0.01	0.00	12.01	7.00
*	24.100	496.78	766.94	0.00	0.04	0.00	12.00	0.01
*	24.100	666.53	768.36	1.42	0.04	0.00	12.00	0.01
*	24.100	748.83	768.80	0.44	0.04	0.00	12.00	0.01
*	24.100	827 13	770.83	2.04	0.04	0.00	12.01	0.01

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
25.000	496.78	767.00	0.00	0.06	0.00	12.00	100.00
25.000	666.53	768.42	1.42	0.06	0.00	12.00	100.00
25.000	748.83	768.87	0.45	0.07	0.00	12.00	100.00
25.000	827.13	771.01	2.14	0.18	0.00	12.01	100.00
27.500	496.78	767.17	0.00	0.18	0.00	12.00	250.00
27.500	666.53	768.60	1.43	0.18	0.00	12.00	250.00
27.500	748.83	769.07	0.46	0.20	0.00	12.00	250.00
27.500	827.13	771.44	2.38	0.44	0.00	12.01	250.00
28.560	496.78	767.26	0.00	0.09	0.00	12.00	106.00
28.560	666.53	768.69	1.43	0.09	0.00	12.00	106.00
28.560	748.83	769.16	0.47	0.09	0.00	12.00	106.00
28.560	827.13	771.65	2.49	0.21	0.00	12.01	106.00
28.570	496.78	767.26	0.00	0.00	0.00	12.00	1.00
28.570	666.53	768.69	1.43	0.00	0.00	12.00	1.00
28.570	748.83	769.16	0.47	0.00	0.00	12.00	1.00
28.570	827.13	772.25	3.09	0.60	0.00	12.01	1.00
28.650	496.78	768.35	0.00	1.09	0.00	32.12	8.00
28.650	666.53	769.91	1.56	1.22	0.00	32.14	8.00
28.650	748.83	770.50	0.60	1.34	0.00	32.15	8.00
28.650	827.13	773.03	2.53	0.79	0.00	32.20	8.00
28.660	615.00	768.83	0.00	0.48	0.00	32.00	1.00
28.660	885.00	770.34	1.51	0.43	0.00	32.00	1.00
28.660	1015.00	770.94	0.60	0.43	0.00	32.00	1.00
28.660	1310.00	773.41	2.48	0.38	0.00	32.01	1.00
28.990	615.00	768.92	0.00	0.09	0.00	67.97	33.00
28.990	885.00	770.47	1.55	0.13	0.00	79.04	33.00
28.990	1015.00	771.09	0.62	0.15	0.00	83.50	33.00
28.990	1310.00	773.58	2.49	0.17	0.00	173.56	33.00
29.310	615.00	768.95	0.00	0.04	0.00	103.56	32.00
29.310	885.00	770.51	1.56	0.05	0.00	114.80	32.00
29.310	1015.00	771.14	0.63	0.05	0.00	119.33	32.00
29.310	1310.00	773.62	2.48	0.03	0.00	137.23	32.00
30.130	615.00	768.91	0.00	-0.04	0.00	75.85	82.00
30.130	885.00	770.47	1.56	-0.04	0.00	94.07	82.00
30.130	1015.00	771.10	0.63	-0.04	0.00	101.42	82.00
30.130	1310.00	773.59	2.50	-0.02	0.00	130.67	82.00
30.630	615.00	768.93	0.00	0.01	0.00	75.92	50.00
30.630	885.00	770.48	1.55	0.01	0.00	94.14	50.00
30.630	1015.00	771.11	0.63	0.01	0.00	101.48	50.00
30.630	1310.00	773.60	2.49	0.01	0.00	130.67	50.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	31.670	615.00	768.93	0.00	0.00	0.00	50.00	104.00
	31.670	885.00	770.47	1.54	-0.01	0.00	50.00	104.00
	31.670	1015.00	771.09	0.62	-0.02	0.00	50.00	104.00
	31.670	1310.00	773.56	2.47	-0.04	0.00	50.01	104.00
	31.770	615.00	768.62	0.00	-0.31	0.00	24.99	10.00
	31.770	885.00	770.17	1.55	-0.30	0.00	24.99	10.00
	31.770	1015.00	770.78	0.61	-0.31	0.00	25.00	10.00
	31.770	1310.00	773.32	2.54	-0.24	0.00	25.01	10.00
*	32.060	615.00	768.27	0.00	-0.35	0.00	19.99	9.00
	32.060	885.00	769.87	1.60	-0.30	0.00	19.99	9.00
	32.060	1015.00	770.47	0.60	-0.31	0.00	20.00	9.00
	32.060	1310.00	773.11	2.64	-0.21	0.00	20.00	9.00
	32.070	615.00	768.28	0.00	0.01	0.00	19.99	1.00
	32.070	885.00	769.87	1.59	0.00	0.00	19.99	1.00
	32.070	1015.00	770.47	0.60	0.00	0.00	20.00	1.00
	32.070	1310.00	773.07	2.60	-0.04	0.00	20.00	1.00
*	33.150	615.00	768.60	0.00	0.32	0.00	19.99	108.00
	33.150	885.00	769.96	1.35	0.09	0.00	19.99	108.00
	33.150	1015.00	770.55	0.59	0.08	0.00	19.99	108.00
	33.150	1310.00	773.20	2.64	0.13	0.00	20.00	108.00
	33.160	615.00	768.62	0.00	0.01	0.00	19.99	1.00
	33.160	885.00	769.96	1.34	0.00	0.00	19.99	1.00
	33.160	1015.00	770.55	0.59	0.00	0.00	19.99	1.00
	33.160	1310.00	773.27	2.71	0.07	0.00	20.00	1.00
*	33.260	615.00	768.64	0.00	0.02	0.00	19.99	10.00
	33.260	885.00	769.97	1.33	0.01	0.00	19.99	10.00
	33.260	1015.00	770.56	0.59	0.01	0.00	19.99	10.00
	33.260	1310.00	773.27	2.71	0.00	0.00	20.00	10.00
	33.270	615.00	771.90	0.00	3.26	0.00	20.00	1.00
	33.270	885.00	772.97	1.07	3.00	0.00	20.00	1.00
	33.270	1015.00	773.45	0.48	2.89	0.00	20.00	1.00
	33.270	1310.00	774.74	1.30	1.47	0.00	20.01	1.00
	33.740	615.00	771.90	0.00	0.01	0.00	20.00	48.00
	33.740	885.00	772.98	1.08	0.01	0.00	20.00	48.00
	33.740	1015.00	773.46	0.48	0.01	0.00	20.00	48.00
	33.740	1310.00	774.75	1.30	0.01	0.00	20.01	48.00
	33.750	615.00	771.90	0.00	0.00	0.00	20.00	1.00
	33.750	885.00	772.98	1.08	0.00	0.00	20.00	1.00
	33.750	1015.00	773.46	0.48	0.00	0.00	20.00	1.00
	33.750	1310.00	774.62	1.16	-0.14	0.00	20.01	1.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
34.710	610.00	771.92	0.00	0.02	0.00	20.00	96.00
34.710	880.00	773.00	1.08	0.02	0.00	20.00	96.00
34.710	1005.00	773.48	0.48	0.03	0.00	20.00	96.00
34.710	1300.00	774.76	1.28	0.15	0.00	20.01	96.00
34.720	610.00	771.92	0.00	0.00	0.00	20.00	1.00
34.720	880.00	773.00	1.08	0.00	0.00	20.00	1.00
34.720	1005.00	773.49	0.48	0.00	0.00	20.00	1.00
34.720	1300.00	775.14	1.66	0.38	0.00	20.01	1.00
34.800	610.00	771.92	0.00	0.00	0.00	20.00	8.00
34.800	880.00	773.00	1.08	0.00	0.00	20.00	8.00
34.800	1005.00	773.49	0.48	0.00	0.00	20.00	8.00
34.800	1300.00	775.15	1.66	0.00	0.00	20.01	8.00
34.810	610.00	773.02	0.00	1.10	0.00	20.00	1.00
34.810	880.00	774.18	1.17	1.18	0.00	20.00	1.00
34.810	1005.00	774.68	0.50	1.19	0.00	20.01	1.00
34.810	1300.00	776.18	1.49	1.03	0.00	20.01	1.00
36.210	610.00	773.03	0.00	0.01	0.00	20.00	140.00
36.210	880.00	774.20	1.17	0.02	0.00	20.00	140.00
36.210	1005.00	774.70	0.50	0.02	0.00	20.00	140.00
36.210	1300.00	776.20	1.50	0.03	0.00	20.01	140.00
38.050	610.00	773.05	0.00	0.02	0.00	20.00	184.00
38.050	880.00	774.23	1.18	0.03	0.00	20.00	184.00
38.050	1005.00	774.74	0.51	0.04	0.00	20.00	184.00
38.050	1300.00	776.24	1.50	0.04	0.00	20.01	184.00
38.060	610.00	773.05	0.00	0.00	0.00	20.00	1.00
38.060	880.00	774.23	1.18	0.00	0.00	20.00	1.00
38.060	1005.00	774.73	0.49	-0.01	0.00	20.00	1.00
38.060	1300.00	776.06	1.33	-0.18	0.00	20.01	1.00
39.760	610.00	773.08	0.00	0.03	0.00	20.00	170.00
39.760	880.00	774.27	1.19	0.03	0.00	20.00	170.00
39.760	1005.00	774.80	0.53	0.07	0.00	20.00	170.00
39.760	1300.00	776.30	1.50	0.24	0.00	20.01	170.00
39.770	610.00	773.08	0.00	0.00	0.00	20.00	1.00
39.770	880.00	774.27	1.19	0.00	0.00	20.00	1.00
39.770	1005.00	774.80	0.53	0.00	0.00	20.00	1.00
39.770	1300.00	776.78	1.98	0.48	0.00	20.01	1.00
39.860	610.00	773.08	0.00	0.00	0.00	20.00	9.00
39.860	880.00	774.27	1.19	0.00	0.00	20.00	9.00
39.860	1005.00	774.80	0.53	0.00	0.00	20.00	9 00
39.860	1300.00	776.78	1.98	0.00	0.00	20.01	9.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
39.870	610.00	774.58	0.00	1.50	0.00	20.00	1.00
39.870	880.00	775.73	1.15	1.46	0.00	20.00	1.00
39.870	1005.00	776.24	0.51	1.44	0.00	20.01	1.00
39.870	1300.00	777.82	1.58	1.04	0.00	20.01	1.00
41.590	605.00	774.61	0.00	0.02	0.00	20.00	172.00
41.590	870.00	775.76	1.16	0.03	0.00	20.00	172.00
41.590	995.00	776.28	0.51	0.03	0.00	20.00	172.00
41.590	1290.00	777.86	1.58	0.04	0.00	20.01	172.00
43.350	605.00	774.63	0.00	0.02	0.00	20.00	176.00
43.350	870.00	775.79	1.17	0.03	0.00	20.00	176.00
43.350	995.00	776.31	0.52	0.03	0.00	20.00	176.00
43.350	1290.00	777.90	1.59	0.04	0.00	20.01	176.00
43.360	605.00	774.63	0.00	0.00	0.00	20.00	1.00
43.360	870.00	775.79	1.17	0.00	0.00	20.00	1.00
43.360	995.00	776.30	0.51	-0.01	0.00	20.00	1.00
43.360	1290.00	777.71	1.41	-0.18	0.00	20.01	1.00
45.860	605.00	774.67	0.00	0.04	0.00	20.00	250.00
45.860	870.00	775.84	1.18	0.05	0.00	20.00	250.00
45.860	995.00	776.40	0.56	0.10	0.00	20.00	250.00
45.860	1290.00	778.06	1.66	0.35	0.00	20.01	250.00
45.870	600.00	774.68	0.00	0.01	0.00	20.00	1.00
45.870	865.00	775.85	1.18	0.01	0.00	20.00	1.00
45.870	990.00	776.41	0.56	0.01	0.00	20.00	1.00
45.870	1285.00	778.52	2.11	0.46	0.00	20.01	1.00
45.970	600.00	774.68	0.00	0.00	0.00	20.00	10.00
45.970	865.00	775.86	1.18	0.00	0.00	20.00	10.00
45.970	990.00	776.42	0.56	0.00	0.00	20.00	10.00
45.970	1285.00	778.52	2.10	0.00	0.00	20.01	10.00
45.980	600.00	776.12	0.00	1.44	0.00	20.00	1.00
45.980	865.00	777.25	1.13	1.39	0.00	20.00	1.00
45.980	990.00	777.77	0.52	1.35	0.00	20.01	1.00
45.980	1285.00	779.49	1.73	0.97	0.00	20.01	1.00
48.330	600.00	776.15	0.00	0.03	0.00	20.00	235.00
48.330	865.00	777.29	1.14	0.04	0.00	20.00	235.00
48.330	990.00	777.81	0.52	0.04	0.00	20.00	235.00
48.330	1285.00	779.54	1.73	0.04	0.00	20.01	235.00
48.340	600.00	776.15	0.00	0.00	0.00	20.00	1.00
48.340	865.00	777.29	1.14	0.00	0.00	20.00	1.00
48.340	990.00	777.80	0.51	-0.01	0.00	20.00	1.00
48.340	1285.00	779.35	1.55	-0.19	0.00	20.01	1.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
49.240	600.00	776.16	0.00	0.01	0.00	20.00	90.00
49.240	865.00	777.30	1.14	0.02	0.00	20.00	90.00
49.240	990.00	777.84	0.54	0.04	0.00	20.00	90.00
49.240	1285.00	779.47	1.63	0.12	0.00	20.01	90.00
49.250	600.00	776.16	0.00	0.00	0.00	20.00	1.00
49.250	865.00	777.30	1.14	0.00	0.00	20.00	1.00
49.250	990.00	777.85	0.55	0.01	0.00	20.00	1.00
49.250	1285.00	780.01	2.16	0.54	0.00	20.01	1.00
49.340	600.00	776.16	0.00	0.00	0.00	20.00	9.00
49.340	865.00	777.31	1.14	0.00	0.00	20.00	9.00
49.340	990.00	777.85	0.55	0.00	0.00	20.00	9.00
49.340	1285.00	780.02	2.16	0.00	0.00	20.01	9.00
49.350	600.00	777.38	0.00	1.22	0.00	20.00	1.00
49.350	865.00	778.54	1.16	1.23	0.00	20.00	1.00
49.350	990.00	779.06	0.52	1.21	0.00	20.01	1.00
49.350	1285.00	780.95	1.90	0.94	0.00	20.01	1.00
50.410	600.00	777.39	0.00	0.01	0.00	20.00	106.00
50.410	865.00	778.55	1.16	0.02	0.00	20.00	106.00
50.410	990.00	779.07	0.52	0.02	0.00	20.01	106.00
50.410	1285.00	780.97	1.90	0.02	0.00	20.01	106.00
51.550	600.00	777.40	0.00	0.01	0.00	20.00	114.00
51.550	865.00	778.57	1.17	0.01	0.00	20.00	114.00
51.550	990.00	779.09	0.52	0.02	0.00	20.00	114.00
51.550	1285.00	780.99	1.90	0.02	0.00	20.01	114.00

SUMMARY OF ERRORS AND SPECIAL NOTES

```
CAUTION  SECNO=    0.330  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    0.330  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=    0.330  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO=    0.330  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    0.330  PROFILE= 2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=    0.330  PROFILE= 2  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO=    0.330  PROFILE= 3  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    0.330  PROFILE= 3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=    0.330  PROFILE= 3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO=    0.330  PROFILE= 4  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    0.330  PROFILE= 4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=    0.330  PROFILE= 4  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO=    0.500  PROFILE= 3  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    0.500  PROFILE= 3  MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=    0.500  PROFILE= 4  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    0.500  PROFILE= 4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=    0.500  PROFILE= 4  20 TRIALS ATTEMPTED TO BALANCE WSEL

NOTE     SECNO=   18.390  PROFILE= 1  WSEL BASED ON X5 LINE
NOTE     SECNO=   18.390  PROFILE= 2  WSEL BASED ON X5 LINE
NOTE     SECNO=   18.390  PROFILE= 3  WSEL BASED ON X5 LINE
NOTE     SECNO=   18.390  PROFILE= 4  WSEL BASED ON X5 LINE

NOTE     SECNO=   18.541  PROFILE= 1  WSEL BASED ON X5 LINE
NOTE     SECNO=   18.541  PROFILE= 2  WSEL BASED ON X5 LINE
NOTE     SECNO=   18.541  PROFILE= 3  WSEL BASED ON X5 LINE
NOTE     SECNO=   18.541  PROFILE= 4  WSEL BASED ON X5 LINE

NOTE     SECNO=   22.510  PROFILE= 1  WSEL BASED ON X5 LINE
NOTE     SECNO=   22.510  PROFILE= 2  WSEL BASED ON X5 LINE
NOTE     SECNO=   22.510  PROFILE= 3  WSEL BASED ON X5 LINE
NOTE     SECNO=   22.510  PROFILE= 4  WSEL BASED ON X5 LINE

NOTE     SECNO=   23.100  PROFILE= 1  WSEL BASED ON X5 LINE
NOTE     SECNO=   23.100  PROFILE= 2  WSEL BASED ON X5 LINE
NOTE     SECNO=   23.100  PROFILE= 3  WSEL BASED ON X5 LINE
NOTE     SECNO=   23.100  PROFILE= 4  WSEL BASED ON X5 LINE

NOTE     SECNO=   23.630  PROFILE= 1  WSEL BASED ON X5 LINE
NOTE     SECNO=   23.630  PROFILE= 2  WSEL BASED ON X5 LINE
NOTE     SECNO=   23.630  PROFILE= 3  WSEL BASED ON X5 LINE
NOTE     SECNO=   23.630  PROFILE= 4  WSEL BASED ON X5 LINE

NOTE     SECNO=   24.100  PROFILE= 1  WSEL BASED ON X5 LINE
NOTE     SECNO=   24.100  PROFILE= 2  WSEL BASED ON X5 LINE
NOTE     SECNO=   24.100  PROFILE= 3  WSEL BASED ON X5 LINE
NOTE     SECNO=   24.100  PROFILE= 4  WSEL BASED ON X5 LINE

CAUTION  SECNO=   32.060  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   32.060  PROFILE= 1  MINIMUM SPECIFIC ENERGY
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CAUTION  SECNO=   33.150  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   33.150  PROFILE= 1  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=   33.260  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   33.260  PROFILE= 1  MINIMUM SPECIFIC ENERGY
```

THIS RUN EXECUTED 17-DEC-90 17:08:26

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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55
**************************************************
```



1) COUNTY: KALAMAZOO

2) STUDY NAME: KALAMAZOO, CITY OF

3) WATERCOURSE: ~~ARCADIA~~ CREEK

4) DOCUMENT TYPE: RATING CURVE RUN

~~East~~ ~~of~~
~~East~~ OF COOLEY TO
~~West~~ West of Elm Street
1977



```
*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
  ERROR CORR -  01
  MODIFICATION -  50,51,52
*****************************************************

C
T1RATING CURVE COMPUTATIONS FOR ENCLOSURE FROM EAST OF COOLEY TO WEST OF ELM ST
T2STARTING WATER SURFACE TAKEN FROM A D/S RUN OF OVERLAND FLOW
T3      ARCADIA CREEK KALAMAZOO

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      0.        2.        0.        0.  0.000000      0.00       0.0       0.   763.000     0.000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     1.000     0.000    -1.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    150.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

J5  LPRNT     NUMSEC                  ********REQUESTED SECTION NUMBERS********

    -10.000   -10.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
NC      0.000     0.000     0.000     0.300     0.500     0.000     0.000     0.000     0.000     0.000
BT      0.000   230.000   220.000   220.000   227.000     0.000     0.000     0.000     0.000     0.000

        D/S END OF THE ENCLOSURE EAST OF COOLEY STREET

X1      1.000     6.000    50.000    50.000     0.000     0.000     0.000     0.000     0.000     0.000
X3     10.000     0.000     0.000     0.000     0.000     0.000     0.000   900.000   900.000     0.000
GR    784.000     0.000   783.200    50.000   776.700    50.100   776.700    58.400   783.200    58.500
GR    784.000   100.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
SB      0.000    56.500     2.600     0.000     0.500     0.000    56.300     0.000   783.900   777.000

        U/S END OF THE ENCLOSURE WEST OF ELM STREET

X1      2.000     0.000     0.000     0.000  1910.000  1910.000  1910.000     0.000     6.900     0.000
X2      0.000     0.000     0.000   790.400   900.000     0.000     0.000     0.000     0.000     0.000
X3     10.000     0.000     0.000     0.000     0.000     0.000     0.000   900.000   900.000     0.000
EJ      0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
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HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
ERROR CORR - 01
MODIFICATION - 50,51,52
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

ARCADIA CREEK KALAMAZOO

SUMMARY PRINTOUT TABLE 150

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10KPS	VCH	AREA	.01K
1.000	0.00	0.00	0.00	776.70	230.00	783.06	0.00	783.35	0.00	4.31	53.41	147708.60
1.000	0.00	0.00	0.00	776.70	228.00	783.34	0.00	783.60	0.00	4.09	55.79	156844.40
1.000	0.00	0.00	0.00	776.70	228.00	783.42	0.00	783.67	0.00	4.04	56.47	159660.90
1.000	0.00	0.00	0.00	776.70	227.00	783.62	0.00	783.86	0.00	3.90	58.17	166704.80
2.000	1910.00	900.00	790.40	783.60	230.00	792.53	0.00	792.67	0.00	3.06	75.23	241251.70
2.000	1910.00	900.00	790.40	783.60	228.00	792.65	0.00	792.79	0.00	2.99	76.25	245904.70
2.000	1910.00	900.00	790.40	783.60	228.00	792.73	0.00	792.87	0.00	2.96	76.95	249102.60
2.000	1910.00	900.00	790.40	783.60	227.00	792.85	0.00	792.98	0.00	2.91	77.99	253873.50

ARCADIA CREEK KALAMAZOO

SUMMARY PRINTOUT TABLE 150

SECNO	X	CHSEL	DIF.SP	DIFHSX	DIFKES	TOPWID	XLOB
1.000	230.00	783.06	0.00	0.00	0.00	8.50	0.00
1.000	228.00	783.34	0.00	0.00	0.00	8.50	0.00
1.000	220.00	783.62	0.00	0.00	0.00	8.50	0.00
1.000	227.00	783.62	0.00	0.00	0.00	8.50	0.00
2.000	230.00	792.53	0.00	9.67	0.00	8.50	1910.00
2.000	228.00	792.65	0.00	9.31	0.00	8.50	1910.00
2.000	220.00	792.73	0.00	9.31	0.00	8.50	1910.00
2.000	227.00	792.85	0.00	9.23	0.00	8.50	1910.00

SUMMARY OF ERRORS

PRINTED IN U.S.A.

00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: KALAMAZOO, CITY OF

3) WATERCOURSE: ARCADIA CREEK

4) DOCUMENT TYPE: RATING CURVE RUN

~~E~~ East ~~E~~. OF COOLEY TO ~~W~~ West of Elm Street

1977

00BREAK00

```
*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
  ERROR CORR -  01
  MODIFICATION -  50,51,52
*****************************************************

C
T1RATING CURVE COMPUTATIONS FOR ENCLOSURE FROM EAST OF COOLEY TO WEST OF ELM ST
T2STARTING WATER SURFACE TAKEN FROM A D/S RUN OF OVERLAND FLOW
T3      ARCADIA CREEK KALAMAZOO

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      0.        2.        0.        0.  0.000000      0.00       0.0        0.   763.000     0.000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IDW       CHNIM     ITRACE

     1.000     0.000    -1.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    150.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

J5  LPRNT     NUMSEC                    ********REQUESTED SECTION NUMBERS********

    -10.000   -10.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
NC      0.000     0.000     0.000     0.000     0.500     0.000     0.000     0.000     0.000     0.000
BT      5.000   250.000   220.000   220.000   227.000     0.000     0.000     0.000     0.000     0.000

        D/S END OF THE ENCLOSURE EAST OF COOLEY STREET

X1      1.000     6.000    50.000    50.000     0.000     0.000     0.000     0.000     0.000     0.000
X3     10.000     0.000     0.000     0.000     0.000     0.000     0.000   900.000   900.000     0.000
GR    784.000     0.000   783.200    50.000   776.700    50.100   776.700    58.400   783.200    58.500
GR    784.000   100.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
SB      0.000    37.500     2.600     0.000     0.000     0.000    56.300     0.000   783.900   777.000

        U/S END OF THE ENCLOSURE WEST OF ELM STREET

X1      2.000     0.000     0.000     0.000  1910.000  1910.000  1910.000     0.000     6.900     0.000
X2      0.000     0.000     1.000   790.400   900.000     0.000     0.000     0.000     0.000     0.000
X3     10.000     0.000     0.000     0.000     0.000     0.000     0.000   900.000   900.000     0.000
EJ      0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
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HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
ERROR CORR - 01
MODIFICATION - 30,31,32

****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

ARCADIA CREEK KALAMAZOO

SUMMARY PRINTOUT TABLE 150

SECNO	XLOB	ELTRD	ELLOB	ELMIN	Q	CWSEL	CRIWS	EG	IOPT	VCH	AREA	.01*K
1.000	0.00	0.00	0.00	776.70	230.00	783.06	0.00	783.35	0.00	4.31	53.41	147708.60
1.000	0.00	0.00	0.00	776.70	228.00	783.34	0.00	783.60	0.30	4.09	55.79	156844.40
1.000	0.00	0.00	0.00	776.70	228.00	783.42	0.00	783.67	0.30	4.04	56.47	159465.50
1.000	0.00	0.00	0.00	776.70	227.00	783.62	0.00	783.86	0.30	3.90	58.17	166761.60
2.000	1910.00	950.00	790.40	783.60	230.00	792.53	0.00	792.67	0.00	3.06	75.23	241259.70
2.000	1910.00	950.00	790.40	783.60	228.00	792.65	0.00	792.79	0.00	2.99	76.25	245904.70
2.000	1910.00	950.00	790.40	783.60	228.00	792.73	0.00	792.87	0.00	2.96	76.95	249102.60
2.000	1910.00	950.00	790.40	783.60	227.00	792.65	0.00	792.93	0.30	2.91	77.99	253873.50

ARCADIA CREEK KALAMAZOO

SUMMARY PRINTOUT TABLE 150

SECNO	Q	CHSEL	DIF.SP	DIFUSK	DIFKUS	TOPWID	KLCH
1.000	230.00	783.06	0.00	0.00	0.00	6.50	0.00
1.000	228.00	783.34	0.00	0.00	0.00	8.50	0.00
1.000	220.00	783.42	0.00	0.00	0.00	6.50	0.00
1.000	227.00	783.62	0.00	0.00	0.00	6.50	0.00
2.000	230.00	792.53	0.00	9.47	0.00	8.50	1910.00
2.000	228.00	792.65	0.00	9.31	0.00	8.50	1910.00
2.000	220.00	792.73	0.00	9.39	0.00	8.50	1910.00
2.000	227.00	792.05	0.00	9.23	0.00	8.50	1910.00

SUMMARY OF ERRORS

00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: KALAMAZOO, CITY OF

3) WATERCOURSE: ARCADIA CREEK

4) DOCUMENT TYPE: RATING CURVE RUN

LOVELL ST to 500 ft downstream of Oliver

00BREAK00

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**************************************************
   NEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
   ERROR CORR -  01
   MODIFICATION -  50,51,52
**************************************************

C
T1RATING CURVE COMPUTATIONS FOR ENCLOSURE FROM LOWELL ST TO 500 FT D/S OF OLIVER
T2STARTING WATER SURFACE TAKEN FROM A D/S RUN OF OVERLAND FLOW
T3      ARCADIA CREEK KALAMAZOO

J1  ICHECK     INQ        NINV       IDIR       STRT       DETRIC     HVINS      Q          WSEL       FQ
         0.         2.         0.         0.  0.000000       0.00       0.0        0.    790.010      0.000

J2  NPROF      IPLOT      PRFVS      XSECV      XSECH      FN         ALLDC      IBH        CHNIM      ITRACE
     1.000      0.000     -1.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT
   150.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000

J5  LPRNT      NUMSEC                          ********REQUESTED SECTION NUMBERS********
    -10.000    -10.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000
NC      0.000      0.000      0.000      0.300      0.500      0.000      0.000      0.000      0.000      0.000
CT      4.000    125.000    124.000    124.000    124.000      0.000      0.000      0.000      0.000      0.000

          D/S END OF THE ENCLOSURE AT LOWELL STREET
X1      1.000      6.000     50.000     54.000      0.000      0.000      0.000      0.000      0.000      0.000
X3     10.000      0.000      0.000      0.000      0.000      0.000      0.000    900.000    900.000      0.000
GR    798.000      0.000    797.000     50.000    791.900     50.100    792.000     53.900    797.000     54.000
GR    790.000    100.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000
SB      0.000     21.500      2.600      0.500      4.000      0.000     19.630      0.000    603.400    792.000

          U/S END OF THE ENCLOSURE AT CULVERT ON STADIUM DRIVE;500' D/S OF OLIVER
X1      2.000      0.000      0.000      0.000   2500.000   2500.000   2500.000      0.000     11.400      0.000
X2      0.000      0.000      1.000    808.400    990.000      0.000      0.000      0.000      0.000      0.000
X3     10.000      0.000      0.000      0.000      0.000      0.000      0.000    900.000    900.000      0.000
EJ      0.000      0.000      0.500      0.000      0.000      0.000      0.000      0.000      0.000      0.000
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CAUTION

SEE

ATTACHED COMMENTS

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FEC2 RELEASE DATED NOV 76 UPDATED FEB 1977

ERROR CORR - 01

MODIFICATION - 30,51,52

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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

ARCADIA CREEK KALAMAZOO

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRTLS	EG	10K*S	VCH	AREA	.01K
	1.000	0.00	0.00	0.00	791.90	125.00	798.01	0.00	798.44	0.00	5.27	23.74	48080.20
	1.000	0.00	0.00	0.00	791.90	124.00	798.69	0.00	799.03	0.00	4.69	26.45	55922.02
	1.000	0.00	0.00	0.00	791.90	124.00	799.07	0.00	799.49	0.00	4.36	27.18	58037.93
	1.000	0.00	0.00	0.00	791.90	124.00	799.36	0.00	799.64	0.00	4.26	29.14	63063.74
	2.000	2500.00	900.00	808.40	803.30	125.00	811.30	0.00	811.55	0.00	3.99	31.30	70400.56
	2.000	2500.00	900.00	808.40	803.30	124.00	811.80	0.00	812.01	0.00	3.73	33.28	76501.44
	2.000	2500.00	900.00	808.40	803.30	124.00	811.99	0.00	812.19	0.00	3.64	34.06	78851.94
	2.000	2500.00	900.00	808.40	803.30	127.00	812.50	0.00	812.68	0.00	3.44	36.99	85269.50

FORM 1611-D PRINTED BY DOT-AV MANIFOLD FORMS

ARCADIA CREEK KALAMAZOO

SUMMARY PRINTOUT TABLE 150

SECNO	Q	CHSEL	DIFMSP	DIFMSX	DIFKMS	TCPMID	XLCH
1.000	125.00	798.01	0.00	0.00	0.00	4.00	0.00
1.000	124.00	798.69	0.00	0.00	0.00	4.00	0.00
1.000	124.00	798.87	0.00	0.00	0.00	4.00	0.00
1.000	124.00	799.36	0.00	0.00	0.00	4.00	0.00
2.000	125.00	811.30	0.00	13.29	0.00	4.00	2500.00
2.000	124.00	811.80	0.00	13.11	0.00	4.00	2500.00
2.000	124.00	811.99	0.00	13.12	0.00	4.00	2500.00
2.000	124.00	812.50	0.00	13.14	0.00	4.00	2500.00

SUMMARY OF ERRORS

00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: KALAMAZOO, CITY OF

3) WATERCOURSE: ARCADIA CREEK

4) DOCUMENT TYPE: RATING CURVE RUN BETWEEN POND AND JUNCTION BOX

00BREAK00

STS CONSULTANTS, LTD
3340 Ranger Road
Lansing, Michigan 48906

REPORT OF SIEVE ANALYSIS

STS Job No. 1069R Project: Arcadia Creek

Date: 11-04-86 Client: Kalamazoo Downtown Development Authority

Sample Description: Dark brown fine to medium sand, some silt and clay, trace coarse sand and organic

Sample Location/Identification: B-26 S-3 5'-6.5'

Sieve Size Number	Weight Retained (grams)	Percent Retained	Cumulative Percent Passing	Specifications
2 1/2-Inch				
2-Inch				
1 1/2-Inch				
1-Inch				
3/4-Inch				
1/2-Inch				
3/8-Inch	0	0	100	
No. 4	0.2	0.2	99.8	
No. 8	1.2	1.4	98.4	
No. 10				
No. 16	2.6	3.0	95.4	
No. 30	8.5	9.7	85.7	
No. 50	23.5	26.9	58.8	
No. 80				
No. 100	21.7	24.8	34.0	
No. 200	9.8	11.1	22.9	
Pan	6.8+13.3=20.1	22.9		
Total Weight	87.6			

Weight of oven dry soil before washing: 87.6 g

Weight of oven dry soil after washing: 74.3 g

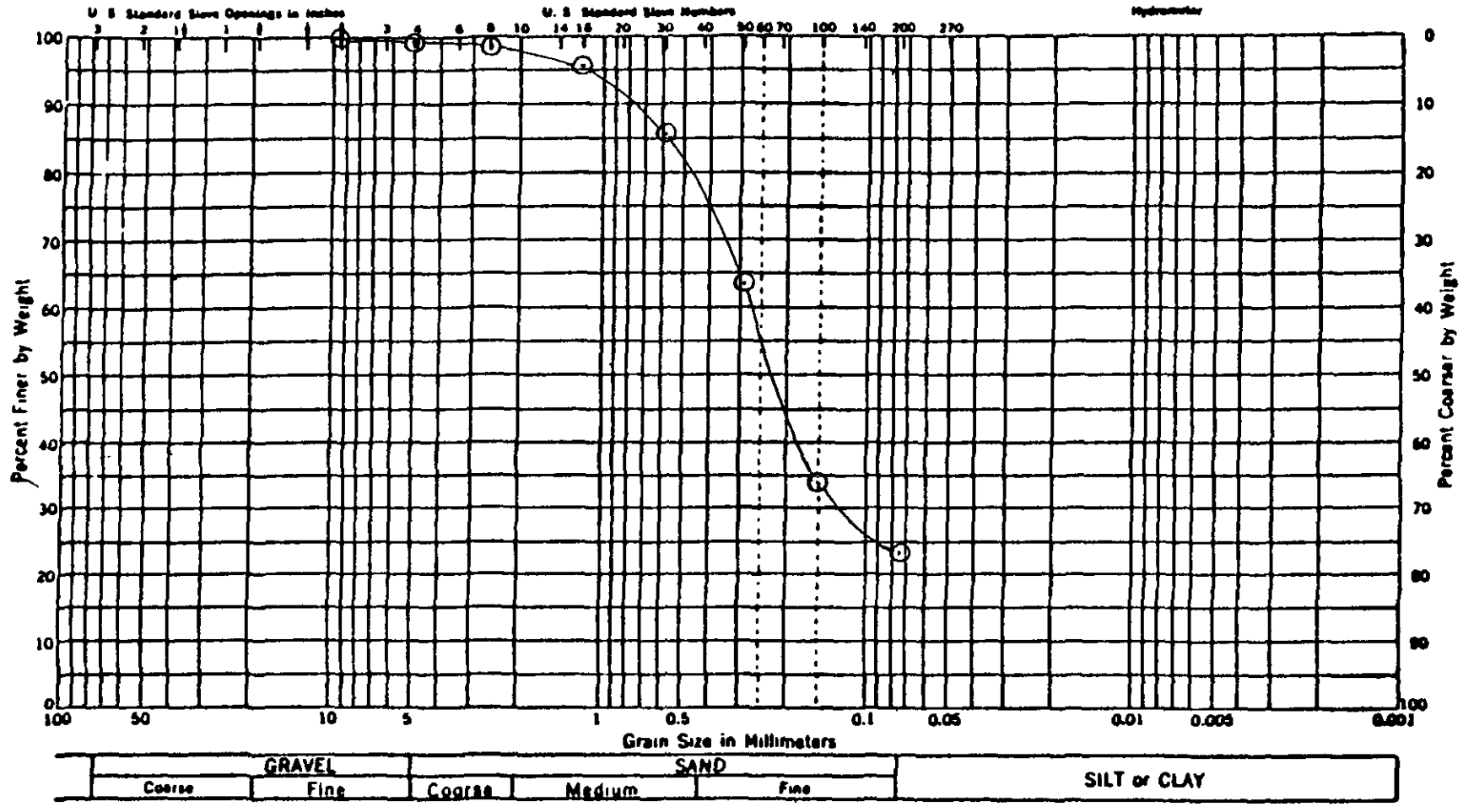
Weight loss by wash: 13.3 g

Remarks:

Checked by: Bob Andrews

Technician: Tom Miller

UNIFIED CLASSIFICATION SYSTEM



SAMPLE NO.	W.C.	LL	PL	PI	CLASSIFICATION
B-26					Fine to medium sand, some clay, little
S-3					organics, trace coarse sand-black (SC)

STS Consultants Ltd.
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Lansing, Michigan 48906
(517) 321-4964

DRAWN	APPROVED	DATE	JOB No.
MLY	WEH	11-12-86	1069R

STS CONSULTANTS, LTD
3340 Ranger Road
Lansing, Michigan 48906

REPORT OF SIEVE ANALYSIS

STS Job No. 1069R Project: Arcadia Creek

Date: 11-04-86 Client: Kalamazoo Downtown Development Authority

Sample Description: Brown medium sand to fine gravel, little fine sand, trace clay and silt

Sample Location/Identification: B-26 S-6 15'-16.5'

Sieve Size Number	Weight Retained (grams)	Percent Retained	Cumulative Percent Passing	Specifications
2 1/2-Inch				
2-Inch				
1 1/2-Inch				
1-Inch	0	0	100	
3/4-Inch	14.4	7.6	92.4	
1/2-Inch	27.9	14.8	77.6	
3/8-Inch	8.9	4.7	72.9	
No. 4	45.3	24.0	48.9	
No. 8	27.4	14.5	34.4	
No. 10				
No. 16	19.7	10.4	24.0	
No. 30	14.8	7.8	16.2	
No. 50	15.9	8.4	7.8	
No. 80				
No. 100	6.1	3.2	4.6	
No. 200	2.2	1.2	3.4	
Pan	0.6+5.9=6.5	3.4		
Total Weight	189.1			

Weight of oven dry soil before washing: 189.1 gr

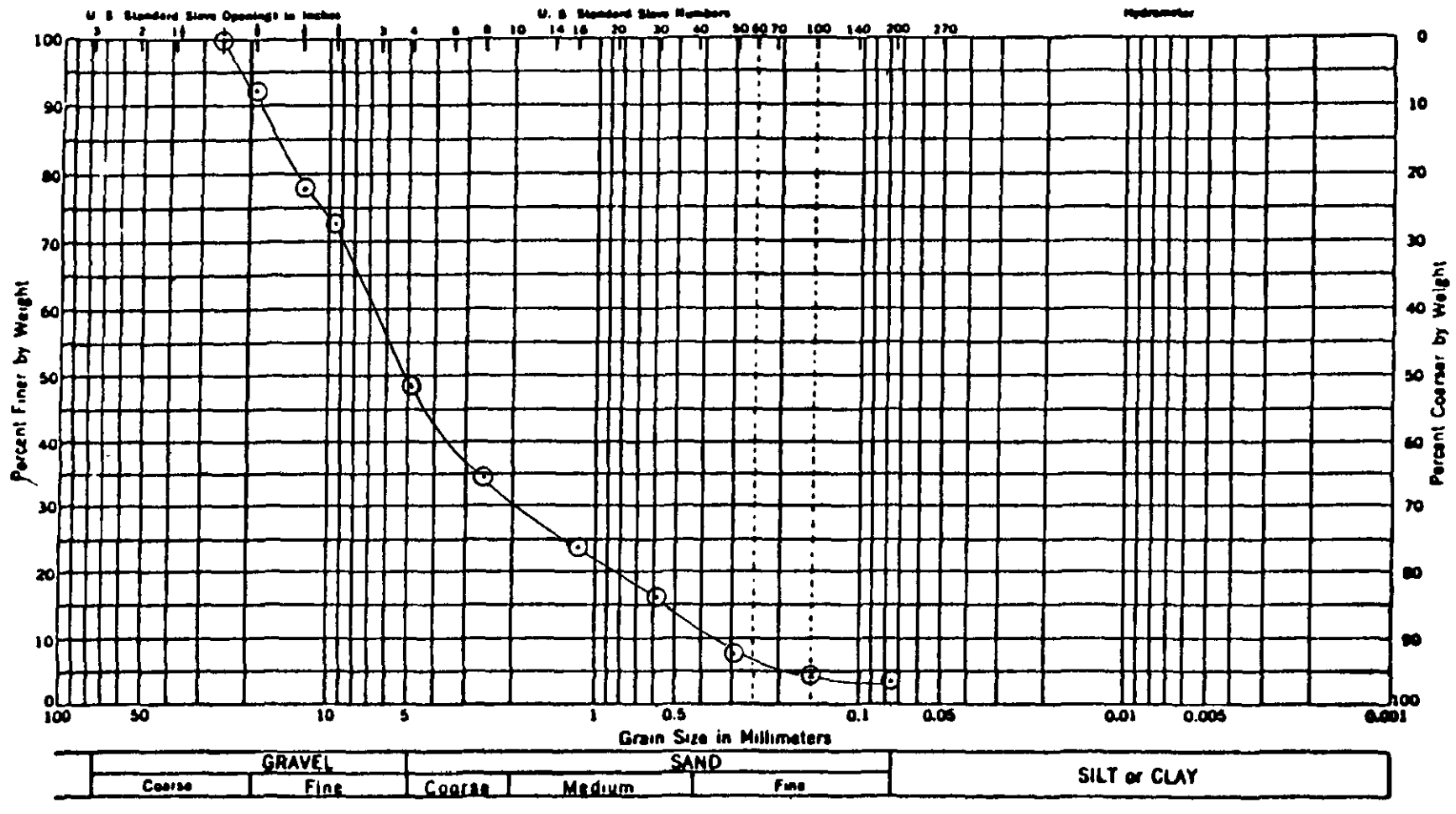
Weight of oven dry soil after washing: 183.2 gr

Weight loss by wash: 5.9 gr

Remarks:

Checked by: Bob Andrews Technician: Tom Miller

UNIFIED CLASSIFICATION SYSTEM



SAMPLE NO.	W.C.	LL	PL	PI	CLASSIFICATION
B-26					Sandy gravel, trace silt-brown (GW)
S-6					

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DRAWN	APPROVED	DATE	JOB No.
MLY	WEH	11-12-86	1069R

STS CONSULTANTS, LTD
3340 Ranger Road
Lansing, Michigan 48906

REPORT OF SIEVE ANALYSIS

STS Job No. 1069R Project: Arcadia Creek

Date: 11-04-86 Client: Kalamazoo Downtown Development Authority

Sample Description: Brown fine to medium sand, little coarse sand, fine gravel, silt, clay

Sample Location/Identification: B-27 S-6 15'-16.5'

Sieve Size Number	Weight Retained (grams)	Percent Retained	Cumulative Percent Passing	Specifications
2 1/2-Inch				
2-Inch				
1 1/2-Inch				
1-Inch				
3/4-Inch				
1/2-Inch	0	0	100	
3/8-Inch	4.6	4.3	95.7	
No. 4	6.6	6.2	89.5	
No. 8	3.7	3.5	86.0	
No. 10				
No. 16	4.3	4.0	82.0	
No. 30	6.5	6.1	75.9	
No. 50	22.6	21.2	54.7	
No. 80				
No. 100	37.1	34.9	19.8	
No. 200	10.6	9.9	9.9	
Pan	0.8+9.8=10.6	9.9		
Total Weight	106.6			

Weight of oven dry soil before washing: 106.6 g

Weight of oven dry soil after washing: 96.8 g

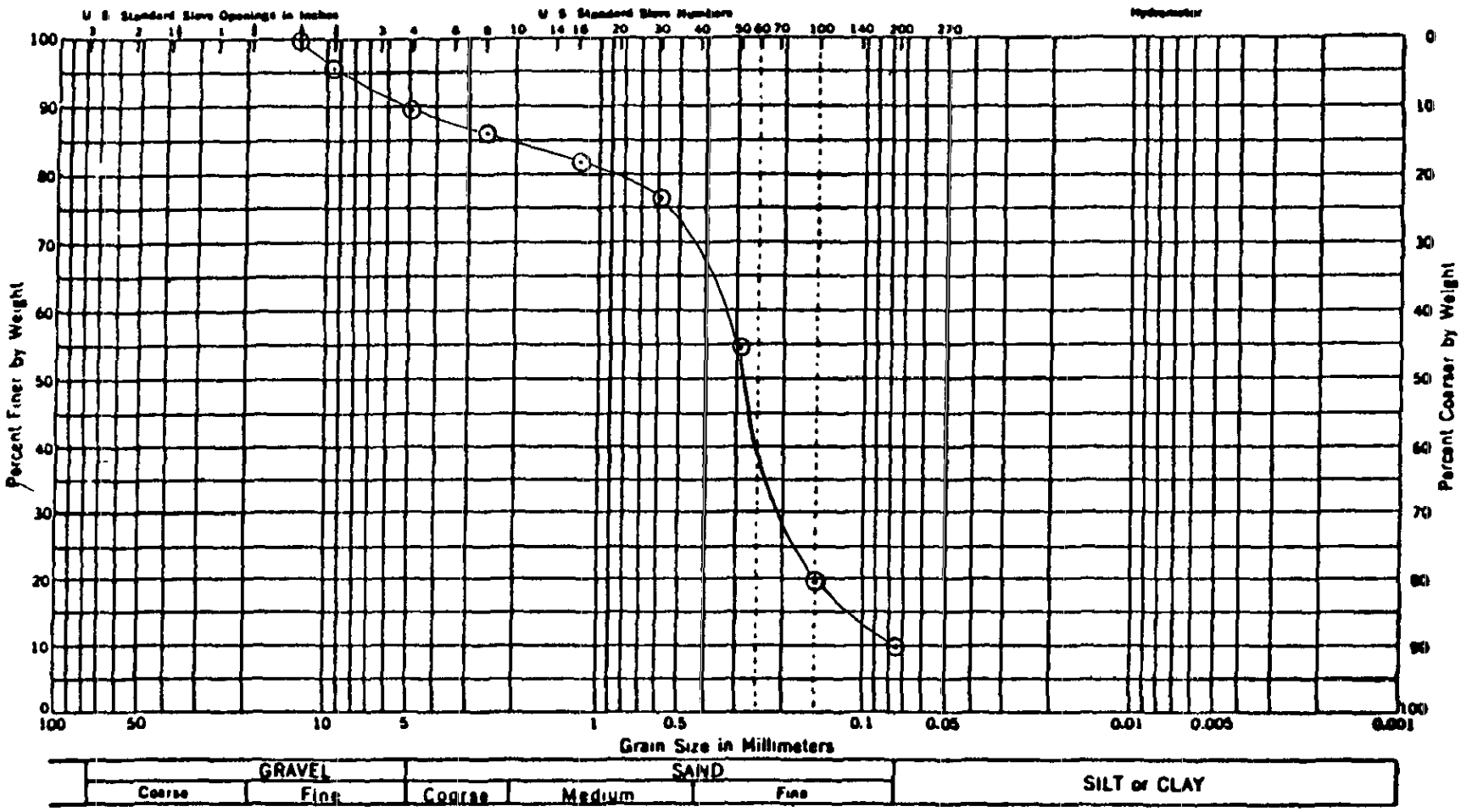
Weight loss by wash: 9.8 g

Remarks:

Checked by: Bob Andrews

Technician: Tom Miller

UNIFIED CLASSIFICATION SYSTEM



SAMPLE NO.	W.C.	LL	PL	PI	CLASSIFICATION
B-27					Fine to coarse sand, trace gravel and
S-6					silt-brown (SP-SM)

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(517) 321-4964

DRAWN	APPROVED	DATE	JOB No.
MLY	WEH	11-12-86	1069R

STS CONSULTANTS, LTD
3340 Ranger Road
Lansing, Michigan 48906

REPORT OF SIEVE ANALYSIS

STS Job No. 1069R Project: Arcadia Creek
Date: 11/4/86 Client: Kalamazoo Downtown Development Authority
Sample Description: Brown fine to coarse sand, little clay, silt & fine gravel
Sample Location/Identification: B-28 S-2 2.5' - 4.0'

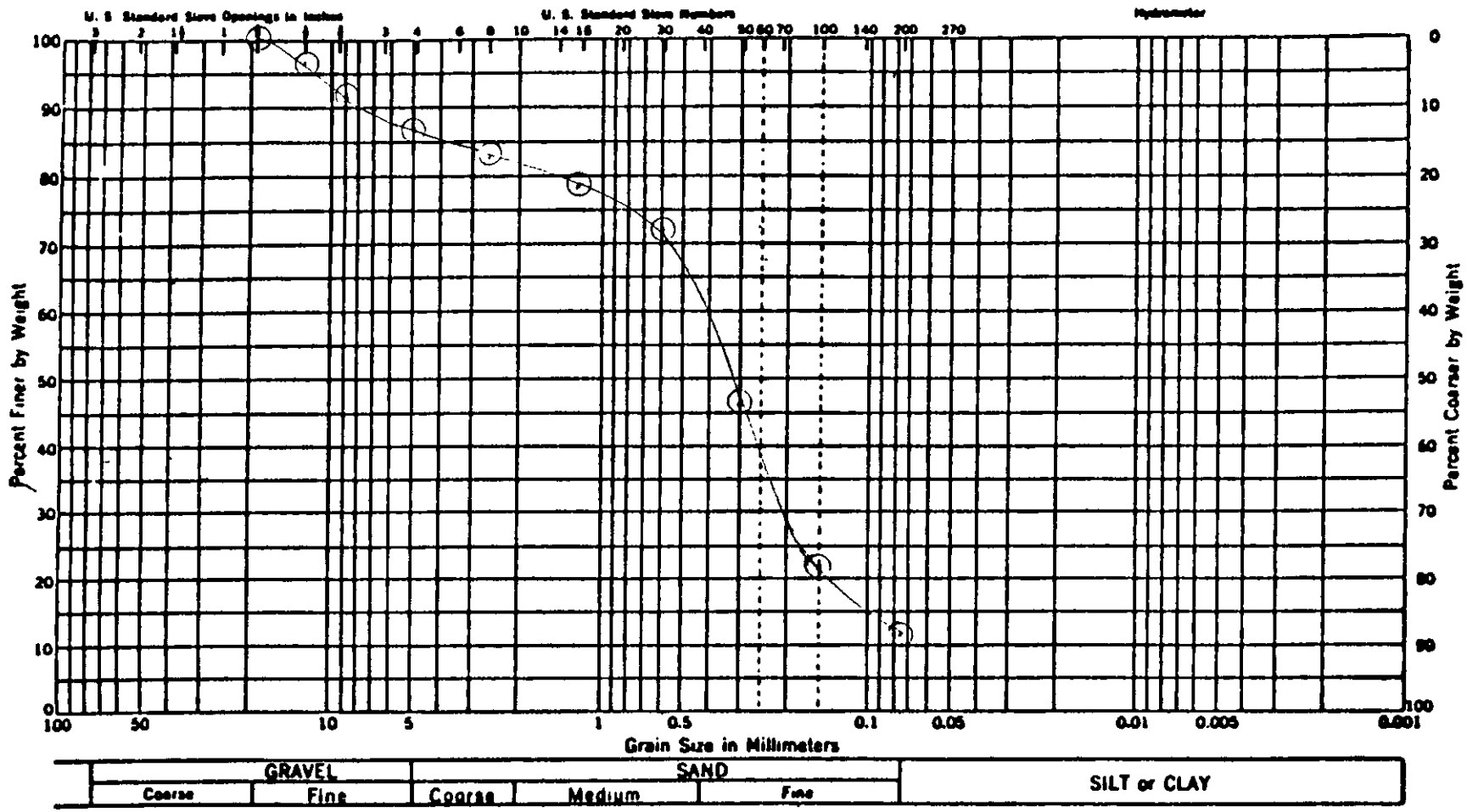
Sieve Size Number	Weight Retained (grams)	Percent Retained	Cumulative Percent Passing	Specifications
2 1/2-Inch				
2-Inch				
1 1/2-Inch				
1-Inch				
3/4-Inch	0.0	0.0	100.0	
1/2-Inch	5.8	4.3	95.7	
3/8-Inch	4.0	3.0	92.7	
No. 4	7.3	5.4	87.3	
No. 8	5.1	3.8	83.5	
No. 10				
No. 16	5.9	4.4	79.1	
No. 30	9.0	6.5	72.6	
No. 50	36.7	27.1	45.5	
No. 80				
No. 100	31.9	23.5	22.0	
No. 200	13.3	9.8	12.2	
Pan	3.8 + 12.7 = 16.5	12.2		
Total Weight	135.5			

Weight of oven dry soil before washing: 135.5 gr
Weight of oven dry soil after washing: 122.8 gr
Weight loss by wash: 12.7 gr

Remarks:

Checked by: Bob Andrews Technician: Tom Miller

UNIFIED CLASSIFICATION SYSTEM



SAMPLE NO.	W.C.	LL	PL	PI	CLASSIFICATION
B-28					Dark brownish gray fine to coarse sand,
S-2					little silt, and fine gravel. (SM)

STS Consultants Ltd.
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DRAWN	APPROVED	DATE	JOB No.
TSP	WEH	11-12-86	1069R

STS CONSULTANTS, LTD
3340 Ranger Road
Lansing, Michigan 48906

REPORT OF SIEVE ANALYSIS

STS Job No. 1069R Project: Arcadia Creek

Date: 11-04-86 Client: Kalamazoo Downtown Development Authority

Sample Description: Brown medium sand to fine gravel, little fine sand, trace clay and silt

Sample Location/Identification: B-28 S-7 18'-20'

Sieve Size Number	Weight Retained (grams)	Percent Retained	Cumulative Percent Passing	Specifications
2 1/2-Inch				
2-Inch				
1 1/2-Inch				
1-Inch				
3/4-Inch	0	0	100	
1/2-Inch	28.6	17.4	82.6	
3/8-Inch	13.5	8.2	74.4	
No. 4	27.4	16.7	57.7	
No. 8	26.3	16.1	41.6	
No. 10				
No. 16	21.5	13.1	28.5	
No. 30	15.1	9.2	19.3	
No. 50	15.4	9.4	9.9	
No. 80				
No. 100	10.7	6.5	3.4	
No. 200	2.1	1.3	2.1	
Pan	0.3+3.2=3.5	2.1		
Total Weight	164.1			

Weight of oven dry soil before washing: 164.1 gr

Weight of oven dry soil after washing: 160.9 gr

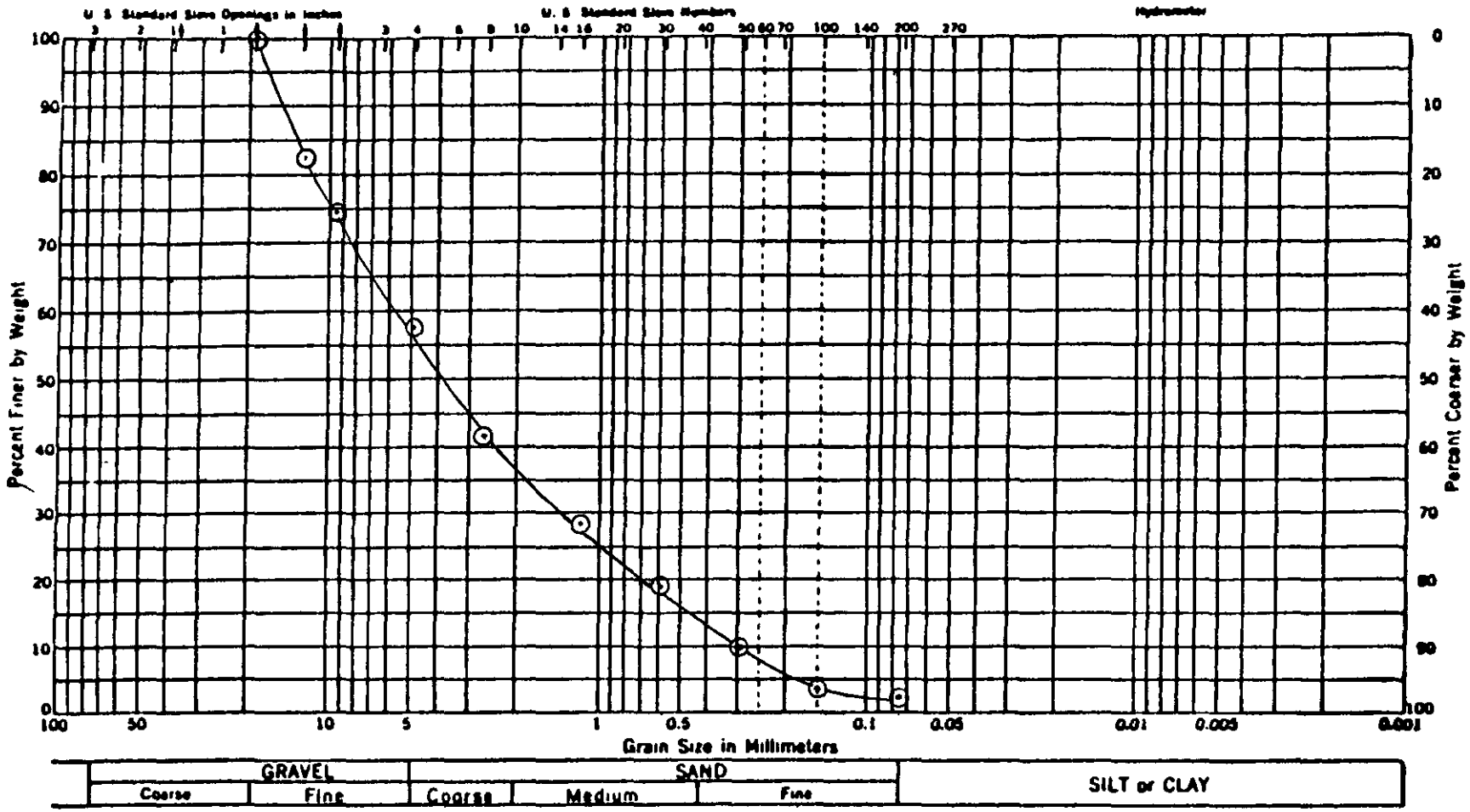
Weight loss by wash: 3.2 gr

Remarks:

Checked by: Bob Andrews

Technician: Tom Miller

UNIFIED CLASSIFICATION SYSTEM



SAMPLE NO.	W.C.	LL	PL	PI	CLASSIFICATION
B-28					Gravelly fine to coarse sand, trace silt
S-7					brown (SW)

STS Consultants Ltd.
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DRAWN	APPROVED	DATE	JOB No.
MLY	WEH	11-12-86	1069R

STS CONSULTANTS, LTD
3340 Ranger Road
Lansing, Michigan 48906

REPORT OF SIEVE ANALYSIS

STS Job No. 1069R Project: Arcadia Creek

Date: 11/5/86 Client: Kalamazoo Downtown Development Authority

Sample Description: Brown fine to coarse sand, little gravel, trace silt & clay

Sample Location/Identification: B-29 S-6 15.0'-16.5'

Sieve Size Number	Weight Retained (grams)	Percent Retained	Cumulative Percent Passing	Specifications
2 1/2-Inch				
2-Inch				
1 1/2-Inch				
1-Inch				
3/4-Inch	0.0	0.0	100.0	
1/2-Inch	10.3	4.6	95.4	
3/8-Inch	6.2	2.8	92.6	
No. 4	25.6	11.5	81.1	
No. 8	25.8	11.6	69.5	
No. 10				
No. 16	24.2	10.9	58.6	
No. 30	32.6	14.6	44.0	
No. 50	59.8	26.9	17.1	
No. 80				
No. 100	24.1	10.8	6.3	
No. 200	4.6	2.1	4.2	
Pan	0.8 + 8.6 = 9.4	4.2		
Total Weight	222.6			

Weight of oven dry soil before washing: 222.6 gr

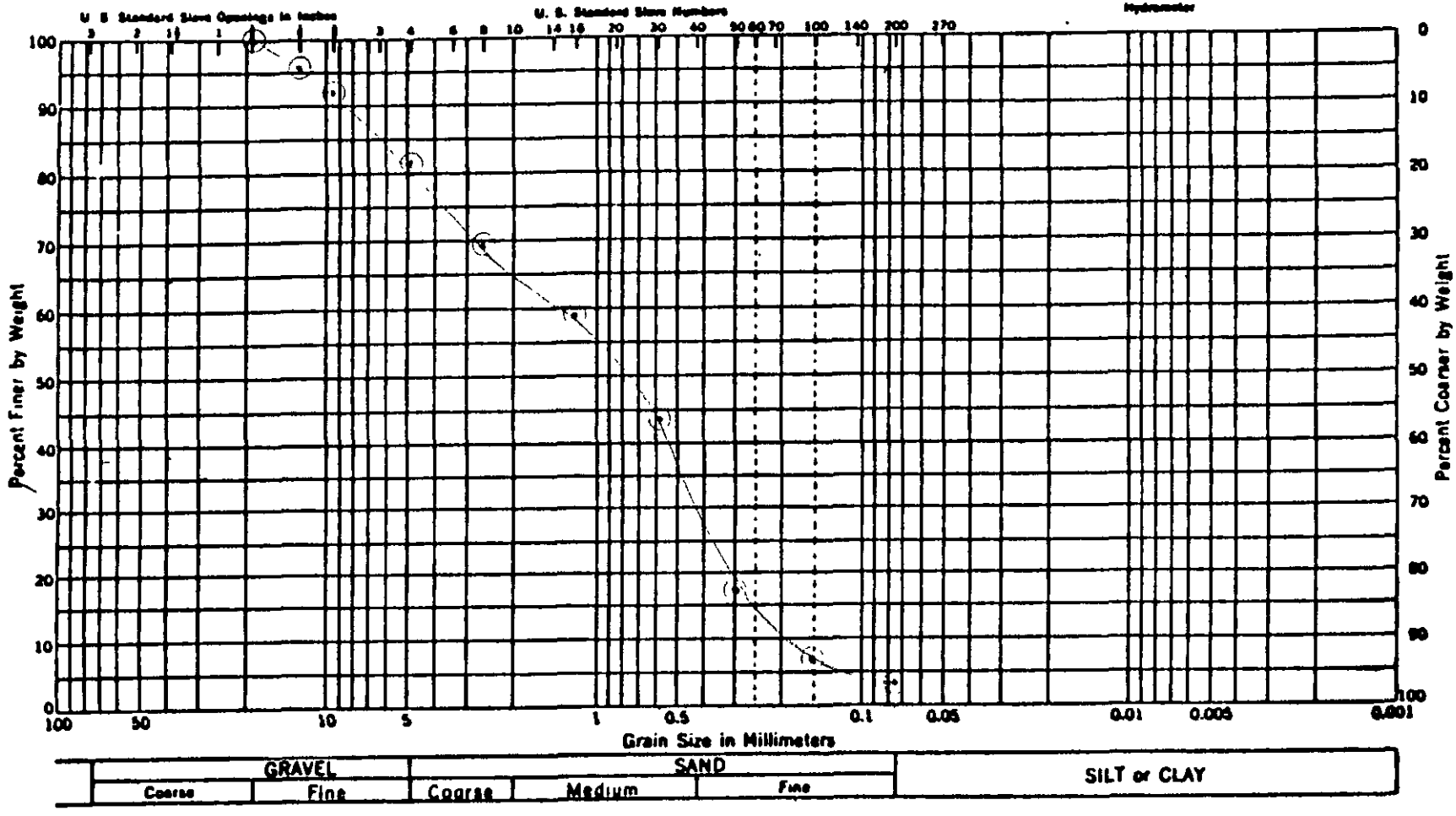
Weight of oven dry soil after washing: 214.0 gr

Weight loss by wash: 8.6 gr

Remarks:

Checked by: Bob Andrews Technician: Tom Miller

UNIFIED CLASSIFICATION SYSTEM



SAMPLE NO.	W.C.	LL	PL	PI	CLASSIFICATION
B-29					Brown fine to coarse sand, little
S-6					gravel, trace silt. (SP)

STS Consultants Ltd.
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(517) 321-4964

DRAWN	APPROVED	DATE	JOB No.
TSP	WEH	11-12-86	1069R

STS CONSULTANTS, LTD
3340 Ranger Road
Lansing, Michigan 48906

REPORT OF SIEVE ANALYSIS

STS Job No. 1069R Project: Arcadia Creek
Date: 11-04-86 Client: Kalamazoo Downtown Development Authority
Sample Description: Brown fine to coarse sand, little clay and silt, trace fine gravel
Sample Location/Identification: B-30 S-4 7.5'-9.0'

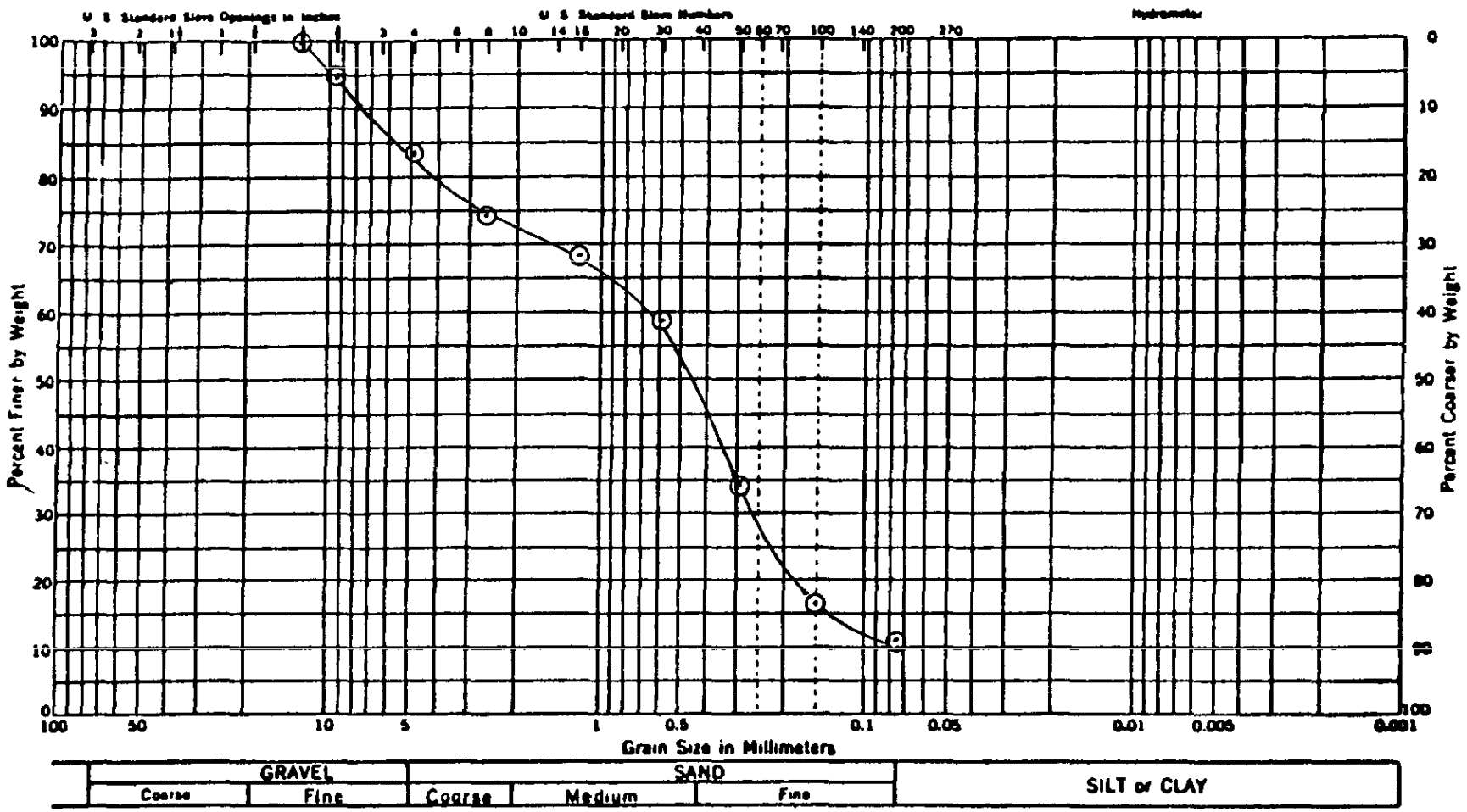
Sieve Size Number	Weight Retained (grams)	Percent Retained	Cumulative Percent Passing	Specifications
2 1/2-Inch				
2-Inch				
1 1/2-Inch				
1-Inch				
3/4-Inch				
1/2-Inch	0	0	100	
3/8-Inch	2.6	5.1	94.9	
No. 4	5.7	11.3	83.6	
No. 8	4.6	9.1	74.5	
No. 10				
No. 16	3.3	6.5	68.0	
No. 30	4.8	9.5	58.5	
No. 50	12.1	23.9	34.6	
No. 80				
No. 100	9.2	18.2	16.4	
No. 200	2.8	5.5	10.9	
Pan	1.2+4.3=5.5	10.9		
Total Weight	50.6			

Weight of oven dry soil before washing: 50.6 g
Weight of oven dry soil after washing: 46.3 g
Weight loss by wash: 4.3 g

Remarks:

Checked by: Bob Andrews Technician: Tom Miller

UNIFIED CLASSIFICATION SYSTEM



SAMPLE NO.	W.C.	LL	PL	PI	CLASSIFICATION
B-30					Fine to coarse sand, some gravel, little
S-4					silt and organics-dark brown and black
					(SW-SM)

STS Consultants Ltd.
3340 Ranger Road
Lansing, Michigan 48906
(517) 321-4964

DRAWN	APPROVED	DATE	JOB No.
MLY	WEH	11-12-86	1069R

STS CONSULTANTS, LTD
3340 Ranger Road
Lansing, Michigan 48906

REPORT OF SIEVE ANALYSIS

STS Job No. 1069R **Project:** Arcadia Creek
Date: 11/4/86 **Client:** Kalamazoo Downtown Development Authority
Sample Description: Dark brown fine to medium sand, some clay and silt, trace coarse sand & organics
Sample Location/Identification: B-31 S-2 2.5' - 4.0'

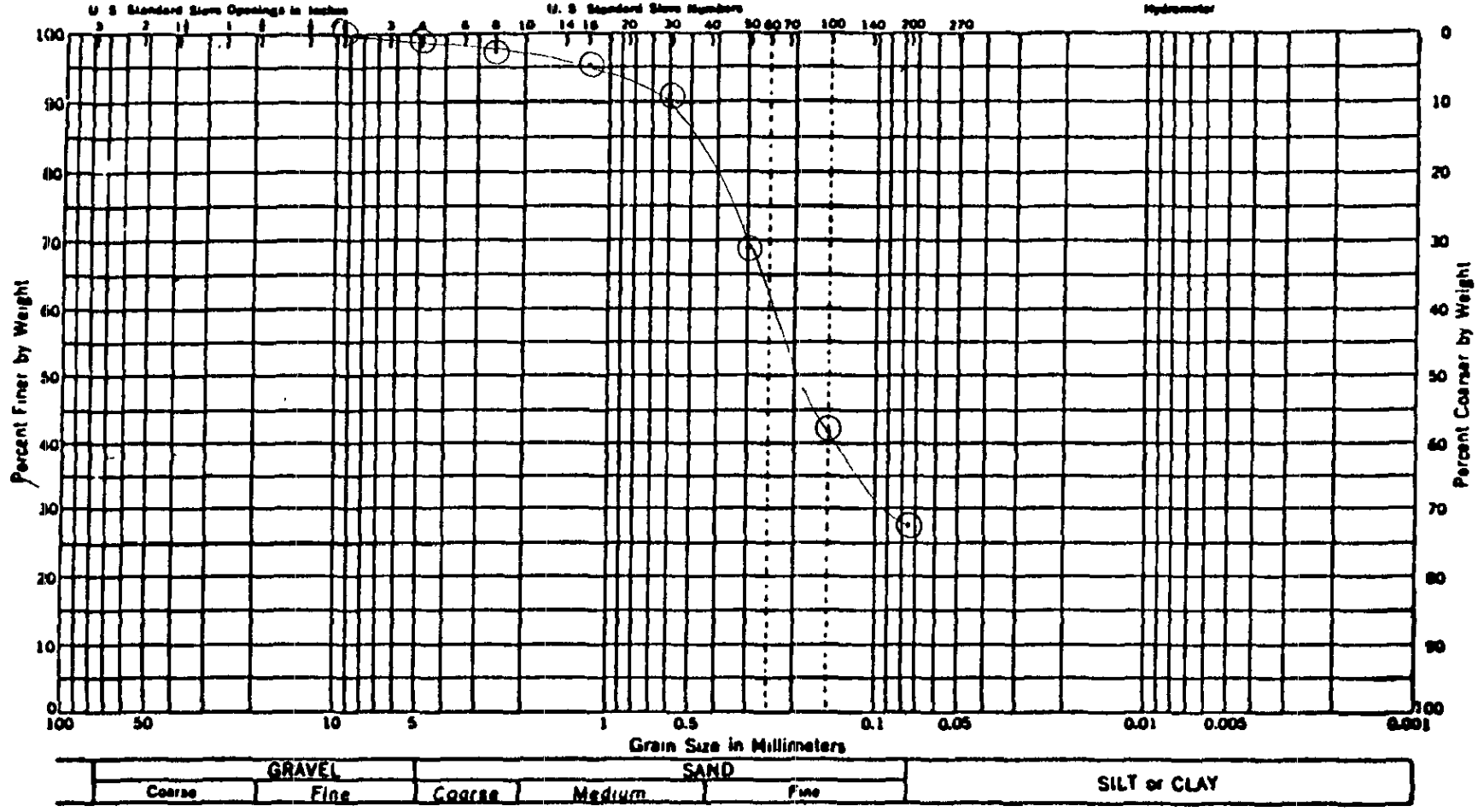
Sieve Size Number	Weight Retained (grams)	Percent Retained	Cumulative Percent Passing	Specifications
2 1/2-Inch				
2-Inch				
1 1/2-Inch				
1-Inch				
3/4-Inch				
1/2-Inch				
3/8-Inch	0.0	0.0	100.0	
No. 4	1.5	1.8	98.2	
No. 8	1.0	1.2	97.2	
No. 10				
No. 16	1.4	1.7	95.3	
No. 30	3.9	4.7	90.6	
No. 50	17.8	21.2	69.4	
No. 80				
No. 100	22.9	27.3	42.1	
No. 200	12.1	14.4	27.7	
Pan	3.5 + 19.7 = 23.2	27.7		
Total Weight	83.8			

Weight of oven dry soil before washing: 83.8 gr
Weight of oven dry soil after washing: 64.1 gr
Weight loss by wash: 19.7 gr

Remarks:

Checked by: Bob Andrews Technician: Tom Miller

UNIFIED CLASSIFICATION SYSTEM



SAMPLE NO.	W.C.	LL	PL	PI	CLASSIFICATION
B-31					Dark brown fine to medium sand, some
S-2					clay, trace coarse sand and organics.
					(SC)

STS Consultants Ltd.
3340 Ranger Road
Lansing, Michigan 48906
(517) 321-4964

DRAWN	APPROVED	DATE	JOB No.
TSP	WEH	11-12-86	1069R

STS CONSULTANTS, LTD
3340 Ranger Road
Lansing, Michigan 48906

REPORT OF SIEVE ANALYSIS

STS Job No. 1069R Project: Arcadia Creek
Date: 11/4/86 Client: Kalamazoo Downtown Development Authority
Sample Description: Brown fine to medium sand, little silt & clay, trace coarse sand
Sample Location/Identification: B-33 S-3 5'-6.5'

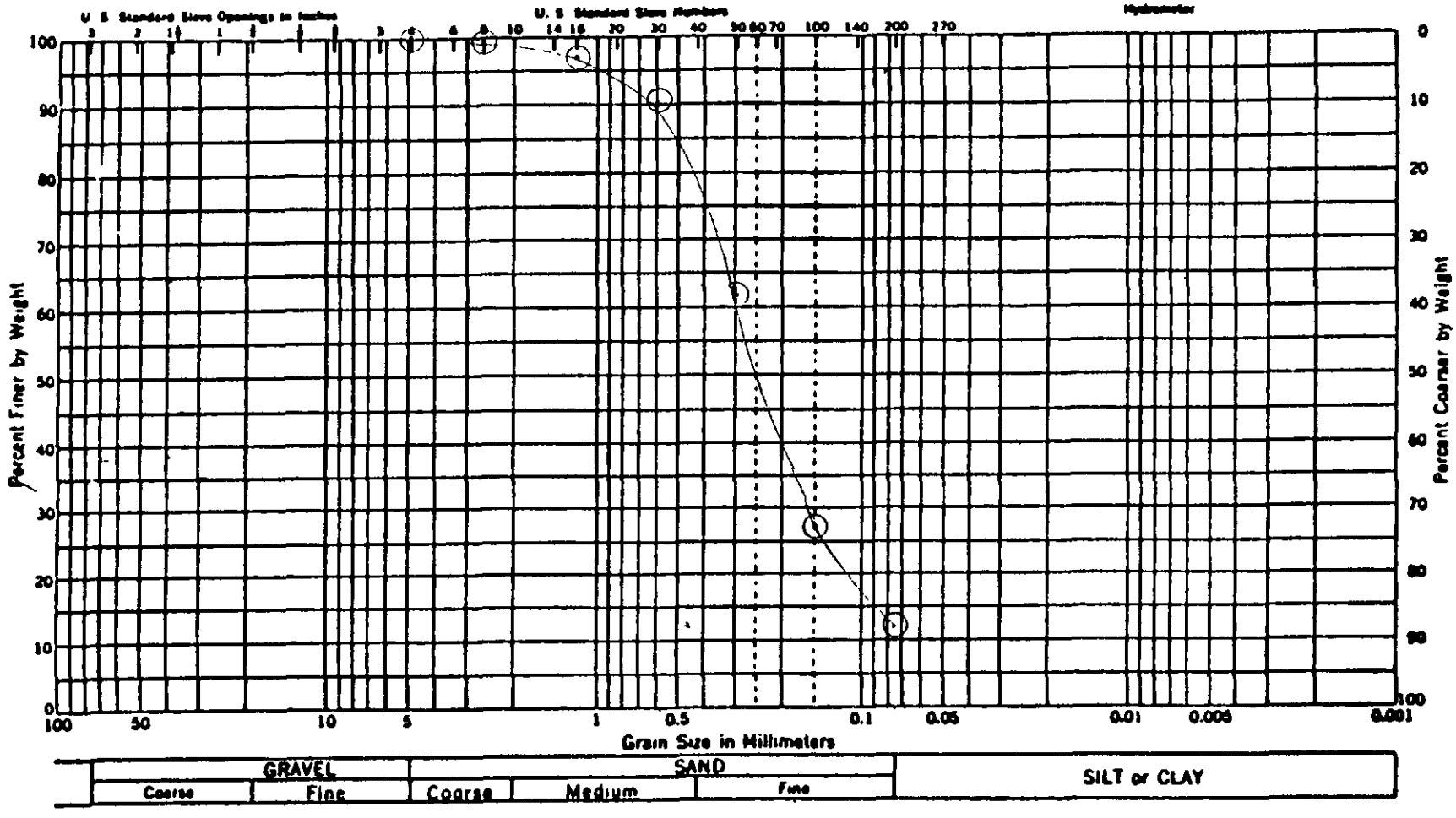
Sieve Size Number	Weight Retained (grams)	Percent Retained	Cumulative Percent Passing	Specifications
2 1/2-Inch				
2-Inch				
1 1/2-Inch				
1-Inch				
3/4-Inch				
1/2-Inch				
3/8-Inch				
No. 4	0.0	0.0	100.0	
No. 8	1.2	1.3	98.7	
No. 10				
No. 16	1.5	1.6	97.1	
No. 30	6.4	6.8	90.3	
No. 50	27.8	29.6	60.7	
No. 80				
No. 100	31.3	33.4	27.3	
No. 200	14.0	14.9	12.4	
Pan	3.6 + 8.0 = 11.6	12.4		
Total Weight	93.8			

Weight of oven dry soil before washing: 93.8 gr
Weight of oven dry soil after washing: 85.8 gr
Weight loss by wash: 8.0 gr

Remarks:

Checked by: Bob Andrews Technician: Tom Miller

UNIFIED CLASSIFICATION SYSTEM



SAMPLE NO.	W.C.	LL	PL	PI	CLASSIFICATION
B-33					Black fine to medium sand, little silt,
S-3					trace organics and coarse sand. (SM)

STS Consultants Ltd.
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Lansing, Michigan 48906
(517) 321-4964

DRAWN	APPROVED	DATE	JOB No.
TSP	WEH	11-12-86	1069R

STS CONSULTANTS, LTD
3340 Ranger Road
Lansing, Michigan 48906

REPORT OF SIEVE ANALYSIS

STS Job No. 1069R Project: Arcadia Creek
Date: 11/5/86 Client: Kalamazoo Downtown Development Authority
Sample Description: Brown fine to coarse sand, trace silt, clay, and fine gravel
Sample Location/Identification: B-33 S-6 15.0'-16.5'

Sieve Size Number	Weight Retained (grams)	Percent Retained	Cumulative Percent Passing	Specifications
2 1/2-Inch				
2-Inch				
1 1/2-Inch				
1-Inch				
3/4-Inch	0.0	0.0	100.0	
1/2-Inch	9.3	6.9	93.1	
3/8-Inch	0.0	0.0	93.1	
No. 4	4.5	3.3	89.8	
No. 8	5.3	3.9	85.9	
No. 10				
No. 16	9.3	6.9	79.0	
No. 30	20.8	15.4	63.6	
No. 50	57.8	43.0	20.6	
No. 80				
No. 100	19.7	14.6	6.0	
No. 200	2.7	2.0	4.0	
Pan	0.8 + 4.6 = 5.4	4.0		
Total Weight	134.7			

Weight of oven dry soil before washing: 134.7 gr
Weight of oven dry soil after washing: 130.1 gr
Weight loss by wash: 4.6 gr

Remarks:

Checked by: Bob Andrews Technician: Tom Miller

1) COUNTY: KALAMAZOO

2) STUDY NAME: KALAMAZOO, CITY OF

3) WATERCOURSE: ARCADIA CREEK

4) DOCUMENT TYPE: RATING CURVE RUN

ABRAMS SEC 96 to 99

FORM 25-0
(313) 291-5400

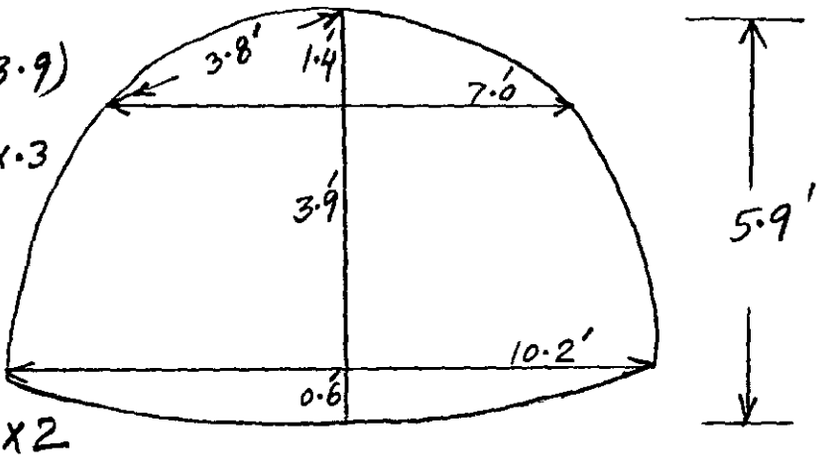
Wade, Trim & Associates, Inc.
Civil Engineers • Land Surveyors
WORK SHEET

25185 GODDARD ROAD
TAYLOR, MICHIGAN 48180

REFERENCE

(ii) Cross section from 13+56 to 17+68

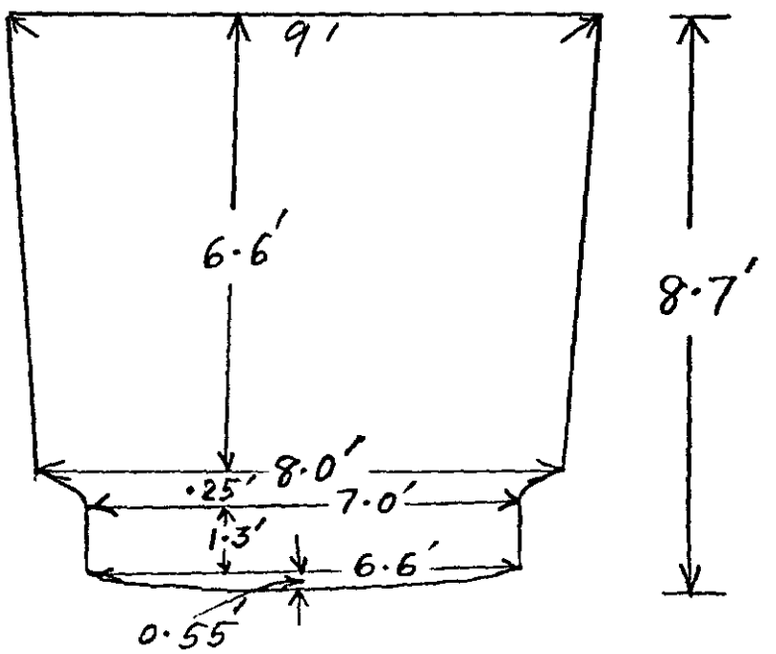
$$A = \frac{7+10.2}{2}(3.9) + \frac{7\times1.4}{2} + 3.8\times.3 + \frac{10.2\times.6}{2} = 42.6 \text{ sq ft}$$



$$P = 4\times2 + 4.2\times2 + 5.4\times2 = 27.2 \text{ ft}$$

$$R = \frac{A}{P} = \underline{1.57 \text{ ft}}$$

(iii) Cross section from 17+68 to 18+82



SUBJECT	BY	CHK.	SHEET NO	File Code No (Job No) Owner Project Suffix
Arcadia Creek Enclosure #1A	Susie		3 OF 16	HUD • 202 • 07
	DATE 4/1/80	DATE		

REFERENCE

$$A = \frac{9.0+8.0}{2}(6.6) + \frac{8.0+7.0}{2}(.25) + \frac{7.0+6.6}{2}(1.3) + \frac{6.6 \times .55}{2}$$

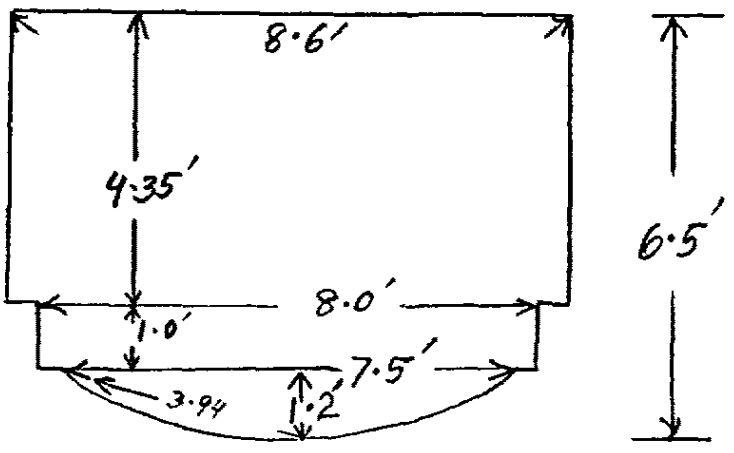
$$= \underline{68.6} \text{ ft}^2$$

$$P = 9.0 + 2(6.7) + 2(.26) + 2(1.3) + 6.7$$

$$= \underline{32.2} \text{ ft}$$

$$R = \frac{A}{P} = \underline{2.13 \text{ ft}}$$

(iv) Cross section from 18+82 to 19+73



$$A = 8.6 \times 4.35 + 8.0 \times 1.0 + \frac{7.5 \times 1.2}{2} + 3.94 \times 0.4$$

$$= \underline{51.5} \text{ ft}^2$$

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Arcadia Creek Enclosure #1A	DATE 4/1/80	DATE	4 OF 16	HUD • 2027 • 07

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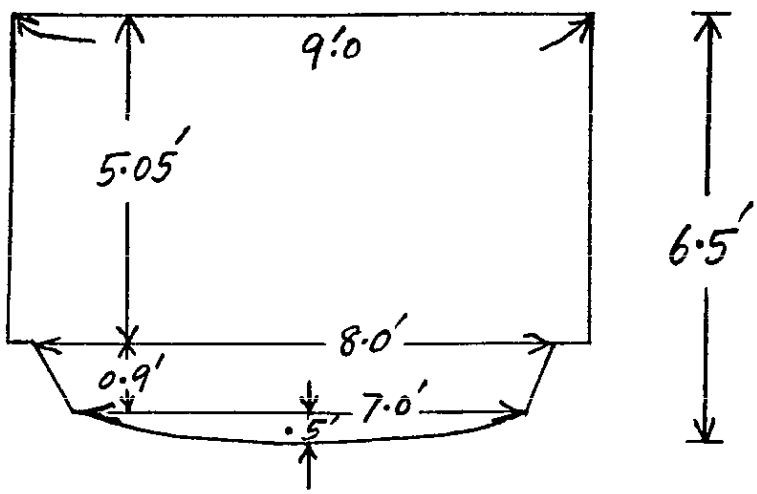
$$P = 8.6 + 2(4.35) + 2(.3) + 2(1.0) + 2(3.96)$$

$$= \underline{27.9 \text{ ft}}$$

$$R = \frac{A}{P} = \underline{1.85 \text{ ft}}$$

(V) Cross section from 19+73 to 24+07



$$A = 9 \times 5.05 + \frac{8+7}{2}(0.9) + \frac{7 \times .5}{2}$$

$$= \underline{53.95 \text{ ft}^2}$$

$$P = 9 + 2(5.05) + 2(.5) + 2(.9) + 7.1$$

$$= \underline{29.0 \text{ ft}}$$

$$R = A/P = \underline{1.86 \text{ ft}}$$

SUBJECT	BY	CHK	SHEET NO.	File Code No (Job No) Owner Project Suffix
Arcadia Creek Enclosure #1A	Sushil		5 OF 16	HUD-202-07
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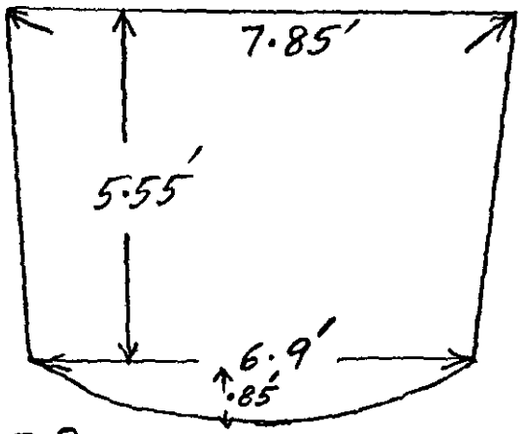
(vi) Cross section from 24+07 to 27+84



$$A = \frac{7.85+6.9}{2}(5.55) + \frac{6.9 \times .9}{2}$$

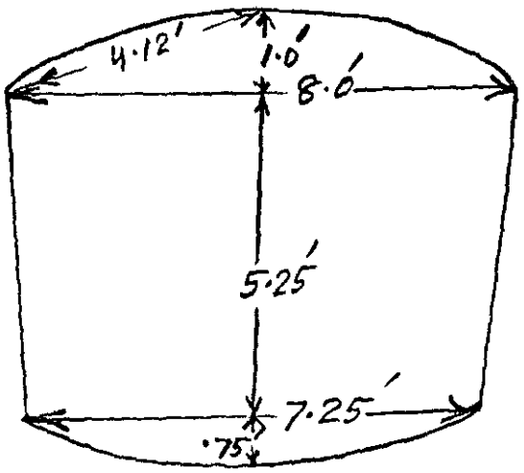
$$= \underline{44.0\ ft^2}$$

$$P = 7.85 + 2(5.6) + 7.2$$

$$= \underline{26.25\ ft}$$

$$R = \frac{A}{P} = \underline{1.68\ ft}$$

(vii) Cross section from 27+84 to 28+84



$$A = \frac{8+7.25}{2}(5.25) + \frac{8 \times 1}{2} + 4.12 \times .2 + \frac{7.25 \times .8}{2}$$

$$= \underline{47.8\ ft^2}$$

$$P = 8.5 + 2 \times 5.25 + 7.4$$

$$= \underline{26.4\ ft}$$

$$R = \frac{A}{P} = \underline{1.81\ ft}$$

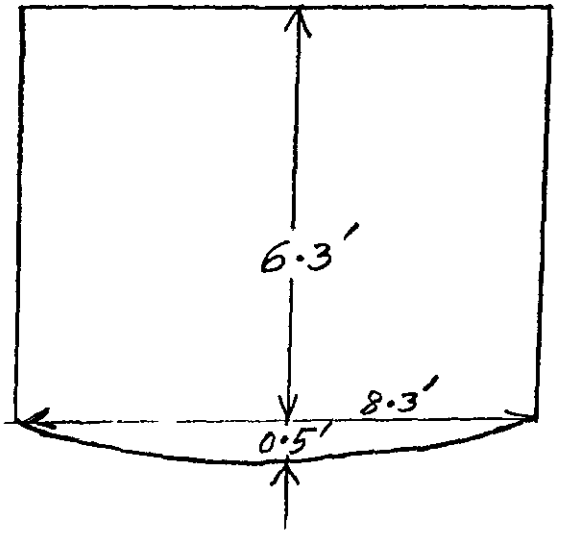
REFERENCE

(viii) Cross section from 28+84 to 29+64

$$A = 6.3 \times 8.3 + \frac{8.3 \times .5}{2}$$
$$= \underline{54.4\ ft^2}$$

$$P = 8.3 + 8.5 + 2(6.3)$$
$$= \underline{29.4\ ft}$$

$$R = \frac{A}{P} = \underline{1.85\ ft}$$

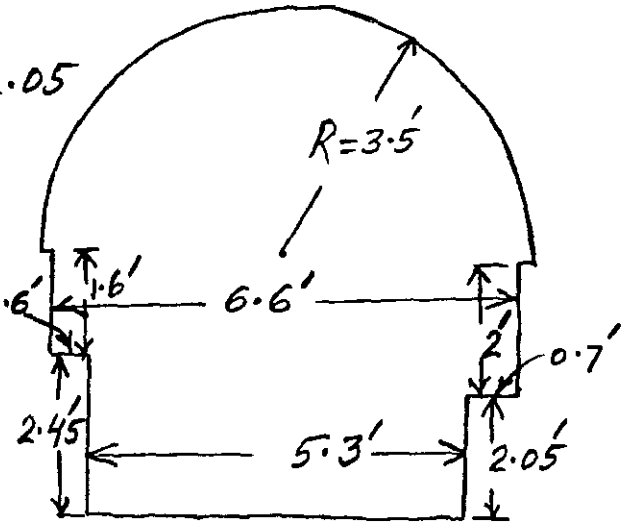


(ix) Cross section from 29+64 to 30+75 (U/S end)

$$A = \frac{\pi\, 3.5^2}{2} + 1.6 \times 6.6 + 0.4 \times 6.0 + 5.3 \times 2.05$$
$$= \underline{43.1\ ft^2}$$

$$P = \pi(3.5) + .2 + 1.6 + .6 + 2.45 + 5.3 + 2.05 + .7 + 2.0 + .2$$
$$= \underline{24.3\ ft}$$

$$R = \frac{A}{P} = \underline{1.77\ ft}$$



SUBJECT	BY	CHK.	SHEET NO	File Code No (Job No) Owner • Project • Suffix
Arcadia Creek Enclosure #1A	DATE 4/1/80	DATE	7 OF 16	HUD • 202 • C

REFERENCE

Computations for XKOR

Bend Losses

$$h_b = K_b \frac{v^2}{2g}$$

$K_b = 0.7$ for 45° bend
$= 0.42$ " $22\frac{1}{2}^\circ$ "
$= 0.83$ " 60° "
≈ 1.0 " 90° " (Assume)

King's Handbook Pg 6-23

Frictional Losses

$$K_f = \frac{29.1\, n^2 L}{R^{4/3}}$$

HEC-2 Manual

Exit Loss

$$h_{exit} = K_{exit} \frac{v^2}{2g}$$

where $K_{exit} = 1.0$

Junction Losses

Assumed negligible

(i) XKOR for the Enclosure Length from 0+00 to 13+56

$$XKOR = K_f + K_b + K_{exit}$$

where

$$K_f = \frac{29.1(0.02)^2 1356}{(1.76)^{4/3}} \quad (n \approx 0.02)$$

REFERENCE

or $K_f = \underline{7.4}$

K_b

one 30° bend and one 90° bend

$\therefore K_b \approx 1.0 + 0.5 = \underline{1.5}$

$K_{Exit} = 1.0$

$\therefore X_{KOR} = 7.4 + 1.5 + 1.0 = \underline{9.9}$

(ii) X_{KOR} for the Enclosure Length from 13+56 to 17+68

$X_{KOR} = K_f + K_b$

where $K_f = \dfrac{29.1(0.02)^2 4l2}{(1.57)^{4/3}}$ $(n \approx 0.02)$

$= 2.6$

K_b

one 60° bend, two $22\frac{1}{2}$° bends, and one 45° bend

$\therefore K_b = 0.83 + 2(0.42) + 0.7$

$= 2.4$

$\therefore X_{KOR} = 2.6 + 2.4 = \underline{5.0}$

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Arcadia Creek Enclosure #1A	DATE 4/12/90	DATE	9 OF 16	HUD • 202 • C

REFERENCE

(iii) XKOR for the Enclosure Length from 17+68 to 18+82

$$XKOR = K_f \quad (\text{There is no bend})$$

$$= \frac{29.1(0.02)^2 114}{(2.13)^{4/3}} \quad (n \approx 0.02)$$

$$= \underline{0.5}$$

(iv) XKOR for the Enclosure Length from 18+82 to 19+73

$$XKOR = K_f + K_b$$

where $K_f = \dfrac{29.1(0.02)^2 91}{(1.85)^{4/3}} \quad (n \approx 0.02)$

$$= \underline{0.5}$$

$\underline{K_b}$ one 12° bend

Take $K_b \approx \underline{0.3}$

$\therefore$ $XKOR = 0.5 + 0.3 = \underline{0.8}$

(v) XKOR for the Enclosure Length from 19+73 to 24+07

$$XKOR = K_f + K_b$$

where $K_f = \dfrac{29.1(0.02)^2 434}{(1.86)^{4/3}} \quad (n \approx 0.02)$

$$= \underline{2.2}$$

REFERENCE

K_b

one 45° bend, and two $22\frac{1}{2}°$ bends

$\therefore \quad K_b = 0.7 + 2(0.42)$

$\approx \underline{1.5}$

$\therefore \quad XKOR = 2.2 + 1.5 = \underline{3.7}$

(vi) XKOR for the Enclosure Length from 24+07 to 27+84

$XKOR = K_f + K_b$

where $K_f = \dfrac{29.1(0.02)^2 377}{(1.68)^{4/3}}$ $(n \approx 0.02)$

$= \underline{2.2}$

K_b one 10° bend

Take $K_b \approx \underline{0.2}$

$\therefore \quad XKOR = 2.2 + 0.2 = \underline{2.4}$

(vii) XKOR for the Enclosure Length from 27+84 to 28+84

$XKOR = K_f + K_b$

where $K_f = \dfrac{29.1(0.02)^2 100}{(1.81)^{4/3}}$ $(n \approx 0.02)$

$= \underline{0.5}$

REFERENCE

K_b

Two $22\frac{1}{2}°$ bends

$\therefore K_b = 2(0.42) = \underline{0.8}$

$XKOR = 0.5 + 0.8 = \underline{1.3}$

(viii) XKOR for the Enclosure Length from 28+84 to 29+64

$XKOR = K_f + K_b$

$K_f = \dfrac{29.1\,(0.02)^2 80}{(1.85)^{4/3}}$ $(n \approx 0.02)$

$= \underline{0.4}$

K_b one 30° bend

$\therefore K_b = \underline{0.5}$

Hence $XKOR = 0.4 + 0.5 = \underline{0.9}$

(ix) XKOR for the Enclosure Length from 29+64 to 30+75 (U/S end)

$XKOR = K_f + K_{Entry}$ (There is no bend)

$K_f = \dfrac{29.1(0.02)^2 111}{(1.77)^{4/3}} = \underline{0.6}$

Take $K_{Entrance} \approx \underline{0.4}$

$\therefore XKOR = 0.6 + 0.4 = \underline{1.0}$

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Arcadia Creek Enclosure #1A	DATE 4/2/80	DATE	12 OF 16	HUD • 2 •

REFERENCE

Computations for average value of XKOR

Total Head Loss through the Enclosure

$$= \sum_{i=1}^{9} h_i$$

$$= \sum_{i=1}^{9} \frac{(XKOR)_i \left(\frac{Q}{A_i}\right)^2}{2g}$$

$$= \frac{9.9\left(\frac{Q}{46.1}\right)^2}{2g} + \frac{5.0\left(\frac{Q}{42.6}\right)^2}{2g} + \frac{0.5\left(\frac{Q}{68.6}\right)^2}{2g}$$
$$+ \frac{0.8\left(\frac{Q}{51.5}\right)^2}{2g} + \frac{3.7\left(\frac{Q}{53.95}\right)^2}{2g} + \frac{2.4\left(\frac{Q}{44.0}\right)^2}{2g}$$
$$+ \frac{1.3\left(\frac{Q}{47.8}\right)^2}{2g} + \frac{0.9\left(\frac{Q}{54.4}\right)^2}{2g} + \frac{1.0\left(\frac{Q}{43.1}\right)^2}{2g}$$

$$= \frac{0.011744\ Q^2}{2g}$$

The average area of flow through the Enclosure shall be taken equal to the area available on the D/S side.

Therefore, taking area of flow equal to 46.1 ft^2, the above noted eqn. can be written as

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Arcadia Creek Enclosure # 1A	Surtid		13 OF 16	HUD • 202 • 07
	DATE 4/2/80	DATE		

REFERENCE

Total Head Loss through the Enclosure

$$= \frac{25.0 \left(\frac{Q}{46.1}\right)^2}{2g}$$

Hence, av. value of XKOR = 25.0

Av. area of flow, BAREA = 46.1 ft^2

As per output enclosed (under a separate folder), flow through the Enclosure is given below:-

10 Yr	50 Yr	100 Yr	500 Yr
344 CFS	347 CFS	348 CFS	350 CFS

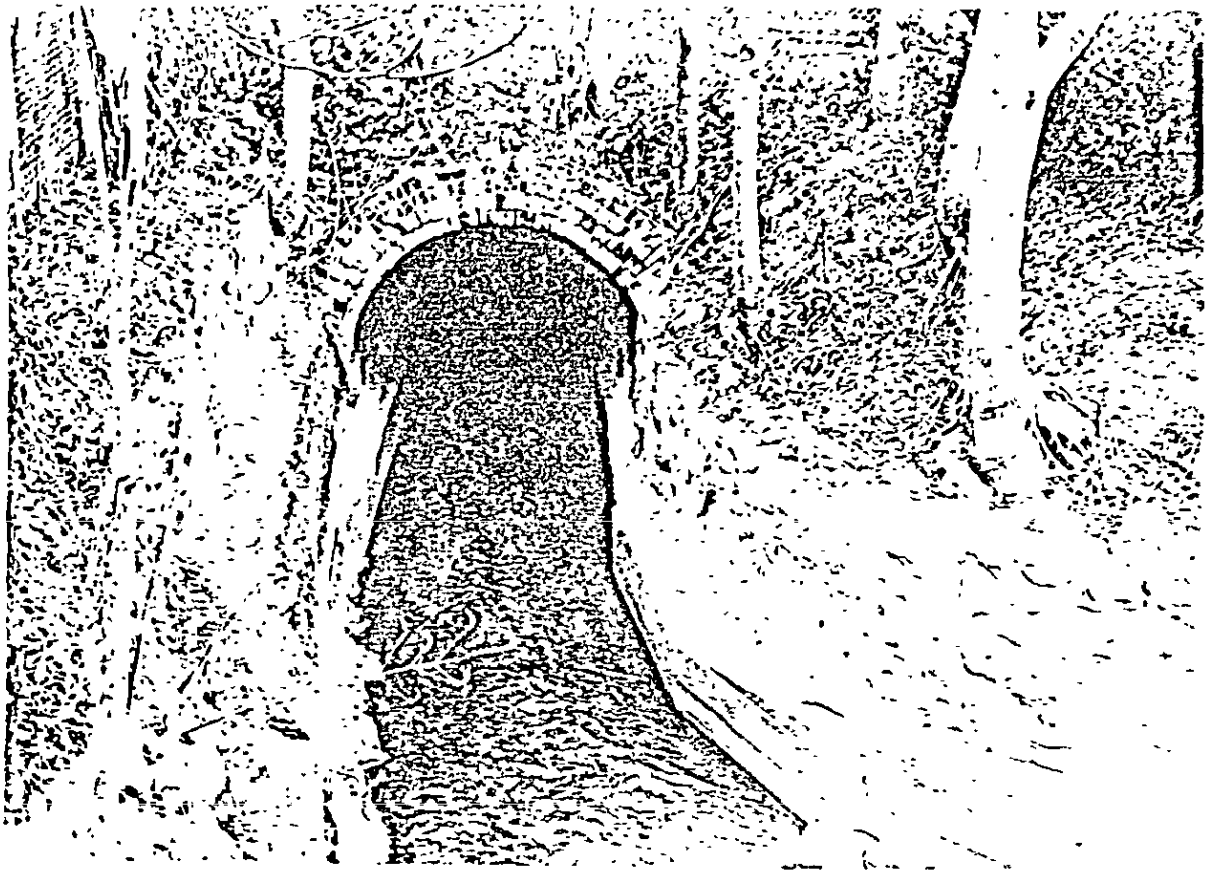


SECTION #73 OUTLET ARCADIA CREEK
INTO PORTAGE CREEK

D/S END OF ENCLOSURE

Sheet 15/16

HUD 2027-07



SECTION #75A ARCADIA ENCLOSURE STA 30+63

U/S END OF ENCLOSURE

Sheet 16/16

HUD 2027-01

REFERENCE

Pressure Flow Computations for Arcadia Creek Enclosures

1B) Enclosure from u/s of Burdick St. to Park St.

Alignment of the Enclosure shown on the next sheet

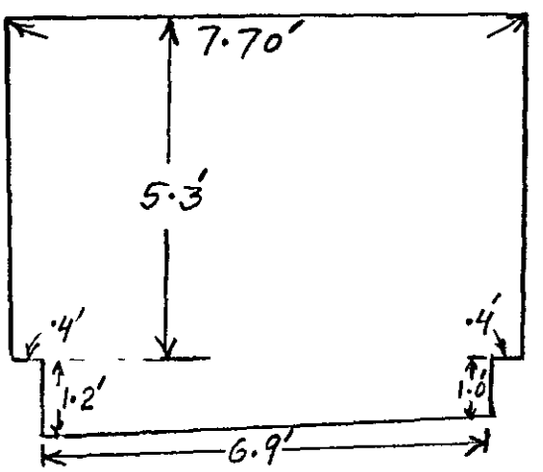
Data taken from Survey Notes

(i) Cross section from 31+13.5 to 32+80

X-sectional Area (A)

$= 7.70 \times 5.3 + 1.1 \times 6.9$

$= \underline{48.4}$ sq. ft.



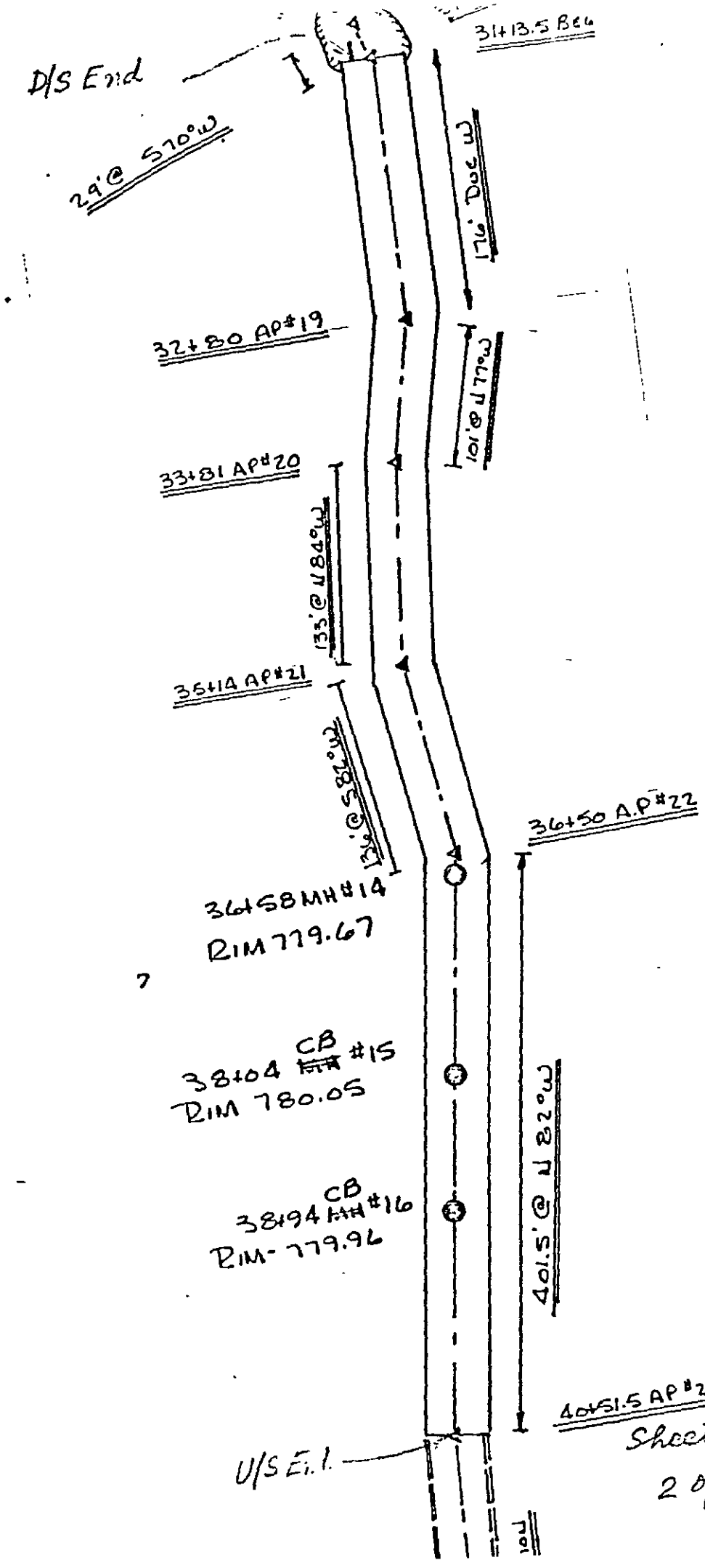
Wetted Perimeter (P)

$= 7.7 + 2(5.3) + 2(.4) + 1.2 + 1.0 + 6.9$

$= \underline{28.2}$ ft

$\therefore R = \frac{A}{P} = \underline{1.72 \text{ ft}}$

SUBJECT	BY	CHK.	SHEET NO	File Code No / Job No / Owner / Project / Suffix
Arcadia Creek Enclosure #1 1B	DATE 4/2/18	DATE	1 OF 13	HUD • 2017 • 07



Subject:
Arcadia Creek
Enclosure #1B

Sheet Swhil 4/2/80

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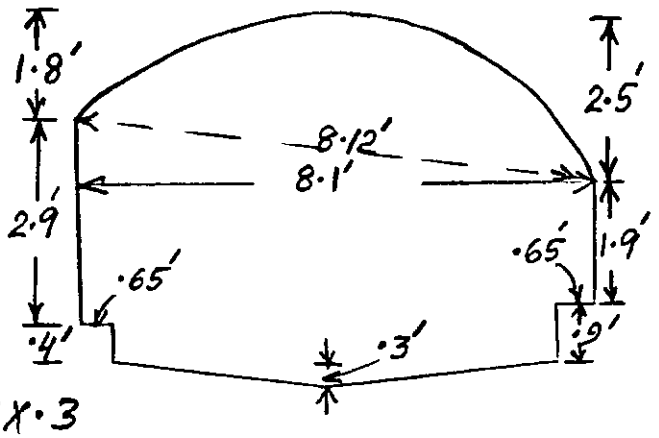
(ii) Cross section from 32+80 to 33+81



Area (A)

$= 13.2 + \frac{2.9+1.9}{2}(8.1) + \frac{.4+.9}{2}(6.8) + \frac{6.8 \times .3}{2}$

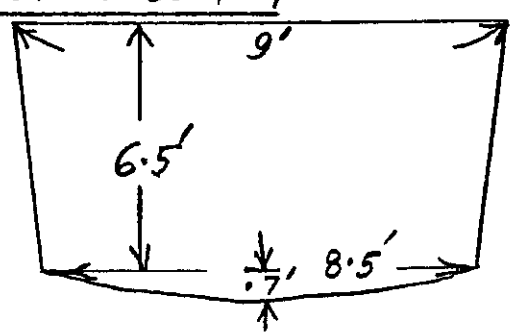
$= \underline{38.1\ ft^2}$

$P = 9.8 + 2.9 + .65 + .4 + 6.9 + .9 + .65 + 1.9$

$= \underline{24.1\ ft}$

$\therefore \quad R = \frac{A}{P} = \underline{1.58\ ft}$

(iii) Cross section from 33+81 to 35+14



$A = \frac{9.0+8.5}{2}(6.5) + \frac{8.5 \times .7}{2}$

$= \underline{59.9\ ft^2}$

$P = 9 + 2(6.5) + 8.6 = \underline{30.6\ ft}$

$\therefore \quad R = \frac{A}{P} = \underline{1.96\ ft}$

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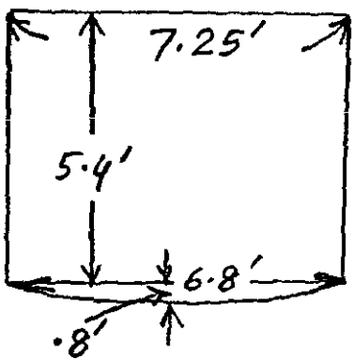
REFERENCE

(IV) Cross section from 35+14 to 37+18



$$A = \frac{7.25+6.8}{2}(5.4) + \frac{6.8 \times .8}{2}$$

$$= \underline{40.7 \text{ ft}^2}$$

$$P = 7.25 + 2(5.4) + 6.9 = 24.95 \text{ ft}$$

$$R = \frac{A}{P} = \underline{1.63 \text{ ft}}$$

(V) Cross section from 37+18 to 38+53

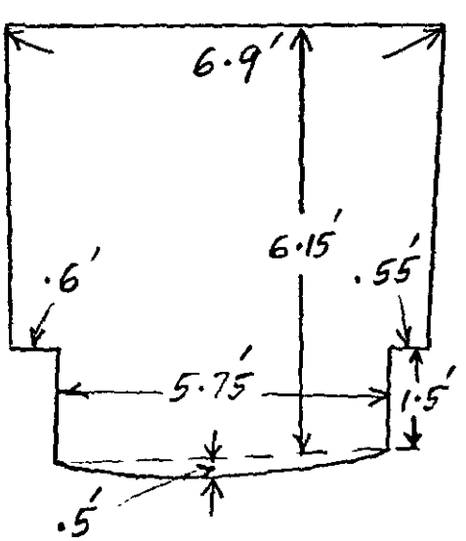
$$A = 6.9 \times 4.65 + 1.5 \times 5.75 + \frac{5.75 \times .5}{2}$$

$$= 42.1 \text{ ft}^2$$

$$P = 6.9 + 2(4.65) + .6 + .55 + 2(1.5) + 5.75$$

$$= 25.5 \text{ ft}$$

$$R = \frac{A}{P} = \underline{1.65 \text{ ft}}$$



SUBJECT	BY	CHK.	SHEET NO	File Code No. (Job No.) Owner Project Suffix
Arcadia Creek Enclosure #1 IC	Sus K.C		4 OF 13	HUD • 2027 • 0
	DATE 4/1/20	DATE		

FORM 25-0
(313) 291-5400

Wade, Trim & Associates, Inc.
Civil Engineers • Land Surveyors
WORK SHEET

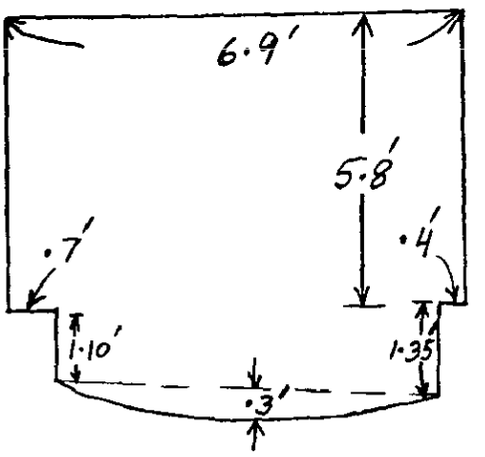
25185 GODDARD ROAD
TAYLOR, MICHIGAN 48180

REFERENCE

(vi) Cross section from 38+53 to 39+85

$$A = 6.9 \times 5.8 + 5.8\,\frac{1.1+1.35}{2} + \frac{5.8 \times .3}{2}$$

$$= \underline{48.0}\ ft^2$$



$$P = 6.9 + 2(5.8) + .7 + .4 + 1.1 + 1.35 + 5.9$$

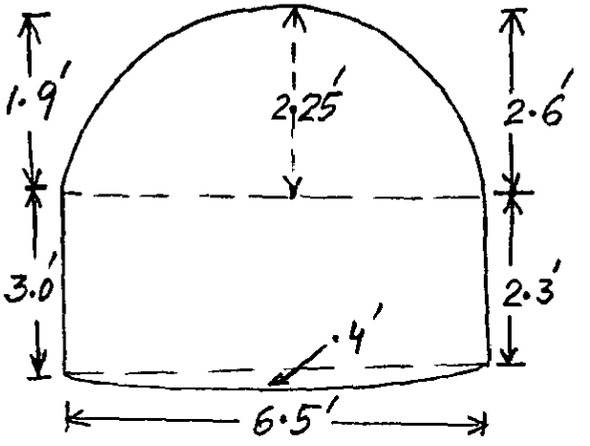
$$= \underline{27.9}\ ft$$

$$R = \frac{A}{P} = \underline{1.72}\ ft$$

(vii) Cross section from 39+85 to 40+51.5

$$A = .276\,\pi\,3.47^2 + 6.5\,\frac{3+2.3}{2} + \frac{6.5 \times .4}{2}$$

$$= \underline{29.0\ ft^2}$$



$$P = 8.4 + 3.0 + 6.5 + 2.3$$

$$= 20.2\ ft$$

$$R = \frac{A}{P} = \underline{1.44\ ft}$$

REFERENCE

Computations for XKOR

(i) XKOR for the Enclosure Length from 31+13.5 to 32+80

$$XKOR = K_f + K_b + K_{exit}$$

where $K_f = \dfrac{29.1\,(.02)^2\,166.5}{(1.72)^{4/3}}$ $(n \approx 0.02)$

$= \underline{0.94}$

$\underline{K_b}$

one bend of 13°

Take $K_b \approx \underline{0.3}$

$K_{exit} = \underline{1.0}$

$\therefore$ $XKOR = 0.94 + 0.3 + 1.0$

$= \underline{2.2}$

(ii) XKOR for the Enclosure Length from 32+80 to 33+81

$$XKOR = K_f + K_b$$

REFERENCE

where $K_f = \dfrac{29.1(.02)^2 101}{(1.58)^{4/3}}$ $(n \approx 0.02)$

$= \underline{0.64}$

$\underline{K_b}$

one 7° bend

Take $K_b \approx \underline{0.2}$

$\therefore$ XKOR $= 0.64 + 0.2 = \underline{0.8}$

(iii) XKOR for the Enclosure Length from 33+81 to 35+14

XKOR $= K_f + K_b$

where $K_f = \dfrac{29.1(0.02)^2 133}{(1.96)^{4/3}}$ $(n \approx 0.02)$

$= \underline{0.63}$

$\underline{K_b}$

one 14° bend

Take $K_b \approx \underline{0.3}$

$\therefore$ XKOR $= 0.63 + 0.3 = \underline{0.9}$

REFERENCE

(iv) XKOR for the Enclosure Length from 35+14 to 37+18

$$XKOR = K_f + K_b$$

where $K_f = \frac{29.1(0.02)^2 204}{(1.63)^{4/3}}$ $(n \approx 0.02)$

$= 1.2$

K_b

one 16° bend

Take $K_b \approx 0.3$

$\therefore XKOR = 1.2 + 0.3 = 1.5$

(v) XKOR for the Enclosure Length from 37+18 to 38+53

$XKOR = K_f$ (There is no bend)

$= \frac{29.1(0.02)^2 135}{(1.65)^{4/3}}$ $(n \approx 0.02)$

$= 0.8$

REFERENCE

(vi) XKOR for the Enclosure Length from 38+53 to 39+85

$$XKOR = K_f \quad (\text{There is no bend})$$

$$= \frac{29.1(0.02)^2 132}{(1.72)^{4/3}} \quad (n \simeq 0.02)$$

$$= \underline{0.7}$$

(vii) XKOR for the Enclosure Length from 39+85 to 40+51.5 (U/S end)

$$XKOR = K_f + K_{entry}$$

$$\text{where } K_f = \frac{29.1(0.02)^2 66.5}{(1.44)^{4/3}} \quad (n \simeq 0.02)$$

$$= \underline{0.5}$$

Take $K_{entry} = \underline{0.4}$

$$\text{i.e.} \quad XKOR = 0.5 + 0.4$$

$$= \underline{0.9}$$

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Arcadia Creek Enclosure #18	Susie		9 of 13	HUD • 2027 • 07
	DATE 4/3/80	DATE		

REFERENCE

Computations for average value of XKOR to be used in SB card for Pressure Flow

Total Head Loss through the Enclosure

$$= \sum_{i=1}^{7} h_i$$

$$= \sum_{i=1}^{7} \frac{(XKOR)_i \cdot \left(\frac{Q}{A_i}\right)^2}{2g}$$

$$= \frac{2.2\left(\frac{Q}{48.4}\right)^2}{2g} + \frac{0.8\left(\frac{Q}{38.1}\right)^2}{2g} + \frac{0.9\left(\frac{Q}{59.9}\right)^2}{2g} + \frac{1.5\left(\frac{Q}{40.7}\right)^2}{2g} + \frac{0.8\left(\frac{Q}{42.1}\right)^2}{2g} + \frac{0.7\left(\frac{Q}{48.0}\right)^2}{2g} + \frac{0.9\left(\frac{Q}{29.0}\right)^2}{2g}$$

$$= \frac{0.004474\ Q^2}{2g}$$

The average area of flow through the Enclosure to be used in SB card shall be taken equal to the area available on the D/S side.

Therefore, taking area of flow equal

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Arcadia Creek Enclosure # 1B	DATE 4/3/85	DATE	10 OF 13	HOD	27	07

REFERENCE

to 48.4 ft^2, the above noted eqn can be written as

Total Head Loss through the Enclosure

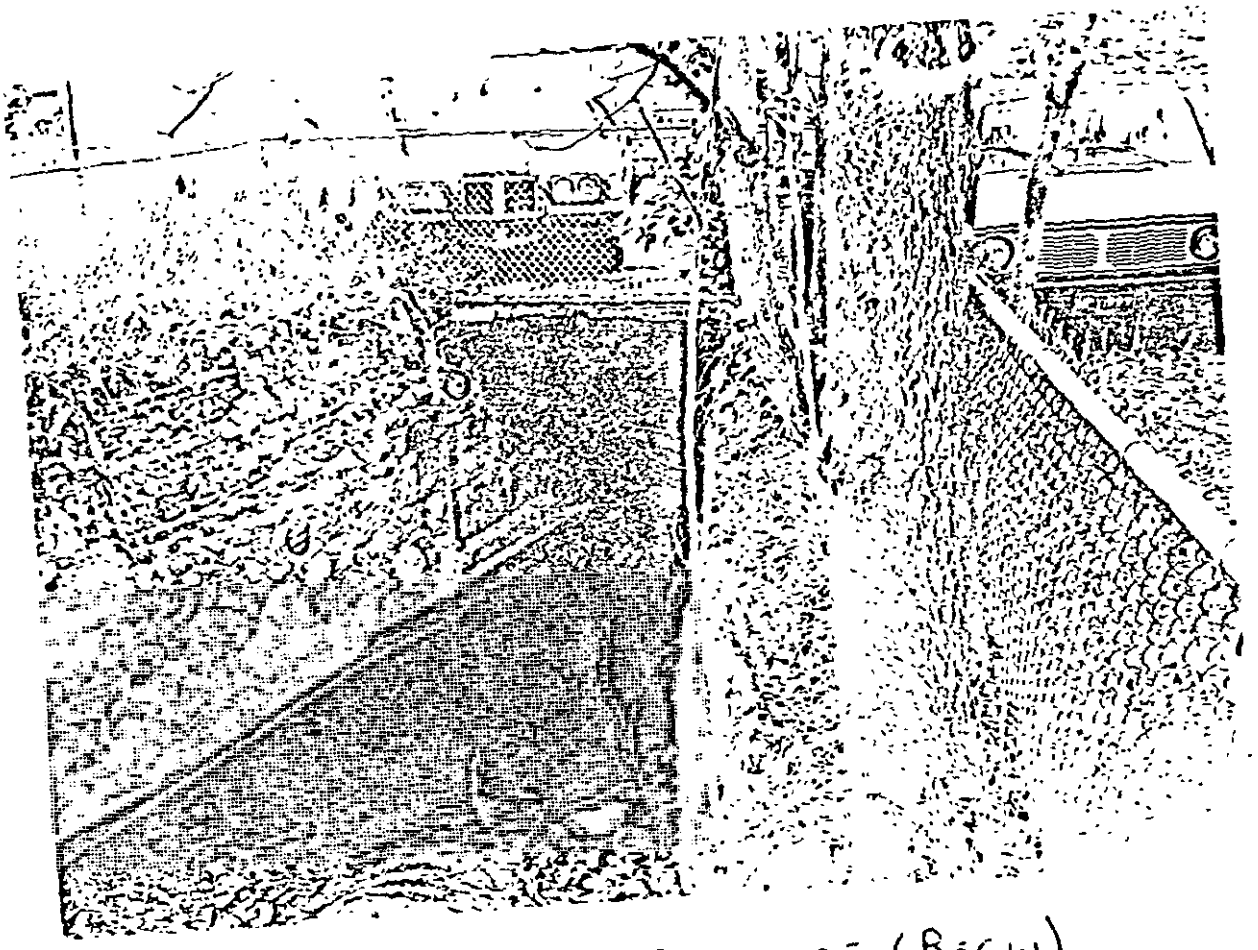
$$= \frac{10.5\left(\frac{Q}{48.4}\right)^2}{2g}$$

Hence av. value of XKOR = 10.5 reasonable

BAREA, Av. area of flow = 48.4 ft^2

As per output enclosed (under a separate folder), flow through the Enclosure is given below:

10 yr	50 yr	100 yr	500 yr
211 CFS	207 CFS	206 CFS	204 CFS

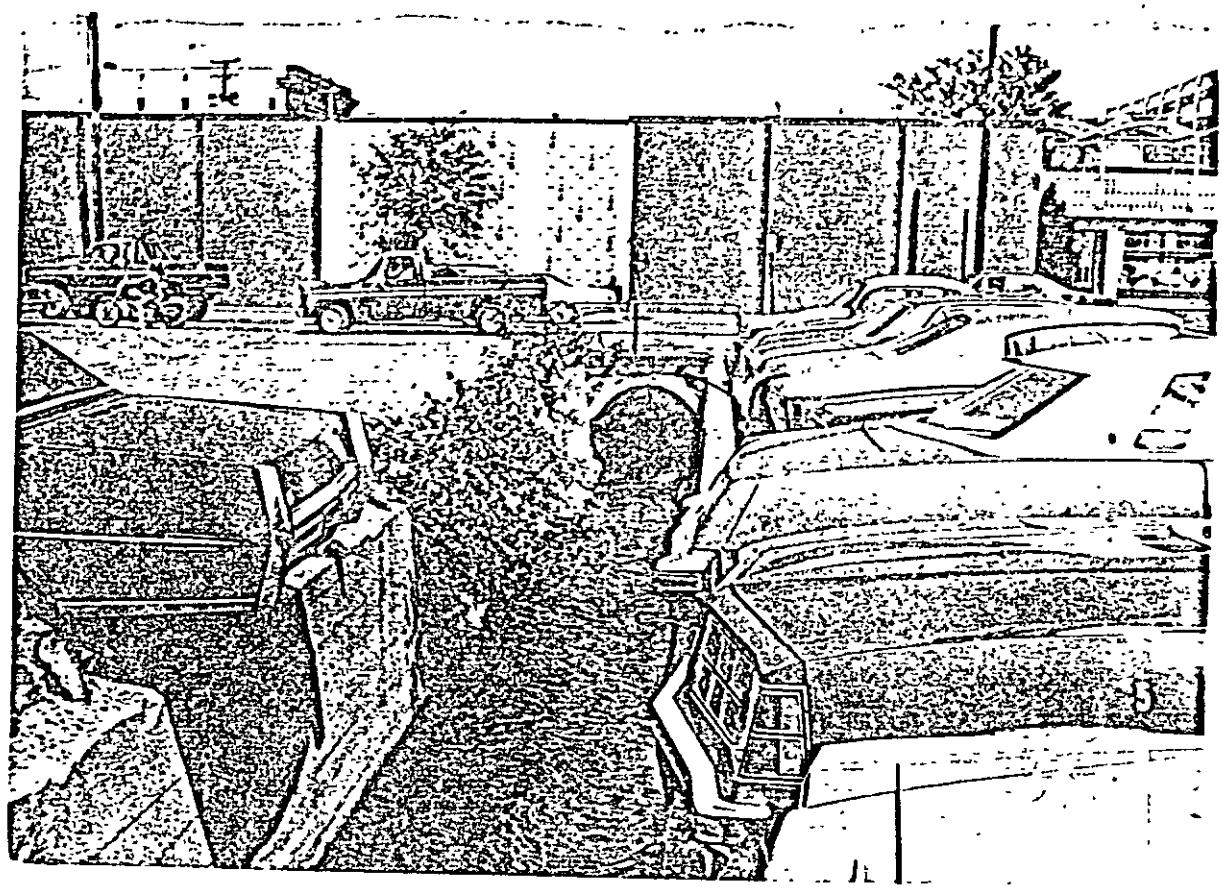


SECTION #75C ARCADIA ENCLOSURE (BEGIN)
STA 31+13.5

D/S END OF ENCLOSURE

Sheet 12/13

HUD 2007.07



ARCADIA DRAIN AT PARK (BEG ENCLOSED
SYSTEM SECTION #76

U/S END OF ENCLOSURE

Sheet 13/13

HUD 2027-07

REFERENCE

Pressure Flow Computations for Arcadia Creek Enclosures

1C) Enclosure from Cooley St to Elm St

Alignment of the Enclosure shown on the next two sheets

Data taken from Survey Notes

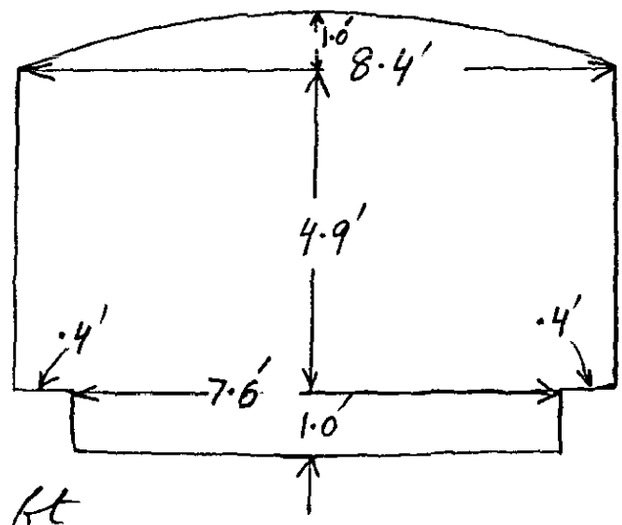
(i) Cross section from 43+16 to 46+53.3

X-sectional Area (A) = 5.5 + 8.4 x 4.9
+7.6 x 1.0 = 54.3 ft²

Wetted Perimeter (P)

= 8.7 + 2(4.9)
+2(.4) + 2(1.0)
+7.6

= 28.9 ft



$$R = \frac{A}{P} = 1.88 \text{ ft}$$

SUBJECT	BY	CHK.	SHEET NO.	File Code No (Job No.) Owner Project Suffix
Arcadia Creek Enclosure #1C	Sushil		1 OF 14	HUD • 202 • 07
	DATE 4/3/80	DATE		

HUD 2027-05 SHEET #2

ARCADIA CREEK ENCLOSURE

REF FB 1009 PG 25-48

MAGNETIC BEARINGS

Arcadia Creek
Enclosure # 1C

3+16 AP #24-BEG. ENCL. (COOLEY)

D/S End of Enclosure

45+40 AP #26

152' @ N 87° W

287' @ N 84° W

38' @ S 87° W

48+81 AP #28

46+86 MH # 18 RIM 785.27

45+64 AP #27

24' @ S 88° W

44+85 CB # 17 RIM 789.39

43+88 AP #25

72' @ S 7

112' @ N 83° W

74' @ S 70° W

49+65 AP #30-MH # 19 RIM 788.23

50+77 AP #31

51+34 AP #32

21+07 AP #33

52+03.5 AP #35

52+34.5 AP #36

30' @ S 61° W

18' @ S 60° W

43' @ S 62° W

50' @ S 64° W

55+58 AP #43

55+88 AP #44

30' @ S 70° W

32.5' @ N 80° W

54+80 AP #42

54+36 AP #41

53+50 AP #37

53+08 AP #38

53+18 AP #39

53+41 AP #40

54+84 AP #47

51+73 AP #48

51+63 AP #34

27' @ S 22° W

29' @ S 40° W

30' @ S 61° W

72' @ N 84° W

10' @ S 18° W

44' @ S 40° W

89' @ S 62° W

17.5' @ S 84° W

51+30 SMH # 20 RIM 792.08

58+25 AP #50

57+90.5 AP #49

59+45 AP #51

59+45 SMH # 22 RIM 791.23

58+00 MH # 21 RIM 792.07

7' @ S 49° W

103' @ S 32° W

59+43 AP #

59+50 AP #52

U/S End of Enclosure

60+53 AP #53

73' @ S 83° W

ELM

Surveyed 4/23/80

Sheet 2 of 4

HUD 2027-

ARCADIA CREEK ENCLOSURE

REF FB1009 PG 25-48

MAGNETIC BEARINGS

1220'@ N84°W

D/S End of Enclosure

MH #1 (2+89) RIM 766.14

8+00 MH #2 RIM 766.91

11+11 MH #3 RIM= 768.65

13+42 MH #4 RIM= 770.57

14+40 MH #5 RIM 770.67

MH #6 RIM 771.53

13+56 A.P #7

12+36 @ S66°W

12+41 @ S72°E

17+14 A.P #16

14+82 A.P #3

45'@ S34°W

15+27 AP #4

52'@ S58°W

15+79 A.P #2

135'@ S76°W

U/S End of Enclosure

30+63 End Enclosure

30+75 AP #17

117'@ N82°W

78'@ S72°W

57'@ N87°W

29+58 AP #16

28+80 AP #15

28+23 AP #14

27+97 CB #11 RIM 775.13

27+40 CB #12 RIM 775.15

27+64 CB #13 RIM 775.12

27+07 AP #13

111'@ S74°W

26+17 CB #10 RIM 775.13

349'@ S69°W

23+38 AP #12

179'@ S69°W

21+43 AP #10

20+67 AP #9

20+00 A.P #8

21+73 C.B #7 RIM 772.44

22+52 CB #8 RIM 772.72

23+28 CB #9 RIM 772.89

23+22 AP #11

76'@ S56°W

67'@ S64°W

112'@ S74°W

174'@ N62°W

18+88 A.P #7

17+14 A.P #6

Subject Arcadia Creek Enclosure #1 1A

Sheet No. 2 of 16 Suite 3/31

File HUD 2027-C

HYDRAULIC REPORT
ARCADIA CREEK
CITY OF KALAMAZOO, MICHIGAN

I INTRODUCTION

This report summarizes the hydraulic studies undertaken to support detailed studies of approximately 4.5 miles of the Arcadia Creek in the City of Kalamazoo, Michigan. Bill Weaver served as Project Manager for this Study.

The Arcadia Creek basin area consists of approximately 16.5 square miles, of which 5.5 square miles are in the City of Kalamazoo. Nine of the 11 square miles which lie outside the City are depression areas. These areas are not included in the Arcadia Creek Drainage Basin which results in the contributing drainage area being reduced to 7.5 square miles. The area outside the City is basically rural while the remaining basin area inside the City is urbanized.

As shown in Exhibit 1, the Arcadia Creek is partially enclosed at the following locations:

A. Mouth to about 150 feet upstream of Burdick Street,

B. Two hundred feet upstream of Burdick Street to upstream of Park Street,

C. Downstream of Cooley Street to upstream of Elm Street, and

D. Downstream of Lovell Street to about 500 feet downstream of Oliver Street.

The four enclosures along with 20 culvert cross sections, two weir sections, and 20 valley sections were field surveyed by Wade, Trim & Associates, Inc. in October, 1979. These cross sections were supplemented by Abrams aerial elevation information, 2-foot contour maps and U.S.G.S. quadrangle maps which consist of 10-foot contour intervals (References 1, 2 and 3).

Cross section locations are shown on Exhibit 1. Table 1 cross references section designations by showing the computer section number which corresponds to each cross section letter shown in Exhibit 1. Table 2 lists discharges which have been approved by the Michigan Department of Natural Resources (M.D.N.R.) for the Arcadia Creek.

TABLE 1

ARCADIA CREEK

CITY OF KALAMAZOO

CROSS REFERENCE INDEX

X-SECTION	ABRAMS/ WTA NO.	COMPUTER NO.	DESCRIPTION
A	-	1	Overland Section
B	-	3	Overland Section
C	-	4	Overland Section
D	74	6	Overland Section
E	-	9	Overland Section
F	-	12	Overland Section; U/S of Enclosure
G	75	15	Overland Section
H	77	17	Overland Section
I	78	19	Overland Section
J	79	22	Overland Section
K	80	28	D/S Face W. Main Street
L	80	29	U/S Face W. Main Street
M	82	32	D/S Face Academy Street
N	82	33	U/S Face Academy Street
O	85	38	D/S Face Lovell Street
P	-	41	Overland Section
Q	-	44	Overland Section
R	-	46	Overland Section
S	89	50	D/S Face Oliver Street
T	89	51	U/S Face Oliver Street
U	92	55	D/S Face Railroad
V	92	56	U/S Face Railroad
W	94	58	D/S Face Stadium Dr.
X	94	59	U/S Face Stadium Dr.
Y	95	69	Valley Section
Z	93	71.05	D/S Face Stadium Dr.
AA	93	71.1	U/S Face Stadium Dr.
AB	92	71.2	D/S Face Railroad

TABLE 1

ARCADIA CREEK

CITY OF KALAMAZOO

CROSS REFERENCE INDEX

(Continued)

X-SECTION	ABRAMS/ WTA NO.	COMPUTER NO.	DESCRIPTION
AC	92	71.3	U/S Face Railroad
AD	92	71.9	D/S Face Railroad
AE	92	71.92	U/S Face Railroad
AF	93	71.94	D/S Face Stadium Dr.
AG	99	72	U/S Face Stadium Dr.
AH	100	73.5	D/S Face Howard St.
AI	100	74	U/S Face Howard St.
AJ	103	77	Valley Section
AK	105	79	Valley Section
AL	106	79.2	D/S Face Stadium Dr.
AM	106	79.5	U/S Face Stadium Dr.
AN	108	81	Valley Section
AO	109	82	Valley Section
AP	110	83	Valley Section
AQ	111	84	Valley Section
AR	112	85	Valley Section
AS	113	86	Valley Section

TABLE 2

ARCADIA CREEK

CITY OF KALAMAZOO

FLOOD FLOW FREQUENCY DATA

LOCATION	DA mi²	10 YEAR CFS	50 YEAR CFS	100 YEAR CFS	500 YEAR CFS
U/S of Howard	3.47	170	365	475	720
Oliver Street	4.13	315	435	485	745
At Kalamazoo River	7.55	665	920	1020	1285

II METHOD OF ANALYSIS

The HEC-2 backwater computer program was used in developing water surface profiles (Reference 4). Table 3 presents water surface elevations at selected locations for the four storms (10, 50, 100 and 500-year) analyzed in this report. HEC-2 printouts including computer cross section plots are presented as Exhibit 2. (Exhibit 2 is contained in the 11" x 15" folder enclosed with this report.) Water surface profiles resulting from the backwater analyses are presented as Exhibit 3.

TABLE 3

ARCADIA CREEK

CITY OF KALAMAZOO

FLOOD ELEVATIONS*

RECEIVED
JUL 6 1981
WATER MANAGEMENT

LOCATION	FREQUENCY 10 YEAR	50 YEAR	100 YEAR	500 YEAR
Pitcher Street	771.3	771.6	771.7	771.9
Burdick Street	778.5	778.7	778.8	778.9
D/S of West Main Street	793.0	793.2	793.3	793.5
D/S of Lovell Street	798.0	798.7	798.9	799.4
D/S of Oliver Street	812.3	813.1	813.4	814.0
U/S of Oliver Street	~~821.6~~ 815.1	~~822.1~~ 815.7	~~822.2~~ 815.9	~~822.8~~ 816.5
D/S of Howard Street	~~833.7~~ 833.8	~~834.4~~ 834.7	~~834.7~~ 835.1	~~836.2~~ 837.0
U/S of Howard Street	~~838.2~~ 840.5	~~841.9~~ 840.7	~~842.6~~ 840.7	~~844.9~~ 840.8
D/S of Stadium Drive West of Howard	845.1 ✓	~~845.7~~ 845.3	~~845.7~~ 845.4	~~845.8~~ 845.5
U/S of Stadium Drive West of Howard	~~850.0~~ 852.2	~~854.0~~ 854.2	~~854.4~~ 854.6	~~855.3~~ 855.5

*All elevations are based upon National Geodetic Vertical Datum

III VARIABLES AND COEFFICIENTS

Roughness coefficients (Mannings "n") were estimated from field inspections, quad maps, and photographs. Typical roughness values for the main channel and overbank areas of Arcadia Creek are .035 and .08, respectively, for all floods. These values are indicative of summer month conditions and are consistent with values recommended and used in engineering practice (Reference 5). Contraction and expansion coefficients were selected as 0.3 and 0.5, respectively, at bridge sections and 0.1 and 0.3, respectively, for gradual channel transitions. Bridge notes and sketches along with loss coefficient computations are included in Exhibit 4.

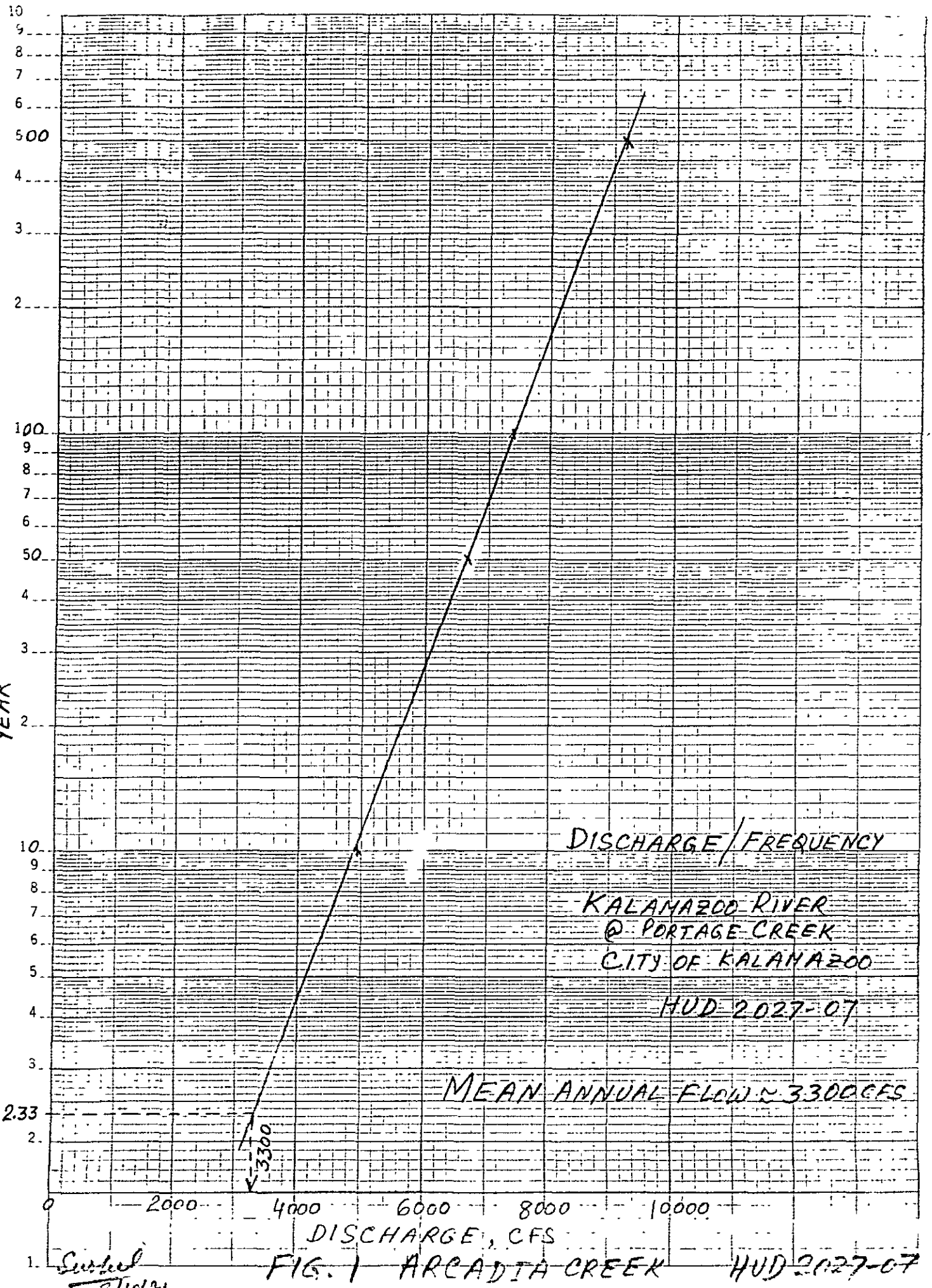
IV HIGH WATER MARKS

There are no documented high water marks for the Arcadia Creek.

V STARTING CONDITIONS

Arcadia Creek begins as an enclosure which outlets into Portage Creek. This outlet is located immediately upstream (100 feet ±) of the Portage Creek/Kalamazoo River confluence, as illustrated on Exhibit 1. Therefore, the mean annual flood elevation of the Kalamazoo River (Reference 6), located at its confluence with Portage Creek, was utilized for the starting water surface elevation for Arcadia Creek (10, 50, 100, and 500 year storms). As shown in Figure 1, the mean annual flood discharge of the Kalamazoo River at its confluence with Portage Creek is approximately 3,300 cfs, corresponding to a frequency of 2.33 years. This results in a mean annual flood elevation of 757.4, as shown in Figure 2.

The overland flow component of the Arcadia Creek had its starting water surface elevation set at critical depth because the roadway elevation (766.4) located at the mouth of Arcadia Creek, is higher than the mean annual flood elevation for the Kalamazoo River.



46 5506

K•E SEMI-LOGARITHMIC • 3 CYCLES X 70 DIVISIONS KEUFFEL & ESSER CO MADE IN U.S.A.

Sealed 2/10/81

FIG. 1 ARCADIA CREEK HUD 2027-07

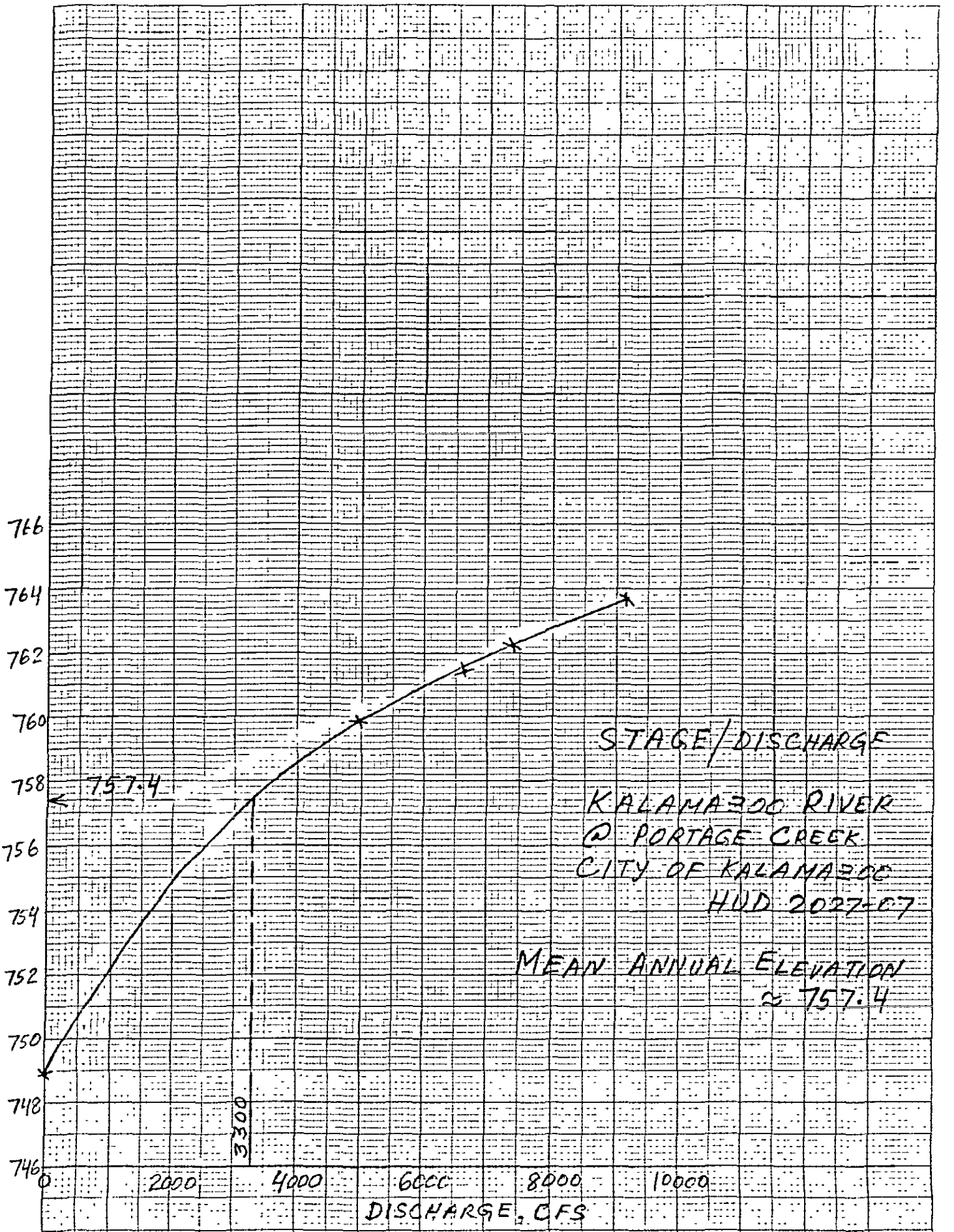


FIG. 2 ARCADIA CREEK HUD 2027-07

Sw[illegible]
2/10/87

K+E 10 TO THE INCH 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A. 46 1320

VI SPECIAL PROBLEMS

A. ENCLOSURES

The enclosures on the Arcadia Creek required detailed analyses. For each of the enclosures, two types of flow would occur during a flood: pressure flow and overland flow. The total flow for each flood was distributed between pressure flow and overland flow as follows:

1. Pressure Flow

The HEC-2 special bridge routine was utilized for the computation of pressure flow through the enclosures. Loss coefficient values XKOR, were computed for each segment of the enclosure. These values were utilized in the computation of average values of XKOR and area of flow, BAREA. The roadway elevation was kept high enough so as to discount the possibility of any weir flow.

2. Overland Flow

Cross sections were located at intervals over each of the enclosures. These sections were dimensioned perpendicular to the anticipated flow lines and were extended across the entire flood plain.

Water surface and energy grade elevations for both overland and pressure flow were matched at both the upstream and downstream faces of each enclosure. This was accomplished by the adjustment of flow distribution between the overland flow paths and the enclosures. Detailed computations for the enclosures are presented as Exhibit 5. Table 4 lists the distribution of flow between pressure and overland flow for each enclosure.

TABLE 4

ARCADIA CREEK

CITY OF KALAMAZOO

FLOOD FLOW DISTRIBUTION

LOCATION	FREQUENCY 10 YEAR CFS	50 YEAR CFS	100 YEAR CFS	500 YEAR CFS
Enclosure from Mouth to 150 feet U/S of Burdick Street				
Flow through the Enclosure	344	347	348	350
Overland Flow	321	573	672	935
Enclosure from 200 feet U/S of Burdick Street to U/S of Park Street				
Flow through the Enclosure	211	207	206	204
Overland Flow	454	713	814	1081
Enclosure from D/S of Cooley Street to U/S of Elm Street				
Flow through the Enclosure	230	228	228	227
Overland Flow	435	692	792	1058
Enclosure from D/S of Lovell Street to 500 feet D/S of Oliver Street				
Flow through the Enclosure	125	124	124	124
Overland Flow	540	796	896	1161

B. DIVERSIONS

As shown in Exhibit 1, there is divided flow in the creek at two locations: between sections Z and AG and between sections AH and AM. Since the HEC-2 computer program is not set up to handle the divided flow in one step, the following analysis was performed for each of the two diversions:

1. Stage/discharge rating curves were developed separately for flow in the channel and overland flow.

2. The two rating curves were then combined to form a rating curve for the total flow versus channel water surface elevation on the upstream end. This information was utilized to distribute the total flow between overland flow and channel flow.

The rating curves for the two diversions are presented as Exhibit 6. Table 5 lists the flow distribution between channel and overland flow for each diversion.

TABLE 5

ARCADIA CREEK

CITY OF KALAMAZOO

FLOOD FLOW DISTRIBUTION

RECEIVED
JUL 6 1981
WATER MANAGEMENT

LOCATION	FREQUENCY 10 YEAR CFS	50 YEAR CFS	100 YEAR CFS	500 YEAR CFS
Diversion between Sections Z and AG				
Overland Flow	190	305	355	605
Channel Flow	125	130	130	140
Diversion between Sections AH and AM				
Overland Flow	0	~~148~~ 177	~~253~~ 283	~~489~~ 520
Channel Flow	170	~~217~~ 188	~~222~~ 192	~~231~~ 200

VII GENERAL

Computed water surface elevations were developed to an accuracy of 0.5 feet for floods of the selected recurrence intervals.

All elevations are referenced to the U.S. Geological Survey (U.S.G.S.) Datum. This datum is equivalent to the National Geodetic Vertical Datum (N.G.V.D.).

The hydraulic analyses for this study were based upon the effects of flow unobstructed by ice or debris. The flood elevations are considered valid only if hydraulic structures, in general, remain unobstructed and do not fail.

REFERENCES

1. Abrams Aerial Survey Corporation, Arcadia Creek Cross Sections, Kalamazoo Township, 1979.

2. U.S. Geological Survey Topographical Maps - Kalamazoo Quadrangle, Kalamazoo County, Michigan, 7.5 Minute Series, Photorevised, 1973.

3. U.S. Geological Survey Topographical Maps - Kalamazoo SW Quadrangle, Kalamazoo County, Michigan, 7.5 Minute Series, Photorevised, 1973.

4. U.S. Army Corps of Engineers - HEC-2 Water Surface Profiles - Users Manual - August, 1979.

5. Chow, Ven Te, Open Channel Hydraulics, McGraw Hill, Inc., 1959.

6. Wade, Trim & Associates, Inc., Taylor, Michigan, Hydraulic Analysis of Kalamazoo River Basin, City of Kalamazoo and Comstock Township, March, 1980.

ARCADIA CREEK

CITY OF KALAMAZOO, MICHIGAN

EXHIBIT 1

FIELD CROSS SECTION LOCATION AND

100-YEAR FLOOD PLAIN - FLOODWAY MAP

ARCADIA CREEK

CITY OF KALAMAZOO, MICHIGAN

EXHIBIT 2

COMPUTER PRINTOUTS

HEC-2 BACKWATER ANALYSIS WITH

CROSS SECTION PLOTS (See Separate Folder)

ARCADIA CREEK

CITY OF KALAMAZOO, MICHIGAN

EXHIBIT 3

WATER SURFACE PROFILES

ARCADIA CREEK

CITY OF KALAMAZOO, MICHIGAN

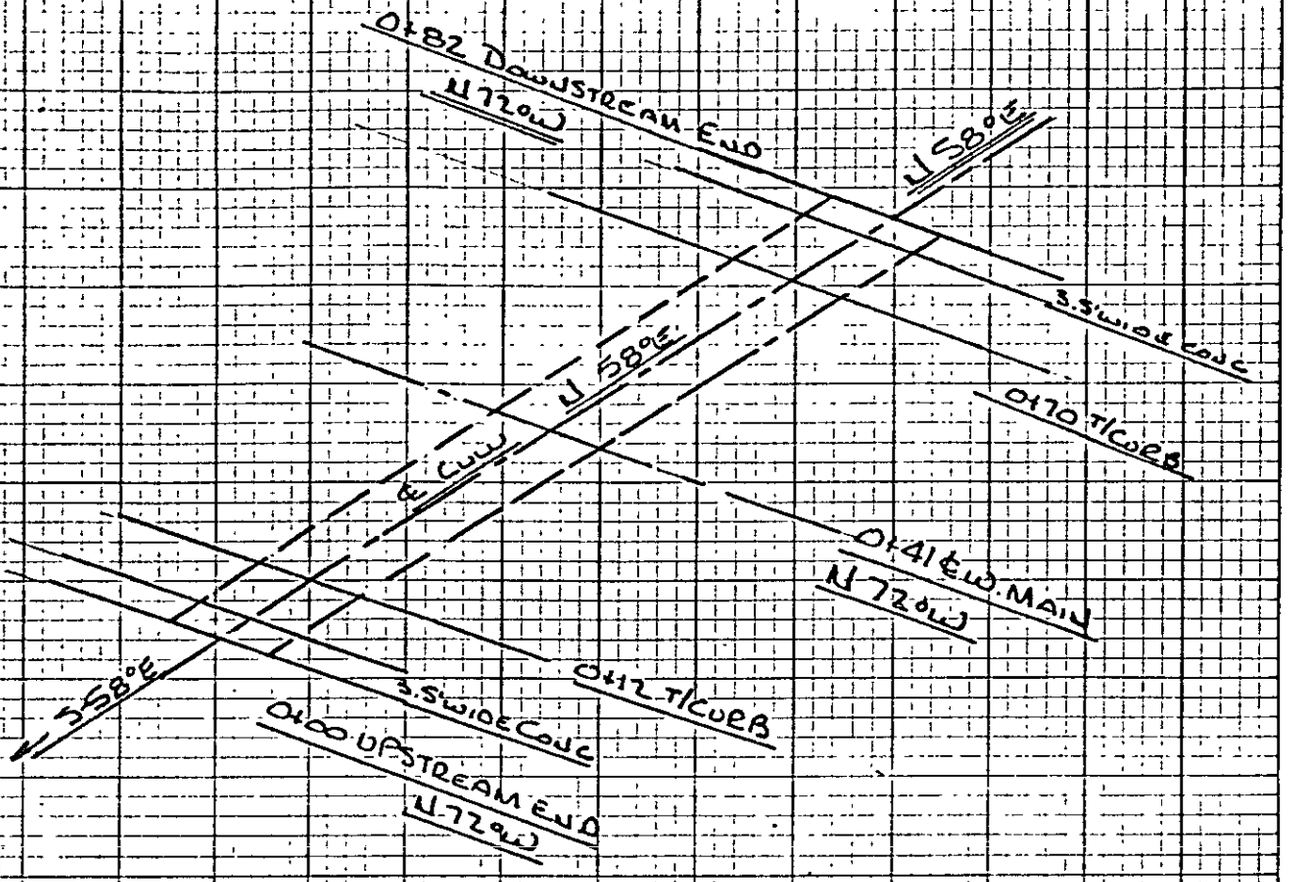
EXHIBIT 4

BRIDGE NOTES AND SKETCHES

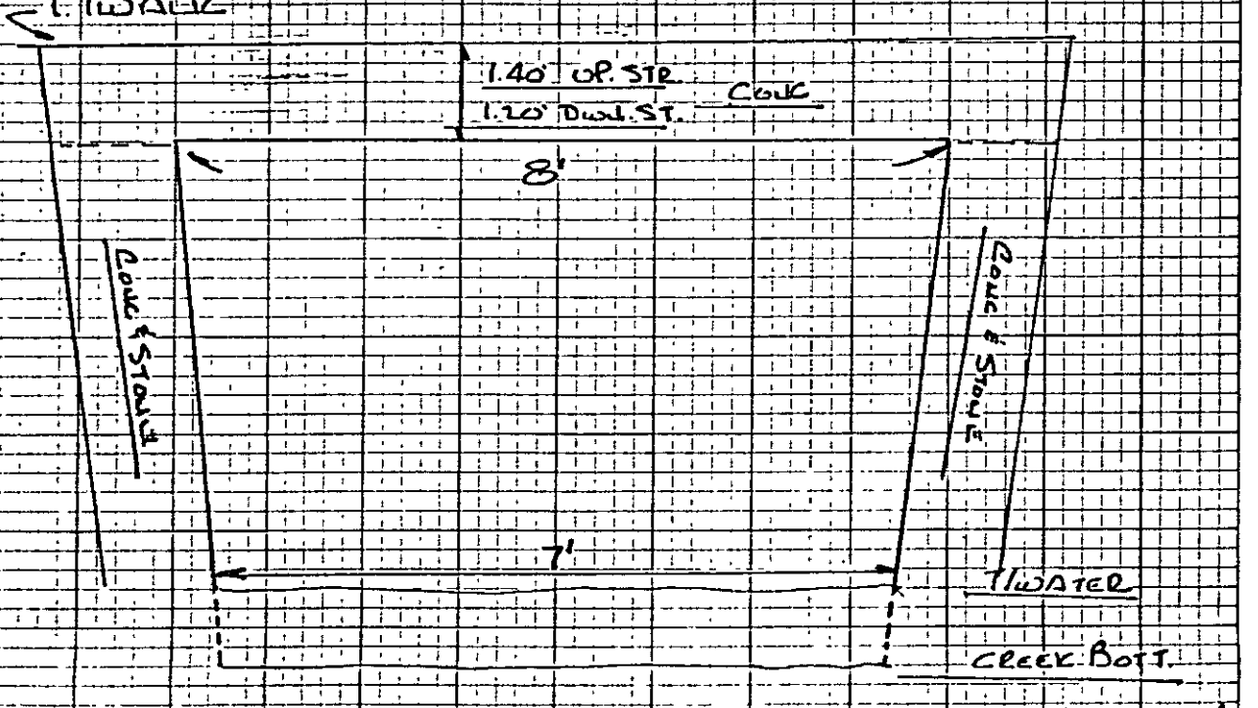
Book #3 53

Cross-Section #80 Arcadia Creek at W Main St

Mag. Bearings



Side View Section #80

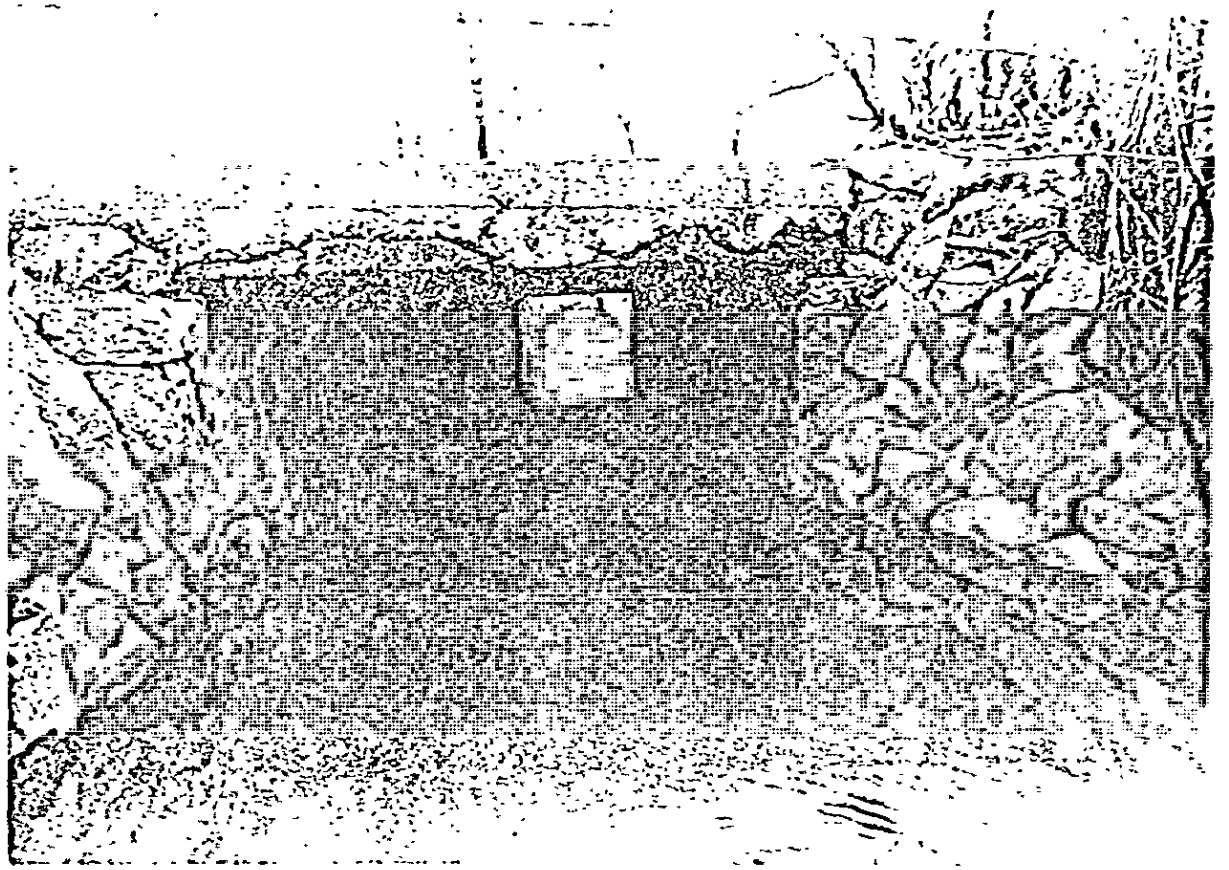


Sheet 1/43

COMPUTE SEC 28-29

ARCADIA CREEK

AUD 2022-07



CROSS-SECTION #80 ARCADIA CREEK AT W MAIN

COMPUTER SECS 28-29

Sheet 2/43

HUD 2027-07

FORM 25 0
(313) 291-5400

Wade, Trim & Associates, Inc.
Civil Engineers • Land Surveyors
WORK SHEET

25185 GODDARD ROAD
TAYLOR, MICHIGAN 48180

Bridge Location:
Bridge Losses - SB Card

REFERENCE

1. XK (Pier Shape Coefficient) 0 — HEC-2 manual
XKOR (Loss Coefficient) = 1.0 + Σk, $\Sigma k = k_f + k_e + k_p$
where k_f = friction loss coefficient
k_e = entrance loss coefficient
k_p = loss from intermediate piers
Description of Bridge: Box Culvert
$k_f = 29.1 n^2 L / R^{4/3}$ for English units
Area = 7.5 (791.4-786.7) = 35.3 ft² Wp = 2(7.5+4.7) = 24.4'
R = A/wp = 1.45' $R^{4/3}$ = 1.64 L = 82'
n (composite) =
$k_f = 29.1 \times (.02)^2 \times 82 / 1.64 = 0.6$

$k_e = 0.5$ — Hydraulic Charts for the Selection of Highway Culverts Circular No. 5 Dec. 1965 pg. 45

k_p = 0 if bridge has no intermediate piers

k_p = 0.05 if bridge has intermediate piers — HEC-2 manual

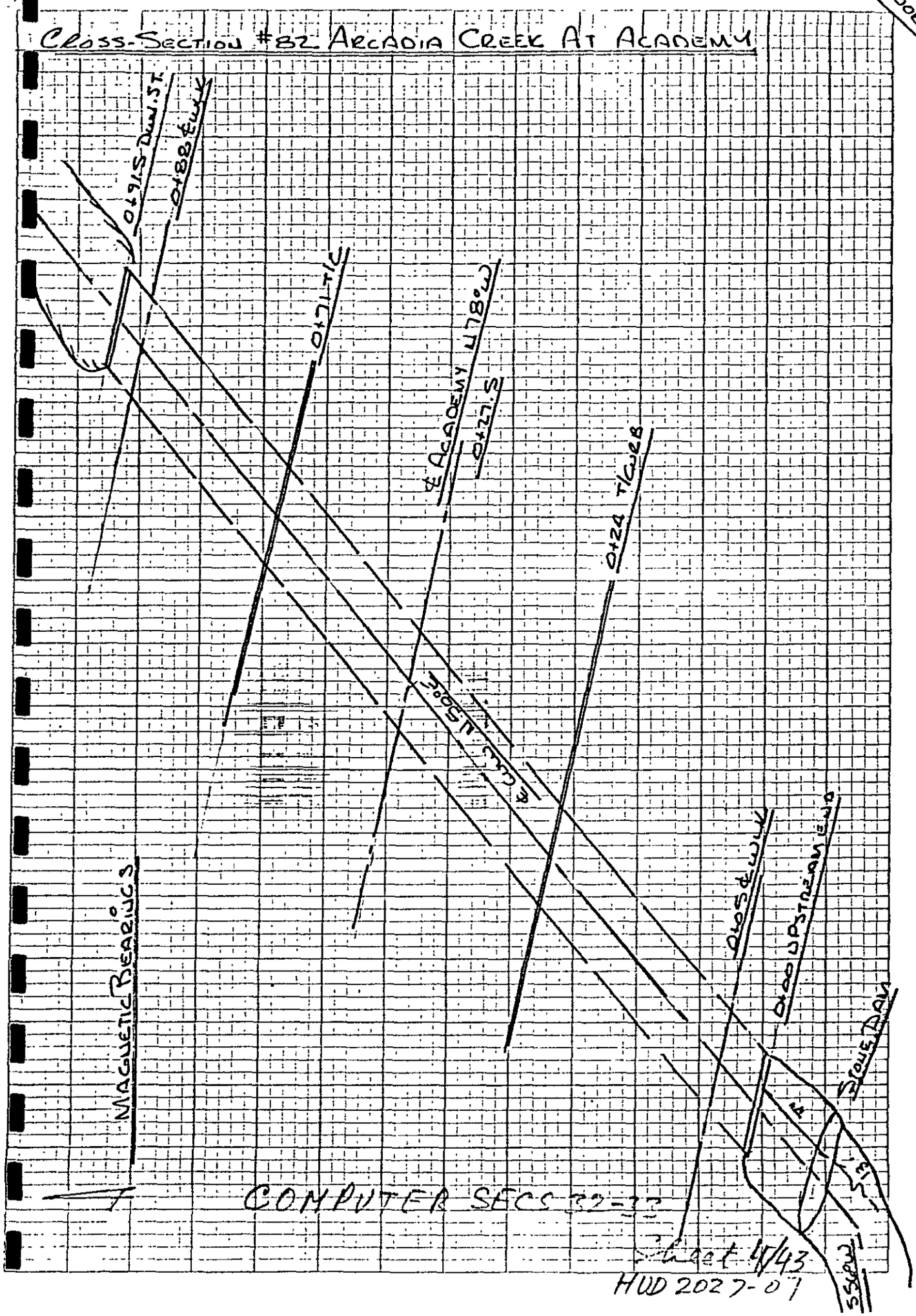
2. XKOR = 1 + + 0.5 + 0.6 = 2.1
3. COFQ Coefficient of discharge = 2.6 — HEC-2 manual
4. RDLEN = Length of weir = _____ (0 if read off BT cards)
5. BWC = bottom width of bridge opening (inc. piers) = 7.5 ft
[illegible] width of obstruction = _____ — field data
[illegible] = bridge opening inc. piers = 7.5 x 4.7 = 35.3 ft²
8. SS = side slope = _____
(horizontal per 1 vertical unit)
9. ELCHU = Elevation of channel invert U/S side = 786.7
(0 if equal to minimum elevation in previous x-sect.)
10. ELCHD = Elevation of channel invert D/S side = 786.3
(0 if equal to minimum elevation in previous x-sect.)

Sheet 3 of 43

SUBJECT	BY	CHK	SHEET NO	File Code No. (Job No.) Owner Project Suffix
Arcadia Creek; Culvert on W. Main St. ABRAMS SEC 80	Sue-Lil		___ OF ___	HUD • 2027 • 07
	DATE 4/9/80	DATE		

COMPUTER SECS 28-29

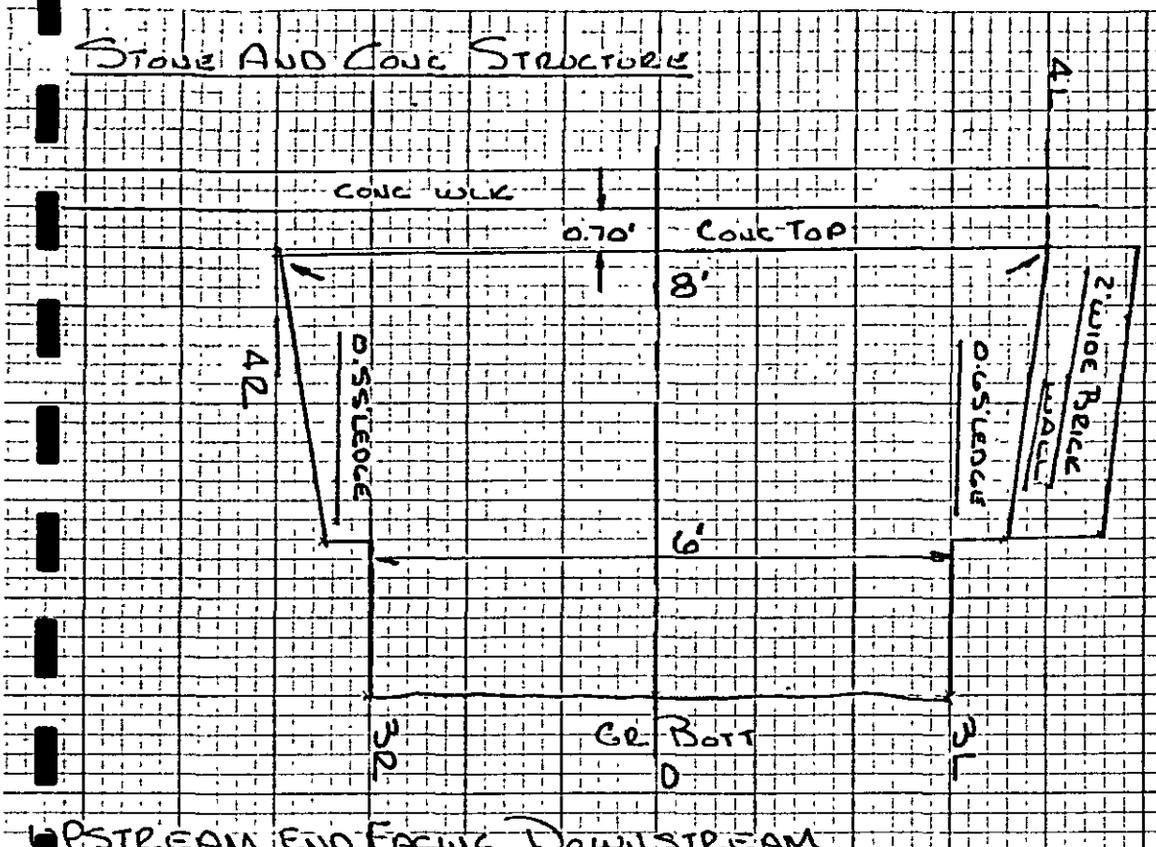
Cross-Section #82 Arcadia Creek at Academy



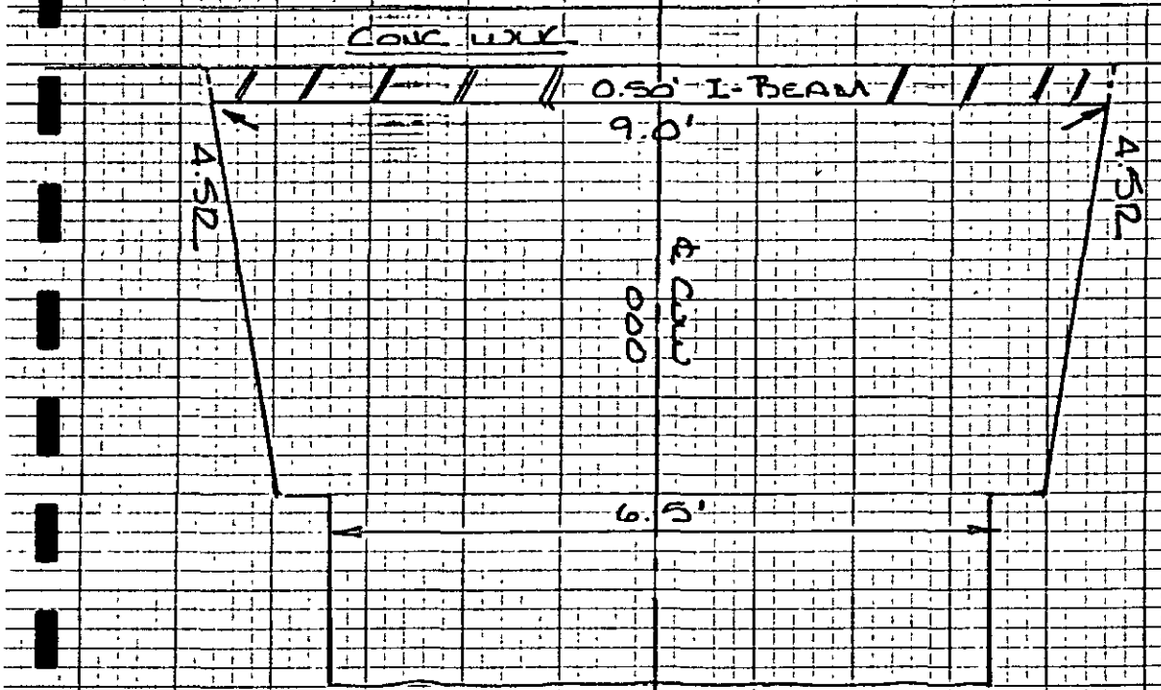
Cross-Sec #82 Arcadia Creek at Academy

Book #3 51

Stone and Conc Structure



Upstream End Facing Downstream

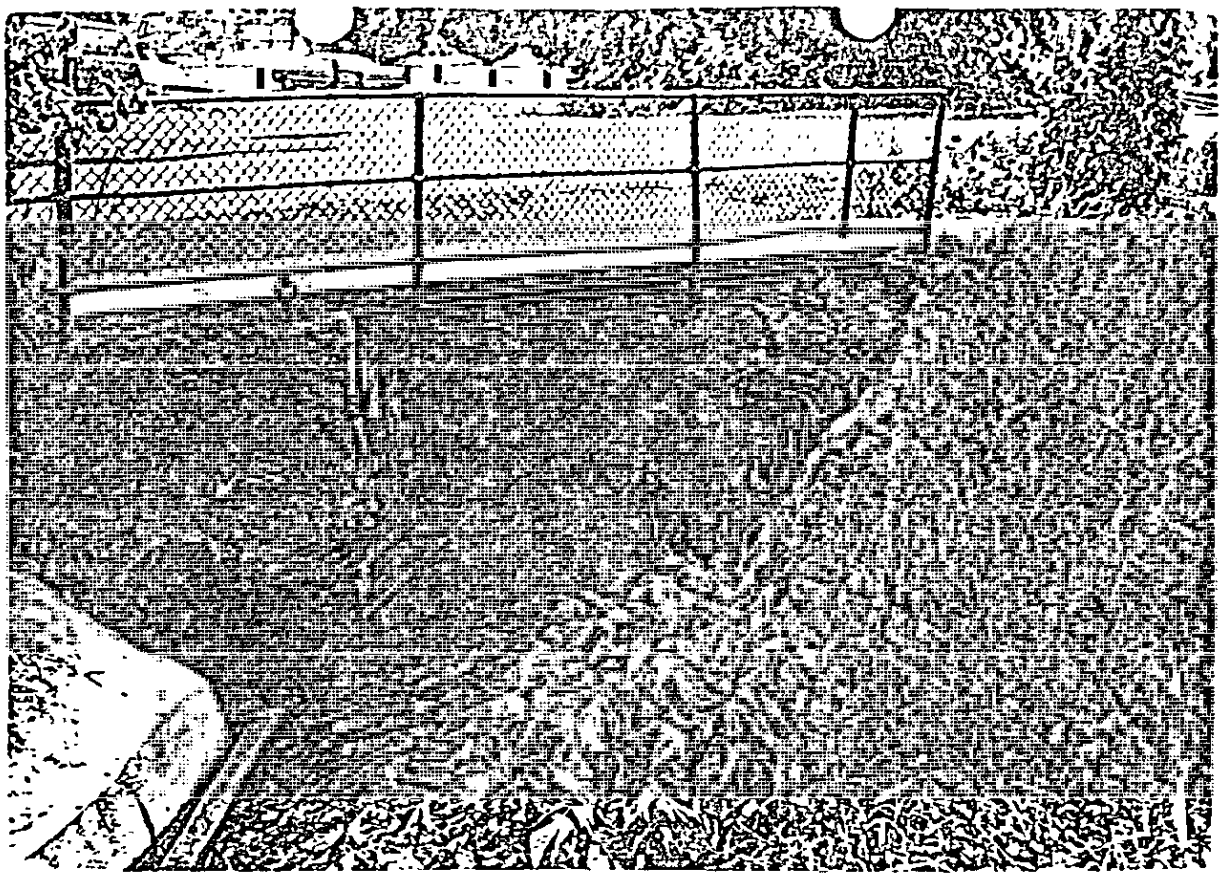


Downstr. Facing Upstr

Computer Secs 32-33

Sheet 5/43

HUD 2-7-07



ARCADIA DRAIN AT. ACADEMY Sec. #92
COMPUTER SECS. 32-33

HUD 20[illegible]

FORM 25 0
(313) 291-6400

Wade, Trim & Associates, Inc.
Civil Engineers • Land Surveyors
WORK SHEET

25185 GODDARD ROAD
TAYLOR, MICHIGAN 48180

Bridge Location:
Bridge Losses - SB Card

REFERENCE

1. XK (Pier Shape Coefficient) 0 — HEC-2 manual
XKOR (Loss Coefficient) = 1.0 + Σk , Σk = $k_f + k_e + k_p$
where k_f = friction loss coefficient
k_e = entrance loss coefficient
k_p = loss from intermediate piers
Description of Bridge: Box Culvert
$k_f = 29.1 n^2 L / R^{4/3}$ for English units
Average Area = 42 ft² = _____ Wp = 28 ft
R = A/wp = 1.5 ft $R^{4/3}$ = 1.72 L = 91.5
n (composite) =
$k_f = 29.1 \times (0.02)^2 \times 91.5 / 1.72 = 0.6$

$k_e = 0.5$ — Hydraulic Charts for the Selection of Highway Culverts Circular No. 5 Dec. 1965 pg. 45

k_p = 0 if bridge has no intermediate piers

$k_p = 0.05$ if bridge has intermediate piers — HEC-2 manual

2. XKOR = 1 + 0.6 + 0.5 + = 2.1
3. COFQ Coefficient of discharge = 2.6 — HEC-2 manual
4. RDLEN = Length of weir = _____ (0 if read off BT cards)
5. BWC = bottom width of bridge opening (inc. piers) = 6.5 ft
6. [illegible] of obstruction = _____ — field data
7. [illegible] = bridge opening inc. piers = 42 ft²
8. SS = side slope = _____
(horizontal per 1 vertical unit)
9. ELCHU = Elevation of channel invert U/S side = 788.5
(0 if equal to minimum elevation in previous x-sect.)
10. ELCHD = Elevation of channel invert D/S side = 788.8
(0 if equal to minimum elevation in previous x-sect.)

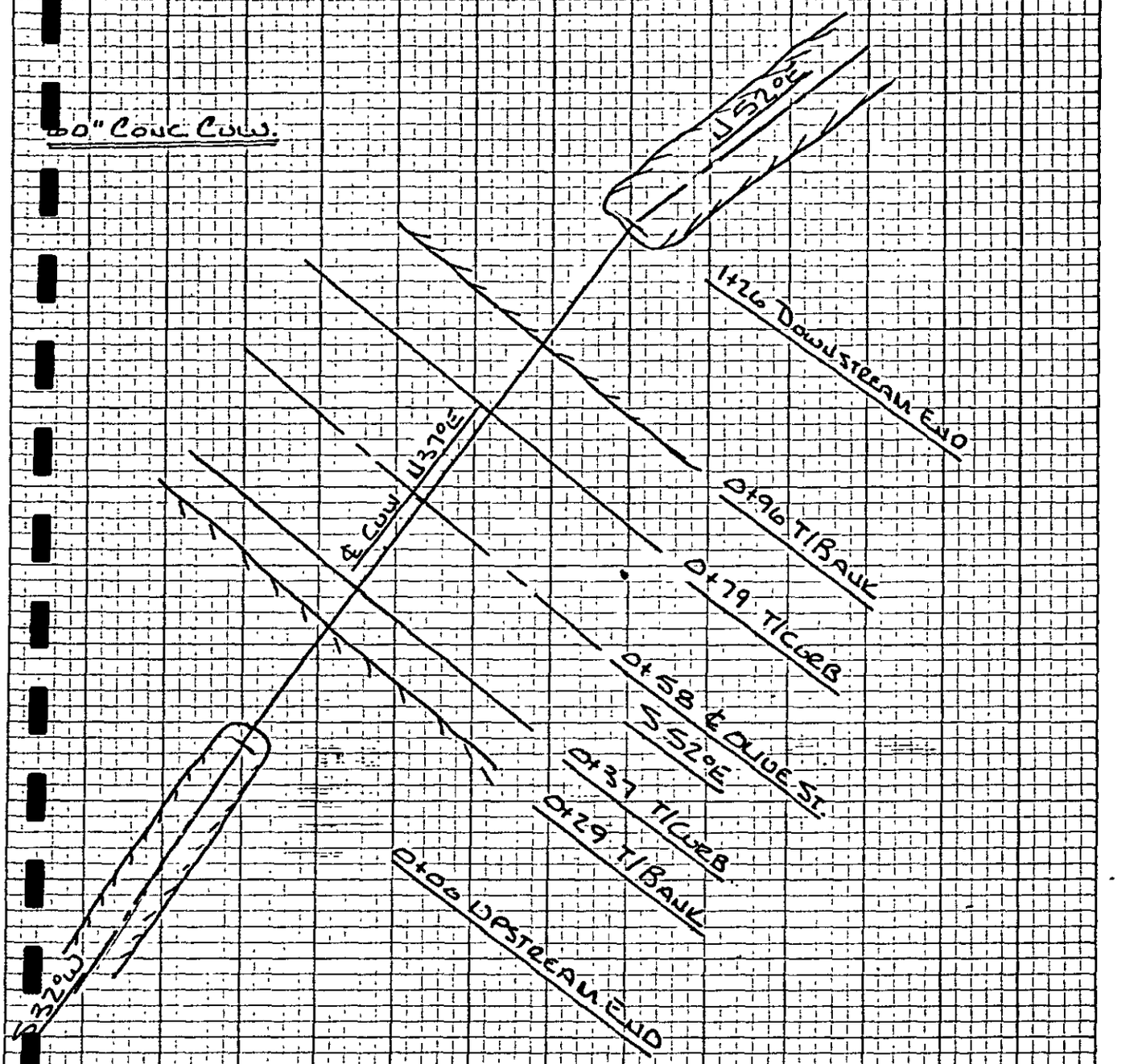
Sheet 7/43

SUBJECT	BY	CHK	SHEET NO	File Code No. (Job No.) Owner	Project	Suffix
Arcadia Creek, Culvert on Academy Street, Alabama Sec 82	Sushil			HUD	2027	07
	DATE 4/10/81	DATE	___ OF ___			

COMPUTER SECS 32-33

Cross Section #89 Olive St at Arcadia Creek

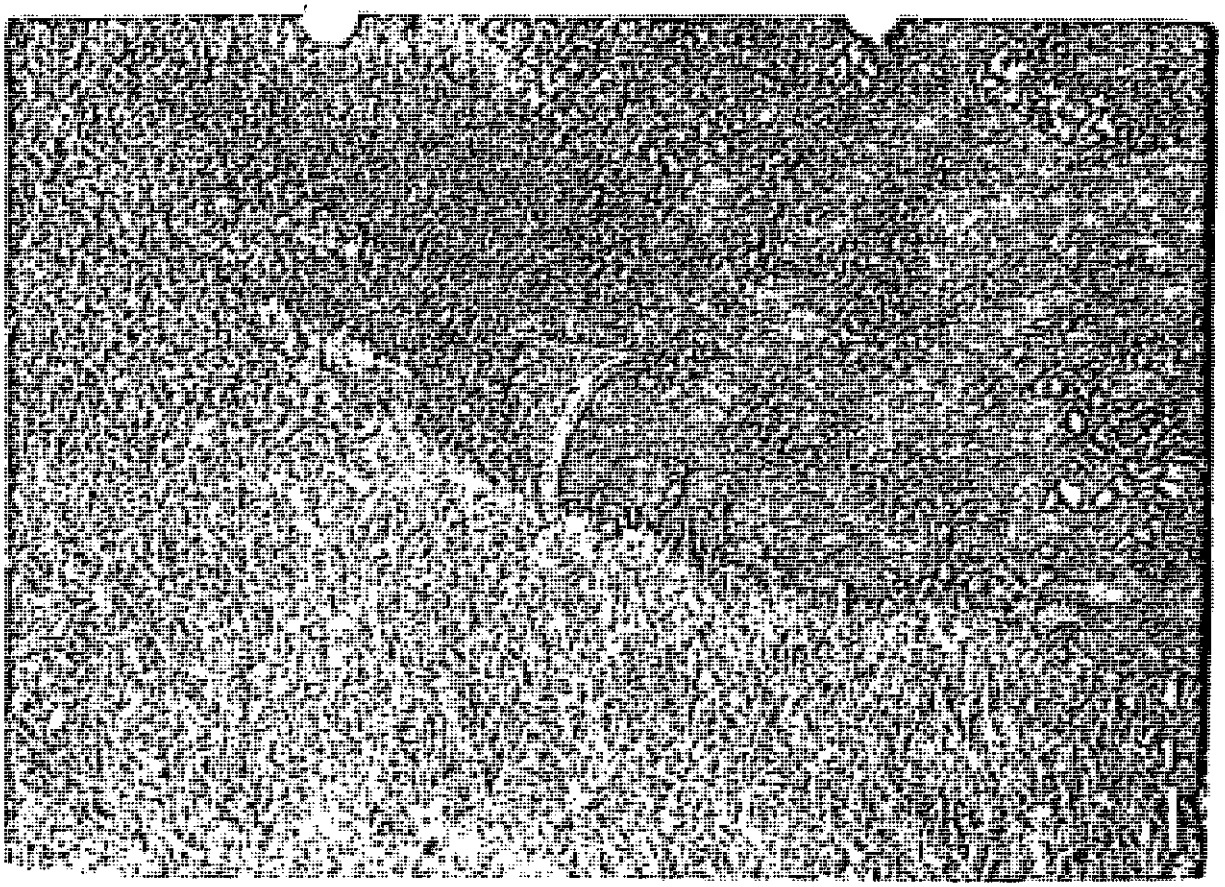
0+00 = Upstream End Mag. Bearings



COMPUTER SECS 50-51

Sheet 8/43

HUD 2027: 07



ARCADIA DRAIN AT OLIVER ST. E.

COMPUTER SECS 50-51

Sheet 9/43
HUD 2027-07

Bridge Location :

Bridge Losses - SB Card

REFERENCE

1. XK (Pier Shape Coefficient) 0 — HEC-2 manual

XKOR (Loss Coefficient) = 1.0 + Σk, $\Sigma k = k_f + k_e + k_p$

where k_f = friction loss coefficient
k_e = entrance loss coefficient
k_p = loss from intermediate piers

Description of Bridge : 60" ϕ Concrete Pipe

$K_f = 29.1\, n^2 L / R^{4/3}$ for English units

Area = ____ Wp = ____

$R = A/wp = \frac{\text{Radius}}{2} = 1.25'$ $R^{4/3} = 1.35$ $L = 126$ ft

n (composite) = .02

$K_f = 29.1 \times (.02)^2 \times 126 \;/\; 1.35 = 1.1$

$K_e = 0.5$ — Hydraulic Charts for the Selection of Highway Culverts Circular No. 5 Dec. 1965 pg. 45

K_p = 0 if bridge has no intermediate piers

$K_p = 0.05$ if bridge has intermediate piers — HEC-2 manual

2. XKOE = 1 + 1.1 + .5 + = 2.6
3. COFQ Coefficient of discharge = 2.6 — HEC-2 manual
4. RDLEN = Length of weir = ____ (0 if read off BT cards)
5. BWC = bottom width of bridge opening (inc. piers) = 3.93 ft
6. [illegible] width of obstruction = ____ — field data
7. [illegible] bridge opening inc. piers = 19.6 ft²
8. SS = side slope = ____ (horizontal per 1 vertical unit)
9. ELCHU = Elevation of channel invert U/S side = 807.7 (0 if equal to minimum elevation in previous x-sect.)
10. ELCHD = Elevation of channel invert D/S side = 807.2 (0 if equal to minimum elevation in previous x-sect.) — Sheet 10/43

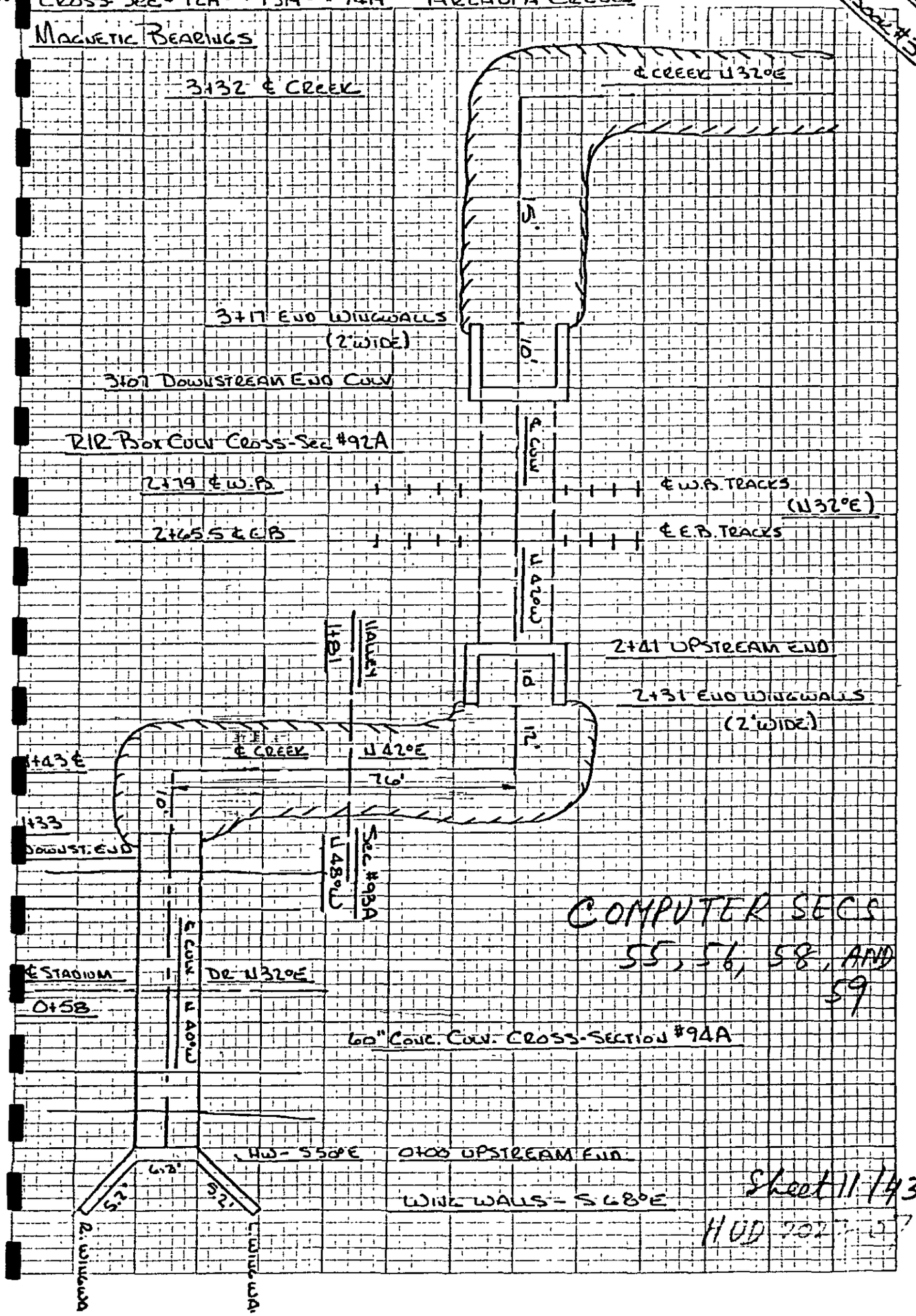
SUBJECT	BY	CHK	SHEET NO.	File Code No (Job No) Owner Project Suffix
Arcadia Creek; Culverton Oliver. St. ABRAMS SEC 89	Sushil		____ OF ____	HDD • 2027 • 07
	DATE 4/16/85	DATE		

COMPUTER SECS 50-51

Cross Sec #92A - #93A - #94A Arcadia Creek

Book #3 36

Magnetic Bearings

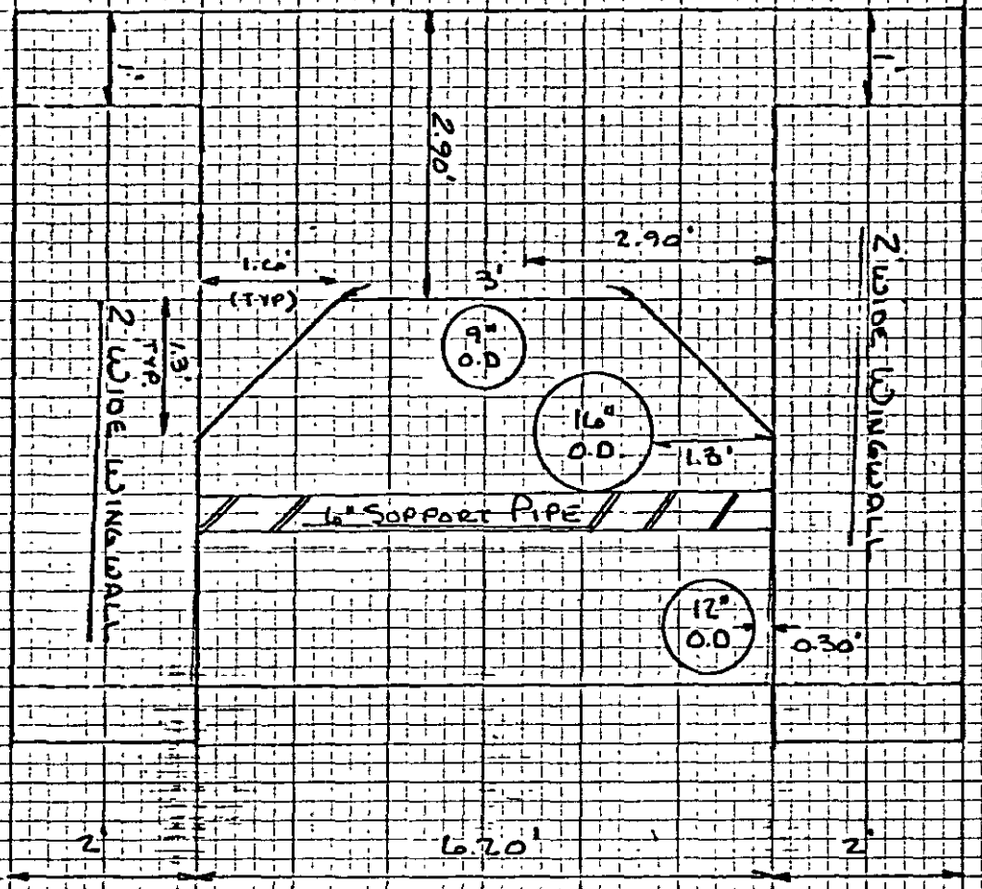


COMPUTER SECS 55, 56, 58, AND 59

Sheet 11 of 43

HUD 702

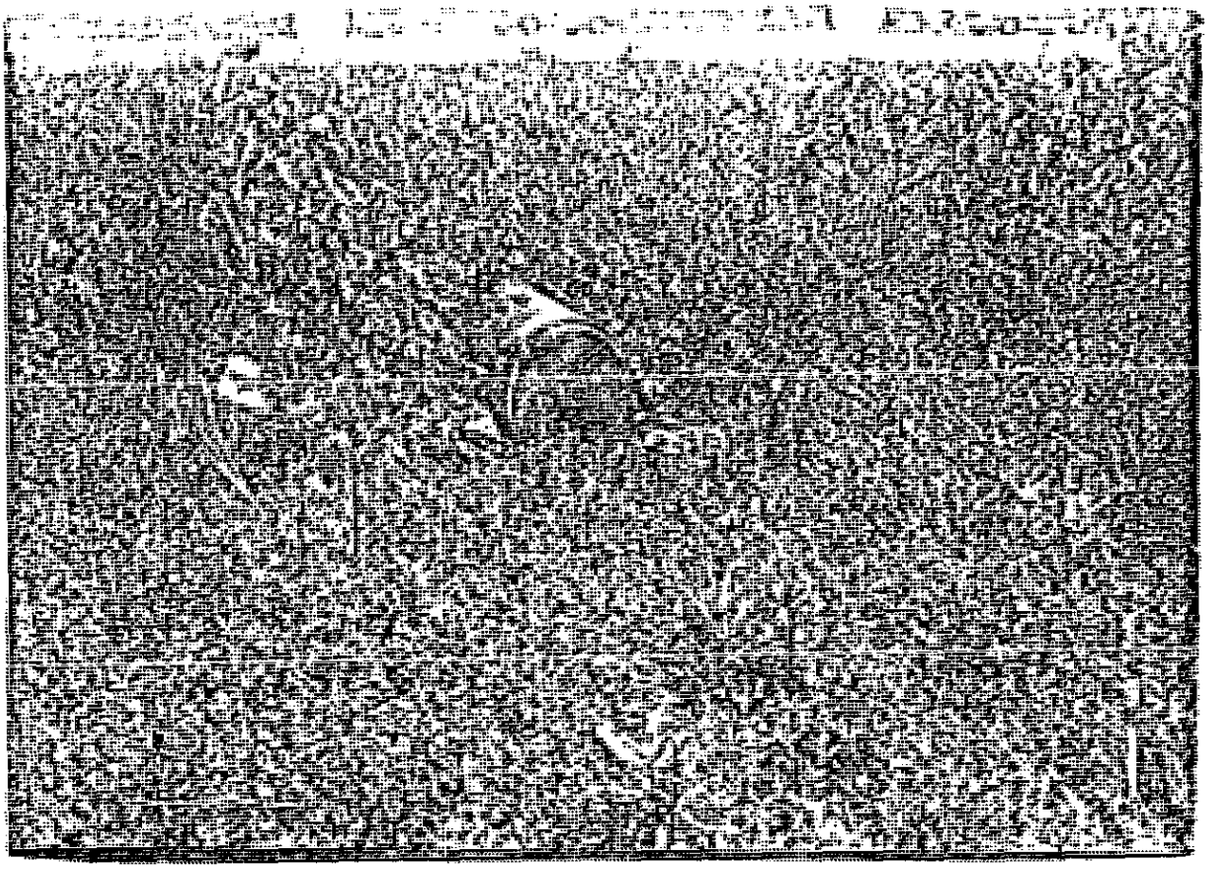
UPSTREAM VIEW OF CROSS-SECTION #92A (RR CROSSING FACING DOWNSTREAM - TYPICAL EXCEPT NO 6" SUPPORT ON DOWNSTREAM SIDE. R&L OFFSETS ARE FROM ℄ CONV. FACING UPSTREAM



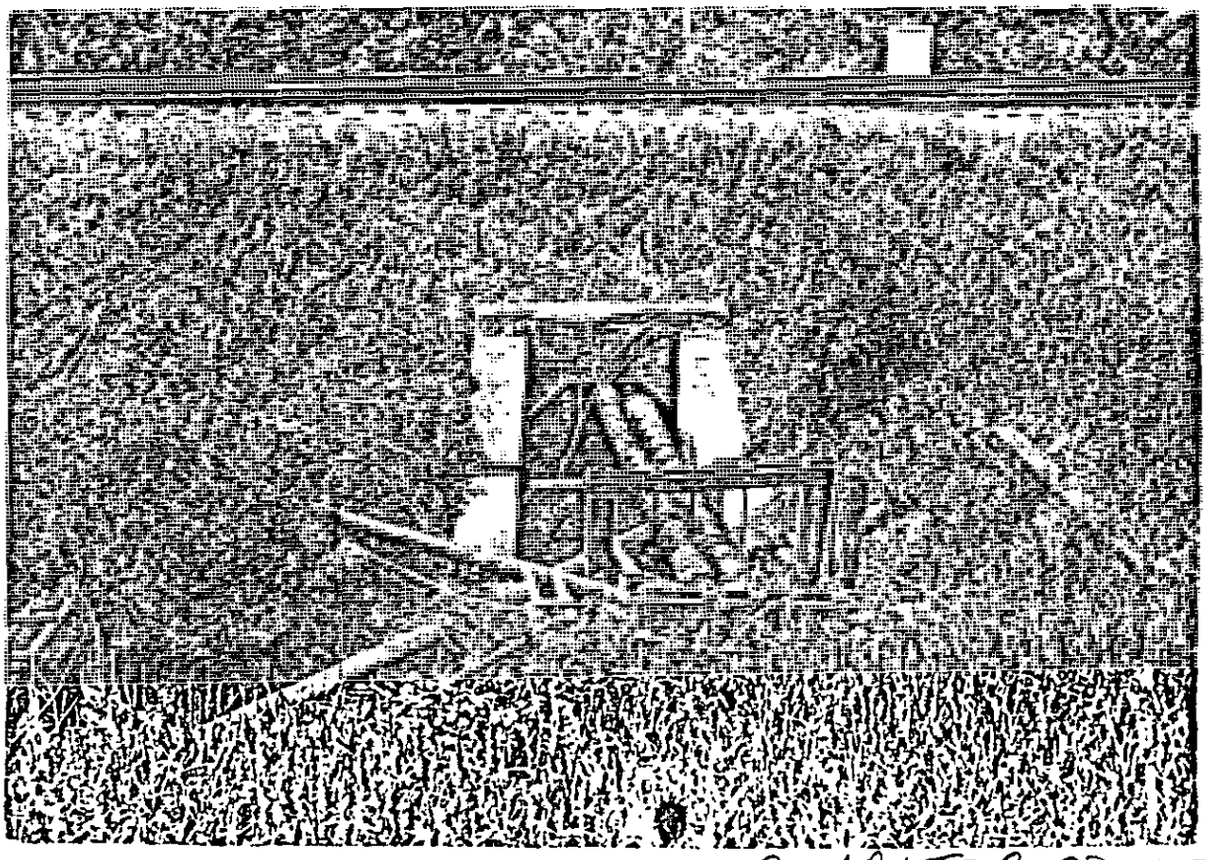
COMPUTER SECS. 55-56

Sheet 12/13

HOD 2027-01



ARCADIA DRAIN AT STADIUM DRIVE. 1ST CROSSING
WEST OF OLIVER ST. COMPUTER SECS 58-59
#94A



COMPUTER SECS. 55-56
ARCADIA SDRAIN AT PENN. CENT. RR N. SIDE STADIUM 1ST CROSSING N. OF OLIVER ST.

Bridge Location :

Bridge Losses - SB Card

REFERENCE

1. XK (Pier Shape Coefficient) 0 — HEC-2 manual

XKOR (Loss Coefficient) = 1.0 + Σk, $\Sigma k = k_f + k_e + k_p$

where k_f = friction loss coefficient
k_e = entrance loss coefficient
k_p = loss from intermediate piers

Description of Bridge : Box Culvert

$K_f = 29.1\, n^2 L / R^{4/3}$ for English units

Area $= 6.2 \times 5 - 1.6 \times 1.3 - \pi(.375^2 + .667^2) \approx 27\ ft^2$ $\quad Wp = 2(6.2+5) + \pi(.75+1.33) = 28.9\ ft$

$R = A/wp = .95\ ft$ $\quad R^{4/3} = .91$ $\quad L = 66\ ft$

n (composite) $= .02$

$K_f = 29.1 \times (.02)^2 \times 66 \;/\; .91 = .8$

$K_e = .5$ — Hydraulic Charts for the Selection of Highway Culverts Circular No. 5 Dec. 1965 pg. 43

K_p = 0 if bridge has no intermediate piers

$K_p = 0.05$ if bridge has intermediate piers — HEC-2 manual

2. XKOR = 1 + .8 + .5 + = 2.3

3. COFQ Coefficient of discharge = 2.6 — HEC-2 manual

4. RDLEN = Length of weir = _____ (0 if read off BT cards)

5. BWC = Bottom width of bridge opening (inc. piers) = 5.4 ft

6. [illegible] width of obstruction = _____ — field data

7. AREA = bridge opening inc. piers = 27 ft^2

8. SS = side slope = _____ (horizontal per 1 vertical unit)

9. ELCHU = Elevation of channel invert U/S side = 810.4 (0 if equal to minimum elevation in previous x-sect.)

10. ELCHD = Elevation of channel invert D/S side = 809.6 (0 if equal to minimum elevation in previous x-sect.) — Sheet 14/43

SUBJECT	BY	CHK	SHEET NO	File Code No (Job No / Project) Owner	Suffix
Arcadia Creek, Culvert on Railroad West of Oliver St.	Sushil		___ OF ___	HUD • 2027 • 07	
COMPUTER SECS 55-56	DATE 4/16/20	DATE			

Bridge Location :

Bridge Losses - SB Card

REFERENCE

1. XK (Pier Shape Coefficient) 0 — HEC-2 manual

XKOR (Loss Coefficient) = 1.0 + Σk , Σk = $k_f + k_e + k_p$

where k_f = friction loss coefficient
k_e = entrance loss coefficient
k_p = loss from intermediate piers

Description of Bridge : 60" ϕ Concrete Pipe

$K_f = 29.1\, n^2 L / R^{4/3}$ for English units

Area = ____ Wp = ____

$R = A/wp = \frac{\text{Radius}}{2} = 1.25$ $R^{4/3} = 1.35$ $L = 133$ ft

n (composite) = .02

$K_f = 29.1 \times (.02)^2 \times 133 \;/\; 1.35 = 1.1$

$K_e = 0.5$ — Hydraulic Charts for the Selection of Highway Culverts Circular No. 5 Dec. 1965 pg. 43

$K_p = 0$ if bridge has no intermediate piers

$K_p = 0.05$ if bridge has intermediate piers — HEC-2 manual

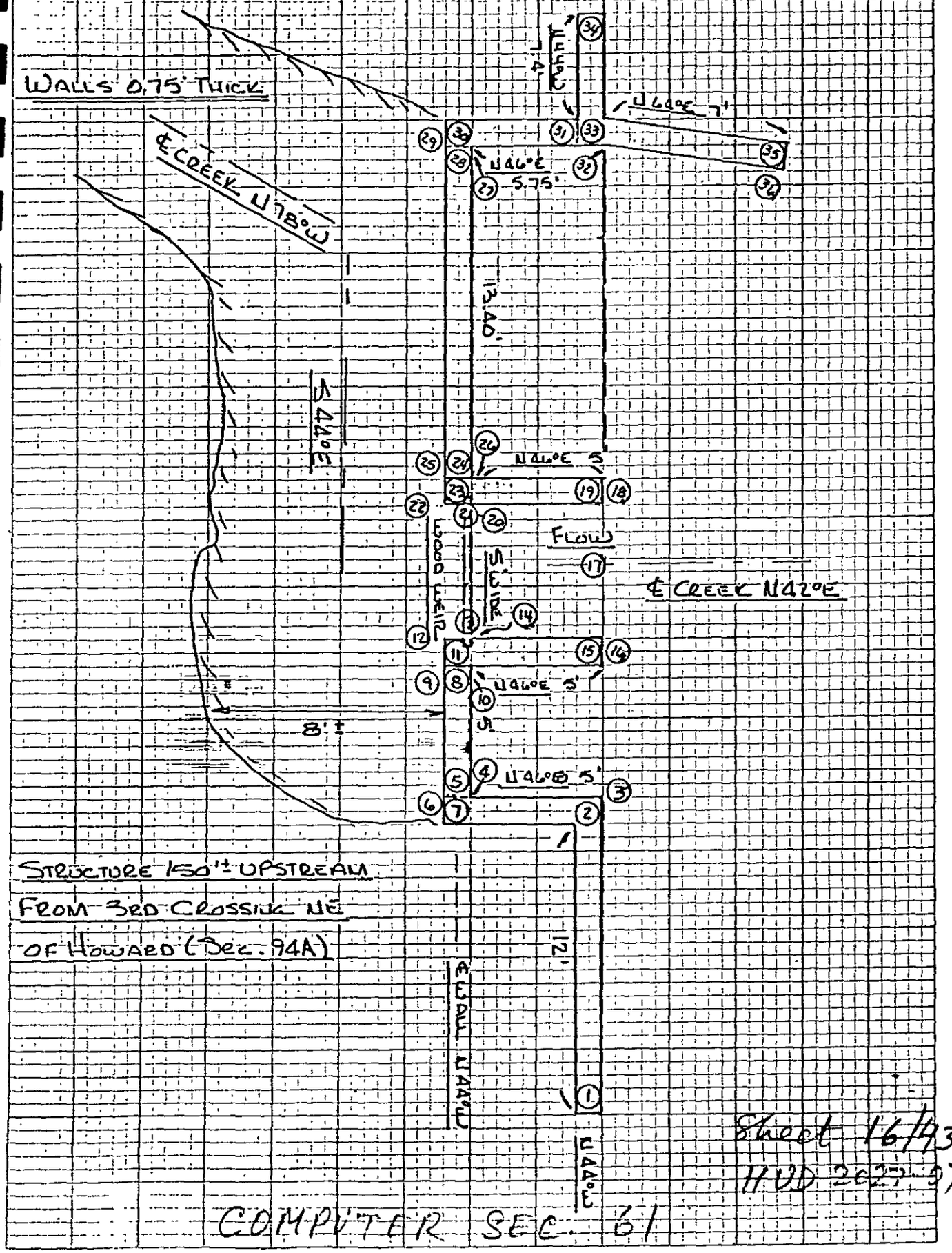
2. XKOR = 1 + 1.1 + .5 + = 2.6
3. COFQ Coefficient of discharge = 2.6 — HEC-2 manual
4. RDLEN = Length of weir = ____ (0 if read off BT cards)
5. BWC = bottom width of bridge opening (inc. piers) = 3.93 ft
6. [illegible] width of obstruction = ____
7. Area of bridge opening inc. piers = 19.6 ft² — field data
8. SS = side slope = ____ (horizontal per 1 vertical unit)
9. ELCHU = Elevation of channel invert U/S side = 814.4 (0 if equal to minimum elevation in previous x-sect.)
10. ELCHD = Elevation of channel invert D/S side = 812.6 (0 if equal to minimum elevation in previous x-sect.) — Sheet 15/42

SUBJECT	BY	CHK.	SHEET NO	File Code No (Job No) Owner Project Suffix
Arcadia Creek Culvert on Stadium Drive West of Oliver St.	DATE 4/16/85	DATE	____ OF ____	HUD • 2027 • 07

COMPUTER SEQ. 58-59

Book #3

ADDED SEC "C" ARCADIA CREEK. MAGNETIC BEARINGS



STRUCTURE 150'± UPSTREAM FROM 3RD CROSSING NE OF HOWARD (SEC. 94A)

Sheet 16/43

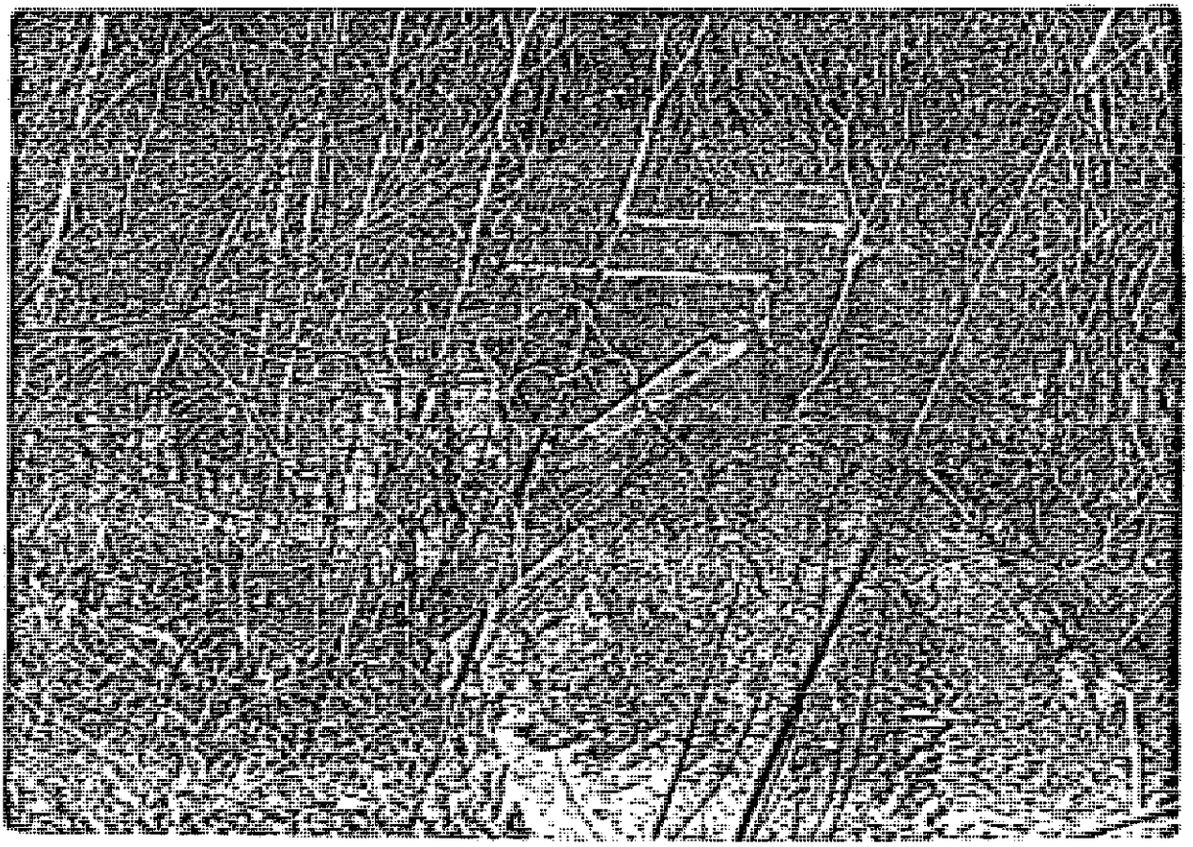
HUD 2027-97

COMPUTER SEC. 61



DAM ADDED SECTION "C" 150' UPSTREAM
FROM SEC 94A

COMPUTER SEC. 61



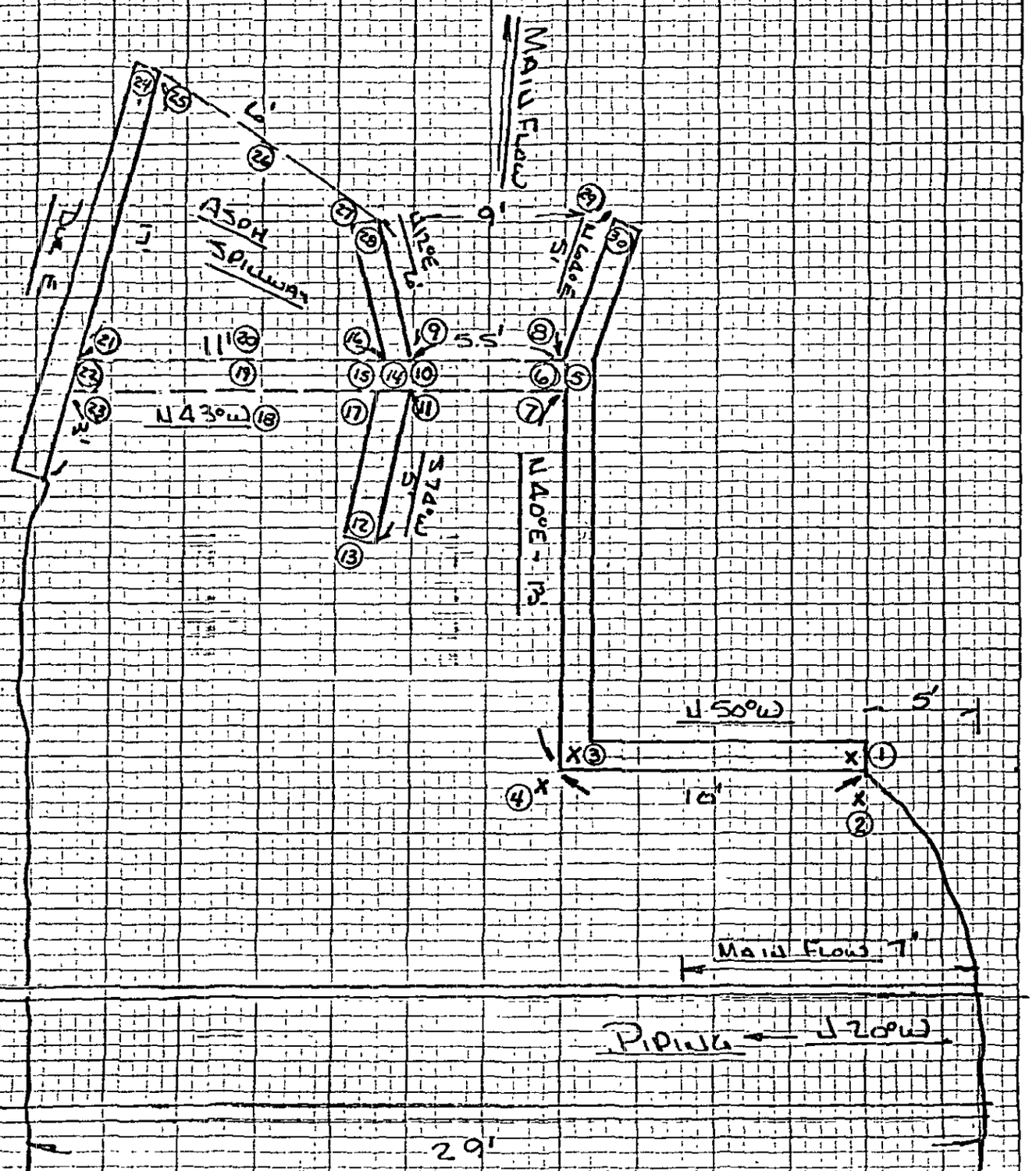
Book #3 31

ADDED SEC "B" ARCADIA CREEK

ALLWALLS 0.8' THICK

O ELEV #

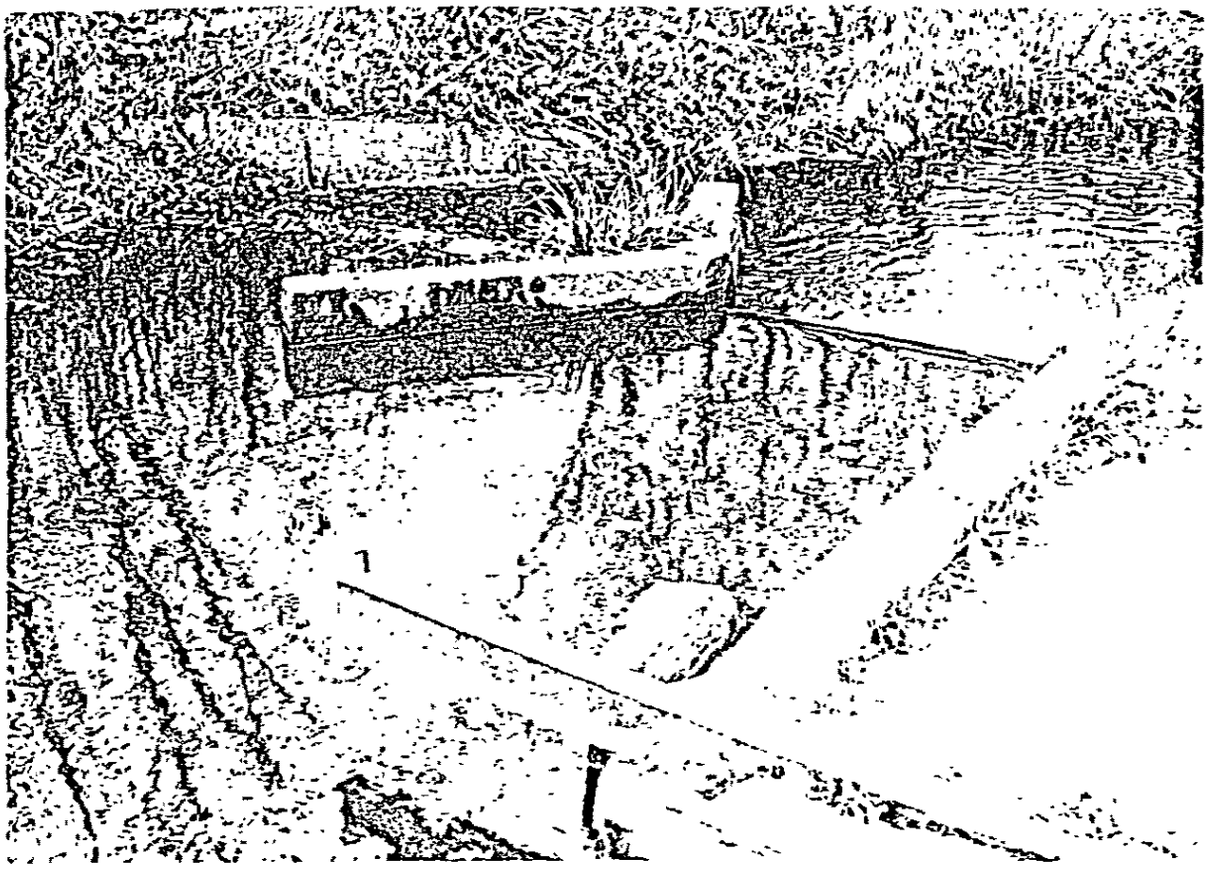
MAGNETIC BEARINGS



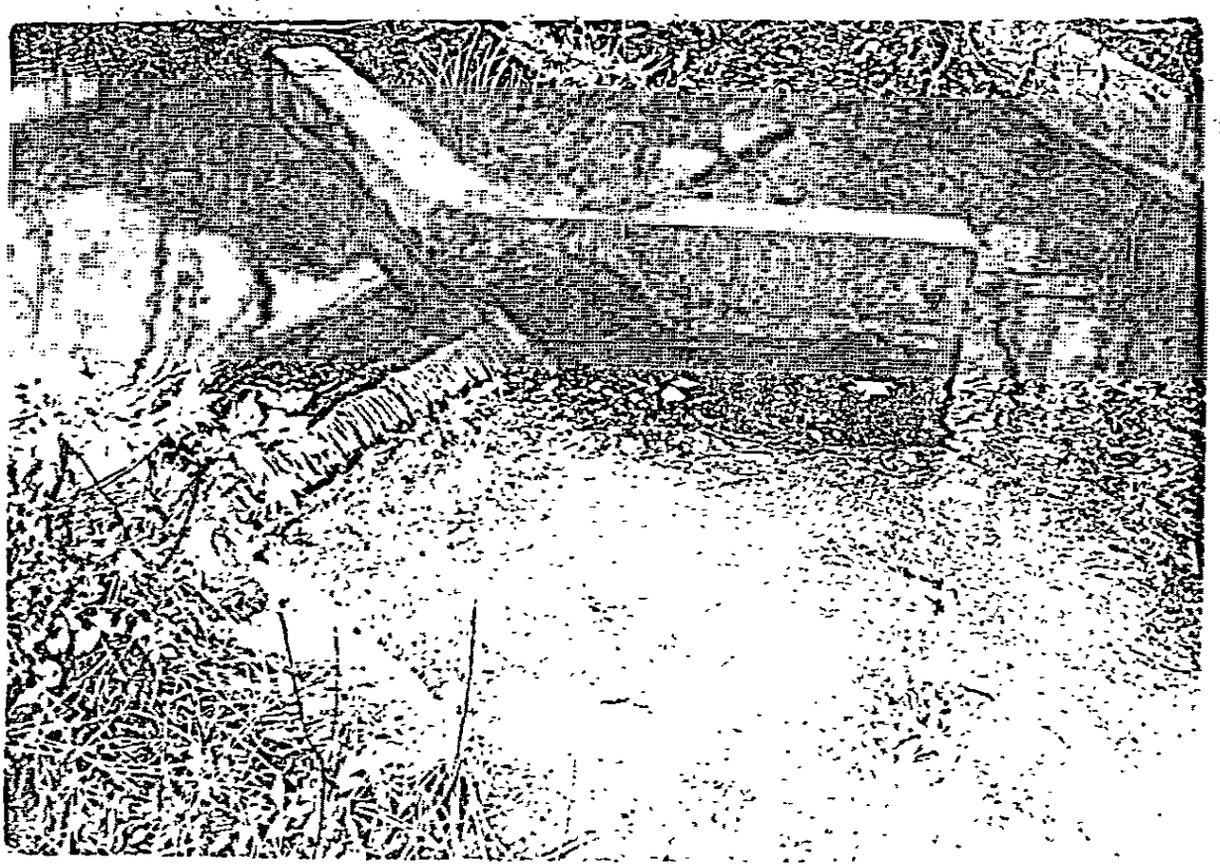
COMPUTER SECS 63-64

Sheet 18/43

HUD 2027



ADDED SEC "B" ARCADIA DRAIN
COMPUTER SEC 63



HUD 202

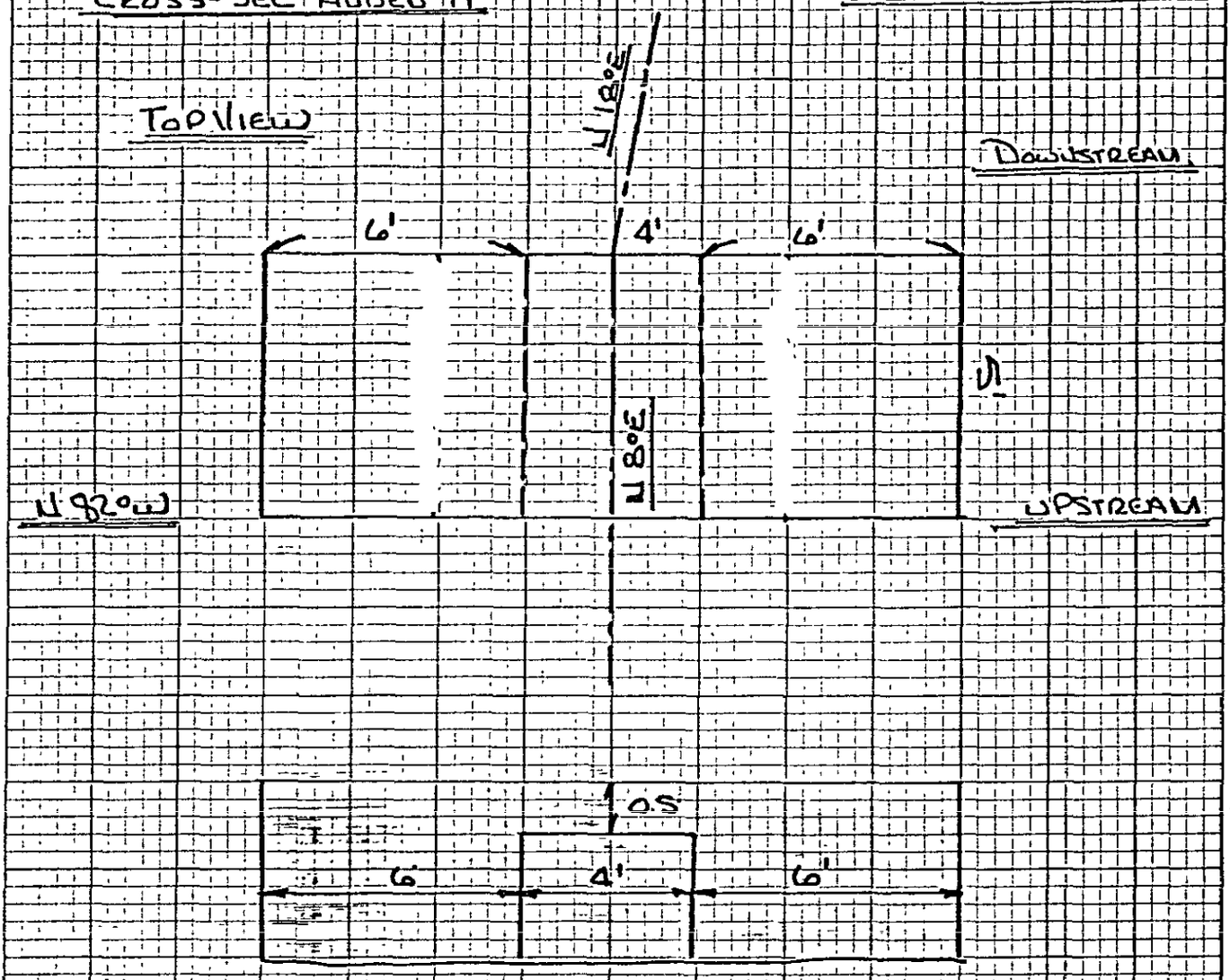
CROSS-SECTION 1ST STRUCTURE DOWNSTREAM

FROM CROSS-SEC #95 ARCADIA CREEK

CROSS-SEC "ADDED "A"

MAGNETIC BEARINGS

TOP VIEW



SIDE VIEW (TYP)

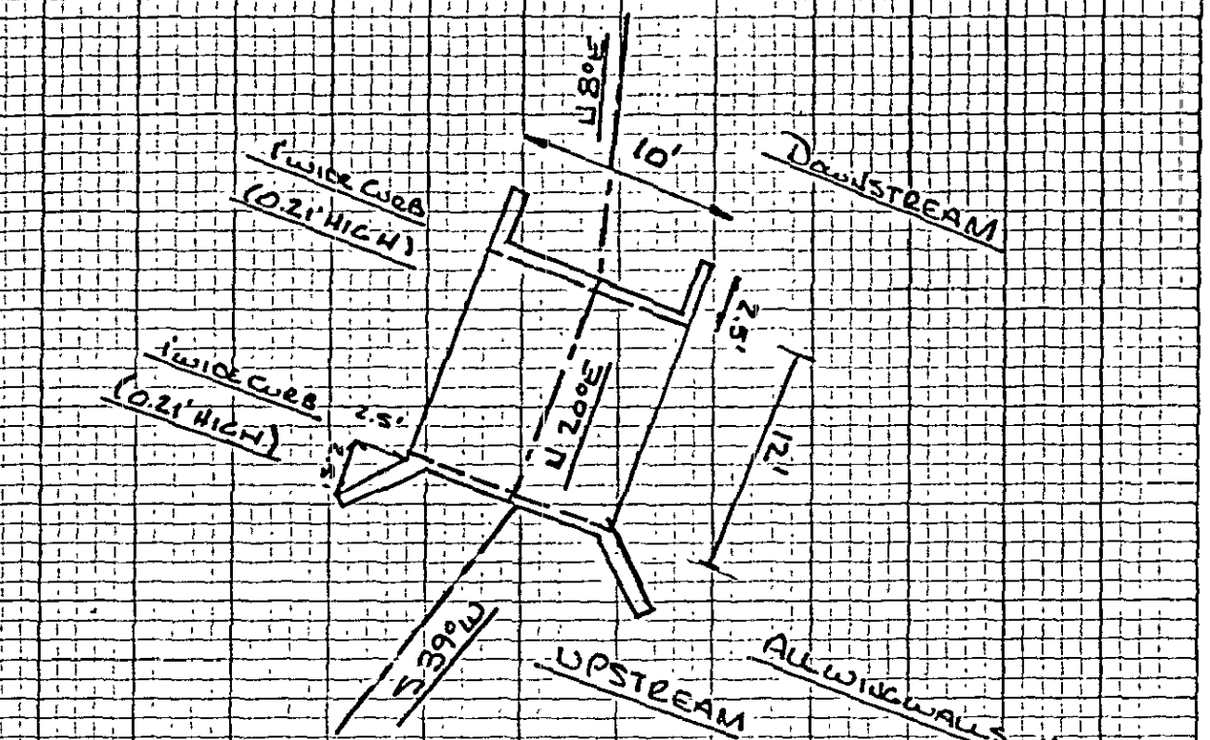
COMPUTER SECS 65-66

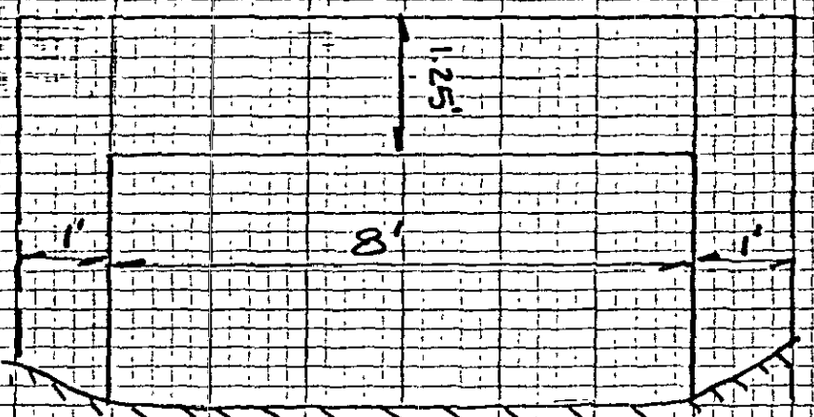
Sheet 20/43
HUD

Cross-Section #95 Arcadia Creek

Book #3

MAGNETIC BEARINGS

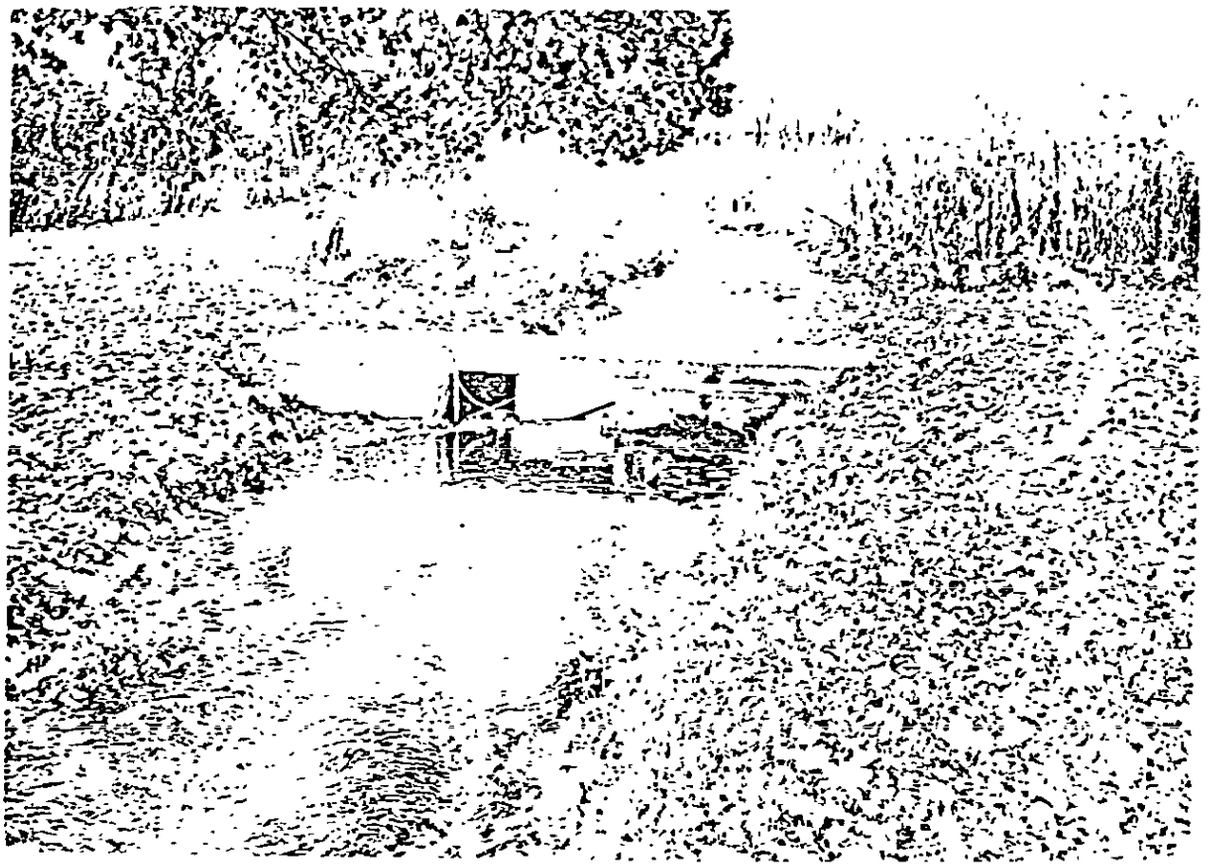




COMPUTER SECS 67-68

Sheet 21/43

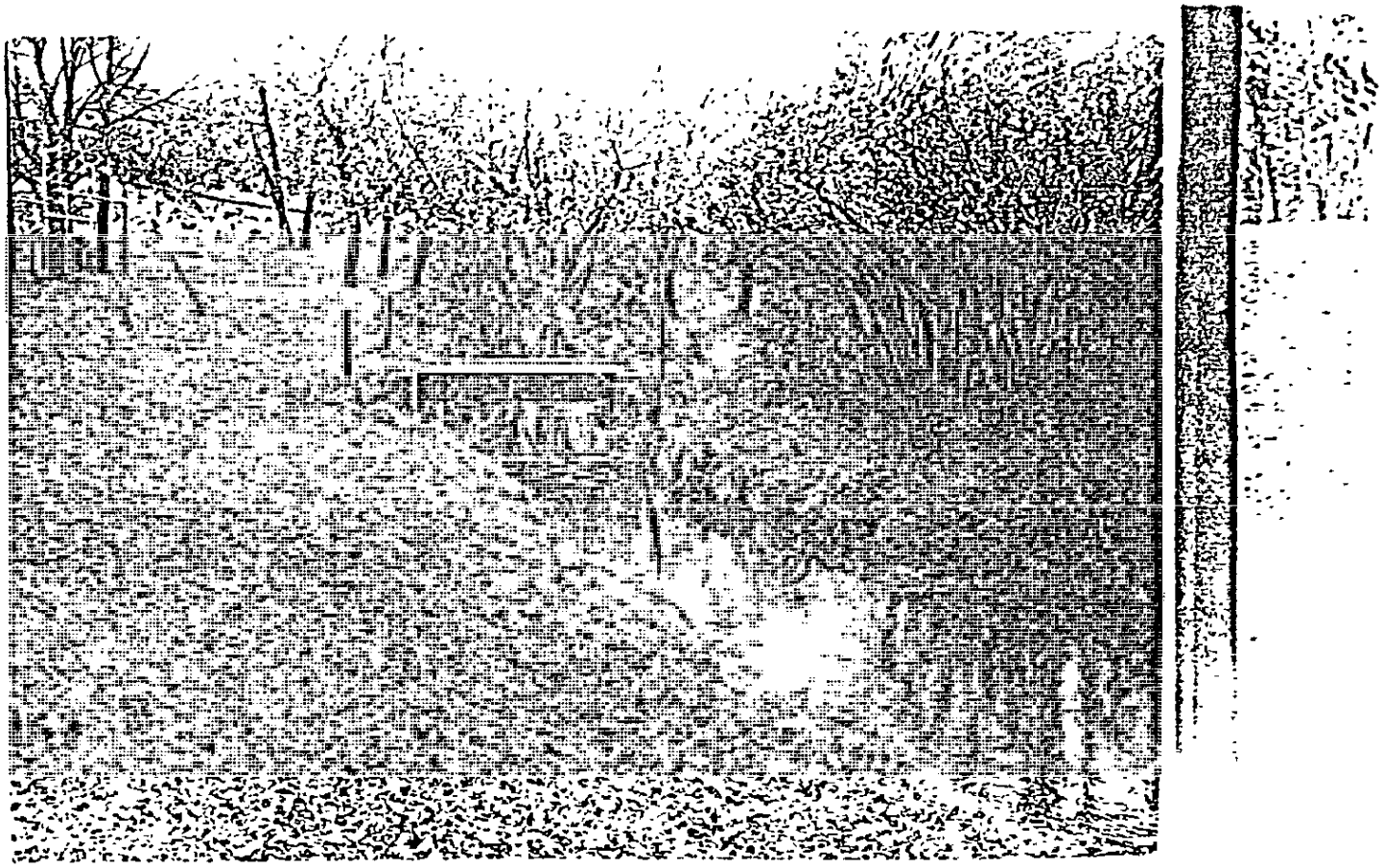
HUD



ADDED SECTION "A" DRAWSTREAM
OF SEC #95

COMPUTER SECS 65-66

Sheet 22 1/43
HUD 202-...



SECTION #95 COMPUTER SECS 67-68

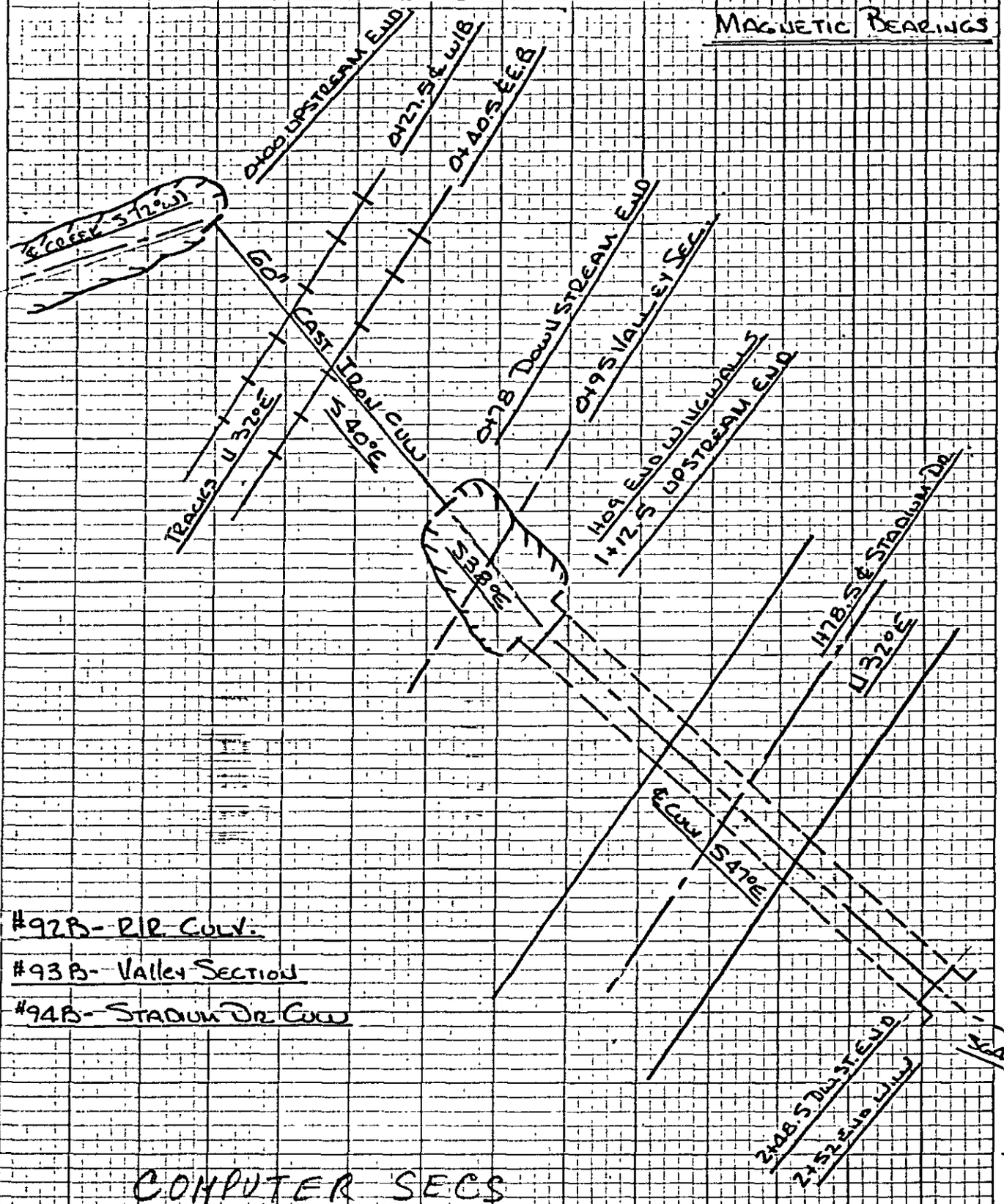
Sheet 23/43
HUD 2027-[illegible]

CROSS SECTIONS #92B - #93B - #94B. ARCADIA CREEK A1

22 Book #3

STADIUM DR. (2ND CROSSING NE. OF HOWARD)

MAGNETIC BEARINGS



#92B - R.R. CULV.

#93B - VALLEY SECTION

#94B - STADIUM DR. CULV.

COMPUTER SECS

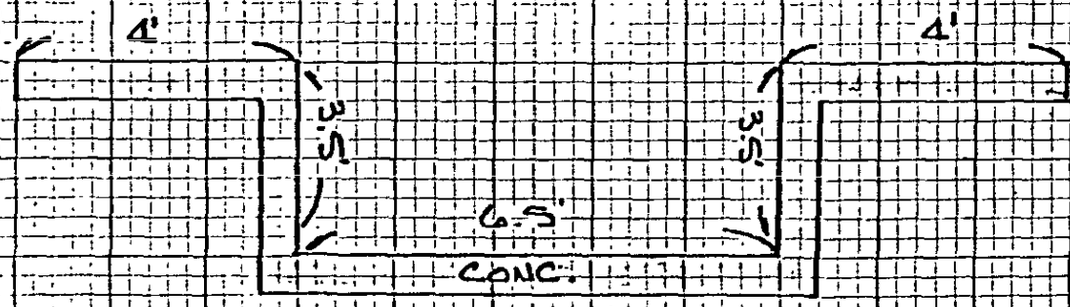
71.05, 71.1, 71.2, AND 71.3

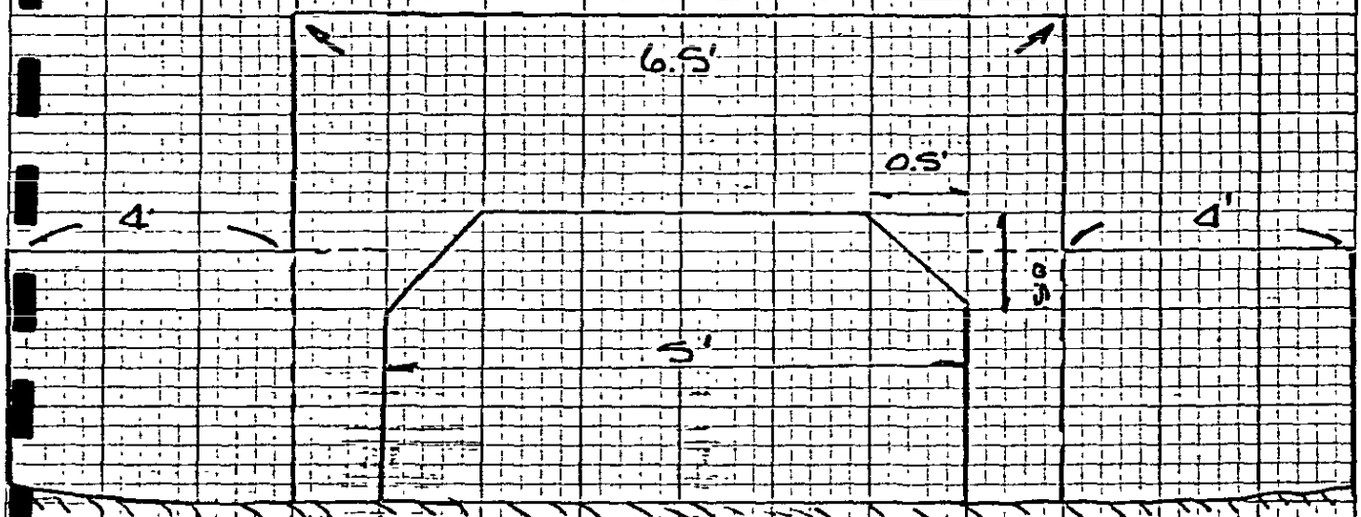
Sheet 24/43

HUD

Book #3

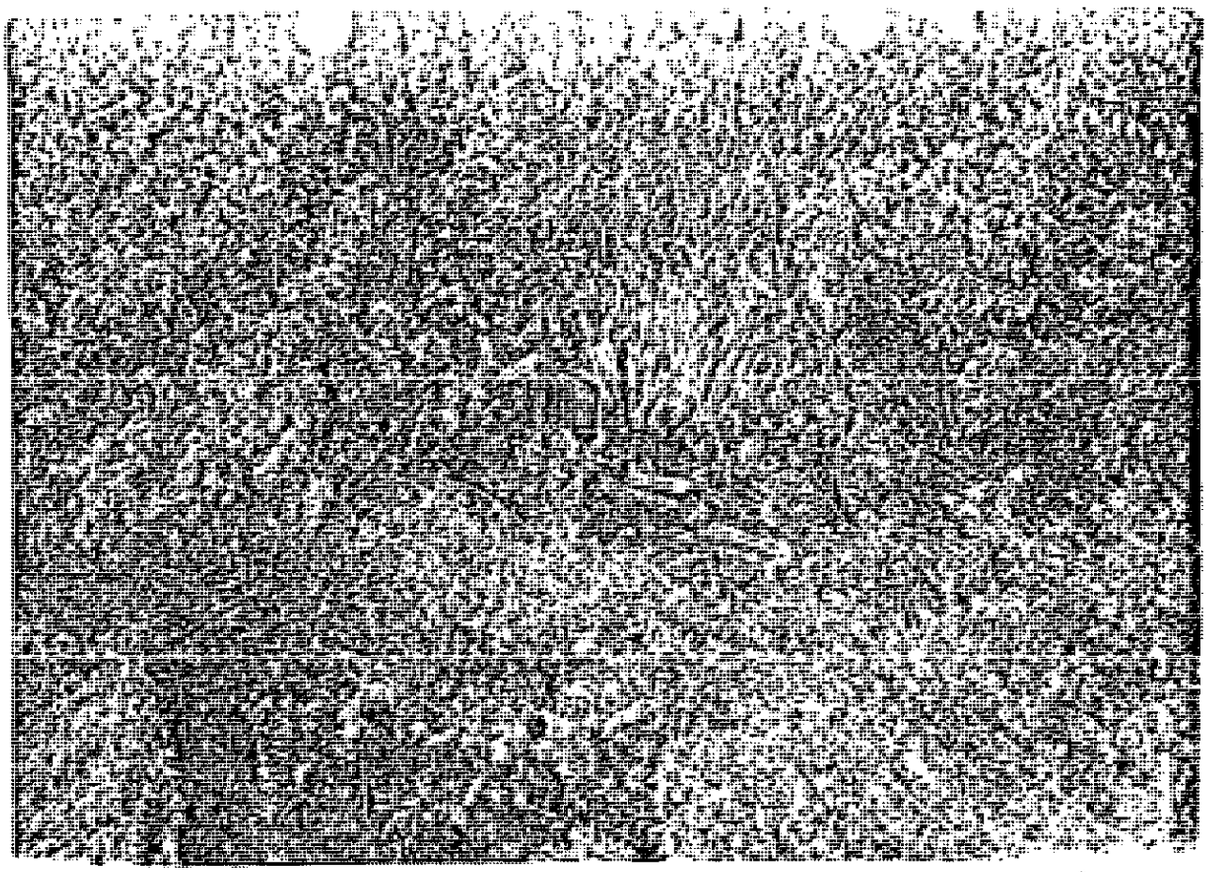
Top View Box Culv # 94 B (TYP)



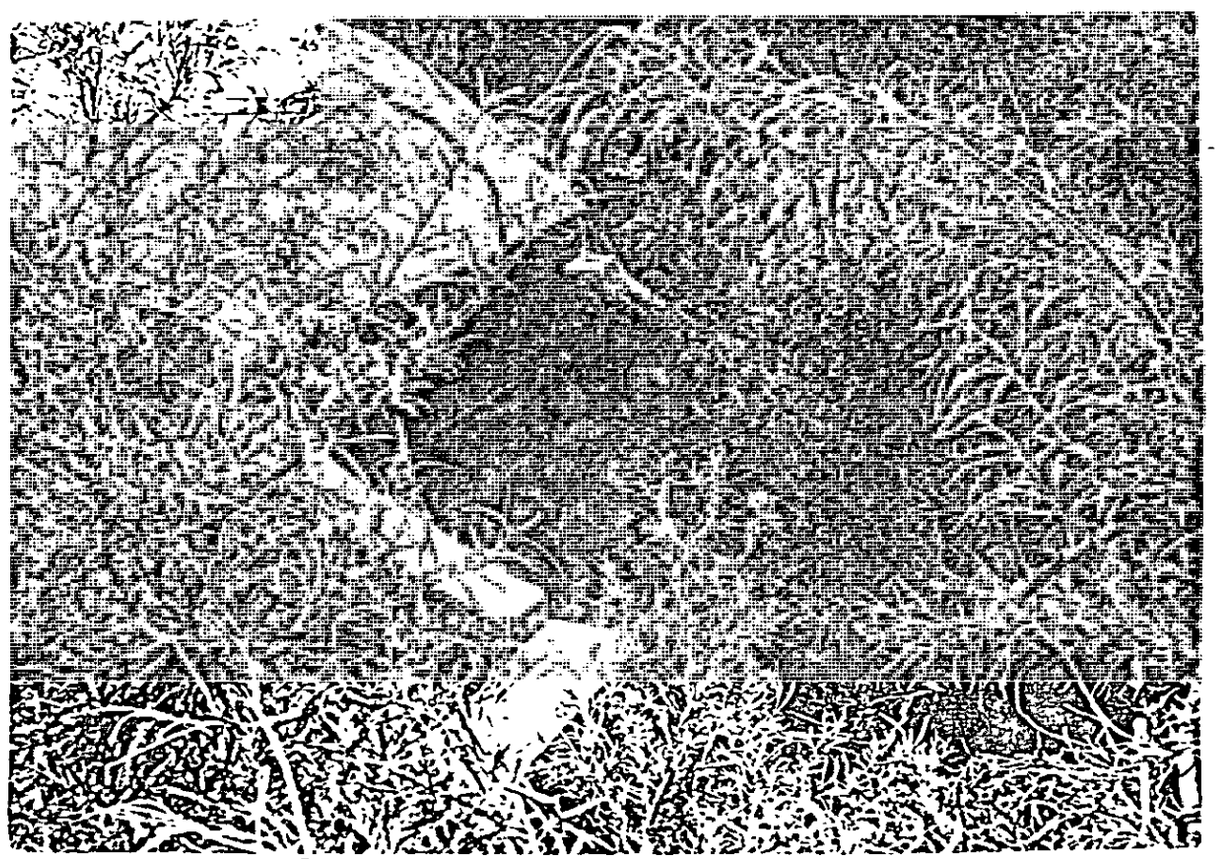


COMPUTER SECS 71.05 – 71.1

Sheet 25/43
HUD 20[illegible]



ARCADIA DRAIN AT PENN. CENT R/R N/SIDE
STADIUM 2ND CROSSING. EAST OF HOWARD
COMPUTER SECS 71.2 - 71.3 #92B



COMPUTER SECS 71.05 - 71.1
ARCADIA DRAIN AT STADIUM DRIVE 2ND CROSSING
EAST OF HOWARD
#94B

SHEET 26/43
HDR

Wade, Trim & Associates, Inc.
Civil Engineers • Land Surveyors
WORK SHEET
25185 GODDARD ROAD
TAYLOR, MICHIGAN 48180

Bridge Location:

Bridge Losses - SB Card

REFERENCE

1. XK (Pier Shape Coefficient) 0 — HEC-2 Manual

XKOR (Loss Coefficient) = 1.0 + Σk , Σk = $k_f + k_e + k_p$

where k_f = friction loss coefficient
k_e = entrance loss coefficient
k_p = loss from intermediate piers

Description of Bridge: Box Culvert

$k_f = 29.1\, n^2 L / R^{4/3}$ for English units

Area = (821.8 - 817.6)5 - .25 = 20.75 ft² Wp = 2(4.2 + 5.0) = 18.4

R = A/wp = 1.13 ft $R^{4/3}$ = 1.17 L = 136 ft

n (composite) = .02

$k_f = 29.1 \times (.02)^2 \times 136 / 1.17 = 1.4$

k_e = 0.5 — Hydraulic Charts for the Selection of Highway Culverts Circular No. 5 Dec. 1965 pg. 45

k_p = 0 if bridge has no intermediate piers

K_p = 0.05 if bridge has intermediate piers — HEC-2 manual

2. XKOR = 1 + 1.4 + .5 + = 2.9

3. COFQ Coefficient of discharge = 2.6 — HEC-2 manual

4. RDLEN = Length of weir = _____ (0 if read off BT cards)

5. BWC = Bottom width of bridge opening (inc. piers) = 5.0

6. [illegible] width of obstruction = _____ — field data

7. AREA = Bridge opening inc. piers = 20.8 ft²

8. SS = side slope = _____ (horizontal per 1 vertical unit)

9. ELCHU = Elevation of channel invert U/S side = 817.6 (0 if equal to minimum elevation in previous X-sect.)

10. ELCHD = Elevation of channel invert D/S side = 817.6 (0 if equal to minimum elevation in previous X-sect.)

Sheet 27 of 43

SUBJECT	BY	CHK.	SHEET NO.	File Code No (Job No) Owner Project Suffix
Arcadia Creek Culvert on Stadium Drive Second Crossing North East of Howard	Sushil			HUD • 2027 • 07
	DATE 4/22/82	DATE	___ OF ___	

COMPUTER SECS 71.05 - 71.1

Wade Trim & Associates, Inc.
Civil Engineers • Land Surveyors
25185 GOODARD ROAD
TAYLOR, MICHIGAN 48180

WORK SHEET

Bridge Location :

Bridge Losses - SB Card

REFERENCE

1. XK (Pier Shape Coefficient) 0 — HEC-2 Manual

XKOR (Loss Coefficient) = 1.0 + Σk, $\Sigma k = k_f + k_e + k_p$

where k_f = friction loss coefficient
k_e = entrance loss coefficient
k_p = loss from intermediate piers

Description of Bridge : 60"ϕ Cast Iron Pipe Culvert

$K_f = 29.1\, n^2 L / R^{4/3}$ for English units

Area = ____ Wp = ____

$R = A/wp = \frac{\text{Radius}}{2} = 1.25$, $R^{4/3} = 1.35$ L = 78 feet

n (composite) = .015

$K_f = 29.1 \times (.015)^2 \times 78 \;/ 1.35 = 0.4$

$K_e = 0.5$ — Hydraulic Charts for the Selection of Highway Culverts Circular No. 5 Dec. 1965 pg. 43

$K_p = 0$ if bridge has no intermediate piers

$K_p = 0.05$ if bridge has intermediate piers — HEC-2 manual

2. XKOE = 1 + .4 + .5 + = 1.9
3. COFQ Coefficient of discharge = 2.6 — HEC-2 manual
4. RDLEN = Length of weir = ____ (0 if read off BT cards)
5. BWC = bottom width of bridge opening (inc. piers) = 3.93 ft
6. Maximum width of obstruction = ____
7. Area of bridge opening inc. piers = 19.6 ft² — field data
8. SS = side slope = ____ (horizontal per 1 vertical unit)
9. ELCHU = Elevation of channel invert U/S side = 819.2 (0 if equal to minimum elevation in previous x-sect.)
10. ELCHD = Elevation of channel invert D/S side = 818.6 (0 if equal to minimum elevation in previous x-sect.) — Sheet 28/43

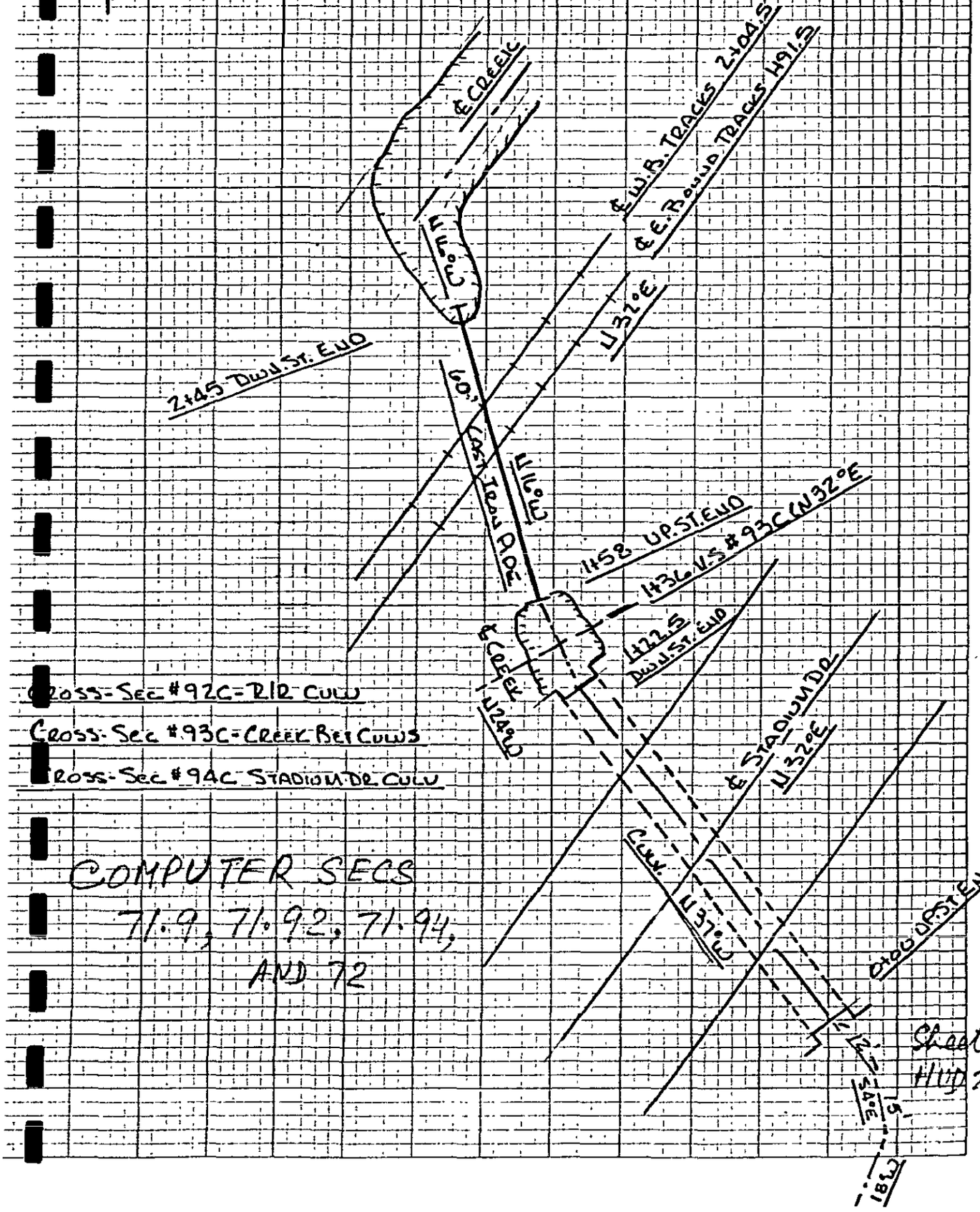
SUBJECT	BY	CHK	SHEET NO	File Code No (Job No) Owner / Project / Suffix
Arcadia Creek Culvert on Railroad Second Crossing North East of Howard	Susul		____ OF ____	HUD • 2027 • 07
	DATE 4/22/82	DATE		

COMPUTER SECS 71.2 - 71.3

Cross-Sec's # 92C-93C-94C- ARCADIA CREEK AT FIRST CROSSING N.E. OF HOWARD

17
Book #3

MAGNETIC BEARINGS



Cross-Sec #92C-R/R CULV

Cross-Sec #93C-CREEK BET CULVS

Cross-Sec #94C STADIUM DR. CULV

COMPUTER SECS
71.9, 71.92, 71.94,
AND 72

Sheet 29 1/3
Hwy 202

CROSS SECTION #94C- ARCADIA CREEK AT STADIUM

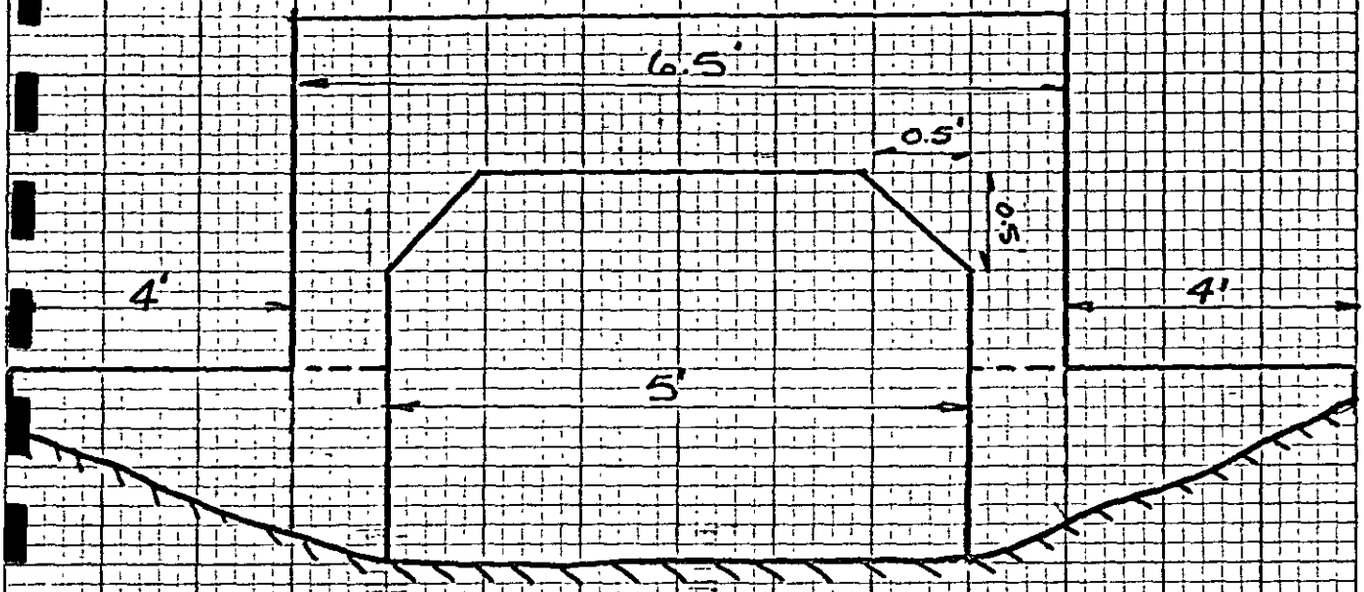
1ST CROSSING E. OF HOWARD

19

BOOK #3

UPSTREAM END FACING DOWNSTREAM (TYP)

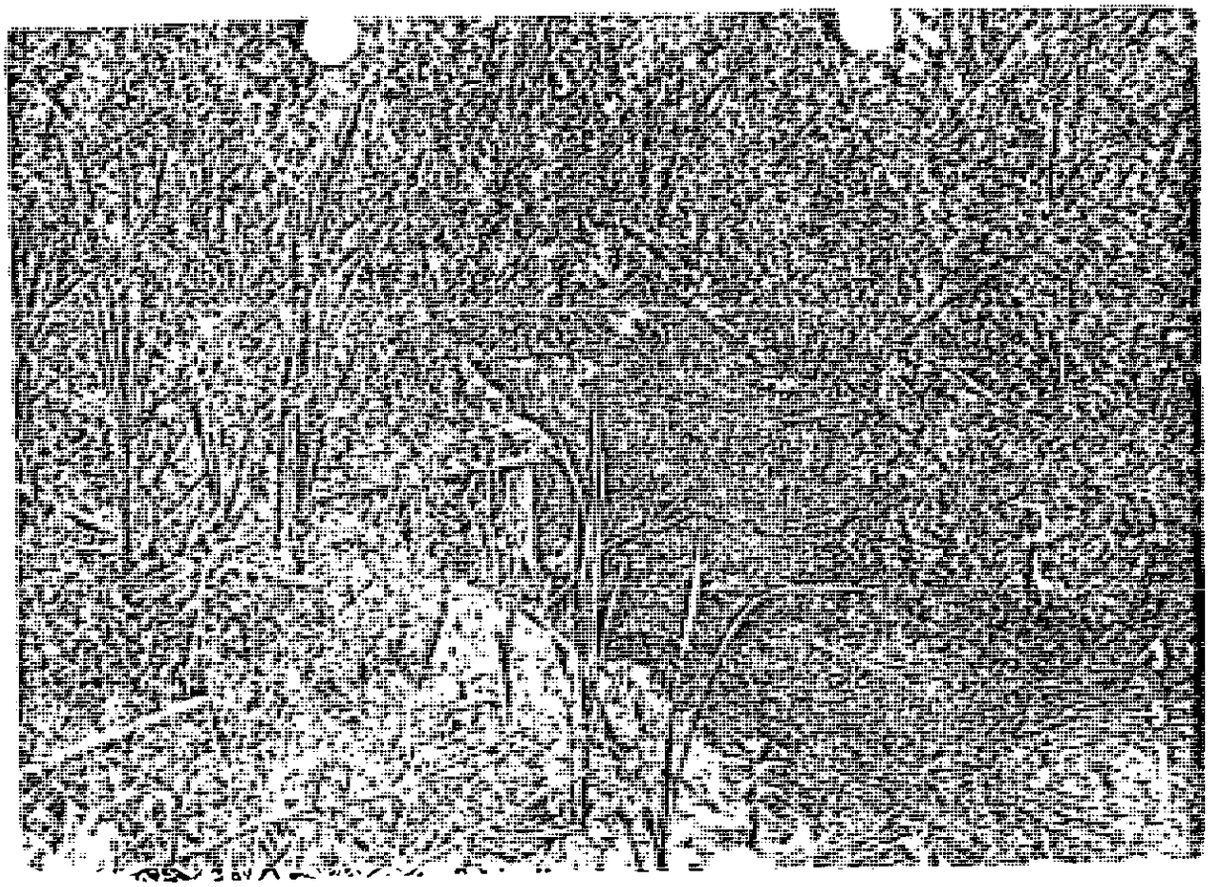
R&L OFFSETS ARE FROM ℄ CULV FACING UPSTREAM



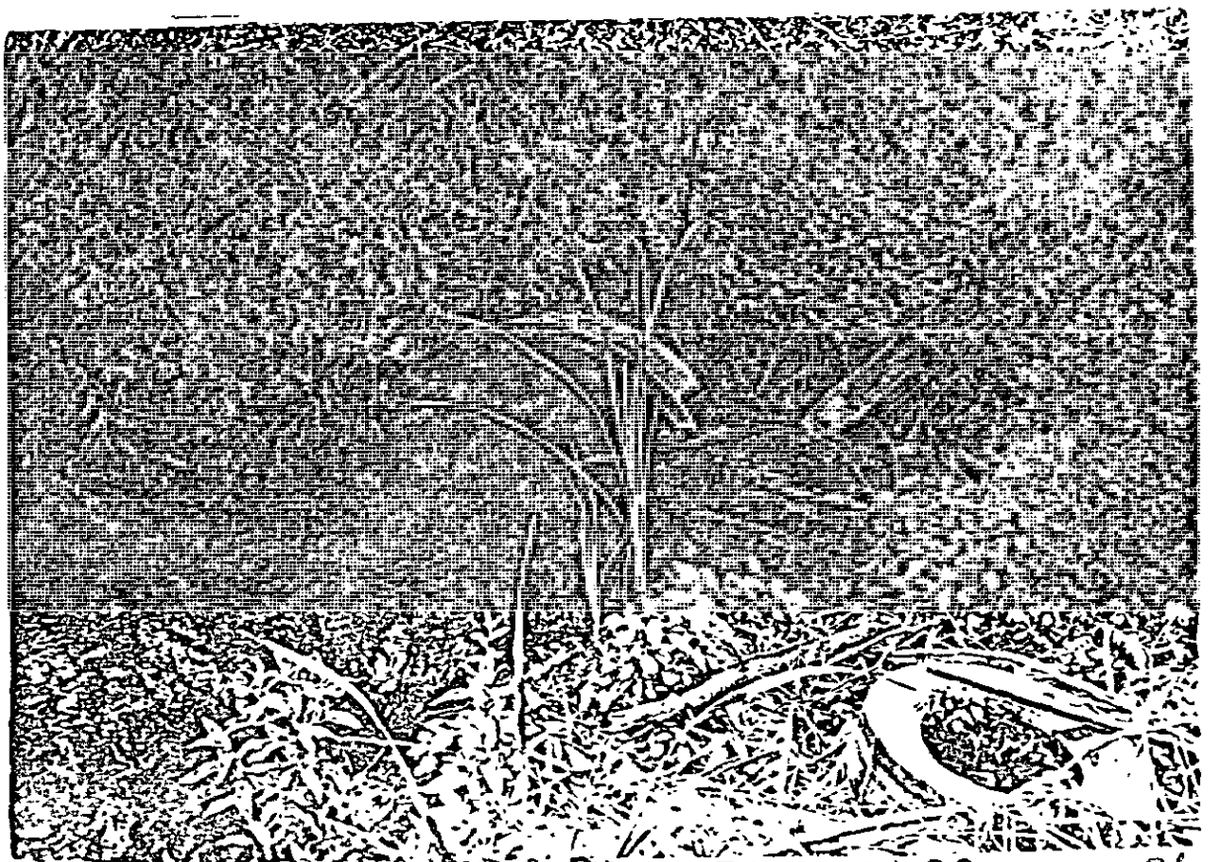
COMPUTER SEC 71.94-72

Sheet 30/43

HOD 2027



ARCADIA DRAIN AT STADIUM FIRST CROSSING
EAST OF HOWARD 94C
COMPUTER SECS 71.94-72



COMPUTER SECS 71.9-71.92
ARCADIA DRAIN AT PENN CENTRIR N/SIDE STADIUM

Sheet 31 43

Bridge Location :
Bridge Losses - SB Card

REFERENCE

1. XK (Pier Shape Coefficient) 0 — HEC-2 manual

XKOR (Loss Coefficient) = 1.0 + Σk , Σk = $k_f + k_e + k_p$

where k_f = friction loss coefficient
k_e = entrance loss coefficient
k_p = loss from intermediate piers

Description of Bridge : 60" ϕ Cast Iron Pipe Culvert

$K_f = 29.1\, n^2 L / R^{4/3}$ for English units

Area = = Wp =

$R = A/wp = \frac{\text{Radius}}{2} = 1.25, R^{4/3} = 1.35$ $L = 87$ ft

n (composite) = .015

$K_f = 29.1 \times (.015)^2 \times 87 \;/ 1.35 = 0.4$

$K_e = 0.5$ — Hydraulic Charts for the Selection of Highway Culverts Circular No. 5 Dec. 1965 pg. 45

$K_p = 0$ if bridge has no intermediate piers

$K_p = 0.05$ if bridge has intermediate piers — HEC-2 manual

2. XKOR = 1 + .4 + .5 + = 1.9
3. COFQ Coefficient of discharge = 2.6 — HEC-2 manual
4. RDLEN = Length of weir = _____ (0 if read off BT cards)
5. BWC = Bottom width of bridge opening (inc. piers) = 3.93 ft
6. [illegible] width of obstruction = _____ — field data
7. AREA = Bridge opening inc. piers = 19.6 ft²
8. SS = side slope = _____ (horizontal per 1 vertical unit)
9. ELCHU = Elevation of channel invert U/S side = 824.0 (0 if equal to minimum elevation in previous x-sect.)
10. ELCHD = Elevation of channel invert D/S side = 823.7 (0 if equal to minimum elevation in previous x-sect.) — Sheet 32 1/3

SUBJECT	BY	CHK	SHEET NO	File Code No (Job No) Project Owner Suff.
Arcadia Creek Culvert on Railroad First Crossing North East of Howard	Sushil			HUD 2027 07
COMPUTER SECS 71.9-71.92	DATE 4/22/80	DATE	OF	

Wade Trim & Associates Inc.
Civil Engineers • Land Surveyors
WORK SHEET
25185 GODDARD ROAD
TAYLOR, MICHIGAN 48180

Bridge Location:

Bridge Losses - SB Card

REFERENCE

1. XK (Pier Shape Coefficient) 0 — HEC-2 manual

XKOR (Loss Coefficient) = 1.0 + Σk , Σk = $k_f + k_e + k_p$

where k_f = friction loss coefficient
k_e = entrance loss coefficient
k_p = loss from intermediate piers

Description of Bridge: Box Culvert

$K_f = 29.1\, n^2 L / R^{4/3}$ for English units

Area = (830.9 - 826.9)5 - .25 = 19.75 Wp = 2(4.0 + 5.0) = 18.'

R = A/wp = 1.10 $R^{4/3}$ = 1.13 L = 122.5 ft

n (composite) = .02'

$K_f = 29.1 \times (.02)^2 \times 122.5 / 1.13 = 1.3$

K_e = .5 — Hydraulic Charts for the Selection of Highway Culverts Circular No. 5 Dec. 1965 pg. 43

K_p = 0 if bridge has no intermediate piers

K_p = 0.05 if bridge has intermediate piers — HEC-2 manual

2. XKOR = 1 + 1.3 + .5 + = 2.8

3. COFQ Coefficient of discharge = 2.6 — HEC-2 manu

4. RDLEN = Length of weir = _____ (0 if read off BT cards)

5. BWC = bottom width of bridge opening (inc. piers): 5.0

6. [illegible] width of construction = _____ — field data

7. AREA = bridge opening inc. piers = 19.8 ft2

8. SS = side slope = _____ (horizontal per 1 vertical unit)

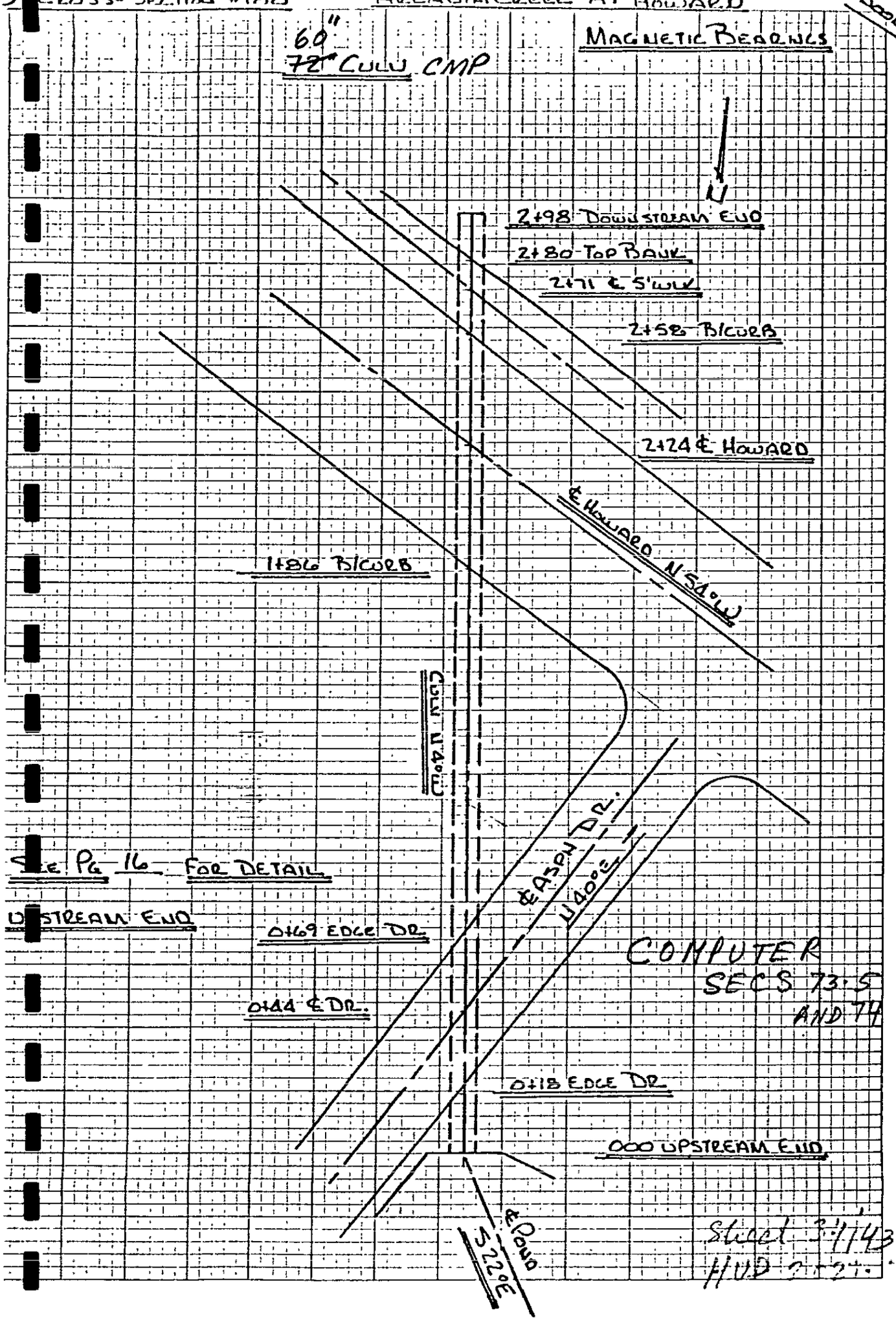
9. ELCHU = Elevation of channel invert U/S side = 826.9 (0 if equal to minimum elevation in previous x-sect.)

10. ELCHD = Elevation of channel invert D/S side = 826.9 (0 if equal to minimum elevation in previous x-sect.) — Slope 3%

SUBJECT	BY	CHK	SHEET NO	File Code No (Job No) Owner Project Suffix
Arcadia Creek Culvert on Stadium Drive First Crossing North East of Howard	Susul		___ OF ___	HUD 2027 0
COMPUTER SECS 11-14-72	DATE 4/23/80	DATE		

Cross-Section #100 Arcadia Creek At Howard

13 Book #3

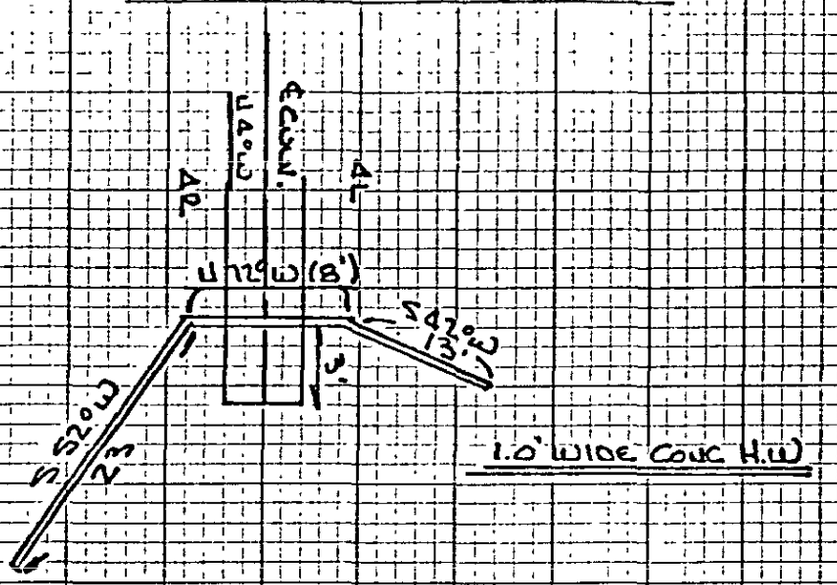


COMPUTER
SECS 73.5
AND 74

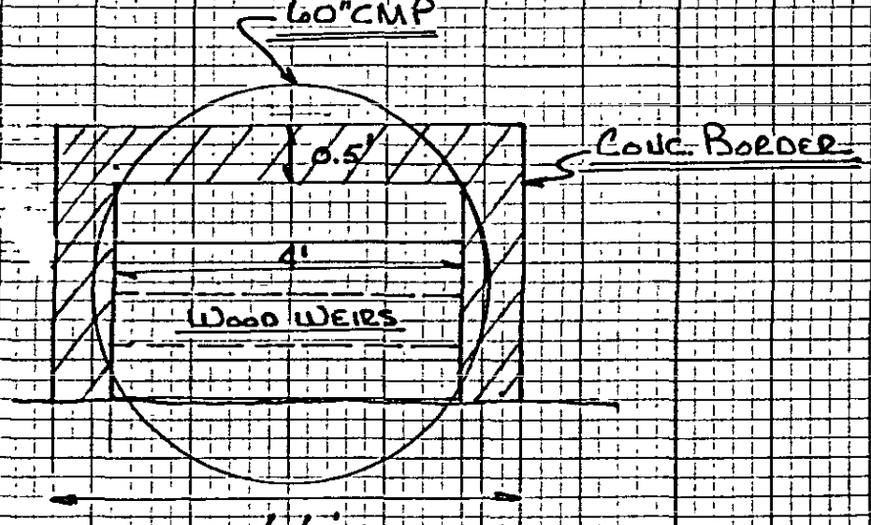
Sheet 3/143
HUD 2-27

Cross-Section #100 — Arcadia Creek At Howard

Book #15



DETAIL UPSTREAM END



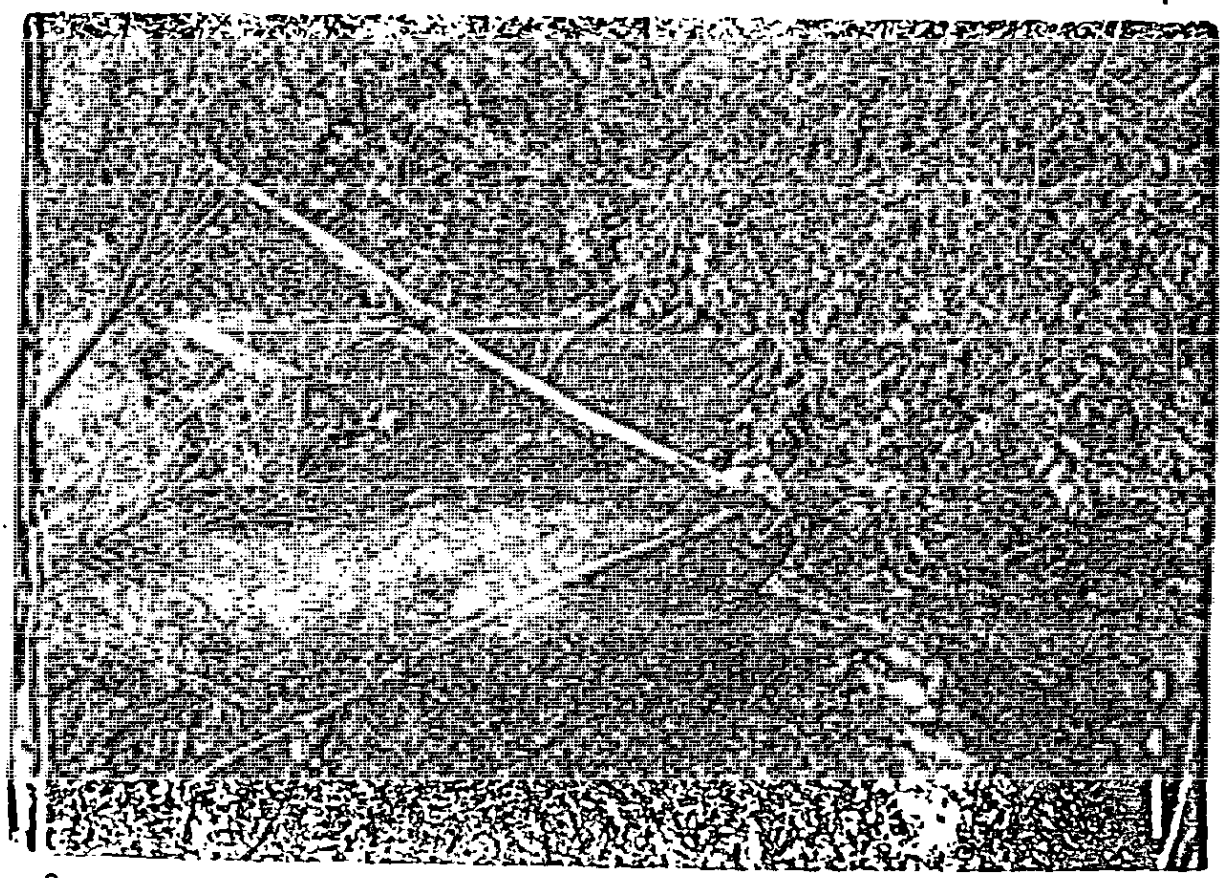
COMPUTER SECS 73.5 AND 74

Sheet 35/43

HUD



ARCADIA DRAIN AT ENTRANCE DRIVE TO KALAMA 200
CHRISTIAN H.S. W/SIDE HOWARD
UPSTR #100 U/S HOWARD ST. COMPUTER SEC 74



ARCADIA DRAIN E SIDE HOWARD & S/SIDE SIERRA
DWNSTR #100 COMPUTER SEC 73.5

Sheet 36 43
HYD 203

Bridge Location :

Bridge Losses - SB Card

REFERENCE

1. XK (Pier Shape Coefficient) 0 — HEC-2 manual

XKOR (Loss Coefficient) = 1.0 + Σk , Σk = $k_f + k_e + k_p$

where k_f = friction loss coefficient
k_e = entrance loss coefficient
k_p = loss from intermediate piers

Description of Bridge : 60" CMP Culvert

$K_f = 29.1\, n^2 L / R^{4/3}$ for English units

Area = ____ Radius = ____ Wp = ____

$R = A/wp = \frac{\text{Radius}}{2} = 1.25'$ $R^{4/3} = 1.35$ $L = 298$ ft

n (composite) = .02

$K_f = 29.1 \times (.02)^2 \times 298 \;/\; 1.35 = 2.6$

$K_e = .5$ — Hydraulic Charts for the Selection of Highway Culverts Circular No. 5 Dec. 1965 pg. 45

K_p = 0 if bridge has no intermediate piers

K_p = 0.05 if bridge has intermediate piers — HEC-2 manual

2. XKOR = 1 + 2.6 + 0.5 + ____ = 4.1
3. COFQ Coefficient of discharge = 2.6 — HEC-2 manual
4. RDLEN - Length of weir = ____ (0 if read off BT cards)
5. BWC = bottom width of bridge opening (inc. piers) = 3.93 ft
6. [illegible] width of obstruction = ____ — field data
7. [illegible] bridge opening inc. piers = 19.6 ft²
8. SS = side slope = ____ (horizontal per 1 vertical unit)
9. ELCHU = Elevation of channel invert U/S side = 831.0 (0 if equal to minimum elevation in previous x-sect.)
10. ELCHD = Elevation of channel invert D/S side = 829.0 (0 if equal to minimum elevation in previous x-sect.)

Sheet 37/43

SUBJECT	BY	CHK.	SHEET NO.	File Code No (Job No) Project Owner Suffix
Arcadia Creek Culvert on Howard Street	Sushil DATE 4/25/80	DATE	____ OF ____	HUD 2027 07

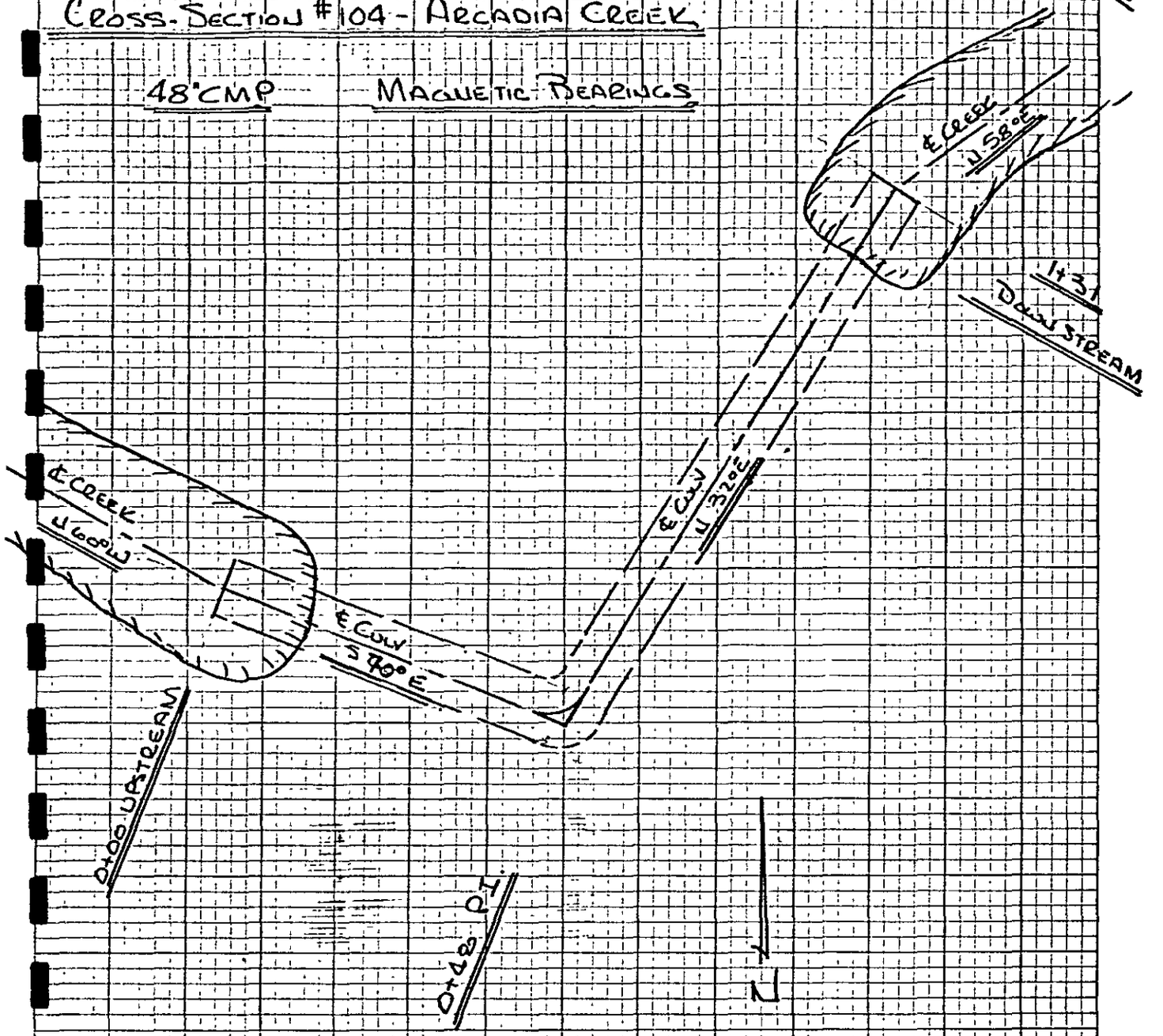
COMPUTER SECS 12-3-79

100
07-.05

7
Book #3

Cross-Section #104 - Arcadia Creek

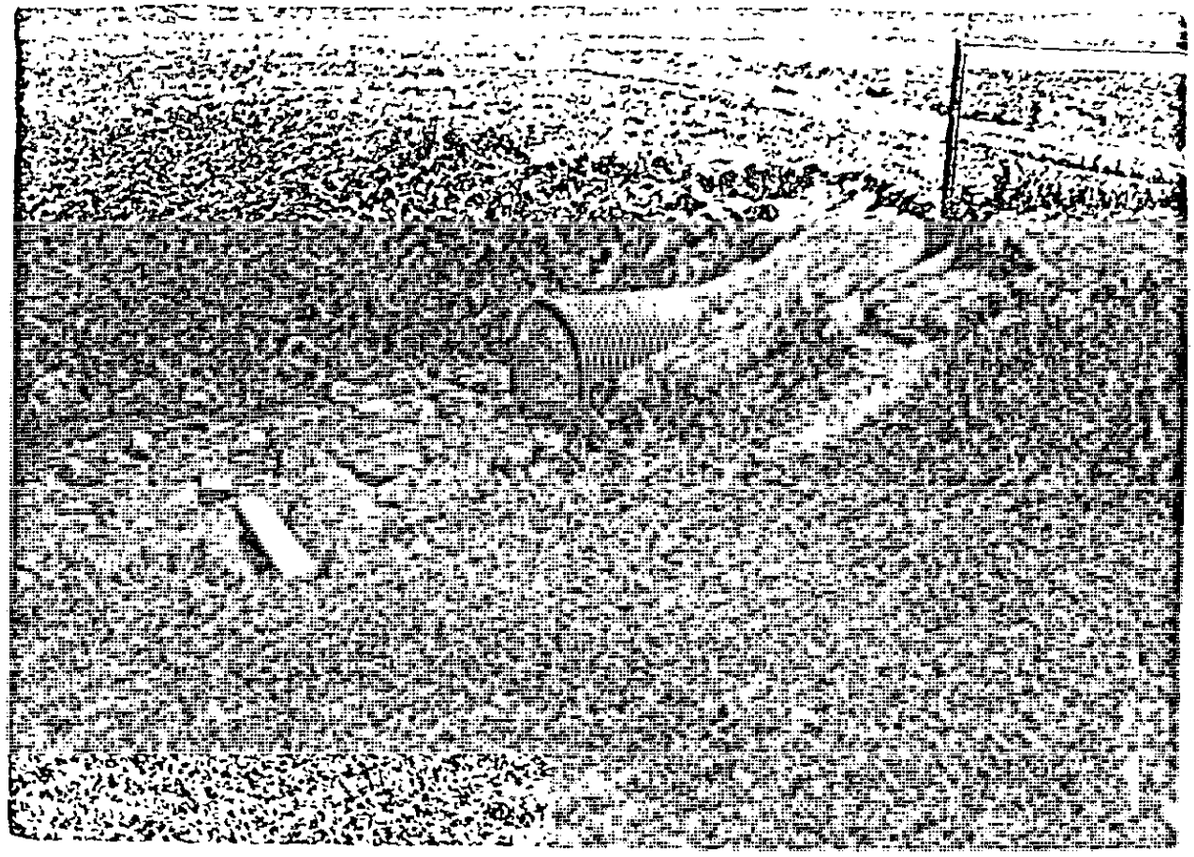
48" CMP Magnetic Bearings



COMPUTER SEC 78

Sheet 38/43

HUD 2[illegible]



ARCADIA DRAIN SOUTH OF STADIUM DR
BEHIND KAL. CHRISTIAN HIGH SCHOOL
CROSS-SEC#104

COMPUTER SEC 78

Sheet 39/43
HID 2022-07

Book 13/5

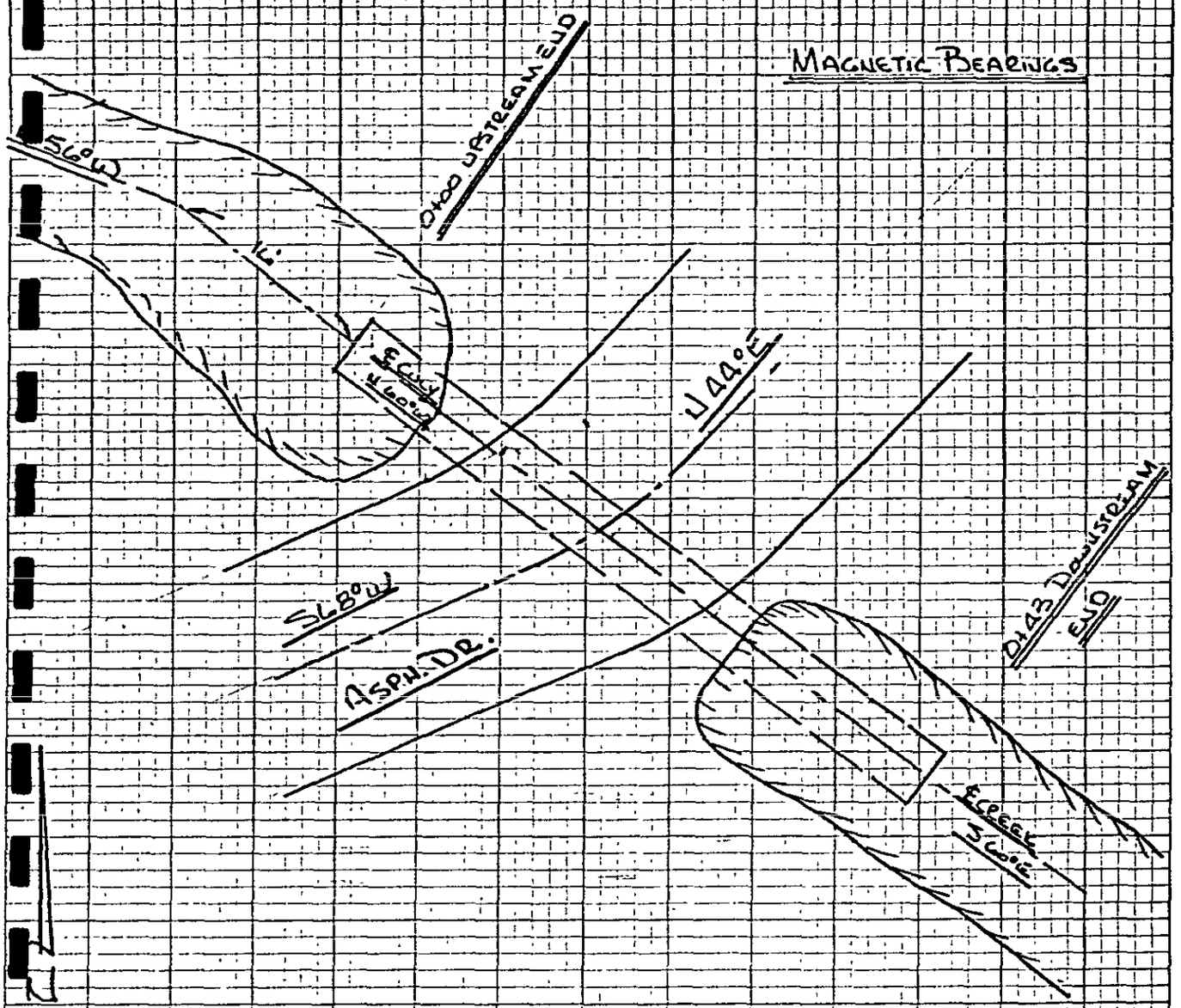
Cross-Section #105 Arcadia Creek

10-24-79

RZ-GK-JH-LP

42" CMP.

MAGNETIC BEARINGS



COMPUTER SEC. 79

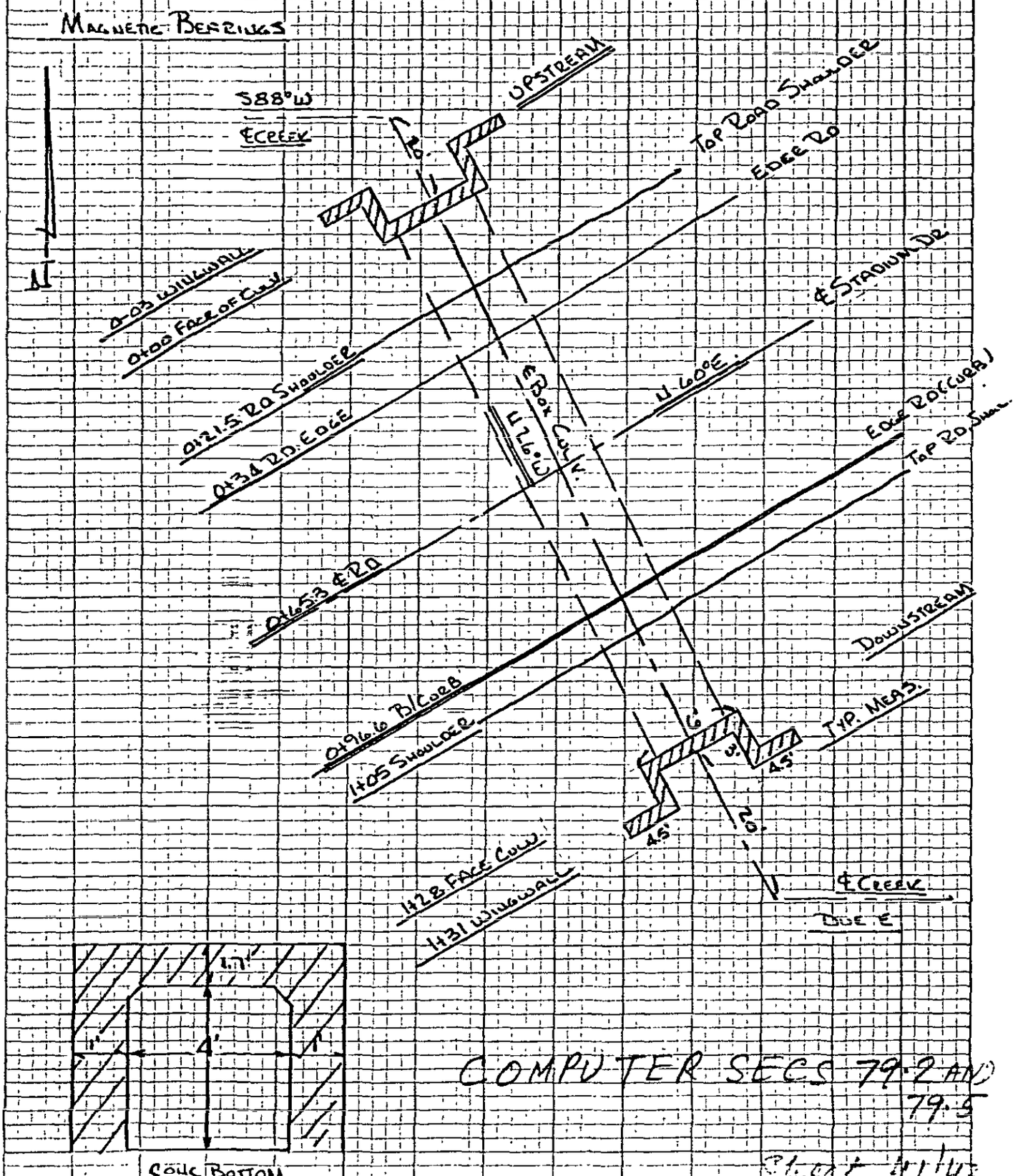
Sheet 40 of 43

HUD ???-??

Book 3

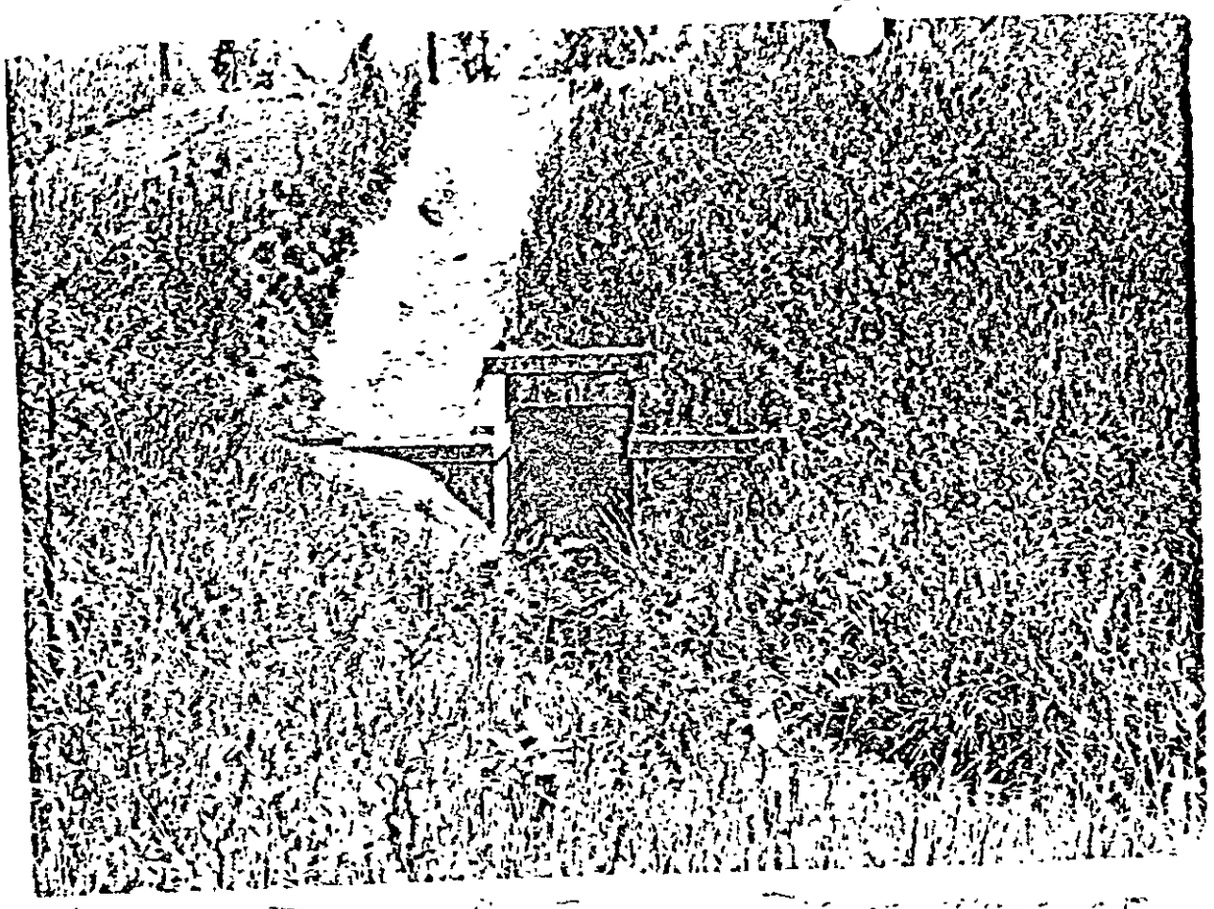
Valley Section #106 - Arcadia Drain

10-24-79
R2-GK-JH-LP



COMPUTER SECS 79.2 AND 79.5

Sheet 41/43
HUD 2[illegible]



106

COMPUTER SEC 79.5

FORM 25 0
(313) 291 5400

Wade, Trim & Associates, Inc.
Civil Engineers • Land Surveyors
WORK SHEET

25185 GODDARD ROAD
TAYLOR, MICHIGAN 48180

REFERENCE

Bridge Location:
Bridge Losses - SB Card

1. XK (Pier Shape Coefficient) 0 — HEC-2 manual
XKOR (Loss Coefficient) = 1.0 + Σk, $\Sigma k = k_f + k_e + k_p$
where k_f = friction loss coefficient
k_e = entrance loss coefficient
k_p = loss from intermediate piers
Description of Bridge: Box Culvert
$k_f = 29.1 n^2 L / R^{4/3}$ for English units
Area = 4x4 = 16 ft² = _____ Wp = 2(4+4) = 16 ft
R = A/wp = 1.0 ft $R^{4/3}$ = 1.0 L = 128 ft
n (composite) = .02
$k_f = 29.1 \times (.02)^2 \times 128 / 1.0 = 1.5$

k_e = 0.5 — Hydraulic Charts for the Selection of Highway Culverts Circular No. 5 Dec. 1965 pg. 45

k_p = 0 if bridge has no intermediate piers

k_p = 0.05 if bridge has intermediate piers — HEC-2 manual

2. XKOR = 1 + 1.5 + 0.5 + = 3.0
3. COFQ Coefficient of discharge = 2.6 — HEC-2 manual
4. RDLEN = Length of weir = _____ (0 if read off BT cards)
5. BWC = bottom width of bridge opening (inc. piers) = 4.0 ft
[illegible] of obstruction = _____ — field data
[illegible] bridge opening inc. piers = 16.0 ft²
8. SS = side slope = _____
(horizontal per 1 vertical unit)
9. ELCHU = Elevation of channel invert U/S side = 840.5
(0 if equal to minimum elevation in previous x-sect.)
10. ELCHD = Elevation of channel invert D/S side = 839.9
(0 if equal to minimum elevation in previous x-sect.)

Sheet 43, 43

SUBJECT	BY	CHK	SHEET NO.	File Code No. (Job No.) Owner Project Suffix
Arcadia Creek Culvert at Stadium Drive West of Howard	Sushil			
	DATE 4/28/[illegible]	DATE	OF	HUD [illegible]

COMPUTER SEC 79.2

ARCADIA CREEK

CITY OF KALAMAZOO, MICHIGAN

EXHIBIT 5

ENCLOSURE COMPUTATIONS

REFERENCE

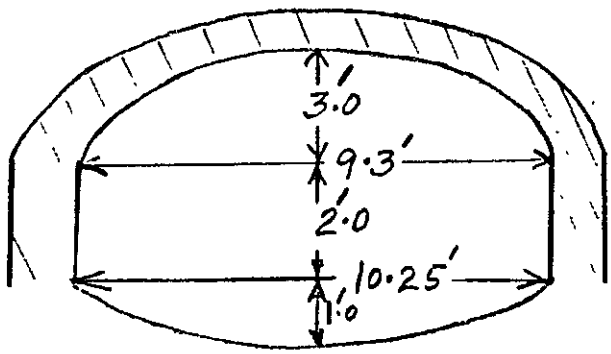
Pressure Flow Computations for Arcadia Creek Enclosures

1A) Enclosure from Outlet of Arcadia Cr. (into Portage Cr.) to U/S of Burdick St.

Alignment of the Enclosure shown on the next two sheets.

Data taken from Survey Notes

(i) Cross section from 0+00 to 13+56



Xsectional Area (A)

$$= \left(\frac{9.3 + 10.25}{2}\right) 2 + 0.012\pi\frac{(26.27)^2}{4} + 0.245\pi\frac{(10.2)^2}{4}$$

$$= \underline{46.1 \text{ ft}^2}$$

Wetted Perimeter (P) $= 11.69 + 2 \times 2 + 10.53 = \underline{26.22 \text{ ft}}$

$\therefore R = A/P = 46.1/26.22 = \underline{1.76 \text{ ft}}$

Cont'd on sheet 4

SUBJECT	BY	CHK.	SHEET NO	File Code No (Job No) Owner Project Suffix
Arcadia Creek Enclosure #1A	Sullivan		1 OF 16	HUD • 2027 • 07
	DATE 3/31/80	DATE		

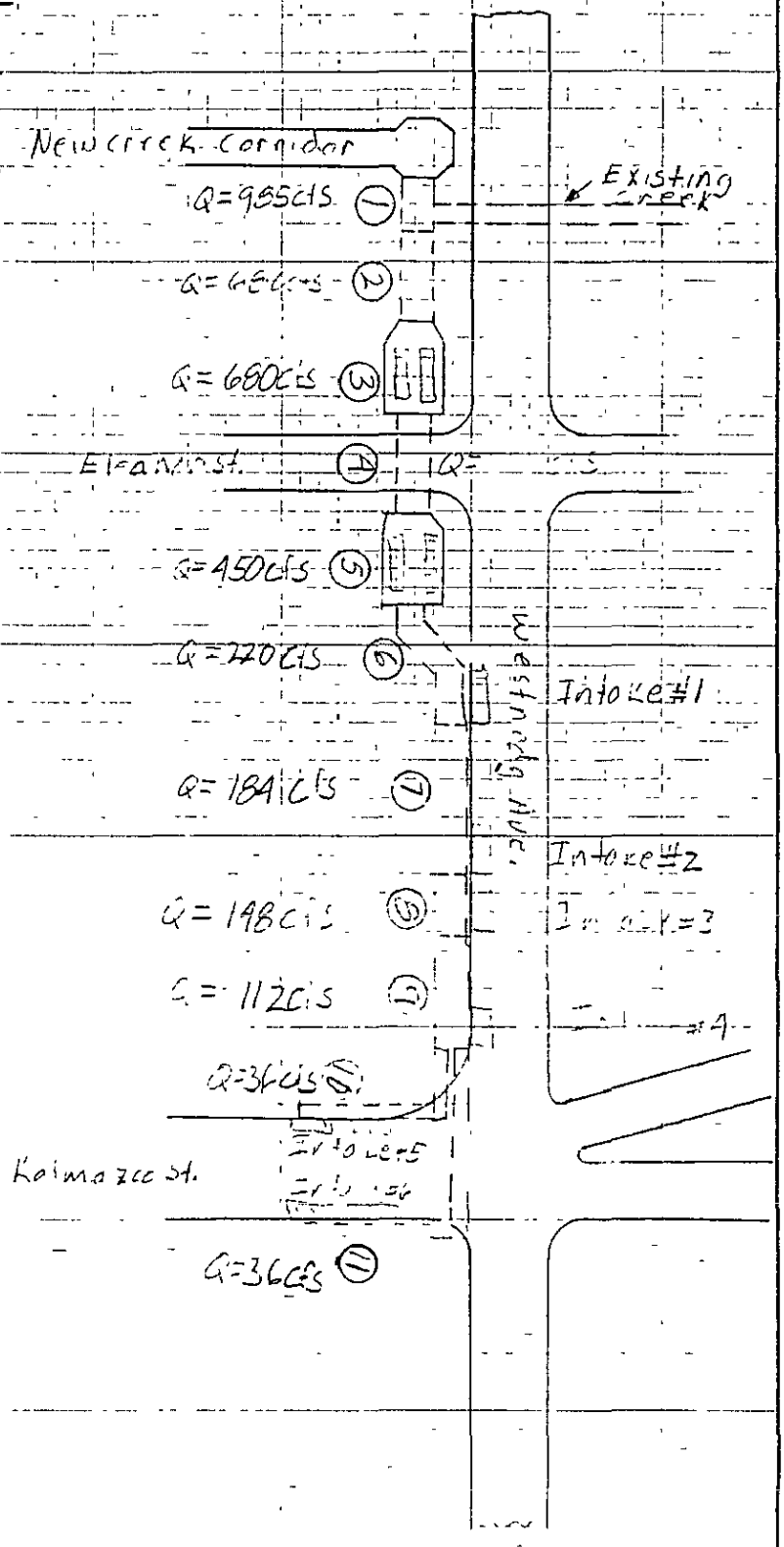
STS Consultants Ltd
CALCULATION SHEET

PROJECT	STS JOB NO.
Arcadia Creek	1959
SUBJECT: Schematic Diagram	CALC NO 2/11
DATE 4/6/90 · BY DEH · CHECKED BY · REV NO	

Schematic Diagram

Westridge Sewer Components

Symbol	Description
①	Transition Box 1
②	Reach 1
③	Collector Box 1
④	Reach 2
⑤	Collector Box 2
⑥	Reach 3
⑦	Reach 4
⑧	Reach 5
⑨	Reach 6
⑩	Reach 7
⑪	Reach 8



BRUNING 45-11

STS Consultants Ltd. CALCULATION SHEET	PROJECT: Arcadia Creek			STS JOB NO: 1069-AJ
	SUBJECT: Westnedge Collector System			CALC. NO.: 4/11
	DATE: 3/7/90	BY: DEH	CHECKED BY:	REV. NO:

Head Loss Computation Methodology

All head losses will be modeled in the following form:

$$H_L = K \frac{V^2}{2g}$$

$$K = \sum_{all\ i} K_i$$

Friction: K_f

$$K_f = 29.1 (n^2) \cdot \frac{L}{R^{4/3}}$$

Ref. - See derivation from Manning's Equation, Technical Data Appendix, pages TDA-23.

Bends: K_b (see Fig. 19)

Ref. - Friction Factors for Large Conduits Flowing Full, US Dept. of the Interior Bureau of Reclamation, 1965.

Piers: K_p

$$K_p = .65$$

Ref. 5. - HEC-2, Water Surface Profiles, Users Manual 1982

BRUNING 45-11

STS Consultants Ltd.
CALCULATION SHEET

PROJECT	STS JOB NO
Arcadia Creek	1069-AT
SUBJECT	**CALC NO**
Westnodge Collector System	5/11
DATE 3/7/90 **BY** DEH	**CHECKED BY** **REV NO**

Transition Losses: K_c & K_{exp}

*Contraction:

$$h_{Lc} = K_c \frac{V^2}{2g}$$

$$K_c = \left(\frac{1}{C_c} - 1\right)^2$$

C_c = Coefficient of contraction (See Table 21-6)

V = velocity in smaller diameter pipe

A_2/A_1	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
C_c	.62	.63	.64	.66	.68	.71	.76	.81	.89	1.0

Table 21-6

*Sudden Expansion:

$$K_{exp} = \frac{(V_1 - V_2)^2}{2g} \Big/ \frac{V_1^2}{2g}$$

V_1 = velocity before enlargement

V_2 = velocity after enlargement

*Ref. 6 - Standard Handbook for Civil Engineers, 1953.

BRUNING 45-11

STS Consultants Ltd.
CALCULATION SHEET

PROJECT			STS JOB NO
Arrading Creek			1069
SUBJECT			CALC NO
Westbrook Collector System			6/11
DATE 3/5/90	BY DEH	CHECKED BY	REV. NO

Entrance losses: Kent.

Ref 3 - Design of Small Dams, 1987.

& Ref 7 - BPR charts.

Miscellaneous: K_{misc}

For Flow thru manholes with no change in size:

$K_{misc} = 0.05$

Ref 4 - Modern Sewer Design, 1980.

For Junction losses: (see Fig 5.55)

Ref 8 - Internal Flow Systems, D.S. Miller, 1978.

BRUNING 45-11

STS Consultants Ltd
CALCULATION SHEET

PROJECT			STS JOB NO
Arcadia Creek			1069-
SUBJECT			CALC NO
Transition Zone			7/11
DATE 9/22/89	BY DEH	CHECKED BY	REV NO

Discharge (at Westnedge Ave.)

Total Q_{100} = 985 cfs

Existing creek Capacity: Q_{100} = 307 cfs (Ref 1)

Transition System required Capacity: 678 cfs

Tailwater Elevation (From HEC-2 printout AC3.out XSEC 30)

≅ 780.0

Existing creek to remain intact upstream of Westnedge Avenue. Computations identifying the distribution of flow between the existing conduit and overalnd flow are the subject of a separate computaion sheet package. The overland flow component (680 cfs) will be collected by the new Westnedge collector sewer. The existing sewer and the new Westnedge sewer will join on the east side of Westnedge Ave. at the upstream limit of the new Arcadia Creek.

BRUNING 45-11

STS Consultants Ltd.
CALCULATION SHEET

PROJECT	STS JOB NO
Arca... Creek	1069
SUBJECT	CALC NO
Westmore Collector	9/11
DATE 2/23/90 BY DEH	CHECKED BY / REV NO

Catch Basins

Neenah frams and grates R-3531-L & 3067-L, will be used for parking Lot and Curb & gutter situations respectively. Even though the EJIW 7355 would provide more open area, the state and city officials would prefer we use the above mentioned due to maintance purposes.

Analysis Methodology:

Inlet capacities are governed by weir flow during low flow and orifice flow during high flow. (Ref 2.)

Governing Equations:

Weir Flow - $Q = C L H^{3/2}$

Q = discharge (CFS)

C = Discharge Coefficient = 3.33

L = Perimeter Length of Grate (ft)

H = Hydraulic Head (ft)

Orifice Flow - $Q = A C \sqrt{2gH}$

Q = discharge (CFS)

A = Flow Area (ft²)

C = Discharge Coefficient = .6

H = Hydraulic Head (ft)

BRUNING 45-111

STS Consultants Ltd. CALCULATION SHEET	PROJECT: Arcadia Creek			STS JOB NO.: 1069-AJ
	SUBJECT: Collector System			CALC NO.: 911
	DATE: 1/11/90	BY: DEH	CHECKED BY:	REV. NO:

Catch Basins

Design Criteria – select a frame/grate that will maximize open area, yet is structurally sound and does not pose any safety hazards.

possibilites:

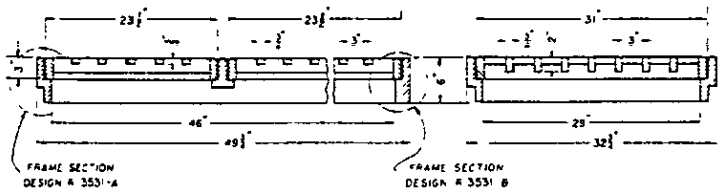
1) Neerah – R-3531-B Frame Grate

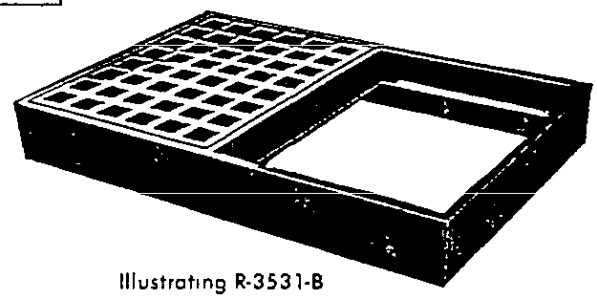
open Area = 2 (3.0 ft²/grate) = 6.0 ft²

R-3531-A&B Turnpike Inlet Frame and Double Grate

Heavy Duty

R-3531-A — 570 Pounds
R-3531-B — 670 Pounds





Illustrating R-3531-B

Rating Curve: $Q_o = c \cdot A\sqrt{2gH}$ or $Q_w = C \cdot L\, H^{3/2}$ (Ref. 2)

$c = .6$ $\quad c = 333$

H (ft)	Q_o 1 grate Q (cfs)	Q_o 2 grates Q (cfs)
0	0	0
.5	10.2	20.4
1.0	14.4	28.8
1.5	17.7	35.4
2.0	20.4	40.5

Weir Flow must be check since the final configuration is set.

(See Technical Data Appendix pages TDA 6-8.

BRUNING 45-111

STS Consultants Ltd. CALCULATION SHEET	PROJECT: Arcadia Creek	STS JOB NO.: 1069
	SUBJECT: Collector System	CALC. NO: 10/11
	DATE: 2/20/90	BY: DEH
	CHECKED BY:	REV NO:

3) Neenah - R-3067-L Frame and Grate

Open Area = 1.9 ft²

R-3067-LL Curb Inlet Frame, Grate, Curb Box

Heavy Duty

Total Weight 485 Pounds

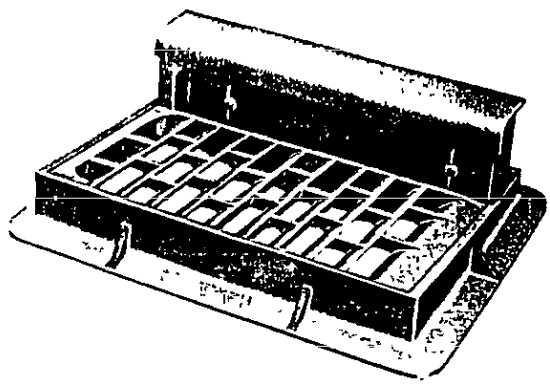
Unit shown is for flow-left. If flow-right is required, order as **R-3067-LR.**

R-3067-V

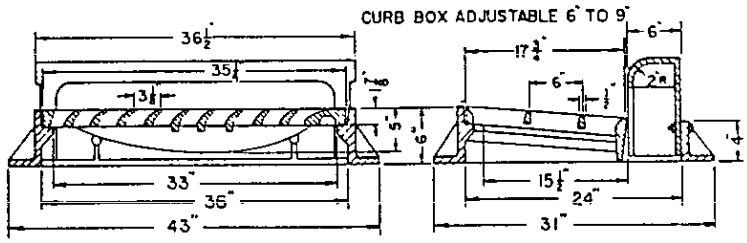
Same as above except with Type V Grate.

Heavy Duty

Total Weight 485 Pounds



Illustrating R-3067-LL



Rating Curve:

H (ft)	Q_o (cfs)
0	0
.5	6.1
1.0	8.7
1.5	10.6
2.0	12.2

BRUNING 45-111

STS Consultants Ltd.
CALCULATION SHEET

PROJECT	STS JOB NO.
Arcadia Creek	1069
SUBJECT	CALC. NO.
Westridge Collector System	11/11
DATE 2/23/90 BY DEH	CHECKED BY / REV NO

References:

1. STS Calculations, West End Diversion, DEH,

2. Inlet Grate Capacities For Gutter Flow and Ponded Water, Neenah Foundry Company, 1987.

3. Design of Small Dams, U.S. Dept. of the Interior, Bureau of Reclamation, 1987.

4. Modern Sewer Design AISI, 1980.

5. HEC-2, Water Surface Profiles, Users Manual, 1982.

6. Standard Handbook For Civil Engineers, McGraw-Hill, Third Edition, 1983.

7. Hydraulic Design of Improved Inlets for Culverts, Hydraulic Engineering Circular No 13, US DOT, FHWA, 1972.

8. Internal Flow Systems, D.S. Miller, BHRA Fluid Engineering, 1978

BRUNING 45-11

STS Consultants Ltd.
CALCULATION SHEET

PROJECT	STS JOB NO.
Arcadia Creek	1069
SUBJECT	**CALC NO.**
Technical Data Appendix	TDA-1/9
DATE 4/6/90 **BY** L.E.H **CHECKED BY**	**REV. NO**

Technical Data Appendix - Following is technical data used in the design of the watercourse Sewer.

Illustration 5.7 — Dimensions and Approximate Weights of Concrete Box Sections

ASTM C789—PRECAST REINFORCED CONCRETE BOX SECTIONS

Span (Ft)	Rise (Ft)	Thickness (in) Top Slab	Bot Slab	Wall	Waterway Area (Sq Feet)	Approx Weight (lbs/ft)
3	2	4	4	4	5 8	600
3	3	4	4	4	8 8	700
4	2	5	5	5	7 7	910
4	3	5	5	5	11 7	1030
4	4	5	5	5	15 7	1160
5	3	6	6	6	14 5	1430
5	4	6	6	6	19 5	1580
5	5	6	6	6	24 5	1730
6	3	7	7	7	17 3	1880
6	4	7	7	7	23 3	2060
6	5	7	7	7	29 3	2230
6	6	7	7	7	35 3	2410
7	4	8	8	8	27 1	2600
7	5	8	8	8	34 1	2800
7	6	8	8	8	41 1	3000
7	7	8	8	8	48 1	3200
8	4	8	8	8	31 1	2800
8	5	8	8	8	39 1	3000
8	6	8	8	8	47 1	3200
8	7	8	8	8	55 1	3400
8	8	8	8	8	63 1	3600
9	5	9	9	9	43 9	3660
9	6	9	9	9	52 9	3880
9	7	9	9	9	61 9	4110
9	8	9	9	9	70 9	4330
9	9	9	9	9	79 9	4560
10	5	10	10	10	48 6	4380
10	6	10	10	10	58 6	4630
10	7	10	10	10	68 6	4880
10	8	10	10	10	78 6	5130
10	9	10	10	10	88 6	5380
10	10	10	10	10	98 6	5630
11	4	11	11	11	42 3	4880
11	6	11	11	11	64 3	5430
11	8	11	11	11	86 3	5980
11	10	11	11	11	108 3	6530
11	11	11	11	11	119 3	6810
12	4	12	12	12	46 0	5700
12	6	12	12	12	70 0	6300
12	8	12	12	12	94 5	6900
12	10	12	12	12	118 0	7500
12	12	12	12	12	142 0	8100

ASTM C850—PRECAST REINFORCED CONCRETE BOX SECTIONS

Span (Ft)	Rise (Ft)	Thickness (in) Top Slab	Bot Slab	Wall	Waterway Area (Sq Feet)	Approx Weight (lbs/ft)
3	2	7	6	4	5 8	830
3	3	7	6	4	8 8	930
4	2	7½	6	5	7 7	1120
4	3	7½	6	5	11 7	1240
4	4	7½	6	5	15 7	1370
5	3	8	7	6	14 5	1650
5	4	8	7	6	19 5	1800
5	5	8	7	6	24 5	1950
6	3	8	7	7	17 3	1970
6	4	8	7	7	23 3	2150
6	5	8	7	7	29 3	2320
6	6	8	7	7	35 3	2500
7	4	8	8	8	27 1	2600
7	5	8	8	8	34 1	2800
7	6	8	8	8	41 1	3000
7	7	8	8	8	48 1	3200
8	4	8	8	8	31 1	2800
8	5	8	8	8	39 1	3000
8	6	8	8	8	47 1	3200
8	7	8	8	8	55 1	3400
8	8	8	8	8	63 1	3600
9	5	9	9	9	43 9	3660
9	6	9	9	9	52 9	3880
9	7	9	9	9	61 9	4110
9	8	9	9	9	70 9	4330
9	9	9	9	9	79 9	4560
10	5	10	10	10	48 6	4380
10	6	10	10	10	58 6	4630
10	7	10	10	10	68 6	4880
10	8	10	10	10	78 6	5130
10	9	10	10	10	88 6	5380
10	10	10	10	10	98 6	5630
11	4	11	11	11	42 3	4880
11	6	11	11	11	64 3	5430
11	8	11	11	11	86 3	5980
11	10	11	11	11	108 3	6530
11	11	11	11	11	119 3	6810
12	4	12	12	12	46 0	5700
12	6	12	12	12	70 0	6300
12	8	12	12	12	94 5	6900
12	10	12	12	12	118 0	7500
12	12	12	12	12	142 0	8100

REF—"CONCRETE PIPE DESIGN MANUAL", AMERICAN CONCRETE PIPE ASSOCIATION, SEVENTH PRINTING, 1987.

BRUNING 45-111

STS Consultants Ltd. CALCULATION SHEET	PROJECT: Arcadia creek	STS JOB NO.: 1069
	SUBJECT: Head loss Computations	CALC. NO.: TDA-219
	DATE: 4/6/90 BY: DEH	CHECKED BY:	REV. NO.:

Derivation of Head loss due to friction in a hydraulically long culvert (outlet control).

assume: - friction losses will be evaluated using Manning's Equation.
- hydraulically long culvert
- zero approach velocity

$$\text{Total Head Loss}(H) = K\frac{V^2}{2g}$$

$$K = \sum_{\text{all's}} K = K_{\text{entrance}} + K_{\text{exit}} + K_{\text{friction}}$$

$$K_{\text{friction}} = \frac{29.1(n^2)L}{R^{4/3}}$$

This Equation comes from Manning's Eq.-

$$V = \frac{1.486}{n} R^{2/3} \sqrt{S_f}$$

S_f = Energy Slope = $\frac{\text{Headwater} - \text{Tailwater}}{\text{Length of culvert}} = \frac{\text{Friction Head}}{L}$

R = hydraulic Radius

n = manning's friction coefficient

$$V = \frac{1.486}{n} R^{2/3} \sqrt{\frac{H_f}{L}} \Rightarrow H_f = \left(\frac{V \cdot n}{R^{2/3} \cdot 1.486}\right)^2 \cdot L \cdot \frac{2g}{2g}$$

$$\therefore H_f = \frac{V^2}{2g} \frac{n^2 \cdot 29.1 \cdot L}{R^{4/3}} = K_f \cdot \frac{V^2}{2g}$$

$$\Rightarrow K_f = 29.1\, n^2 \cdot L / R^{4/3}$$

BRUNING 45-11

STS Consultants Ltd.
CALCULATION SHEET

PROJECT	STS JOB NO.
Arcadia Creek	1069
SUBJECT	CALC. NO.
Head loss Computations	TDA-3/9
DATE 4/6/90	BY DEH	CHECKED BY	REV. NO.

(Head loss cont.)

$$H = H_{entrance} + H_{exit} + H_{friction}$$

$$= \left(K_e + 1.0 + \frac{29.1 n^2 L}{R^{4/3}}\right) \frac{V^2}{2g}$$ ✓

. If we rearrange terms.

$$V = \sqrt{\frac{2gH}{K}}$$

or

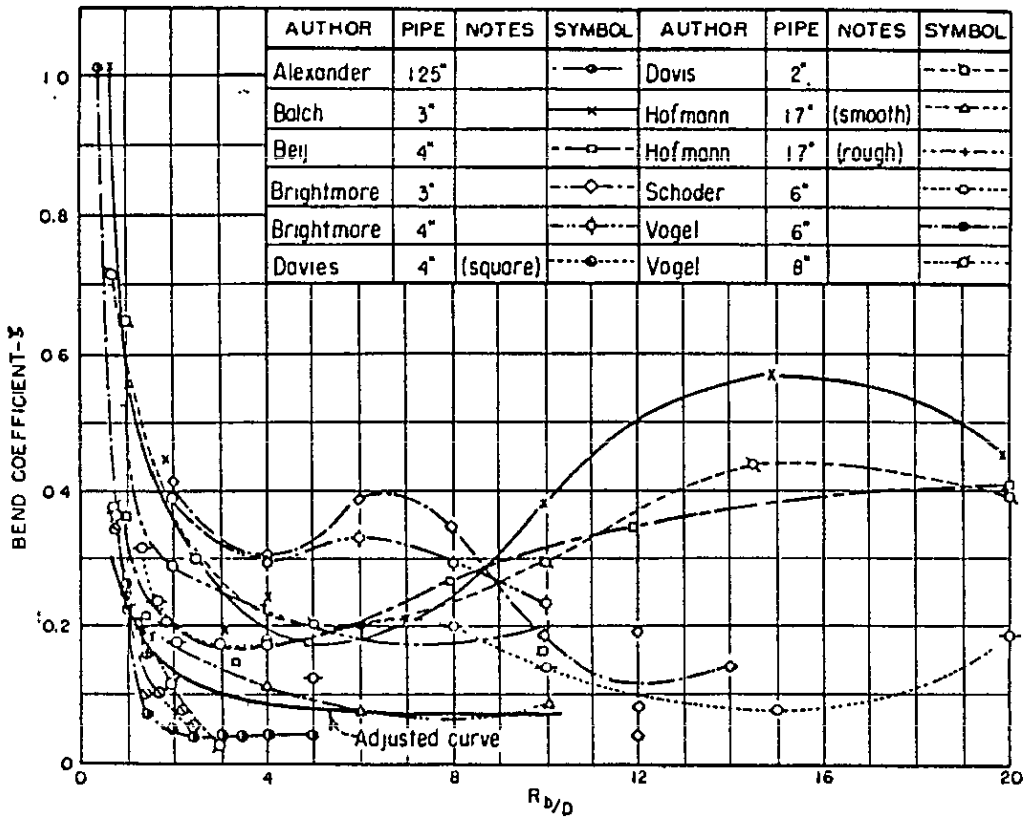
$$Q = A \cdot \sqrt{\frac{2gH}{K}}$$ ✓

Comments: 1. For culverts flowing less than Full, the equation should be evaluated using the appropriate A & R. This has been termed the modified orifice equation.

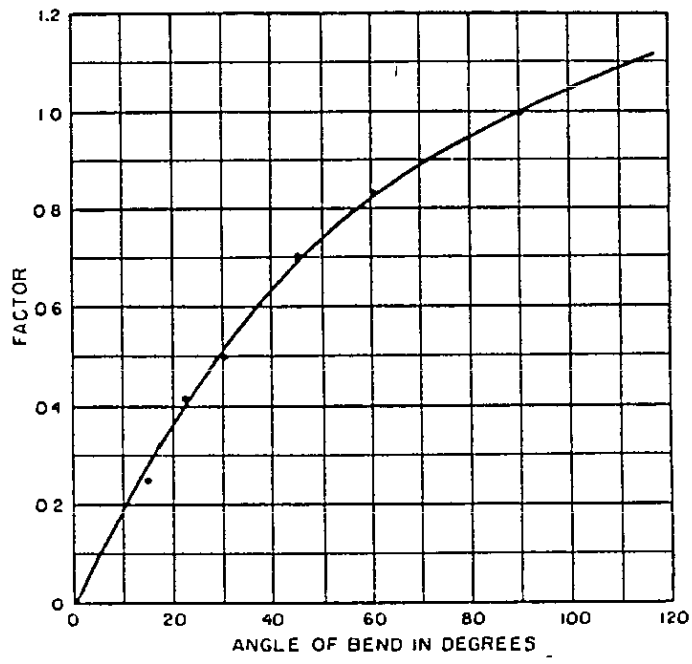
2. In HEC-2, K = XKOR

BRUNING 45-1

TDA-4:19



A-VARIATION OF BEND COEFFICIENT WITH RELATIVE RADIUS FOR 90° BENDS OF CIRCULAR CROSS SECTION, AS MEASURED BY VARIOUS INVESTIGATORS



B-FACTORS FOR OTHER THAN 90° BENDS

FIGURE 19.—*Bend loss coefficients as observed are tabulated in A, and a multiplying factor for bends other than 90° can be obtained from B.*

REF.- FRICTION FACTORS FOR LARGE CONDUITS FLOWING FULL,

UNITED STATES EPARTMENT OF THE INTERIOR BUREAU OF RECLAMATION 1965 ,

TDA-5/9

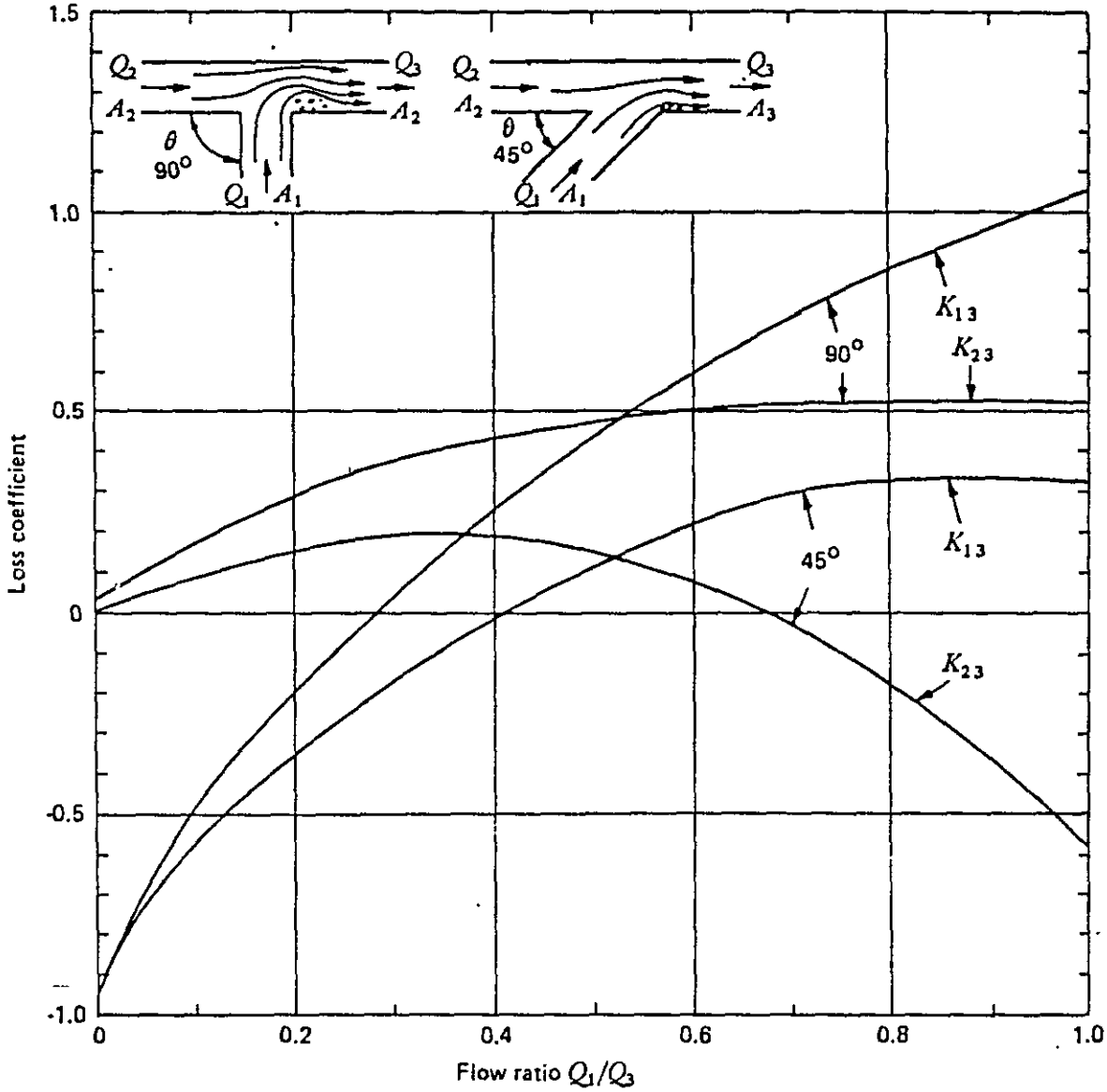


Fig. 5.55. Loss coefficients for sharp-edged 45° and 90° combining 'T's

REF- "INTERNAL FLOW SYSTEMS", D.S. MILLER, BHRA FLUID ENGINEERING, 1978.

TDA-619

ORIFICE FLOW

CAPACITY OF NEENAH GRATES FOR PONDING CONDITIONS

For flow through a grate under ponding conditions, orifice type flow occurs. If the net open area is used as the orifice area, the discharge can be computed using the orifice equation $Q = CA\sqrt{2gh}$ where C has a value of 0.60, A = area in square feet, g = the constant value 32.2, and h = depth in feet of water over the grate.

The orifice equation is most accurate when large depths of ponding are encountered. At shallower depths, the equation loses its accuracy. The determining factor is the grate's free open area. The orifice equation remains accurate for grates of smaller area when depths are in the 0.4 - 0.3 foot range. Grates of larger free open area are not able to sustain ponding conditions at shallow depths, and therefore flow reverts to wier or one directional flow as detailed in our **Inlet Grate Capacities** for gutter flow manual.

Since this equation contains three variables, two must be known to make a determination of the third. To facilitate rapid solution of the equation a nomograph (see page 60) is used. Please note the nomograph is limited to depths of .3 foot.

To use the nomograph, a line is drawn through the two known values on their respective axis. The third value will be obtained at the intersection of this line with the third axis. For example, if the area of a grate required to pass 6.7 cubic feet/second under a .5 feet head is desired, a line is projected from the .5 unit point on the right axis through the 6.7 unit point on the center axis. This line intersects the left axis at approximately 2.0 units indicating that a grate with a net open area of 2.0 square feet is required. Selection of this grate can be made by referring to the size table for the various Neenah grates.

It should be left to the designer to make any necessary reductions in the discharge due to trash accumulation or clogging.

For an example of the relationship between the weir and orifice equations and the expected flow through a grate under varying conditions see page 68.

REF- "INLET GRATE CAPACITIES", MEYER,ANDERSON, MILLER, AND HANDEL,

NEENAH FOUNDRY CO., 1987

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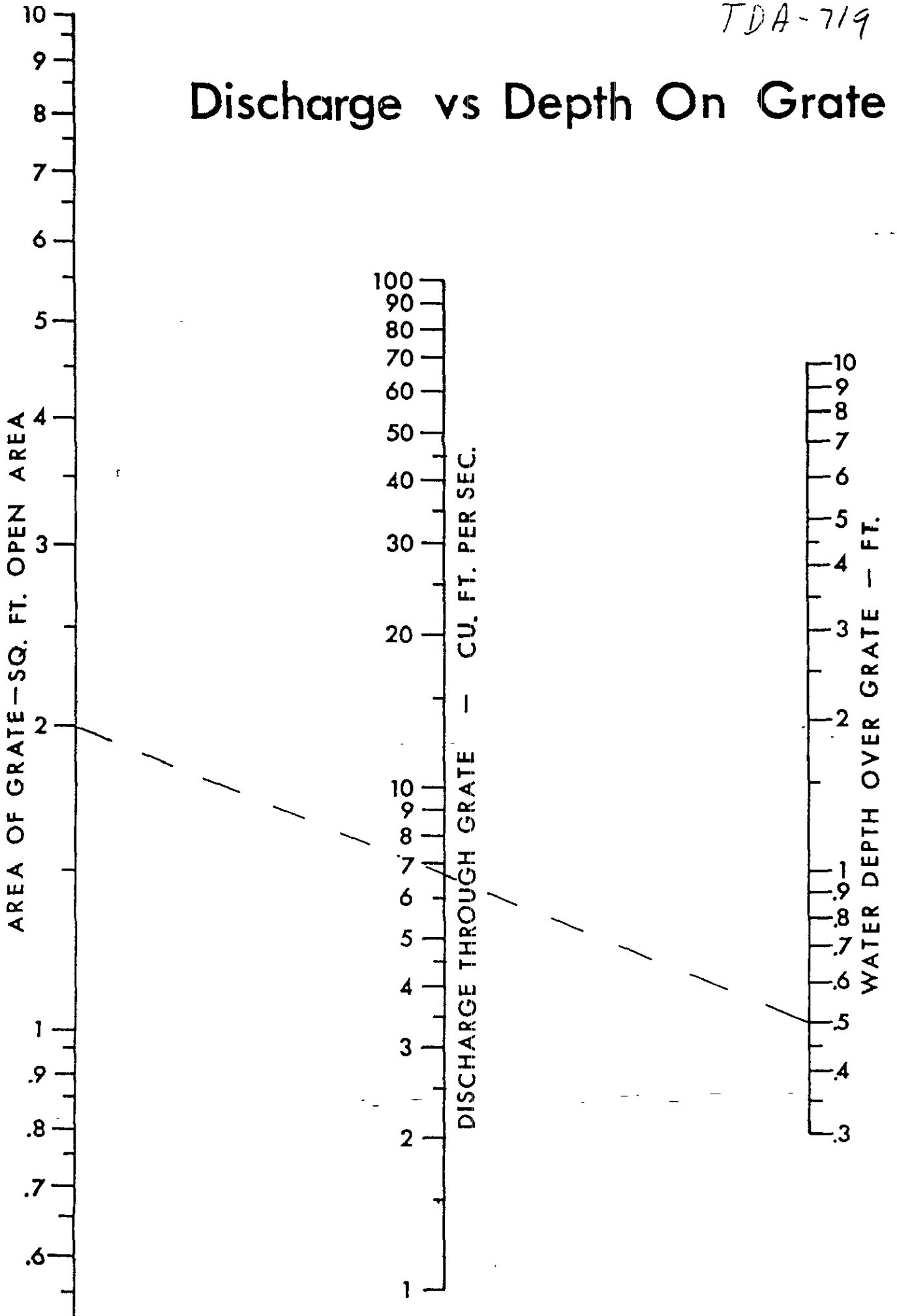
TDA-719

Discharge vs Depth On Grate



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TDA-8/9

WEIR FLOW

One of the most accurate methods of measuring water is by use of a weir. Many weir configurations are around with just about as many equations. They are all adaptations of the general weir equation $Q = 3.33\,L(h^{1.5})$ where Q = flow in cubic feet per second, L = length of crest of weir in feet, and h = feet of head observed where there is negligable flow velocity.

When using the Neenah Slide Rule Calculator, a slightly modified form is employed, namely:

$$Q = 3.3\,P(h)^{1.5}$$

where
Q = Capacity CFS
P = Perimeter of grate in feet
h = Head in feet

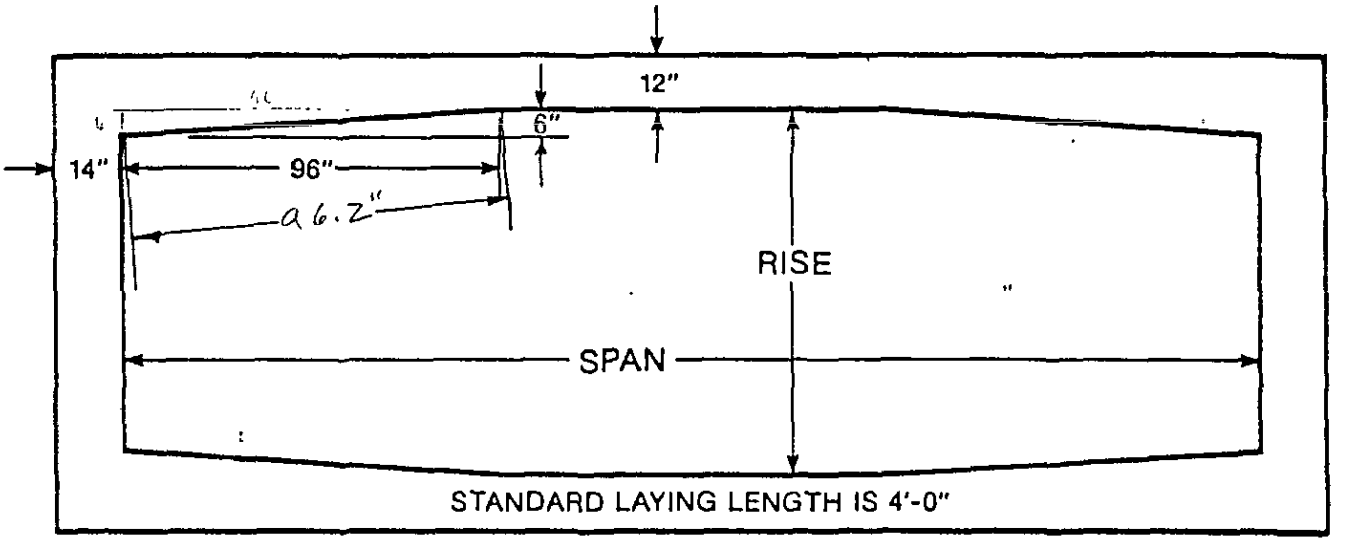
When determining inlet perimeter, add only the footage of the sides subject to flow. For example, should a grate be placed next to a curb, do not include the side of the grate next to it.

It's always wise to compare the weir flow expected with the orifice equation results. The equation with the lower flow value predominates. A graphic illustration of both equations is on the following page. When both equations are relatively the same, physically a vortex appears over the grate. This type of flow, due to its rotation, is not as efficient as either the weir or orifice equations imply. Using 80% of the expected flow in this situation should be a conservative estimate.

REF- "INLET GRATE CAPACITIES", MEYER, ANDERSON, MILLER, AND HANDEL, NEENAH FOUNDRY CO., 1987

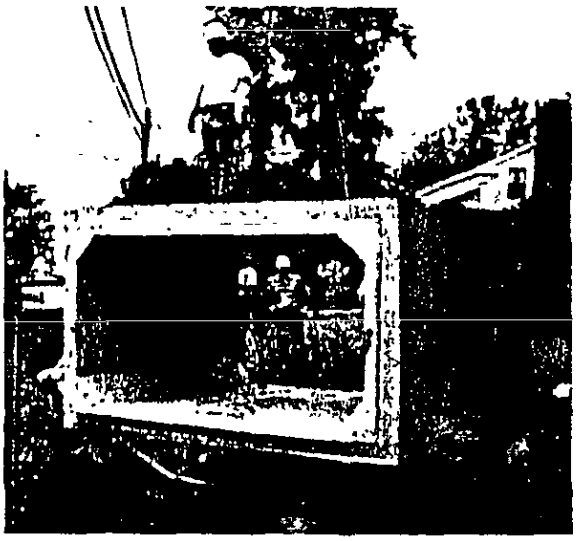
TDA-9/9

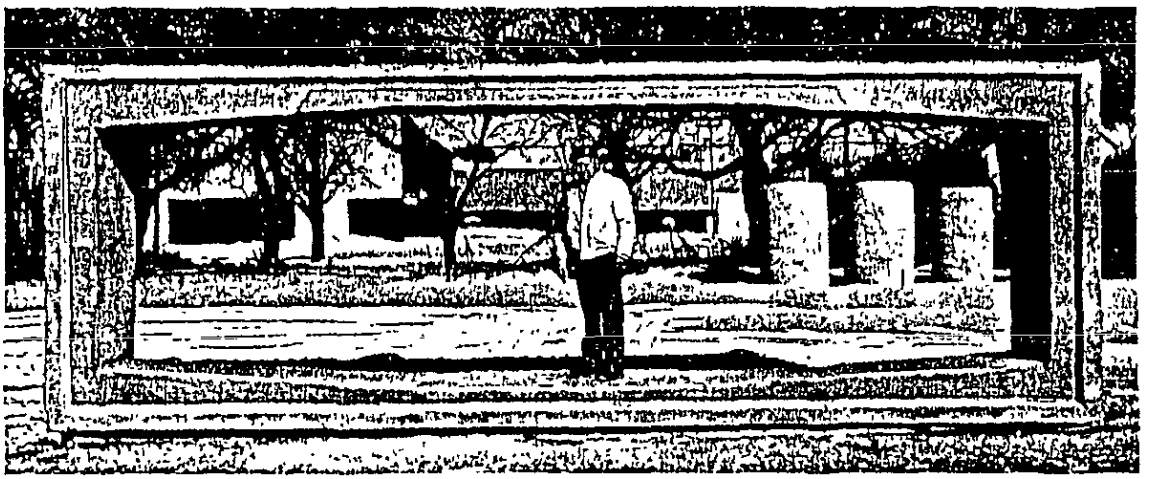
NORTHERN CONCRETE PIPE'S NEW "MAXI-BRIDGE"



AVAILABLE SIZES

SPAN (ft)	RISE (ft)	WEIGHT PER SECTION (tons)	END AREA (sq ft)
18	7	19.5	118
18	9	20.9	154
18	11	22.3	190
20	7	20.7	132
20	9	22.1	172
20	11	23.5	212
22	7	21.9	146
22	9	23.3	190
22	11	24.7	234
24	7 8	23.1	160
24	9	24.5	208
24	11	25.9	256





24' x 7' "MAXI-BRIDGE"

CALCULATION COVER SHEET

STS Consultants Ltd.

PROJECT Arcadia Creek JOB NO 1069 DIVISION W.R.

SUBJECT West-End Overland Flooding Analysis FILE NO

CALC NO

ORIGINATOR DEH DATE 3/13/90

CHECKER WJW DATE NO OF SHEETS

RECORD OF ISSUES

NO	DESCRIPTION	BY	DATE	CHKD	DATE	APPRD		
△								
△								
△								
△								
△								
△								

PRELIMINARY CALC ☐

SUPERSEDED CALC ☐ FINAL CALC ☐

BRIEF SUMMARY OF CALCULATIONS INCLUDING SCOPE AND RESULTS

West End Flooding Analysis

Hydraulic computations for the diversion of Elm St. Computations include step backwater analyses for the existing system and the overland flooding between Elm and Westnedge.

STS Consultants Ltd.
CALCULATION SHEET

PROJECT	STS JOB NO
Arcadia Creek	1069
SUBJECT	CALC NO.
West End Hydraulics	
DATE 3/13/90 BY DEH	CHECKED BY / REV. NO.

Purpose:

The Arcadia creek project is slated to end at Westnedge Ave. Following calculations document the diversion of flow at Elm St. from the existing system to overland flooding.

Methodology

Step backwater calculations were performed for the existing system and for overland flooding. The computer program HEC2 was utilized for these calculations. The split-flow option was utilized for the diversion analysis. A rating curve for the overland flow was developed using HEC2, and then input into the diversion analysis run.

Computer Files:

Overland Flooding - overate2.HEC2
Existing System and Diversion: WE.HEC2

Note: Elevations used to develop the closed conduit system do not appear to correlate with topographic maps developed by Abrams. Therefore, 1 foot will be added to the overland flow elevations so that they correlate.

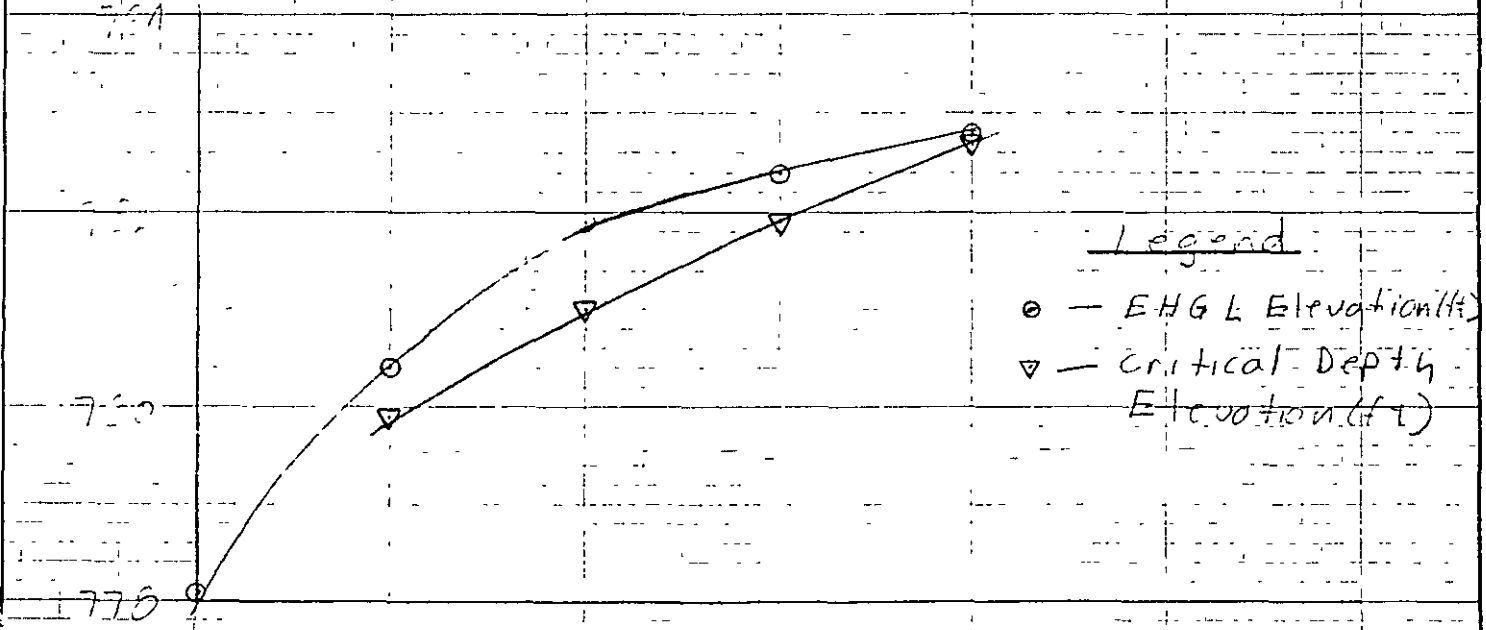
BRUNING 45-111

STS Consultants Ltd.
CALCULATION SHEET

PROJECT	STS JOB NO.
Arcadia Creek	1069
SUBJECT	CALC. NO
Starting Conditions	
DATE 12/7/89 BY DEH	CHECKED BY / REV NO.

Starting Conditions (cont.) @ westnedge

Discharge (cfs)	critical Depth (ft)	EHGL $(\frac{h+D}{2})$	Elevation (ft)
0	0	0	778.1
100	1.63	3.29	781.4
200	2.91	3.83	781.9
300	3.81	4.25	782.4
400	4.62	4.68	782.8
500	above top of duct		

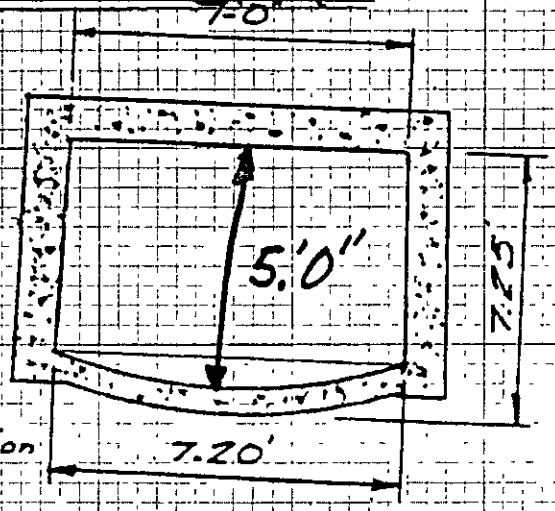


Use EHGL for starting conditions.

BRUNING 45-11

STS Consultants Ltd. CALCULATION SHEET	PROJECT: Arcadia Creek	STS JOB NO.: 1069-AT
	SUBJECT: Existing Conditions	CALC. NO.
	DATE: 12/7/94 BY: DEH	CHECKED BY	REV. NO.

Existing Culvert at Westnedge



SECTION-O

Westnedge-Approx. 58 Feet

Scale 1/4" = 1'0"

Calculate Equivalent Hydraulic Grade Line (EHGL)

$$EHGL = \frac{D_c + D}{2}$$

For the purposes of calculating D_c, assume a rectangle 7.1' x 4.75';

$$\frac{Q^2 \cdot T}{g A^3} = 1; \quad \frac{Q^2 T}{g T^3 D_c^3} = 1$$

$$D_c = \sqrt[3]{\frac{Q^2}{g}}$$

BRUNING 45-11

STS Consultants Ltd. CALCULATION SHEET	PROJECT [illegible]		STS JOB NO. [illegible]
	SUBJECT Critical Depth Calcs.		CALC. NO
	DATE 9/25/89	BY DEH	CHECKED BY	REV NO.

Critical Depth Calculations

Critical Depth results when the Froude Number equals 1. (Ref 3)

$$Fr = \frac{V^2}{gD} = 1$$

V = velocity (fps)

g = gravity (32.2 ft/sec²)

D = Hydraulic Depth = A/T

A = Area (ft²)

T = Top width (ft)

$$\frac{V^2}{gD} = 1; \quad \frac{A^2 V^2 \cdot T}{A^2 \cdot g \; A} = 1; \quad \therefore \quad \frac{Q^2 T}{g A^3} = 1$$

BRUNING 45-1

STS Consultants Ltd
CALCULATION SHEET

PROJECT	STS JOB NO.
Arcadia Creek	1069
SUBJECT	CALC NO
West End Diversion Analysis	
DATE 3/13/90	BY DEH	CHECKED BY	REV NO

Bend Losses

Methodology - • Assume a velocity.
• Calculate velocity head
• evaluate a bend coefficient
• Calculate a head loss
• insert the bend loss into HEC-2 using an XE card.

Governing Equation:

$$H_b = K_b \frac{V^2}{2g}$$

Reference for Kb - Friction Factors for Large Conduits Flowing Full, Bureau of Reclamation, 1965.

Note: Culverts may not be flowing full, however these coefficients should provide a reasonable estimate.

Bend losses will be evaluated at Four (4) locations.

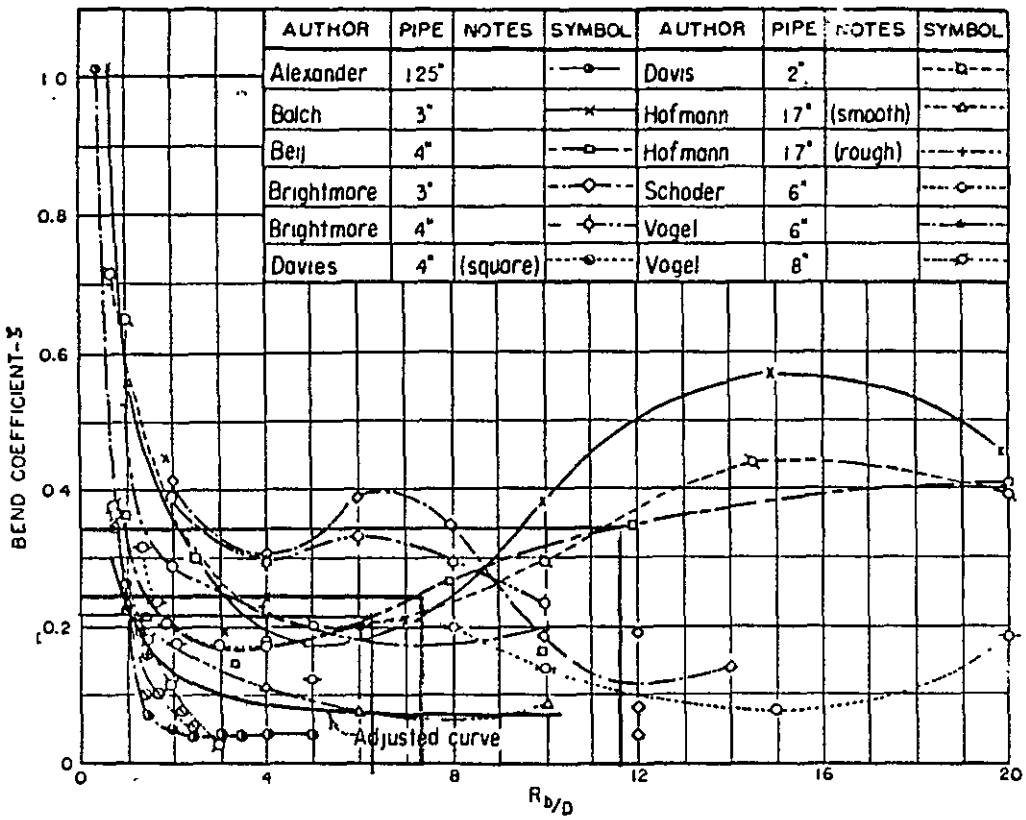
BRUNING 45-11

STS Consultants Ltd.
CALCULATION SHEET

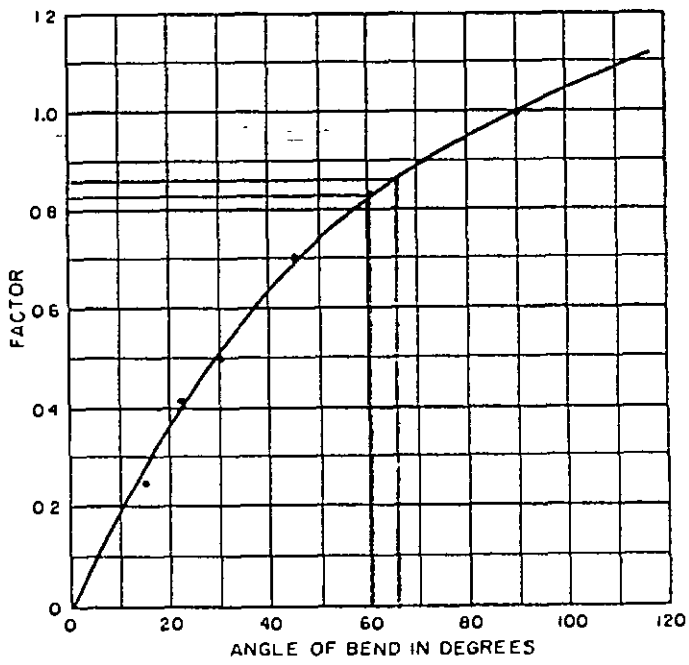
PROJECT	STS JOB NO.
Arcadia Creek	1269
SUBJECT	CALC NO.
West End Diversion Analysis	
DATE 3/12/90 BY DEH CHECKED BY	REV NO.

Designation	Assumed Velocity (fps)	Velocity Head (ft)	Kb	Head loss (ft)
Bend 1&2	6	.56	.28	.16
	7	.76	.28	.21
	8	.99	.28	.28
	9	1.26	.28	.35
	10	1.55	.28	.43
	11	1.9	.28	.53
	12	2.2	.28	.62
Bend 3	6	.56	.21	.12
	7	.76	.21	.16
	8	.99	.21	.21
	9	1.26	.21	.26
	10	1.55	.21	.33
	11	1.9	.21	.4
Bend 4	6	.56	.17	.1
	7	.76	.17	.13
	8	.99	.17	.17
	9	1.26	.17	.21
	10	1.55	.17	.26
	11	1.9	.17	.32

BRUNING 45-11



A-VARIATION OF BEND COEFFICIENT WITH RELATIVE RADIUS FOR 90° BENDS OF CIRCULAR CROSS SECTION, AS MEASURED BY VARIOUS INVESTIGATORS



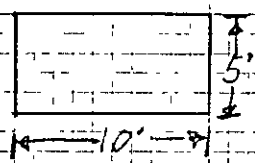
B-FACTORS FOR OTHER THAN 90° BENDS

FIGURE 19.—*Bend loss coefficients as observed are tabulated in A, and a multiplying factor for bends other than 90° can be obtained from B.*

REF.- FRICTION FACTORS FOR LARGE CONDUITS FLOWING FULL,

UNITED STATES EPARTMENT OF THE INTERIOR BUREAU OF RECLAMATION 1965 .

STS Consultants Ltd. CALCULATION SHEET	PROJECT: Arcadia Creek			STS JOB NO: 1069
	SUBJECT: West End Diversion			CALC NO.
	DATE: 3/13/90	BY: JEH	CHECKED BY	REV NO.



Section R'-R'

Use the special Bridge technique to model section R'-R'.

Governing Equation:

$$H_L = XKOR \frac{V^2}{2g}$$

XKOR (loss coeficient) = Kexit + Kfriction + Kentrance

Kexit = 0; exit losses will be accessed by HEC 2 as [illegible] contraction.

$$K_{friction} = 29.1(n^2) \cdot \frac{L}{R^{4/3}}$$

$$= 29.1(.012^2) \cdot \frac{110}{1.67^{4/3}} = .23$$

Kentrance = .5 (Roff [illegible], Table 1, entrance [illegible]).

XKOR = .5 + [illegible] = .73

cof Q = 3.0

RDtem = 0 (Well Flow not being [illegible])

[illegible] = 10 [illegible] = 50 ETCHG = [illegible]

[illegible] = 0 SS = 0 [illegible] = 3.0

BRUNING 45-11

HEC-2 ANALYSIS FOR THE EXISTING SYSTEM

AND THE DIVERSION ANALYSIS

HEC-2 ANALYSIS FOR THE OVERLAND FLOODING

BETWEEN ELM AND WESTNEDGE

00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: KALAMAZOO, CITY OF

3) WATERCOURSE: ARCADIA CREEK

4) DOCUMENT TYPE: RATING CURVE RUN

BETWEEN JUNCTION BOX AND KALAMAZOO RIVER

00BREAK00

```
**********************************************************
*  WATER SURFACE PROFILES                                *
*  VERSION OF NOVEMBER 1976                              *
*  UPDATED MAY 1984                                      *
*                                                        *
*  RUN DATE 12-DEC-90 TIME 14:57:14                      *
**********************************************************
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*****************************************
*  U.S. ARMY CORPS OF ENGINEERS         *
*  THE HYDROLOGIC ENGINEERING CENTER    *
*  609 SECOND STREET, SUITE D           *
*  DAVIS, CALIFORNIA 95616              *
*  (916) 440-2105 (FTS) 448-2105        *
*****************************************
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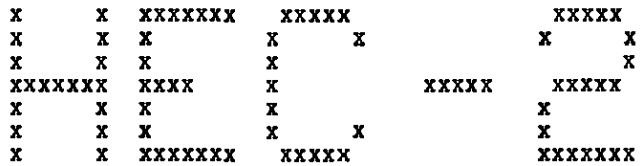

RATING CURVE FOR FLOW BETWEEN JUNCTION BOX AND KALMAZOO RIVER

THIS RUN EXECUTED 12-DEC-90 14:57:16

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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55
**************************************************

C
T1 ARCADIA CREEK HYDRAULIC ANALYSIS
T2 RATING CURVE FOR THE DIVERSION AT EDWARDS ST.:EHGL START
T3 JTP 10/30/86 [RATINGEE.HEC] REVISED DEH 9/22/89

J1  ICHECK     INQ        NINV       IDIR       STRT       METRIC     HVINS      Q          WSEL       FQ

       0.        2.         0.         0.  0.000000       0.00       0.0         0.    757.500      0.000

J2  NPROF      IPLOT      PRFVS      XSECV      XSECH      FN         ALLDC      IBW        CHNIM      ITRACE

     1.000      0.000     -1.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    150.000      0 000      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000


NC      0 000        0 000      0.015      0.500      0.700      0.000      0.000      0.000      0.000      0.000
QT     10 000        0 000     50.000     75.000    100.000    150.000    200.000    250.000    300.000    350.000
QT    400.000        0 000      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000
X1      0.100          000    100.100    120.000      0.000      0.000      0.000      0.000      0.000      0.000
GR    770.000        0 000    752.000    100.100    752.000    120.000    770.000    120.100      0.000      0.000

NC      0.015           15      0.015      0.300      0.500      0.000      0.000      0.000      0.000      0.000
        BEGIN SECTION A (670' LONG)
X1      1 000        0 000    200.000    210.300     20.000     20.000     20.000      0.000      0.000      0.000
BT      7.000        0 000    775.000    750.000    200.100    775.000    756.800    202.600    775.000    761.700
BT    205.200        0 000    761.700    207.800    775.000    761.700    210.200    775.000    756.800    210.300
BT    775.000        0 000      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000
GR    775.000        0 000    756.800    200.100    756.200    202.600    755.700    205.200    756.200    207.800
GR    756 800        0 000    775.000    210.300      0.000      0.000      0.000      0.000      0.000      0.000

        SECTION A
X1      1.100        0 000      0.000      0.000    100.000    100.000    100.000      0.000      0.600      0.000
X2      0 000        0 000      0.000      0.000      0.000      0.000      1.000      0.000      0.000      0.000

X1      1.200        0 000      0.000      0.000    100.000    100.000    100.000      0.000      0.600      0.000
X2      0.000        0 000      0.000      0.000      0.000      0.000      1.000      0.000      0.000      0.000

X1      1 300                   0.000      0.000    100.000    100.000    100.000      0.000      0.600      0.000
X2      0 000                   0.000      0.000      0.000      0.000      1.000      0.000      0.000      0.000
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X1	1.400	0.000	0.000	0.000	100.000	100.000	100.000	0.000	0.600	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
	BEGIN SECTION B(34' LONG)									
X1	2.000	5.000	100.000	110.550	270.000	270.000	270.000	0.000	0.000	0.000
BT	2.000	100.000	780.000	766.750	110.550	780.000	766.750	0.000	0.000	0.000
GR	766.750	100.000	760.000	101.000	759.000	105.500	760.000	110.000	766.750	110.550
	END SECTION B									
X1	2.100	0.000	0.000	0.000	34.000	34.000	34.000	0.000	0.100	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
	BEGIN SECTION A (830'LONG)									
X1	3.000	7.000	200.000	210.300	1.000	1.000	1.000	0.000	0.000	0.000
BT	7.000	200.000	775.000	760.700	200.100	775.000	760.700	202.600	775.000	766.600
BT	205.200	775.000	766.600	207.800	775.000	766.600	210.200	775.000	760.700	210.300
BT	775.000	760.700	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	775.000	200.000	760.700	200.100	759.500	202.600	759.100	205.200	759.500	207.800
GR	760.700	210.200	775.000	210.300	0.000	0.000	0.000	0.000	0.000	0.000
	SECTION A :STA. 8+00									
X1	3.100	0.000	0.000	0.000	100.000	100.000	100.000	0.000	0.400	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X1	3.150	0.000	0.000	0.000	200.000	200.000	200.000	0.000	1.100	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
	SECTION A :STA. 12+00									
X1	3.200	0.000	0.000	0.000	200.000	200.000	200.000	0.000	1.100	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
	SECTION A :STA. 16+00									
X1	3.300	0.000	0.000	0.000	200.000	200.000	200.000	0.000	0.450	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X1	3.350	0.000	0.000	0.000	200.000	200.000	200.000	0.000	0.450	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X1	3.390	0.000	0.000	0.000	0.100	0.100	0.100	0.000	0.000	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X5	-9.000	0.070	0.080	0.090	0.100	0.120	0.150	0.180	0.220	0.250
	END SECTION A									
X1	3.400	0.000	0.000	0.000	30.000	30.000	30.000	0.000	-0.100	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
	BEGIN SECTION D (250' LONG)									
X1	4.000	5.000	200.000	209.000	1.000	1.000	1.000	0.000	0.000	0.000
BT	5.000	[illegible]	780.000	770.000	200.100	780.000	770.000	204.500	780.000	770.000
BT	208.900	[illegible]	770.000	209.000	780.000	770.000	0.000	0.000	0.000	0.000
GR	780.000		763.900	200.100	762.500	204.500	763.900	208.900	780.000	209.000

X1	4.010	0.000	0.000	0.000	0.010	0.010	0.010	0.000	0.000	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X5	-9.000	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140
	SECTION D :PITCHER ST.									
X1	4.100	0.000	0.000	0.000	250.000	250.000	250.000	0.000	1.100	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X1	4.110	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
BT	2.000	200.000	780.000	770.000	209.000	780.000	770.000	0.000	0.000	0.000
	BEGIN SECTION E (470' LONG)									
X1	5.000	11.000	100.000	108.500	1.000	1.000	1.000	0.000	0.000	0.000
BT	2.000	100.000	780.000	771.100	108.500	780.000	771.100	0.000	0.000	0.000
GR	771.100	100.000	766.100	100.500	766.100	101.000	765.100	101.100	763.850	102.500
GR	763.500	104.250	763.850	106.000	765.100	107.500	766.100	107.510	766.100	108.000
GR	771.100	108.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	5.010	0.000	0.000	0.000	0.010	0.010	0.010	0.000	0.000	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X5	-9.000	0.140	0.170	0.210	0.240	0.270	0.300	0.320	0.320	0.320
	SECTION E									
X1	5.100	0.000	0.000	0.000	35.000	35.000	35.000	0.000	0.100	0.000
	1' INTO JUNCTION BOX. 10' WIDE SECTION TO MODEL INLET LOSS									
X1	6.000	0.000	0.000	0.000	1.000	1.000	1.000	1.250	0.000	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	1.250	0.000
	SAME SECTI 23 62 FROM MAINSTREAM MODEL									
X1	23.620	0.000	150.000	170.010	10.000	10.000	10.000	0.000	0.000	0.000
BT	6.000	0.000	771.500	770.000	159.500	771.500	770.000	159.510	771.500	761.700
BT	160.500	0.000	761.700	160.510	771.500	770.000	170.100	771.500	770.000	0.000
GR	771.500	0.000	771.500	150.000	761.700	150.010	761.700	159.500	761.700	160.700
GR	761.700	0.000	771.500	170.010	771.500	200.000	0.000	0.000	0.000	0.000
EJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

THIS RUN EXECUTED 12-DEC-90 14:59:44

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  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

0/30/86 [RATINGEE.HEC] R

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
	0.100	0.00	0.00	0.00	752.00	25.00	757.50	0.00	757.50	0.01	0.23	109.62	340.36
	0.100	0.00	0.00	0.00	752.00	50.00	757.50	0.00	757.50	0.02	0.45	109.62	340.36
	0.100	0.00	0.00	0.00	752.00	75.00	757.50	0.00	757.51	0.05	0.68	109.62	340.36
	0.100	0.00	0.00	0.00	752.00	100.00	757.50	0.00	757.51	0.09	0.91	109.62	340.36
	0.100	0.00	0.00	0.00	752.00	150.00	757.50	0.00	757.53	0.19	1.36	109.62	340.36
	0.100	0.00	0.00	0.00	752.00	200.00	757.50	0.00	757.56	0.35	1.81	109.62	340.36
	0.100	0.00	0.00	0.00	752.00	250.00	757.50	0.00	757.59	0.54	2.27	109.62	340.36
	0.100	0.00	0.00	0.00	752.00	300.00	757.50	0.00	757.63	0.78	2.72	109.62	340.36
	0.100	0.00	0.00	0.00	752.00	400.00	757.50	0.00	757.74	1.38	3.63	109.62	340.36
	0.100	0.00	0.00	0.00	752.00	400.00	757.50	0.00	757.74	1.38	3.63	109.62	340.36
	1.000	0.00	775.00	761.70	755.70	25.00	757.47	0.00	757.53	3.87	2.01	12.42	12.71
	1.000	0.00	775.00	761.70	755.70	50.00	757.35	0.00	757.65	20.41	4.41	11.33	11.07
*	1.000	0.00	775.00	761.70	755.70	75.00	757.40	757.40	758.03	41.12	6.38	11.75	11.70
*	1.000	0.00	775.00	761.70	755.70	100.00	757.65	757.65	758.43	42.26	7.08	14.12	15.38
*	1.000	0.00	775.00	761.70	755.70	150.00	758.11	758.11	759.16	45.13	8.23	18.23	22.33
*	1.000	0.00	775.00	761.70	755.70	200.00	758.51	758.51	759.83	48.88	9.21	21.72	28.61
*	1.000	0.00	775.00	761.70	755.70	250.00	758.89	758.89	760.47	52.81	10.07	24.83	34.40
*	1.000	0.00	775.00	761.70	755.70	300.00	759.25	759.25	761.08	57.04	10.85	27.64	39.72
*	1.000	0.00	775.00	761.70	755.70	400.00	759.91	759.91	762.27	66.77	12.32	32.47	48.95
*	1.000	0.00	775.00	761.70	755.70	400.00	759.91	759.91	762.27	66.77	12.32	32.47	48.95
	1.100	100.00	775.00	762.30	756.30	25.00	757.47	0.00	757.69	25.77	3.73	6.71	4.92
*	1.100	100.00	775.00	762.30	756.30	50.00	757.72	757.72	758.19	40.74	5.53	9.04	7.83
*	1.100	100.00	775.00	762.30	756.30	75.00	758.00	758.00	758.63	41.12	6.38	11.75	11.70
*	1.100	100.00	775.00	762.30	756.30	100.00	758.25	758.25	759.03	42.26	7.08	14.12	15.38
*	1.100	100.00	775.00	762.30	756.30	150.00	758.71	758.71	759.76	45.13	8.23	18.23	22.33
*	1.100	100.00	775.00	762.30	756.30	200.00	759.11	759.11	760.43	48.88	9.21	21.72	28.61
*	1.100	100.00	775.00	762.30	756.30	250.00	759.49	759.49	761.07	52.81	10.07	24.83	34.40
*	1.100	100.00	775.00	762.30	756.30	300.00	759.85	759.85	761.68	57.04	10.85	27.64	39.72
	1.100	100.00	775.00	762.30	756.30	400.00	761.14	760.51	762.99	49.44	10.91	36.66	56.89
	1.100	100.00	775.00	762.30	756.30	400.00	761.14	760.51	762.99	49.44	10.91	36.66	56.89

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
*	1.200	100.00	775.00	762.90	756.90	25.00	757.99	757.99	758.28	41.64	4.35	5.74	3.87
*	1.200	100.00	775.00	762.90	756.90	50.00	758.32	758.32	758.79	40.74	5.53	9.04	7.83
*	1.200	100.00	775.00	762.90	756.90	75.00	758.60	758.60	759.23	41.12	6.38	11.75	11.70
*	1.200	100.00	775.00	762.90	756.90	100.00	758.85	758.85	759.63	42.26	7.08	14.12	15.38
*	1.200	100.00	775.00	762.90	756.90	150.00	759.31	759.31	760.36	45.13	8.23	18.23	22.33
*	1.200	100.00	775.00	762.90	756.90	200.00	759.71	759.71	761.03	48.88	9.21	21.72	28.61
*	1.200	100.00	775.00	762.90	756.90	250.00	760.09	760.09	761.67	52.81	10.07	24.83	34.40
*	1.200	100.00	775.00	762.90	756.90	300.00	760.45	760.45	762.28	57.04	10.85	27.64	39.72
	1.200	100.00	775.00	762.90	756.90	400.00	761.61	761.11	763.54	52.31	11.17	35.82	55.31
	1.200	100.00	775.00	762.90	756.90	400.00	761.61	761.11	763.54	52.31	11.17	35.82	55.31
*	1.300	100.00	775.00	763.50	757.50	25.00	758.59	758.59	758.88	41.64	4.35	5.74	3.87
*	1.300	100.00	775.00	763.50	757.50	50.00	758.92	758.92	759.39	40.74	5.53	9.04	7.83
*	1.300	100.00	775.00	763.50	757.50	75.00	759.20	759.20	759.83	41.12	6.38	11.75	11.70
*	1.300	100.00	775.00	763.50	757.50	100.00	759.45	759.45	760.23	42.26	7.08	14.12	15.38
*	1.300	100.00	775.00	763.50	757.50	150.00	759.91	759.91	760.96	45.13	8.23	18.23	22.33
*	1.300	100.00	775.00	763.50	757.50	200.00	760.31	760.31	761.63	48.88	9.21	21.72	28.61
*	1.300	100.00	775.00	763.50	757.50	250.00	760.69	760.69	762.27	52.81	10.07	24.83	34.40
*	1.300	100.00	775.00	763.50	757.50	300.00	761.05	761.05	762.88	57.04	10.85	27.64	39.72
	1.300	100.00	775.00	763.50	757.50	400.00	762.11	761.71	764.11	54.52	11.36	35.22	54.17
	1.300	100.00	775.00	763.50	757.50	400.00	762.11	761.71	764.11	54.52	11.36	35.22	54.17
*	1.400	100.00	775.00	764.10	758.10	25.00	759.19	759.19	759.48	41.64	4.35	5.74	3.87
*	1.400	100.00	775.00	764.10	758.10	50.00	759.52	759.52	759.99	40.74	5.53	9.04	7.83
*	1.400	100.00	775.00	764.10	758.10	75.00	759.80	759.80	760.43	41.12	6.38	11.75	11.70
*	1.400	100.00	775.00	764.10	758.10	100.00	760.05	760.05	760.83	42.26	7.08	14.12	15.38
*	1.400	100.00	775.00	764.10	758.10	150.00	760.51	760.51	761.56	45.13	8.23	18.23	22.33
*	1.400	100.00	775.00	764.10	758.10	200.00	760.91	760.91	762.23	48.88	9.21	21.72	28.61
*	1.400	100.00	775.00	764.10	758.10	250.00	761.29	761.29	762.87	52.81	10.07	24.83	34.40
*	1.400	100.00	775.00	764.10	758.10	300.00	761.65	761.65	763.48	57.04	10.85	27.64	39.72
	1.400	100.00	775.00	764.10	758.10	400.00	762.63	762.31	764.69	56.44	11.52	34.73	53.25
	1.400	100.00	775.00	764.10	758.10	400.00	762.63	762.31	764.69	56.44	11.52	34.73	53.25
	2.000	100.00	780.00	766.75	759.00	25.00	760.18	0.00	760.44	29.90	4.04	6.18	4.57
	2.000	100.00	780.00	766.75	759.00	50.00	760.54	0.00	760.98	32.37	5.31	9.42	8.79
	2.000	100.00	780.00	766.75	759.00	75.00	760.85	0.00	761.43	32.76	6.12	12.26	13.10
	2.000	100.00	780.00	766.75	759.00	100.00	761.15	0.00	761.84	31.71	6.65	15.03	17.76
	2.000	100.00	780.00	766.75	759.00	150.00	761.76	0.00	762.58	28.05	7.24	20.71	28.32
	2.000	100.00	780.00	766.75	759.00	200.00	762.40	0.00	763.26	24.11	7.47	26.76	40.73
	2.000	100.00	780.00	766.75	759.00	250.00	763.03	0.00	763.93	21.42	7.62	32.81	54.01
	2.000	100.00	780.00	766.75	759.00	300.00	763.67	0.00	764.59	19.24	7.68	39.04	68.40
	2.000	100.00	780.00	766.75	759.00	400.00	764.82	0.00	765.79	17.27	7.92	50.50	96.26
	2.000	100.00	780.00	766.75	759.00	400.00	764.82	0.00	765.79	17.27	7.92	50.50	96.26

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
	2.100	34.00	780.00	766.85	759.10	25.00	760.30	0.00	760.54	27.41	3.93	6.36	4.77
	2.100	34.00	780.00	766.85	759.10	50.00	760.67	0.00	761.09	30.15	5.19	9.64	9.11
	2.100	34.00	780.00	766.85	759.10	75.00	761.03	0.00	761.55	27.92	5.80	12.93	14.19
	2.100	34.00	780.00	766.85	759.10	100.00	761.29	0.00	761.95	30.28	6.55	15.27	18.17
	2.100	34.00	780.00	766.85	759.10	150.00	761.88	0.00	762.67	27.19	7.17	20.93	28.76
	2.100	34.00	780.00	766.85	759.10	200.00	762.47	0.00	763.35	24.84	7.55	26.48	40.13
	2.100	34.00	780.00	766.85	759.10	250.00	763.09	0.00	764.01	21.99	7.69	32.50	53.31
	2.100	34.00	780.00	766.85	759.10	300.00	763.73	0.00	764.66	19.77	7.76	38.65	67.47
	2.100	34.00	780.00	766.85	759.10	400.00	764.87	0.00	765.86	17.69	8.00	50.03	95.09
	2.100	34.00	780.00	766.85	759.10	400.00	764.87	0.00	765.86	17.69	8.00	50.03	95.09
	3.000	1.00	775.00	766.60	759.10	25.00	760.36	0.00	760.56	18.06	3.53	7.07	5.88
	3.000	1.00	775.00	766.60	759.10	50.00	760.87	0.00	761.14	16.01	4.17	11.98	12.50
	3.000	1.00	775.00	766.60	759.10	75.00	761.24	0.00	761.60	16.68	4.83	15.51	18.36
	3.000	1.00	775.00	766.60	759.10	100.00	761.59	0.00	762.02	16.76	5.30	18.88	24.43
	3.000	1.00	775.00	766.60	759.10	150.00	762.08	0.00	762.72	20.82	6.44	23.28	32.87
	3.000	1.00	775.00	766.60	759.10	200.00	762.57	0.00	763.38	23.07	7.23	27.66	41.64
	3.000	1.00	775.00	766.60	759.10	250.00	763.08	0.00	764.03	24.49	7.81	31.99	50.52
	3.000	1.00	775.00	766.60	759.10	300.00	763.67	0.00	764.72	24.97	8.20	36.58	60.03
	3.000	1 00	775.00	766.60	759.10	400.00	764.73	0.00	766.00	27.95	9.05	44.19	75.66
	3.000	1 00	775.00	766.60	759.10	400.00	764.73	0.00	766.00	27.95	9.05	44.19	75.66
*	3.100	100 00	775.00	767.00	759.50	25.00	760.55	760.55	760.90	40.52	4.71	5.31	3.93
	3.100	100 00	775.00	767.00	759.50	50.00	761.00	760.98	761.45	33.89	5.39	9.28	8.59
	3.100	100 00	775.00	767.00	759.50	75.00	761.38	0.00	761.89	28.21	5.77	13.00	14.12
	3.100	100 00	775.00	767.00	759.50	100.00	761.72	0.00	762.30	25.58	6.13	16.32	19.77
	3.100	100 00	775.00	767.00	759.50	150.00	762.25	0.00	763.02	26.74	7.04	21.30	29.01
	3.100	1	775.00	767.00	759.50	200.00	762.76	0.00	763.69	27.71	7.73	25.86	37.99
	3.100	1	775.00	767.00	759.50	250.00	763.29	0.00	764.34	28.09	8.23	30.36	47.17
	3.100	1	775.00	767.00	759.50	300.00	763.89	0.00	765.02	27.50	8.52	35.22	57.21
	3.100	1	775.00	767.00	759.50	400.00	764.99	0.00	766.32	29.47	9.26	43.22	73.69
	3.100	1	775.00	767.00	759.50	400.00	764.99	0.00	766.32	29.47	9.26	43.22	73.69
*	3.150	1	775.00	768.10	760.60	25.00	761.65	761.65	762.00	40.52	4.71	5.31	3.93
*	3.150	1	775.00	768.10	760.60	50.00	762.08	762.08	762.56	36.04	5.51	9.08	8.33
*	3.150	1	775.00	768.10	760.60	75.00	762.37	762.37	762.98	36.64	6.29	11.92	12.39
*	3.150	100	775.00	768.10	760.60	100.00	762.62	762.62	763.37	37.33	6.97	14.35	16.37
*	3.150	100 00	775.00	768.10	760.60	150.00	763.06	763.06	764.07	39.39	8.07	18.59	23.90
*	3.150	1	775.00	768.10	760.60	200.00	763.46	763.46	764.71	41.90	8.98	22.27	30.90
*	3 150	1	775.00	768.10	760.60	250.00	763.84	763.84	765.31	44.08	9.73	25.69	37.65
	3.150	100	775.00	768.10	760.60	300.00	764.35	764.18	765.90	41.63	9.99	30.04	46.50
	3.150	100 00	775.00	768.10	760.60	400.00	765.50	0.00	767.13	37.69	10.24	39.05	65.15
	3.150	100 00	775.00	768.10	760.60	400.00	765.50	0.00	767.13	37.69	10.24	39.05	65.15

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
*	3.200	200.00	775.00	769.20	761.70	25.00	762.75	762.75	763.10	40.52	4.71	5.31	3.93
*	3.200	200.00	775.00	769.20	761.70	50.00	763.18	763.18	763.66	36.03	5.51	9.08	8.33
*	3.200	200.00	775.00	769.20	761.70	75.00	763.47	763.47	764.08	36.64	6.29	11.92	12.39
*	3.200	200.00	775.00	769.20	761.70	100.00	763.72	763.72	764.47	37.33	6.97	14.35	16.37
*	3.200	200.00	775.00	769.20	761.70	150.00	764.16	764.16	765.17	39.39	8.07	18.59	23.90
*	3.200	200.00	775.00	769.20	761.70	200.00	764.56	764.56	765.81	41.90	8.98	22.27	30.90
*	3.200	200.00	775.00	769.20	761.70	250.00	764.94	764.94	766.41	44.08	9.73	25.69	37.65
*	3.200	200.00	775.00	769.20	761.70	300.00	765.28	765.28	766.99	47.66	10.51	28.55	43.45
	3.200	200.00	775.00	769.20	761.70	400.00	766.19	765.92	768.12	46.65	11.15	35.87	58.57
	3.200	200.00	775.00	769.20	761.70	400.00	766.19	765.92	768.12	46.65	11.15	35.87	58.57
	3.300	200.00	775.00	769.65	762.15	25.00	763.45	0.00	763.63	16.00	3.38	7.39	6.25
	3.300	200.00	775.00	769.65	762.15	50.00	763.91	0.00	764.19	16.88	4.25	11.78	12.17
	3.300	200.00	775.00	769.65	762.15	75.00	764.27	0.00	764.64	17.10	4.88	15.38	18.14
	3.300	200.00	775.00	769.65	762.15	100.00	764.61	0.00	765.05	17.51	5.38	18.59	23.90
	3.300	200.00	775.00	769.65	762.15	150.00	765.22	0.00	765.82	18.76	6.20	24.17	34.63
	3.300	200.00	775.00	769.65	762.15	200.00	765.79	0.00	766.53	20.11	6.87	29.11	44.60
	3.300	200.00	775.00	769.65	762.15	250.00	766.33	0.00	767.20	21.79	7.47	33.46	53.56
	3.300	200.00	775.00	769.65	762.15	300.00	766.86	0.00	767.85	23.33	7.98	37.58	62.10
	3.300	200.00	775.00	769.65	762.15	400.00	767.74	0.00	769.03	28.38	9.11	43.90	75.08
	3.300	200.00	775.00	769.65	762.15	400.00	767.74	0.00	769.03	28.38	9.11	43.90	75.08
	3.350	200.00	775.00	770.10	762.60	25.00	763.80	0.00	764.03	22.45	3.82	6.55	5.28
	3.350	200.00	775.00	770.10	762.60	50.00	764.26	0.00	764.59	21.55	4.60	10.87	10.77
	3.350	200.00	775.00	770.10	762.60	75.00	764.62	0.00	765.04	20.77	5.21	14.40	16.46
	3.350	200.00	775.00	770.10	762.60	100.00	764.96	0.00	765.46	20.36	5.67	17.64	22.16
	3.350	200.00	775.00	770.10	762.60	150.00	765.59	0.00	766.23	20.23	6.38	23.53	33.35
	3.350	[illegible]	775.00	770.10	762.60	200.00	766.19	0.00	766.95	20.81	6.96	28.74	43.84
	3.350	[illegible]	775.00	770.10	762.60	250.00	766.76	0.00	767.63	21.88	7.48	33.41	53.45
	3.350	[illegible]	775.00	770.10	762.60	300.00	767.35	0.00	768.32	22.78	7.91	37.94	62.85
	3.350	[illegible]	775.00	770.10	762.60	400.00	768.38	0.00	769.60	26.49	8.85	45.21	77.72
	3.350		775.00	770.10	762.60	400.00	768.38	0.00	769.60	26.49	8.85	45.21	77.72
*	3.390	[illegible]	775.00	770.10	762.60	25.00	763.87	0.00	764.06	17.54	3.50	7.15	5.97
*	3.390	[illegible]	775.00	770.10	762.60	50.00	764.34	0.00	764.63	17.36	4.29	11.67	12.00
*	3.390	[illegible]	775.00	770.10	762.60	75.00	764.71	0.00	765.09	17.44	4.91	15.28	17.96
*	3.390	[illegible]	775.00	770.10	762.60	100.00	765.06	0.00	765.51	17.54	5.38	18.58	23.88
*	3.390	[illegible]	775.00	770.10	762.60	150.00	765.71	0.00	766.29	17.96	6.11	24.56	35.40
*	3.390	[illegible]	775.00	770.10	762.60	200.00	766.34	0.00	767.04	18.61	6.67	29.97	46.36
*	3.390	[illegible]	775.00	770.10	762.60	250.00	766.94	0.00	767.74	19.68	7.18	34.80	56.35
*	3.390	[illegible]	775.00	770.10	762.60	300.00	767.57	0.00	768.46	20.57	7.59	39.53	66.14
*	3.390	[illegible]	775.00	770.10	762.60	400.00	973.58	766.82	973.58	0.01	0.19	2100.68	4639.11
*	3.390	[illegible]	775.00	770.10	762.60	400.00	973.58	766.82	973.58	0.01	0.19	2100.68	4639.11

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
	3.400	30.00	775.00	770.00	762.50	25.00	764.01	0.00	764.12	8.27	2.67	9.37	8.70
	3.400	30.00	775.00	770.00	762.50	50.00	764.50	0.00	764.70	9.49	3.50	14.27	16.23
	3.400	30.00	775.00	770.00	762.50	75.00	764.89	0.00	765.16	10.93	4.18	17.93	22.69
	3.400	30.00	775.00	770.00	762.50	100.00	765.24	0.00	765.58	12.05	4.72	21.19	28.81
	3.400	30.00	775.00	770.00	762.50	150.00	765.89	0.00	766.37	13.86	5.56	27.00	40.29
	3.400	30.00	775.00	770.00	762.50	200.00	766.52	0.00	767.11	15.40	6.21	32.21	50.97
	3.400	30.00	775.00	770.00	762.50	250.00	767.11	0.00	767.83	16.98	6.78	36.89	60.67
	3.400	30.00	775.00	770.00	762.50	300.00	767.73	0.00	768.55	18.35	7.24	41.42	70.03
	3.400	30.00	775.00	770.00	762.50	400.00	973.58	766.72	973.58	0.01	0.19	2100.68	4638.63
	3.400	30.00	775.00	770.00	762.50	400.00	973.58	766.72	973.58	0.01	0.19	2100.68	4638.63
	4.000	1.00	780.00	770.00	762.50	25.00	763.96	0.00	764.18	22.11	3.73	6.70	5.32
	4.000	1.00	780.00	770.00	762.50	50.00	764.44	0.00	764.76	19.88	4.59	10.90	11.21
	4.000	1.00	780.00	770.00	762.50	75.00	764.80	0.00	765.24	20.65	5.31	14.13	16.50
	4.000	1.00	780.00	770.00	762.50	100.00	765.15	0.00	765.67	20.87	5.83	17.15	21.89
	4.000	1.00	780.00	770.00	762.50	150.00	765.80	0.00	766.47	20.61	6.55	22.90	33.04
	4.000	1.00	780.00	770.00	762.50	200.00	766.43	0.00	767.20	19.99	7.02	28.51	44.73
	4.000	1.00	780.00	770.00	762.50	250.00	767.05	0.00	767.89	19.50	7.37	33.94	56.62
	4.000	1.00	780.00	770.00	762.50	300.00	767.70	0.00	768.58	18.60	7.57	39.65	69.56
	4.000	1.00	780.00	770.00	762.50	400.00	973.58	767.18	973.58	0.00	0.22	1802.32	6986.15
	4.000	1.00	780.00	770.00	762.50	400.00	973.58	767.18	973.58	0.00	0.22	1802.32	6986.15
*	4.010	0 01	780.00	770.00	762.50	25.00	764.10	0.00	764.26	13.13	3.15	7.93	6.90
*	4.010	0 01	780.00	770.00	762.50	50.00	764.58	0.00	764.84	14.44	4.12	12.13	13.16
*	4.010	0 01	780.00	770.00	762.50	75.00	764.94	0.00	765.31	16.18	4.88	15.36	18.64
*	4.010	0 01	780.00	770.00	762.50	100.00	765.29	0.00	765.75	17.11	5.44	18.38	24.18
*	4.010	0 01	780.00	770.00	762.50	150.00	765.94	0.00	766.54	17.81	6.22	24.13	35.54
*	4 010	1	780.00	770.00	762.50	200.00	766.57	0.00	767.28	17.82	6.72	29.74	47.38
*	4.010	1	780.00	770.00	762.50	250.00	767.19	0.00	767.97	17.72	7.11	35.18	59.39
*	4.010	1	780.00	770.00	762.50	300.00	767.84	0.00	768.67	17.16	7.34	40.89	72.42
	0.000		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.000		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
*	4.100	1	780.00	771.10	763.60	25.00	764.91	764.91	765.24	41.07	4.64	5.39	3.90
*	4.100	1	780.00	771.10	763.60	50.00	765.30	765.30	765.80	38.70	5.71	8.76	8.04
*	4.100	1	780.00	771.10	763.60	75.00	765.60	765.60	766.27	38.75	6.56	11.44	12.05
*	4.100	1	780.00	771.10	763.60	100.00	765.88	765.88	766.68	38.75	7.21	13.88	16.06
*	4 100	1	780.00	771.10	763.60	150.00	766.37	766.37	767.42	39.54	8.24	18.21	23.86
	4.100	1	780.00	771.10	763.60	200.00	766.96	0.00	768.09	34.25	8.52	23.46	34.18
	4.100	1	780.00	771.10	763.60	250.00	767.57	0.00	768.74	30.41	8.68	28.79	45.33
	4.100	1	780.00	771.10	763.60	300.00	768.19	0.00	769.38	27.23	8.74	34.33	57.49
	0 000	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.000	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
	4.110	1.00	780.00	770.00	763.60	25.00	764.92	764.91	765.25	40.40	4.61	5.43	3.93
	4.110	1.00	780.00	770.00	763.60	50.00	765.30	765.29	765.81	38.25	5.69	8.79	8.08
	4.110	1.00	780.00	770.00	763.60	75.00	765.61	765.60	766.27	38.41	6.54	11.47	12.10
	4.110	1.00	780.00	770.00	763.60	100.00	765.89	765.88	766.69	38.48	7.19	13.91	16.12
	4.110	1.00	780.00	770.00	763.60	150.00	766.39	766.38	767.43	38.64	8.17	18.35	24.13
	4.110	1.00	780.00	770.00	763.60	200.00	766.97	0.00	768.10	34.17	8.52	23.48	34.21
	4.110	1.00	780.00	770.00	763.60	250.00	767.57	0.00	768.74	30.36	8.68	28.81	45.37
	4.110	1.00	780.00	770.00	763.60	300.00	768.20	0.00	769.38	27.19	8.73	34.35	57.53
	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5.000	1.00	780.00	771.10	763.50	25.00	765.04	0.00	765.28	18.20	3.91	6.40	5.86
*	5.000	1.00	780.00	771.10	763.50	50.00	765.27	765.27	765.89	40.23	6.36	7.87	7.88
*	5.000	1.00	780.00	771.10	763.50	75.00	765.65	765.65	766.47	41.26	7.25	10.34	11.68
*	5.000	1.00	780.00	771.10	763.50	100.00	765.98	765.98	766.98	43.30	8.01	12.48	15.20
*	5.000	1.00	780.00	771.10	763.50	150.00	766.64	766.64	767.80	44.03	8.65	17.33	22.60
*	5.000	1.00	780.00	771.10	763.50	200.00	767.13	767.13	768.53	45.34	9.47	21.11	29.70
*	5.000	1.00	780.00	771.10	763.50	250.00	767.58	767.58	769.19	46.73	10.17	24.59	36.57
*	5.000	1.00	780.00	771.10	763.50	300.00	768.01	768.01	769.80	47.92	10.75	27.91	43.34
	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
*	5.010	0.01	780.00	771.10	763.50	25.00	765.18	0.00	765.36	12.37	3.41	7.33	7.11
*	5.010	0.01	780.00	771.10	763.50	50.00	765.44	0.00	765.92	27.62	5.58	8.96	9.51
*	5.010	0.01	780.00	771.10	763.50	75.00	765.86	0.00	766.50	29.16	6.41	11.70	13.89
*	5.010	0.01	780.00	771.10	763.50	100.00	766.22	0.00	767.00	34.64	7.06	14.17	16.99
*	5.010	0.01	780.00	771.10	763.50	150.00	766.91	0.00	767.84	32.20	7.73	19.40	26.43
*	5.010	0.01	780.00	771.10	763.50	200.00	767.43	0.00	768.56	34.10	8.54	23.43	34.25
*	5.010	0.01	780.00	771.10	763.50	250.00	767.90	0.00	769.22	36.01	9.23	27.10	41.66
*	5.010	0.01	780.00	771.10	763.50	300.00	768.33	0.00	769.83	38.05	9.85	30.44	48.63
	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5.100	1.00	0.00	0.00	763.60	25.00	765.22	0.00	765.42	14.26	3.58	6.98	6.62
	5.100	1.00	0.00	0.00	763.60	50.00	765.55	0.00	766.02	26.58	5.51	9.08	9.70
	5.100	1.00	0.00	0.00	763.60	75.00	765.98	0.00	766.60	28.14	6.33	11.85	14.14
	5.100	1.00	0.00	0.00	763.60	100.00	766.45	0.00	767.13	28.78	6.61	15.12	18.64
	5.100	1.00	0.00	0.00	763.60	150.00	767.05	0.00	767.96	31.05	7.63	19.65	26.92
	5.100	1.00	0.00	0.00	763.60	200.00	767.70	0.00	768.71	29.30	8.07	24.78	36.95
	5.100	1.00	0.00	0.00	763.60	250.00	768.19	0.00	769.38	31.46	8.77	28.51	44.57
	5.100	1.00	0.00	0.00	763.60	300.00	768.69	0.00	770.01	31.98	9.22	32.52	53.05
	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
6.000	1.00	0.00	0.00	763.60	25.00	765.35	0.00	765.45	6.26	2.58	9.69	9.99
6.000	1.00	0.00	0.00	763.60	50.00	765.91	0.00	766.10	8.24	3.53	14.17	17.42
6.000	1.00	0.00	0.00	763.60	75.00	766.48	0.00	766.72	8.97	3.92	19.15	25.04
6.000	1.00	0.00	0.00	763.60	100.00	766.99	0.00	767.26	8.40	4.18	23.95	34.51
6.000	1.00	0.00	0.00	763.60	150.00	767.78	0.00	768.12	8.65	4.74	31.65	51.01
6.000	1.00	0.00	0.00	763.60	200.00	768.47	0.00	768.89	9.07	5.21	38.38	66.39
6.000	1.00	0.00	0.00	763.60	250.00	769.12	0.00	769.60	9.26	5.56	44.96	82.14
6.000	1.00	0.00	0.00	763.60	300.00	769.71	0.00	770.25	9.54	5.88	51.03	97.15
0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23.620	10.00	771.50	770.00	761.70	25.00	765.48	0.00	765.48	0.03	0.33	75.52	146.57
23.620	10.00	771.50	770.00	761.70	50.00	766.16	0.00	766.16	0.07	0.56	89.08	186.91
23.620	10.00	771.50	770.00	761.70	75.00	766.78	0.00	766.79	0.11	0.74	101.60	226.23
23.620	10.00	771.50	770.00	761.70	100.00	767.32	0.00	767.34	0.15	0.89	112.44	261.65
23.620	10.00	771.50	770.00	761.70	150.00	768.20	0.00	768.22	0.22	1.15	130.05	321.46
23.620	10.00	771.50	770.00	761.70	200.00	768.98	0.00	769.01	0.28	1.37	145.56	376.17
23.620	10.00	771.50	770.00	761.70	250.00	769.69	0.00	769.73	0.34	1.56	159.82	427.90
23.620	10.00	771.50	770.00	761.70	300.00	770.35	0.00	770.40	0.79	1.81	165.92	336.76
0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	0.100	25.00	757.50	0.00	0.00	0.00	19.96	0.00
	0.100	50.00	757.50	0.00	0.00	0.00	19.96	0.00
	0.100	75.00	757.50	0.00	0.00	0.00	19.96	0.00
	0.100	100.00	757.50	0.00	0.00	0.00	19.96	0.00
	0.100	150.00	757.50	0.00	0.00	0.00	19.96	0.00
	0.100	200.00	757.50	0.00	0.00	0.00	19.96	0.00
	0.100	250.00	757.50	0.00	0.00	0.00	19.96	0.00
	0.100	300.00	757.50	0.00	0.00	0.00	19.96	0.00
	0.100	400.00	757.50	0.00	0.00	0.00	19.96	0.00
	0.100	400.00	757.50	0.00	0.00	0.00	19.96	0.00
	1.000	25.00	757.47	0.00	-0.03	0.00	10.11	20.00
	1.000	50.00	757.35	-0.12	-0.15	0.00	10.11	20.00
*	1.000	75.00	757.40	0.05	-0.10	0.00	10.11	20.00
*	1.000	100.00	757.65	0.25	0.15	0.00	10.11	20.00
*	1.000	150.00	758.11	0.46	0.61	0.00	10.11	20.00
*	1.000	200 00	758.51	0.41	1.01	0.00	10.12	20.00
*	1.000	250 00	758.89	0.38	1.39	0.00	10.12	20.00
*	1.000	300 00	759.25	0.36	1.75	0.00	10.13	20.00
*	1.000	400 00	759.91	0.66	2.41	0.00	10.13	20.00
*	1.000	400 00	759.91	0.00	2.41	0.00	10.13	20.00
	1.100		757.47	0.00	0.00	0.00	10.10	100.00
*	1.100		757.72	0.24	0.37	0.00	10.10	100.00
*	1.100		758.00	0.28	0.60	0.00	10.11	100.00
*	1 100		758.25	0.25	0.60	0.00	10.11	100.00
*	1.100		758.71	0.46	0.60	0.00	10.11	100.00
*	1.100		759.11	0.41	0.60	0.00	10.12	100.00
*	1.100		759.49	0.38	0.60	0.00	10.12	100.00
*	1 100		759.85	0.36	0.60	0.00	10.13	100.00
	1.100		761.14	1.29	1.23	0.00	10.14	100.00
	1.100		761.14	0.00	1.23	0.00	10.14	100.00
*	1.200		757.99	0.00	0.51	0.00	9.98	100.00
*	1.200		758.32	0.33	0.60	0.00	10.10	100.00
*	1.200		758.60	0.28	0.60	0.00	10.11	100.00
*	1.200		758.85	0.25	0.60	0.00	10.11	100.00
*	1.200		759.31	0.46	0.60	0.00	10.11	100.00
*	1.200		759.71	0.41	0.60	0.00	10.12	100.00
*	1.200		760.09	0.38	0.60	0.00	10.12	100.00
*	1.200		760.45	0.36	0.60	0.00	10.13	100.00
	1.200		761.61	1.16	0.46	0.00	10.14	100.00
	1.200		761.61	0.00	0.46	0.00	10.14	100.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	1.300	25.00	758.59	0.00	0.60	0.00	9.98	100.00
*	1.300	50.00	758.92	0.33	0.60	0.00	10.10	100.00
*	1.300	75.00	759.20	0.28	0.60	0.00	10.11	100.00
*	1.300	100.00	759.45	0.25	0.60	0.00	10.11	100.00
*	1.300	150.00	759.91	0.46	0.60	0.00	10.11	100.00
*	1.300	200.00	760.31	0.41	0.60	0.00	10.12	100.00
*	1.300	250.00	760.69	0.38	0.60	0.00	10.12	100.00
*	1.300	300.00	761.05	0.36	0.60	0.00	10.13	100.00
	1.300	400.00	762.11	1.06	0.50	0.00	10.14	100.00
	1.300	400.00	762.11	0.00	0.50	0.00	10.14	100.00
*	1.400	25.00	759.19	0.00	0.60	0.00	9.98	100.00
*	1.400	50.00	759.52	0.33	0.60	0.00	10.10	100.00
*	1.400	75.00	759.80	0.28	0.60	0.00	10.11	100.00
*	1.400	100.00	760.05	0.25	0.60	0.00	10.11	100.00
*	1.400	150.00	760.51	0.46	0.60	0.00	10.11	100.00
*	1.400	200.00	760.91	0.41	0.60	0.00	10.12	100.00
*	1.400	250.00	761.29	0.38	0.60	0.00	10.12	100.00
*	1.400	300.00	761.65	0.36	0.60	0.00	10.13	100.00
	1.400	400.00	762.63	0.98	0.53	0.00	10.14	100.00
	1.400	400.00	762.63	0.00	0.53	0.00	10.14	100.00
	2.000	25.00	760.18	0.00	1.00	0.00	9.04	270.00
	2.000	50.00	760.54	0.36	1.03	0.00	9.12	270.00
	2.000	75.00	760.85	0.31	1.05	0.00	9.20	270.00
	2.000	100.00	761.15	0.30	1.10	0.00	9.26	270.00
	2.000	150.00	761.76	0.61	1.25	0.00	9.40	270.00
	2.000	[illegible]	762.40	0.63	1.48	0.00	9.55	270.00
	2.000	[illegible]	763.03	0.63	1.74	0.00	9.70	270.00
	2.000	[illegible]	763.67	0.64	2.02	0.00	9.84	270.00
	2.000	[illegible]	764.82	1.15	2.18	0.00	10.11	270.00
	2.000	[illegible]	764.82	0.00	2.18	0.00	10.11	270.00
	2.100	[illegible]	760.30	0.00	0.12	0.00	9.05	34.00
	2.100	[illegible]	760.67	0.38	0.13	0.00	9.13	34.00
	2.100	[illegible]	761.03	0.36	0.18	0.00	9.21	34.00
	2.100	[illegible]	761.29	0.25	0.13	0.00	9.27	34.00
	2.100	[illegible]	761.88	0.59	0.12	0.00	9.41	34.00
	2.100	[illegible]	762.47	0.59	0.07	0.00	9.54	34.00
	2.100	[illegible]	763.09	0.63	0.07	0.00	9.69	34.00
	2.100	[illegible]	763.73	0.63	0.06	0.00	9.83	34.00
	2.100	[illegible]	764.87	1.14	0.05	0.00	10.10	34.00
	2.100	[illegible]	764.87	0.00	0.05	0.00	10.10	34.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	3.000	25.00	760.36	0.00	0.06	0.00	8.74	1.00
	3.000	50.00	760.87	0.51	0.19	0.00	10.10	1.00
	3.000	75.00	761.24	0.37	0.21	0.00	10.11	1.00
	3.000	100.00	761.59	0.35	0.30	0.00	10.11	1.00
	3.000	150.00	762.08	0.49	0.20	0.00	10.12	1.00
	3.000	200.00	762.57	0.49	0.10	0.00	10.13	1.00
	3.000	250.00	763.08	0.51	-0.01	0.00	10.13	1.00
	3.000	300.00	763.67	0.59	-0.05	0.00	10.14	1.00
	3.000	400.00	764.73	1.06	-0.14	0.00	10.16	1.00
	3.000	400.00	764.73	0.00	-0.14	0.00	10.16	1.00
*	3.100	25.00	760.55	0.00	0.19	0.00	7.87	100.00
	3.100	50.00	761.00	0.45	0.13	0.00	9.71	100.00
	3.100	75.00	761.38	0.37	0.14	0.00	10.10	100.00
	3.100	100.00	761.72	0.34	0.13	0.00	10.11	100.00
	3.100	150.00	762.25	0.53	0.17	0.00	10.12	100.00
	3.100	200.00	762.76	0.51	0.19	0.00	10.12	100.00
	3.100	250.00	763.29	0.53	0.21	0.00	10.13	100.00
	3.100	300.00	763.89	0.60	0.22	0.00	10.14	100.00
	3.100	400.00	764.99	1.09	0.26	0.00	10.15	100.00
	3.100	400.00	764.99	0.00	0.26	0.00	10.15	100.00
*	3.150	25.00	761.65	0.00	1.10	0.00	7.87	200.00
*	3.150	50.00	762.08	0.43	1.08	0.00	9.63	200.00
*	3.150	75.00	762.37	0.28	0.99	0.00	10.10	200.00
*	3.150	100.00	762.62	0.25	0.90	0.00	10.11	200.00
*	3.150	150.00	763.06	0.44	0.81	0.00	10.11	200.00
*	3.150	[illegible]	763.46	0.40	0.70	0.00	10.12	200.00
*	3.150	[illegible]	763.84	0.38	0.55	0.00	10.12	200.00
	3.150	[illegible]	764.35	0.51	0.46	0.00	10.13	200.00
	3.150		765.50	1.15	0.51	0.00	10.15	200.00
	3.150		765.50	0.00	0.51	0.00	10.15	200.00
*	3.200	[illegible]	762.75	0.00	1.10	0.00	7.87	200.00
*	3.200		763.18	0.43	1.10	0.00	9.63	200.00
*	3.200	[illegible]	763.47	0.28	1.10	0.00	10.10	200.00
*	3.200	[illegible]	763.72	0.25	1.10	0.00	10.11	200.00
*	3.200	[illegible]	764.16	0.44	1.10	0.00	10.11	200.00
*	3.200	[illegible]	764.56	0.40	1.10	0.00	10.12	200.00
*	3.200	[illegible]	764.94	0.38	1.10	0.00	10.12	200.00
*	3.200	[illegible]	765.28	0.33	0.92	0.00	10.13	200.00
	3.200	[illegible]	766.19	0.91	0.69	0.00	10.14	200.00
	3.200	[illegible]	766.19	0.00	0.69	0.00	10.14	200.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	3.300	25.00	763.45	0.00	0.70	0.00	8.88	200.00
	3.300	50.00	763.91	0.46	0.72	0.00	10.10	200.00
	3.300	75.00	764.27	0.36	0.80	0.00	10.11	200.00
	3.300	100.00	764.61	0.33	0.89	0.00	10.11	200.00
	3.300	150.00	765.22	0.62	1.06	0.00	10.12	200.00
	3.300	200.00	765.79	0.57	1.24	0.00	10.13	200.00
	3.300	250.00	766.33	0.53	1.39	0.00	10.14	200.00
	3.300	300.00	766.86	0.54	1.59	0.00	10.14	200.00
	3.300	400.00	767.74	0.88	1.55	0.00	10.16	200.00
	3.300	400.00	767.74	0.00	1.55	0.00	10.16	200.00
	3.350	25.00	763.80	0.00	0.35	0.00	8.49	200.00
	3.350	50.00	764.26	0.46	0.36	0.00	10.10	200.00
	3.350	75.00	764.62	0.36	0.35	0.00	10.11	200.00
	3.350	100.00	764.96	0.34	0.35	0.00	10.11	200.00
	3.350	150.00	765.59	0.64	0.37	0.00	10.12	200.00
	3.350	200.00	766.19	0.60	0.40	0.00	10.13	200.00
	3.350	250.00	766.76	0.57	0.44	0.00	10.14	200.00
	3.350	300 00	767.35	0.59	0.49	0.00	10.14	200.00
	3.350	400 00	768.38	1.03	0.64	0.00	10.16	200.00
	3.350	400 00	768.38	0.00	0.64	0.00	10.16	200.00
*	3.390	25 00	763.87	0.00	0.07	0.00	8.77	0.10
*	3.390	50 00	764.34	0.47	0.08	0.00	10.10	0.10
*	3.390	75 00	764.71	0.37	0.09	0.00	10.11	0.10
*	3.390	100 00	765.06	0.35	0.10	0.00	10.11	0.10
*	3.390	1 [illegible]	765.71	0.66	0.12	0.00	10.12	0.10
*	3.390	[illegible]	766.34	0.63	0.15	0.00	10.13	0.10
*	3.390	[illegible]	766.94	0.60	0.18	0.00	10.14	0.10
*	3.390	[illegible]	767.57	0.63	0.22	0.00	10.15	0.10
*	3.390		973.58	206.01	205.20	0.00	10.31	0.10
*	3 390		973.58	0.00	205.20	0.00	10.31	0.10
	3.400		764.01	0.00	0.14	0.00	9.75	30.00
	3.400		764.50	0.49	0.16	0.00	10.11	30.00
	3.400	[illegible]	764.89	0.38	0.17	0.00	10.11	30.00
	3.400	100	765.24	0.35	0.18	0.00	10.12	30.00
	3.400	150 00	765.89	0.65	0.18	0.00	10.13	30.00
	3.400	[illegible]	766.52	0.62	0.17	0.00	10.13	30.00
	3.400	[illegible]	767.11	0.60	0.17	0.00	10.14	30.00
	3.400	[illegible]	767.73	0.62	0.16	0.00	10.15	30.00
	3.400	400 00	973.58	205.85	0.00	0.00	10.31	30.00
	3.400	[illegible]	973.58	0.00	0.00	0.00	10.31	30.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	4.000	25.00	763.96	0.00	-0.05	0.00	8.80	1.00
	4.000	50.00	764.44	0.48	-0.07	0.00	8.81	1.00
	4.000	75.00	764.80	0.37	-0.08	0.00	8.81	1.00
	4.000	100.00	765.15	0.34	-0.09	0.00	8.82	1.00
	4.000	150.00	765.80	0.65	-0.09	0.00	8.82	1.00
	4.000	200.00	766.43	0.64	-0.08	0.00	8.83	1.00
	4.000	250.00	767.05	0.62	-0.06	0.00	8.84	1.00
	4.000	300.00	767.70	0.65	-0.04	0.00	8.85	1.00
	4.000	400.00	973.58	205.89	0.00	0.00	9.01	1.00
	4.000	400.00	973.58	0.00	0.00	0.00	9.01	1.00
*	4.010	25.00	764.10	0.00	0.14	0.00	8.80	0.01
*	4.010	50.00	764.58	0.48	0.14	0.00	8.81	0.01
*	4.010	75.00	764.94	0.37	0.14	0.00	8.81	0.01
*	4.010	100.00	765.29	0.34	0.14	0.00	8.82	0.01
*	4.010	150.00	765.94	0.65	0.14	0.00	8.83	0.01
*	4.010	200.00	766.57	0.64	0.14	0.00	8.83	0.01
*	4.010	250.00	767.19	0.62	0.14	0.00	8.84	0.01
*	4.010	300.00	767.84	0.65	0.14	0.00	8.85	0.01
	0.000	0.00	0.00	-767.84	0.00	0.00	0.00	0.00
	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00
*	4.100	25.00	764.91	0.00	0.81	0.00	8.23	250.00
*	4.100	50.00	765.30	0.39	0.72	0.00	8.80	250.00
*	4.100	75.00	765.60	0.30	0.65	0.00	8.81	250.00
*	4.100	100.00	765.88	0.28	0.59	0.00	8.81	250.00
*	4.100	150.00	766.37	0.49	0.43	0.00	8.82	250.00
	4.100	[illegible]	766.96	0.60	0.39	0.00	8.82	250.00
	4.100	[illegible]	767.57	0.60	0.38	0.00	8.83	250.00
	4.100	[illegible]	768.19	0.63	0.36	0.00	8.84	250.00
	0.000	[illegible]	0.00	-768.19	0.00	0.00	0.00	0.00
	0.000	[illegible]	0.00	0.00	0.00	0.00	0.00	0.00
	4.110	[illegible]	764.92	0.00	0.01	0.00	8.26	1.00
	4.110	[illegible]	765.30	0.38	0.01	0.00	8.80	1.00
	4.110	[illegible]	765.61	0.30	0.01	0.00	8.81	1.00
	4.110	[illegible]	765.89	0.28	0.01	0.00	8.81	1.00
	4.110	[illegible]	766.39	0.51	0.03	0.00	8.82	1.00
	4.110	[illegible]	766.97	0.58	0.01	0.00	8.82	1.00
	4.110	[illegible]	767.57	0.60	0.00	0.00	8.83	1.00
	4.110	[illegible]	768.20	0.63	0.00	0.00	8.84	1.00
	0.000	[illegible]	0.00	-768.20	0.00	0.00	0.00	0.00
	0.000	[illegible]	0.00	0.00	0.00	0.00	0.00	0.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	5.000	25.00	765.04	0.00	0.12	0.00	6.25	1.00
*	5.000	50.00	765.27	0.22	-0.04	0.00	6.42	1.00
*	5.000	75.00	765.65	0.38	0.04	0.00	6.46	1.00
*	5.000	100.00	765.98	0.33	0.10	0.00	6.50	1.00
*	5.000	150.00	766.64	0.66	0.25	0.00	7.61	1.00
*	5.000	200.00	767.13	0.49	0.16	0.00	7.71	1.00
*	5.000	250.00	767.58	0.45	0.01	0.00	7.80	1.00
*	5.000	300.00	768.01	0.42	-0.19	0.00	7.88	1.00
	0.000	0.00	0.00	-768.01	0.00	0.00	0.00	0.00
	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00
*	5.010	25.00	765.18	0.00	0.14	0.00	6.41	0.01
*	5.010	50.00	765.44	0.25	0.17	0.00	6.44	0.01
*	5.010	75.00	765.86	0.42	0.21	0.00	6.48	0.01
*	5.010	100.00	766.22	0.36	0.24	0.00	7.52	0.01
*	5.010	150.00	766.91	0.69	0.27	0.00	7.66	0.01
*	5.010	200.00	767.43	0.52	0.30	0.00	7.77	0.01
*	5.010	250.00	767.90	0.47	0.32	0.00	7.86	0.01
*	5.010	300.00	768.33	0.42	0.32	0.00	7.95	0.01
	0.000	0.00	0.00	-768.33	0.00	0.00	0.00	0.00
	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5.100	25.00	765.22	0.00	0.04	0.00	6.40	35.00
	5.100	50.00	765.55	0.33	0.11	0.00	6.44	35.00
	5.100	75.00	765.98	0.43	0.12	0.00	6.49	35.00
	5.100	100.00	766.45	0.47	0.23	0.00	7.55	35.00
	5.100	150.00	767.05	0.60	0.14	0.00	7.67	35.00
	5.100	200.00	767.70	0.65	0.27	0.00	7.80	35.00
	5.100	250.00	768.19	0.49	0.28	0.00	7.90	35.00
	5.100	300.00	768.69	0.50	0.36	0.00	8.00	35.00
	0.000	0.00	0.00	-768.69	0.00	0.00	0.00	0.00
	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6.000	25.00	765.35	0.00	0.13	0.00	8.02	1.00
	6.000	50.00	765.91	0.56	0.36	0.00	8.10	1.00
	6.000	75.00	766.48	0.57	0.50	0.00	9.44	1.00
	6.000	100.00	766.99	0.50	0.53	0.00	9.57	1.00
	6.000	150.00	767.78	0.79	0.72	0.00	9.77	1.00
	6.000	200.00	768.47	0.69	0.77	0.00	9.94	1.00
	6.000	250.00	769.12	0.65	0.93	0.00	10.10	1.00
	6.000	300.00	769.71	0.60	1.02	0.00	10.25	1.00
	0.000	0.00	0.00	-769.71	0.00	0.00	0.00	0.00
	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
23.620	25.00	765.48	0.00	0.13	0.00	20.00	10.00
23.620	50.00	766.16	0.68	0.25	0.00	20.00	10.00
23.620	75.00	766.78	0.63	0.30	0.00	20.00	10.00
23.620	100.00	767.32	0.54	0.34	0.00	20.00	10.00
23.620	150.00	768.20	0.88	0.43	0.00	20.00	10.00
23.620	200.00	768.98	0.78	0.51	0.00	20.00	10.00
23.620	250.00	769.69	0.71	0.58	0.00	20.01	10.00
23.620	300.00	770.35	0.65	0.63	0.00	20.01	10.00
0.000	0.00	0.00	-770.35	0.00	0.00	0.00	0.00
0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 1.000 PROFILE= 3 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1.000 PROFILE= 3 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 1.000 PROFILE= 3 20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO= 1.000 PROFILE= 4 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1.000 PROFILE= 4 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 1.000 PROFILE= 4 20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO= 1.000 PROFILE= 5 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1.000 PROFILE= 5 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 1.000 PROFILE= 5 20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO= 1.000 PROFILE= 6 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1.000 PROFILE= 6 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 1.000 PROFILE= 6 20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO= 1.000 PROFILE= 7 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1.000 PROFILE= 7 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 1.000 PROFILE= 7 20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO= 1.000 PROFILE= 8 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1.000 PROFILE= 8 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 1.000 PROFILE= 8 20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO= 1.000 PROFILE= 9 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1.000 PROFILE= 9 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 1.000 PROFILE= 9 20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO= 1.000 PROFILE=10 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1.000 PROFILE=10 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 1.000 PROFILE=10 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 0.000 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 0.000 PROFILE= 2 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 0.000 PROFILE= 2 20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO= 0.000 PROFILE= 3 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 0.000 PROFILE= 3 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 0.000 PROFILE= 4 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 0.000 PROFILE= 4 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 0.000 PROFILE= 5 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 0.000 PROFILE= 5 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 0.000 PROFILE= 6 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 0.000 PROFILE= 6 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 0.000 PROFILE= 7 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 0.000 PROFILE= 7 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 0.000 PROFILE= 8 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 0.000 PROFILE= 8 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 0.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 0.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 0.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO= 0.000 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 0.000 PROFILE= 2 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 0.000 PROFILE= 3 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 0.000 PROFILE= 3 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 0.000 PROFILE= 4 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 0.000 PROFILE= 4 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 0.000 PROFILE= 5 CRITICAL DEPTH ASSUMED

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CAUTION  SECNO=    3.200  PROFILE= 8  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    3.200  PROFILE= 8  MINIMUM SPECIFIC ENERGY

NOTE     SECNO=    3.390  PROFILE= 1  WSEL BASED ON X5 LINE
NOTE     SECNO=    3.390  PROFILE= 2  WSEL BASED ON X5 LINE
NOTE     SECNO=    3.390  PROFILE= 3  WSEL BASED ON X5 LINE
NOTE     SECNO=    3.390  PROFILE= 4  WSEL BASED ON X5 LINE
NOTE     SECNO=    3.390  PROFILE= 5  WSEL BASED ON X5 LINE
NOTE     SECNO=           PROFILE= 6  WSEL BASED ON X5 LINE
NOTE     SECNO=           PROFILE= 7  WSEL BASED ON X5 LINE
NOTE     SECNO=           PROFILE= 8  WSEL BASED ON X5 LINE
NOTE     SECNO=           PROFILE= 9  WSEL BASED ON X5 LINE
NOTE     SECNO=           PROFILE=10  WSEL BASED ON X5 LINE

NOTE     SECNO=           PROFILE= 1  WSEL BASED ON X5 LINE
NOTE     SECNO=           PROFILE= 2  WSEL BASED ON X5 LINE
NOTE     SECNO=           PROFILE= 3  WSEL BASED ON X5 LINE
NOTE     SECNO=           PROFILE= 4  WSEL BASED ON X5 LINE
NOTE     SECNO=           PROFILE= 5  WSEL BASED ON X5 LINE
NOTE     SECNO=           PROFILE= 6  WSEL BASED ON X5 LINE
NOTE     SECNO=           PROFILE= 7  WSEL BASED ON X5 LINE
NOTE     SECNO=           PROFILE= 8  WSEL BASED ON X5 LINE

CAUTION  SECNO=           PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=           PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=           PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO=           PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=           PROFILE= 2  MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=           PROFILE= 3  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=           PROFILE= 3  MINIMUM SPECIFIC ENERGY
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CAUTION  SECNO=           PROFILE= 5  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=           PROFILE= 5  MINIMUM SPECIFIC ENERGY
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CAUTION  SECNO=    5.000  PROFILE= 2  MINIMUM SPECIFIC ENERGY
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CAUTION  SECNO=    5.000  PROFILE= 3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=    5.000  PROFILE= 3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO=    5.000  PROFILE= 4  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    5.000  PROFILE= 4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=    5.000  PROFILE= 4  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO=    5.000  PROFILE= 5  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    5.000  PROFILE= 5  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=    5.000  PROFILE= 5  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO=    5.000  PROFILE= 6  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    5.000  PROFILE= 6  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=    5.000  PROFILE= 6  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO=    5.000  PROFILE= 7  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    5.000  PROFILE= 7  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=    5.000  PROFILE= 7  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO=    5.000  PROFILE= 8  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    5.000  PROFILE= 8  MINIMUM SPECIFIC ENERGY

NOTE     SECNO=    5 010  PROFILE= 1  WSEL BASED ON X5 LINE
NOTE     SECNO=    5 010  PROFILE= 2  WSEL BASED ON X5 LINE
NOTE     SECNO=    5.010  PROFILE= 3  WSEL BASED ON X5 LINE
NOTE     SECNO=    5 010  PROFILE= 4  WSEL BASED ON X5 LINE
NOTE     SECNO=    5 010  PROFILE= 5  WSEL BASED ON X5 LINE
NOTE     SECNO=    5 010  PROFILE= 6  WSEL BASED ON X5 LINE
NOTE     SECNO=    ' 010  PROFILE= 7  WSEL BASED ON X5 LINE
NOTE     SECNO=      )10  PROFILE= 8  WSEL BASED ON X5 LINE
```

THIS RUN EXECUTED 12-DEC-90 15:00:11

```
**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55
**************************************************
```

00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: KALAMAZOO, CITY OF

3) WATERCOURSE: ARCADIA CREEK

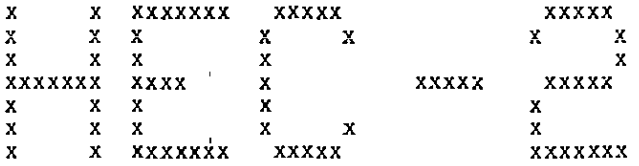
4) DOCUMENT TYPE: RATING CURVE RUN

DIVERSON AT EDWARDS ST.

00BREAK00

```
**********************************************
*  HEC-2 WATER SURFACE PROFILES              *
*                                            *
*  Version   4.6.0;  February 1991           *
*                                            *
*  RUN DATE    23JUL92    TIME   11:55:40    *
**********************************************
```


```
**************************************
*  U.S. ARMY CORPS OF ENGINEERS      *
*  HYDROLOGIC ENGINEERING CENTER     *
*  609 SECOND STREET, SUITE D        *
*  DAVIS, CALIFORNIA 95616-4687      *
*          (916) 756-1104            *
**************************************
```

THIS RUN EXECUTED 23JUL92 11:55:42

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*************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.0;  February 1991
*************************************


T1 ARCADIA CREEK HYDRAULIC ANALYSIS
T2 RATING CURVE FOR THE DIVERSION AT EDWARDS ST.:EHGL START
T3 JTP 10/30/86 [RATINGEE.HEC] REVISED DEH 9/22/89, 7/17/92 BAS

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

          2.0                                                                      757.5

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

  1.0              -1.0


J3  VARIABLE CODES FOR SUMMARY PRINTOUT

 150.0

NC      0.0       0.0      0.015          .5          .7
QT     10.0        25.        50.        75.        100.        150.        200.        250.        300.        350.
QT     400.
X1       .1         4.      100.1       120.
GR     770.       100.       752.      100.1        752.        120.        770.       120.1

NC   0.015    0.015     0.015            .3          .5
        BEGIN SECTION A (670' LONG)
X1    1.0     7.0       200.0      210.3            20.         20.         20.
BT    7.0     200.0     775.0      750.0       200.1       775.0       756.8       202.6       775.0       761.7
BT   205.2    775.0     761.7      207.8       775.0       761.7       210.2       775.0       756.8       210.3
BT   775.0    750.0
GR   775.0    200.0     756.8      200.1       756.2       202.6       755.7       205.2       756.2       207.8
GR   756.8    210.2     775.0      210.3

        SECTION A
X1    1.1                                     100.0       100.0       100.0                    .6
X2                                                                        1.

X1    1.2                                     100.0       100.0       100.0                    .6
X2                                                                        1.

X1    1.3                                     100.0       100.0       100.0                    .6
X2                                                                        1.
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```
X1    1.4                                        100.0       100.0       100.0                   .6
X2                                                                          1.

        BEGIN SECTION B(34' LONG)
X1     2.0          5.        100.     110.55        270.        270.        270.
BT       2.       100.       780.0     766.75      110.55       780.0      766.75
GR   766.75       100.       760.0       101.       759.0       105.5       760.0        110.      766.75      110.55

        END SECTION B
X1    2.1                                            34.         34.         34.                   .1
X2                                                                          1.

        BEGIN SECTION A (830'LONG)
X1    3.0      7.0        200.0      210.3          1.          1.          1.
BT    7.0      200.0      775.0      760.7       200.1       775.0       760.7       202.6       775.0       766.6
BT   205.2     775.0      766.6      207.8       775.0       766.6       210.2       775.0       760.7       210.3
BT   775.0     760.7
GR   775.0     200.0      760.7      200.1       759.5       202.6       759.1       205.2       759.5       207.8
GR   760.7     210.2      775.0      210.3

        SECTION A :STA. 8+00
X1      3.1                                          100.        100.        100.                      .4
X2                                                                          1.

X1     3.15                                          200.        200.        200.                     1.1
X2                                                                          1.

        SECTION A :STA. 12+00
X1      3.2                                          200.        200.        200.                     1.1
X2                                                                          1.

        SECTION A :STA. 16+00
X1      3.3                                          200.        200.        200.                     .45
X2                                                                          1.

X1     3.35                                          200.        200.        200.                     .45
X2                                                                          1.

X1     3.39                                            .1          .1          .1
X2                                                                          1.
X5      -9.        .03        .04        .06         .08         .09         .10         .12         .14         .15
X5      .17

        END SECTION A
X1      3.4                                           30.         30.         30.                     -.1
X2                                                                          1.

        BEGIN SECTION D (250' LONG)
X1    4.0      5.0        200.0      209.0        1.0         1.0         1.0
BT    5.0      200.0      780.0      770.0       200.1       780.0       770.0       204.5       780.0       770.0
BT   208.9     780.0      770.0      209.0       780.0       770.0
GR   780.0     200.0      763.9      200.1       762.5       204.5       763.9       208.9       780.0       209.0
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X1     4.01                                        .01       .01       .01
X2                                                                     1.
X5      -9.       .03       .05       .07       .08       .10       .12       .13       .14       .15
X5      .15

        SECTION D :PITCHER ST.
X1     4.1                                      250.0     250.0     250.0                 1.1
X2                                                                    1.0

X1    4.11                                        1.        1.        1.
BT       2.      200.      780.      770.      209.      780.      770.

        BEGIN SECTION E (470' LONG)
X1       5.0       11.      100.     108.5        1.        1.        1.
BT       2.0      100.     780.0     771.1     108.5      780.     771.1
GR     771.1      100.     766.1     100.5     766.1      101.     765.1     101.1    763.85     102.5
GR     763.5    104.25    763.85       106.    765.1     107.5     766.1    107.51     766.1     108.0
GR     771.1     108.5

X1      5.01                                      .01       .01       .01
X2                                                                     1.
X5      -9.       .02       .06       .08       .10       .12       .14       .16       .18       .19
X5      .20

        SECTION E
X1      5.1                                       35.       35.       35.                 .1

        1' INTO JUNCTION BOX.  10' WIDE SECTION TO MODEL INLET LOSS
X1      6.0                                                 1.        1.        1.     1.25
X2                                                                     1.                1.25

X1    23.62         8.       150.    170.01        10.       10.       10.
BT       6.       150.     771.5       770.     159.5     771.5       770.    159.51     771.5     761.7
BT     160.5      771.5     761.7     160.51     771.5       770.    170.1     771.5       770.
GR     771.5      100.     771.5       150.     761.7    150.01     761.7     159.5     761.7     160.7
GR     761.7      170.     771.5     170.01     771.5       200.
```

THIS RUN EXECUTED 23JUL92 11:56:5C

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.0; February 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

0/30/86 [RATINGEE.HEC] R

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRO	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	0.100	0.00	0.00	0.00	752.00	25.00	757.50	0.00	757.50	0.01	0.23	109.62	340.36
	0.100	0.00	0.00	0.00	752.00	50.00	757.50	0.00	757.50	0.02	0.45	109.62	340.36
	0.100	0.00	0.00	0.00	752.00	75.00	757.50	0.00	757.51	0.05	0.68	109.62	340.36
	0.100	0.00	0.00	0.00	752.00	100.00	757.50	0.00	757.51	0.09	0.91	109.62	340.36
	0.100	0.00	0.00	0.00	752.00	150.00	757.50	0.00	757.53	0.19	1.36	109.62	340.36
	0.100	0.00	0.00	0.00	752.00	200.00	757.50	0.00	757.56	0.35	1.81	109.62	340.36
	0.100	0.00	0.00	0.00	752.00	250.00	757.50	0.00	757.59	0.54	2.27	109.62	340.36
	0.100	0.00	0.00	0.00	752.00	300.00	757.50	0.00	757.63	0.78	2.72	109.62	340.36
	0.100	0.00	0.00	0.00	752.00	350.00	757.50	0.00	757.68	1.06	3.17	109.62	340.36
	0.100	0.00	0.00	0.00	752.00	400.00	757.50	0.00	757.74	1.38	3.63	109.62	340.36
*	1.000	20.00	775.00	761.70	755.70	25.00	757.47	0.00	757.53	3.87	2.01	12.42	12.71
*	1.000	20.00	775.00	761.70	755.70	50.00	757.35	0.00	757.65	20.41	4.41	11.33	11.07
*	1.000	20.00	775.00	761.70	755.70	75.00	757.40	757.40	758.03	41.12	6.38	11.75	11.70
*	1.000	20.00	775.00	761.70	755.70	100.00	757.65	757.65	758.43	42.26	7.08	14.12	15.38
*	1.000	20.00	775.00	761.70	755.70	150.00	758.11	758.11	759.16	45.13	8.23	18.23	22.33
*	1.000	20.00	775.00	761.70	755.70	200.00	758.51	758.51	759.83	48.88	9.21	21.72	28.61
*	1.000	20.00	775.00	761.70	755.70	250.00	758.89	758.89	760.47	52.81	10.07	24.83	34.40
*	1.000	20.00	775.00	761.70	755.70	300.00	759.25	759.25	761.08	57.02	10.85	27.64	39.73
*	1.000	20.00	775.00	761.70	755.70	350.00	759.59	759.59	761.68	61.79	11.61	30.16	44.53
*	1.000	20.00	775.00	761.70	755.70	400.00	759.91	759.91	762.27	66.72	12.32	32.48	48.97
*	1.100	100.00	775.00	762.30	756.30	25.00	757.47	0.00	757.69	25.77	3.73	6.71	4.92
*	1.100	100.00	775.00	762.30	756.30	50.00	757.72	757.72	758.19	40.74	5.53	9.04	7.83
*	1.100	100.00	775.00	762.30	756.30	75.00	758.00	758.00	758.63	41.12	6.38	11.75	11.70
*	1.100	100.00	775.00	762.30	756.30	100.00	758.25	758.25	759.03	42.26	7.08	14.12	15.38
*	1.100	100.00	775.00	762.30	756.30	150.00	758.71	758.71	759.76	45.13	8.23	18.23	22.33
*	1.100	100.00	775.00	762.30	756.30	200.00	759.11	759.11	760.43	48.88	9.21	21.72	28.61
*	1.100	100.00	775.00	762.30	756.30	250.00	759.49	759.49	761.07	52 81	10.07	24.83	34.40
*	1.100	100.00	775.00	762.30	756.30	300.00	759.85	759.85	761.68	57.02	10.85	27.64	39.73
*	1.100	100.00	775.00	762.30	756.30	350.00	760.56	760.19	762.33	49.96	10.68	32.76	49.52
	1.100	100.00	775.00	762.30	756.30	400.00	761.14	760.51	762.99	49.48	10.92	36.65	56.86

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	1.200	100.00	775.00	762.90	756.90	25.00	757.99	757.99	758.28	41.64	4.35	5.74	3.87
*	1.200	100.00	775.00	762.90	756.90	50.00	758.32	758.32	758.79	40.74	5.53	9.04	7.83
*	1.200	100.00	775.00	762.90	756.90	75.00	758.60	758.60	759.23	41.12	6.38	11.75	11.70
*	1.200	100.00	775.00	762.90	756.90	100.00	758.85	758.85	759.63	42.26	7.08	14.12	15.38
*	1.200	100.00	775.00	762.90	756.90	150.00	759.31	759.31	760.36	45.13	8.23	18.23	22.33
*	1.200	100.00	775.00	762.90	756.90	200.00	759.71	759.71	761.03	48.88	9.21	21.72	28.61
*	1.200	100.00	775.00	762.90	756.90	250.00	760.09	760.09	761.67	52.81	10.07	24.83	34.40
*	1.200	100.00	775.00	762.90	756.90	300.00	760.45	760.45	762.28	57.02	10.85	27.64	39.73
	1.200	100.00	775.00	762.90	756.90	350.00	761.02	760.79	762.90	53.63	10.98	31.86	47.79
	1.200	100.00	775.00	762.90	756.90	400.00	761.61	761.11	763.54	52.34	11.17	35.81	55.29
*	1.300	100.00	775.00	763.50	757.50	25.00	758.59	758.59	758.88	41.64	4.35	5.74	3.87
*	1.300	100.00	775.00	763.50	757.50	50.00	758.92	758.92	759.39	40.74	5.53	9.04	7.83
*	1.300	100.00	775.00	763.50	757.50	75.00	759.20	759.20	759.83	41.12	6.38	11.75	11.70
*	1.300	100.00	775.00	763.50	757.50	100.00	759.45	759.45	760.23	42.26	7.08	14.12	15.38
*	1.300	100.00	775.00	763.50	757.50	150.00	759.91	759.91	760.96	45.13	8.23	18.23	22.33
*	1.300	100.00	775.00	763.50	757.50	200.00	760.31	760.31	761.63	48.88	9.21	21.72	28.61
*	1.300	100.00	775.00	763.50	757.50	250.00	760.69	760.69	762.27	52.81	10.07	24.83	34.40
*	1.300	100.00	775.00	763.50	757.50	300.00	761.05	761.05	762.88	57.02	10.85	27.64	39.73
	1.300	100.00	775.00	763.50	757.50	350.00	761.54	761.39	763.48	56.25	11.19	31.27	46.67
	1.300	100.00	775.00	763.50	757.50	400.00	762.11	761.71	764.11	54.55	11.36	35.21	54.16
*	1.400	100.00	775.00	764.10	758.10	25.00	759.19	759.19	759.48	41.64	4.35	5.74	3.87
*	1.400	100.00	775.00	764.10	758.10	50.00	759.52	759.52	759.99	40.74	5.53	9.04	7.83
*	1.400	100.00	775.00	764.10	758.10	75.00	759.80	759.80	760.43	41.12	6.38	11.75	11.70
*	1.400	100.00	775.00	764.10	758.10	100.00	760.05	760.05	760.83	42.26	7.08	14.12	15.38
*	1.400	100.00	775.00	764.10	758.10	150.00	760.51	760.51	761.56	45.13	8.23	18.23	22.33
*	1.400	100.00	775.00	764.10	758.10	200.00	760.91	760.91	762.23	48.88	9.21	21.72	28.61
*	1.400	100.00	775.00	764.10	758.10	250.00	761.29	761.29	762.87	52.81	10.07	24.83	34.40
*	1.400	100.00	775.00	764.10	758.10	300.00	761.65	761.65	763.48	57.02	10.85	27.64	39.73
	1.400	100.00	775.00	764.10	758.10	350.00	762.08	761.99	764.08	58.12	11.33	30.88	45.91
	1.400	100.00	775.00	764.10	758.10	400.00	762.63	762.31	764.69	56.46	11.52	34.72	53.24
	2.000	270.00	780.00	766.75	759.00	25.00	760.18	0.00	760.44	29.91	4.04	6.18	4.57
	2.000	270.00	780.00	766.75	759.00	50.00	760.54	0.00	760.98	32.37	5.31	9.42	8.79
	2.000	270.00	780.00	766.75	759.00	75.00	760.85	0.00	761.43	32.76	6.12	12.26	13.10
	2.000	270.00	780.00	766.75	759.00	100.00	761.15	0.00	761.84	31.71	6.65	15.03	17.78
	2.000	270.00	780.00	766.75	759.00	150.00	761.76	0.00	762.58	28.05	7.24	20.71	28.32
*	2.000	270.00	780.00	766.75	759.00	200.00	762.40	0.00	763.26	24.11	7.47	26.76	40.73
*	2.000	270.00	780.00	766.75	759.00	250.00	763.03	0.00	763.93	21.42	7.62	32.81	54.01
*	2.000	270.00	780.00	766.75	759.00	300.00	763.67	0.00	764.59	19.24	7.68	39.04	68.39
*	2.000	270.00	780.00	766.75	759.00	350.00	764.25	0.00	765.20	18.12	7.81	44.81	82.22
*	2.000	270.00	780.00	766.75	759.00	400.00	764.82	0.00	765.79	17.26	7.92	50.50	96.27

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	2.100	34.00	780.00	766.85	759.10	25.00	760.30	0.00	760.54	27.41	3.93	6.36	4.78
	2.100	34.00	780.00	766.85	759.10	50.00	760.67	0.00	761.09	30.15	5.19	9.64	9.11
	2.100	34.00	780.00	766.85	759.10	75.00	761.04	0.00	761.55	27.37	5.76	13.02	14.34
	2.100	34.00	780.00	766.85	759.10	100.00	761.29	0.00	761.95	30.28	6.55	15.27	18.17
	2.100	34.00	780.00	766.85	759.10	150.00	761.88	0.00	762.67	27.19	7.17	20.93	28.76
	2.100	34.00	780.00	766.85	759.10	200.00	762.47	0.00	763.35	24.84	7.55	26.48	40.13
	2.100	34.00	780.00	766.85	759.10	250.00	763.09	0.00	764.01	21.99	7.69	32.50	53.31
	2.100	34.00	780.00	766.85	759.10	300.00	763.73	0.00	764.66	19.78	7.76	38.65	67.46
	2.100	34.00	780.00	766.85	759.10	350.00	764.30	0.00	765.27	18.59	7.89	44.38	81.18
	2.100	34.00	780.00	766.85	759.10	400.00	764.87	0.00	765.86	17.69	8.00	50.03	95.10
	3.000	1.00	775.00	766.60	759.10	25.00	760.36	0.00	760.56	18.19	3.54	7.06	5.86
	3.000	1.00	775.00	766.60	759.10	50.00	760.87	0.00	761.14	16.02	4.17	11.98	12.49
	3.000	1.00	775.00	766.60	759.10	75.00	761.24	0.00	761.60	16.66	4.83	15.52	18.38
	3.000	1.00	775.00	766.60	759.10	100.00	761.59	0.00	762.02	16.75	5.30	18.88	24.44
	3.000	1.00	775.00	766.60	759.10	150.00	762.08	0.00	762.72	20.83	6.44	23.28	32.86
	3.000	1.00	775.00	766.60	759.10	200.00	762.57	0.00	763.38	23.07	7.23	27.66	41.64
	3.000	1.00	775.00	766.60	759.10	250.00	763.08	0.00	764.03	24.49	7.81	31.99	50.52
	3.000	1.00	775.00	766.60	759.10	300.00	763.67	0.00	764.72	24.98	8.20	36.58	60.03
	3.000	1.00	775.00	766.60	759.10	350.00	764.21	0.00	765.37	26.27	8.63	40.57	68.28
	3.000	1.00	775.00	766.60	759.10	400.00	764.73	0.00	766.00	27.95	9.05	44.19	75.66
*	3.100	100.00	775.00	767.00	759.50	25.00	760.55	760.55	760.90	40.52	4.71	5.31	3.93
*	3.100	100.00	775.00	767.00	759.50	50.00	761.00	760.98	761.45	33.91	5.39	9.28	8.59
	3.100	100.00	775.00	767.00	759.50	75.00	761.38	0.00	761.89	28.30	5.78	12.99	14.10
	3.100	100.00	775.00	767.00	759.50	100.00	761.72	0.00	762.30	25.55	6.13	16.32	19.78
	3.100	100.00	775.00	767.00	759.50	150.00	762.25	0.00	763.02	26.75	7.04	21.29	29.00
	3.100	100.00	775.00	767.00	759.50	200.00	762.76	0.00	763.69	27.72	7.74	25.85	37.99
	3.100	100.00	775.00	767.00	759.50	250.00	763.29	0.00	764.34	28.09	8.23	30.37	47.17
	3.100	100.00	775.00	767.00	759.50	300.00	763.89	0.00	765.02	27.50	8.52	35.22	57.21
	3.100	100.00	775.00	767.00	759.50	350.00	764.45	0.00	765.68	28.35	8.90	39.33	65.73
	3.100	100.00	775.00	767.00	759.50	400.00	764.99	0.00	766.32	29.46	9.26	43.22	73.69
*	3.150	200.00	775.00	768.10	760.60	25.00	761.65	761.65	762.00	40.52	4.71	5.31	3.93
*	3.150	200.00	775.00	768.10	760.60	50.00	762.08	762.08	762.56	36.04	5.51	9.08	8.33
*	3.150	200.00	775.00	768.10	760.60	75.00	762.37	762.37	762.98	36.64	6.29	11.92	12.39
*	3.150	200.00	775.00	768.10	760.60	100.00	762.62	762.62	763.37	37.33	6.97	14.35	16.37
*	3.150	200.00	775.00	768.10	760.60	150.00	763.06	763.06	764.07	39.39	8.07	18.59	23.90
*	3.150	200.00	775.00	768.10	760.60	200.00	763.46	763.46	764.71	41.90	8.98	22.27	30.90
*	3.150	200.00	775.00	768.10	760.60	250.00	763.84	763.84	765.31	44.08	9.73	25.69	37.65
	3.150	200.00	775.00	768.10	760.60	300.00	764.35	764.18	765.90	41.63	9.99	30.04	46.50
	3.150	200.00	775.00	768.10	760.60	350.00	764.93	0.00	766.51	38.80	10.08	34.73	56.19
	3.150	200.00	775.00	768.10	760.60	400.00	765.50	0.00	767.13	37.69	10.24	39.05	65.19

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	3.200	200.00	775.00	769.20	761.70	25.00	762.75	762.75	763.10	40.52	4.71	5.31	3.93
*	3.200	200.00	775.00	769.20	761.70	50.00	763.18	763.18	763.66	36.03	5.51	9.08	8.33
*	3.200	200.00	775.00	769.20	761.70	75.00	763.47	763.47	764.08	36.64	6.29	11.92	12.39
*	3.200	200.00	775.00	769.20	761.70	100.00	763.72	763.72	764.47	37.33	6.97	14.35	16.37
*	3.200	200.00	775.00	769.20	761.70	150.00	764.16	764.16	765.17	39.42	8.07	18.59	23.89
*	3.200	200.00	775.00	769.20	761.70	200.00	764.56	764.56	765.81	41.90	8.98	22.27	30.90
*	3.200	200.00	775.00	769.20	761.70	250.00	764.94	764.94	766.41	44.08	9.73	25.69	37.65
*	3.200	200.00	775.00	769.20	761.70	300.00	765.28	765.28	766.99	47.66	10.51	28.55	43.45
	3.200	200.00	775.00	769.20	761.70	350.00	765.64	765.62	767.56	49.87	11.10	31.53	49.56
	3.200	200.00	775.00	769.20	761.70	400.00	766.19	765.92	768.12	46.64	11.15	35.87	58.57
*	3.300	200.00	775.00	769.65	762.15	25.00	763.45	0.00	763.63	16.00	3.38	7.39	6.25
*	3.300	200.00	775.00	769.65	762.15	50.00	763.91	0.00	764.19	16.88	4.25	11.78	12.17
*	3.300	200.00	775.00	769.65	762.15	75.00	764.27	0.00	764.64	17.10	4.88	15.38	18.14
*	3 300	200.00	775.00	769.65	762.15	100.00	764.61	0.00	765.05	17.51	5.38	18.59	23.90
*	3.300	200.00	775.00	769.65	762.15	150.00	765.22	0.00	765.82	18.75	6.20	24.18	34.64
*	3.300	200.00	775.00	769.65	762.15	200.00	765.79	0.00	766.53	20.11	6.87	29.11	44.60
*	3.300	200.00	775.00	769.65	762.15	250.00	766.33	0.00	767.20	21.79	7.47	33.46	53.56
*	3.300	200.00	775.00	769.65	762.15	300.00	766.86	0.00	767.85	23.33	7.98	37.58	62.11
*	3.300	200.00	775.00	769.65	762.15	350.00	767.37	0.00	768.48	25.12	8.47	41.33	69.84
	3.300	200.00	775.00	769.65	762.15	400.00	767.74	0.00	769.03	28.38	9.11	43.90	75.08
	3.350	200.00	775.00	770.10	762.60	25.00	763.80	0.00	764.03	22.46	3.82	6.55	5.28
	3.350	200.00	775.00	770.10	762.60	50.00	764.26	0.00	764.59	21.55	4.60	10.87	10.77
	3.350	200.00	775.00	770.10	762.60	75.00	764.62	0.00	765.04	20.77	5.21	14.40	16.46
	3.350	200.00	775.00	770.10	762.60	100.00	764.96	0.00	765.46	20.36	5.67	17.64	22.16
	3.350	200.00	775.00	770.10	762.60	150.00	765.59	0.00	766.23	20.22	6.38	23.53	33.36
	3.350	200.00	775.00	770.10	762.60	200.00	766.19	0.00	766.95	20.81	6.96	28.74	43.84
	3.350	200.00	775.00	770.10	762.60	250.00	766.76	0.00	767.63	21.88	7.48	33.41	53.45
	3.350	200.00	775.00	770.10	762.60	300.00	767.35	0.00	768.32	22.79	7.91	37.94	62.85
	3.350	200.00	775.00	770.10	762.60	350.00	767.91	0.00	768.99	24.20	8.34	41.97	71.15
	3.350	200.00	775.00	770.10	762.60	400.00	768.38	0.00	769.60	26.49	8.85	45.21	77.71
*	3.390	0.10	775.00	770.10	762.60	25.00	763.83	0.00	764.04	20.16	3.68	6.80	5.57
*	3.390	0.10	775.00	770.10	762.60	50.00	764.30	0.00	764.61	19.30	4.44	11.27	11.38
*	3.390	0.10	775.00	770.10	762.60	75.00	764.68	0.00	765.07	18.46	5.00	14.99	17.46
*	3.390	0.10	775.00	770.10	762.60	100.00	765.04	0.00	765.50	18.06	5.44	18.39	23.53
*	3.390	0.10	775.00	770.10	762.60	150.00	765.68	0.00	766.28	18.50	6.17	24.30	34.88
*	3.390	0.10	775.00	770.10	762.60	200.00	766.29	0.00	767.01	19.32	6.77	29.55	45.50
*	3.390	0.10	775.00	770.10	762.60	250.00	766.88	0.00	767.71	20.38	7.28	34.33	55.37
*	3.390	0.10	775.00	770.10	762.60	300.00	767.49	0.00	768.41	21.35	7.70	38.95	64.93
*	3.390	0.10	775.00	770.10	762.60	350.00	768.06	0.00	769.09	22.84	8.14	42.99	73.23
*	3.390	0.10	775.00	770.10	762.60	400.00	766.83	766.82	768.99	53.97	11.80	33.89	54.45

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	3.400	30.00	775.00	770.00	762.50	25.00	764.00	0.00	764.11	8.62	2.71	9.23	8.52
*	3.400	30.00	775.00	770.00	762.50	50.00	764.49	0.00	764.68	9.77	3.54	14.13	16.00
	3.400	30.00	775.00	770.00	762.50	75.00	764.87	0.00	765.15	11.15	4.21	17.81	22.46
	3.400	30.00	775.00	770.00	762.50	100.00	765.23	0.00	765.57	12.21	4.74	21.09	28.62
	3.400	30.00	775.00	770.00	762.50	150.00	765.87	0.00	766.36	14.09	5.59	26.83	39.95
	3.400	30.00	775.00	770.00	762.50	200.00	766.48	0.00	767.09	15.78	6.27	31.91	50.35
	3.400	30.00	775.00	770.00	762.50	250.00	767.06	0.00	767.79	17.41	6.84	36.52	59.92
	3.400	30.00	775.00	770.00	762.50	300.00	767.66	0.00	768.50	18.88	7.33	40.94	69.04
	3.400	30.00	775.00	770.00	762.50	350.00	768.23	0.00	769.18	20.66	7.80	44.86	77.01
*	3.400	30.00	775.00	770.00	762.50	400.00	768.08	766.72	769.37	28.43	9.12	43.87	75.02
*	4.000	1.00	780.00	770.00	762.50	25.00	763.94	0.00	764.17	23.95	3.83	6.53	5.11
*	4.000	1.00	780.00	770.00	762.50	50.00	764.42	0.00	764.76	20.82	4.66	10.74	10.96
	4.000	1.00	780.00	770.00	762.50	75.00	764.79	0.00	765.23	21.33	5.36	13.98	16.24
	4.000	1.00	780.00	770.00	762.50	100.00	765.13	0.00	765.67	21.29	5.87	17.03	21.67
	4.000	1.00	780.00	770.00	762.50	150.00	765.78	0.00	766.45	21.13	6.61	22.70	32.63
	4.000	1.00	780.00	770.00	762.50	200.00	766.39	0.00	767.18	20.72	7.11	28.14	43.96
	4.000	1.00	780.00	770.00	762.50	250.00	767.00	0.00	767.86	20.23	7.47	33.48	55.58
	4.000	1.00	780.00	770.00	762.50	300.00	767.62	0.00	768.54	19.42	7.69	39.01	68.08
	4.000	1.00	780.00	770.00	762.50	350.00	768.22	0.00	769.19	18.85	7.88	44.40	80.61
	4.000	1.00	780.00	770.00	762.50	400.00	768.04	0.00	769.40	27.19	9.36	42.74	76.71
*	4.010	0.01	780.00	770.00	762.50	25.00	763.97	0.00	764.18	21.24	3.68	6.79	5.42
*	4.010	0.01	780.00	770.00	762.50	50.00	764.47	0.00	764.78	18.49	4.48	11.17	11.63
*	4.010	0.01	780.00	770.00	762.50	75.00	764.86	0.00	765.27	18.81	5.14	14.59	17.29
*	4.010	0.01	780.00	770.00	762.50	100.00	765.21	0.00	765.71	18.96	5.64	17.73	22.97
*	4.010	0.01	780.00	770.00	762.50	150.00	765.88	0.00	766.51	19.01	6.36	23.58	34.41
*	4.010	0.01	780.00	770.00	762.50	200.00	766.51	0.00	767.24	18.74	6.85	29.20	46.20
*	4.010	0.01	780.00	770.00	762.50	250.00	767.13	0.00	767.94	18.49	7.22	34.62	58.14
*	4.010	0.01	780.00	770.00	762.50	300.00	767.76	0.00	768.63	17.89	7.45	40.24	70.93
*	4.010	0.01	780.00	770.00	762.50	350.00	768.37	0.00	769.29	17.56	7.67	45.64	83.53
*	4.010	0.01	780.00	770.00	762.50	400.00	767.19	767.18	769.20	45.48	11.38	35.15	59.31
*	4.100	250.00	780.00	771.10	763.60	25.00	764.91	764.91	765.24	41.11	4.64	5.39	3.90
*	4.100	250.00	780.00	771.10	763.60	50.00	765.30	765.30	765.80	38.70	5.71	8.76	8.04
*	4.100	250.00	780.00	771.10	763.60	75.00	765.60	765.60	766.27	38.75	6.56	11.44	12.05
*	4.100	250.00	780.00	771.10	763.60	100.00	765.88	765.88	766.68	38.75	7.21	13.88	16.06
*	4.100	250.00	780.00	771.10	763.60	150.00	766.37	766.37	767.42	39.54	8.24	18.21	23.86
	4.100	250.00	780.00	771.10	763.60	200.00	766.93	0.00	768.09	35.59	8.64	23.14	33.52
	4.100	250.00	780.00	771.10	763.60	250.00	767.52	0.00	768.73	31.53	8.80	28.41	44.52
	4.100	250.00	780.00	771.10	763.60	300.00	768.14	0.00	769.36	28.28	8.86	33.85	56.41
	4.100	250.00	780.00	771.10	763.60	350.00	768.74	0.00	769.98	26.17	8.94	39.15	68.42
	4.100	250.00	780.00	771.10	763.60	400.00	768.51	0.00	770.32	39.35	10.78	37.11	63.76

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	4.110	1.00	780.00	770.00	763.60	25.00	764.92	764.91	765.25	40.43	4.61	5.42	3.93
	4.110	1.00	780.00	770.00	763.60	50.00	765.30	765.29	765.81	38.25	5.69	8.79	8.08
	4.110	1.00	780.00	770.00	763.60	75.00	765.61	765.60	766.27	38.41	6.54	11.47	12.10
	4.110	1.00	780.00	770.00	763.60	100.00	765.89	765.88	766.69	38.48	7.19	13.91	16.12
	4.110	1.00	780.00	770.00	763.60	150.00	766.39	766.38	767.43	38.64	8.17	18.35	24.13
	4.110	1.00	780.00	770.00	763.60	200.00	766.93	0.00	768.09	35.51	8.63	23.16	33.56
	4.110	1.00	780.00	770.00	763.60	250.00	767.53	0.00	768.73	31.47	8.79	28.43	44.56
	4.110	1.00	780.00	770.00	763.60	300.00	768.14	0.00	769.36	28.24	8.86	33.87	56.45
	4.110	1.00	780.00	770.00	763.60	350.00	768.74	0.00	769.98	26.14	8.93	39.17	68.46
	4.110	1.00	780.00	770.00	763.60	400.00	768.53	0.00	770.32	39.16	10.76	37.18	63.92
*	5.000	1.00	780.00	771.10	763.50	25.00	765.04	0.00	765.28	18.19	3.90	6.40	5.86
*	5.000	1.00	780.00	771.10	763.50	50.00	765.27	765.27	765.89	40.23	6.36	7.87	7.88
*	5.000	1.00	780.00	771.10	763.50	75.00	765.65	765.65	766.47	41.26	7.25	10.34	11.68
*	5.000	1.00	780.00	771.10	763.50	100.00	765.98	765.98	766.98	43.23	8.01	12.49	15.21
*	5.000	1.00	780.00	771.10	763.50	150.00	766.64	766.64	767.80	44.03	8.65	17.33	22.60
*	5.000	1.00	780.00	771.10	763.50	200.00	767.13	767.13	768.53	45.34	9.47	21.11	29.70
*	5.000	1.00	780.00	771.10	763.50	250.00	767.58	767.58	769.19	46.74	10.17	24.59	36.57
*	5.000	1.00	780.00	771.10	763.50	300.00	768.01	768.01	769.80	47.92	10.75	27.91	43.34
*	5.000	1.00	780.00	771.10	763.50	350.00	768.40	768.40	770.38	49.38	11.29	31.00	49.81
*	5.000	1.00	780.00	771.10	763.50	400.00	768.77	768.77	770.92	50.61	11.77	34.00	56.23
*	5.010	0.01	780.00	771.10	763.50	25.00	765.06	0.00	765.29	16.99	3.81	6.56	6.07
*	5.010	0.01	780.00	771.10	763.50	50.00	765.33	0.00	765.90	35.01	6.06	8.25	8.45
*	5.010	0.01	780.00	771.10	763.50	75.00	765.73	0.00	766.47	35.95	6.91	10.86	12.51
*	5.010	0.01	780.00	771.10	763.50	100.00	766.08	0.00	766.98	37.58	7.61	13.14	16.31
*	5.010	0.01	780.00	771.10	763.50	150.00	766.76	0.00	767.81	38.14	8.22	18.25	24.29
*	5.010	0.01	780.00	771.10	763.50	200.00	767.27	0.00	768.53	39.55	9.01	22.19	31.80
*	5.010	0.01	780.00	771.10	763.50	250.00	767.74	0.00	769.20	40.90	9.67	25.84	39.09
*	5.010	0.01	780.00	771.10	763.50	300.00	768.19	0.00	769.81	41.99	10.23	29.33	46.30
*	5.010	0.01	780.00	771.10	763.50	350.00	768.59	0.00	770.38	43.55	10.76	32.51	53.04
*	5.010	0.01	780.00	771.10	763.50	400.00	768.78	768.77	770.92	50.45	11.75	34.04	56.32
	5.100	35.00	0.00	0.00	763.60	25.00	765.12	0.00	765.36	18.83	3.95	6.32	5.76
	5.100	35.00	0.00	0.00	763.60	50.00	765.57	0.00	766.03	26.07	5.47	9.14	9.79
	5.100	35.00	0.00	0.00	763.60	75.00	766.05	0.00	766.63	25.50	6.11	12.28	14.85
	5.100	35.00	0.00	0.00	763.60	100.00	766.57	0.00	767.18	24.23	6.22	16.07	20.32
	5.100	35.00	0.00	0.00	763.60	150.00	767.15	0.00	767.99	27.90	7.34	20.43	28.40
	5.100	35.00	0.00	0.00	763.60	200.00	767.77	767.25	768.74	27.74	7.91	25.29	37.97
	5.100	35.00	0.00	0.00	763.60	250.00	768.26	0.00	769.41	29.73	8.59	29.12	45.85
	5.100	35.00	0.00	0.00	763.60	300.00	768.77	0.00	770.04	30.27	9.03	33.21	54.52
	5.100	35.00	0.00	0.00	763.60	350.00	769.27	0.00	770.64	30.46	9.39	37.29	63.42
	5.100	35.00	0.00	0.00	763.60	400.00	769.87	0.00	771.27	29.25	9.52	42.02	73.96

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*FS	VCH	AREA	.01K
*	6.000	1.00	0.00	0.00	763.60	25.00	765.29	0.00	765.40	7.17	2.70	9.26	9.3
*	6.000	1.00	0.00	0.00	763.60	50.00	765.93	0.00	766.12	7.98	3.49	14.32	17.6
*	6.000	1.00	0.00	0.00	763.60	75.00	766.50	0.00	766.73	8.76	3.88	19.31	25.3
*	6.000	1.00	0.00	0.00	763.60	100.00	767.01	0.00	767.28	8.10	4.12	24.25	35.1
*	6.000	1.00	0.00	0.00	763.60	150.00	767.79	0.00	768.13	8.62	4.73	31.69	51.0
*	6.000	1.00	0.00	0.00	763.60	200.00	768.49	0.00	768.90	8.93	5.18	38.60	66.9
*	6.000	1.00	0.00	0.00	763.60	250.00	769.13	0.00	769.61	9.22	5.55	45.04	82.3
*	6.000	1.00	0.00	0.00	763.60	300.00	769.73	0.00	770.26	9.51	5.87	51.09	97.3
*	6.000	1.00	0.00	0.00	763.60	350.00	770.29	0.00	770.88	9.76	6.15	56.90	112.0
*	6.000	1.00	0.00	0.00	763.60	400.00	770.89	0.00	771.51	9.70	6.33	63.21	128.4
*	23.620	10.00	771.50	770.00	761.70	25.00	765.43	0.00	765.43	0.03	0.34	74.60	143.9
*	23.620	10.00	771.50	770.00	761.70	50.00	766.17	0.00	766.17	0.07	0.56	89.33	167.6
*	23.620	10.00	771.50	770.00	761.70	75.00	766.79	0.00	766.80	0.11	0.74	101.77	226.7
*	23.620	10.00	771.50	770.00	761.70	100.00	767.34	0.00	767.35	0.14	0.89	112.81	262.8
*	23.620	10.00	771.50	770.00	761.70	150.00	768.21	0.00	768.23	0.22	1.15	130.24	322.1
*	23.620	10.00	771.50	770.00	761.70	200.00	768.99	0.00	769.02	0.28	1.37	145.82	377.1
*	23.620	10.00	771.50	770.00	761.70	250.00	769.71	0.00	769.74	0.34	1.56	160.11	428.9
*	23.620	10.00	771.50	770.00	761.70	300.00	770.36	0.00	770.41	0.79	1.81	165.92	336.7
*	23.620	10.00	771.50	770.00	761.70	350.00	770.97	0.00	771.03	1.08	2.11	165.92	336.7
*	23.620	10.00	771.50	770.00	761.70	400.00	771.59	0.00	771.67	2.03	2.38	174.15	281.0

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SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	0.100	25.00	757.50	0.00	0.00	0.00	19.96	0.00
	0.100	50.00	757.50	0.00	0.00	0.00	19.96	0.00
	0.100	75.00	757.50	0.00	0.00	0.00	19.96	0.00
	0.100	100.00	757.50	0.00	0.00	0.00	19.96	0.00
	0.100	150.00	757.50	0.00	0.00	0.00	19.96	0.00
	0.100	200.00	757.50	0.00	0.00	0.00	19.96	0.00
	0.100	250.00	757.50	0.00	0.00	0.00	19.96	0.00
	0.100	300.00	757.50	0.00	0.00	0.00	19.96	0.00
	0.100	350.00	757.50	0.00	0.00	0.00	19.96	0.00
	0.100	400.00	757.50	0.00	0.00	0.00	19.96	0.00
*	1.000	25.00	757.47	0.00	-0.03	0.00	10.11	20.00
*	1.000	50.00	757.35	-0.12	-0.15	0.00	10.11	20.00
*	1.000	75.00	757.40	0.05	-0.10	0.00	10.11	20.00
*	1.000	100.00	757.65	0.25	0.15	0.00	10.11	20.00
*	1.000	150.00	758.11	0.46	0.61	0.00	10.11	20.00
*	1.000	200.00	758.51	0.41	1.01	0.00	10.12	20.00
*	1.000	250.00	758.89	0.38	1.39	0.00	10.12	20.00
*	1.000	300.00	759.25	0.36	1.75	0.00	10.13	20.00
*	1.000	350.00	759.59	0.34	2.09	0.00	10.13	20.00
*	1.000	400.00	759.91	0.33	2.41	0.00	10.13	20.00
*	1.100	25.00	757.47	0.00	0.00	0.00	10.10	100.00
*	1.100	50.00	757.72	0.24	0.37	0.00	10.10	100.00
*	1.100	75.00	758.00	0.28	0.60	0.00	10.11	100.00
*	1.100	100.00	758.25	0.25	0.60	0.00	10.11	100.00
*	1.100	150.00	758.71	0.46	0.60	0.00	10.11	100.00
*	1.100	200.00	759.11	0.41	0.60	0.00	10.12	100.00
*	1.100	250.00	759.49	0.38	0.60	0.00	10.12	100.00
*	1.100	300.00	759.85	0.36	0.60	0.00	10.13	100.00
*	1.100	350.00	760.56	0.71	0.97	0.00	10.13	100.00
	1.100	400.00	761.14	0.58	1.23	0.00	10.14	100.00
*	1.200	25.00	757.99	0.00	0.51	0.00	9.98	100.00
*	1.200	50.00	758.32	0.33	0.60	0.00	10.10	100.00
*	1.200	75.00	758.60	0.28	0.60	0.00	10.11	100.00
*	1.200	100.00	758.85	0.25	0.60	0.00	10.11	100.00
*	1.200	150.00	759.31	0.46	0.60	0.00	10.11	100.00
*	1.200	200.00	759.71	0.41	0.60	0.00	10.12	100.00
*	1.200	250.00	760.09	0.38	0.60	0.00	10.12	100.00
*	1.200	300.00	760.45	0.36	0.60	0.00	10.13	100.00
	1.200	350.00	761.02	0.57	0.47	0.00	10.13	100.00
	1.200	400.00	761.61	0.58	0.46	0.00	10.14	100.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	1.300	25.00	758.59	0.00	0.60	0.00	9.98	100.00
*	1.300	50.00	758.92	0.33	0.60	0.00	10.10	100.00
*	1.300	75.00	759.20	0.28	0.60	0.00	10.11	100.00
*	1.300	100.00	759.45	0.25	0.60	0.00	10.11	100.00
*	1.300	150.00	759.91	0.46	0.60	0.00	10.11	100.00
*	1.300	200.00	760.31	0.41	0.60	0.00	10.12	100.00
*	1.300	250.00	760.69	0.38	0.60	0.00	10.12	100.00
*	1.300	300.00	761.05	0.36	0.60	0.00	10.13	100.00
	1.300	350.00	761.54	0.49	0.51	0.00	10.13	100.00
	1.300	400.00	762.11	0.57	0.50	0.00	10.14	100.00
*	1.400	25.00	759.19	0.00	0.60	0.00	9.98	100.00
*	1.400	50.00	759.52	0.33	0.60	0.00	10.10	100.00
*	1.400	75.00	759.80	0.28	0.60	0.00	10.11	100.00
*	1.400	100.00	760.05	0.25	0.60	0.00	10.11	100.00
*	1.400	150.00	760.51	0.46	0.60	0.00	10.11	100.00
*	1.400	200.00	760.91	0.41	0.60	0.00	10.12	100.00
*	1.400	250.00	761.29	0.38	0.60	0.00	10.12	100.00
*	1.400	300.00	761.65	0.36	0.60	0.00	10.13	100.00
	1.400	350.00	762.08	0.43	0.55	0.00	10.13	100.00
	1.400	400.00	762.63	0.55	0.53	0.00	10.14	100.00
	2.000	25.00	760.18	0.00	1.00	0.00	9.04	270.00
	2.000	50.00	760.54	0.36	1.03	0.00	9.12	270.00
	2.000	75.00	760.85	0.31	1.05	0.00	9.20	270.00
	2.000	100.00	761.15	0.30	1.10	0.00	9.26	270.00
	2.000	150.00	761.76	0.61	1.25	0.00	9.40	270.00
*	2.000	200.00	762.40	0.63	1.48	0.00	9.55	270.00
*	2.000	250.00	763.03	0.63	1.74	0.00	9.70	270.00
*	2.000	300.00	763.67	0.64	2.02	0.00	9.84	270.00
*	2.000	350.00	764.25	0.58	2.17	0.00	9.98	270.00
*	2.000	400.00	764.82	0.57	2.19	0.00	10.11	270.00
	2.100	25.00	760.30	0.00	0.12	0.00	9.05	34.00
	2.100	50.00	760.67	0.38	0.13	0.00	9.13	34.00
	2.100	75.00	761.04	0.36	0.19	0.00	9.21	34.00
	2.100	100.00	761.29	0.25	0.13	0.00	9.27	34.00
	2.100	150.00	761.88	0.59	0.12	0.00	9.41	34.00
	2.100	200.00	762.47	0.59	0.07	0.00	9.54	34.00
	2.100	250.00	763.09	0.63	0.07	0.00	9.69	34.00
	2.100	300.00	763.73	0.63	0.06	0.00	9.83	34.00
	2.100	350.00	764.30	0.58	0.05	0.00	9.97	34.00
	2.100	400.00	764.87	0.56	0.05	0.00	10.10	34.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	3.000	25.00	760.36	0.00	0.06	0.00	8.73	1.00
	3.000	50.00	760.87	0.51	0.19	0.00	10.10	1.00
	3.000	75.00	761.24	0.37	0.20	0.00	10.11	1.00
	3.000	100.00	761.59	0.35	0.30	0.00	10.11	1.00
	3.000	150.00	762.08	0.49	0.20	0.00	10.12	1.00
	3.000	200.00	762.57	0.49	0.10	0.00	10.13	1.00
	3.000	250.00	763.08	0.51	-0.01	0.00	10.13	1.00
	3.000	300.00	763.67	0.59	-0.05	0.00	10.14	1.00
	3.000	350.00	764.21	0.54	-0.09	0.00	10.15	1.00
	3.000	400.00	764.73	0.52	-0.14	0.00	10.16	1.00
*	3.100	25.00	760.55	0.00	0.19	0.00	7.87	100.00
*	3.100	50.00	761.00	0.45	0.13	0.00	9.71	100.00
	3.100	75.00	761.38	0.37	0.14	0.00	10.10	100.00
	3.100	100.00	761.72	0.34	0.13	0.00	10.11	100.00
	3.100	150.00	762.25	0.53	0.17	0.00	10.12	100.00
	3.100	200.00	762.76	0.51	0.19	0.00	10.12	100.00
	3.100	250.00	763.29	0.53	0.21	0.00	10.13	100.00
	3.100	300.00	763.89	0.60	0.22	0.00	10.14	100.00
	3.100	350.00	764.45	0.55	0.24	0.00	10.15	100.00
	3.100	400.00	764.99	0.54	0.26	0.00	10.15	100.00
*	3.150	25.00	761.65	0.00	1.10	0.00	7.87	200.00
*	3.150	50.00	762.08	0.43	1.08	0.00	9.63	200.00
*	3.150	75.00	762.37	0.28	0.99	0.00	10.10	200.00
*	3.150	100.00	762.62	0.25	0.90	0.00	10.11	200.00
*	3.150	150.00	763.06	0.44	0.81	0.00	10.11	200.00
*	3.150	200.00	763.46	0.40	0.70	0.00	10.12	200.00
*	3.150	250.00	763.84	0.38	0.55	0.00	10.12	200.00
	3.150	300.00	764.35	0.51	0.46	0.00	10.13	200.00
	3.150	350.00	764.93	0.58	0.49	0.00	10.14	200.00
	3.150	400.00	765.50	0.57	0.51	0.00	10.15	200.00
*	3.200	25.00	762.75	0.00	1.10	0.00	7.87	200.00
*	3.200	50.00	763.18	0.43	1.10	0.00	9.63	200.00
*	3.200	75.00	763.47	0.28	1.10	0.00	10.10	200.00
*	3.200	100.00	763.72	0.25	1.10	0.00	10.11	200.00
*	3.200	150.00	764.16	0.44	1.10	0.00	10.11	200.00
*	3.200	200.00	764.56	0.40	1.10	0.00	10.12	200.00
*	3.200	250.00	764.94	0.38	1.10	0.00	10.12	200.00
*	3.200	300.00	765.28	0.33	0.92	0.00	10.13	200.00
	3.200	350.00	765.64	0.37	0.71	0.00	10.13	200.00
	3.200	400.00	766.19	0.55	0.69	0.00	10.14	200.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	3.300	25.00	763.45	0.00	0.70	0.00	8.88	200.00
*	3.300	50.00	763.91	0.46	0.72	0.00	10.10	200.00
*	3.300	75.00	764.27	0.36	0.80	0.00	10.11	200.00
*	3.300	100.00	764.61	0.33	0.89	0.00	10.11	200.00
*	3.300	150.00	765.22	0.62	1.06	0.00	10.12	200.00
*	3.300	200.00	765.79	0.57	1.24	0.00	10.13	200.00
*	3.300	250.00	766.33	0.53	1.39	0.00	10.14	200.00
*	3.300	300.00	766.86	0.54	1.59	0.00	10.14	200.00
*	3.300	350.00	767.37	0.51	1.73	0.00	10.15	200.00
	3.300	400 00	767.74	0.37	1.55	0.00	10.16	200.00
	3.350	25.00	763.80	0.00	0.35	0.00	8.49	200.00
	3.350	50.00	764.26	0.46	0.36	0.00	10.10	200.00
	3.350	75.00	764.62	0.36	0.35	0.00	10.11	200.00
	3.350	100.00	764.96	0.34	0.35	0.00	10.11	200.00
	3 350	150.00	765.59	0.64	0.37	0.00	10.12	200.00
	3.350	200.00	766.19	0.60	0.40	0.00	10.13	200.00
	3.350	250.00	766.76	0.57	0.44	0.00	10.14	200.00
	3.350	300.00	767.35	0.59	0.49	0.00	10.14	200.00
	3.350	350.00	767.91	0.56	0.54	0.00	10.15	200.00
	3.350	400.00	768.38	0.48	0.64	0.00	10.16	200.00
*	3.390	25.00	763.83	0.00	0.03	0.00	8.61	0.10
*	3.390	50.00	764.30	0.47	0.04	0.00	10.10	0.10
*	3.390	75.00	764.68	0.38	0.06	0.00	10.11	0.10
*	3.390	100.00	765.04	0.36	0.08	0.00	10.11	0.10
*	3.390	150.00	765.68	0.65	0.09	0.00	10.12	0.10
*	3.390	200.00	766.29	0.61	0.10	0.00	10.13	0.10
*	3.390	250.00	766.88	0.59	0.12	0.00	10.14	0.10
*	3.390	300.00	767.49	0.61	0.14	0.00	10.15	0.10
*	3.390	350.00	768.06	0.57	0.15	0.00	10.15	0.10
*	3.390	400.00	766.83	-1.23	-1.56	0.00	10.14	0.10
*	3.400	25.00	764.00	0.00	0.16	0.00	9.69	30.00
*	3.400	50.00	764.49	0.49	0.18	0.00	10.11	30.00
	3.400	75.00	764.87	0.38	0.19	0.00	10.11	30.00
	3.400	100.00	765.23	0.35	0.19	0.00	10.12	30.00
	3.400	150.00	765.87	0.65	0.19	0.00	10.12	30.00
	3.400	200.00	766.48	0.61	0.18	0.00	10.13	30.00
	3.400	250.00	767.06	0.59	0.18	0.00	10.14	30.00
	3.400	300.00	767.66	0.60	0.17	0.00	10.15	30.00
	3.400	350.00	768.23	0.57	0.17	0.00	10.16	30.00
*	3.400	400.00	768.08	-0.15	1.25	0.00	10.16	30.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	4.000	25.00	763.94	0.00	-0.06	0.00	8.80	1.00
*	4.000	50.00	764.42	0.48	-0.07	0.00	8.81	1.00
	4.000	75.00	764.79	0.37	-0.08	0.00	8.81	1.00
	4.000	100.00	765.13	0.35	-0.09	0.00	8.82	1.00
	4.000	150.00	765.78	0.64	-0.09	0.00	8.82	1.00
	4.000	200.00	766.39	0.62	-0.09	0.00	8.83	1.00
	4.000	250.00	767.00	0.60	-0.07	0.00	8.84	1.00
	4.000	300.00	767.62	0.63	-0.04	0.00	8.85	1.00
	4.000	350.00	768.22	0.60	-0.01	0.00	8.85	1.00
	4.000	400.00	768.04	-0.18	-0.03	0.00	8.85	1.00
*	4.010	25.00	763.97	0.00	0.03	0.00	8.80	0.01
*	4.010	50.00	764.47	0.50	0.05	0.00	8.81	0.01
*	4.010	75.00	764.86	0.39	0.07	0.00	8.81	0.01
*	4.010	100.00	765.21	0.36	0.08	0.00	8.82	0.01
*	4.010	150.00	765.88	0.66	0.10	0.00	8.82	0.01
*	4.010	200.00	766.51	0.64	0.12	0.00	8.83	0.01
*	4.010	250.00	767.13	0.61	0.13	0.00	8.84	0.01
*	4.010	300.00	767.76	0.64	0.14	0.00	8.85	0.01
*	4.010	350.00	768.37	0.61	0.15	0.00	8.86	0.01
*	4.010	400.00	767.19	-1.19	-0.86	0.00	8.84	0.01
*	4.100	25.00	764.91	0.00	0.94	0.00	8.23	250.00
*	4.100	50.00	765.30	0.39	0.83	0.00	8.80	250.00
*	4.100	75.00	765.60	0.30	0.74	0.00	8.81	250.00
*	4.100	100.00	765.88	0.28	0.66	0.00	8.81	250.00
*	4.100	150.00	766.37	0.49	0.49	0.00	8.82	250.00
	4.100	200.00	766.93	0.56	0.41	0.00	8.82	250.00
	4.100	250.00	767.52	0.60	0.40	0.00	8.83	250.00
	4.100	300.00	768.14	0.62	0.38	0.00	8.84	250.00
	4.100	350.00	768.74	0.60	0.37	0.00	8.85	250.00
	4.100	400.00	768.51	-0.23	1.33	0.00	8.84	250.00
	4.110	25.00	764.92	0.00	0.01	0.00	8.26	1.00
	4.110	50.00	765.30	0.39	0.01	0.00	8.80	1.00
	4.110	75.00	765.61	0.30	0.01	0.00	8.81	1.00
	4.110	100.00	765.89	0.28	0.01	0.00	8.81	1.00
	4.110	150.00	766.39	0.51	0.03	0.00	8.82	1.00
	4.110	200.00	766.93	0.54	0.01	0.00	8.82	1.00
	4.110	250.00	767.53	0.60	0.01	0.00	8.83	1.00
	4.110	300.00	768.14	0.61	0.00	0.00	8.84	1.00
	4.110	350.00	768.74	0.60	0.00	0.00	8.85	1.00
	4.110	400.00	768.53	-0.22	0.01	0.00	8.84	1.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	5.000	25.00	765.04	0.00	0.12	0.00	6.25	1.00
*	5.000	50.00	765.27	0.22	-0.04	0.00	6.42	1.00
*	5.000	75.00	765.65	0.38	0.04	0.00	6.46	1.00
*	5.000	100.00	765.98	0.33	0.10	0.00	6.50	1.00
*	5.000	150.00	766.64	0.66	0.25	0.00	7.61	1.00
*	5.000	200.00	767.13	0.49	0.20	0.00	7.71	1.00
*	5.000	250.00	767.58	0.45	0.05	0.00	7.80	1.00
*	5.000	300.00	768.01	0.42	-0.14	0.00	7.88	1.00
*	5.000	350.00	768.40	0.39	-0.35	0.00	7.96	1.00
*	5.000	400.00	768.77	0.37	0.25	0.00	8.03	1.00
*	5.010	25.00	765.06	0.00	0.02	0.00	6.31	0.01
*	5.010	50.00	765.33	0.26	0.06	0.00	6.42	0.01
*	5.010	75.00	765.73	0.40	0.08	0.00	6.47	0.01
*	5.010	100.00	766.08	0.35	0.10	0.00	6.51	0.01
*	5.010	150.00	766.76	0.68	0.12	0.00	7.63	0.01
*	5.010	200.00	767.27	0.51	0.14	0.00	7.73	0.01
*	5.010	250.00	767.74	0.47	0.16	0.00	7.83	0.01
*	5.010	300.00	768.19	0.44	0.18	0.00	7.92	0.01
*	5.010	350.00	768.59	0.40	0.19	0.00	8.00	0.01
*	5.010	400.00	768.78	0.19	0.01	0.00	8.04	0.01
	5.100	25.00	765.12	0.00	0.05	0.00	6.22	35.00
	5.100	50.00	765.57	0.45	0.24	0.00	6.44	35.00
	5.100	75.00	766.05	0.48	0.31	0.00	6.49	35.00
	5.100	100.00	766.57	0.53	0.49	0.00	7.57	35.00
	5.100	150.00	767.15	0.58	0.39	0.00	7.69	35.00
	5.100	200.00	767.77	0.62	0.49	0.00	7.81	35.00
	5.100	250.00	768.26	0.50	0.52	0.00	7.91	35.00
	5.100	300.00	768.77	0.51	0.59	0.00	8.01	35.00
	5.100	350.00	769.27	0.50	0.69	0.00	8.12	35.00
	5.100	400.00	769.87	0.59	1.09	0.00	8.23	35.00
*	6.000	25.00	765.29	0.00	0.17	0.00	8.01	1.00
*	6.000	50.00	765.93	0.64	0.36	0.00	8.10	1.00
*	6.000	75.00	766.50	0.57	0.45	0.00	9.45	1.00
*	6.000	100.00	767.01	0.52	0.44	0.00	9.58	1.00
*	6.000	150.00	767.79	0.77	0.64	0.00	9.77	1.00
*	6.000	200.00	768.49	0.70	0.72	0.00	9.95	1.00
*	6.000	250.00	769.13	0.65	0.87	0.00	10.11	1.00
*	6.000	300.00	769.73	0.59	0.95	0.00	10.25	1.00
*	6.000	350.00	770.29	0.56	1.02	0.00	10.40	1.00
*	6.000	400.00	770.89	0.60	1.02	0.00	10.55	1.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	23.620	25.00	765.43	0.00	0.14	0.00	20.00	10.00
*	23.620	50.00	766.17	0.74	0.24	0.00	20.00	10.00
*	23.620	75.00	766.79	0.62	0.29	0.00	20.00	10.00
*	23.620	100.00	767.34	0.55	0.33	0.00	20.00	10.00
*	23.620	150.00	768.21	0.87	0.43	0.00	20.00	10.00
*	23.620	200.00	768.99	0.78	0.50	0.00	20.00	10.00
*	23.620	250.00	769.71	0.71	0.57	0.00	20.01	10.00
*	23.620	300.00	770.36	0.65	0.63	0.00	20.01	10.00
*	23.620	350.00	770.97	0.61	0.68	0.00	20.01	10.00
*	23.620	400.00	771.59	0.62	0.70	0.00	100.00	10.00

SUMMARY OF ERRORS AND SPECIAL NOTES

WARNING	SECNO=	1.000	PROFILE= 1	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO=	1.000	PROFILE= 2	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
CAUTION	SECNO=	1.000	PROFILE= 3	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	1.000	PROFILE= 3	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	1.000	PROFILE= 3	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	1.000	PROFILE= 4	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	1.000	PROFILE= 4	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	1.000	PROFILE= 4	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	1.000	PROFILE= 5	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	1.000	PROFILE= 5	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	1.000	PROFILE= 5	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	1.000	PROFILE= 6	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	1.000	PROFILE= 6	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	1.000	PROFILE= 6	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	1.000	PROFILE= 7	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	1.000	PROFILE= 7	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	1.000	PROFILE= 7	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	1.000	PROFILE= 8	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	1.000	PROFILE= 8	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	1.000	PROFILE= 8	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	1.000	PROFILE= 9	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	1.000	PROFILE= 9	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	1.000	PROFILE= 9	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	1.000	PROFILE= 10	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	1.000	PROFILE= 10	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	1.000	PROFILE= 10	20 TRIALS ATTEMPTED TO BALANCE WSEL
WARNING	SECNO=	1.100	PROFILE= 1	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
CAUTION	SECNO=	1.100	PROFILE= 2	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	1.100	PROFILE= 2	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	1.100	PROFILE= 2	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	1.100	PROFILE= 3	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	1.100	PROFILE= 3	MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	1.100	PROFILE= 4	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	1.100	PROFILE= 4	MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	1.100	PROFILE= 5	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	1.100	PROFILE= 5	MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	1.100	PROFILE= 6	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	1.100	PROFILE= 6	MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	1.100	PROFILE= 7	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	1.100	PROFILE= 7	MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	1.100	PROFILE= 8	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	1.100	PROFILE= 8	MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	1.100	PROFILE= 9	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	1.200	PROFILE= 1	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	1.200	PROFILE= 1	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	1.200	PROFILE= 1	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	1.200	PROFILE= 2	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	1.200	PROFILE= 2	MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	1.200	PROFILE= 3	CRITICAL DEPTH ASSUMED

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CAUTION SECNO=     1.200  PROFILE=  3  MINIMUM SPECIFIC ENERGY
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CAUTION SECNO=     1.200  PROFILE=  4  MINIMUM SPECIFIC ENERGY
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CAUTION SECNO=     1.200  PROFILE=  5  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     1.200  PROFILE=  6  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     1.200  PROFILE=  6  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     1.200  PROFILE=  7  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     1.200  PROFILE=  7  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     1.200  PROFILE=  8  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     1.200  PROFILE=  8  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=     1.300  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     1.300  PROFILE=  1  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     1.300  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     1.300  PROFILE=  2  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     1.300  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     1.300  PROFILE=  3  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     1.300  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     1.300  PROFILE=  4  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     1.300  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     1.300  PROFILE=  5  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     1.300  PROFILE=  6  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     1.300  PROFILE=  6  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     1.300  PROFILE=  7  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     1.300  PROFILE=  7  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     1.300  PROFILE=  8  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     1.300  PROFILE=  8  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=     1.400  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     1.400  PROFILE=  1  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     1.400  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     1.400  PROFILE=  2  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     1.400  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     1.400  PROFILE=  3  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     1.400  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     1.400  PROFILE=  4  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     1.400  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     1.400  PROFILE=  5  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     1.400  PROFILE=  6  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     1.400  PROFILE=  6  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     1.400  PROFILE=  7  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     1.400  PROFILE=  7  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     1.400  PROFILE=  8  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     1.400  PROFILE=  8  MINIMUM SPECIFIC ENERGY

WARNING SECNO=     2.000  PROFILE=  6  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     2.000  PROFILE=  7  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     2.000  PROFILE=  8  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     2.000  PROFILE=  9  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     2.000  PROFILE= 10  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=     3.100  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     3.100  PROFILE=  1  MINIMUM SPECIFIC ENERGY
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WARNING SECNO=      3.100  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=      3.150  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      3.150  PROFILE=  1  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      3.150  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      3.150  PROFILE=  2  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      3.150  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      3.150  PROFILE=  3  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      3.150  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      3.150  PROFILE=  4  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      3.150  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      3.150  PROFILE=  5  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      3.150  PROFILE=  6  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      3.150  PROFILE=  6  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      3.150  PROFILE=  7  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      3.150  PROFILE=  7  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=      3.200  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      3.200  PROFILE=  1  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      3.200  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      3.200  PROFILE=  2  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      3.200  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      3.200  PROFILE=  3  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      3.200  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      3.200  PROFILE=  4  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      3.200  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      3.200  PROFILE=  5  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      3.200  PROFILE=  6  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      3.200  PROFILE=  6  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      3.200  PROFILE=  7  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      3.200  PROFILE=  7  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      3.200  PROFILE=  8  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      3.200  PROFILE=  8  MINIMUM SPECIFIC ENERGY

WARNING SECNO=      3.300  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      3.300  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      3.300  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      3.300  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      3.300  PROFILE=  5  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      3.300  PROFILE=  6  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      3.300  PROFILE=  7  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      3.300  PROFILE=  8  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      3.300  PROFILE=  9  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

NOTE    SECNO=      3.390  PROFILE=  1  WSEL BASED ON X5 CARD
NOTE    SECNO=      3.390  PROFILE=  2  WSEL BASED ON X5 CARD
NOTE    SECNO=      3.390  PROFILE=  3  WSEL BASED ON X5 CARD
NOTE    SECNO=      3.390  PROFILE=  4  WSEL BASED ON X5 CARD
NOTE    SECNO=      3.390  PROFILE=  5  WSEL BASED ON X5 CARD
NOTE    SECNO=      3.390  PROFILE=  6  WSEL BASED ON X5 CARD
NOTE    SECNO=      3.390  PROFILE=  7  WSEL BASED ON X5 CARD
NOTE    SECNO=      3.390  PROFILE=  8  WSEL BASED ON X5 CARD
NOTE    SECNO=      3.390  PROFILE=  9  WSEL BASED ON X5 CARD
NOTE    SECNO=      3.390  PROFILE= 10  WSEL BASED ON X2 CARD
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WARNING SECNO=      3.400  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      3.400  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
CAUTION SECNO=      3.400  PROFILE= 10  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO=      4.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      4.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

NOTE    SECNO=      4.010  PROFILE=  1  WSEL BASED ON X5 CARD
NOTE    SECNO=      4.010  PROFILE=  2  WSEL BASED ON X5 CARD
NOTE    SECNO=      4.010  PROFILE=  3  WSEL BASED ON X5 CARD
NOTE    SECNO=      4.010  PROFILE=  4  WSEL BASED ON X5 CARD
NOTE    SECNO=      4.010  PROFILE=  5  WSEL BASED ON X5 CARD
NOTE    SECNO=      4.010  PROFILE=  6  WSEL BASED ON X5 CARD
NOTE    SECNO=      4.010  PROFILE=  7  WSEL BASED ON X5 CARD
NOTE    SECNO=      4.010  PROFILE=  8  WSEL BASED ON X5 CARD
NOTE    SECNO=      4.010  PROFILE=  9  WSEL BASED ON X5 CARD
NOTE    SECNO=      4.010  PROFILE= 10  WSEL BASED ON X2 CARD

CAUTION SECNO=      4.100  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      4.100  PROFILE=  1  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      4.100  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      4.100  PROFILE=  2  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      4.100  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      4.100  PROFILE=  3  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      4.100  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      4.100  PROFILE=  4  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      4.100  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      4.100  PROFILE=  5  MINIMUM SPECIFIC ENERGY

WARNING SECNO=      5.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
CAUTION SECNO=      5.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      5.000  PROFILE=  2  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      5.000  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      5.000  PROFILE=  3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      5.000  PROFILE=  3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=      5.000  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      5.000  PROFILE=  4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      5.000  PROFILE=  4  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=      5.000  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      5.000  PROFILE=  5  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      5.000  PROFILE=  5  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=      5.000  PROFILE=  6  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      5.000  PROFILE=  6  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      5.000  PROFILE=  6  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=      5.000  PROFILE=  7  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      5.000  PROFILE=  7  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      5.000  PROFILE=  7  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=      5.000  PROFILE=  8  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      5.000  PROFILE=  8  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      5.000  PROFILE=  9  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      5.000  PROFILE=  9  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      5.000  PROFILE= 10  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      5.000  PROFILE= 10  PROBABLE MINIMUM SPECIFIC ENERGY
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CAUTION SECNO=      5.000  PROFILE= 10  20 TRIALS ATTEMPTED TO BALANCE WSEL

NOTE    SECNO=      5.010  PROFILE=  1  WSEL BASED ON X5 CARD
NOTE    SECNO=      5.010  PROFILE=  2  WSEL BASED ON X5 CARD
NOTE    SECNO=      5.010  PROFILE=  3  WSEL BASED ON X5 CARD
NOTE    SECNO=      5.010  PROFILE=  4  WSEL BASED ON X5 CARD
NOTE    SECNO=      5.010  PROFILE=  5  WSEL BASED ON X5 CARD
NOTE    SECNO=      5.010  PROFILE=  6  WSEL BASED ON X5 CARD
NOTE    SECNO=      5.010  PROFILE=  7  WSEL BASED ON X5 CARD
NOTE    SECNO=      5.010  PROFILE=  8  WSEL BASED ON X5 CARD
NOTE    SECNO=      5.010  PROFILE=  9  WSEL BASED ON X5 CARD
NOTE    SECNO=      5.010  PROFILE= 10  WSEL BASED ON X2 CARD

WARNING SECNO=      6.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      6.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      6.000  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      6.000  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      6.000  PROFILE=  5  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      6.000  PROFILE=  6  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      6.000  PROFILE=  7  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      6.000  PROFILE=  8  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      6.000  PROFILE=  9  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      6.000  PROFILE= 10  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     23.620  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     23.620  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     23.620  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     23.620  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     23.620  PROFILE=  5  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     23.620  PROFILE=  6  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     23.620  PROFILE=  7  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     23.620  PROFILE=  8  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     23.620  PROFILE=  9  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     23.620  PROFILE= 10  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
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00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: KALAMAZOO, CITY OF

3) WATERCOURSE: ARCADIA CREEK

4) DOCUMENT TYPE: RATING CURVE RUN

Upstream of Burdick Street to west of Park

00BREAK00

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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
  ERROR CORR -  01
  MODIFICATION -  50,51,52
*****************************************************

C 2.
T1RATING CURVE COMPUTATIONS FOR ENCLOSURE FROM U/S OF BURDICK ST TO WEST OF PARK
T2STARTING WATER DEPTH TAKEN FROM A D/S RUN
T3      ARCADIA CREEK KALAMAZOO

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   KWINS    Q        WSEL     FQ

      0.       2.       0.       0.  0.000003     0.00     0.0      0.   773.950   0.000

J2  NPROF    IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBH      CHNIM    ITRACE

     1.000    0.000   -1.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    150.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000

J5  LPRNT    NUMSEC                  ********REQUESTED SECTION NUMBERS********

    -10.000  -10.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000
NC      0.000    0.000    0.035    0.000    0.500    0.000    0.000    0.000    0.000    0.000
OT      4.000  211.000  207.000  206.000  204.000    0.000    0.000    0.000    0.000    0.000

X1      .000    6.000   50.000   57.500    0.000    0.000    0.000    0.000    0.000    0.000
X3     10.000    0.000    0.000    0.000    0.000    0.000    0.000  900.000  900.000    0.000
GR    770.000    0.000  777.300   50.000  770.000   50.100  770.000   57.600  777.300   57.500
GR    770.000  100.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000
SB      0.000   10.500    2.600    0.000    7.500    0.000   48.400    0.000  773.300  770.800

        U/S END OF THE ENCLOSURE AT WEST OF PARK STREET

X1      2.000    0.000    0.000    0.000  938.000  938.000  938.000    0.000    2.500    0.000
X2      0.000    0.000    1.000  779.600  900.000    0.000    0.000    0.000    0.000    0.000
X3     10.000    0.000    0.000    0.000    0.000    0.000    0.000  900.000  900.000    0.000
EJ      0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000
```

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*****************************************************
  HEC2 RELEASE DATED NOV 75 UPDATED FEB 1977
  ERROR CORR -  01
  MODIFICATION -  50,51,52
*****************************************************
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

ARCADIA CREEK KALAMAZOO

SUMMARY PRINTOUT TABLE 150

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CLSEL	CRIMS	EG	10K S	VCH	AREA	.01K
1.000	0.00	0.00	0.00	770.80	211.00	778.95	0.00	779.14	17.49	3.49	60.47	50.46
1.000	0.00	0.00	0.00	770.80	207.00	779.35	0.00	779.52	14.67	3.26	63.48	54.05
1.000	0.00	0.00	0.00	770.80	206.00	779.43	0.00	779.54	13.92	3.20	64.45	55.22
1.000	0.00	0.00	0.00	770.80	204.00	779.73	0.00	779.93	12.39	3.06	68.70	57.96
2.000	938.00	900.00	779.80	773.30	211.00	781.80	0.00	782.05	15.10	3.51	63.69	54.30
2.000	938.00	900.00	779.80	773.30	207.00	782.18	0.00	782.33	13.17	3.14	65.94	57.04
2.000	938.00	900.00	779.80	773.30	206.00	782.29	0.00	782.43	12.61	3.09	66.74	58.01
2.000	938.00	900.00	779.80	773.30	204.00	782.54	0.00	782.66	11.43	2.97	68.64	60.35

ARCADIA CREEK KALAMAZOO

SUMMARY PRINTOUT TABLE 150

SECNO	Q	CLSEL	DIFUSP	DIFUSX	DIFK.S	TOP.ID	XLCH
1.000	211.00	778.95	0.00	0.00	0.00	7.50	0.00
1.000	207.00	779.35	0.00	0.00	0.00	7.50	0.00
1.000	206.00	779.48	0.00	0.00	0.00	7.50	0.00
1.000	204.00	779.78	0.00	0.00	0.00	7.50	0.00
2.000	211.00	781.08	0.00	2.93	0.00	7.50	938.00
2.000	207.00	782.18	0.00	2.83	0.00	7.50	938.00
2.000	206.00	782.29	0.00	2.81	0.00	7.50	938.00
2.000	204.00	782.54	0.00	2.76	0.00	7.50	938.00

SUMMARY OF ERRORS

00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: KALAMAZOO, CITY OF

3) WATERCOURSE: ARCADIA CREEK

4) DOCUMENT TYPE: RATING CURVE RUN

MOUTH TO UPSTREAM OF BURDICK STREET.

00BREAK00

```
*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
  ERROR CORR -  01
  MODIFICATION -  50,51,52
*****************************************************

C 2.
T1RATING CURVE COMPUTATIONS FOR ENCLOSURE FROM MOUTH TO U/S OF BURDICK ST
T2STARTING WATER SURFACE PORTAGE CREEK MEAN WATER SURFACE ELEVATION
T3      ARCADIA CREEK KALAMAZOO

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      0.        2.        0.        0.  0.000000      0.00       0.0       0.   757.400     0.000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIN     ITRACE

     1.000     0.000    -1.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    150.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

J5  LPRNT    NUMSEC                  ********REQUESTED SECTION NUMBERS********

    -10.000   -10.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
NC      0.000     0.000     0.033     0.300     0.500     0.000     0.000     0.000     0.000     0.000
QT      4.000   346.000   347.000   348.000   350.000     0.000     0.000     0.000     0.000     0.000

X1      1.000     6.000    50.000    60.000     0.000     0.000     0.000     0.000     0.000     0.000
X3     10.000     0.000     0.000     0.000     0.000     0.000     0.000   900.000   900.000     0.000
GR    755.000     0.000   757.400    50.000   752.740    50.100   752.740    39.900   757.400    60.000
GR    755.000   100.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
SB      0.000    25.000     2.600     0.000    10.000     0.000    76.100     0.000   760.400   752.700

        U/S END OF THE ENCLOSURE 150 FT U/S OF BURDICK ST

X1      2.000     0.000     0.000     0.000  3063.000  3063.000  3063.000     0.000    15.660     0.000
X2      0.000     0.000     1.000   773.060   900.000     0.000     0.000     0.000     0.000     0.000
X3     10.000     0.000     0.000     0.000     0.000     0.000     0.000   900.000   900.000     0.000
EJ      0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
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HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977

ERROR CORR - 01

MODIFICATION - 50,51,52

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NOTE--ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES RESULTS IN SUMMARY OF ERRONEOUS LIST

ARCADIA CREEK KALAMAZOO

SUMMARY PRINTOUT TABLE 150

SECNO	XLCH	ELTRD	ELLC	EL MIN	[illegible]	[illegible]	[illegible]	[illegible]	TOPWID	VCH	AREA	.CCK
1.000	0.00	0.00	0.00	752.74	344.00	757.40	1.00	758.26	95.32	7.46	46.13	35.23
1.000	0.00	0.00	0.00	752.74	347.00	757.40	0.01	758.28	96.99	7.52	46.13	35.23
1.000	0.00	0.00	0.00	752.74	348.00	757.40	0.01	758.28	97.55	7.54	46.13	35.23
1.000	0.00	0.00	0.00	752.74	350.00	757.40	0.01	758.28	98.63	7.59	46.13	35.23
2.000	3063.00	900.00	773.06	768.60	344.00	778.65	0.00	779.02	9.03	3.31	103.99	114.49
2.000	3063.00	900.00	773.06	768.60	347.00	779.23	0.00	779.39	8.30	3.22	107.87	120.45
2.000	3063.00	900.00	773.06	768.60	348.00	779.36	0.00	779.52	8.08	3.19	109.17	122.45
2.000	3063.00	900.00	773.06	768.60	350.00	779.62	0.00	779.78	7.65	3.13	111.78	126.45

ARCADIA CREEK KALAMAZOO

SUMMARY PRINTOUT TABLE 150

SECNO	Q	CUSEL	DIFMSP	DIFMSX	DIFKLS	TOPWID	XLOC
1.000	344.00	757.43	0.00	0.00	0.00	10.00	0.00
1.000	347.00	757.60	0.00	0.00	0.00	10.00	0.00
1.000	348.00	757.43	0.00	0.00	0.00	10.00	0.00
1.000	350.00	757.43	0.00	0.00	0.00	10.00	0.00
2.000	344.00	778.65	0.00	21.45	0.00	10.00	3063.00
2.000	347.00	779.23	0.00	21.33	0.00	10.00	3063.00
2.000	348.00	779.36	0.00	21.96	0.00	10.00	3063.00
2.000	350.00	779.62	0.00	22.22	0.00	10.00	3063.00

SUMMARY OF ERRORS

00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: KALAMAZOO, CITY OF

3) WATERCOURSE: ARCADIA CREEK

4) DOCUMENT TYPE: RATING CURVE RUN

LOVELL ST to 500 ft downstream of Oliver

00BREAK00

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**************************************************
    NEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
    ERROR CORR - 01
    MODIFICATION - 50,51,52
**************************************************

C
T1RATING CURVE COMPUTATIONS FOR ENCLOSURE FROM LOVELL ST TO 500 FT D/S OF OLIVER
T2STARTING WATER SURFACE TAKEN FROM A D/S RUN OF OVERLAND FLOW
T3      ARCADIA CREEK KALAMAZOO

J1  ICHECK     INQ        NINV       IDIR       STRT       METRIC     HVINS      Q          WSEL       FQ
          0.         2.         0.         0.  0.000020       0.00       0.0        0.    796.010      0.000

J2  NPROF      IPLOT      PRFVS      XSECV      XSECH      FN         ALLDC      IBW        CHNIM      ITRACE
      1.000      0.000     -1.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT
    150.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000

J5  LPRNT      NUMSEC                        ********REQUESTED SECTION NUMBERS********
    -10.000    -10.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000
NC    0.000      0.000      0.000      0.300      0.500      0.000      0.000      0.000      0.000      0.000
GT    4.000    125.000    124.000    124.000    124.000      0.000      0.000      0.000      0.000      0.000

          D/S END OF THE ENCLOSURE AT LOVELL STREET

X1    1.000      6.000     50.000     54.000      0.000      0.000      0.000      0.000      0.000      0.000
X3   10.000      0.000      0.000      0.000      0.000      0.000      0.000    900.000    900.000      0.000
GR  798.000      0.000    797.000     50.000    791.900     50.100    792.000     53.900    797.000     54.000
GR  790.000    100.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000
SD    0.000     21.500      2.600      0.500      4.000      0.000     19.630      0.000    603.400    792.000

          U/S END OF THE ENCLOSURE AT CULVERT ON STADIUM DRIVE;500' D/S OF OLIVER

X1    2.000      0.000      0.000      0.000   2500.000   2500.000   2500.000      0.000     11.400      0.000
X2    0.000      0.000      1.000    808.400    930.000      0.000      0.000      0.000      0.000      0.000
X3   10.000      0.000      0.000      0.000      0.000      0.000      0.000    900.000    900.000      0.000
EJ    0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000
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CAUTION

SEE

ATTACHED COMMENTS

****

HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
ERROR CORR - 01
MODIFICATION - 30,51,52

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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

ARCADIA CREEK KALAMAZOO

SUMMARY PRINTOUT TABLE 150

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	IOPT	VCH	AREA	.01K
1.000	0.00	0.00	0.00	791.90	125.00	798.01	0.00	798.44	0.00	5.27	23.74	48080.20
1.000	0.00	0.00	0.00	791.90	124.00	798.69	0.00	799.03	0.00	4.69	26.45	55922.02
1.000	0.00	0.00	0.00	791.90	124.00	799.07	0.00	799.39	0.00	4.56	27.18	58037.93
1.000	0.00	0.00	0.00	791.90	124.00	799.36	0.00	799.64	0.00	4.26	29.14	63063.04
2.000	2500.00	900.00	808.40	803.30	125.00	811.30	0.00	811.55	0.00	3.99	31.30	70400.56
2.000	2500.00	900.00	808.40	803.30	124.00	811.80	0.00	812.01	0.00	3.73	33.28	76501.44
2.000	2500.00	900.00	808.40	803.30	124.00	811.99	0.00	812.19	0.00	3.64	34.06	78851.94
2.000	2500.00	900.00	808.40	803.30	124.00	812.50	0.00	812.68	0.00	3.44	36.09	85269.50

FORM 1611-CA PRINTED BY DETROIT MANIFOLD FORMS

ARCADIA CREEK KALAMAZOO

SUMMARY PRINTOUT TABLE 150

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKHS	TOPWID	XLCH
1.000	125.00	798.01	0.00	0.00	0.00	4.00	0.00
1.000	124.00	798.69	0.00	0.00	0.00	4.00	0.00
1.000	124.00	798.87	0.00	0.00	0.00	4.00	0.00
1.000	124.00	799.36	0.00	0.00	0.00	4.00	0.00
2.000	125.00	811.30	0.00	13.29	0.00	4.00	2500.00
2.000	124.00	811.80	0.00	13.11	0.00	4.00	2500.00
2.000	124.00	811.99	0.00	13.12	0.00	4.00	2500.00
2.000	124.00	812.50	0.00	13.14	0.00	4.00	2500.00

SUMMARY OF ERRORS

1) COUNTY: KALAMAZOO

2) STUDY NAME: KALAMAZOO, CITY OF

3) WATERCOURSE: ARCADIA CREEK

4) DOCUMENT TYPE: RATING CURVE RUN

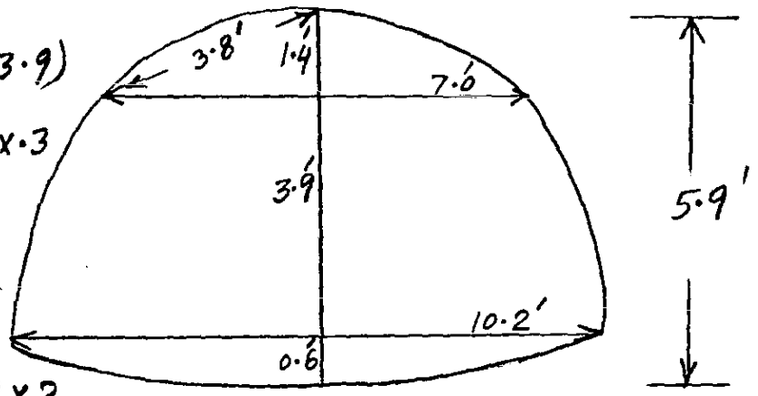
2 ABRAMS SEC 96 to 99

REFERENCE

(ii) Cross section from 13+56 to 17+68

$$A = \frac{7+10.2}{2}(3.9) + \frac{7 \times 1.4}{2} + 3.8 \times 3 + \frac{10.2 \times .6}{2}$$

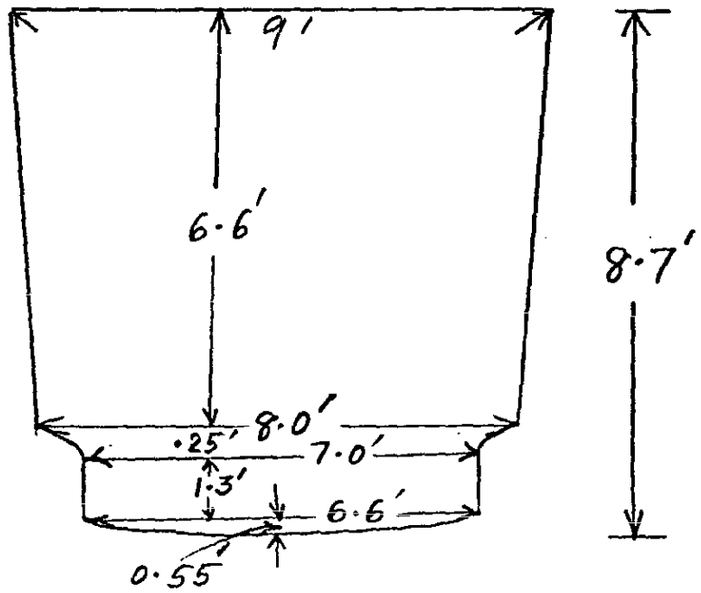
$$= 42.6 \text{ sq ft}$$



$$P = 4 \times 2 + 4.2 \times 2 + 5.4 \times 2 = 27.2 \text{ ft}$$

$$R = \frac{A}{P} = 1.57 \text{ ft}$$

(iii) Cross section from 17+68 to 18+82



SUBJECT	BY	CHK.	SHEET NO.	File Code No. (Job No.) Owner / Project / Suffix
Arcadia Creek Enclosure #1A	S.W.S.		3 of 16	HUD • 202 • 07
	DATE 4/1/80	DATE		

REFERENCE

$$A = \frac{9.0+8.0}{2}(6.6) + \frac{8.0+7.0}{2}(.25) + \frac{7.0+6.6}{2}(1.3) + \frac{6.6 \times .55}{2}$$

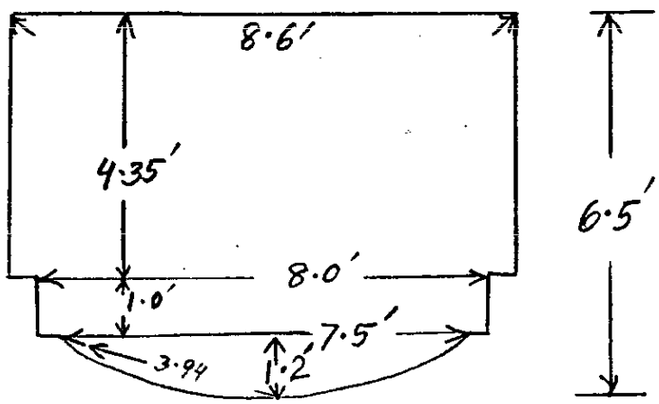
$$= \underline{68.6}\ ft^2$$

$$P = 9.0 + 2(6.7) + 2(.26) + 2(1.3) + 6.7$$

$$= \underline{32.2}\ ft$$

$$R = \frac{A}{P} = \underline{2.13\ ft}$$

(iv) Cross section from 18+82 to 19+73



$$A = 8.6 \times 4.35 + 8.0 \times 1.0 + \frac{7.5 \times 1.2}{2} + 3.94 \times 0.4$$

$$= \underline{51.5}\ ft^2$$

SUBJECT	BY	CHK.	SHEET NO.	File Code No. (Job No.) Owner Project Suffix
Arcadia Creek Enclosure #1A	Sushil		4 OF 16	HUD • 2027 • 07
	DATE 4/1/80	DATE		

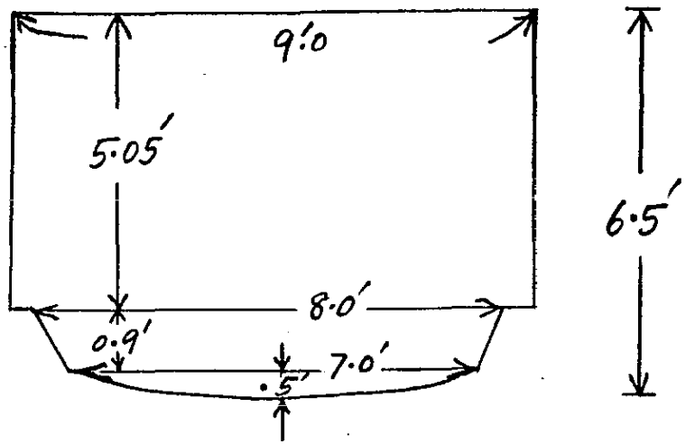
REFERENCE

$$P = 8.6 + 2(4.35) + 2(.3) + 2(1.0) + 2(3.96)$$

$$= \underline{27.9 \text{ ft}}$$

$$R = \frac{A}{P} = \underline{1.85 \text{ ft}}$$

(V) Cross section from 19+73 to 24+07



$$A = 9 \times 5.05 + \frac{8+7}{2}(0.9) + \frac{7 \times .5}{2}$$

$$= \underline{53.95 \text{ ft}^2}$$

$$P = 9 + 2(5.05) + 2(.5) + 2(.9) + 7.1$$

$$= \underline{29.0 \text{ ft}}$$

$$R = A/P = \underline{1.86 \text{ ft}}$$

SUBJECT	BY	CHK.	SHEET NO.	File Code No. (Job No.) Owner Project Suffix
Arcadia Creek Enclosure #1A	Sushil		5 OF 16	HUD-202-07
	DATE 4/1/80	DATE		

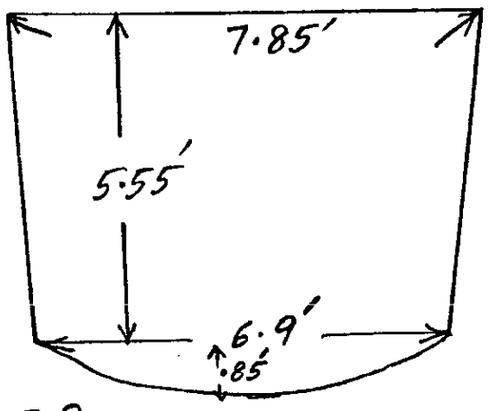
FORM 25-0
(313) 291-5400

Wade, Trim & Associates, Inc.
Civil Engineers • Land Surveyors
WORK SHEET

25185 GODDARD ROAD
TAYLOR, MICHIGAN 48180

REFERENCE

(vi) Cross section from 24+07 to 27+84



$$A = \frac{7.85+6.9}{2}(5.55) + \frac{6.9 \times .9}{2}$$

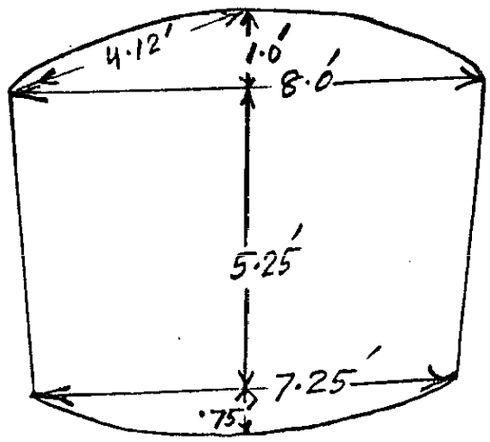
$$= \underline{44.0\ ft^2}$$

$$P = 7.85 + 2(5.6) + 7.2$$

$$= \underline{26.25\ ft}$$

$$R = \frac{A}{P} = \underline{1.68\ ft}$$

(vii) Cross section from 27+84 to 28+84



$$A = \frac{8+7.25}{2}(5.25) + \frac{8 \times 1}{2} + 4.12 \times .2 + \frac{7.25 \times .8}{2}$$

$$= \underline{47.8\ ft^2}$$

$$P = 8.5 + 2 \times 5.25 + 7.4$$

$$= \underline{26.4\ ft}$$

$$R = \frac{A}{P} = \underline{1.81\ ft}$$

REFERENCE

(viii) Cross section from 28+84 to 29+64

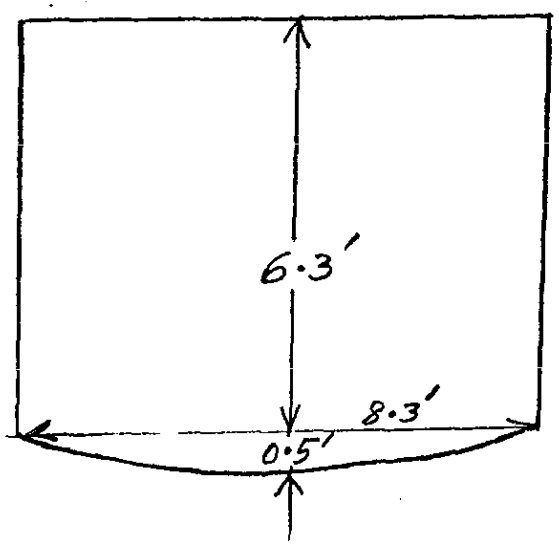
$A = 6.3 \times 8.3 + \frac{8.3 \times .5}{2}$

$= \underline{54.4\ ft^2}$

$P = 8.3 + 8.5 + 2(6.3)$

$= \underline{29.4\ ft}$

$R = \frac{A}{P} = \underline{1.85\ ft}$



(ix) Cross section from 29+64 to 30+75 (U/S end)

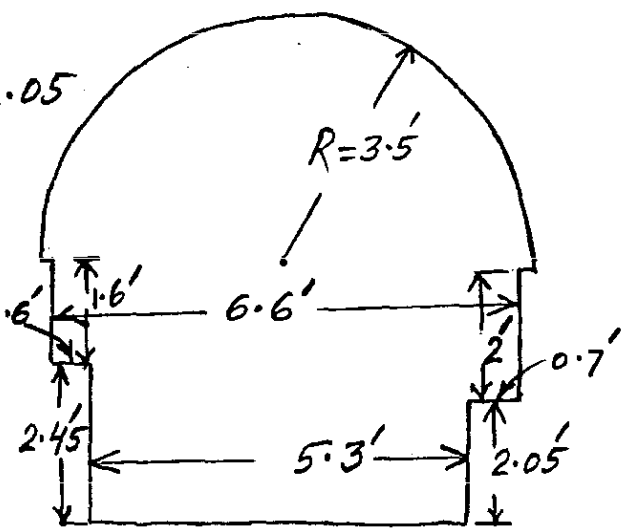
$A = \frac{\pi\, 3.5^2}{2} + 1.6 \times 6.6 + 0.4 \times 6.0 + 5.3 \times 2.05$

$= \underline{43.1\ ft^2}$

$P = \pi(3.5) + .2 + 1.6 + .6 + 2.45 + 5.3 + 2.05 + .7 + 2.0 + .2$

$= \underline{24.3\ ft}$

$R = \frac{A}{P} = \underline{1.77\ ft}$



REFERENCE

Computations for XKOR

Bend Losses

$$h_b = K_b \frac{v^2}{2g}$$

$K_b = 0.7$ for 45° bend — King's Handbook Pg 6-23
$= 0.42$ " $22\frac{1}{2}^\circ$ "
$= 0.83$ " 60° "
$\simeq 1.0$ " 90° " (Assume)

Frictional Losses

$$K_f = \frac{29.1\, n^2 L}{R^{4/3}}$$ — HEC-2 Manual

Exit Loss

$$h_{exit} = K_{exit} \frac{v^2}{2g}$$

where $K_{exit} = 1.0$

Junction Losses

Assumed negligible

(i) XKOR for the Enclosure Length from 0+00 to 13+56

$$XKOR = K_f + K_b + K_{exit}$$

where

$$K_f = \frac{29.1(0.02)^2 1356}{(1.76)^{4/3}} \qquad (n \simeq 0.02)$$

REFERENCE

or $K_f = \underline{7.4}$

K_b

one 30° bend and one 90° bend

$\therefore K_b \approx 1.0 + 0.5 = \underline{1.5}$

$K_{Exit} = 1.0$

$\therefore X_{KOR} = 7.4 + 1.5 + 1.0 = \underline{9.9}$

(ii) X_{KOR} for the Enclosure Length from 13+56 to 17+68

$X_{KOR} = K_f + K_b$

where $K_f = \dfrac{29.1(0.02)^2 412}{(1.57)^{4/3}}$ $(n \approx 0.02)$

$= 2.6$

K_b

one 60° bend, two $22\frac{1}{2}$° bends, and one 45° bend

$\therefore K_b = 0.83 + 2(0.42) + 0.7$

$= 2.4$

$\therefore X_{KOR} = 2.6 + 2.4 = \underline{5.0}$

SUBJECT	BY	CHK.	SHEET NO.	File Code No. (Job No.) Owner • Project • Suffix
Arcadia Creek Enclosure #1A	DATE 4/12/90	DATE	9 OF 16	HUD • 2027 • 05

REFERENCE

(iii) XKOR for the Enclosure Length from 17+68 to 18+82

$$XKOR = K_f \quad \text{(There is no bend)}$$

$$= \frac{29.1(0.02)^2 114}{(2.13)^{4/3}} \quad (n \approx 0.02)$$

$$= \underline{0.5}$$

(iv) XKOR for the Enclosure Length from 18+82 to 19+73

$$XKOR = K_f + K_b$$

$$\text{where } K_f = \frac{29.1(0.02)^2 91}{(1.85)^{4/3}} \quad (n \approx 0.02)$$

$$= \underline{0.5}$$

K_b one 12° bend

Take $K_b \approx \underline{0.3}$

$\therefore XKOR = 0.5 + 0.3 = \underline{0.8}$

(v) XKOR for the Enclosure Length from 19+73 to 24+07

$$XKOR = K_f + K_b$$

$$\text{where } K_f = \frac{29.1(0.02)^2 434}{(1.86)^{4/3}} \quad (n \approx 0.02)$$

$$= \underline{2.2}$$

SUBJECT	BY	CHK.	SHEET NO.	File Code No. (Job No.) Owner Project Suffix
Arcadia Creek Enclosure #1A	Susan		10 OF 16	HUD • 200 • 07
	DATE 4/2/90	DATE		

REFERENCE

K_b

one 45° bend, and two $22\frac{1}{2}°$ bends

$\therefore \quad K_b = 0.7 + 2(0.42)$

$\approx \underline{1.5}$

$\therefore \quad XKOR = 2.2 + 1.5 = \underline{3.7}$

(vi) XKOR for the Enclosure Length from 24+07 to 27+84

$XKOR = K_f + K_b$

where $K_f = \dfrac{29.1(0.02)^2 377}{(1.68)^{4/3}}$ $(n \approx 0.02)$

$= \underline{2.2}$

K_b one 10° bend

Take $K_b \approx \underline{0.2}$

$\therefore \quad XKOR = 2.2 + 0.2 = \underline{2.4}$

(vii) XKOR for the Enclosure Length from 27+84 to 28+84

$XKOR = K_f + K_b$

where $K_f = \dfrac{29.1(0.02)^2 100}{(1.81)^{4/3}}$ $(n \approx 0.02)$

$= \underline{0.5}$

K_b

Two $22\frac{1}{2}^\circ$ bends

$\therefore K_b = 2(0.42) = \underline{0.8}$

$XKOR = 0.5 + 0.8 = \underline{1.3}$

(viii) XKOR for the Enclosure Length from 28+84 to 29+64

$XKOR = K_f + K_b$

$K_f = \dfrac{29.1\,(0.02)^2\,80}{(1.85)^{4/3}}$ $(n \approx 0.02)$

$= \underline{0.4}$

K_b one 30° bend

$\therefore K_b = \underline{0.5}$

Hence $XKOR = 0.4 + 0.5 = \underline{0.9}$

(ix) XKOR for the Enclosure Length from 29+64 to 30+75 (U/s end)

$XKOR = K_f + K_{Entry}$ (There is no bend)

$K_f = \dfrac{29.1\,(0.02)^2\,111}{(1.77)^{4/3}} = \underline{0.6}$

Take $K_{Entrance} \approx \underline{0.4}$

$\therefore XKOR = 0.6 + 0.4 = \underline{1.0}$

REFERENCE

Computations for average value of XKOR

Total Head Loss through the Enclosure

$$= \sum_{i=1}^{9} h_i$$

$$= \sum_{i=1}^{9} \frac{(XKOR)_i \left(\frac{Q}{A_i}\right)^2}{2g}$$

$$= \frac{9.9\left(\frac{Q}{46.1}\right)^2}{2g} + \frac{5.0\left(\frac{Q}{42.6}\right)^2}{2g} + \frac{0.5\left(\frac{Q}{68.6}\right)^2}{2g}$$
$$+ \frac{0.8\left(\frac{Q}{51.5}\right)^2}{2g} + \frac{3.7\left(\frac{Q}{53.95}\right)^2}{2g} + \frac{2.4\left(\frac{Q}{44.0}\right)^2}{2g}$$
$$+ \frac{1.3\left(\frac{Q}{47.8}\right)^2}{2g} + \frac{0.9\left(\frac{Q}{54.4}\right)^2}{2g} + \frac{1.0\left(\frac{Q}{43.1}\right)^2}{2g}$$

$$= \frac{0.011744\, Q^2}{2g}$$

The average area of flow through the Enclosure shall be taken equal to the area available on the D/S side.

Therefore, taking area of flow equal to 46.1 ft^2, the above noted eqn. can be written as

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TAYLOR, MICHIGAN 48180

REFERENCE

Total Head Loss through the Enclosure

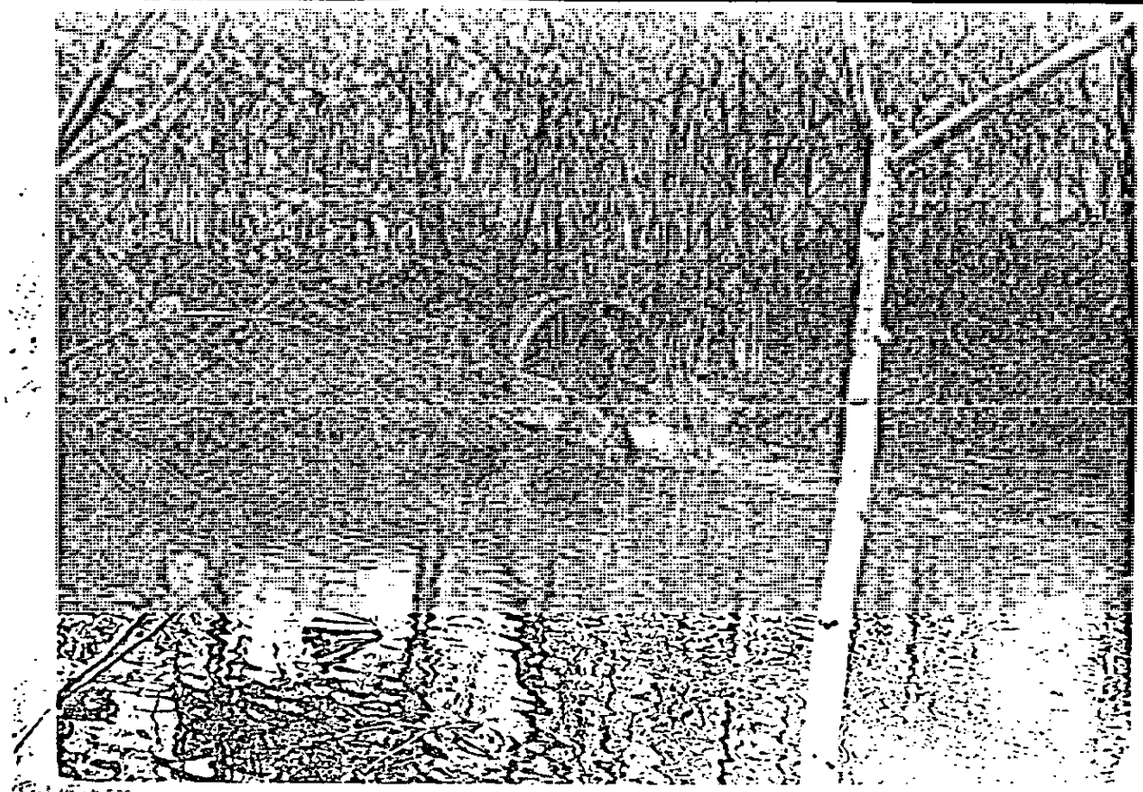
$$= \frac{25.0 \left(\frac{Q}{46.1}\right)^2}{2g}$$

Hence, av. value of XKOR = 25.0

Av. area of flow, BAREA = 46.1 ft^2

As per output enclosed (under a separate folder), flow through the Enclosure is given below:-

10 yr	50 yr	100 yr	500 yr
344 CFS	347 CFS	348 CFS	350 CFS

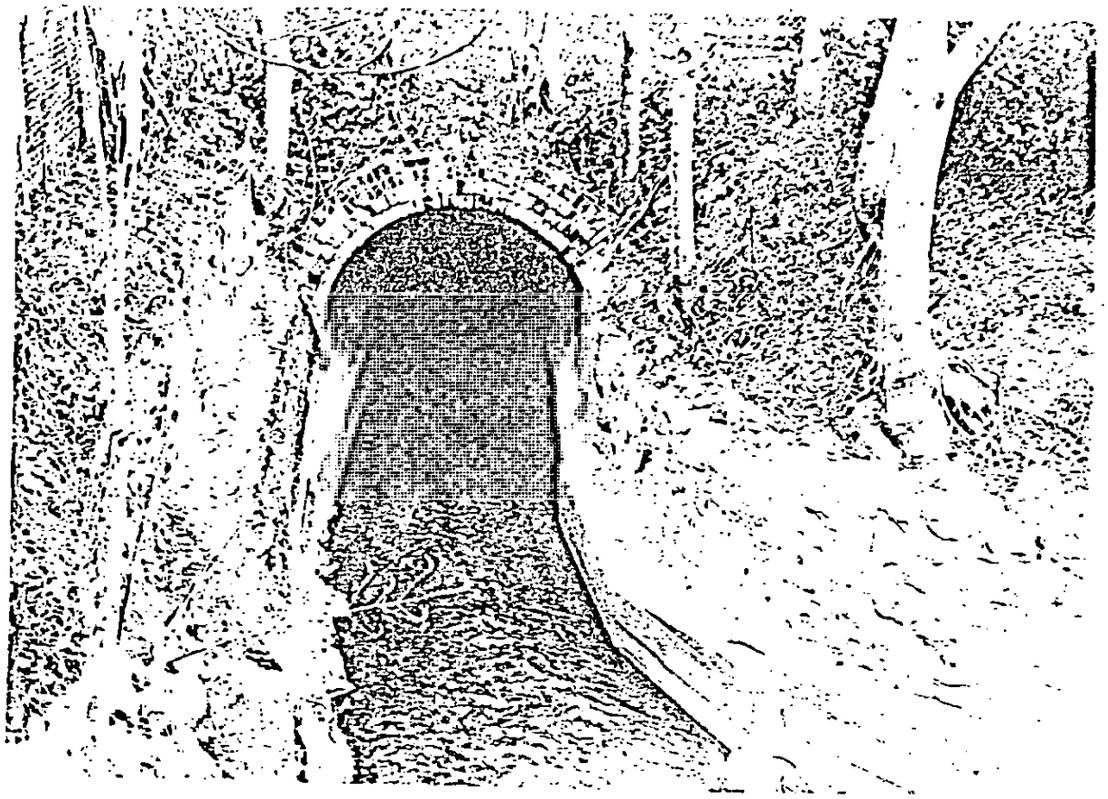


SECTION #73 OUTLET ARCADIA CREEK
INTO PORTAGE CREEK

D/S END OF ENCLOSURE

Sheet 15/16

HUD 2027-07



SECTION #75A ARCADIA ENCLOSURE STA 30+63

U/S END OF ENCLOSURE

Sheet 16/16

HUD 2027-01

REFERENCE

Pressure Flow Computations for Arcadia Creek Enclosures

1B) Enclosure from u/s of Busdick st. to Park St.

Alignment of the Enclosure shown on the next sheet.

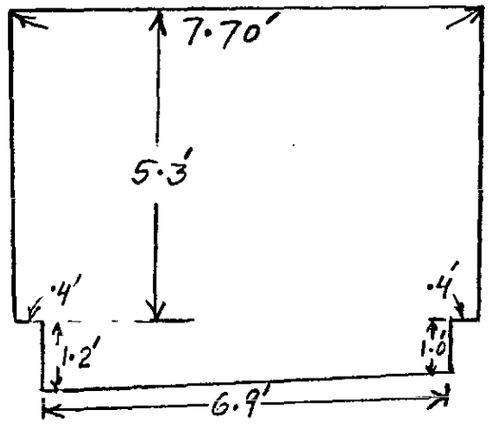
Data taken from Survey Notes

(i) Cross section from 31+13.5 to 32+80

X-sectional Area (A)

$= 7.70 \times 5.3 + 1.1 \times 6.9$

$= \underline{48.4}$ sq. ft.



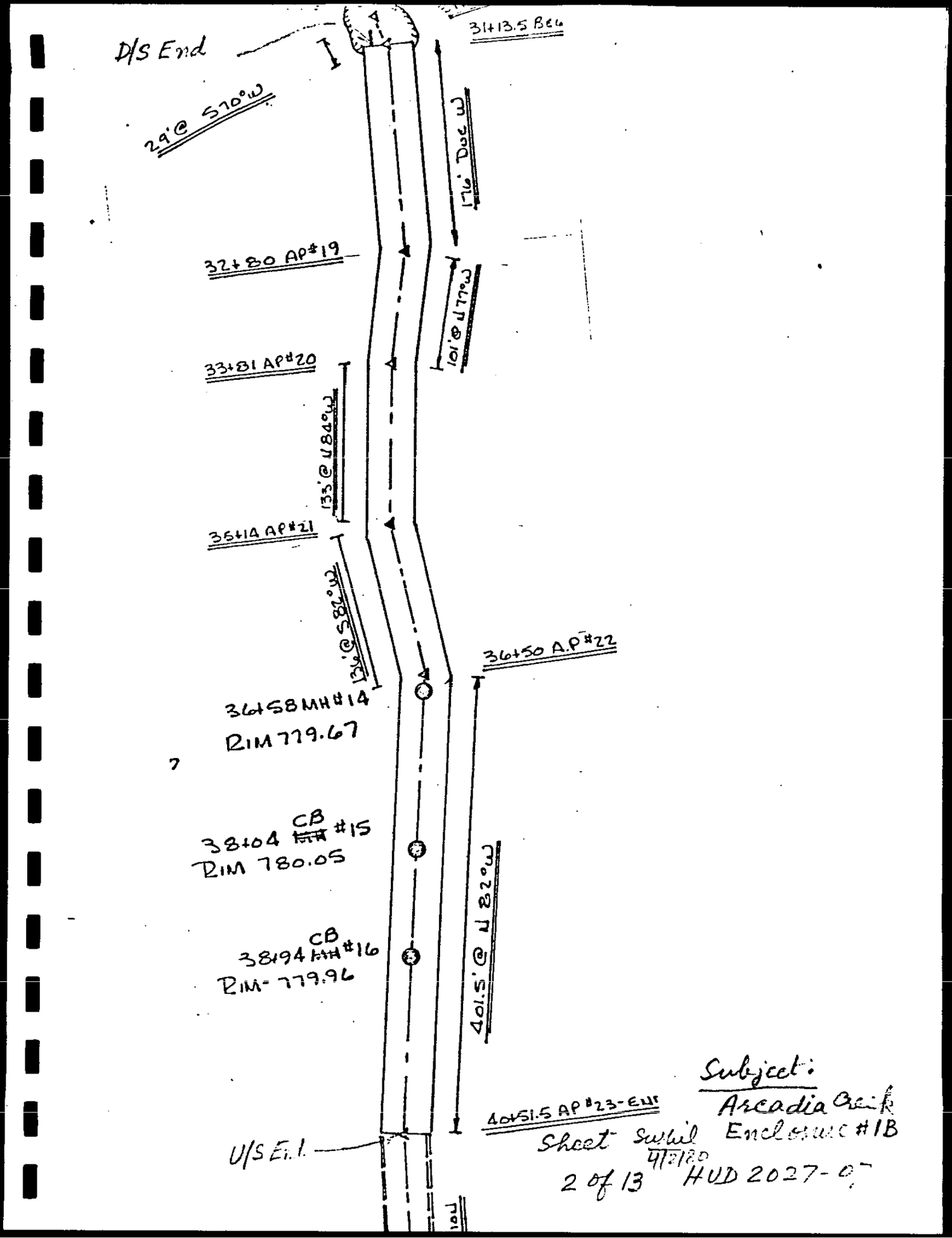
Wetted Perimeter (P)

$= 7.7 + 2(5.3) + 2(.4) + 1.2 + 1.0 + 6.9$

$= \underline{28.2}$ ft

$\therefore R = \frac{A}{P} = \underline{1.72 \text{ ft}}$

SUBJECT	BY	CHK.	SHEET NO.	File Code No. (Job No Owner Project Suffix
Arcadia Creek Enclosure #1 1B	DATE 4/2/18	DATE	1 OF 13	HUD • 2037 • 07

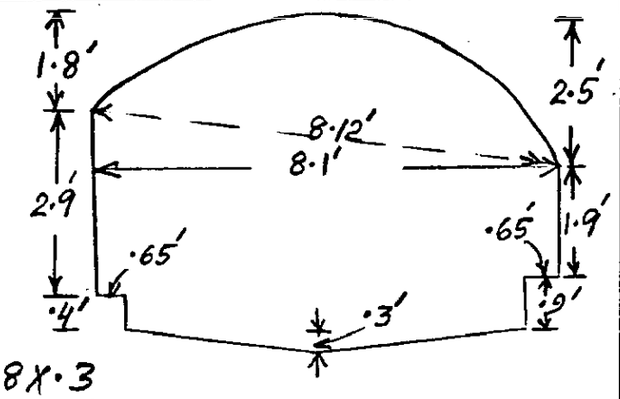


Subject:
Arcadia Creek
Enclosure #1B

Sheet Serial 41-2180
2 of 13 HUD 2027-0

REFERENCE

(ii) Cross section from 32+80 to 33+81



Area (A)

$= 13.2 + \frac{2.9+1.9}{2}(8.1) + \frac{.4+.9}{2}(6.8) + \frac{6.8 \times .3}{2}$

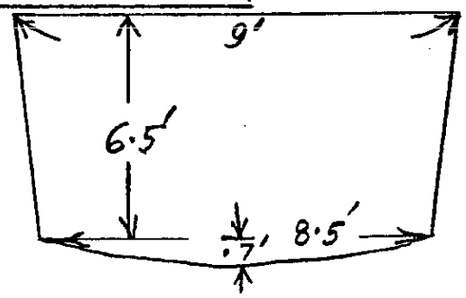
$= \underline{38.1\ ft^2}$

$P = 9.8 + 2.9 + .65 + .4 + 6.9 + .9 + .65 + 1.9$

$= \underline{24.1\ ft}$

$\therefore R = \frac{A}{P} = \underline{1.58\ ft}$

(iii) Cross section from 33+81 to 35+14



$A = \frac{9.0+8.5}{2}(6.5) + \frac{8.5 \times .7}{2}$

$= \underline{59.9\ ft^2}$

$P = 9 + 2(6.5) + 8.6 = \underline{30.6\ ft}$

$\therefore R = \frac{A}{P} = \underline{1.96\ ft}$

SUBJECT	BY	CHK.	SHEET NO.	File Code No. (Job No.) Owner Project Suffix
Arcadia Creek Enclosure #1B	Sue Gil		3 OF 13	HUD • 202 • C
	DATE 4/2/80	DATE		

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WORK SHEET

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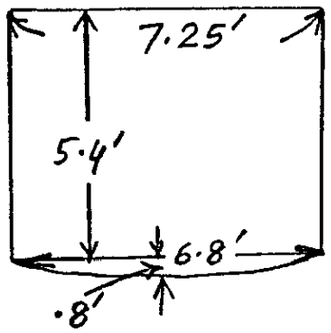
REFERENCE

(iV) Cross section from 35+14 to 37+18



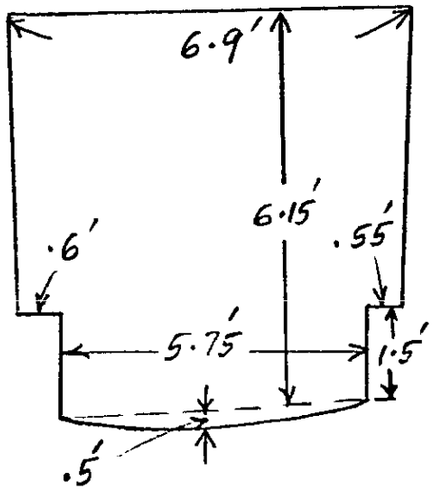
$$A = \frac{7.25+6.8}{2}(5.4) + \frac{6.8 \times .8}{2}$$

$$= \underline{40.7\ ft^2}$$

$$P = 7.25 + 2(5.4) + 6.9 = 24.95\ ft$$

$$R = \frac{A}{P} = \underline{1.63\ ft}$$

(V) Cross section from 37+18 to 38+53



$$A = 6.9 \times 4.65 + 1.5 \times 5.75 + \frac{5.75 \times .5}{2}$$

$$= 42.1\ ft^2$$

$$P = 6.9 + 2(4.65) + .6 + .55 + 2(1.5) + 5.75$$

$$= 25.5\ ft$$

$$R = \frac{A}{P} = \underline{1.65\ ft}$$

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WORK SHEET

25185 GODDARD ROAD
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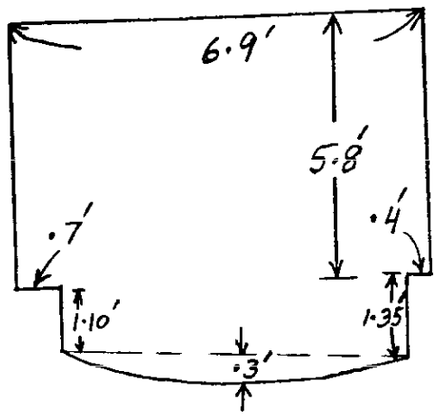
REFERENCE

(vi) Cross section from 38+53 to 39+85

$$A = 6.9 \times 5.8 + 5.8\,\frac{1.1+1.35}{2} + \frac{5.8 \times .3}{2}$$

$$= \underline{48.0}\ ft^2$$



$$P = 6.9 + 2(5.8) + .7 + .4 + 1.1 + 1.35 + 5.9$$

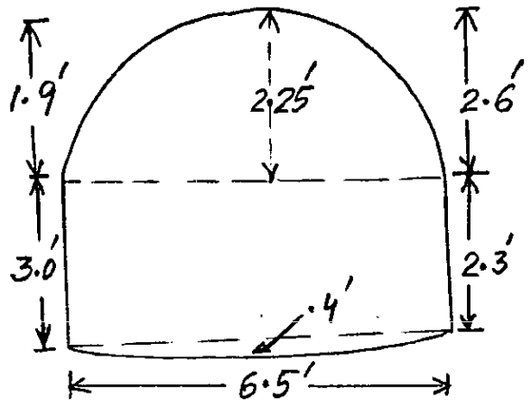
$$= \underline{27.9}\ ft$$

$$R = \frac{A}{P} = \underline{1.72}\ ft$$

(vii) Cross section from 39+85 to 40+51.5

$$A = .276\,\pi\,3.47^2 + 6.5\,\frac{3+2.3}{2} + \frac{6.5 \times .4}{2}$$

$$= \underline{29.0\ ft^2}$$



$$P = 8.4 + 3.0 + 6.5 + 2.3$$

$$= 20.2\ ft$$

$$R = \frac{A}{P} = \underline{1.44\ ft}$$

FORM 25-0
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Wade, Trim & Associates, Inc.
Civil Engineers • Land Surveyors
WORK SHEET

25185 GODDARD ROAD
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REFERENCE

Computations for XKOR

(i) XKOR for the Enclosure Length from 31+13.5 to 32+80

$$XKOR = K_f + K_b + K_{exit}$$

where $K_f = \dfrac{29.1\,(.02)^2\,166.5}{(1.72)^{4/3}}$ $(n \approx 0.02)$

$= \underline{0.94}$

$\underline{K_b}$

one bend of 13°

Take $K_b \approx \underline{0.3}$

$K_{exit} = \underline{1.0}$

$\therefore$ $XKOR = 0.94 + 0.3 + 1.0$

$= \underline{2.2}$

(ii) XKOR for the Enclosure Length from 32+80 to 33+81

$$XKOR = K_f + K_b$$

REFERENCE

where $K_f = \frac{29.1(.02)^2 101}{(1.58)^{4/3}}$ $(n \approx 0.02)$

$= \underline{0.64}$

K_ℓ

one 7° bend

Take $K_\ell \approx \underline{0.2}$

$\therefore \Sigma K OR = 0.64 + 0.2 = \underline{0.8}$

(iii) $\Sigma K OR$ for the Enclosure Length from 33+81 to 35+14

$\Sigma K OR = K_f + K_\ell$

where $K_f = \frac{29.1(0.02)^2 133}{(1.96)^{4/3}}$ $(n \approx 0.02)$

$= \underline{0.63}$

K_ℓ

one 14° bend

Take $K_\ell \approx \underline{0.3}$

$\therefore \Sigma K OR = 0.63 + 0.3 = \underline{0.9}$

REFERENCE

(iv) XKOR for the Enclosure Length from 35+14 to 37+18

$$XKOR = K_f + K_b$$

where $K_f = \dfrac{29.1(0.02)^2 204}{(1.63)^{4/3}}$ $(n \approx 0.02)$

$= \underline{1.2}$

$\underline{K_b}$

one 16° bend

Take $K_b \approx \underline{0.3}$

$\therefore$ $XKOR = 1.2 + 0.3 = \underline{1.5}$

(v) XKOR for the Enclosure Length from 37+18 to 38+53

$XKOR = K_f$ (There is no bend)

$= \dfrac{29.1(0.02)^2 135}{(1.65)^{4/3}}$ $(n \approx 0.02)$

$= \underline{0.8}$

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Civil Engineers • Land Surveyors
25185 GODDARD ROAD
TAYLOR, MICHIGAN 48180

WORK SHEET

REFERENCE

(vi) XKOR for the Enclosure Length from 38+53 to 39+85

$$XKOR = K_f \text{ (There is no bend)}$$

$$= \frac{29.1(0.02)^2 132}{(1.72)^{4/3}} \quad (n \simeq 0.02)$$

$$= \underline{0.7}$$

(vii) XKOR for the Enclosure Length from 39+85 to 40+51.5 (U/S end)

$$XKOR = K_f + K_{entry}$$

where $$K_f = \frac{29.1(0.02)^2 66.5}{(1.44)^{4/3}} \quad (n \simeq 0.02)$$

$$= \underline{0.5}$$

Take $K_{entry} \simeq \underline{0.4}$

$$\therefore \quad XKOR = 0.5 + 0.4$$

$$= \underline{0.9}$$

SUBJECT	BY	CHK.	SHEET NO.	File Code No. (Job No.) Owner / Project / Suffix
Arcadia Creek Enclosure #18	Susie		9 OF 13	HUD • 2027 • 07
	DATE 4/3/80	DATE		

REFERENCE

Computations for average value of XKOR to be used in SB card for Pressure Flow

Total Head Loss through the Enclosure

$$= \sum_{i=1}^{7} h_i$$

$$= \sum_{i=1}^{7} \frac{(XKOR)_i \left(\frac{Q}{A_i}\right)^2}{2g}$$

$$= \frac{2.2\left(\frac{Q}{48.4}\right)^2}{2g} + \frac{0.8\left(\frac{Q}{38.1}\right)^2}{2g} + \frac{0.9\left(\frac{Q}{59.9}\right)^2}{2g} + \frac{1.5\left(\frac{Q}{40.7}\right)^2}{2g} + \frac{0.8\left(\frac{Q}{42.1}\right)^2}{2g} + \frac{0.7\left(\frac{Q}{48.0}\right)^2}{2g} + \frac{0.9\left(\frac{Q}{29.0}\right)^2}{2g}$$

$$= \frac{0.004474\ Q^2}{2g}$$

The average area of flow through the Enclosure to be used in SB card shall be taken equal to the area available on the D/S side.

Therefore, taking area of flow equal

SUBJECT	BY	CHK.	SHEET NO.	File Code No. (Job No.) Owner Project Suffix
Arcadia Creek Enclosure # 1B	DATE 4/3/80	DATE	10 OF 13	HOD • 27 • 07

REFERENCE

to 48.4 ft^2, the above noted eqn. can be written as

Total Head Loss through the Enclosure

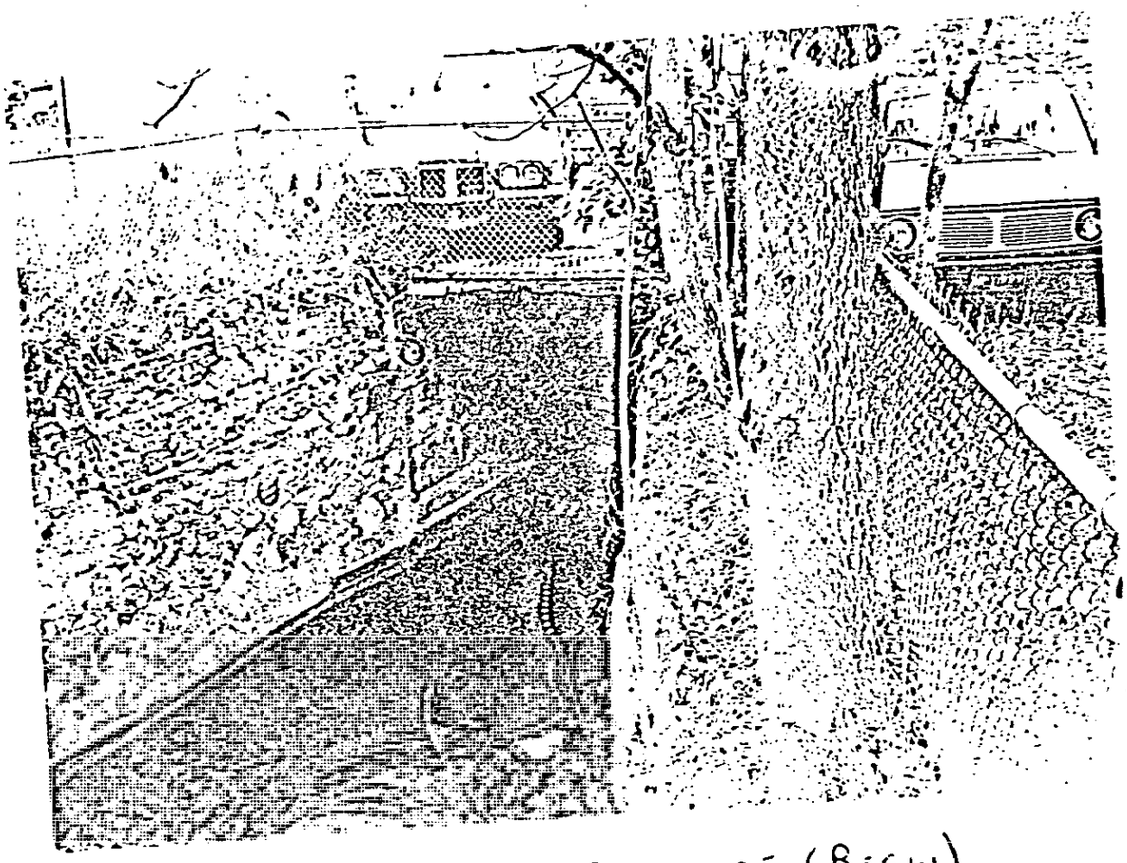
$$= \frac{10.5\left(\frac{Q}{48.4}\right)^2}{2g}$$

Hence av. value of XKOR = 10.5 reasonable

BAREA, Av. area of flow = 48.4 ft^2

As per output enclosed (under a separate folder), flow through the Enclosure is given below:

10 yr	50 yr	100 yr	500 yr
211 CFS	207 CFS	206 CFS	204 CFS

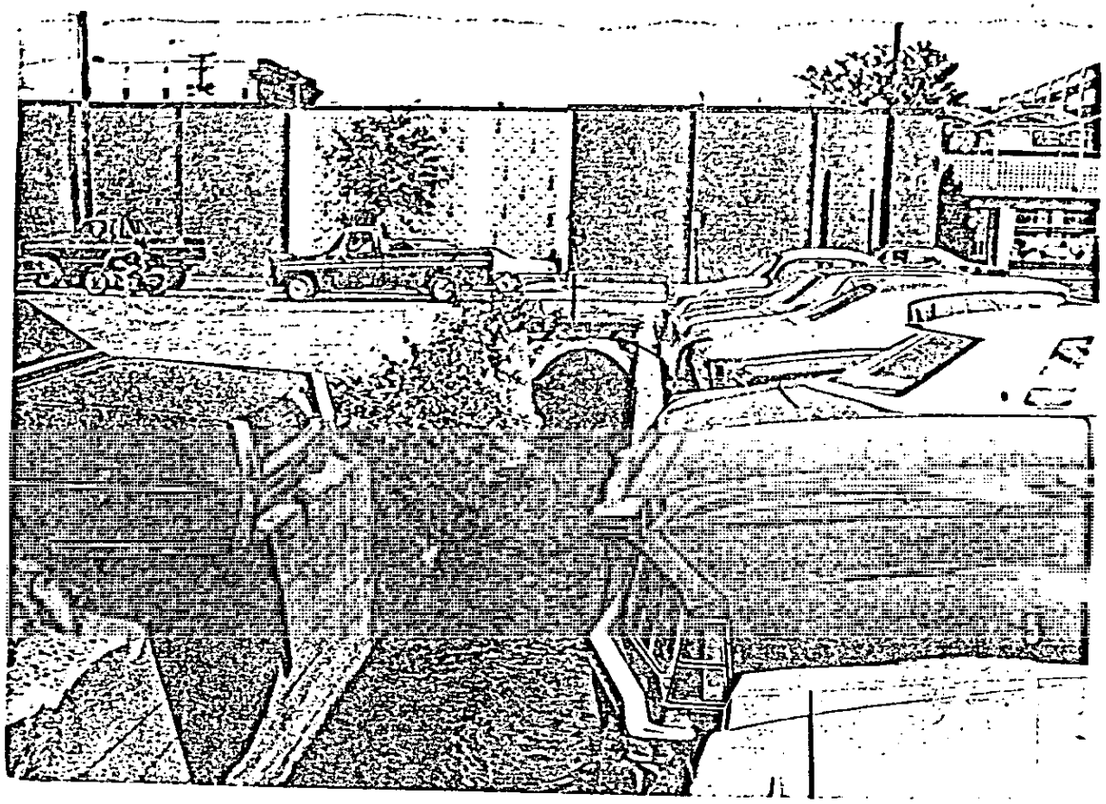


SECTION #75C ARCADIA ENCLOSURE (BEGIN)
STA 31+13.5

D/S END OF ENCLOSURE

Sheet 12/13

HUD 2007.07



ARCADIA DRAIN AT PARK (BEG ENCLOSED SYSTEM SECTION #76

U/S END OF ENCLOSURE

Sheet 13/13

HUD 2027-07

REFERENCE

Pressure Flow Computations for Arcadia Creek Enclosures

1C) Enclosure from Cooley St to Elm St

Alignment of the Enclosure shown on the next two sheets

Data taken from Survey Notes

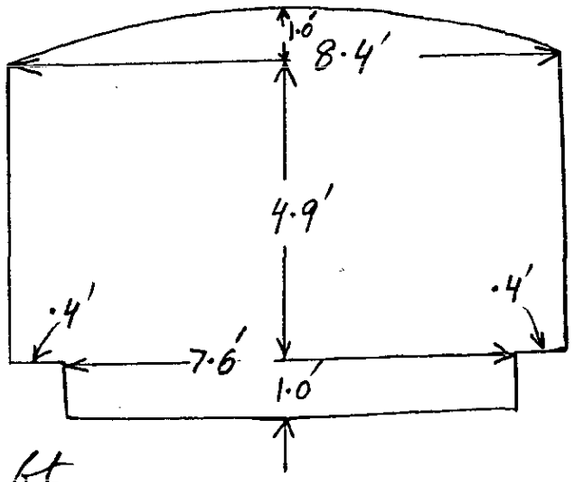
(i) Cross section from 43+16 to 46+53.3

X-sectional Area (A) = $5.5 + 8.4 \times 4.9 + 7.6 \times 1.0 = 54.3\ ft^2$

Wetted Perimeter (P)

$= 8.7 + 2(4.9) + 2(.4) + 2(1.0) + 7.6$

$= 28.9\ ft$

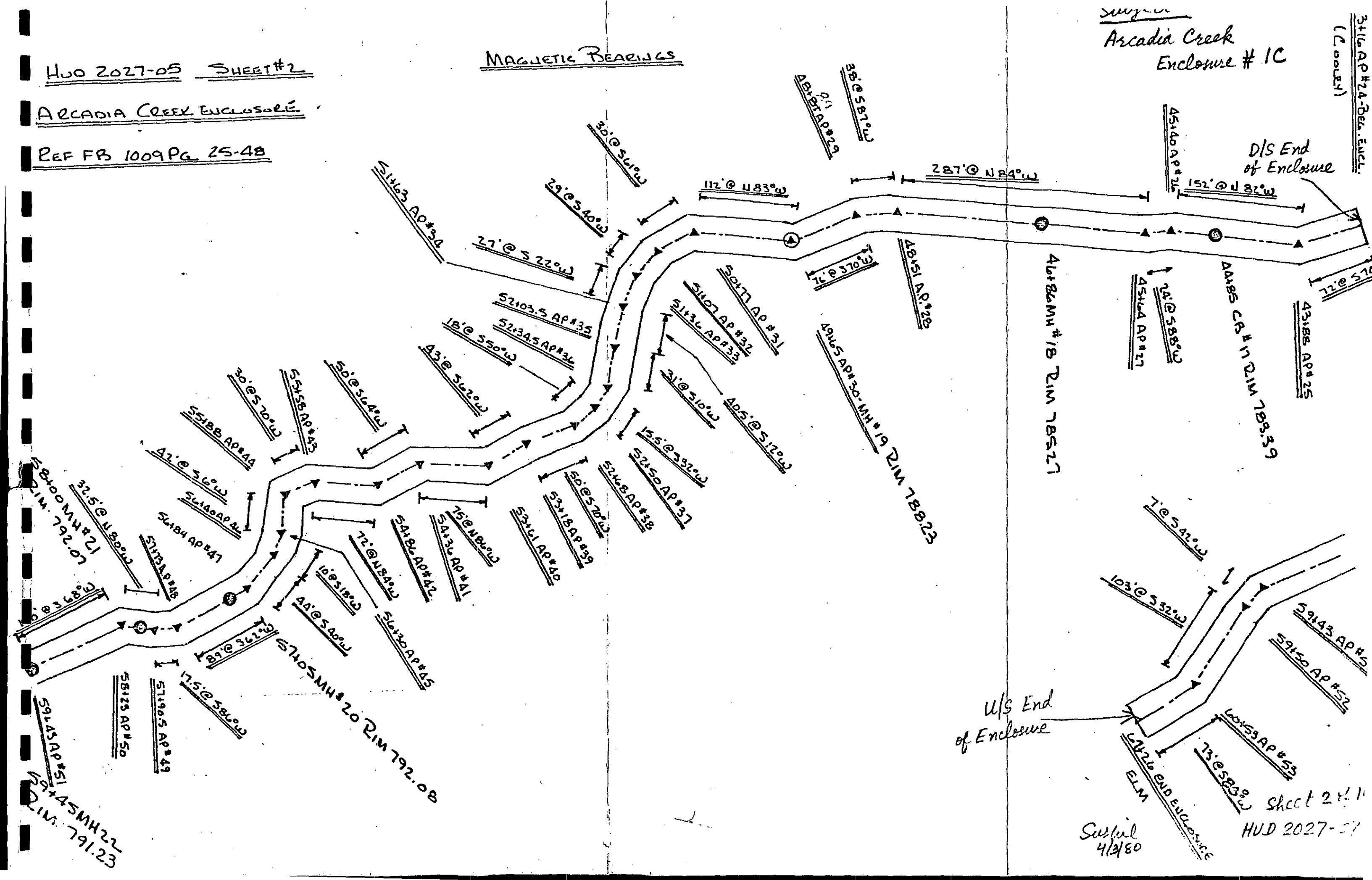


$R = \frac{A}{P} = 1.88\ ft$

HUD 2027-05 SHEET #2

ARCADIA CREEK ENCLOSURE

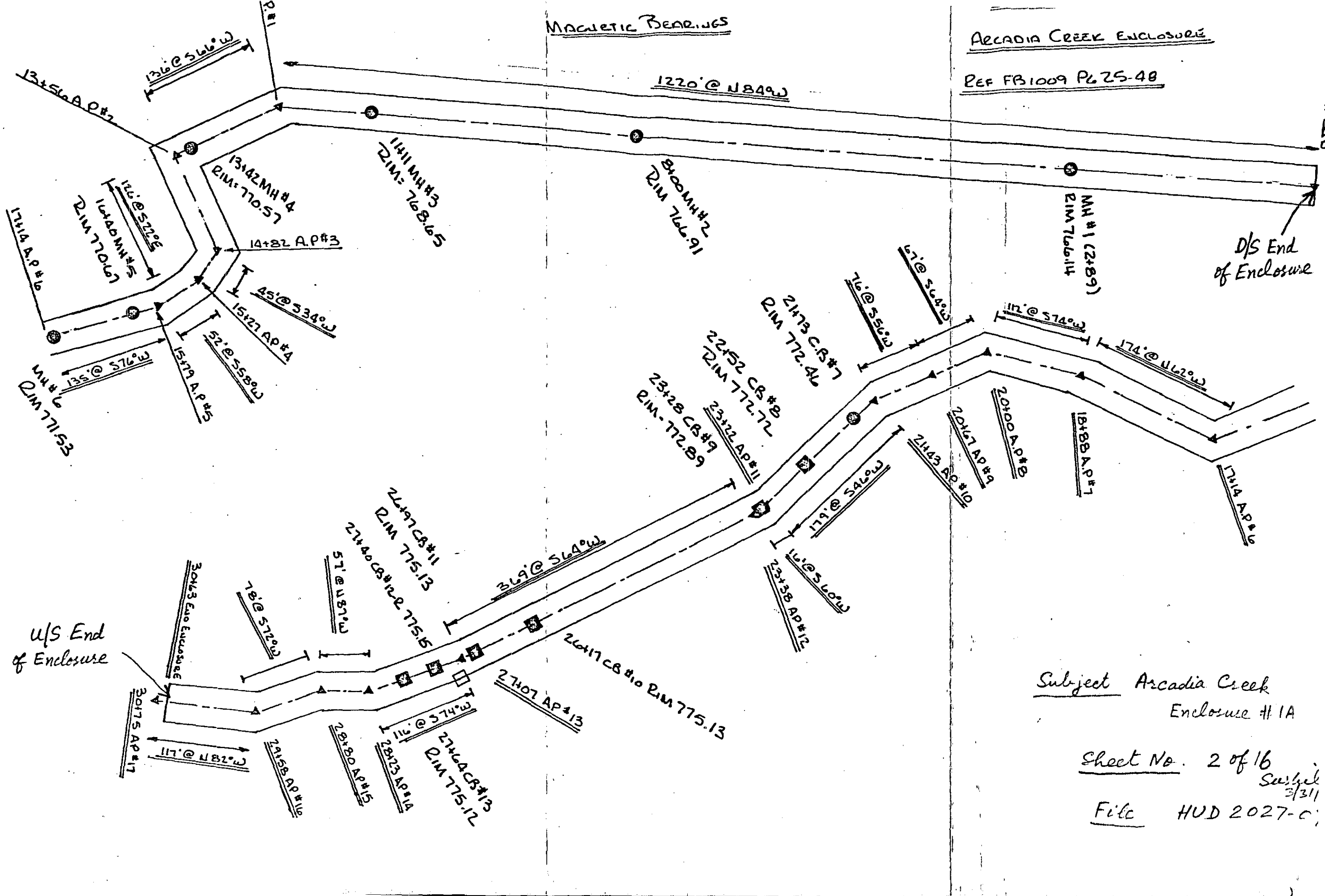
REF FB 1009 PG 25-48



Sheet 2 of 1

HUD 2027-

Surfvil 4/3/80



Subject Arcadia Creek Enclosure #1A

Sheet No. 2 of 16

Sushil 3/31/

File HUD 2027-0

HYDRAULIC REPORT
ARCADIA CREEK
CITY OF KALAMAZOO, MICHIGAN

I INTRODUCTION

This report summarizes the hydraulic studies undertaken to support detailed studies of approximately 4.5 miles of the Arcadia Creek in the City of Kalamazoo, Michigan. Bill Weaver served as Project Manager for this Study.

The Arcadia Creek basin area consists of approximately 16.5 square miles, of which 5.5 square miles are in the City of Kalamazoo. Nine of the 11 square miles which lie outside the City are depression areas. These areas are not included in the Arcadia Creek Drainage Basin which results in the contributing drainage area being reduced to 7.5 square miles. The area outside the City is basically rural while the remaining basin area inside the City is urbanized.

As shown in Exhibit 1, the Arcadia Creek is partially enclosed at the following locations:

A. Mouth to about 150 feet upstream of Burdick Street,

B. Two hundred feet upstream of Burdick Street to upstream of Park Street,

C. Downstream of Cooley Street to upstream of Elm Street, and

D. Downstream of Lovell Street to about 500 feet downstream of Oliver Street.

The four enclosures along with 20 culvert cross sections, two weir sections, and 20 valley sections were field surveyed by Wade, Trim & Associates, Inc. in October, 1979. These cross sections were supplemented by Abrams aerial elevation information, 2-foot contour maps and U.S.G.S. quadrangle maps which consist of 10-foot contour intervals (References 1, 2 and 3).

Cross section locations are shown on Exhibit 1. Table 1 cross references section designations by showing the computer section number which corresponds to each cross section letter shown in Exhibit 1. Table 2 lists discharges which have been approved by the Michigan Department of Natural Resources (M.D.N.R.) for the Arcadia Creek.

TABLE 1

ARCADIA CREEK

CITY OF KALAMAZOO

CROSS REFERENCE INDEX

X-SECTION	ABRAMS/ WTA NO.	COMPUTER NO.	DESCRIPTION
A	-	1	Overland Section
B	-	3	Overland Section
C	-	4	Overland Section
D	74	6	Overland Section
E	-	9	Overland Section
F	-	12	Overland Section; U/S of Enclosure
G	75	15	Overland Section
H	77	17	Overland Section
I	78	19	Overland Section
J	79	22	Overland Section
K	80	28	D/S Face W. Main Street
L	80	29	U/S Face W. Main Street
M	82	32	D/S Face Academy Street
N	82	33	U/S Face Academy Street
O	85	38	D/S Face Lovell Street
P	-	41	Overland Section
Q	-	44	Overland Section
R	-	46	Overland Section
S	89	50	D/S Face Oliver Street
T	89	51	U/S Face Oliver Street
U	92	55	D/S Face Railroad
V	92	56	U/S Face Railroad
W	94	58	D/S Face Stadium Dr.
X	94	59	U/S Face Stadium Dr.
Y	95	69	Valley Section
Z	93	71.05	D/S Face Stadium Dr.
AA	93	71.1	U/S Face Stadium Dr.
AB	92	71.2	D/S Face Railroad

TABLE 1

ARCADIA CREEK

CITY OF KALAMAZOO

CROSS REFERENCE INDEX

(Continued)

X-SECTION	ABRAMS/ WTA NO.	COMPUTER NO.	DESCRIPTION
AC	92	71.3	U/S Face Railroad
AD	92	71.9	D/S Face Railroad
AE	92	71.92	U/S Face Railroad
AF	93	71.94	D/S Face Stadium Dr.
AG	99	72	U/S Face Stadium Dr.
AH	100	73.5	D/S Face Howard St.
AI	100	74	U/S Face Howard St.
AJ	103	77	Valley Section
AK	105	79	Valley Section
AL	106	79.2	D/S Face Stadium Dr.
AM	106	79.5	U/S Face Stadium Dr.
AN	108	81	Valley Section
AO	109	82	Valley Section
AP	110	83	Valley Section
AQ	111	84	Valley Section
AR	112	85	Valley Section
AS	113	86	Valley Section

TABLE 2

ARCADIA CREEK

CITY OF KALAMAZOO

FLOOD FLOW FREQUENCY DATA

LOCATION	DA mi^2	10 YEAR CFS	50 YEAR CFS	100 YEAR CFS	500 YEAR CFS
U/S of Howard	3.47	170	365	475	720
Oliver Street	4.13	315	435	485	745
At Kalamazoo River	7.55	665	920	1020	1285

II METHOD OF ANALYSIS

The HEC-2 backwater computer program was used in developing water surface profiles (Reference 4). Table 3 presents water surface elevations at selected locations for the four storms (10, 50, 100 and 500-year) analyzed in this report. HEC-2 printouts including computer cross section plots are presented as Exhibit 2. (Exhibit 2 is contained in the 11" x 15" folder enclosed with this report.) Water surface profiles resulting from the backwater analyses are presented as Exhibit 3.

TABLE 3

ARCADIA CREEK

CITY OF KALAMAZOO

FLOOD ELEVATIONS*

RECEIVED
JUL 6 1981
WATER MANAGEMENT

LOCATION	FREQUENCY 10 YEAR	50 YEAR	100 YEAR	500 YEAR
Pitcher Street	771.3	771.6	771.7	771.9
Burdick Street	778.5	778.7	778.8	778.9
D/S of West Main Street	793.0	793.2	793.3	793.5
D/S of Lovell Street	798.0	798.7	798.9	799.4
D/S of Oliver Street	812.3	813.1	813.4	814.0
U/S of Oliver Street	~~821.6~~ 815.1	~~822.1~~ 815.7	~~822.2~~ 815.9	~~822.8~~ 816.5
D/S of Howard Street	~~833.7~~ 833.8	~~834.4~~ 834.7	~~834.7~~ 835.1	~~836.2~~ 837.0
U/S of Howard Street	~~838.2~~ 840.5	~~841.9~~ 840.7	~~842.6~~ 840.7	~~844.9~~ 840.8
D/S of Stadium Drive West of Howard	845.1 ✓	~~845.7~~ 845.3	~~845.7~~ 845.4	~~845.8~~ 845.5
U/S of Stadium Drive West of Howard	~~850.0~~ 852.2	~~854.0~~ 854.2	~~854.4~~ 854.6	~~855.3~~ 855.5

*All elevations are based upon National Geodetic Vertical Datum

III VARIABLES AND COEFFICIENTS

Roughness coefficients (Mannings "n") were estimated from field inspections, quad maps, and photographs. Typical roughness values for the main channel and overbank areas of Arcadia Creek are .035 and .08, respectively, for all floods. These values are indicative of summer month conditions and are consistent with values recommended and used in engineering practice (Reference 5). Contraction and expansion coefficients were selected as 0.3 and 0.5, respectively, at bridge sections and 0.1 and 0.3, respectively, for gradual channel transitions. Bridge notes and sketches along with loss coefficient computations are included in Exhibit 4.

IV HIGH WATER MARKS

There are no documented high water marks for the Arcadia Creek.

V STARTING CONDITIONS

Arcadia Creek begins as an enclosure which outlets into Portage Creek. This outlet is located immediately upstream (100 feet ±) of the Portage Creek/Kalamazoo River confluence, as illustrated on Exhibit 1. Therefore, the mean annual flood elevation of the Kalamazoo River (Reference 6), located at its confluence with Portage Creek, was utilized for the starting water surface elevation for Arcadia Creek (10, 50, 100, and 500 year storms). As shown in Figure 1, the mean annual flood discharge of the Kalamazoo River at its confluence with Portage Creek is approximately 3,300 cfs, corresponding to a frequency of 2.33 years. This results in a mean annual flood elevation of 757.4, as shown in Figure 2.

The overland flow component of the Arcadia Creek had its starting water surface elevation set at critical depth because the roadway elevation (766.4) located at the mouth of Arcadia Creek, is higher than the mean annual flood elevation for the Kalamazoo River.

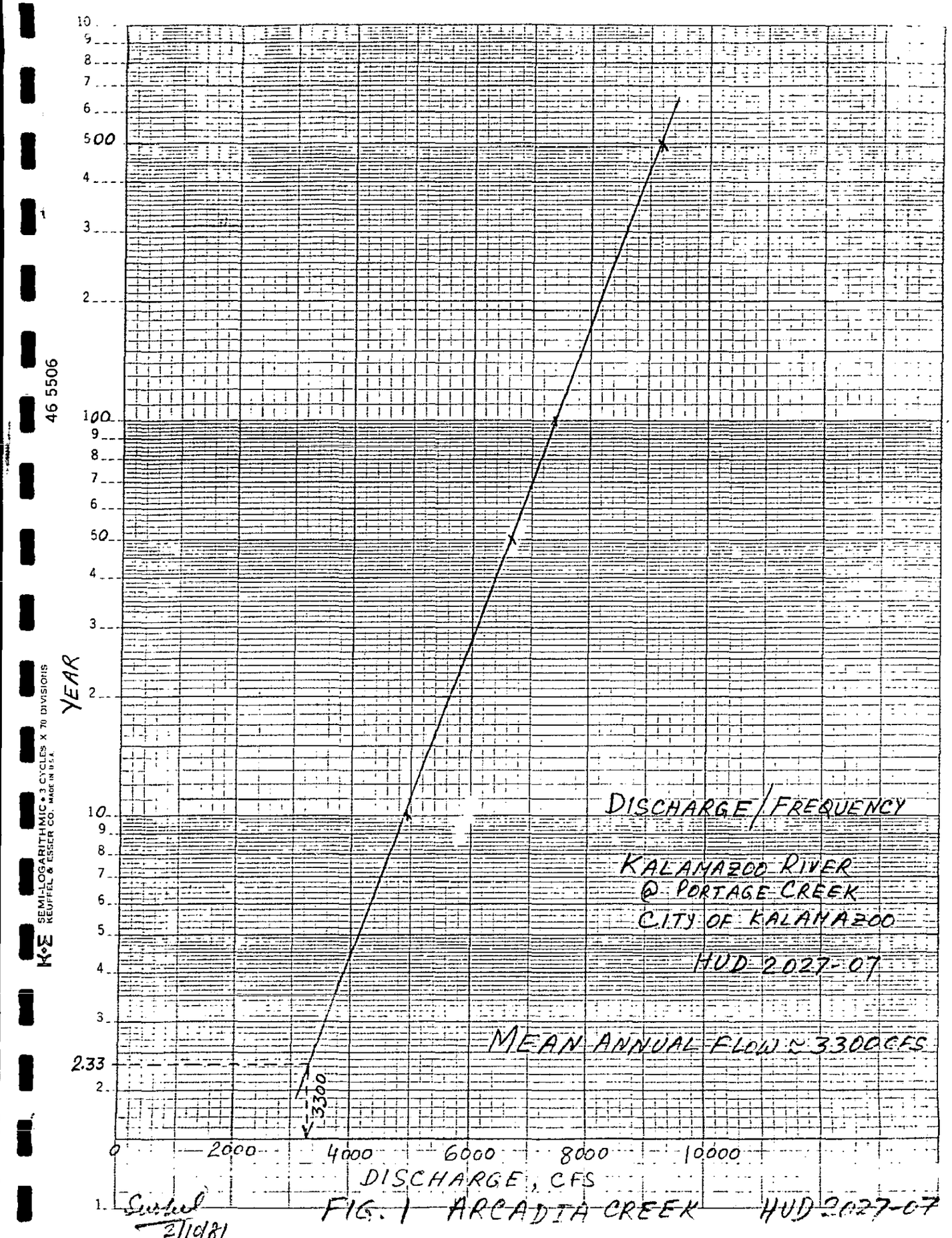


FIG. 1 ARCADIA CREEK HUD 2027-07

Sushel 2/10/81

K+E SEMI-LOGARITHMIC • 3 CYCLES X 70 DIVISIONS KEUFFEL & ESSER CO. MADE IN U.S.A. 46 5506

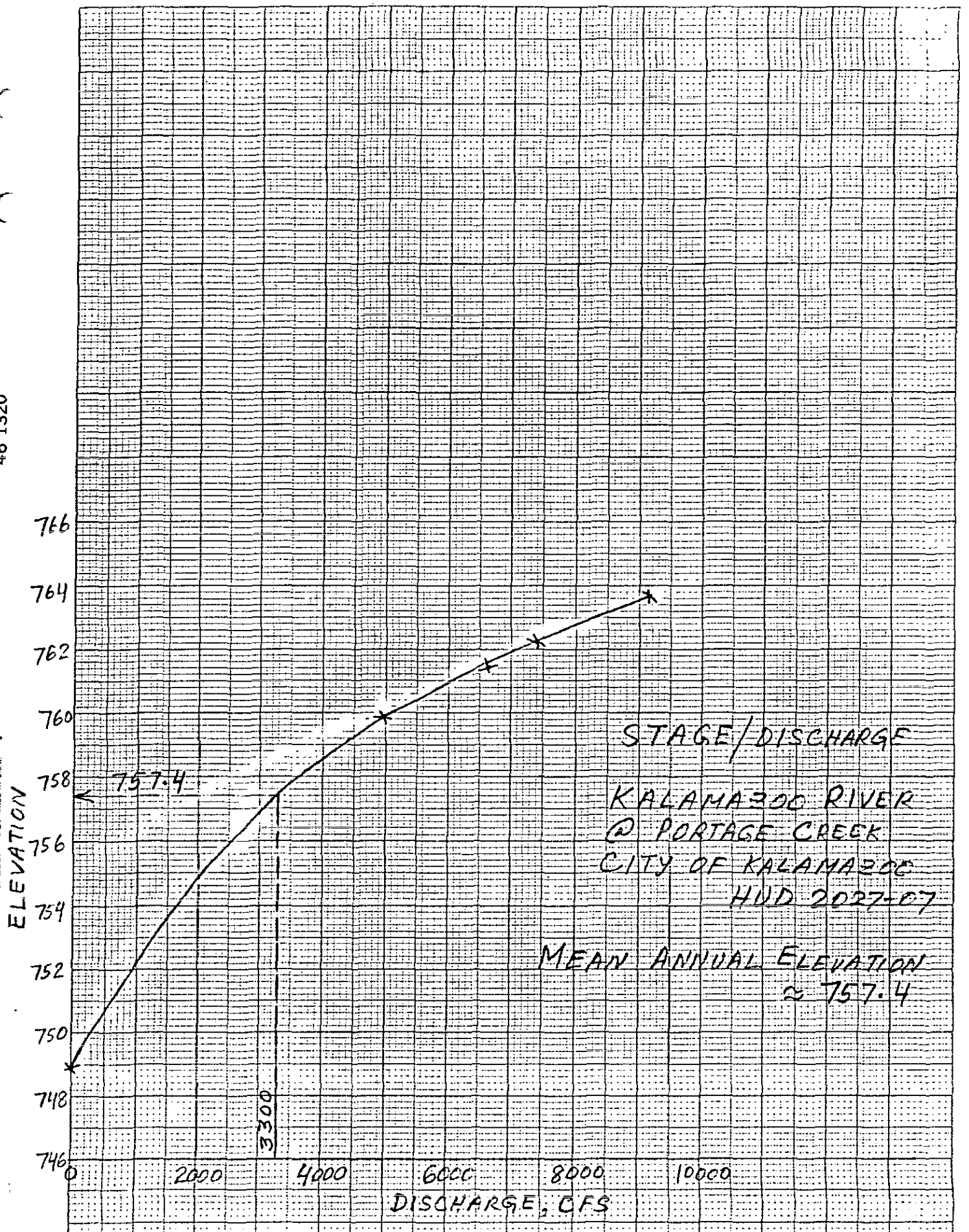


FIG. 2 ARCADIA CREEK HUD 2027-07

Sushil
2/10/87

46 1320
K+E 10 TO 1 INCH 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

VI SPECIAL PROBLEMS

A. ENCLOSURES

The enclosures on the Arcadia Creek required detailed analyses. For each of the enclosures, two types of flow would occur during a flood: pressure flow and overland flow. The total flow for each flood was distributed between pressure flow and overland flow as follows:

1. Pressure Flow

The HEC-2 special bridge routine was utilized for the computation of pressure flow through the enclosures. Loss coefficient values XKOR, were computed for each segment of the enclosure. These values were utilized in the computation of average values of XKOR and area of flow, BAREA. The roadway elevation was kept high enough so as to discount the possibility of any weir flow.

2. Overland Flow

Cross sections were located at intervals over each of the enclosures. These sections were dimensioned perpendicular to the anticipated flow lines and were extended across the entire flood plain.

Water surface and energy grade elevations for both overland and pressure flow were matched at both the upstream and downstream faces of each enclosure. This was accomplished by the adjustment of flow distribution between the overland flow paths and the enclosures. Detailed computations for the enclosures are presented as Exhibit 5. Table 4 lists the distribution of flow between pressure and overland flow for each enclosure.

TABLE 4

ARCADIA CREEK

CITY OF KALAMAZOO

FLOOD FLOW DISTRIBUTION

LOCATION	FREQUENCY 10 YEAR CFS	50 YEAR CFS	100 YEAR CFS	500 YEAR CFS
Enclosure from Mouth to 150 feet U/S of Burdick Street				
Flow through the Enclosure	344	347	348	350
Overland Flow	321	573	672	935
Enclosure from 200 feet U/S of Burdick Street to U/S of Park Street				
Flow through the Enclosure	211	207	206	204
Overland Flow	454	713	814	1081
Enclosure from D/S of Cooley Street to U/S of Elm Street				
Flow through the Enclosure	230	228	228	227
Overland Flow	435	692	792	1058
Enclosure from D/S of Lovell Street to 500 feet D/S of Oliver Street				
Flow through the Enclosure	125	124	124	124
Overland Flow	540	796	896	1161

B. *DIVERSIONS*

As shown in Exhibit 1, there is divided flow in the creek at two locations: between sections Z and AG and between sections AH and AM. Since the HEC-2 computer program is not set up to handle the divided flow in one step, the following analysis was performed for each of the two diversions:

1. Stage/discharge rating curves were developed separately for flow in the channel and overland flow.

2. The two rating curves were then combined to form a rating curve for the total flow versus channel water surface elevation on the upstream end. This information was utilized to distribute the total flow between overland flow and channel flow.

The rating curves for the two diversions are presented as Exhibit 6. Table 5 lists the flow distribution between channel and overland flow for each diversion.

TABLE 5

ARCADIA CREEK

CITY OF KALAMAZOO

FLOOD FLOW DISTRIBUTION

RECEIVED
JUL 6 1981
WATER MANAGEMENT

LOCATION	FREQUENCY 10 YEAR CFS	50 YEAR CFS	100 YEAR CFS	500 YEAR CFS
Diversion between Sections Z and AG				
Overland Flow	190	305	355	605
Channel Flow	125	130	130	140
Diversion between Sections AH and AM				
Overland Flow	0	~~148~~ 177	~~253~~ 283	~~489~~ 520
Channel Flow	170	~~217~~ 188	~~222~~ 192	~~231~~ 200

VII GENERAL

Computed water surface elevations were developed to an accuracy of 0.5 feet for floods of the selected recurrence intervals.

All elevations are referenced to the U.S. Geological Survey (U.S.G.S.) Datum. This datum is equivalent to the National Geodetic Vertical Datum (N.G.V.D.).

The hydraulic analyses for this study were based upon the effects of flow unobstructed by ice or debris. The flood elevations are considered valid only if hydraulic structures, in general, remain unobstructed and do not fail.

REFERENCES

1. Abrams Aerial Survey Corporation, Arcadia Creek Cross Sections, Kalamazoo Township, 1979.

2. U.S. Geological Survey Topographical Maps - Kalamazoo Quadrangle, Kalamazoo County, Michigan, 7.5 Minute Series, Photorevised, 1973.

3. U.S. Geological Survey Topographical Maps - Kalamazoo SW Quadrangle, Kalamazoo County, Michigan, 7.5 Minute Series, Photorevised, 1973.

4. U.S. Army Corps of Engineers - HEC-2 Water Surface Profiles - Users Manual - August, 1979.

5. Chow, Ven Te, Open Channel Hydraulics, McGraw Hill, Inc., 1959.

6. Wade, Trim & Associates, Inc., Taylor, Michigan, Hydraulic Analysis of Kalamazoo River Basin, City of Kalamazoo and Comstock Township, March, 1980.

ARCADIA CREEK

CITY OF KALAMAZOO, MICHIGAN

EXHIBIT 1

FIELD CROSS SECTION LOCATION AND

100-YEAR FLOOD PLAIN - FLOODWAY MAP

ARCADIA CREEK

CITY OF KALAMAZOO, MICHIGAN

EXHIBIT 2

COMPUTER PRINTOUTS

HEC-2 BACKWATER ANALYSIS WITH

CROSS SECTION PLOTS (See Separate Folder)

ARCADIA CREEK

CITY OF KALAMAZOO, MICHIGAN

EXHIBIT 3

WATER SURFACE PROFILES

ARCADIA CREEK

CITY OF KALAMAZOO, MICHIGAN

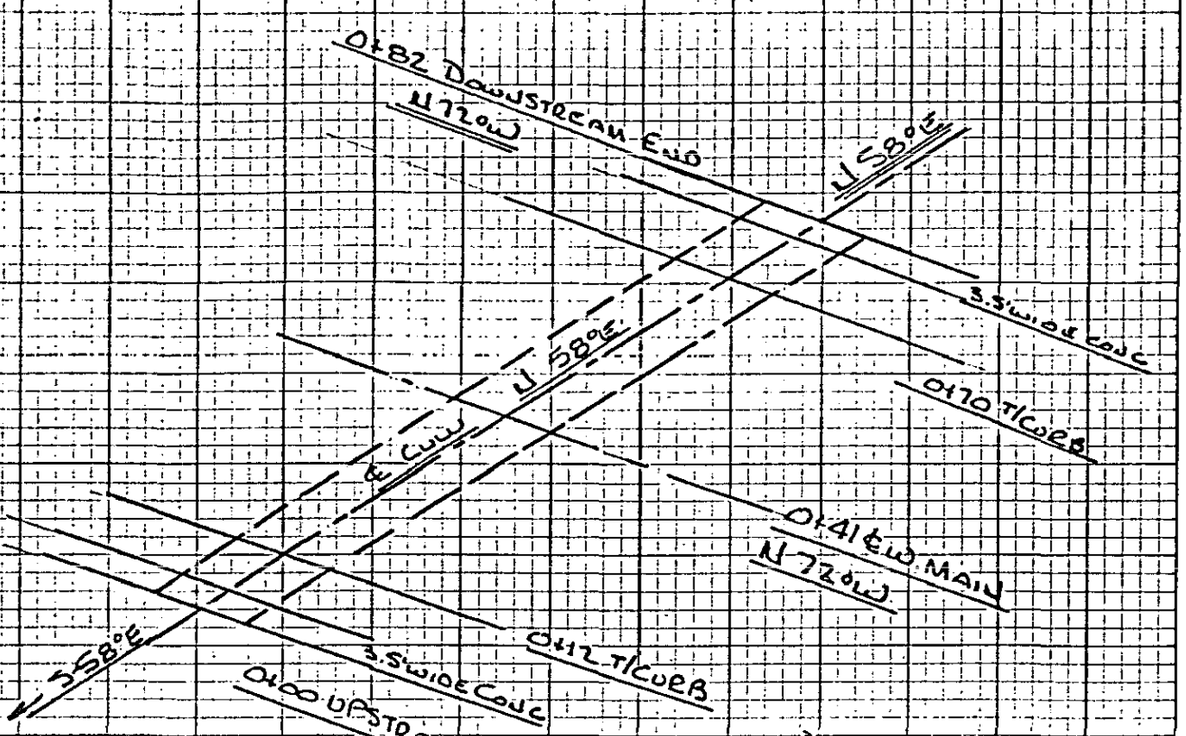
EXHIBIT 4

BRIDGE NOTES AND SKETCHES

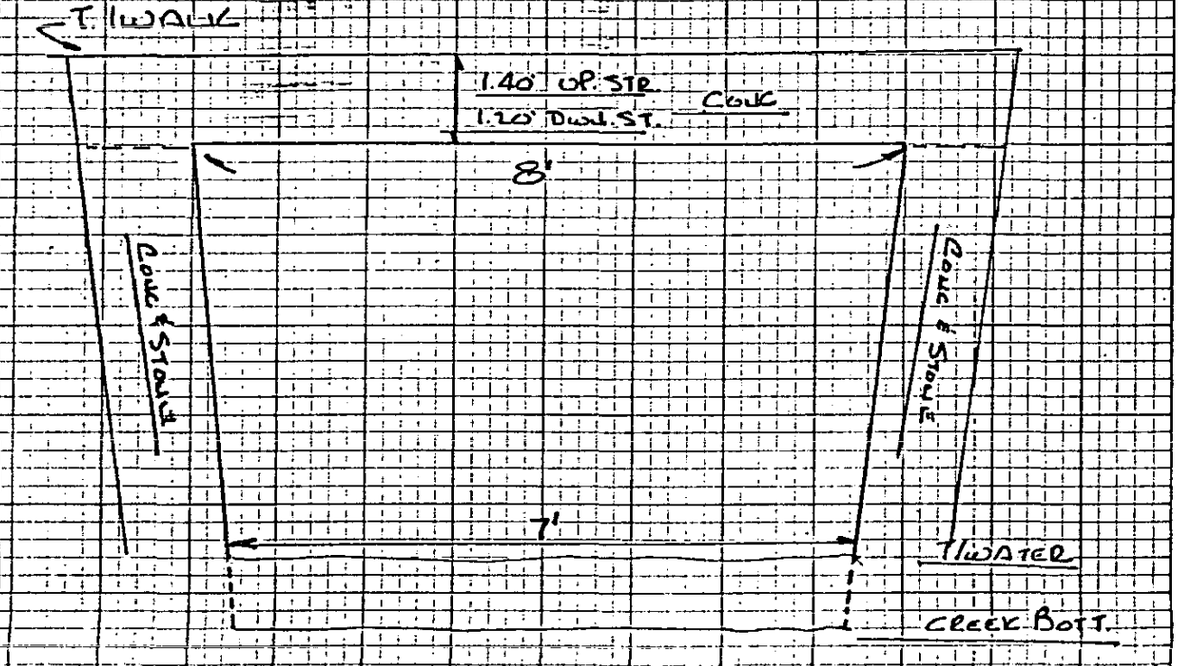
Book #3 53

Cross-Section #80 Arcadia Creek at W. Main St

Mag. Bearings



Fine View Section #80

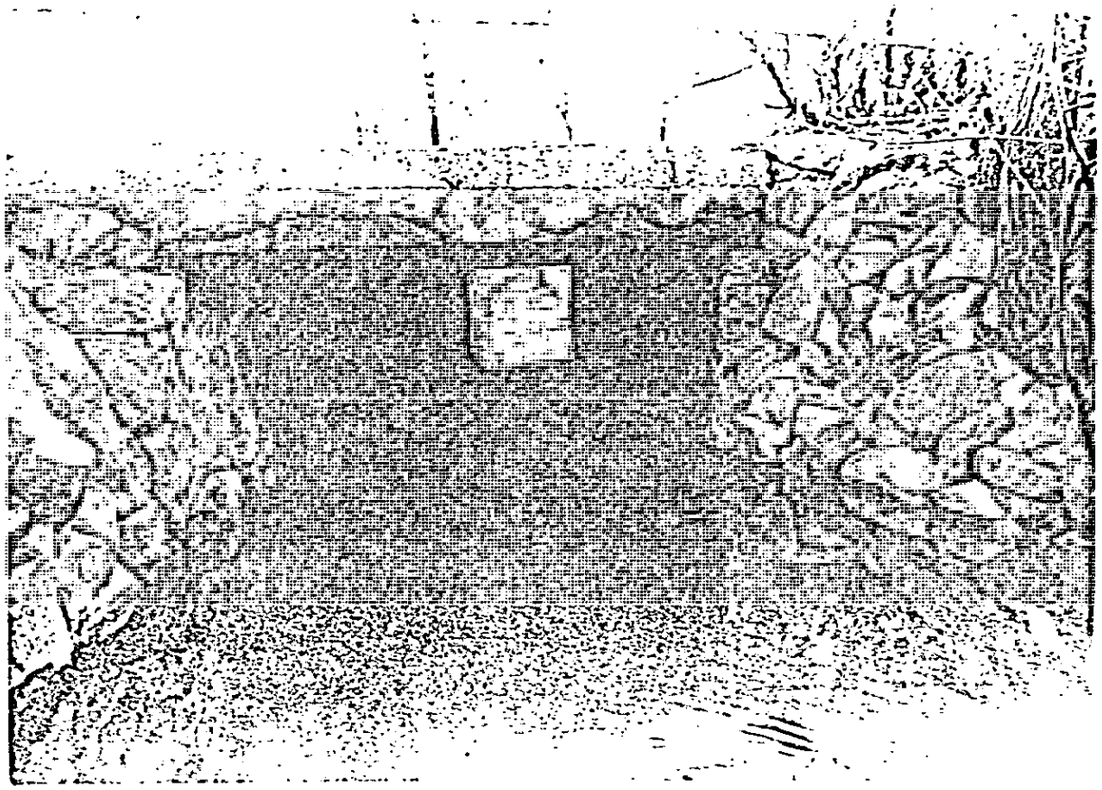


Sheet 1/43

COMPUTER SECS 28-29

ARCADIA CREEK

AHD 2023-07



CROSS-SECTION #80 ARCADIA CREEK AT W MAIN

COMPUTER SECS 28-29

Sheet 2/43

HUD 2027-07

FORM 25-0
(313) 291-5400

Wade, Trim & Associates, Inc.
Civil Engineers • Land Surveyors
WORK SHEET

25185 GODDARD ROAD
TAYLOR, MICHIGAN 48180

Bridge Location:

Bridge Losses - SB Card

REFERENCE

1. XK (Pier Shape Coefficient) 0

XKOR (Loss Coefficient) = 1.0 + Σk, $\Sigma k = k_f + k_e + k_p$ — HEC-2 Manual

where k_f: friction loss coefficient
k_e: entrance loss coefficient
k_p: loss from intermediate piers

Description of Bridge: Box Culvert

$K_f = 29.1\, n^2 L / R^{4/3}$ for English units

Area = 7.5 (791.4 - 786.7) = 35.3 ft^2 — Wp = 2(7.5 + 4.7) = 24.4'

R = A/wp = 1.45' — $R^{4/3}$ = 1.64 — L = 82'

n (composite).

$K_f = 29.1 \times (.02)^2 \times 82 / 1.64 = 0.6$

$K_e = 0.5$ — Hydraulic Charts for the Selection of Highway Culverts Circular No. 5 Dec. 1965 pg. 45

K_p: 0 if bridge has no intermediate piers

K_p: 0.05 if bridge has intermediate piers — HEC-2 manual

2. XKOE = 1 + 0.5 + 0.6 = 2.1

3. COFQ Coefficient of discharge = 2.6 — HEC-2 manual

1. RDLEN = Length of weir = _____ (0 if read off BT cards)

5. BWC = Bottom width of bridge opening (inc. piers): 7.5 ft

[illegible] total width of obstruction = _____

[illegible] = bridge opening inc. piers = 7.5 x 4.7 = 35.3 ft^2 — field data

8. SS = side slope = _____
(horizontal per 1 vertical unit)

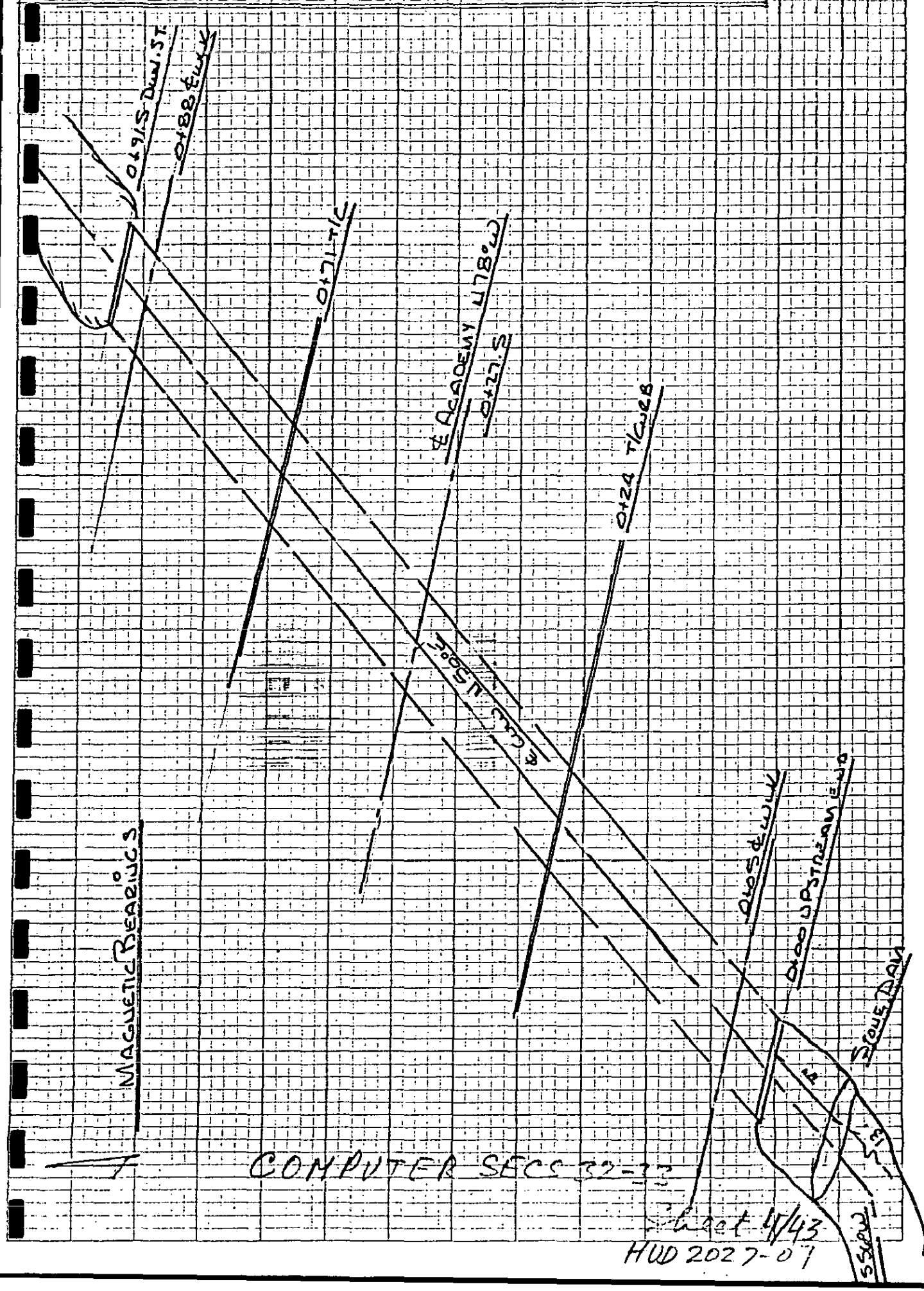
9. ELCHU = Elevation of channel invert U/S side = 786.7
(0 if equal to minimum elevation in previous x-sect.)

0. ELCHD = Elevation of channel invert D/S side = 786.3
(0 if equal to minimum elevation in previous x-sect.)

Sheet 3 of 3

SUBJECT	BY	CHK.	SHEET NO.	File Code No (Job No.) Owner Project Suffix
Arcadia Creek, Culvert on W. Main St. ARPAMS SEC 80	Sue-Lil		___ OF ___	HUD • 2027 • 07
COMPUTER SECS 28-29	DATE 4/9/80	DATE		

Cross-Section #82 Arcadia Creek At Academy

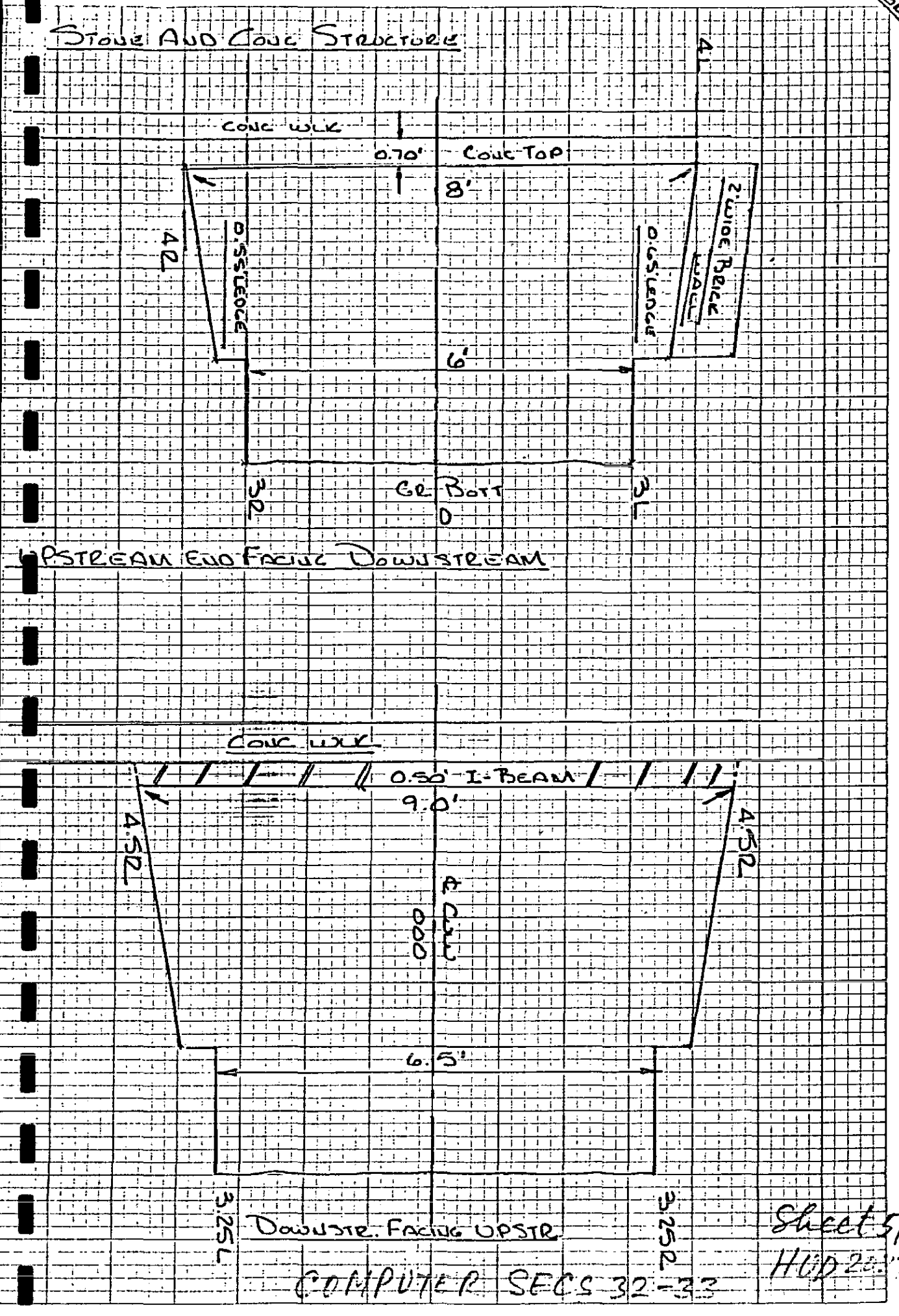


Sheet 4/43
HUD 2027-07

Cross-Sec #82 Arcadia Creek at Academy

Book #3 51

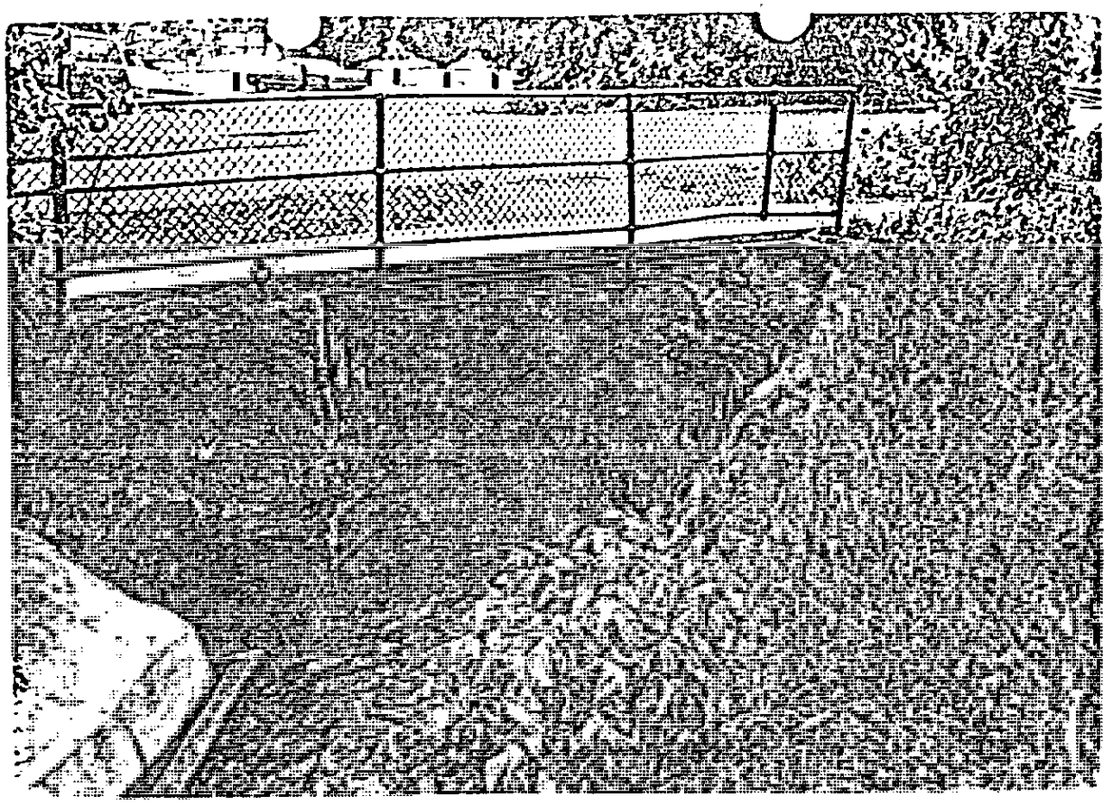
Stone and Conc Structure



Computer Secs 32-33

Sheet 5/43

HCP 2007



ARCADIA DRAIN AT. ACADEMY Sec. #82

COMPUTER SECS. 32-33

Sheet 6/43

HUD 20[illegible]

FORM 25-0
(313) 291-6400

Wade, Trim & Associates, Inc.
Civil Engineers • Land Surveyors
WORK SHEET

25185 GODDARD ROAD
TAYLOR, MICHIGAN 48180

Bridge Location:
Bridge Losses - SB Card

REFERENCE

1. XK (Pier Shape Coefficient) 0 — HEC-2 manual
XKOR (Loss Coefficient) = 1.0 + Σk, $\Sigma k = k_f + k_e + k_p$
where k_f = friction loss coefficient
k_e = entrance loss coefficient
k_p = loss from intermediate piers
Description of Bridge: Box Culvert
$k_f = 29.1\, n^2 L / R^{4/3}$ for English units
Average Area = 42 ft² = ____ Wp = 28 ft
$R = A/w_p$ = 1.5 ft $R^{4/3}$ = 1.72 L = 91.5
n (composite) =
$k_f = 29.1 \times (0.02)^2 \times 91.5 / 1.72 = 0.6$

$k_e = 0.5$ — Hydraulic Charts for the Selection of Highway Culverts Circular No. 5 Dec. 1965 pg. 45

k_p = 0 if bridge has no intermediate piers

k_p = 0.05 if bridge has intermediate piers — HEC-2 manual

2. XKOR = 1 + 0.6 + 0.5 + = 2.1
3. COFQ Coefficient of discharge = 2.6 — HEC-2 manual
4. RDLEN = Length of weir = ____ (0 if read off BT cards)
5. BWC = bottom width of bridge opening (inc. piers): 6.5 ft
6. [illegible] total width of obstruction = ____ — field data
7. [illegible] = bridge opening inc. piers = 42 ft²
8. SS = side slope = ____
(horizontal per 1 vertical unit)
9. ELCHU = Elevation of channel invert U/S side = 788.5
(0 if equal to minimum elevation in previous x-sect.)
10. ELCHD = Elevation of channel invert D/S side = 788.8
(0 if equal to minimum elevation in previous x-sect.)

Sheet 7/43

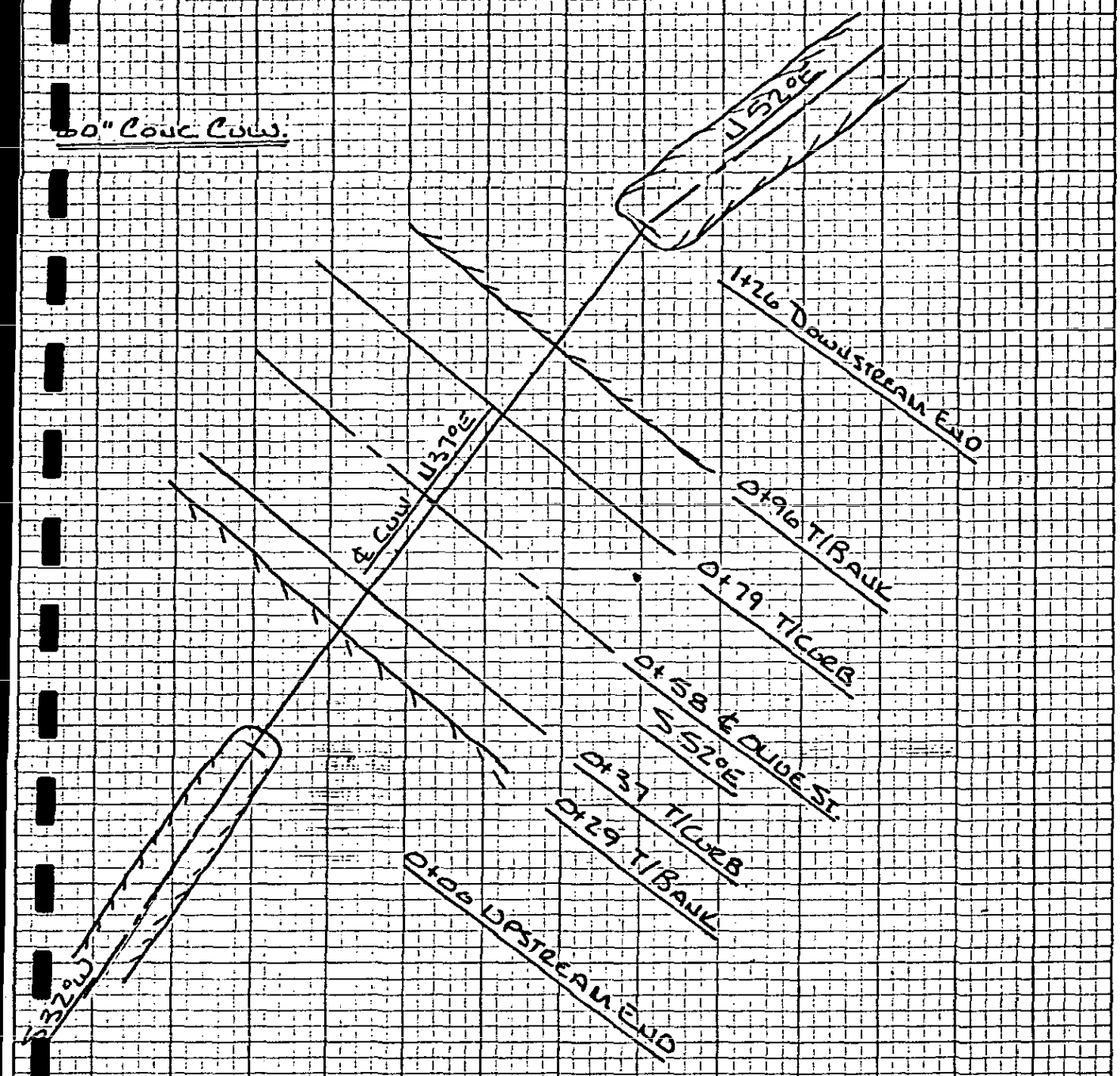
SUBJECT	BY	CHK.	SHEET NO.	File Code No. (Job No.) Owner Project Suffix
Arcadia Creek, Culvert on Academy Street, Abram Sec 8.2	Suffil		____ OF ____	HUD 2027 07
	DATE 4/10/80	DATE		

COMPUTER SECS 32-33

Cross Section #89 Olive St at Arcadia Creek

0+00 = Upstream End Mag. Bearings

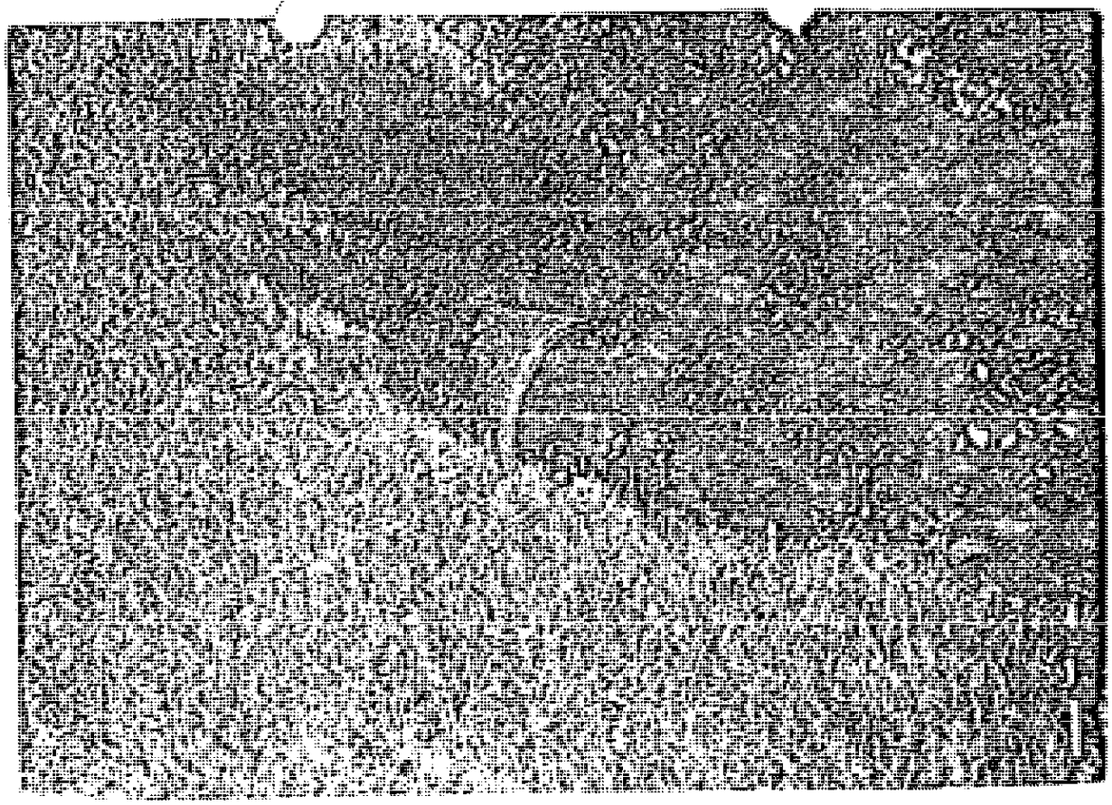
60" Conc. Culv.



COMPUTER SECS 50-51

Sheet 8/43

HUD 2027.07



ARCADIA DRAIN AT OLIVER ST. E.

COMPUTER SECS 50-51

Sheet 9/43
HUD 2027-07

Wade, Trim & Associates, Inc.
Civil Engineers • Land Surveyors
25185 GODDARD ROAD
TAYLOR, MICHIGAN 48180

WORK SHEET

Bridge Location :

Bridge Losses - SB Card

REFERENCE

1. XK (Pier Shape Coefficient) 0 — HEC-2 Manual

XKOR (Loss Coefficient) = 1.0 + Σk, $\Sigma k = k_f + k_e + k_p$

where k_f = friction loss coefficient
k_e = entrance loss coefficient
k_p = loss from intermediate piers

Description of Bridge : 60" ϕ Concrete Pipe

$K_f = 29.1\, n^2 L / R^{4/3}$ for English units

Area = Radius = WP =
$R = A/wp = \frac{\text{Radius}}{2} = 1.25' \quad R^{4/3} = 1.35 \quad L = 126$ ft

n (composite) = .02

$K_f = 29.1 \times (.02)^2 \times 126 \;/\; 1.35 = 1.1$

$K_c = 0.5$

Hydraulic Charts for the Selection of Highway Culverts Circular No. 5 Dec. 1965 pg. 45

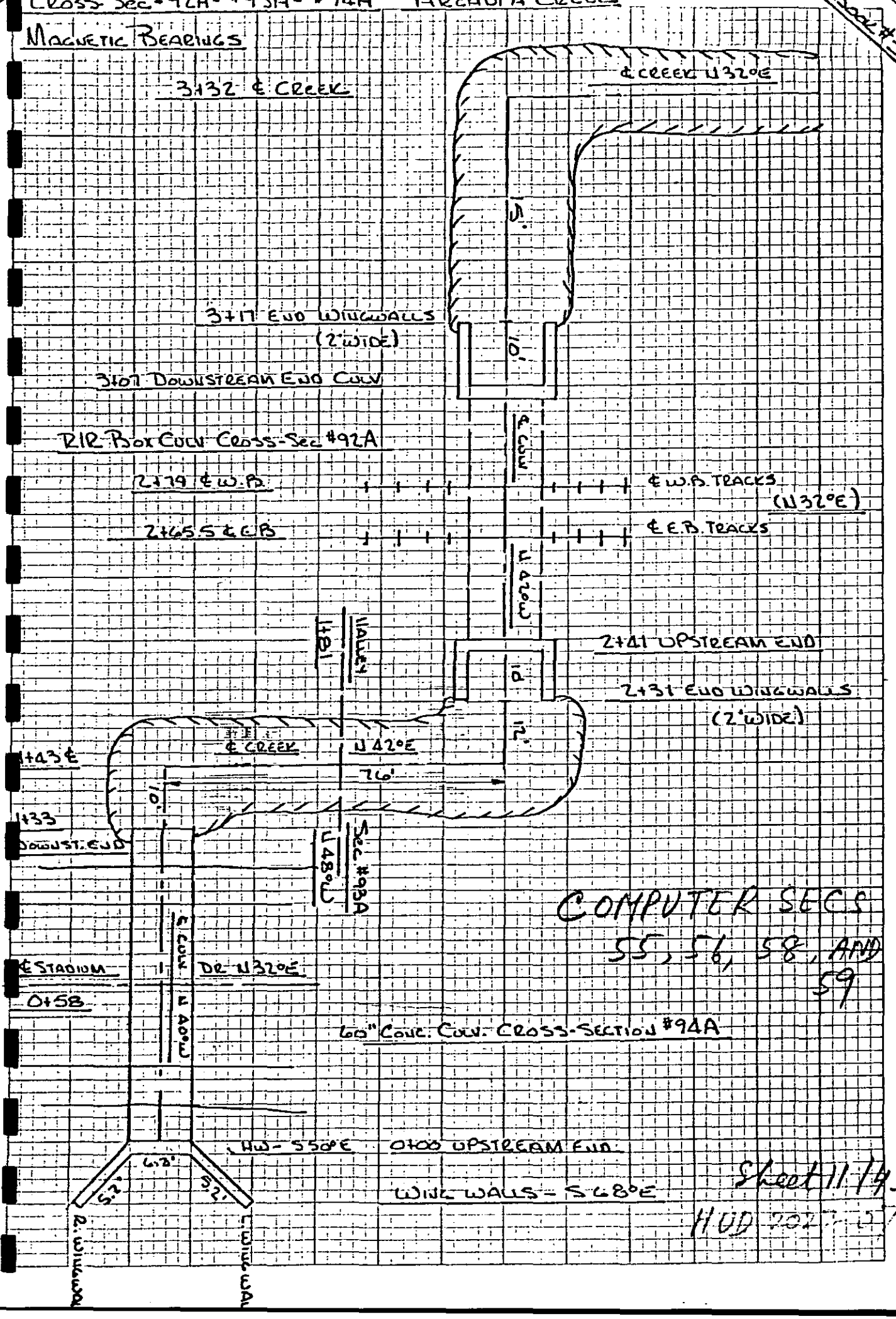
K_p = 0 if bridge has no intermediate piers

$K_p = 0.05$ if bridge has intermediate piers — HEC-2 manual

2. XKOE = 1 + 1.1 + .5 + = 2.6
3. COFQ Coefficient of discharge = 2.6 — HEC-2 manual
4. RDLEN = Length of weir = _____ (0 if read off BT cards)
5. BWC = Bottom width of bridge opening (inc. piers) = 3.93 ft
6. [illegible] = Total width of obstruction = _____ — field data
7. AREA = Bridge opening inc. piers = 19.6 ft²
8. SS = side slope = _____ (horizontal per 1 vertical unit)
9. ELCHU = Elevation of channel invert U/S side = 807.7 (0 if equal to minimum elevation in previous x-sect.)
10. ELCHD = Elevation of channel invert D/S side = 807.2 (0 if equal to minimum elevation in previous x-sect.) — Sheet 10/43

SUBJECT	BY	CHK.	SHEET NO.	File Code No. (Job No.) Owner	Project	Suffix
Arcadia Creek; Culverton Oliver St. ABRAMS SEC. 89	Sushil		___ OF ___	HUD	2027	07
	DATE 4/16/86	DATE				

COMPUTER SECS 50-51

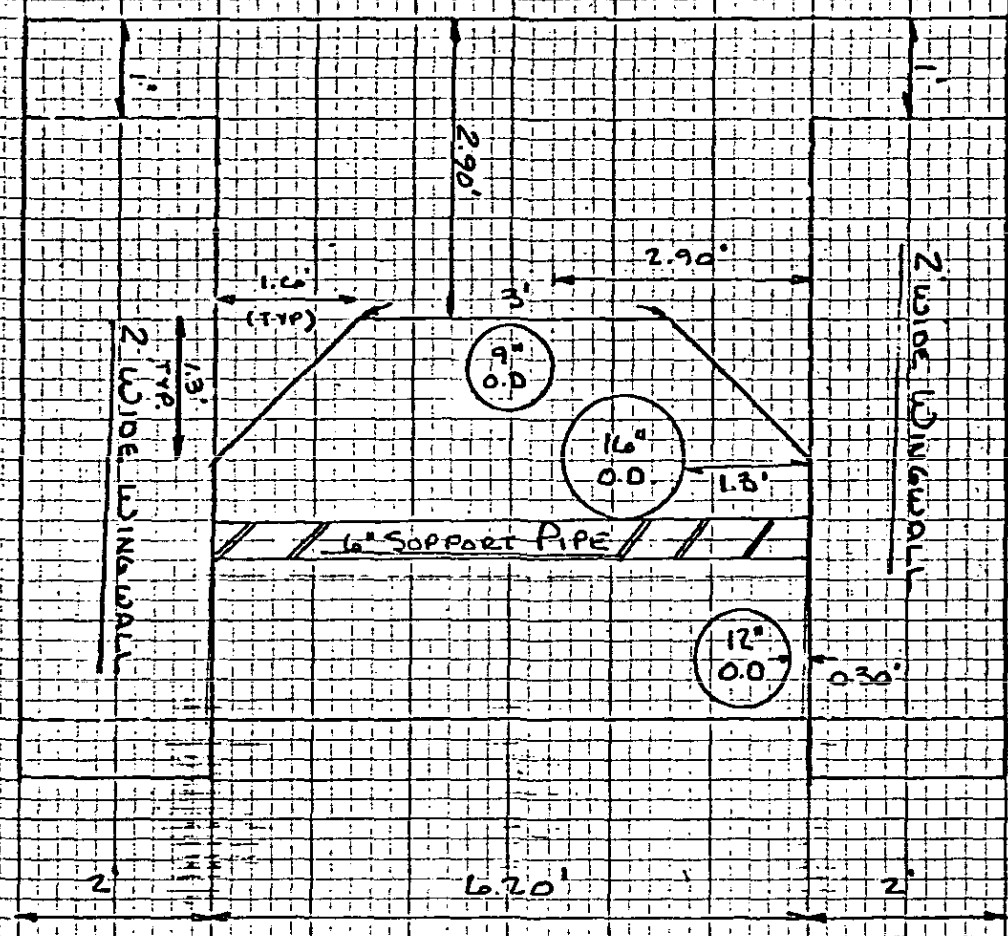


COMPUTER SECS
55, 56, 58, AND
59

Sheet 11/43

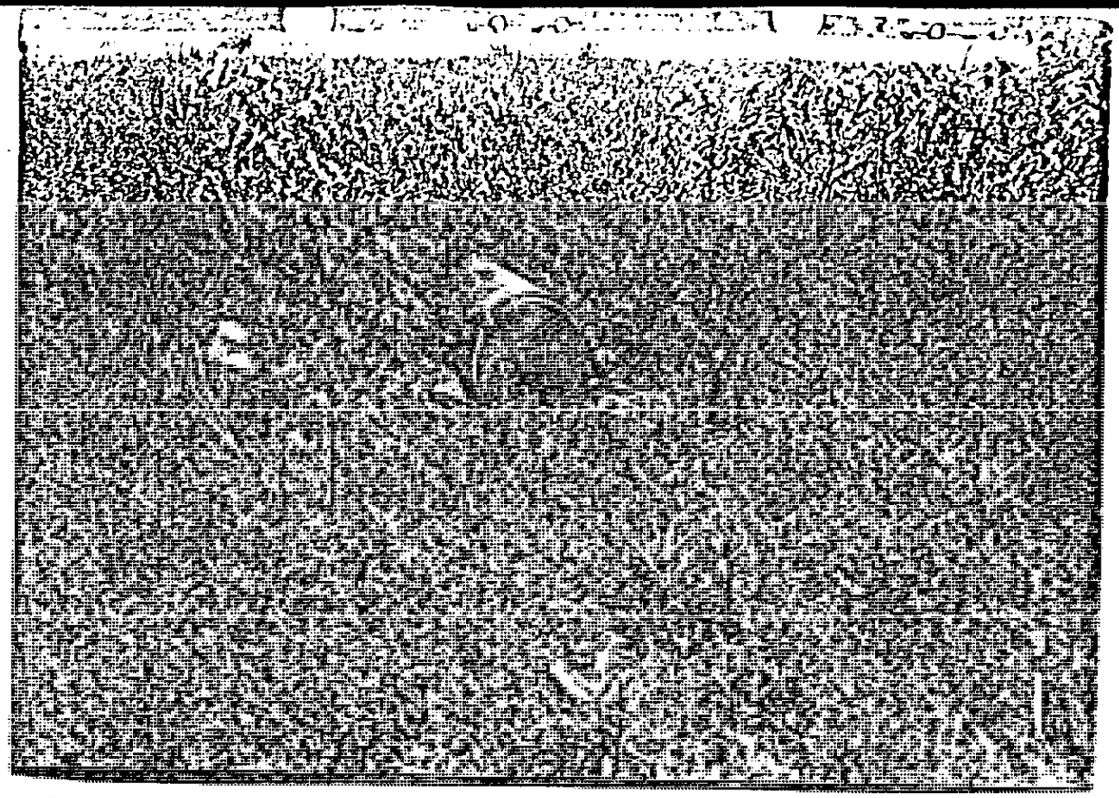
HUD 2027-07

UPSTREAM VIEW OF CROSS-SECTION #92A (R/R CROSSING
FACING DOWNSTREAM - TYPICAL EXCEPT NO 6" SUPPORT
ON DOWNSTREAM SIDE. R&L OFFSETS ARE FROM ℄
CULV. FACING UPSTREAM

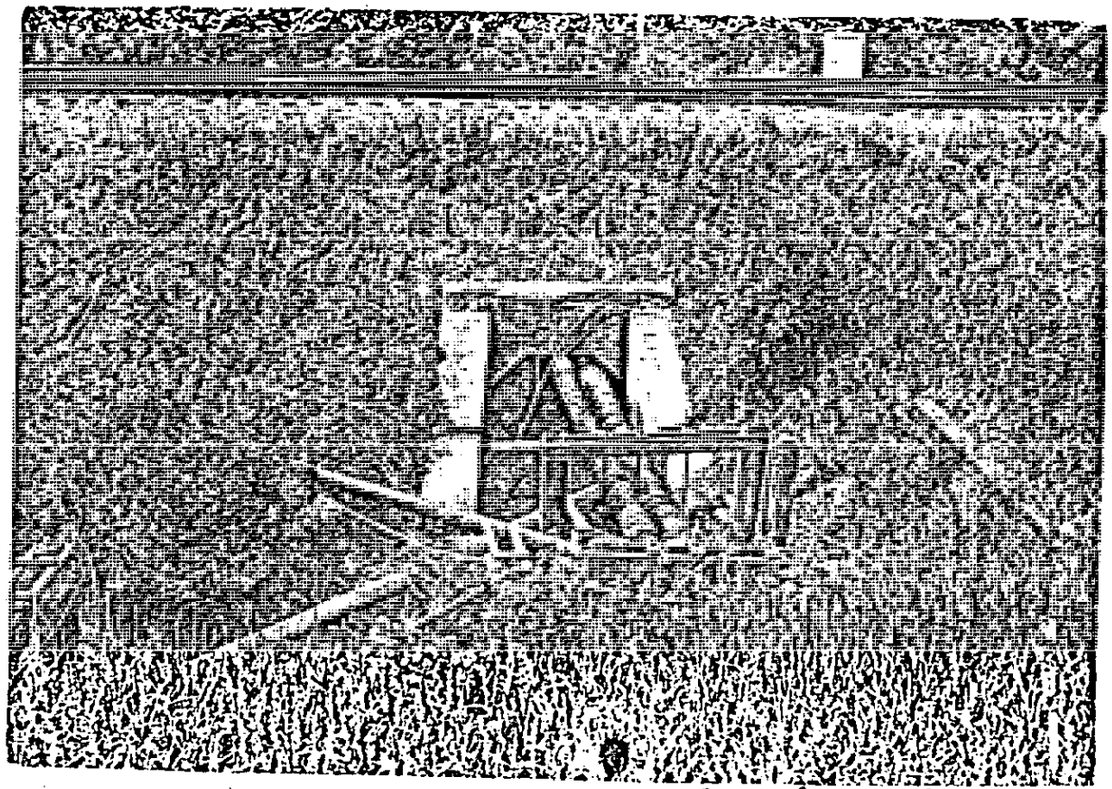


COMPUTER SECS. 55-56

Sheet 12/43
HOD 2027-81



ARCADIA DRAIN AT STADIUM DRIVE. 1ST CROSSING
WEST OF OLIVER ST. COMPUTER SECS 58-59
#94A



ARCADIA DRAIN AT PENN. CENT. RR N. SIDE COMPUTER SECS. 55-56
STADIUM 1ST CROSSING W. OF OLIVER ST. Sheet 13/43
HUD

Wade, Trim & Associates, Inc.
Civil Engineers • Land Surveyors
25185 GODDARD ROAD
TAYLOR, MICHIGAN 48180

WORK SHEET

Bridge Location :

Bridge Losses - SB Card

REFERENCE

1. XK (Pier Shape Coefficient)

XKOR (Loss Coefficient) = $1.0 + \Sigma k$, $\Sigma k = k_f + k_c + k_p$ — 0 — HEC-2 Manual

where k_f = friction loss coefficient
k_c = entrance loss coefficient
k_p = loss from intermediate piers

Description of Bridge : Box Culvert

$K_f = 29.1\, n^2 L / R^{4/3}$ for English units

Area $= 6.2 \times 5 - 1.6 \times 1.3 - \pi(.375^2 + .667^2) \approx 27\ ft^2$

$R = A/wp = .95$ ft

$R^{4/3} = .91$

$wp = 2(6.2+5) + \pi(.75+1.33) = 28.9$ ft

$L = 66$ ft

n (composite) = .02

$K_f = 29.1 \times (.02)^2 \times 66 \;/\; .91 = .8$

$K_c = .5$

Hydraulic Charts for the Selection of Highway Culverts Circular No. 5 Dec. 1965 pg. 43

K_p = 0 if bridge has no intermediate piers

K_p = 0.05 if bridge has intermediate piers — HEC-2 manual

2. XKOR = 1 + .8 + .5 + = 2.3

3. COFQ Coefficient of discharge = 2.6

4. RDLEN = Length of weir = _____ (0 if read off BT cards) — HEC-2 manual

5. BWC = bottom width of bridge opening (inc. piers) = 5.4 ft

[illegible] width of obstruction = _____

[illegible] = bridge opening inc. piers = 27 ft^2 — field data

6. SS = side slope = _____ (horizontal per 1 vertical unit)

7. ELCHU = Elevation of channel invert U/S side = 810.4
(0 if equal to minimum elevation in previous x-sect.)

8. ELCHD = Elevation of channel invert D/S side = 809.6
(0 if equal to minimum elevation in previous x-sect.) — Sheet 14/43

SUBJECT	BY	CHK.	SHEET NO.	File Code No (Job No.) Project	Suffix
Arcadia Creek, Culvert on Railroad west of Oliver St.	Sushil		___ OF ___	HUD • 2027 • 07	
COMPUTER SECS 55-56	DATE 4/16/90	DATE		Owner	

FORM 25-0
(313) 291-5400

Wade, Trim & Associates, Inc.
Civil Engineers • Land Surveyors
WORK SHEET

25185 GODDARD ROAD
TAYLOR, MICHIGAN 48180

Bridge Location:
Bridge Losses - SB Card

REFERENCE

1. XK (Pier Shape Coefficient) 0 — HEC-2 manual
XKOR (Loss Coefficient) = 1.0 + Σk, $\Sigma k = k_f + k_e + k_p$
where k_f = friction loss coefficient
k_e = entrance loss coefficient
k_p = loss from intermediate piers
Description of Bridge: 60" ϕ Concrete Pipe
$k_f = 29.1\, n^2 L / R^{4/3}$ for English units
Area = ____ Wp = ____
$R = A/wp = \frac{Radius}{2} = 1.25$ $R^{4/3} = 1.35$ $L = 133$ ft
n (composite) = .02
$k_f = 29.1 \times (.02)^2 \times 133 / 1.35 = 1.1$

$k_e = 0.5$ — Hydraulic Charts for the Selection of Highway Culverts Circular No. 5 Dec. 1965 pg. 49

k_p = 0 if bridge has no intermediate piers

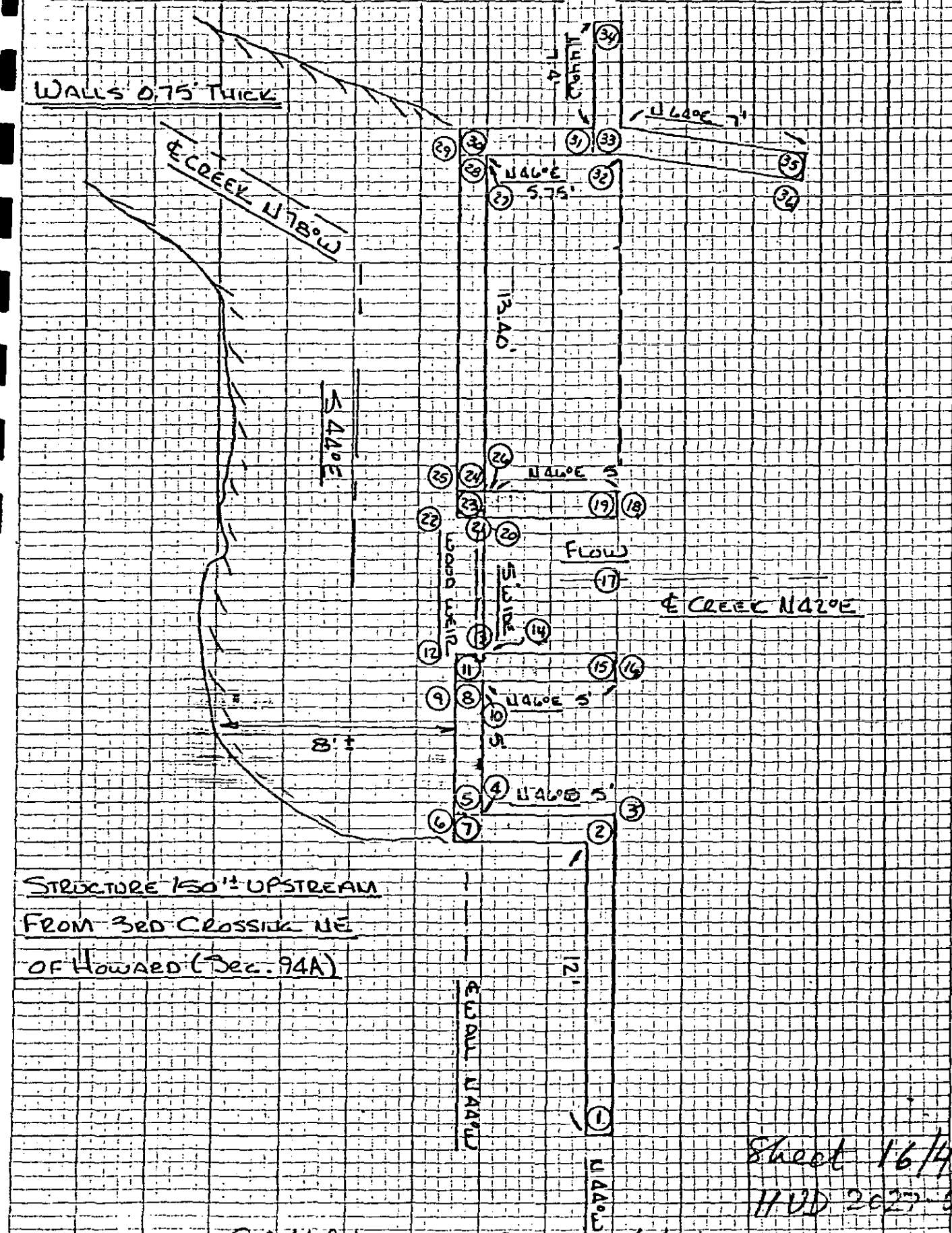
$k_p = 0.05$ if bridge has intermediate piers — HEC-2 manual

2. XKOR = 1 + 1.1 + .5 + = 2.6
3. COFQ Coefficient of discharge = 2.6 — HEC-2 manual
4. RDLEN = Length of weir = ____ (0 if read off BT cards)
5. BWC = bottom width of bridge opening (inc. piers) = 3.93 ft
6. [illegible] width of obstruction = ____ — field data
7. [illegible] = bridge opening inc. piers = 19.6 ft²
8. SS = side slope = ____
(horizontal per 1 vertical unit)
9. ELCHU = Elevation of channel invert U/S side = 814.4
(0 if equal to minimum elevation in previous x-sect.)
10. ELCHD = Elevation of channel invert D/S side = 812.6 — Sheet 15/43
(0 if equal to minimum elevation in previous x-sect.)

SUBJECT	BY	CHK.	SHEET NO.	File Code No. (Job No.) Owner Project Suffix
Arcadia Creek Culvert on Stadium Drive West of Oliver St.	Sushil		____ OF ____	HVD 2027 07
	DATE 4/16/[illegible]	DATE		

COMPUTER SECS 58-59

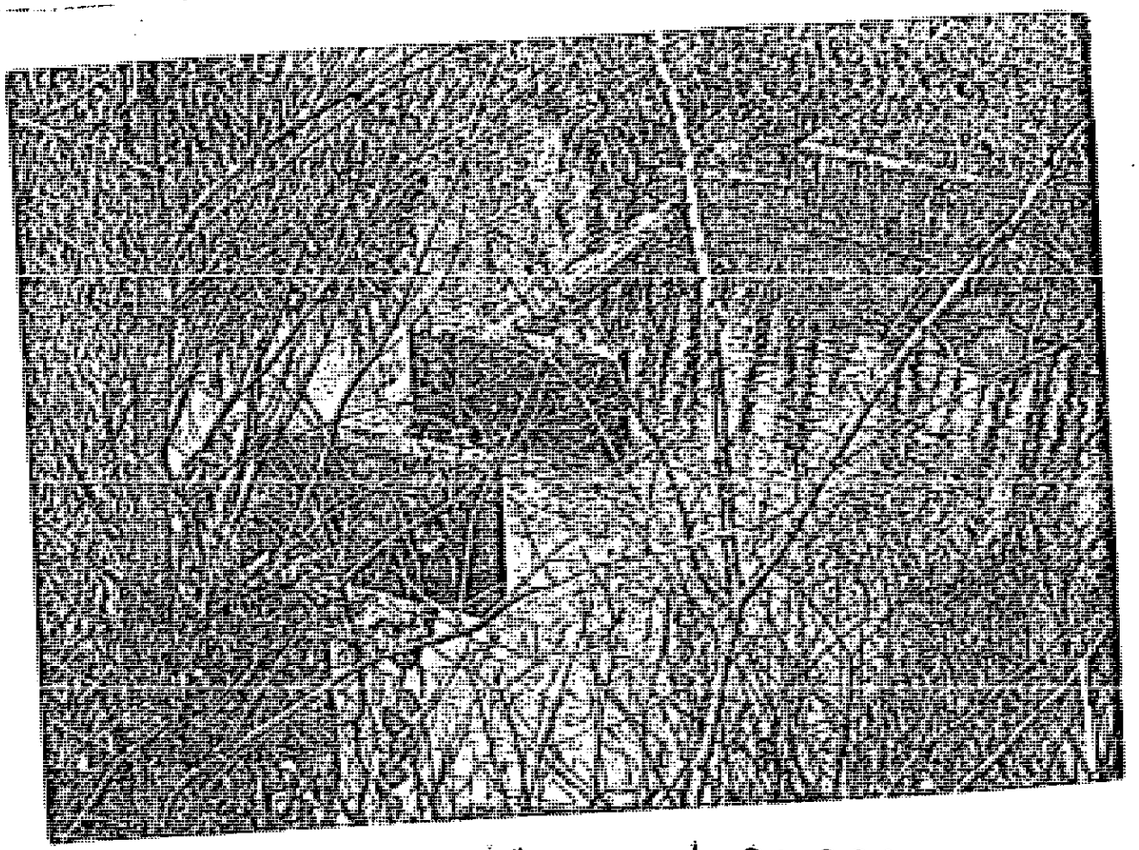
ADDED SEC "C" ARCADIA CREEK. MAGNETIC BEARINGS



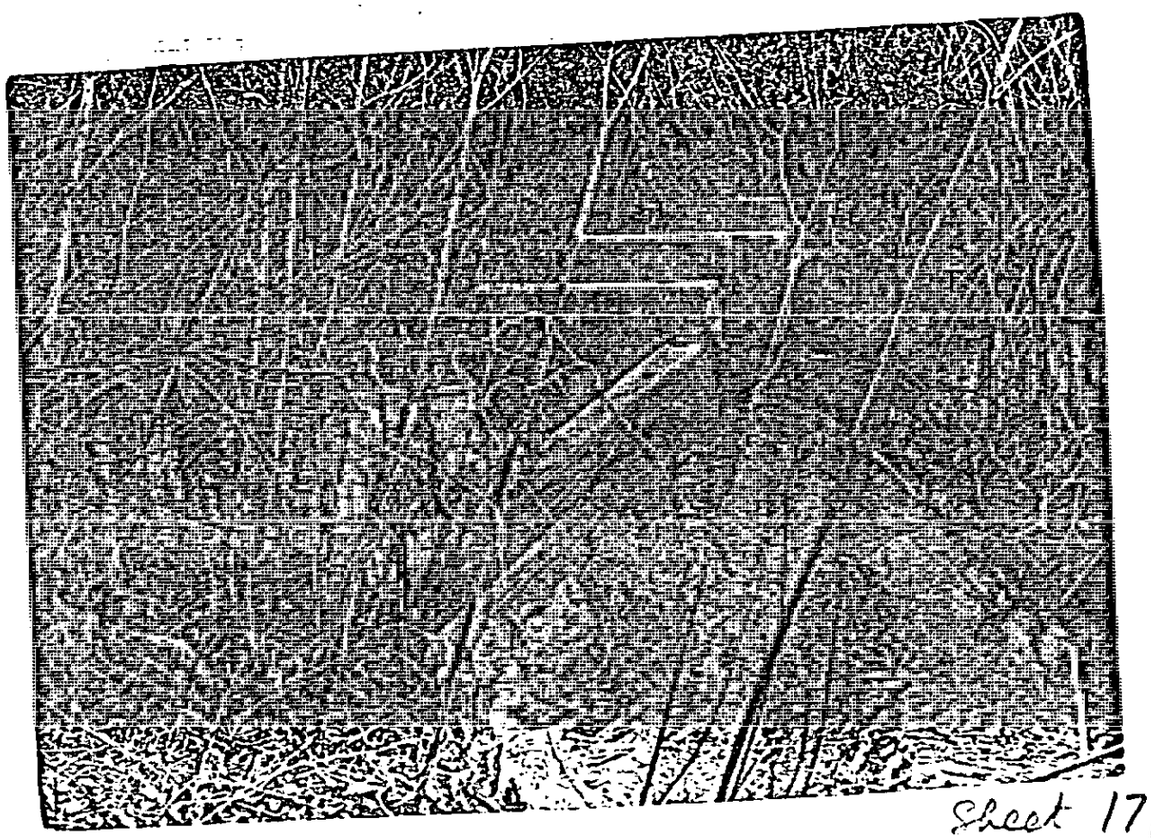
STRUCTURE 150'± UPSTREAM FROM 3RD CROSSING NE OF HOWARD (SEC. 94A)

Sheet 16/43
HUD 2027-07

COMPUTER SEC. 61



DAM ADDED SECTION "C" 150' UPSTREAM
FROM SEC 94A COMPUTER SEC. 61



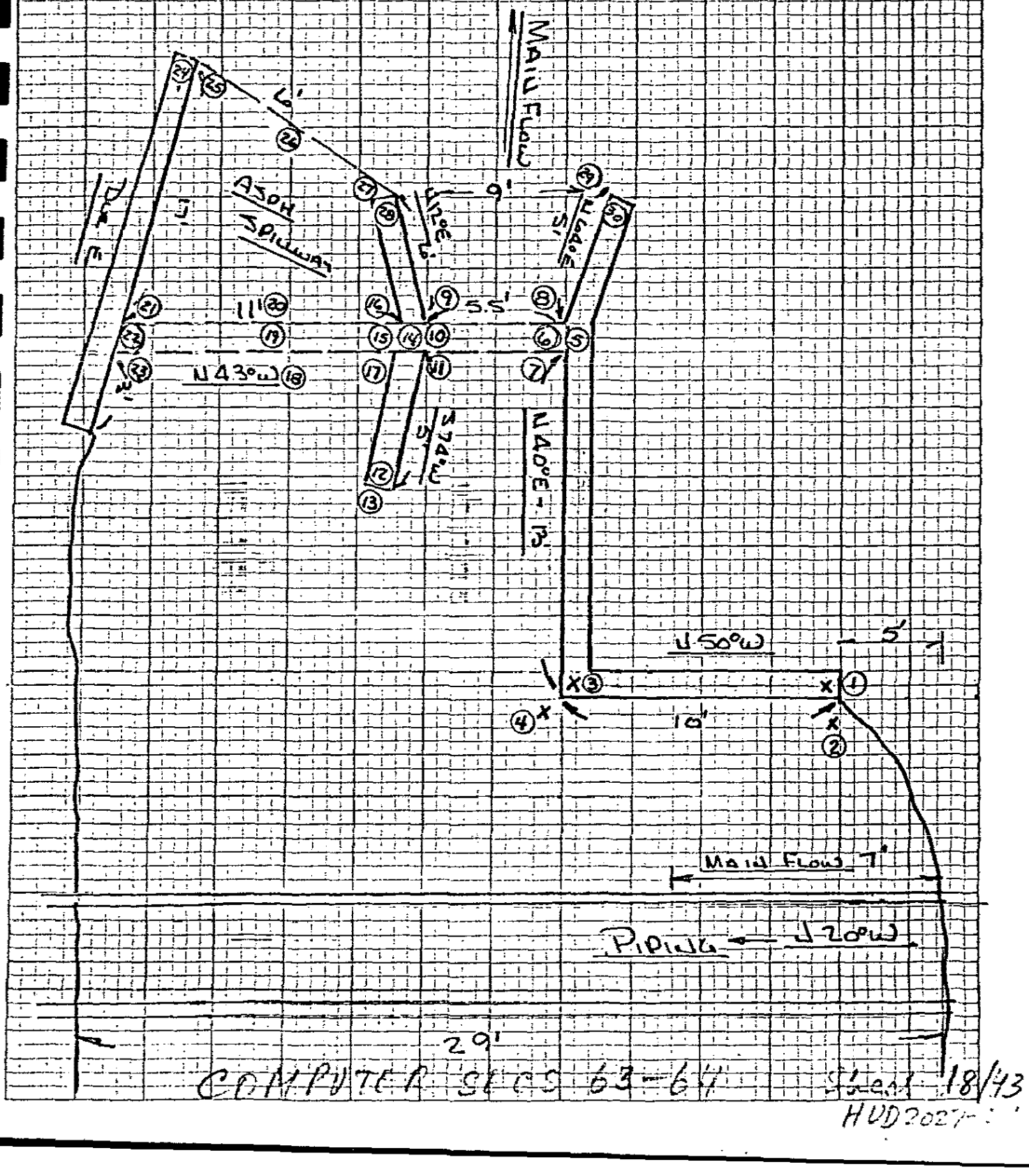
Book #3

ADDED SEC "B" ARCADIA CREEK

ALLWALLS 0.8' THICK

○ ELEV #

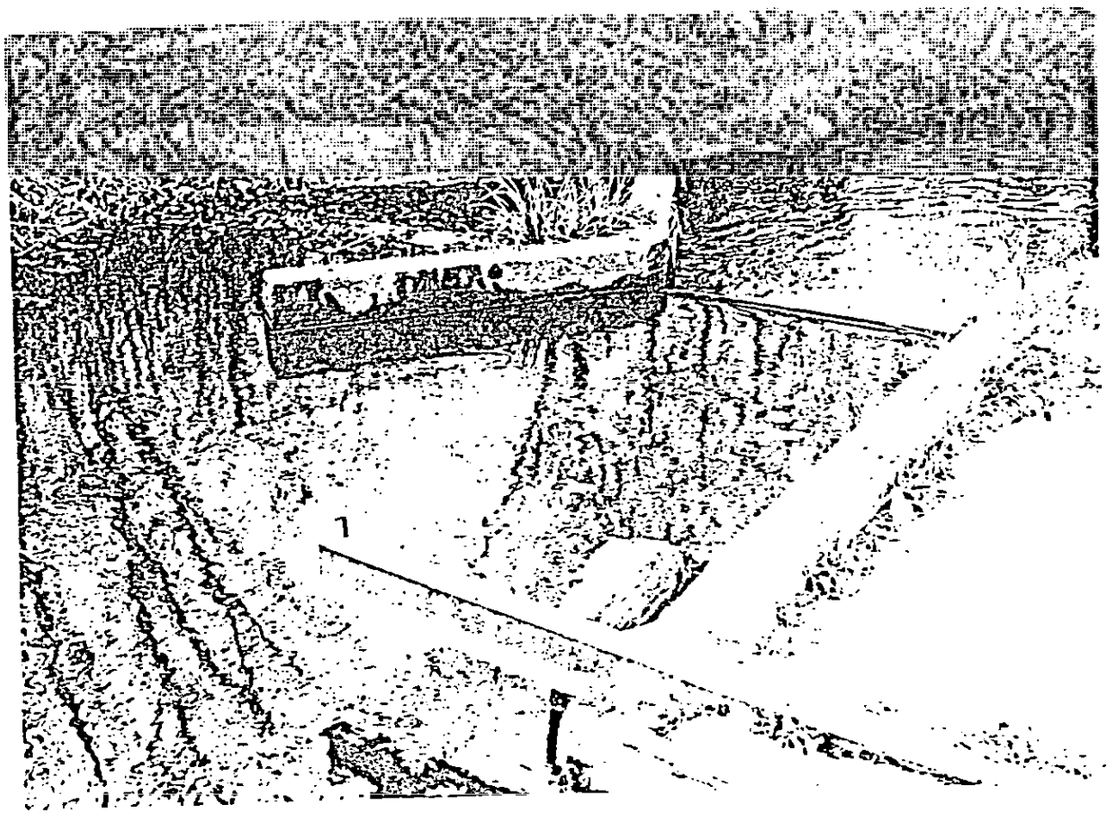
MAGNETIC BEARINGS



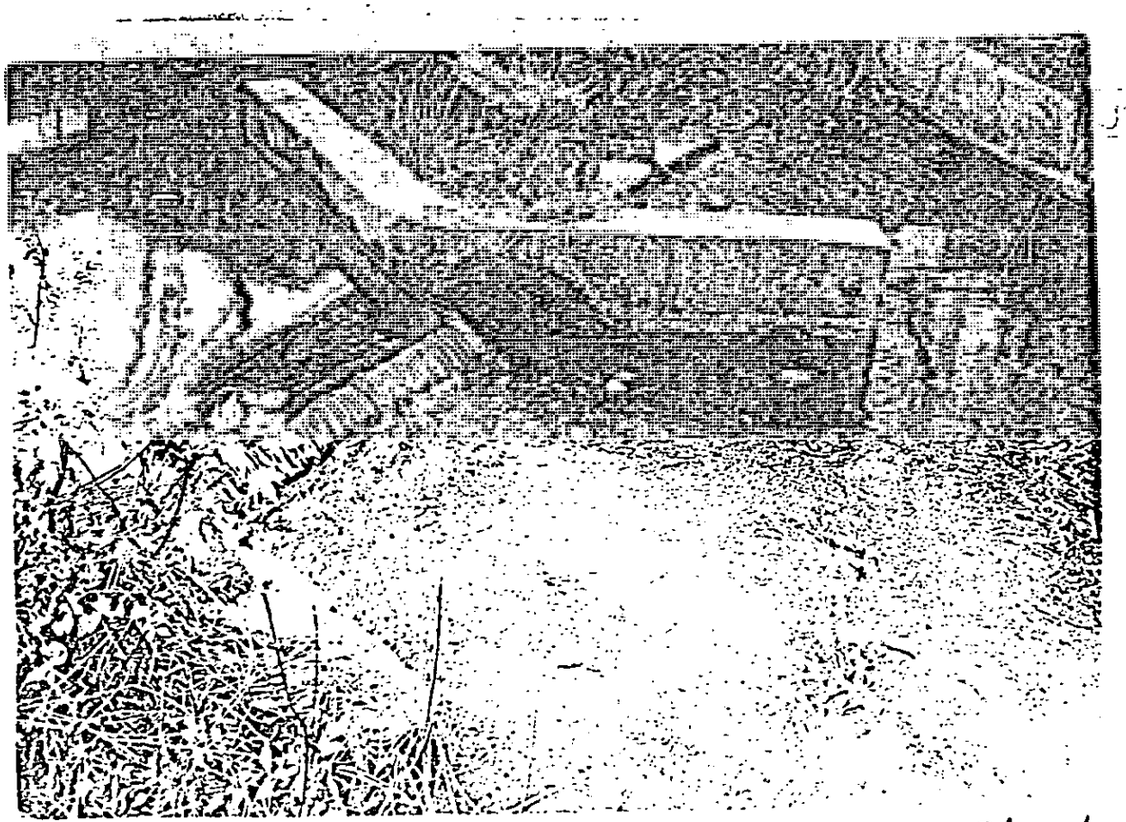
COMPUTER SECS 63-64

18/43

HUD 2027



ADDED SEC "B" ARCADIA DRAIN
COMPUTER SEC 63



HUD 202

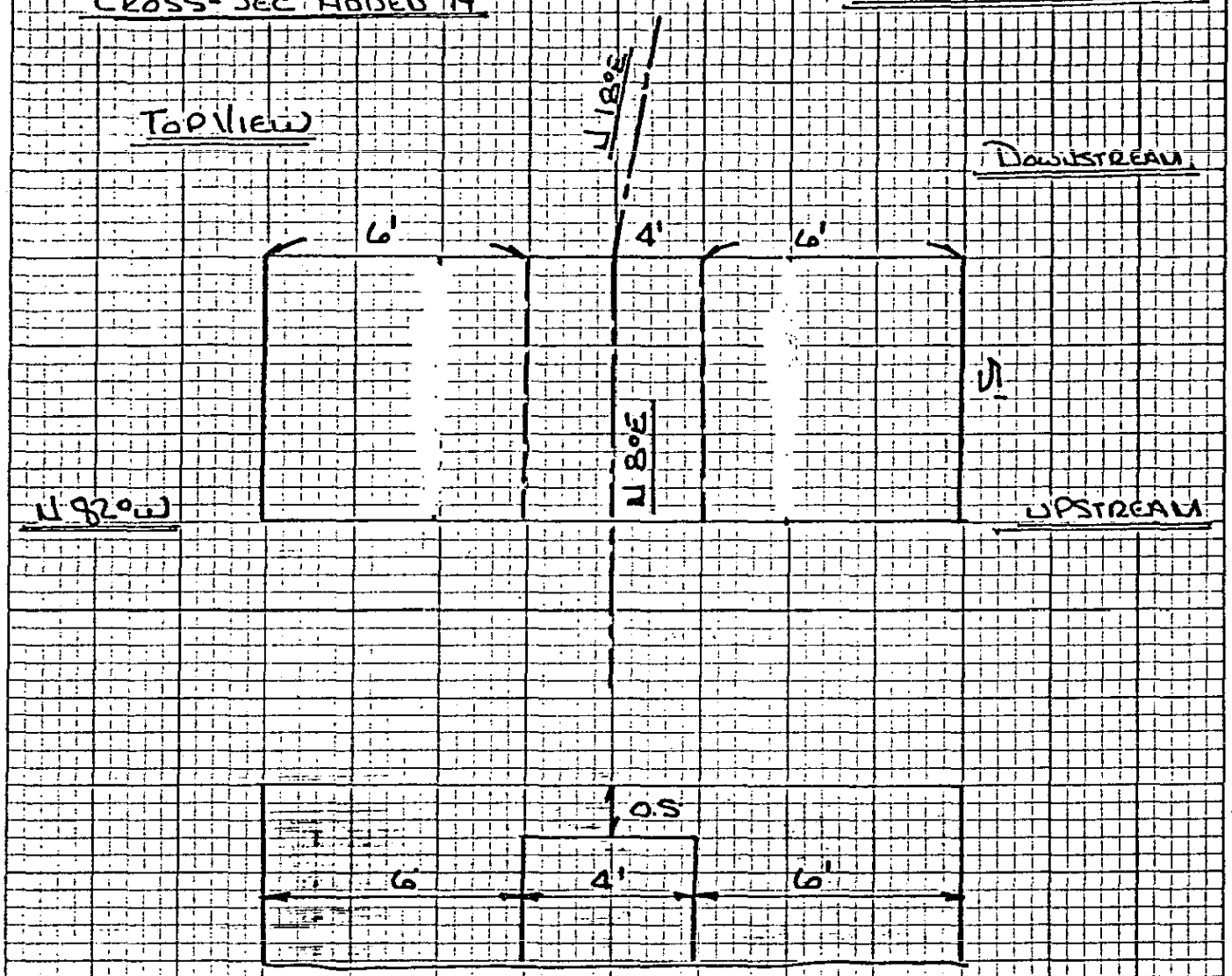
CROSS-SECTION 1ST STRUCTURE DOWNSTREAM

FROM CROSS SEC #95 ARCADIA CREEK

CROSS-SEC ADDED "A"

MAGNETIC BEARINGS

TOP VIEW



SIDE VIEW (TYP)

COMPUTER SECS 65-66

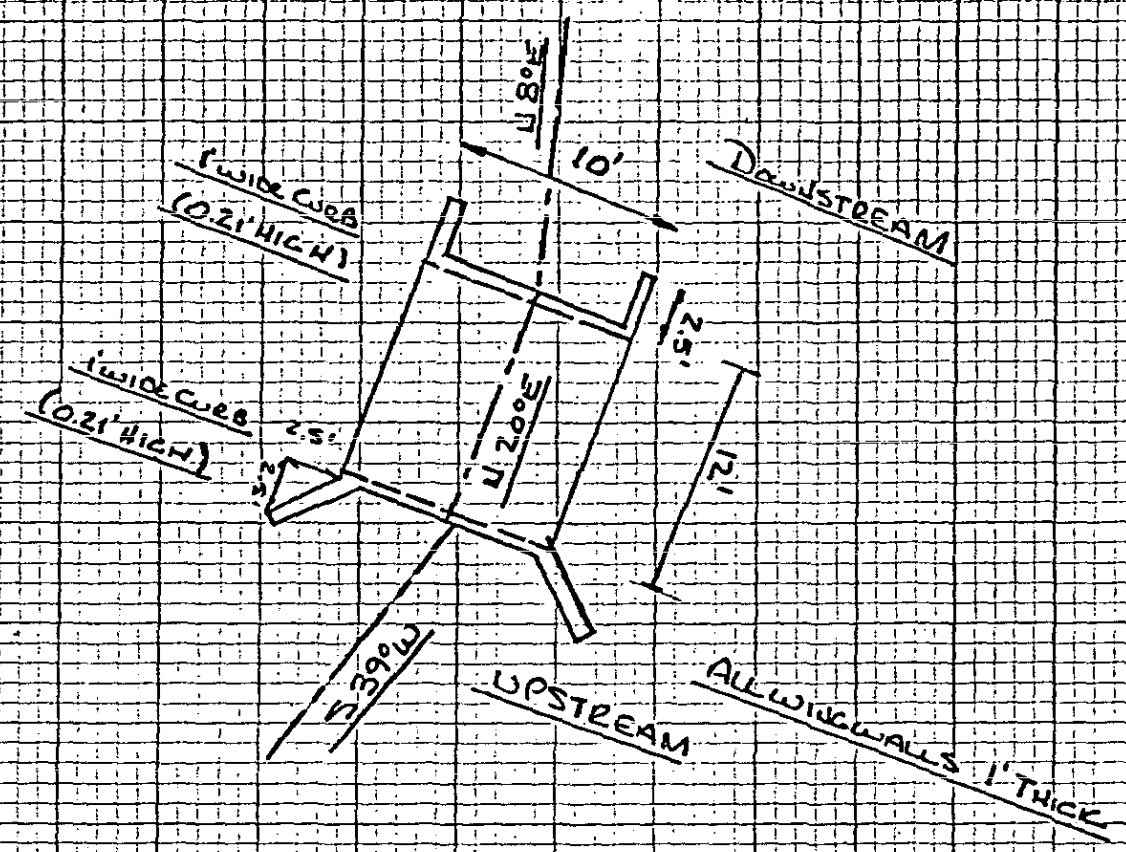
Hud 20[illegible]-05

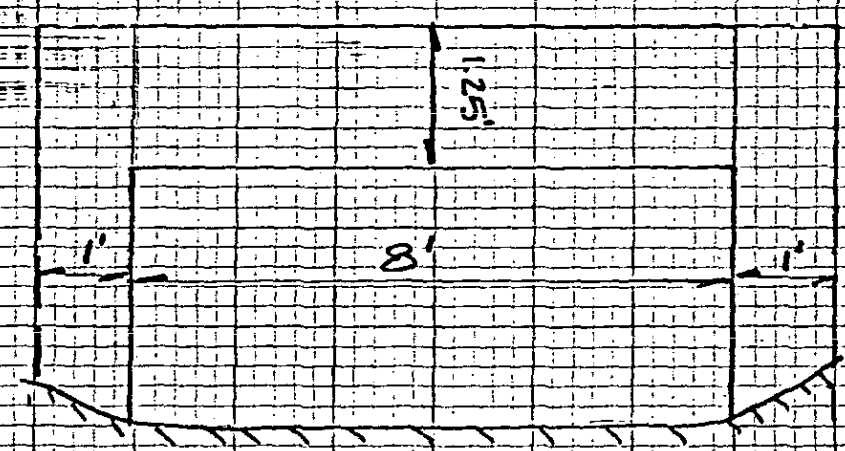
27

Book #3

Cross-Section #95 Arcadia Creek

Magnetic Bearings

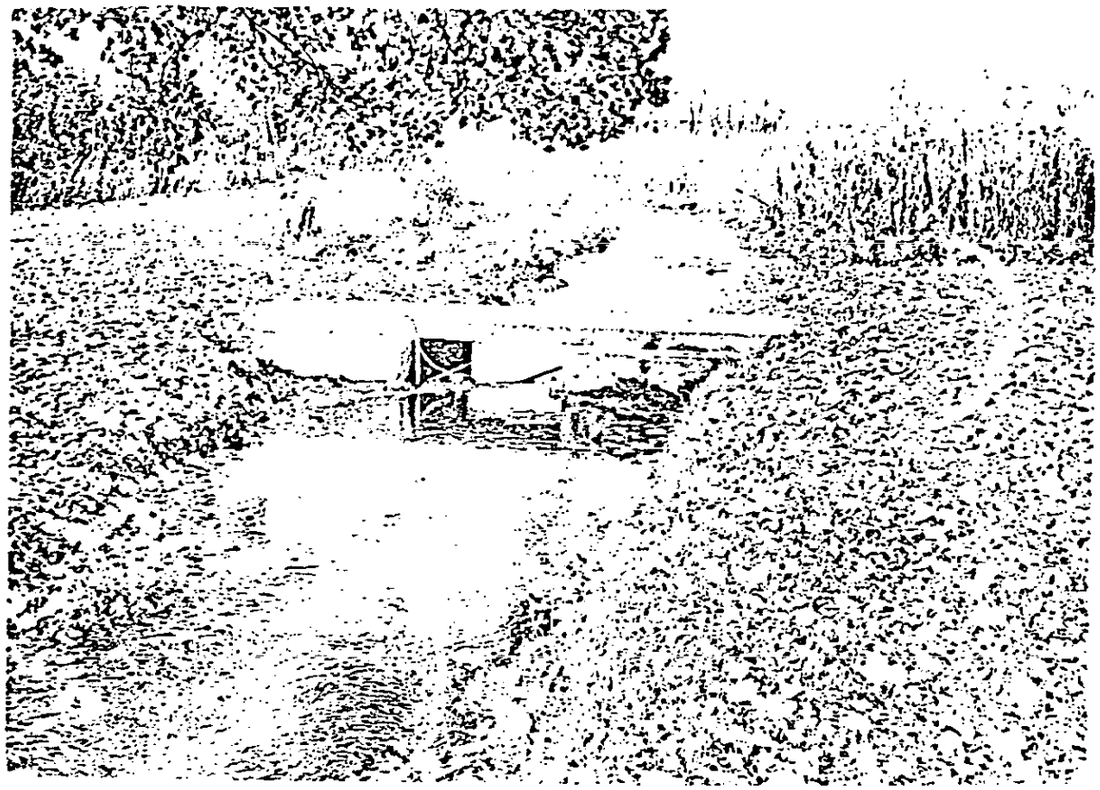




COMPUTER SECS 67 - 68

Sheet 21/43

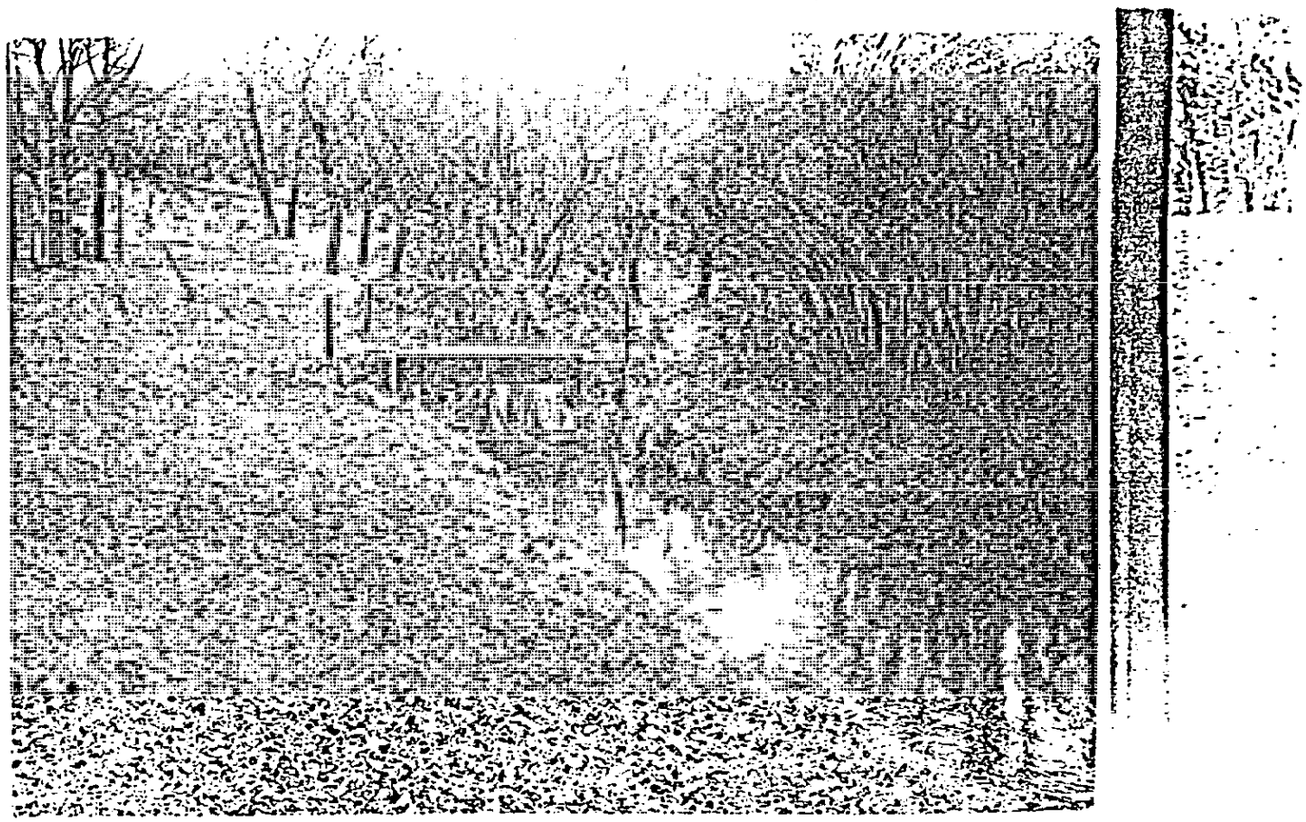
HUD [illegible]



ADDED SECTION "A" DAVISTELAM
OF SEC #95

COMPUTER SECS 65-66

Sheet 22 1/43
HUD 202-07



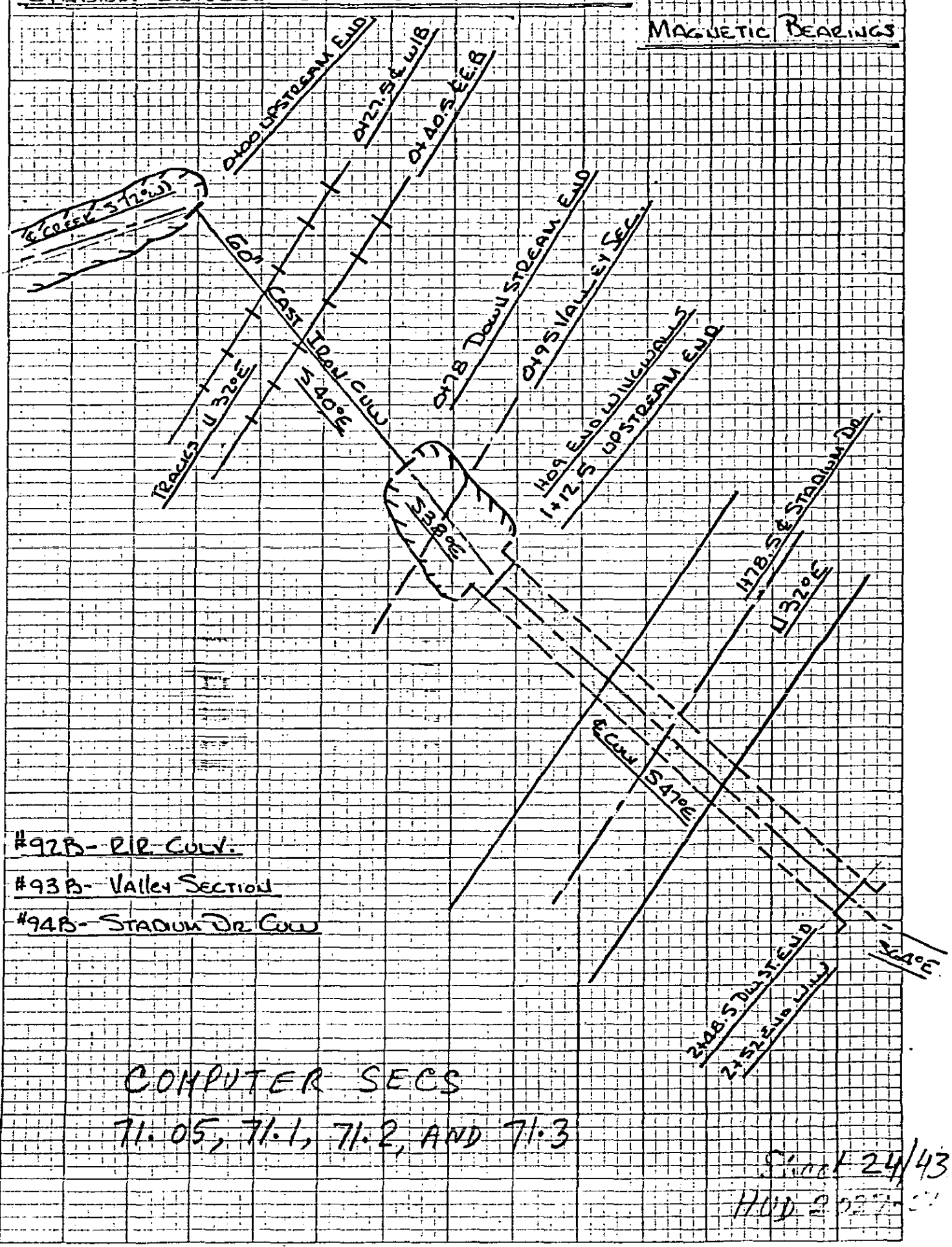
SECTION #95 COMPUTER SECS 67-68

Sheet 23/43
HUD 2027-[illegible]

CROSS-SECTIONS #92B - #93B - #94B. ARCADIA CREEK A1

STADIUM DR (2ND CROSSING NE. OF HOWARD

MAGNETIC BEARINGS



#92B - RIP. CULV.

#93B - VALLEY SECTION

#94B - STADIUM DR CULV.

COMPUTER SECS

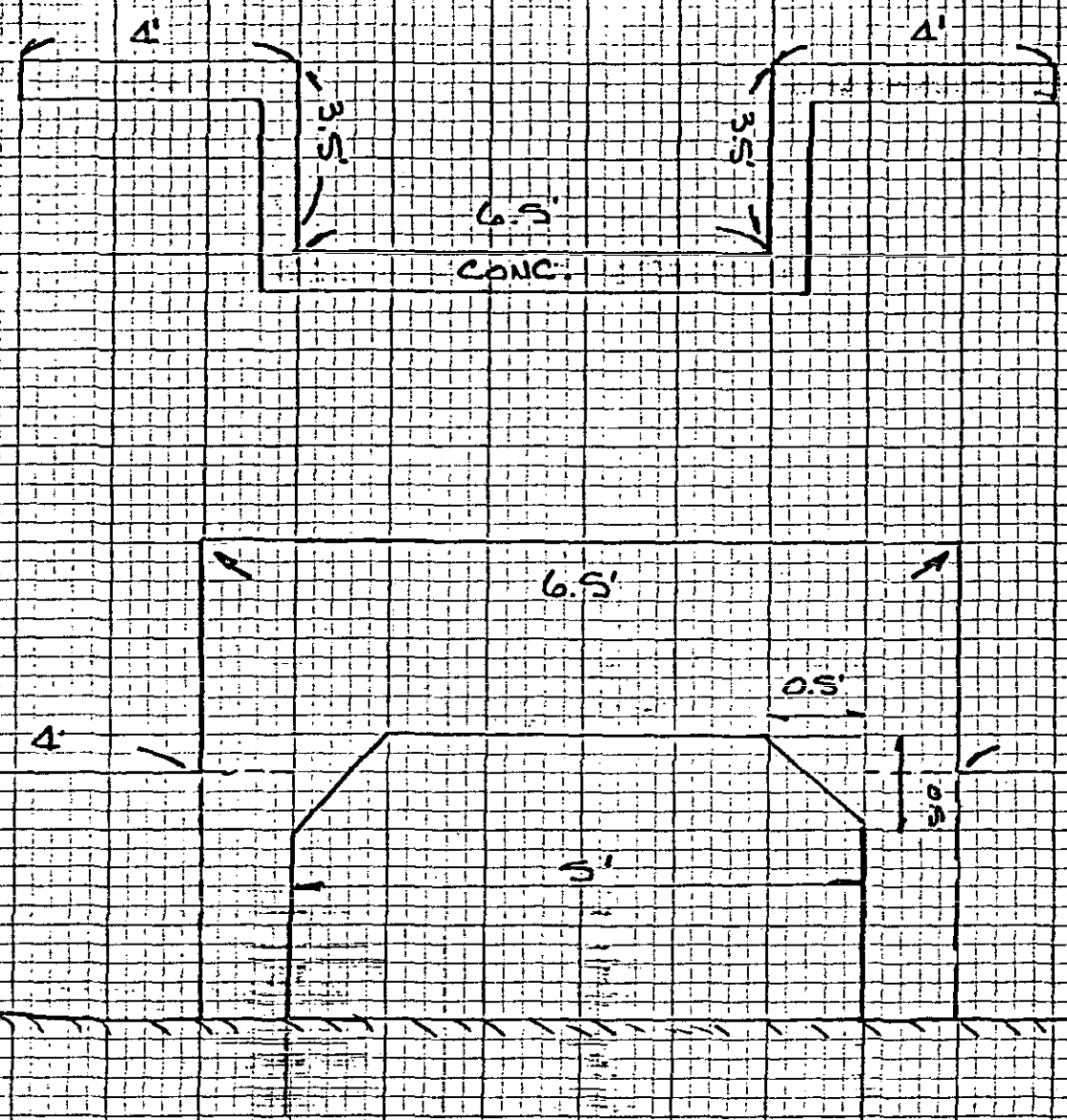
71.05, 71.1, 71.2, AND 71.3

SHEET 24/43

HUD 2

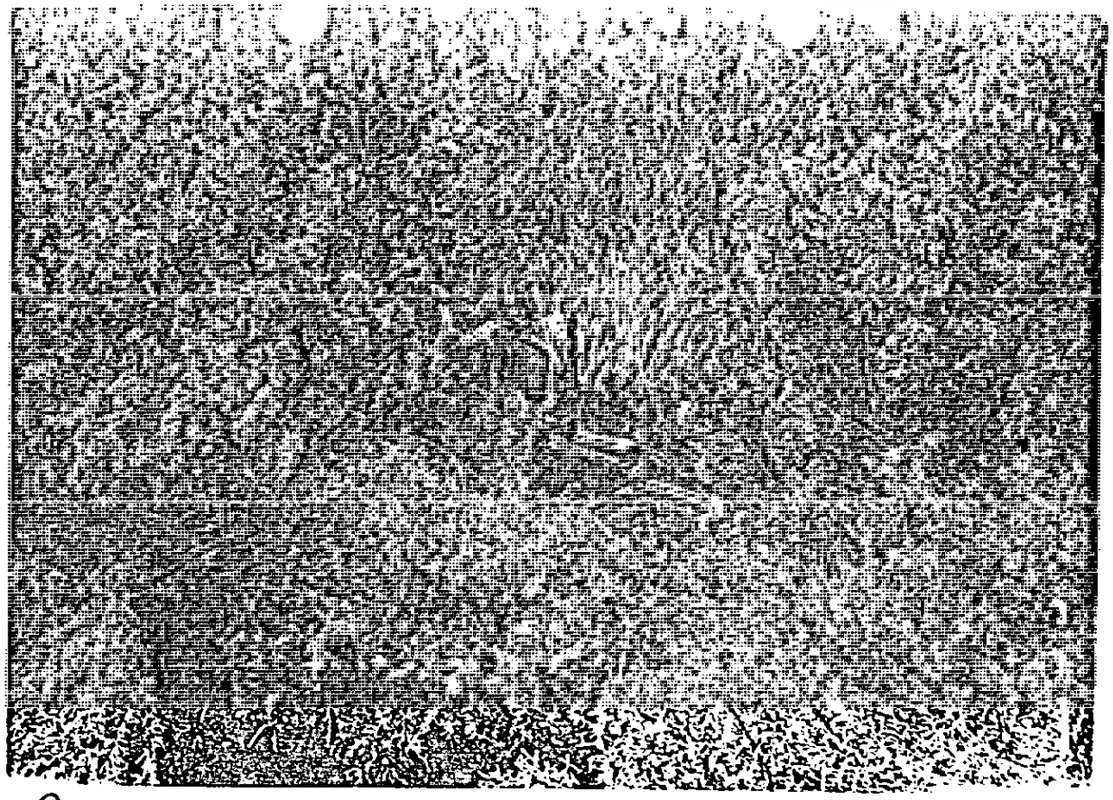
24
Book #3

Top View Box Culv #94B (TYP)

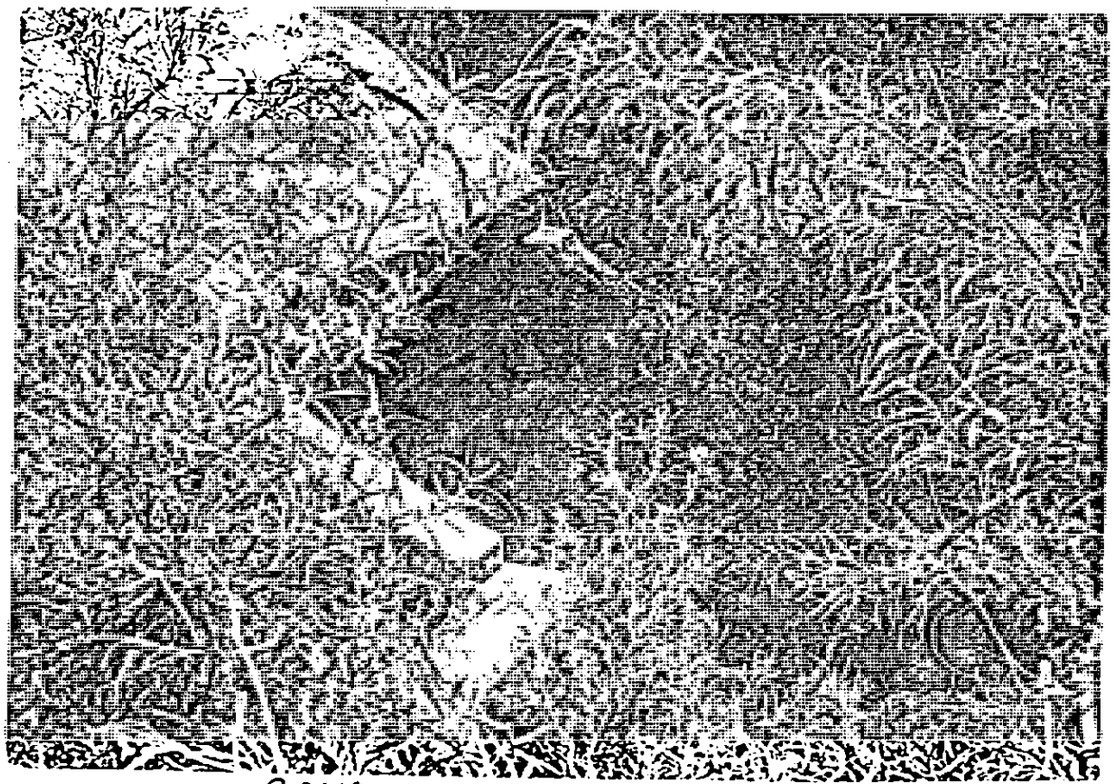


COMPUTER SECS 71.05 – 71.1

Sheet 25/43
HUD 202



ARCADIA DRAIN AT PENN. CENT R/R N/SIDE
STADIUM 2ND CROSSING. EAST OF HOWARD
COMPUTER SECS 71.2 - 71.3 #92B



COMPUTER SECS 71.05 - 71.1
ARCADIA DRAIN AT STADIUM DRIVE 2ND CROSSING
EAST OF HOWARD #94B

SHEET 26/43
HUDSON

FORM 25-0
(313) 291-5400

Wade, Trim & Associates, Inc.
Civil Engineers • Land Surveyors
WORK SHEET

25185 GODDARD ROAD
TAYLOR, MICHIGAN 48180

Bridge Location:
Bridge Losses - SB Card

REFERENCE

1. XK (Pier Shape Coefficient) — HEC-2 manual
XKOR (Loss Coefficient) = 1.0 + Σk , Σk = $\frac{0}{k_f + k_e + k_p}$
where k_f = friction loss coefficient
k_e = entrance loss coefficient
k_p = loss from intermediate piers
Description of Bridge: Box Culvert
$k_f = 29.1 n^2 L / R^{4/3}$ for English units
Area = (821.8 - 817.6)5 - .25 = 20.75 ft² Wp = 2(4.2 + 5.0) = 18.4'
R = A/wp = 1.13 ft $R^{4/3}$ = 1.17 L = 136 ft
n (composite) = .02
$k_f = 29.1 \times (.02)^2 \times 136 / 1.17 = 1.4$

k_e = 0.5 — Hydraulic Charts for the Selection of Highway Culverts Circular No. 5 Dec. 1965 pg. 45

k_p = 0 if bridge has no intermediate piers

k_p = 0.05 if bridge has intermediate piers — HEC-2 manual

2. XKOR = 1 + 1.4 + .5 + = 2.9
3. COFQ Coefficient of discharge = 2.6 — HEC-2 manual
4. RDLEN = Length of weir = _____ (0 if read off BT cards)
5. BWC = bottom width of bridge opening (inc. piers): 5.0
6. [illegible] width of obstruction = _____ — field data
7. [illegible] = bridge opening inc. piers = 20.8 ft²
8. SS = side slope = _____
(horizontal per 1 vertical unit)
9. ELCHU = Elevation of channel invert U/S side = 817.6
(0 if equal to minimum elevation in previous x-sect.)
10. ELCHD = Elevation of channel invert D/S side = 817.6
(0 if equal to minimum elevation in previous x-sect.)

Sheet 27/43

SUBJECT	BY	CHK.	SHEET NO.	File Code No. (Job No.) Owner Project Suffix
Arcadia Creek Culvert on Stadium Drive Second Crossing North East of Howard	Sushil			
	DATE 4/22/80	DATE	___ OF ___	HUD • 2027 • 07

COMPUTER SECS 71.05 - 71.1

Bridge Location :

Bridge Losses - SB Card

REFERENCE

1. XK (Pier Shape Coefficient)
XKOR (Loss Coefficient) = 1.0 + Σk, $\Sigma k = k_f + k_e + k_p$ — 0 — HEC-2 Manual

where k_f = friction loss coefficient
k_e = entrance loss coefficient
k_p = loss from intermediate piers

Description of Bridge : 60"ϕ Cast Iron Pipe Culvert

$K_f = 29.1\, n^2 L / R^{4/3}$ for English units

Area = Wp =
$R = A/wp = \frac{\text{Radius}}{2} = 1.25, R^{4/3} = 1.35$ L = 78 feet

n (composite) = .015

$K_f = 29.1 \times (.015)^2 \times 78 \;/ 1.35 = 0.4$

$K_c = 0.5$

Hydraulic Charts for the Selection of Highway Culverts Circular No. 5 Dec. 1965 pg. 49

K_p = 0 if bridge has no intermediate piers

K_p = 0.05 if bridge has intermediate piers — HEC-2 manual

2. XKOE = 1 + .4 + .5 + = 1.9
3. COFQ Coefficient of discharge = 2.6 — HEC-2 manual
4. RDLEN = Length of weir = _____ (0 if read off BT cards)
5. BWC = Bottom width of bridge opening (inc. piers) = 3.93 ft
6. [illegible] width of obstruction = _____ — field data
7. AREA = Bridge opening inc. piers = 19.6 ft²
8. SS = side slope = _____ (horizontal per 1 vertical unit)
9. ELCHU = Elevation of channel invert U/S side = 819.2 (0 if equal to minimum elevation in previous X-sect.)
10. ELCHD = Elevation of channel invert D/S side = 818.6 (0 if equal to minimum elevation in previous X-sect.) — Sheet 28/43

SUBJECT	BY	CHK.	SHEET NO.	File Code No. (Job No.) Owner	Project	Suffix
Arcadia Creek Culvert on Railroad Second Crossing North East of Howard	Susan		____ OF ____	HUD	2027	07
	DATE 4/22/82	DATE				

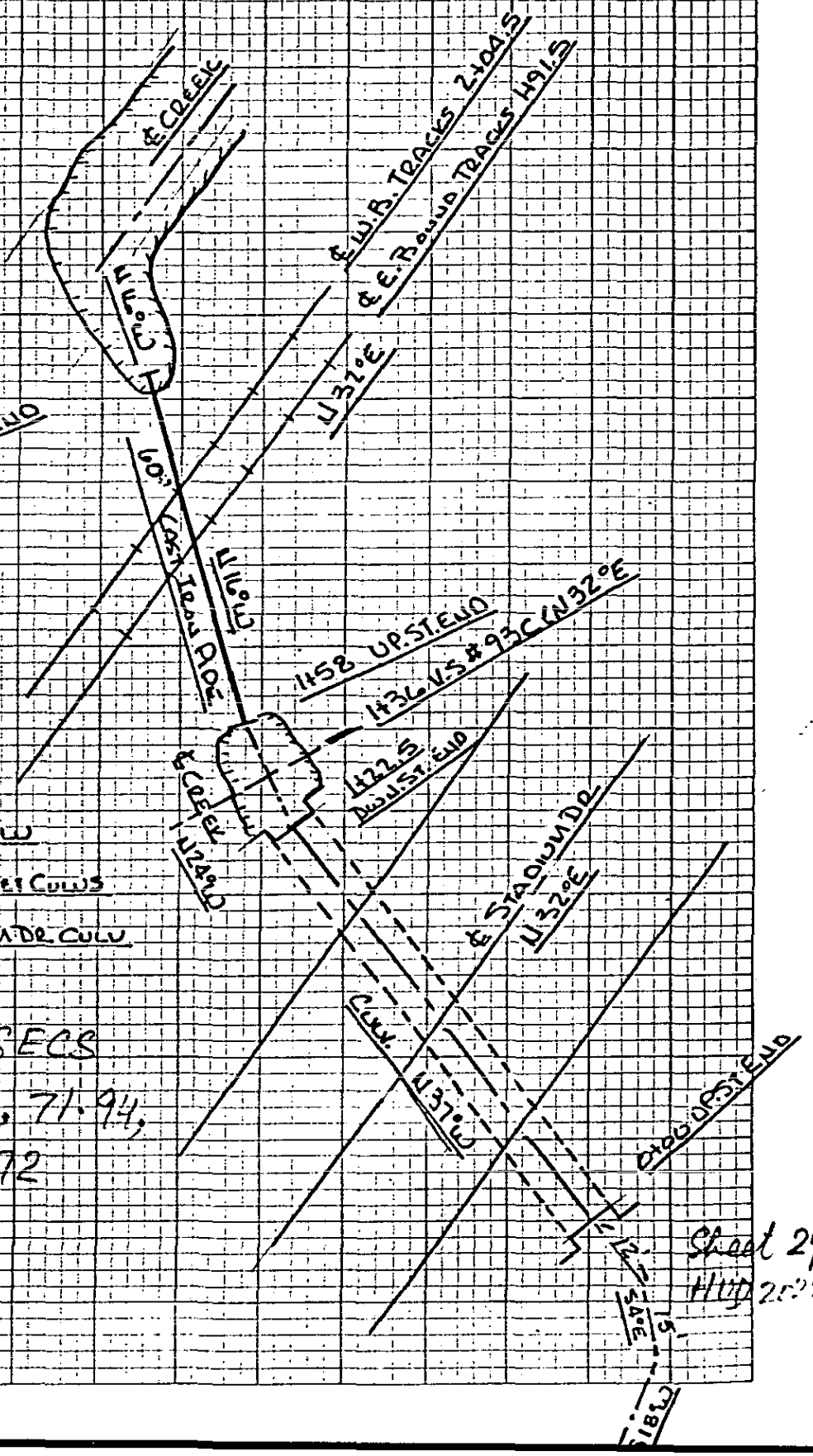
COMPUTER SECS 71.2 - 71.3

Cross-Sec's # 92C-93C-94C- Arcadia Creek At First Crossing

17
Book #3

N.E. of Howard

Magnetic Bearings



Cross-Sec #92C-R/R Culv

Cross-Sec #93C-Creek Bet Culvs

Cross-Sec #94C Stadium Dr. Culv

COMPUTER SECS
71.9, 71.92, 71.94,
AND 72

Sheet 29/43
HUD 2022

CROSS SECTION #94C- ARCADIA CREEK AT STADIUM

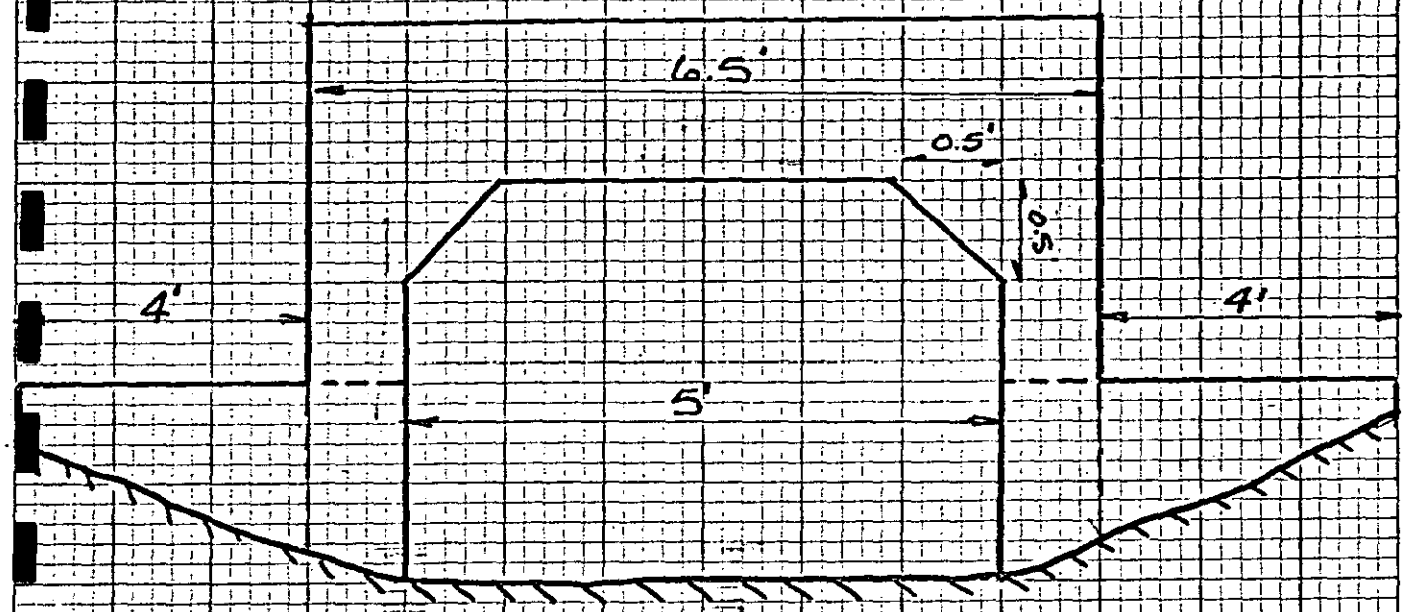
1ST CROSSING E. OF HOWARD

19

BOOK #3

UPSTREAM END FACING DOWNSTREAM (TYP)

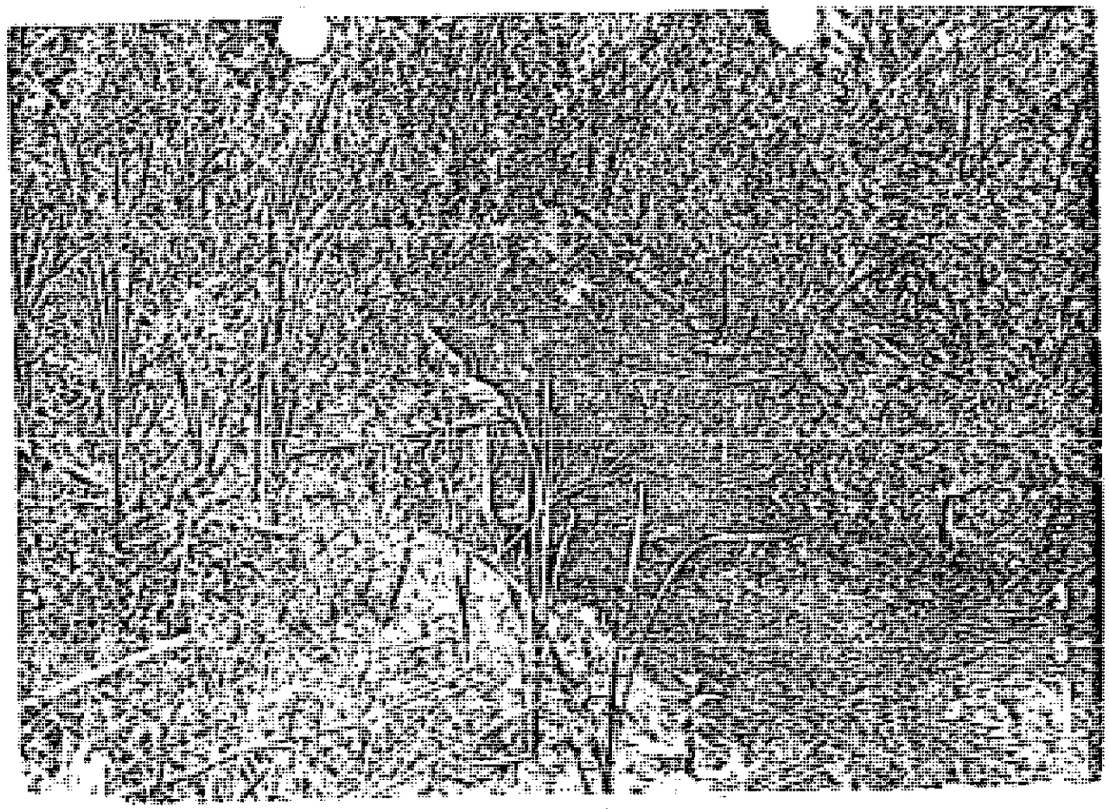
R&L OFFSETS ARE FROM ℄ CULV FACING UPSTREAM



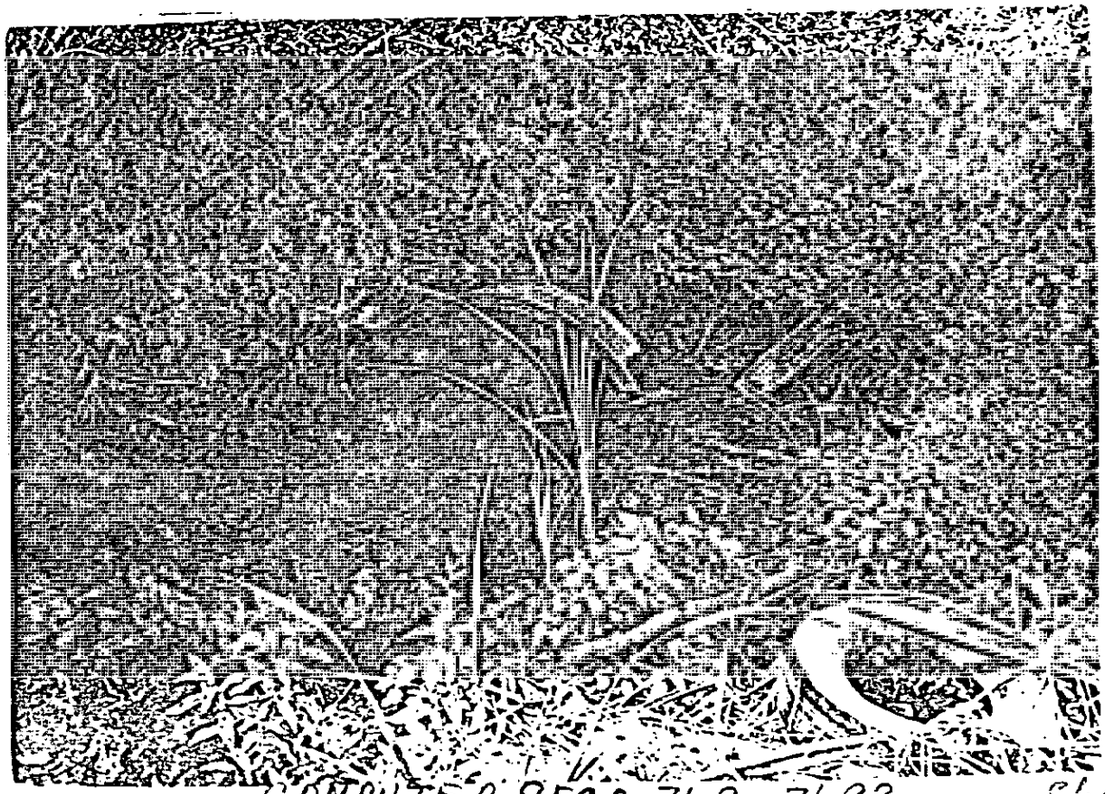
COMPUTER SEC 71.94-72

Sheet 30/43

HUD 2027-5



ARCADIA DRAIN AT STADIUM FIRST CROSSING
~~EAST~~ EAST OF HOWARD 94C
COMPUTER SECS 71.94-72



COMPUTER SECS 71.9-71.92
ARCADIA DRAIN AT PENN CENT R/R N/SIDE STADIUM

Sheet 31 43
HUD

FORM 25-0
(313) 291-6400

Wade, Trim & Associates, Inc.
Civil Engineers • Land Surveyors
WORK SHEET

25185 GODDARD ROAD
TAYLOR, MICHIGAN 48180

Bridge Location:

Bridge Losses - SB Card

REFERENCE

1. XK (Pier Shape Coefficient)
XKOR (Loss Coefficient) = $1.0 + \Sigma k$, $\Sigma k = k_f + k_e + k_p$ — HEC-2 Manual

where k_f = friction loss coefficient
k_e = entrance loss coefficient
k_p = loss from intermediate piers

Description of Bridge: 60"Φ Cast Iron Pipe Culvert

$K_f = 29.1\, n^2 L / R^{4/3}$ for English units

Area = 0 — Wp = 0

$R = A/wp = \text{Radius}/2 = 1.25$, $R^{4/3} = 1.35$ — $L = 87$ ft

n (composite) = .015

$K_f = 29.1 \times (.015)^2 \times 87 \;/\; 1.35 = 0.4$

$K_e = 0.5$

Hydraulic Charts for the Selection of Highway Culverts Circular No. 5 Dec. 1965 pg. 45

$K_p = 0$ if bridge has no intermediate piers

$K_p = 0.05$ if bridge has intermediate piers — HEC-2 manual

2. XKOR = 1 + .4 + .5 + = 1.9
3. COFQ Coefficient of discharge = 2.6
4. RDLEN = Length of weir = _____ (0 if read off BT cards) — HEC-2 manual
5. BWC = bottom width of bridge opening (inc. piers): 3.93 ft
6. [illegible] total width of obstruction = _____
7. AREA = Bridge opening inc. piers = 19.6 ft2 — field data
8. SS = side slope = _____ (horizontal per 1 vertical unit)
9. ELCHU = Elevation of channel invert U/S side = 824.0 (0 if equal to minimum elevation in previous x-sect.)
10. ELCHD = Elevation of channel invert D/S side = 823.7 (0 if equal to minimum elevation in previous x-sect.) — Sheet 32 1/2

SUBJECT	BY	CHK.	SHEET NO.	File Code No. (Job No.) Owner / Project / Suff.
Arcadia Creek Culvert on Railroad First Crossing North East of Howard	Susan		___ OF ___	HUD • 2027 • 07
COMPUTER SECS 71.9-71.92	DATE 4/22/80	DATE		

FORM 25-0
(313) 291-5400

Wade, Trim & Associates, Inc.
Civil Engineers • Land Surveyors
WORK SHEET

25185 GODDARD ROAD
TAYLOR, MICHIGAN 48180

Bridge Location :

Bridge Losses - SB Card

REFERENCE

1. XK (Pier Shape Coefficient)
XKOR (Loss Coefficient) = $1.0 + \Sigma k$, $\Sigma k = k_f + k_e + k_p$ — 0 — HEC-2 Manual

where k_f = friction loss coefficient
k_e = entrance loss coefficient
k_p = loss from intermediate piers

Description of Bridge : Box Culvert

$K_f = 29.1\, n^2 L / R^{4/3}$ for English units

Area = $(830.9 - 826.9)5 - .25 = 19.75$ WP = $2(4.0 + 5.0) = 18.'$

$R = A/wp = 1.10$ $R^{4/3} = 1.13$ $L = 122.5$ ft

n (composite) = .02

$K_f = 29.1 \times (.02)^2 \times 122.5 / 1.13 = 1.3$

$K_e = .5$

Hydraulic Charts for the Selection of Highway Culverts Circular No. 5 Dec. 1965 pg. 45

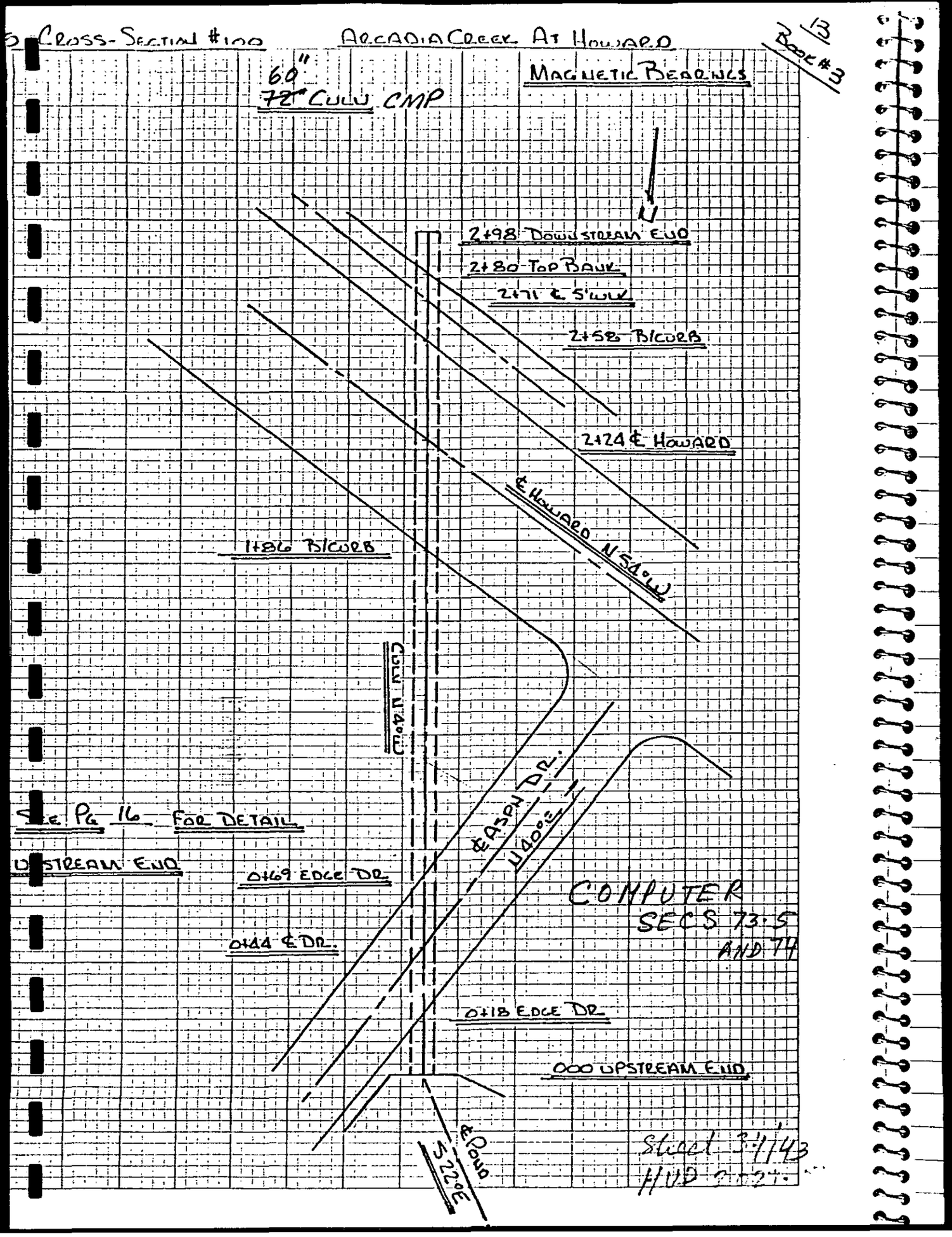
$K_p = 0$ if bridge has no intermediate piers

$K_p = 0.05$ if bridge has intermediate piers — HEC-2 manual

2. XKOR = $1 + 1.3 + .5 + = 2.8$
3. COFQ Coefficient of discharge = 2.6
4. RDLEN = Length of weir = _____ (0 if read off BT cards) — HEC-2 manual
5. BWC = bottom width of bridge opening (inc. piers) = 5.0
6. [illegible] width of obstruction = _____
7. OPNG = bridge opening inc. piers = 19.8 ft2 — field data
8. SS = side slope = _____ (horizontal per 1 vertical unit)
9. ELCHU = Elevation of channel invert U/S side = 826.9 (0 if equal to minimum elevation in previous x-sect.)
10. ELCHD = Elevation of channel invert D/S side = 826.9 (0 if equal to minimum elevation in previous x-sect.) — Sht 3 of 3

SUBJECT	BY	CHK.	SHEET NO.	File Code No. (Job No.) Owner Project Suff.:
Arcadia Creek Culvert on Stadium Drive First Crossing North East of Howard	Sushil		____ OF ____	HUD 2027 0
	DATE 4/22/80	DATE		

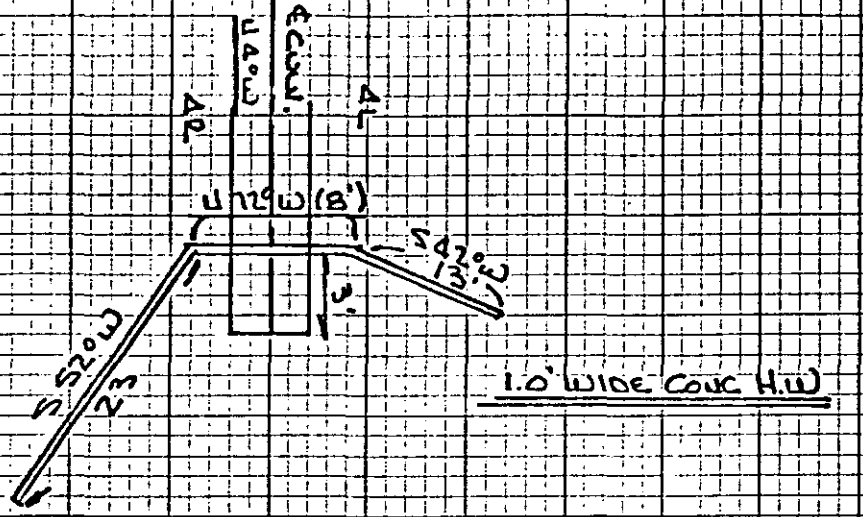
COMPUTER SECS 71-11-72



Cross-Section #100
Arcadia Creek At Howard
13
Book #3
60"
~~72"~~ Culv CMP
Magnetic Bearings
N
2+98 Downstream End
2+80 Top Bank
2+71 ℄ S'wlk
2+58 B/Curb
2+24 ℄ Howard
℄ Howard N 54°W
1+86 B/Curb
Culv N 4°W
℄ Asph Dr.
N 40°E
See Pg 16 For Detail
Upstream End
0+69 Edge Dr.
0+44 ℄ Dr.
0+18 Edge Dr.
000 Upstream End
℄ Pond
S 22°E
Computer
Secs 73.5
and 74
Sheet 3/43

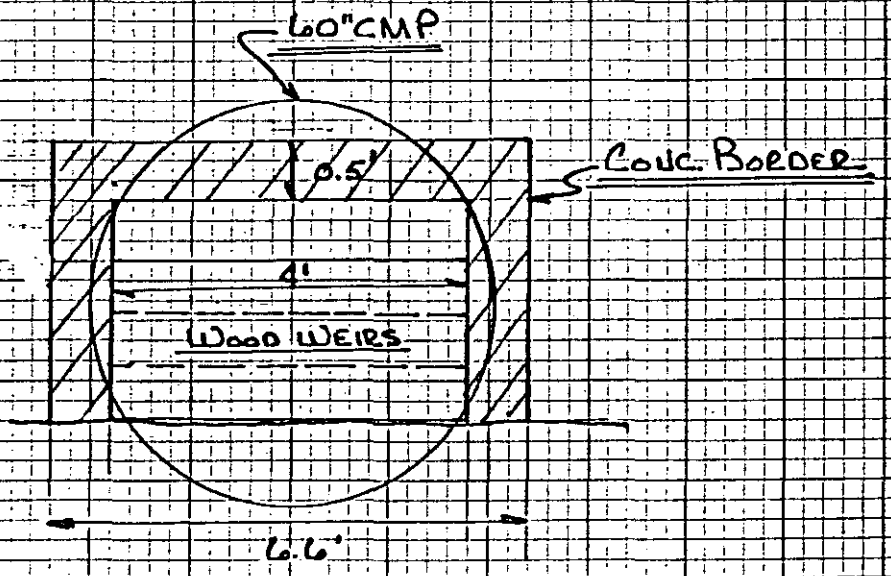
Cross-Section #100 — Arcadia Creek At Howard

Book #15



1.0' Wide Conc. H.W.

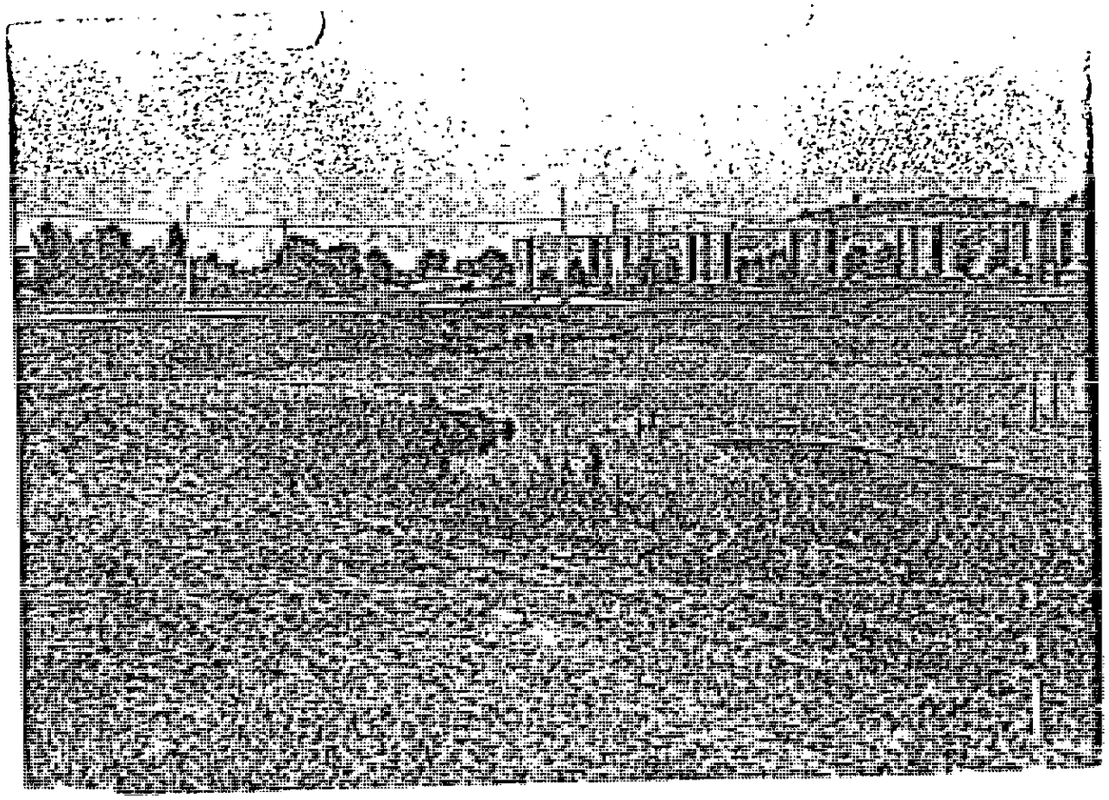
Detail Upstream End



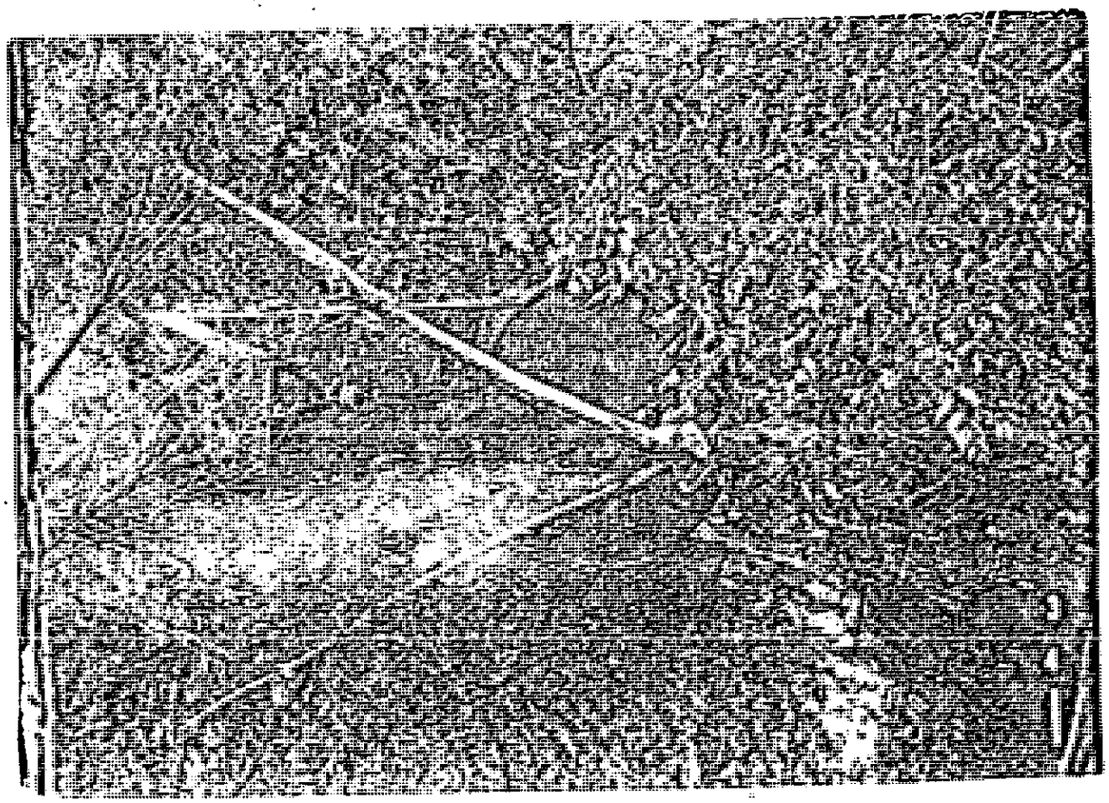
COMPUTER SECS 73.5 AND 74

Sheet 35/43

HUD



ARCADIA DRAIN AT ENTRANCE DRIVE TO KALAMA 200
CHRISTIAN H.S. W/SIDE HOWARD
UPSTR #100 U/S HOWARD ST. COMPUTER SEC 74



ARCADIA DRAIN E. SIDE HOWARD & S/SIDE SIERRA
DWNSTR #100 COMPUTER SEC 73.5

Sheet 36 43
HUD 203

FORM 25-0
(313) 291-5400

Wade, Trim & Associates, Inc.
Civil Engineers • Land Surveyors
WORK SHEET

25185 GODDARD ROAD
TAYLOR, MICHIGAN 48180

Bridge Location:
Bridge Losses - SB Card

REFERENCE

1. XK (Pier Shape Coefficient)
XKOR (Loss Coefficient) = 1.0 + Σk , Σk = $k_f + k_e + k_p$ 0 — HEC-2 manual
where k_f = friction loss coefficient
k_e = entrance loss coefficient
k_p = loss from intermediate piers
Description of Bridge: 60" CMP Culvert
$K_f = 29.1 n^2 L / R^{4/3}$ for English units
Area = ____ = ____ Wp =
$R = A/wp = \frac{Radius}{2} = 1.25'$ $R^{4/3} = 1.35$ $L = 298$ ft
n (composite) = .02
$K_f = 29.1 \times (.02)^2 \times 298 / 1.35 = 2.6$
$K_e = .5$ — Hydraulic Charts for the Selection of Highway Culverts Circular No. 5 Dec. 1965 pg. 45

K_p = 0 if bridge has no intermediate piers
K_p = 0.05 if bridge has intermediate piers — HEC-2 manual

2. XKOR = 1 + 2.6 + 0.5 + = 4.1
3. COFQ Coefficient of discharge = 2.6
4. RDLEN = Length of weir = ____ (0 if read off BT cards) — HEC-2 manual
5. BWC = bottom width of bridge opening (inc. piers) = 3.93 ft
[illegible] total width of obstruction = ____
7. [illegible] = bridge opening inc. piers = 19.6 ft² — field data
8. SS = side slope = ____
(horizontal per 1 vertical unit)
9. ELCHU = Elevation of channel invert U/S side = 831.0
(0 if equal to minimum elevation in previous x-sect.)
10. ELCHD = Elevation of channel invert D/S side = 829.0
(0 if equal to minimum elevation in previous x-sect.)

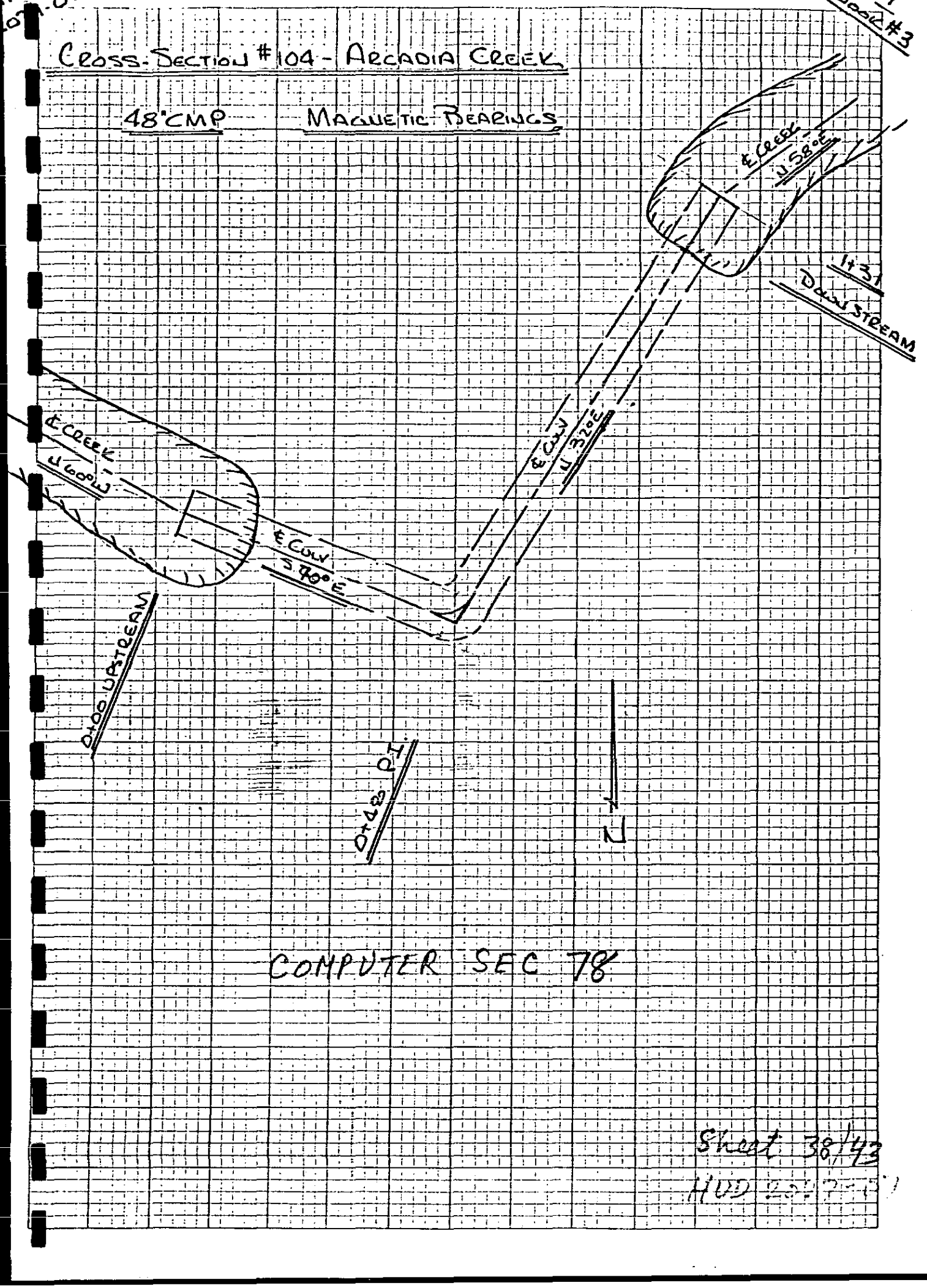
Sheet 37/43

SUBJECT Arcadia Creek Culvert on Howard Street
COMPUTER SECS 73.5-74
BY Sushil DATE 4/25/80
CHK. DATE
SHEET NO. ____ OF ____
File Code No. (Job No.) Owner Project Suffix HUD 2027 07

Cross-Section #104 - Arcadia Creek

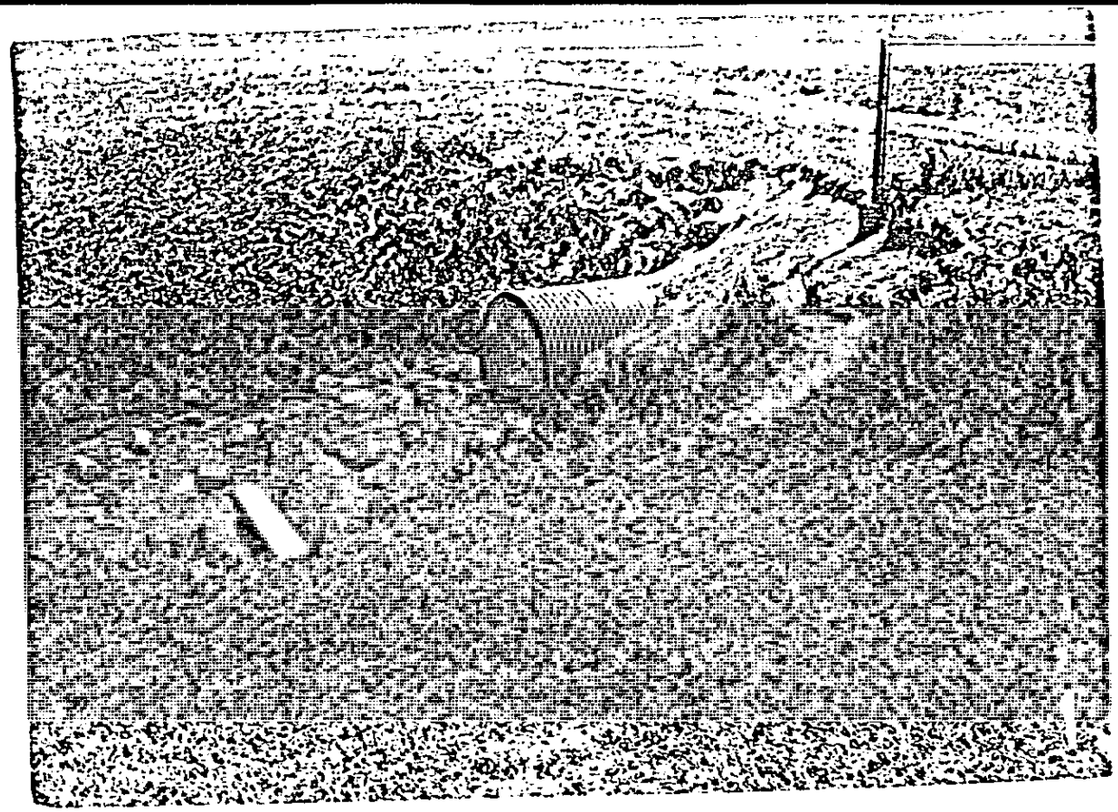
48" CMP

Magnetic Bearings



COMPUTER SEC 78

Sheet 38/43



ARCADIA DEAIN SOUTH OF STADIUM DR
BEHIND KAL. CHRISTIAN HIGH SCHOOL
CROSS-SEC #104

COMPUTER SEC 78

Sheet 39/43
HID 2027-07

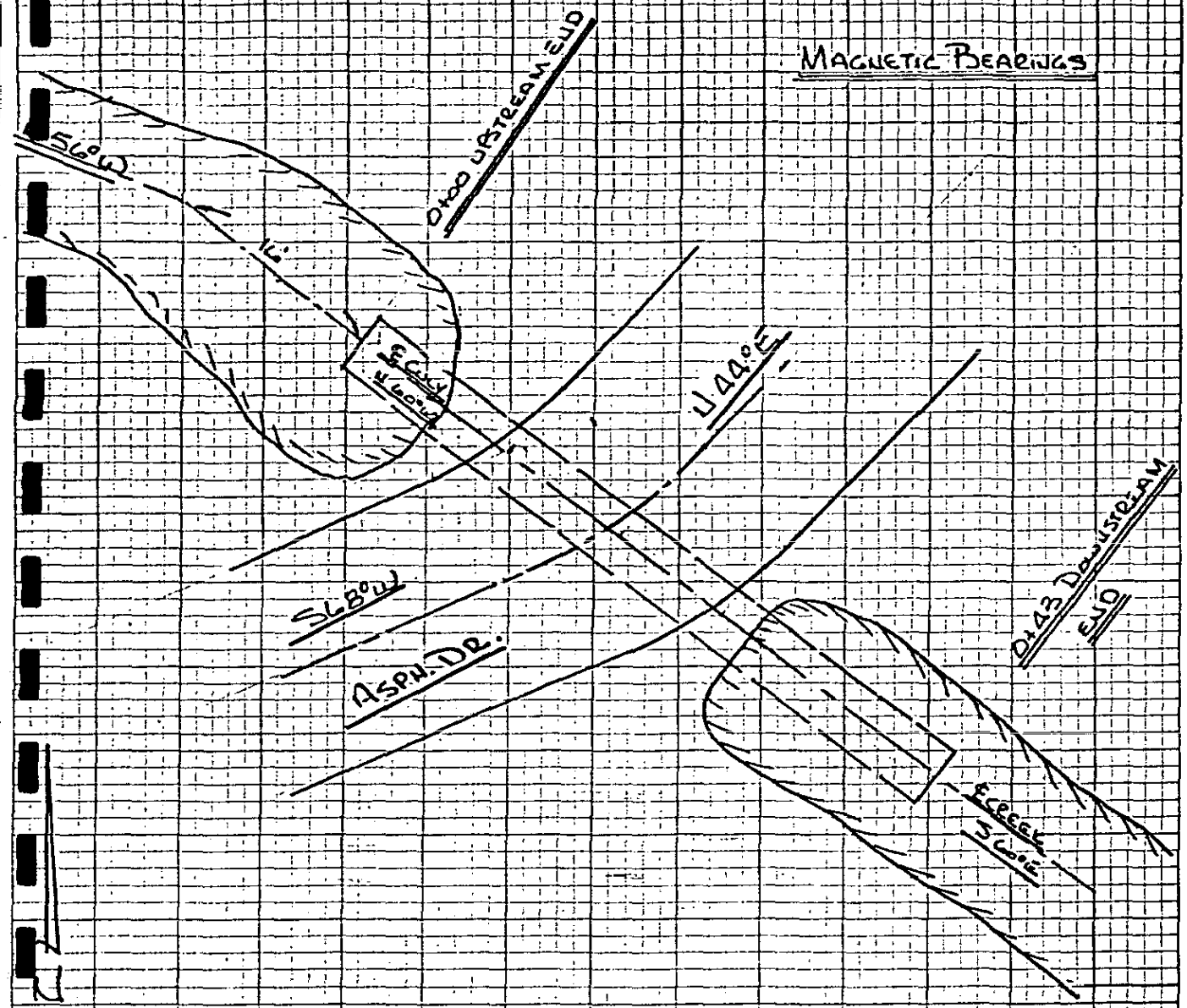
Cross-Section #105 Arcadia Creek

10-24-79

R2-GK-JH-LP

42" CMP.

MAGNETIC BEARINGS



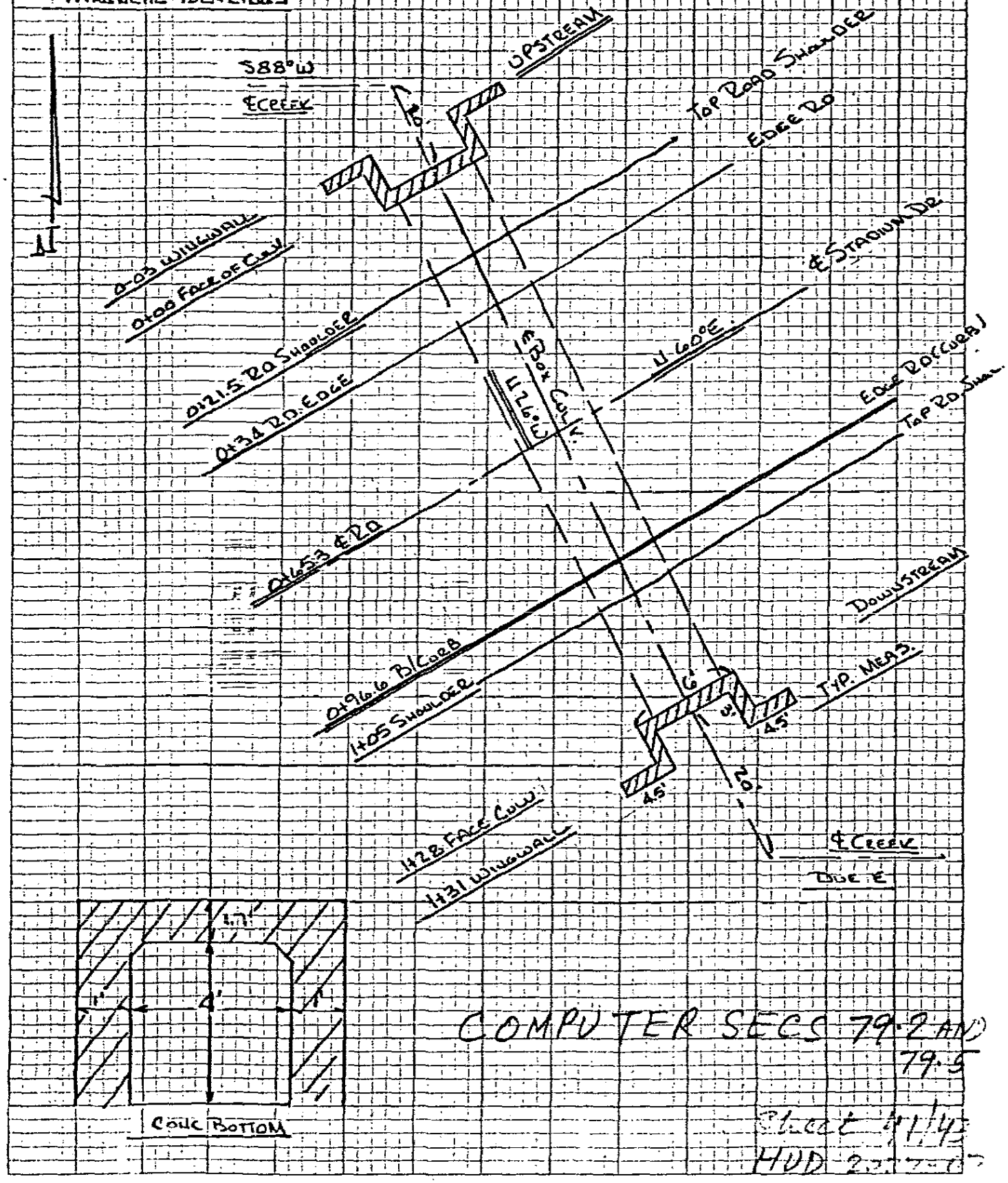
COMPUTER SEC. 79

Sheet 40 of 43

HUD ???-??

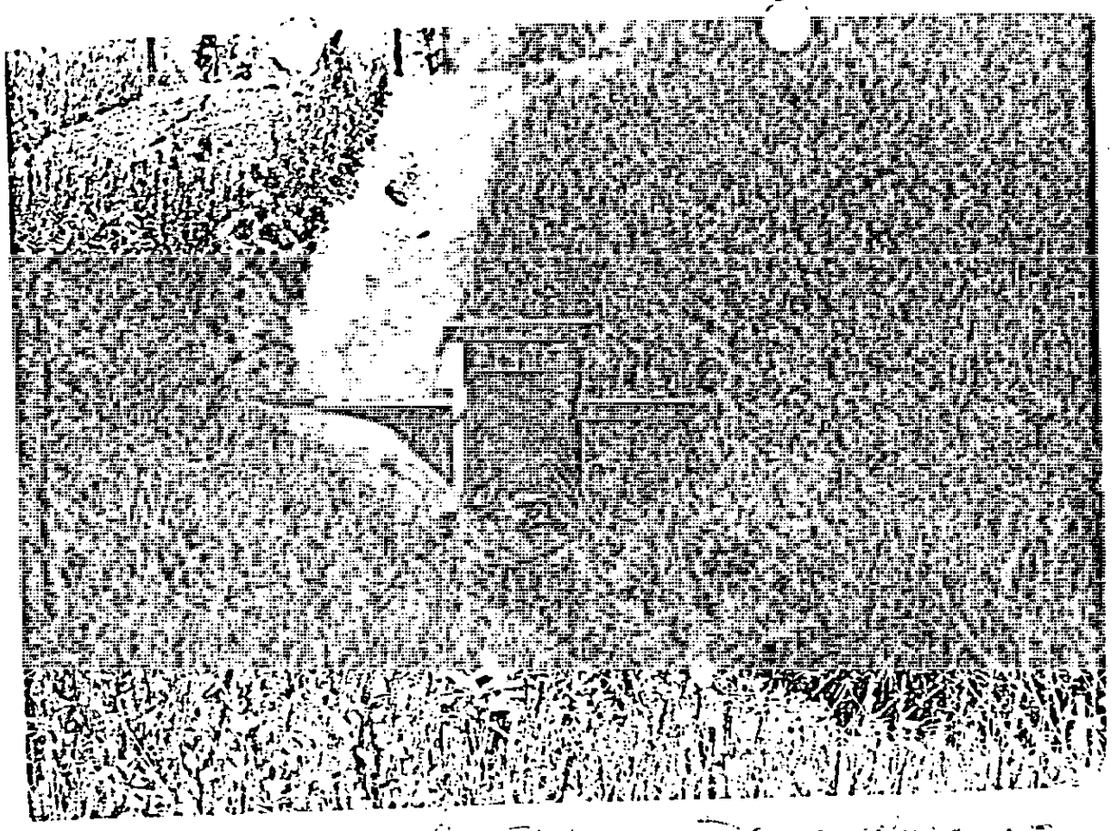
Valley Section #106 - Arcadia Drain

10-24-79
RZ-GK-JH-LP



COMPUTER SECS 79.2 AND 79.5

Sheet 41/43
HUD 2[illegible]



106

COMPUTER SEC 79.5

Sheet 42/43

HUD 2037-57

FORM 25-0
(313) 291-5400

Wade, Trim & Associates, Inc.
Civil Engineers • Land Surveyors
WORK SHEET

25185 GODDARD ROAD
TAYLOR, MICHIGAN 48180

Bridge Location:
Bridge Losses - SB Card

REFERENCE

1. XK (Pier Shape Coefficient) 0 — HEC-2 manual
XKOR (Loss Coefficient) = 1.0 + Σk, $\Sigma k = k_f + k_e + k_p$
where k_f = friction loss coefficient
k_e = entrance loss coefficient
k_p = loss from intermediate piers
Description of Bridge: Box Culvert
$k_f = 29.1 n^2 L / R^{4/3}$ for English units
Area = 4x4 = 16 ft² = ____ Wp = 2(4+4) = 16 ft
R = A/wp = 1.0 ft $R^{4/3}$ = 1.0 L = 128 ft
n (composite) = .02
$k_f = 29.1 \times (.02)^2 \times 128 / 1.0 = 1.5$

k_e = 0.5 — Hydraulic Charts for the Selection of Highway Culverts Circular No. 5 Dec. 1965 pg. 45

k_p = 0 if bridge has no intermediate piers

k_p = 0.05 if bridge has intermediate piers — HEC-2 manual

2. XKOR = 1 + 1.5 + 0.5 + = 3.0
3. COFQ Coefficient of discharge = 2.6 — HEC-2 manual
4. RDLEN = Length of weir = ____ (0 if read off BT cards)
5. BWC = bottom width of bridge opening (inc. piers) = 4.0 ft
6. [illegible] total width of obstruction = ____ — field data
7. [illegible] = bridge opening inc. piers = 16.0 ft²
8. SS = side slope = ____
(horizontal per 1 vertical unit)
9. ELCHU = Elevation of channel invert U/S side = 840.5
(0 if equal to minimum elevation in previous x-sect.)
10. ELCHD = Elevation of channel invert D/S side = 839.9
(0 if equal to minimum elevation in previous x-sect.)

Sheet 43/43

SUBJECT	BY	CHK.	SHEET NO.	File Code No. (Job No.) Owner Project Suffix
Arcadia Creek Culvert at Stadium Drive West of Howard	Sushil		____ OF ____	HUD • [illegible] •
	DATE 4/28/[illegible]	DATE		

COMPUTER SEC 79.2

ARCADIA CREEK

CITY OF KALAMAZOO, MICHIGAN

EXHIBIT 5

ENCLOSURE COMPUTATIONS

REFERENCE

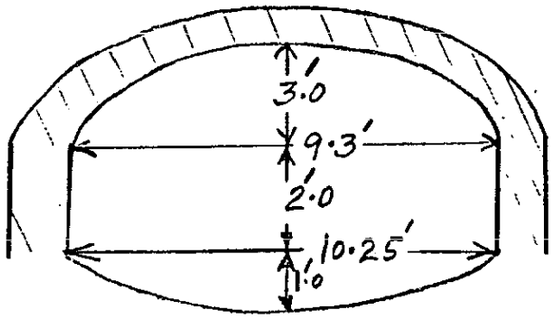
Pressure Flow Computations for Arcadia Creek Enclosures

1A) Enclosure from Outlet of Arcadia Cr. (into Portage Cr.) to U/S of Burdick St.

Alignment of the Enclosure shown on the next two sheets.

Data taken from Survey Notes

(i) Cross section from 0+00 to 13+56



Xsectional Area (A)

$$= \left(\frac{9.3 + 10.25}{2}\right) 2 + 0.012\pi\frac{(26.27)^2}{4} + 0.245\pi\frac{(10.2)^2}{4}$$

$$= \underline{46.1\ ft^2}$$

Wetted Perimeter (P) $= 11.69 + 2 \times 2 + 10.53 = \underline{26.22\ ft}$

$\therefore R = A/P = 46.1/26.22 = \underline{1.76\ ft}$

Contd. on sheet 4

SUBJECT	BY	CHK.	SHEET NO.	File Code No. (Job No.) Owner Project Suffix
Arcadia Creek Enclosure #1A	Surber		1 OF 16	HUD • 2027 • 07
	DATE 3/31/80	DATE		

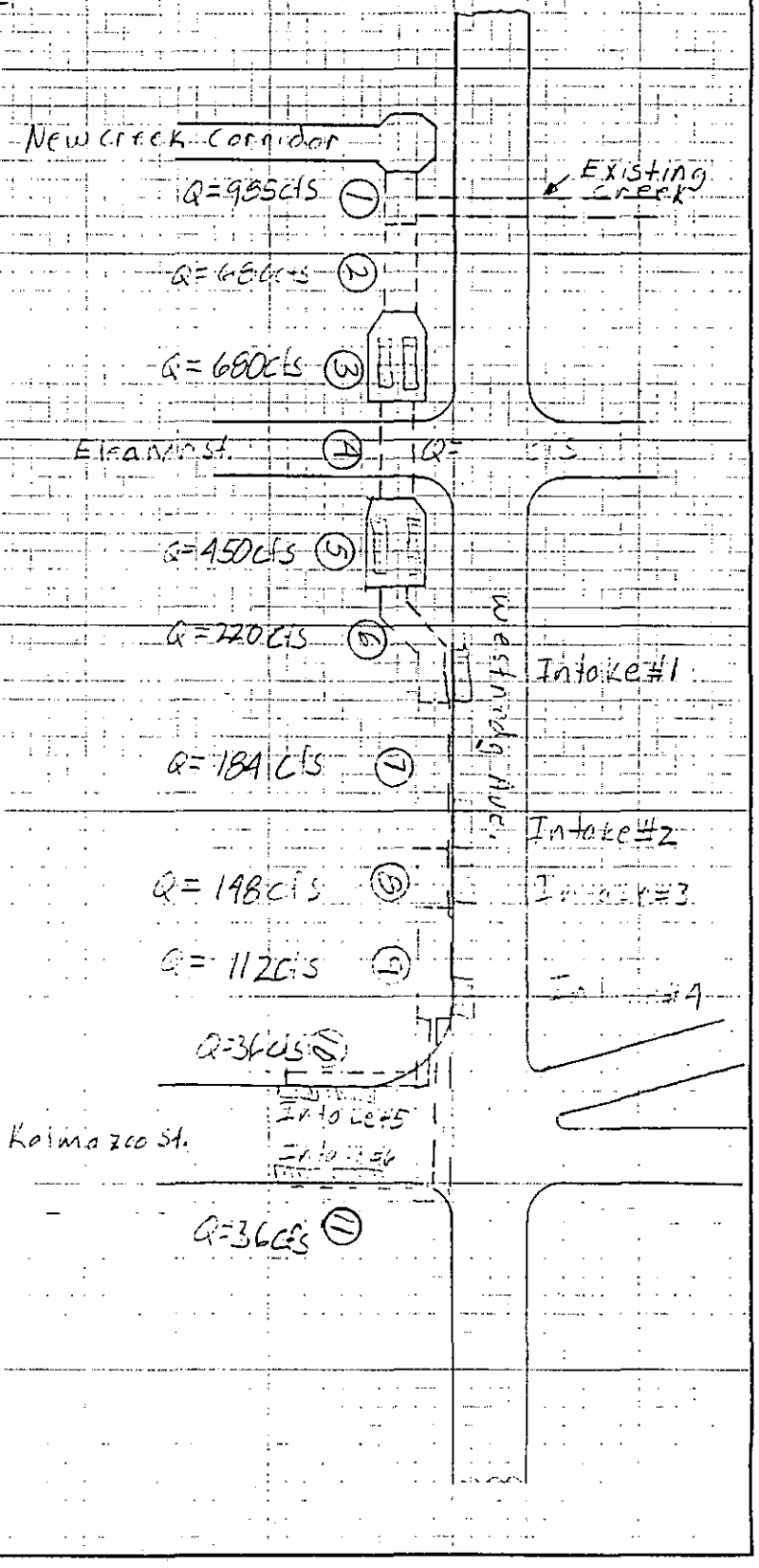
STS Consultants Ltd.
CALCULATION SHEET

PROJECT	STS JOB NO.
Arcadia Creek	1969
SUBJECT	CALC. NO.
Schematic Diagram	2/11
DATE 4/6/90 · BY DEH · CHECKED BY	REV. NO.

Westnedge Sewer Components

Symbol	Description
①	Transition Box 1
②	Reach 1
③	Collector Box 1
④	Reach 2
⑤	Collector Box 2
⑥	Reach 3
⑦	Reach 4
⑧	Reach 5
⑨	Reach 6
⑩	Reach 7
⑪	Reach 8

Schematic Diagram



BRUNING 45-111

STS Consultants Ltd.
CALCULATION SHEET

PROJECT	STS JOB NO.
Arcadia Creek	106a-AJ
SUBJECT: Westridge Collector System	CALC. NO. 4/11
DATE 3/7/90 BY DEH	CHECKED BY / REV. NO.

Head Loss Computation Methodology

All head losses will be modeled in the following form:

$$H_L = K \frac{V^2}{2g}$$

$$K = \sum K_i$$

Friction: K_f

$$K_f = \frac{29.1 (n^2) \cdot L}{R^{4/3}}$$

Ref. - See derivation from Manning's Equation, Technical Data Appendix, pages TDA-2,3.

Bends: K_b (see Fig. 19)

Ref. - Friction Factors for Large Conduits Flowing Full, US Dept. of the Interior Bureau of Reclamation, 1965.

Piers: K_p

$K_p = .05$

Ref. 5 - HEC-2 Water Surface Profiles, Users Manual 1982

BRUNING 45-114

STS Consultants Ltd.
CALCULATION SHEET

PROJECT	STS JOB NO.
Arcadia Creek	1069-AT
SUBJECT	**CALC. NO.**
Westnedge Caller for System	5/11
DATE 3/7/90 **BY** DEH	**CHECKED BY** / **REV. NO.**

Transition Losses: K_c & K_{exp}

*Contraction:

$$h_{L_c} = K_c \frac{V^2}{2g}$$

$$K_c = \left(\frac{1}{C_c} - 1\right)^2$$

C_c - Coefficient of contraction (See Table 21-6)

V - velocity in smaller diameter pipe

A_2/A_1	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
C_c	.62	.63	.64	.66	.68	.71	.76	.81	.89	1.0

Table 21-6

*Sudden Expansion:

$$K_{exp} = \frac{(V_1 - V_2)^2}{2g} \Bigg/ \frac{V_1^2}{2g}$$

V_1 = velocity before enlargement

V_2 = velocity after enlargement

*Ref. 6 - Standard Handbook for Civil Engineers, 1953.

BRUNING 45-11

STS Consultants Ltd.
CALCULATION SHEET

PROJECT	STS JOB NO.
Arcadia Creek	104-9
SUBJECT	CALC. NO.
Westridge Collector System	6/11
DATE 3/5/90 BY DEH CHECKED BY	REV. NO.

Entrance losses: Kent

Ref 3 - Design of Small Dams, 1987.

& Ref. 7 - BPR charts.

Miscellaneous: K_{misc}

For Flow thru manholes with no change in size:

$K_{misc} = 0.05$

Ref 4 - Modern Sewer Design, 1980.

For Junction losses: (see Fig 5.55)

Ref 8 - Internal Flow Systems, D.S. Miller, 1978

BRUNING 45-11

STS Consultants Ltd.
CALCULATION SHEET

PROJECT	STS JOB NO.
Arcadia Creek	1069-
SUBJECT	CALC. NO.
Transition Zone	7/11
DATE 9/22/89 BY DEH	CHECKED BY / REV. NO.

Discharge (at Westnedge Ave.)

Total: Q_{100} = 985 cfs

Existing creek Capacity: Q_{100} = 307 cfs (Ref 1)

Transition System required Capacity: 678 cfs

Tailwater Elevation (From HEC-2 printout AC3.out XSEC 30)

≅ 780.0

Existing creek to remain intact upstream of Westnedge Avenue. Computations identifying the distribution of flow between the existing conduit and overalnd flow are the subject of a separate computaion sheet package. The overland flow component (680 cfs) will be collected by the new Westnedge collector sewer. The existing sewer and the new Westnedge sewer will join on the east side of Westnedge Ave. at the upstream limit of the new Arcadia Creek.

BRUNING 45-11

STS Consultants Ltd.
CALCULATION SHEET

PROJECT	STS JOB NO.
Arcadia Creek	1069
SUBJECT	CALC. NO.
Westnedge Collector	8/11
DATE 2/23/90 BY DEH	CHECKED BY / REV. NO.

Catch Basins

Neenah frams and grates R-3531 & 3067-L, will be used for parking Lot and curb & gutter situations respectively. Even though the EJIW 7355 would provide more open area, the state and city officials would prefer we use the above mentioned due to maintenance purposes.

Analysis Methodology:

In sump capacities are governed by weir flow during low flow and orifice flow during high flow. (Ref 2.)

Governing Equations:

Weir Flow – $Q = C L H^{3/2}$

Q = discharge (CFS)

C = Discharge Coefficient = 3.33

L = Perimeter length of Grate (Ft)

H = Hydraulic Head (ft)

Orifice Flow – $Q = AC\sqrt{2gH}$

Q = discharge (CFS)

A = Effective open Area (Ft^2)

C = Discharge Coefficient = .6

H = Hydraulic Head (Ft)

BRUNING 45-111

STS Consultants Ltd. CALCULATION SHEET	PROJECT	STS JOB NO.
	Arcadia Creek	1069-AT
	SUBJECT: Collector System	CALC. NO. 911
	DATE 11/11/90 · BY DEH · CHECKED BY	REV. NO.

Catch Basins

Design Criteria= select a frame/grate that will maximize open area, yet is structurally sound and does not pose any safety hazards.

possibilites:

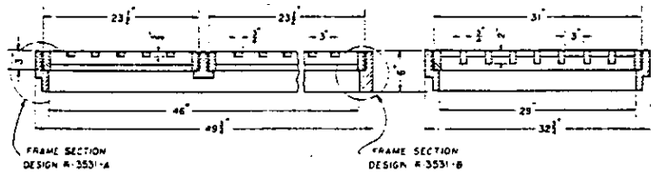
1) Neenah — R-3531-B : row 2 Grate

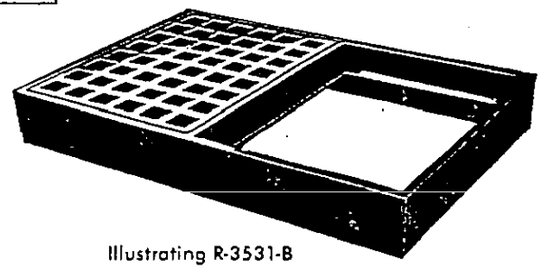
open Area = 2 (3.0 ft²/grate) = 6.0 ft²

R-3531-A&B Turnpike Inlet Frame and Double Grate

Heavy Duty

R-3531-A — 570 Pounds
R-3531-B — 670 Pounds





Illustrating R-3531-B

Rating Curve: $Q_o = C \cdot A\sqrt{2gH}$ or $Q_w = C \cdot L\, H^{3/2}$ (Ref. 2)

$C = .6$ $\quad C = 3.33$

H(ft)	Q_o 1 grate Q(cfs)	Q_o 2 grates Q(cfs)
0	0	0
.5	10.2	20.4
1.0	14.4	28.8
1.5	17.7	35.4
2.0	20.4	40.8

Weir Flow must be checked once the final configuration is set.

(See Technical Data Approval pages T.D.A. 6-8.

BRUNING 45-111

STS Consultants Ltd.
CALCULATION SHEET

PROJECT	STS JOB NO.
Arcadia Creek	1069
SUBJECT	CALC. NO.
Collector System	10/11
DATE 2/20/90	BY DEH
CHECKED BY	REV. NO.

3) Neenah - R-3067-L Frame and Grate

Open Area = 1.9 ft²

R-3067-LL Curb Inlet Frame, Grate, Curb Box

Heavy Duty

Total Weight 485 Pounds

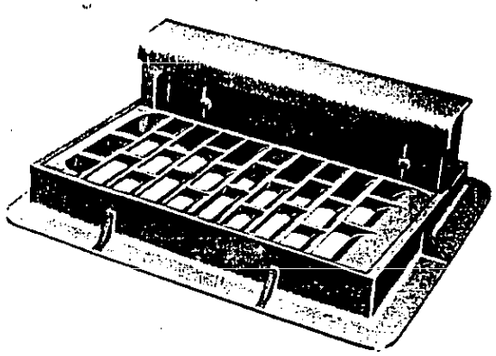
Unit shown is for flow-left. If flow-right is required, order as **R-3067-LR.**

R-3067-V

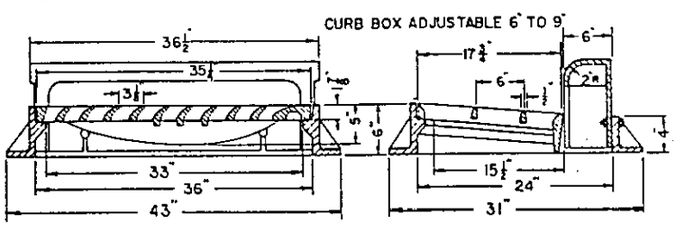
Same as above except with Type V Grate.

Heavy Duty

Total Weight 485 Pounds



Illustrating R-3067-LL



Rating Curve:

H (ft)	Q_o (cfs)
0	0
.5	6.1
1.0	5.7
1.5	10.6
2.0	12.2

BRUNING 45-111

STS Consultants Ltd.
CALCULATION SHEET

PROJECT	STS JOB NO.
Arcadia Creek	1069
SUBJECT	CALC. NO.
Westridge Collector System	1111
DATE 2/23/90 BY DEH	CHECKED BY / REV. NO.

References:

1. STS Calculations, West End Diversion, DEH,

2. Inlet Grate Capacities For Sutro Flow and Ponded Water, Neenah Foundry Company, 1987.

3. Design of Small Dams, U.S. Dept. of the Interior, Bureau of Reclamation, 1987.

4. Modern Sewer Design AISI, 1980.

5. HEC-2, Water Surface Profiles, Users Manual, 1982.

6. Standard Handbook For Civil Engineers, McGraw-Hill, Third Edition, 1983.

7. Hydraulic Design of Improved Inlets for Culverts Hydraulic Engineering Circular No. 13 U.S DOT, FHWA, 1972.

8. Internal Flow Systems, D.S. Miller, BHRA Fluid Engineering, 1978

BRUNING 45-111

STS Consultants Ltd.
CALCULATION SHEET

PROJECT	STS JOB NO.
Arcadia Creek	1069
SUBJECT	**CALC. NO.**
Technical Data Appendix	TDA-1/9
DATE 4/6/90 **BY** DEH **CHECKED BY**	**REV. NO.**

Technical Data Appendix - Following is technical data used in the design of the wetlodge Sewer

Illustration 5.7 — Dimensions and Approximate Weights of Concrete Box Sections

ASTM C789—PRECAST REINFORCED CONCRETE BOX SECTIONS

Span (Ft.)	Rise (Ft.)	Thickness (in.) Top Slab	Bot. Slab	Wall	Waterway Area (Sq. Feet)	Approx. Weight (lbs/ft)
3	2	4	4	4	5.8	600
3	3	4	4	4	8.8	700
4	2	5	5	5	7.7	910
4	3	5	5	5	11.7	1030
4	4	5	5	5	15.7	1160
5	3	6	6	6	14.5	1430
5	4	6	6	6	19.5	1580
5	5	6	6	6	24.5	1730
6	3	7	7	7	17.3	1880
6	4	7	7	7	23.3	2060
6	5	7	7	7	29.3	2230
6	6	7	7	7	35.3	2410
7	4	8	8	8	27.1	2600
7	5	8	8	8	34.1	2800
7	6	8	8	8	41.1	3000
7	7	8	8	8	48.1	3200
8	4	8	8	8	31.1	2800
8	5	8	8	8	39.1	3000
8	6	8	8	8	47.1	3200
8	7	8	8	8	55.1	3400
8	8	8	8	8	63.1	3600
9	5	9	9	9	43.9	3660
9	6	9	9	9	52.9	3880
9	7	9	9	9	61.9	4110
9	8	9	9	9	70.9	4330
9	9	9	9	9	79.9	4560
10	5	10	10	10	48.6	4380
10	6	10	10	10	58.6	4630
10	7	10	10	10	68.6	4880
10	8	10	10	10	78.6	5130
10	9	10	10	10	88.6	5380
10	10	10	10	10	98.6	5630
11	4	11	11	11	42.3	4880
11	6	11	11	11	64.3	5430
11	8	11	11	11	86.3	5980
11	10	11	11	11	108.3	6530
11	11	11	11	11	119.3	6810
12	4	12	12	12	46.0	5700
12	6	12	12	12	70.0	6300
12	8	12	12	12	94.5	6900
12	10	12	12	12	118.0	7500
12	12	12	12	12	142.0	8100

ASTM C850—PRECAST REINFORCED CONCRETE BOX SECTIONS

Span (Ft.)	Rise (Ft.)	Thickness (in.) Top Slab	Bot. Slab	Wall	Waterway Area (Sq. Feet)	Approx. Weight (lbs/ft)
3	2	7	6	4	5.8	830
3	3	7	6	4	8.8	930
4	2	7½	6	5	7.7	1120
4	3	7½	6	5	11.7	1240
4	4	7½	6	5	15.7	1370
5	3	8	7	6	14.5	1650
5	4	8	7	6	19.5	1800
5	5	8	7	6	24.5	1950
6	3	8	7	7	17.3	1970
6	4	8	7	7	23.3	2150
6	5	8	7	7	29.3	2320
6	6	8	7	7	35.3	2500
7	4	8	8	8	27.1	2600
7	5	8	8	8	34.1	2800
7	6	8	8	8	41.1	3000
7	7	8	8	8	48.1	3200
8	4	8	8	8	31.1	2800
8	5	8	8	8	39.1	3000
8	6	8	8	8	47.1	3200
8	7	8	8	8	55.1	3400
8	8	8	8	8	63.1	3600
9	5	9	9	9	43.9	3660
9	6	9	9	9	52.9	3880
9	7	9	9	9	61.9	4110
9	8	9	9	9	70.9	4330
9	9	9	9	9	79.9	4560
10	5	10	10	10	48.6	4380
10	6	10	10	10	58.6	4630
10	7	10	10	10	68.6	4880
10	8	10	10	10	78.6	5130
10	9	10	10	10	88.6	5380
10	10	10	10	10	98.6	5630
11	4	11	11	11	42.3	4880
11	6	11	11	11	64.3	5430
11	8	11	11	11	86.3	5980
11	10	11	11	11	108.3	6530
11	11	11	11	11	119.3	6810
12	4	12	12	12	46.0	5700
12	6	12	12	12	70.0	6300
12	8	12	12	12	94.5	6900
12	10	12	12	12	118.0	7500
12	12	12	12	12	142.0	8100

REF- "CONCRETE PIPE DESIGN MANUAL", AMERICAN CONCRETE PIPE ASSOCIATION, SEVENTH PRINTING, 1987.

BRUNING 45-111

STS Consultants Ltd.
CALCULATION SHEET

PROJECT	STS JOB NO.
Arcadia Creek	1069
SUBJECT	**CALC. NO.**
Head loss Computations	TDA-219
DATE 4/6/90 **BY** DEH **CHECKED BY**	**REV. NO.**

Derivation of Head loss due to friction in a hydraulically long culvert (outlet control).

assume: - friction losses will be evaluated using Manning's Equation.
- hydraulically long culvert
- zero approach velocity

$$\text{Total Head Loss}(H) = K\frac{V^2}{2g}$$

$$K = \sum_{all} K = K_{entrance} + K_{exit} + K_{friction}$$

$$K_{friction} = \frac{29.1(n^2)L}{R^{4/3}}$$

This Equation comes from Manning's Eq.-

$$V = \frac{1.486}{n} R^{2/3} \sqrt{S_f}$$

S_f = Energy Slope = $\frac{\text{Headwater} - \text{Tailwater}}{\text{Length of culvert}} = \frac{\text{Friction Head}}{L}$

R = hydraulic Radius

n = manning's friction coefficient

$$V = \frac{1.486}{n} R^{2/3} \sqrt{\frac{H_f}{L}} \Rightarrow H_f = \left(\frac{V \cdot n}{R^{2/3} 1.486}\right)^2 \cdot L \cdot \frac{2g}{2g}$$

$$\therefore H_f = \frac{V^2}{2g} \frac{n^2 \cdot 29.1 \cdot L}{R^{4/3}} = K_f \cdot \frac{V^2}{2g}$$

$$\Rightarrow K_f = 29.1\, n^2 \cdot L / R^{4/3}$$

BRUNING 45-11

STS Consultants Ltd.
CALCULATION SHEET

PROJECT	STS JOB NO.
Arcadia Creek	1069
SUBJECT	CALC. NO.
Headloss Computations	TDA-3/9
DATE 4/6/90 · BY DEH · CHECKED BY	REV. NO.

(Headloss cont.)

$H = H_{entrance} + H_{ext} + H_{friction}$

$= \left(K_e + 1.0 + \frac{29.1\, n^2 L}{R^{4/3}}\right) \frac{V^2}{2g}$ ✓

∴ If we rearrange terms:

$V = \sqrt{\frac{2gH}{K}}$

or

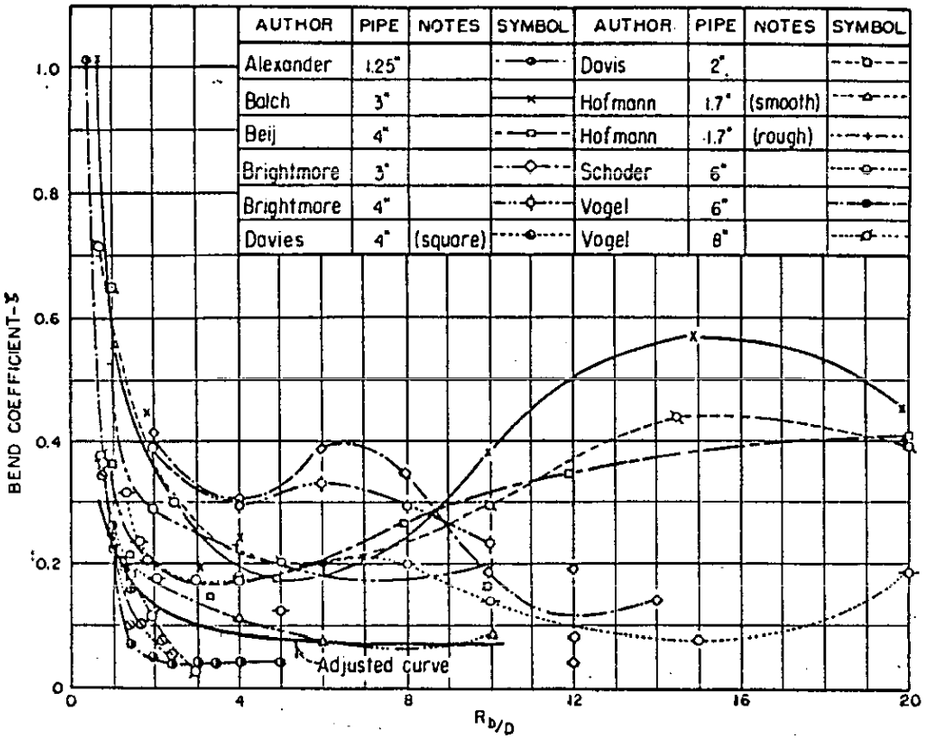
$Q = A \cdot \sqrt{\frac{2gH}{K}}$ ✓

Comments: 1. For culverts flowing less than full, the equation should be evaluated using the appropriate A & R. This has been termed the modified orifice equation.

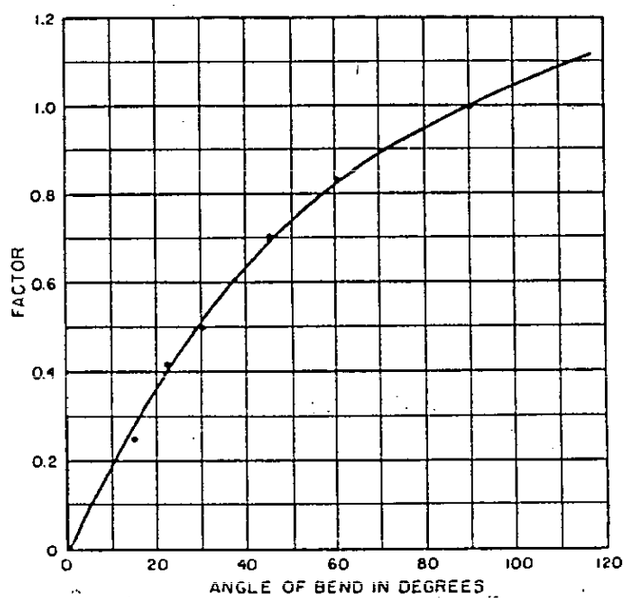
2. In HEC-2, K = XKOR

BRUNING 45-1

 TDA-4.19



A-VARIATION OF BEND COEFFICIENT WITH RELATIVE RADIUS FOR 90° BENDS OF CIRCULAR CROSS SECTION, AS MEASURED BY VARIOUS INVESTIGATORS



B-FACTORS FOR OTHER THAN 90° BENDS

FIGURE 19.—*Bend loss coefficients as observed are tabulated in A, and a multiplying factor for bends other than 90° can be obtained from B.*

REF.- FRICTION FACTORS FOR LARGE CONDUITS FLOWING FULL,

UNITED STATES EPARTMENT OF THE INTERIOR BUREAU OF RECLAMATION 1965 ,

TDA-5/9

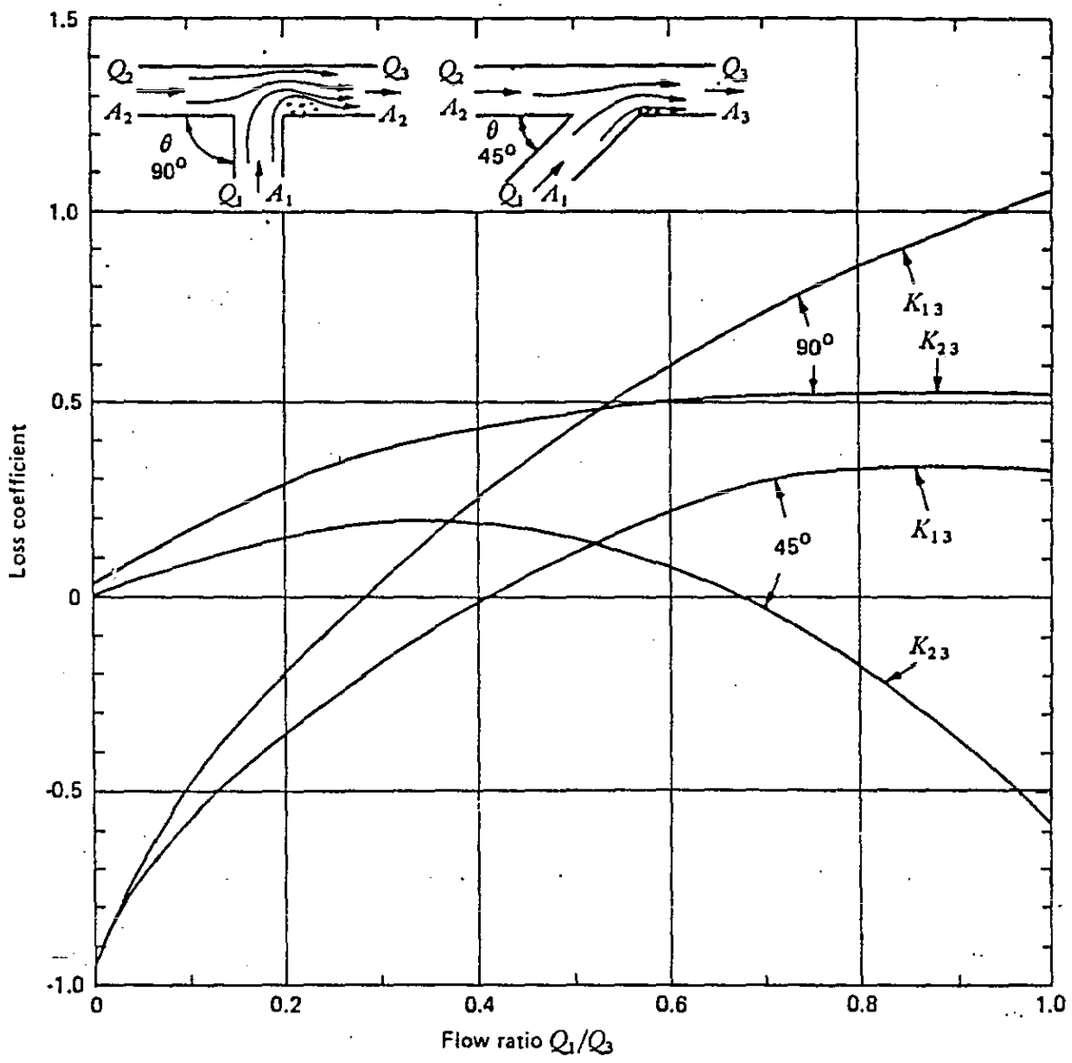


Fig. 5.55. Loss coefficients for sharp-edged 45° and 90° combining 'T's

REF- "INTERNAL FLOW SYSTEMS", D.S. MILLER, BHRA FLUID ENGINEERING, 1978.

TDA-619

ORIFICE FLOW

CAPACITY OF NEENAH GRATES FOR PONDING CONDITIONS

For flow through a grate under ponding conditions, orifice type flow occurs. If the net open area is used as the orifice area, the discharge can be computed using the orifice equation $Q = CA\sqrt{2gh}$ where C has a value of 0.60, A = area in square feet, g = the constant value 32.2, and h = depth in feet of water over the grate.

The orifice equation is most accurate when large depths of ponding are encountered. At shallower depths, the equation loses its accuracy. The determining factor is the grate's free open area. The orifice equation remains accurate for grates of smaller area when depths are in the 0.4 - 0.3 foot range. Grates of larger free open area are not able to sustain ponding conditions at shallow depths, and therefore flow reverts to wier or one directional flow as detailed in our **Inlet Grate Capacities** for gutter flow manual.

Since this equation contains three variables, two must be known to make a determination of the third. To facilitate rapid solution of the equation a nomograph (see page 60) is used. Please note the nomograph is limited to depths of .3 foot.

To use the nomograph, a line is drawn through the two known values on their respective axis. The third value will be obtained at the intersection of this line with the third axis. For example, if the area of a grate required to pass 6.7 cubic feet/second under a .5 feet head is desired, a line is projected from the .5 unit point on the right axis through the 6.7 unit point on the center axis. This line intersects the left axis at approximately 2.0 units indicating that a grate with a net open area of 2.0 square feet is required. Selection of this grate can be made by referring to the size table for the various Neenah grates.

It should be left to the designer to make any necessary reductions in the discharge due to trash accumulation or clogging.

For an example of the relationship between the weir and orifice equations and the expected flow through a grate under varying conditions see page 68.

REF- "INLET GRATE CAPACITIES", MEYER,ANDERSON, MILLER, AND HANDEL,

NEENAH FOUNDRY CO., 1987

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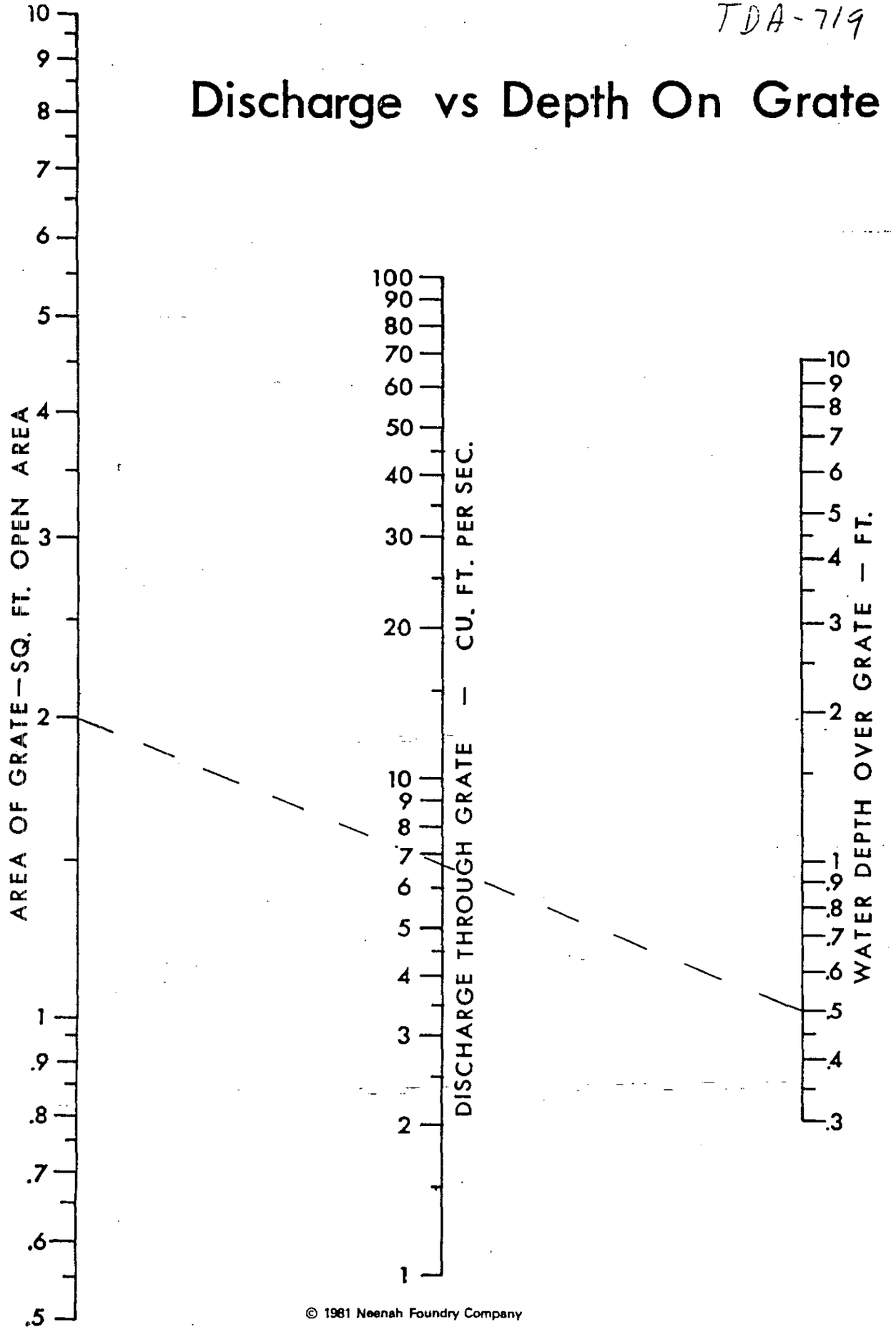
TDA-719

Discharge vs Depth On Grate



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TDA-8/9

WEIR FLOW

One of the most accurate methods of measuring water is by use of a weir. Many weir configurations are around with just about as many equations. They are all adaptations of the general weir equation $Q = 3.33\,L(h^{1.5})$ where Q = flow in cubic feet per second, L = length of crest of weir in feet, and h = feet of head observed where there is negligable flow velocity.

When using the Neenah Slide Rule Calculator, a slightly modified form is employed, namely:

$$Q = 3.3\,P(h)^{1.5}$$

where Q = Capacity CFS
P = Perimeter of grate in feet
h = Head in feet

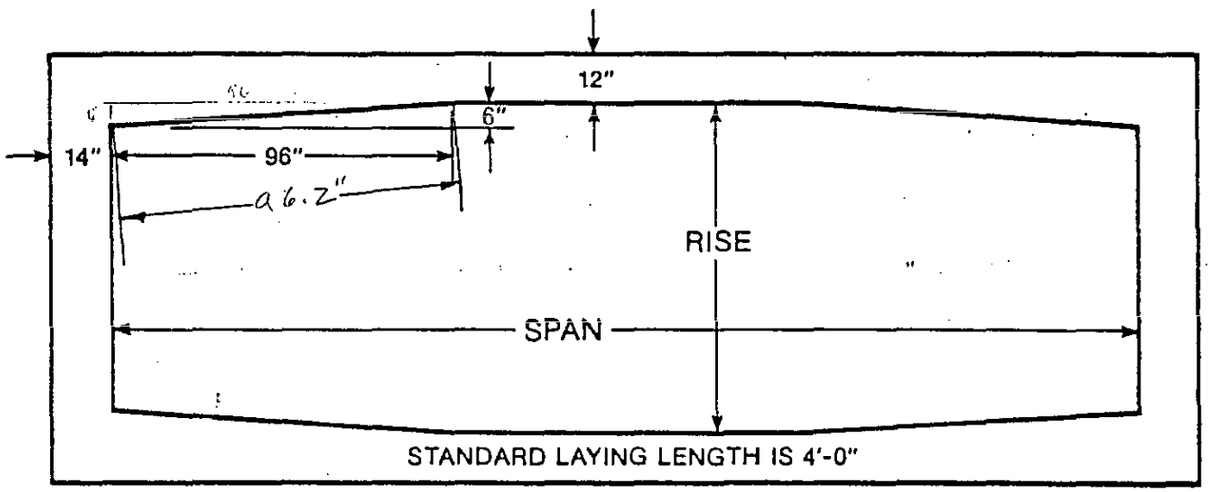
When determining inlet perimeter, add only the footage of the sides subject to flow. For example, should a grate be placed next to a curb, do not include the side of the grate next to it.

It's always wise to compare the weir flow expected with the orifice equation results. The equation with the lower flow value predominates. A graphic illustration of both equations is on the following page. When both equations are relatively the same, physically a vortex appears over the grate. This type of flow, due to its rotation, is not as efficient as either the weir or orifice equations imply. Using 80% of the expected flow in this situation should be a conservative estimate.

REF- "INLET GRATE CAPACITIES", MEYER, ANDERSON, MILLER, AND HANDEL, NEENAH FOUNDRY CO., 1987

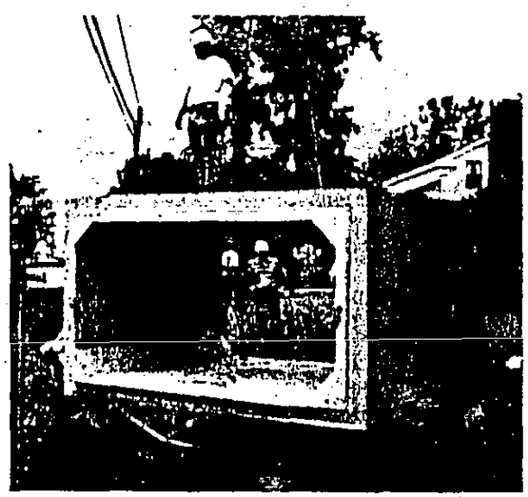
TDA-9/9

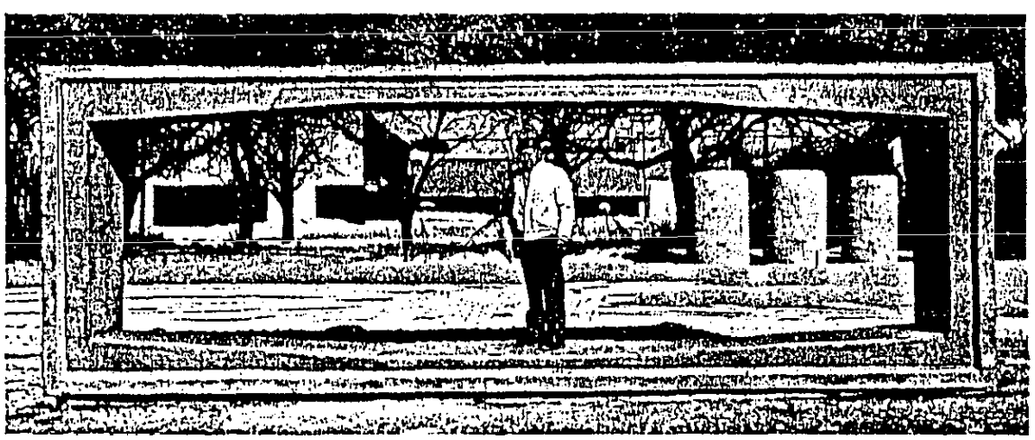
NORTHERN CONCRETE PIPE'S NEW "MAXI-BRIDGE"



AVAILABLE SIZES

SPAN (ft)	RISE (ft)	WEIGHT PER SECTION (tons)	END AREA (sq ft)
18	7	19.5	118
18	9	20.9	154
18	11	22.3	190
20	7	20.7	132
20	9	22.1	172
20	11	23.5	212
22	7	21.9	146
22	9	23.3	190
22	11	24.7	234
24	7 8	23.1	160
24	9	24.5	208
24	11	25.9	256





24' x 7' "MAXI-BRIDGE"

CALCULATION COVER SHEET

STS Consultants Ltd.

PROJECT Arcadia Creek JOB NO. 1069 DIVISION W.R.

SUBJECT West-End Overland Flooding Analysis FILE NO.

CALC. NO.

ORIGINATOR DEH DATE 3/13/90

CHECKER WJW DATE NO. OF SHEETS

RECORD OF ISSUES

NO.	DESCRIPTION	BY	DATE	CHKD.	DATE	APPRD.		
1								
2								
3								
4								
5								
6								

PRELIMINARY CALC. ☐

SUPERSEDED CALC. ☐ FINAL CALC. ☐

BRIEF SUMMARY OF CALCULATIONS INCLUDING SCOPE AND RESULTS

West End Flooding Analysis

Hydraulic computations for the diversion at Elm St. Computations include step backwater analyses for the existing system and the overland flooding between Elm and westnedge.

STS Consultants Ltd.
CALCULATION SHEET

PROJECT	STS JOB NO.
Arcadia Creek	1069
SUBJECT	CALC. NO.
West End Hydraulics	
DATE 3/13/90 BY DEH	CHECKED BY / REV. NO.

Purpose:

The Arcadia creek project is slated to end at Westnedge Ave. Following calculations document the diversion of flow at Elm St. from the existing system to overland flooding.

Methodology

Step backwater calculations were performed for the existing system and for overland flooding. The computer program HEC2 was utilized for these calculations. The split-flow option was utilized for the diversion analysis. A rating curve for the overland flow was developed using HEC-2, and then input into the diversion analysis run.

computer files:

Overland Flooding — Overate2.HEC2
Existing System and Diversion: WE.HEC2

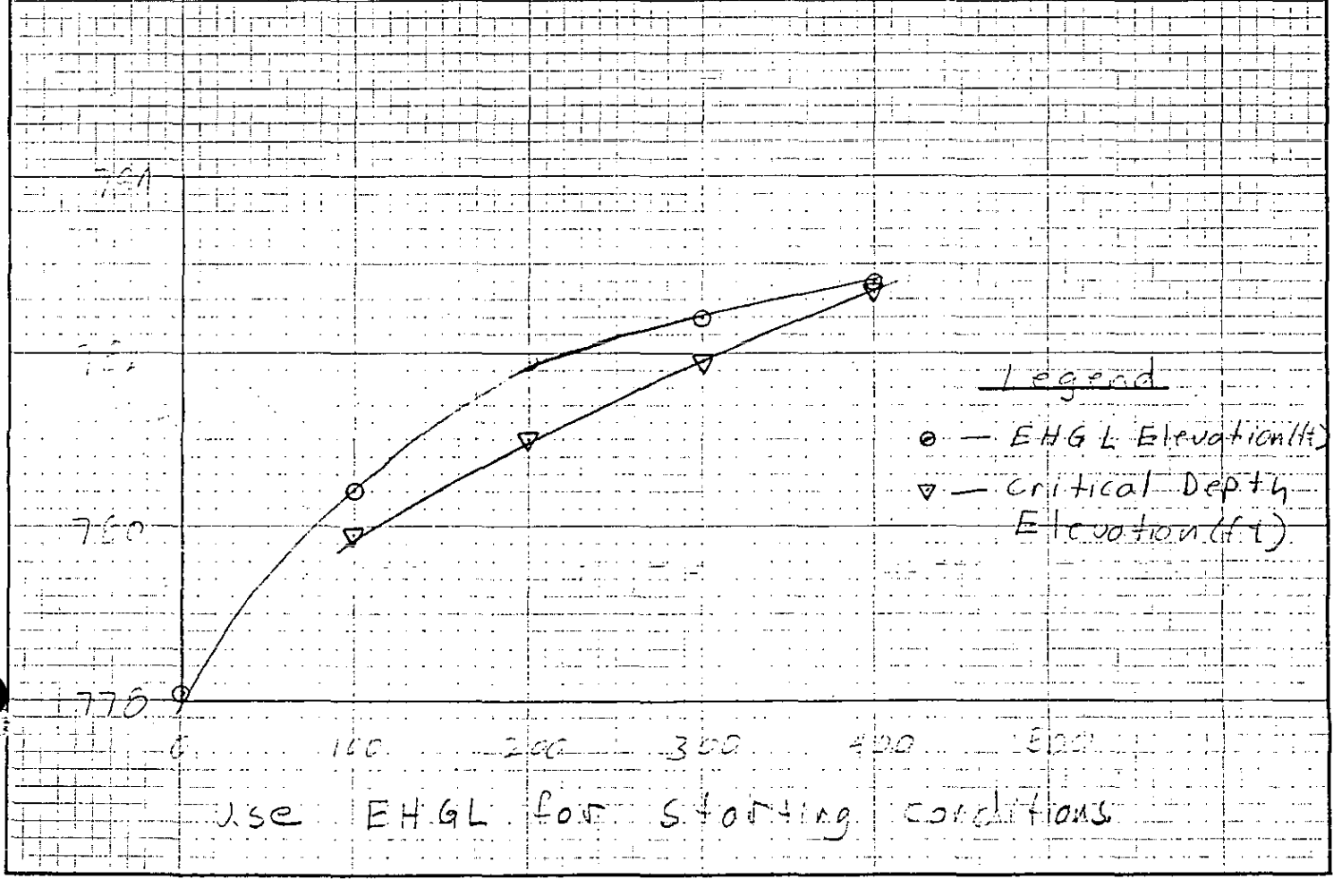
Note: Elevations used to develop the closed conduit system do not appear to correlate with topography maps developed by Abrams. Therefore, 1 foot will be added to the overland flow elevations so that they correlate.

BRUNING 45-111

STS Consultants Ltd. CALCULATION SHEET	PROJECT: Arcadia Creek	STS JOB NO.: 1069
	SUBJECT: Starting Conditions	CALC. NO.
	DATE: 12/7/89 BY: DEH	CHECKED BY	REV. NO.

Starting Conditions (cont) @ westnedge

Discharge (cfs)	Critical Depth (ft)	EHGL $(\frac{D+D}{2})$	Elevation (ft)
0	0	0	778.1
100	1.83	3.29	781.4
200	2.91	3.83	751.9
300	3.81	4.25	782.4
400	4.62	4.68	782.8
500	above top of culvert		



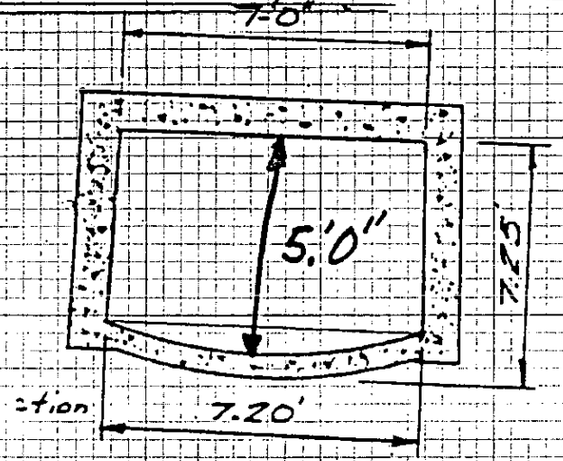
Use EHGL for starting conditions

BRUNING 45-117

STS Consultants Ltd.
CALCULATION SHEET

PROJECT	STS JOB NO.
Arcadia Creek	1069-AT
SUBJECT	CALC. NO.
Starting Conditions	
DATE 12/7/89 BY DEH	CHECKED BY / REV. NO.

Existing Culvert at Westnedge



Section

SECTION-O

Westnedge-Aprox. 58 Feet
Scale 1/4" = 1'0"

Calculate Equivalent Hydraulic Grade Line (EHGL)

$$EHGL = \frac{D_c + D}{2}$$

For the purposes of calculating D_c, assume a rectangle 7.1' x 4.75'.

$$\frac{Q^2 \cdot T}{g \cdot A^3} = 1; \qquad \frac{Q^2 \cdot T}{g \cdot T^3 D_c^3} = 1$$

$$D_c = \sqrt[3]{\frac{Q^2}{g}}$$

BRUNING 45-11

STS Consultants Ltd. CALCULATION SHEET	PROJECT		STS JOB NO.
	SUBJECT: Critical Depth Calcs.		CALC. NO.
	DATE: 9/25/89	BY: DEH	CHECKED BY:	REV. NO.

Critical Depth Calculations

Critical Depth results when the Froude Number equals 1. (Ref 3)

$$Fr = \frac{V^2}{g D} = 1$$

V = Velocity (fps)

g = gravity (32.2 ft/sec²)

D = Hydraulic Depth = A/T

A = Area (ft²)

T = Top width (ft)

$$\frac{V^2}{gD} = 1 \quad ; \quad \frac{A^2 V^2 \cdot T}{A^2 g A} = 1 \quad ; \quad \therefore \quad \underline{\underline{\frac{Q^2 T}{g A^3} = 1}}$$

BRUNING 45-17

STS Consultants Ltd.
CALCULATION SHEET

PROJECT	STS JOB NO.
Arcadia Creek	1069
SUBJECT	CALC. NO.
West End Diversion Analysis	
DATE 3/13/90 BY DEH CHECKED BY	REV. NO.

Bend Losses

Methodology - • Assume a velocity.
• Calculate velocity head
• evaluate a bend coefficient
• Calculate a head loss
• insert the bend loss into HEC-2 using an XS card.

Governing Equation.

$$H_b = K_b \frac{V^2}{2g}$$

Reference for Kb - Friction Factors for Large Conduits Flowing Full, Bureau of Reclamation, 1965.

Note: Culverts may not be flowing full however these coefficients should provide a reasonable estimate.

Bend losses will be evaluated at Four (4) locations.

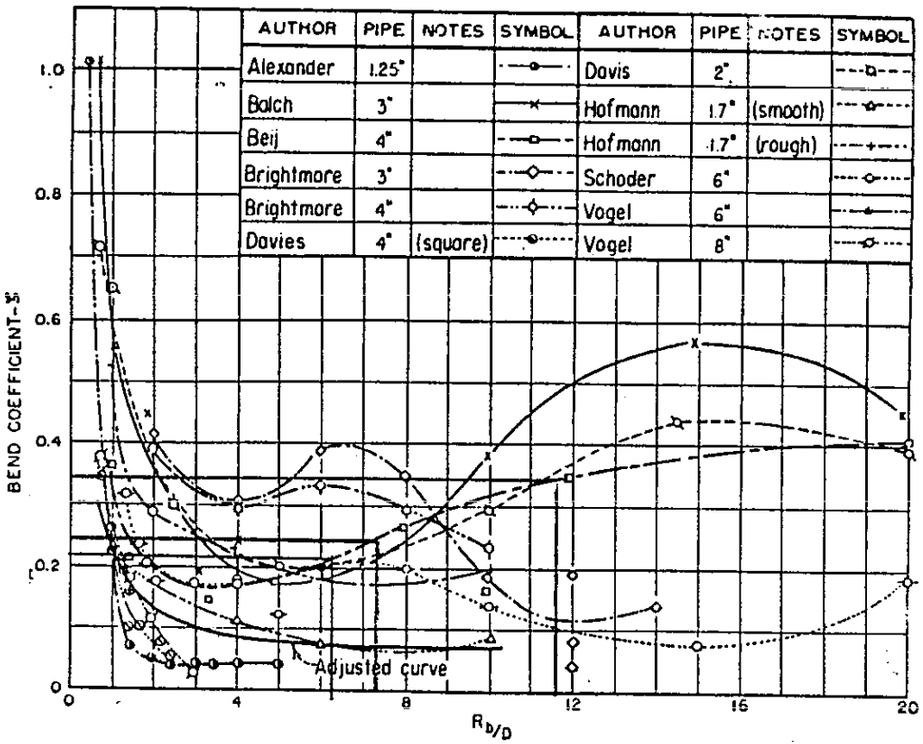
BRUNING 45-11

STS Consultants Ltd.
CALCULATION SHEET

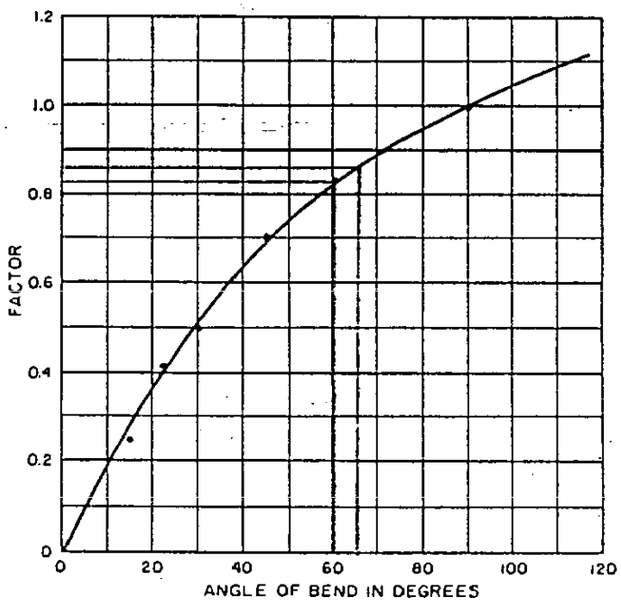
PROJECT	STS JOB NO.
Arcadia Creek	1569
SUBJECT	CALC. NO.
West End Diversion Analysis	
DATE 3/12/90 BY DEH CHECKED BY	REV. NO.

Destination	Assumed Velocity (fps)	Velocity Head (ft)	Kb	Head loss (ft)
Bend 1&2	6	.56	.28	.16
	7	.76	.28	.21
	8	.99	.28	.28
	9	1.26	.28	.35
	10	1.55	.28	.43
	11	1.9	.28	.53
	12	2.2	.28	.63
Bend 3	6	.56	.21	.12
	7	.76	.21	.16
	8	.99	.21	.21
	9	1.26	.21	.26
	10	1.55	.21	.33
	11	1.9	.21	.4
Bend 4	6	.55	.17	.1
	7	.76	.17	.13
	8	.99	.17	.17
	9	1.26	.17	.21
	10	1.55	.17	.26
	11	1.9	.17	.32

BRUNING 45-11



A-VARIATION OF BEND COEFFICIENT WITH RELATIVE RADIUS FOR 90° BENDS OF CIRCULAR CROSS SECTION, AS MEASURED BY VARIOUS INVESTIGATORS



B-FACTORS FOR OTHER THAN 90° BENDS

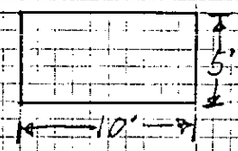
FIGURE 19.—*Bend loss coefficients as observed are tabulated in A, and a multiplying factor for bends other than 90° can be obtained from B.*

REF.- FRICTION FACTORS FOR LARGE CONDUITS FLOWING FULL,

UNITED STATES EPARTMENT OF THE INTERIOR BUREAU OF RECLAMATION 1965 .

STS Consultants Ltd. CALCULATION SHEET	PROJECT: Arcadia Creek		STS JOB NO.: 1069
	SUBJECT: West End Diversion		CALC. NO.
	DATE: 3/12/90	BY: DEH	CHECKED BY	REV. NO.

Section R'-R'



Use the special Bridge technique to model section R'-R'.

Governing Equation:

$$H_L = XKOR \frac{V^2}{2g}$$

XKOR (loss coefficient) = Kexit + Kfriction + Kentrance

Kexit = 0; exit losses will be accessed by HEC 2 as [illegible] of contraction.

$$K_{friction} = 29.1(n^2) \cdot \frac{L}{R^{4/3}}$$

$$= 29.1(.012^2) \cdot \frac{110}{1.67^{4/3}} = .23$$

Kentrance = .5 (Ref - BPR [illegible], Table 1, entrance loss [illegible]).

XKOR = .5 + .23 = .73

cofQ = 3.0

RDtem = 0 (weir flow not being [illegible])

[illegible] = 10' [illegible] = 50 ETCHU = [illegible]

SWP = 0 SS = 0 [illegible] = [illegible]

BRUNING 45-11

HEC-2 ANALYSIS FOR THE EXISTING SYSTEM

AND THE DIVERSION ANALYSIS

HEC-2 ANALYSIS FOR THE OVERLAND FLOODING

BETWEEN ELM AND WESTNEDGE

00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: KALAMAZOO, CITY OF

3) WATERCOURSE: ARCADIA CREEK

4) DOCUMENT TYPE: RATING CURVE RUN

BETWEEN JUNCTION BOX AND KALAMAZOO RIVER

00BREAK00

```
**********************************************
*  WATER SURFACE PROFILES                    *
*  VERSION OF NOVEMBER 1976                  *
*  UPDATED MAY 1984                          *
*                                            *
*  RUN DATE 12-DEC-90 TIME 14:57:14          *
**********************************************
```


```
****************************************
*  U.S. ARMY CORPS OF ENGINEERS        *
*  THE HYDROLOGIC ENGINEERING CENTER   *
*  609 SECOND STREET, SUITE D          *
*  DAVIS, CALIFORNIA 95616             *
*  (916) 440-2105 (FTS) 448-2105       *
****************************************
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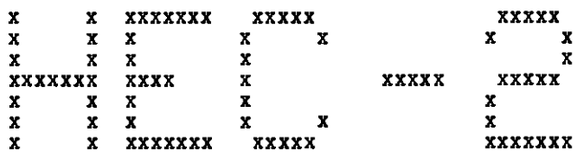

RATING CURVE FOR FLOW BETWEEN JUNCTION BOX AND KALMAZOO RIVER

THIS RUN EXECUTED 12-DEC-90 14:57:16

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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55
**************************************************

C
T1 ARCADIA CREEK HYDRAULIC ANALYSIS
T2 RATING CURVE FOR THE DIVERSION AT EDWARDS ST.:EHGL START
T3 JTP 10/30/86 [RATINGEE.HEC] REVISED DEH 9/22/89

J1   ICHECK     INQ        NINV       IDIR       STRT       METRIC     HVINS      Q          WSEL       FQ

        0.         2.         0.         0.   0.000000       0.00       0.0         0.    757.500      0.000

J2   NPROF      IPLOT      PRFVS      XSECV      XSECH      FN         ALLDC      IBW        CHNIM      ITRACE

       1.000      0.000     -1.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000

J3   VARIABLE CODES FOR SUMMARY PRINTOUT

     150.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000


NC       0.000      0.000      0.015      0.500      0.700      0.000      0.000      0.000      0.000      0.000
QT      10.000     25.000     50.000     75.000    100.000    150.000    200.000    250.000    300.000    350.000
QT     400.000      .000      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000
X1       0.100      .000    100.100    120.000      0.000      0.000      0.000      0.000      0.000      0.000
GR     770.000    [illegible]  752.000    100.100    752.000    120.000    770.000    120.100      0.000      0.000

NC       0.015      .015      0.015      0.300      0.500      0.000      0.000      0.000      0.000      0.000
         BEGIN SECTION A (670' LONG)
X1       1.000      .000    200.000    210.300     20.000     20.000     20.000      0.000      0.000      0.000
BT       7.000    200.000    775.000    750.000    200.100    775.000    756.800    202.600    775.000    761.700
BT     205.200    775.000    761.700    207.800    775.000    761.700    210.200    775.000    756.800    210.300
BT     775.000    750.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000
GR     775.000    200.000    756.800    200.100    756.200    202.600    755.700    205.200    756.200    207.800
GR     756.800    210.300    775.000    210.300      0.000      0.000      0.000      0.000      0.000      0.000

         SECTION A
X1       1.100      0.000      0.000      0.000      0.000    100.000    100.000    100.000      0.000      0.600      0.000
X2       0.000      0.000      0.000      0.000      0.000      0.000      0.000      1.000      0.000      0.000      0.000

X1       1.200      0.000      0.000      0.000      0.000    100.000    100.000    100.000      0.000      0.600      0.000
X2       0.000      0.000      0.000      0.000      0.000      0.000      0.000      1.000      0.000      0.000      0.000

X1       1.300      .300      0.000      0.000      0.000    100.000    100.000    100.000      0.000      0.600      0.000
X2       0.000      .000      0.000      0.000      0.000      0.000      0.000      1.000      0.000      0.000      0.000
```

X1	1.400	0.000	0.000	0.000	100.000	100.000	100.000	0.000	0.600	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
	BEGIN SECTION B(34' LONG)									
X1	2.000	5.000	100.000	110.550	270.000	270.000	270.000	0.000	0.000	0.000
BT	2.000	100.000	780.000	766.750	110.550	780.000	766.750	0.000	0.000	0.000
GR	766.750	100.000	760.000	101.000	759.000	105.500	760.000	110.000	766.750	110.550
	END SECTION B									
X1	2.100	0.000	0.000	0.000	34.000	34.000	34.000	0.000	0.100	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
	BEGIN SECTION A (830'LONG)									
X1	3.000	7.000	200.000	210.300	1.000	1.000	1.000	0.000	0.000	0.000
BT	7.000	200.000	775.000	760.700	200.100	775.000	760.700	202.600	775.000	766.600
BT	205.200	775.000	766.600	207.800	775.000	766.600	210.200	775.000	760.700	210.300
BT	775.000	760.700	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	775.000	200.000	760.700	200.100	759.500	202.600	759.100	205.200	759.500	207.800
GR	760.700	210.200	775.000	210.300	0.000	0.000	0.000	0.000	0.000	0.000
	SECTION A :STA. 8+00									
X1	3.100	0.000	0.000	0.000	100.000	100.000	100.000	0.000	0.400	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X1	3.150	0.000	0.000	0.000	200.000	200.000	200.000	0.000	1.100	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
	SECTION A :STA. 12+00									
X1	3.200	[illegible]	0.000	0.000	200.000	200.000	200.000	0.000	1.100	0.000
X2	0.000	[illegible]	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
	SECTION A :STA. 16+00									
X1	3.300	[illegible]	0.000	0.000	200.000	200.000	200.000	0.000	0.450	0.000
X2	0.000	[illegible]	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X1	3.350	[illegible]	0.000	0.000	200.000	200.000	200.000	0.000	0.450	0.000
X2	0.000	[illegible]	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X1	3.390	[illegible]	0.000	0.000	0.100	0.100	0.100	0.000	0.000	0.000
X2	0.000	[illegible]	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X5	-9.000	[illegible]	0.080	0.090	0.100	0.120	0.150	0.180	0.220	0.250
	END SECTION A									
X1	3.400	[illegible]	0.000	0.000	30.000	30.000	30.000	0.000	-0.100	0.000
X2	0.000	[illegible]	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
	BEGIN SECTION D (250' LONG)									
X1	4.000	[illegible]	200.000	209.000	1.000	1.000	1.000	0.000	0.000	0.000
BT	5.000	[illegible]	780.000	770.000	200.100	780.000	770.000	204.500	780.000	770.000
BT	208.900	[illegible]	770.000	209.000	780.000	770.000	0.000	0.000	0.000	0.000
GR	780.000	[illegible]	763.900	200.100	762.500	204.500	763.900	208.900	780.000	209.000

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X1      4.010      0.000      0.000      0.000      0.010      0.010      0.010      0.000      0.000      0.000
X2      0.000      0.000      0.000      0.000      0.000      0.000      1.000      0.000      0.000      0.000
X5     -9.000      0.140      0.140      0.140      0.140      0.140      0.140      0.140      0.140      0.140

       SECTION D :PITCHER ST.
X1      4.100      0.000      0.000      0.000    250.000    250.000    250.000      0.000      1.100      0.000
X2      0.000      0.000      0.000      0.000      0.000      0.000      1.000      0.000      0.000      0.000

X1      4.110      0.000      0.000      0.000      1.000      1.000      1.000      0.000      0.000      0.000
BT      2.000    200.000    780.000    770.000    209.000    780.000    770.000      0.000      0.000      0.000

       BEGIN SECTION E (470' LONG)
X1      5.000     11.000    100.000    108.500      1.000      1.000      1.000      0.000      0.000      0.000
BT      2.000    100.000    780.000    771.100    108.500    780.000    771.100      0.000      0.000      0.000
GR    771.100    100.000    766.100    100.500    766.100    101.000    765.100    101.100    763.850    102.500
GR    763.500    104.250    763.850    106.000    765.100    107.500    766.100    107.510    766.100    108.000
GR    771.100    108.500      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000

X1      5.010      0.000      0.000      0.000      0.010      0.010      0.010      0.000      0.000      0.000
X2      0.000      0.000      0.000      0.000      0.000      0.000      1.000      0.000      0.000      0.000
X5     -9.000      0.140      0.170      0.210      0.240      0.270      0.300      0.320      0.320      0.320

       SECTION E
X1      5.100      0.000      0.000      0.000     35.000     35.000     35.000      0.000      0.100      0.000

       1' INTO JUNCTION BOX.  10' WIDE SECTION TO MODEL INLET LOSS
X1      6.000      0.000      0.000      0.000      1.000      1.000      1.250      0.000      0.000
X2      0.000      0.000      0.000      0.000      0.000      0.000      1.000      0.000      1.250      0.000

       SAME SECTION 13.62 FROM MAINSTREAM MODEL
X1     23.620      0.000    150.000    170.010     10.000     10.000     10.000      0.000      0.000      0.000
BT      6.000    150.000    771.500    770.000    159.500    771.500    770.000    159.510    771.500    761.700
BT    160.500    771.500    761.700    160.510    771.500    770.000    170.100    771.500    770.000      0.000
GR    771.500      0.000    771.500    150.000    761.700    150.010    761.700    159.500    761.700    160.700
GR    761.700     10.000    771.500    170.010    771.500    200.000      0.000      0.000      0.000      0.000
EJ      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000
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THIS RUN EXECUTED 12-DEC-90 14:59:44

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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

0/30/86 [RATINGEE.HEC] R

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
	0.100	0.00	0.00	0.00	752.00	25.00	757.50	0.00	757.50	0.01	0.23	109.62	340.36
	0.100	0.00	0.00	0.00	752.00	50.00	757.50	0.00	757.50	0.02	0.45	109.62	340.36
	0.100	0.00	0.00	0.00	752.00	75.00	757.50	0.00	757.51	0.05	0.68	109.62	340.36
	0.100	0.00	0.00	0.00	752.00	100.00	757.50	0.00	757.51	0.09	0.91	109.62	340.36
	0.100	0.00	0.00	0.00	752.00	150.00	757.50	0.00	757.53	0.19	1.36	109.62	340.36
	0.100	0.00	0.00	0.00	752.00	200.00	757.50	0.00	757.56	0.35	1.81	109.62	340.36
	0.100	0.00	0.00	0.00	752.00	250.00	757.50	0.00	757.59	0.54	2.27	109.62	340.36
	0.100	0.00	0.00	0.00	752.00	300.00	757.50	0.00	757.63	0.78	2.72	109.62	340.36
	0.100	0.00	0.00	0.00	752.00	400.00	757.50	0.00	757.74	1.38	3.63	109.62	340.36
	0.100		0.00	0.00	752.00	400.00	757.50	0.00	757.74	1.38	3.63	109.62	340.36
	1.000	[illegible]	775.00	761.70	755.70	25.00	757.47	0.00	757.53	3.87	2.01	12.42	12.71
	1.000	[illegible]	775.00	761.70	755.70	50.00	757.35	0.00	757.65	20.41	4.41	11.33	11.07
*	1.000	[illegible]	775.00	761.70	755.70	75.00	757.40	757.40	758.03	41.12	6.38	11.75	11.70
*	1.000	[illegible]	775.00	761.70	755.70	100.00	757.65	757.65	758.43	42.26	7.08	14.12	15.38
*	1.000	[illegible]	775.00	761.70	755.70	150.00	758.11	758.11	759.16	45.13	8.23	18.23	22.33
*	1.000	[illegible]	775.00	761.70	755.70	200.00	758.51	758.51	759.83	48.88	9.21	21.72	28.61
*	1.000	[illegible]	775.00	761.70	755.70	250.00	758.89	758.89	760.47	52.81	10.07	24.83	34.40
*	1.000	[illegible]	775.00	761.70	755.70	300.00	759.25	759.25	761.08	57.04	10.85	27.64	39.72
*	1.000	[illegible]	775.00	761.70	755.70	400.00	759.91	759.91	762.27	66.77	12.32	32.47	48.95
*	1.000	[illegible]	775.00	761.70	755.70	400.00	759.91	759.91	762.27	66.77	12.32	32.47	48.95
	1.100	[illegible]	775.00	762.30	756.30	25.00	757.47	0.00	757.69	25.77	3.73	6.71	4.92
*	1.100	[illegible]	775.00	762.30	756.30	50.00	757.72	757.72	758.19	40.74	5.53	9.04	7.83
*	1.100	[illegible]	775.00	762.30	756.30	75.00	758.00	758.00	758.63	41.12	6.38	11.75	11.70
*	1.100	[illegible]	775.00	762.30	756.30	100.00	758.25	758.25	759.03	42.26	7.08	14.12	15.38
*	1.100	[illegible]	775.00	762.30	756.30	150.00	758.71	758.71	759.76	45.13	8.23	18.23	22.33
*	1.100	[illegible]	775.00	762.30	756.30	200.00	759.11	759.11	760.43	48.88	9.21	21.72	28.61
*	1.100	[illegible]	775.00	762.30	756.30	250.00	759.49	759.49	761.07	52.81	10.07	24.83	34.40
*	1.100	[illegible]	775.00	762.30	756.30	300.00	759.85	759.85	761.68	57.04	10.85	27.64	39.72
	1.100	[illegible]	775.00	762.30	756.30	400.00	761.14	760.51	762.99	49.44	10.91	36.66	56.89
	1.100	[illegible]	775.00	762.30	756.30	400.00	761.14	760.51	762.99	49.44	10.91	36.66	56.89

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
*	1.200	100.00	775.00	762.90	756.90	25.00	757.99	757.99	758.28	41.64	4.35	5.74	3.87
*	1.200	100.00	775.00	762.90	756.90	50.00	758.32	758.32	758.79	40.74	5.53	9.04	7.83
*	1.200	100.00	775.00	762.90	756.90	75.00	758.60	758.60	759.23	41.12	6.38	11.75	11.70
*	1.200	100.00	775.00	762.90	756.90	100.00	758.85	758.85	759.63	42.26	7.08	14.12	15.38
*	1.200	100.00	775.00	762.90	756.90	150.00	759.31	759.31	760.36	45.13	8.23	18.23	22.33
*	1.200	100.00	775.00	762.90	756.90	200.00	759.71	759.71	761.03	48.88	9.21	21.72	28.61
*	1.200	100.00	775.00	762.90	756.90	250.00	760.09	760.09	761.67	52.81	10.07	24.83	34.40
*	1.200	100.00	775.00	762.90	756.90	300.00	760.45	760.45	762.28	57.04	10.85	27.64	39.72
	1.200	100.00	775.00	762.90	756.90	400.00	761.61	761.11	763.54	52.31	11.17	35.82	55.31
	1.200	100.00	775.00	762.90	756.90	400.00	761.61	761.11	763.54	52.31	11.17	35.82	55.31
*	1.300	100.00	775.00	763.50	757.50	25.00	758.59	758.59	758.88	41.64	4.35	5.74	3.87
*	1.300	100.00	775.00	763.50	757.50	50.00	758.92	758.92	759.39	40.74	5.53	9.04	7.83
*	1.300	100.00	775.00	763.50	757.50	75.00	759.20	759.20	759.83	41.12	6.38	11.75	11.70
*	1.300	100.00	775.00	763.50	757.50	100.00	759.45	759.45	760.23	42.26	7.08	14.12	15.38
*	1.300	100.00	775.00	763.50	757.50	150.00	759.91	759.91	760.96	45.13	8.23	18.23	22.33
*	1.300	100.00	775.00	763.50	757.50	200.00	760.31	760.31	761.63	48.88	9.21	21.72	28.61
*	1.300	100.00	775.00	763.50	757.50	250.00	760.69	760.69	762.27	52.81	10.07	24.83	34.40
*	1.300	100.00	775.00	763.50	757.50	300.00	761.05	761.05	762.88	57.04	10.85	27.64	39.72
	1.300	100.00	775.00	763.50	757.50	400.00	762.11	761.71	764.11	54.52	11.36	35.22	54.17
	1.300	100.00	775.00	763.50	757.50	400.00	762.11	761.71	764.11	54.52	11.36	35.22	54.17
*	1.400	100.00	775.00	764.10	758.10	25.00	759.19	759.19	759.48	41.64	4.35	5.74	3.87
*	1.400	100.00	775.00	764.10	758.10	50.00	759.52	759.52	759.99	40.74	5.53	9.04	7.83
*	1.400	100.00	775.00	764.10	758.10	75.00	759.80	759.80	760.43	41.12	6.38	11.75	11.70
*	1.400	100.00	775.00	764.10	758.10	100.00	760.05	760.05	760.83	42.26	7.08	14.12	15.38
*	1.400	100.00	775.00	764.10	758.10	150.00	760.51	760.51	761.56	45.13	8.23	18.23	22.33
*	1.400	100.00	775.00	764.10	758.10	200.00	760.91	760.91	762.23	48.88	9.21	21.72	28.61
*	1.400	100.00	775.00	764.10	758.10	250.00	761.29	761.29	762.87	52.81	10.07	24.83	34.40
*	1.400	100.00	775.00	764.10	758.10	300.00	761.65	761.65	763.48	57.04	10.85	27.64	39.72
	1.400	100.00	775.00	764.10	758.10	400.00	762.63	762.31	764.69	56.44	11.52	34.73	53.25
	1.400	100.00	775.00	764.10	758.10	400.00	762.63	762.31	764.69	56.44	11.52	34.73	53.25
	2.000	100.00	780.00	766.75	759.00	25.00	760.18	0.00	760.44	29.90	4.04	6.18	4.57
	2.000	100.00	780.00	766.75	759.00	50.00	760.54	0.00	760.98	32.37	5.31	9.42	8.79
	2.000	100.00	780.00	766.75	759.00	75.00	760.85	0.00	761.43	32.76	6.12	12.26	13.10
	2.000	100.00	780.00	766.75	759.00	100.00	761.15	0.00	761.84	31.71	6.65	15.03	17.76
	2.000	100.00	780.00	766.75	759.00	150.00	761.76	0.00	762.58	28.05	7.24	20.71	28.32
	2.000	100.00	780.00	766.75	759.00	200.00	762.40	0.00	763.26	24.11	7.47	26.76	40.73
	2.000	100.00	780.00	766.75	759.00	250.00	763.03	0.00	763.93	21.42	7.62	32.81	54.01
	2.000	100.00	780.00	766.75	759.00	300.00	763.67	0.00	764.59	19.24	7.68	39.04	68.40
	2.000	100.00	780.00	766.75	759.00	400.00	764.82	0.00	765.79	17.27	7.92	50.50	96.26
	2.000	100.00	780.00	766.75	759.00	400.00	764.82	0.00	765.79	17.27	7.92	50.50	96.26

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
	2.100	34.00	780.00	766.85	759.10	25.00	760.30	0.00	760.54	27.41	3.93	6.36	4.77
	2.100	34.00	780.00	766.85	759.10	50.00	760.67	0.00	761.09	30.15	5.19	9.64	9.11
	2.100	34.00	780.00	766.85	759.10	75.00	761.03	0.00	761.55	27.92	5.80	12.93	14.19
	2.100	34.00	780.00	766.85	759.10	100.00	761.29	0.00	761.95	30.28	6.55	15.27	18.17
	2.100	34.00	780.00	766.85	759.10	150.00	761.88	0.00	762.67	27.19	7.17	20.93	28.76
	2.100	34.00	780.00	766.85	759.10	200.00	762.47	0.00	763.35	24.84	7.55	26.48	40.13
	2.100	34.00	780.00	766.85	759.10	250.00	763.09	0.00	764.01	21.99	7.69	32.50	53.31
	2.100	34.00	780.00	766.85	759.10	300.00	763.73	0.00	764.66	19.77	7.76	38.65	67.47
	2.100	34.00	780.00	766.85	759.10	400.00	764.87	0.00	765.86	17.69	8.00	50.03	95.09
	2.100	34.00	780.00	766.85	759.10	400.00	764.87	0.00	765.86	17.69	8.00	50.03	95.09
	3.000	1.00	775.00	766.60	759.10	25.00	760.36	0.00	760.56	18.06	3.53	7.07	5.88
	3.000	1.00	775.00	766.60	759.10	50.00	760.87	0.00	761.14	16.01	4.17	11.98	12.50
	3.000	1.00	775.00	766.60	759.10	75.00	761.24	0.00	761.60	16.68	4.83	15.51	18.36
	3.000	1.00	775.00	766.60	759.10	100.00	761.59	0.00	762.02	16.76	5.30	18.88	24.43
	3.000	1.00	775.00	766.60	759.10	150.00	762.08	0.00	762.72	20.82	6.44	23.28	32.87
	3.000	1.00	775.00	766.60	759.10	200.00	762.57	0.00	763.38	23.07	7.23	27.66	41.64
	3.000	1.00	775.00	766.60	759.10	250.00	763.08	0.00	764.03	24.49	7.81	31.99	50.52
	3.000	1.00	775.00	766.60	759.10	300.00	763.67	0.00	764.72	24.97	8.20	36.58	60.03
	3.000	1.00	775.00	766.60	759.10	400.00	764.73	0.00	766.00	27.95	9.05	44.19	75.66
	3.000	1.00	775.00	766.60	759.10	400.00	764.73	0.00	766.00	27.95	9.05	44.19	75.66
*	3.100	100.00	775.00	767.00	759.50	25.00	760.55	760.55	760.90	40.52	4.71	5.31	3.93
	3.100	100.00	775.00	767.00	759.50	50.00	761.00	760.98	761.45	33.89	5.39	9.28	8.59
	3.100	100.00	775.00	767.00	759.50	75.00	761.38	0.00	761.89	28.21	5.77	13.00	14.12
	3.100	100.00	775.00	767.00	759.50	100.00	761.72	0.00	762.30	25.58	6.13	16.32	19.77
	3.100	100.00	775.00	767.00	759.50	150.00	762.25	0.00	763.02	26.74	7.04	21.30	29.01
	3.100	100.00	775.00	767.00	759.50	200.00	762.76	0.00	763.69	27.71	7.73	25.86	37.99
	3.100	100.00	775.00	767.00	759.50	250.00	763.29	0.00	764.34	28.09	8.23	30.36	47.17
	3.100	100.00	775.00	767.00	759.50	300.00	763.89	0.00	765.02	27.50	8.52	35.22	57.21
	3.100	100.00	775.00	767.00	759.50	400.00	764.99	0.00	766.32	29.47	9.26	43.22	73.69
	3.100	100.00	775.00	767.00	759.50	400.00	764.99	0.00	766.32	29.47	9.26	43.22	73.69
*	3.150	200.00	775.00	768.10	760.60	25.00	761.65	761.65	762.00	40.52	4.71	5.31	3.93
*	3.150	200.00	775.00	768.10	760.60	50.00	762.08	762.08	762.56	36.04	5.51	9.08	8.33
*	3.150	200.00	775.00	768.10	760.60	75.00	762.37	762.37	762.98	36.64	6.29	11.92	12.39
*	3.150	200.00	775.00	768.10	760.60	100.00	762.62	762.62	763.37	37.33	6.97	14.35	16.37
*	3.150	200.00	775.00	768.10	760.60	150.00	763.06	763.06	764.07	39.39	8.07	18.59	23.90
*	3.150	200.00	775.00	768.10	760.60	200.00	763.46	763.46	764.71	41.90	8.98	22.27	30.90
*	3.150	200.00	775.00	768.10	760.60	250.00	763.84	763.84	765.31	44.08	9.73	25.69	37.65
	3.150	200.00	775.00	768.10	760.60	300.00	764.35	764.18	765.90	41.63	9.99	30.04	46.50
	3.150	200.00	775.00	768.10	760.60	400.00	765.50	0.00	767.13	37.69	10.24	39.05	65.15
	3.150	200.00	775.00	768.10	760.60	400.00	765.50	0.00	767.13	37.69	10.24	39.05	65.15

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
*	3.200	200.00	775.00	769.20	761.70	25.00	762.75	762.75	763.10	40.52	4.71	5.31	3.93
*	3.200	200.00	775.00	769.20	761.70	50.00	763.18	763.18	763.66	36.03	5.51	9.08	8.33
*	3.200	200.00	775.00	769.20	761.70	75.00	763.47	763.47	764.08	36.64	6.29	11.92	12.39
*	3.200	200.00	775.00	769.20	761.70	100.00	763.72	763.72	764.47	37.33	6.97	14.35	16.37
*	3.200	200.00	775.00	769.20	761.70	150.00	764.16	764.16	765.17	39.39	8.07	18.59	23.90
*	3.200	200.00	775.00	769.20	761.70	200.00	764.56	764.56	765.81	41.90	8.98	22.27	30.90
*	3.200	200.00	775.00	769.20	761.70	250.00	764.94	764.94	766.41	44.08	9.73	25.69	37.65
*	3.200	200.00	775.00	769.20	761.70	300.00	765.28	765.28	766.99	47.66	10.51	28.55	43.45
	3.200	200.00	775.00	769.20	761.70	400.00	766.19	765.92	768.12	46.65	11.15	35.87	58.57
	3.200	200.00	775.00	769.20	761.70	400.00	766.19	765.92	768.12	46.65	11.15	35.87	58.57
	3.300	200.00	775.00	769.65	762.15	25.00	763.45	0.00	763.63	16.00	3.38	7.39	6.25
	3.300	200.00	775.00	769.65	762.15	50.00	763.91	0.00	764.19	16.88	4.25	11.78	12.17
	3.300	200.00	775.00	769.65	762.15	75.00	764.27	0.00	764.64	17.10	4.88	15.38	18.14
	3.300	200.00	775.00	769.65	762.15	100.00	764.61	0.00	765.05	17.51	5.38	18.59	23.90
	3.300	200.00	775.00	769.65	762.15	150.00	765.22	0.00	765.82	18.76	6.20	24.17	34.63
	3.300	200.00	775.00	769.65	762.15	200.00	765.79	0.00	766.53	20.11	6.87	29.11	44.60
	3.300	200.00	775.00	769.65	762.15	250.00	766.33	0.00	767.20	21.79	7.47	33.46	53.56
	3.300	200.00	775.00	769.65	762.15	300.00	766.86	0.00	767.85	23.33	7.98	37.58	62.10
	3.300	200.00	775.00	769.65	762.15	400.00	767.74	0.00	769.03	28.38	9.11	43.90	75.08
	3.300	200.00	775.00	769.65	762.15	400.00	767.74	0.00	769.03	28.38	9.11	43.90	75.08
	3.350	200.00	775.00	770.10	762.60	25.00	763.80	0.00	764.03	22.45	3.82	6.55	5.28
	3.350	200.00	775.00	770.10	762.60	50.00	764.26	0.00	764.59	21.55	4.60	10.87	10.77
	3.350	200.00	775.00	770.10	762.60	75.00	764.62	0.00	765.04	20.77	5.21	14.40	16.46
	3.350	200.00	775.00	770.10	762.60	100.00	764.96	0.00	765.46	20.36	5.67	17.64	22.16
	3.350	200.00	775.00	770.10	762.60	150.00	765.59	0.00	766.23	20.23	6.38	23.53	33.35
	3.350	200.00	775.00	770.10	762.60	200.00	766.19	0.00	766.95	20.81	6.96	28.74	43.84
	3.350	200.00	775.00	770.10	762.60	250.00	766.76	0.00	767.63	21.88	7.48	33.41	53.45
	3.350	200.00	775.00	770.10	762.60	300.00	767.35	0.00	768.32	22.78	7.91	37.94	62.85
	3.350	200.00	775.00	770.10	762.60	400.00	768.38	0.00	769.60	26.49	8.85	45.21	77.72
	3.350	200.00	775.00	770.10	762.60	400.00	768.38	0.00	769.60	26.49	8.85	45.21	77.72
*	3.390	200.00	775.00	770.10	762.60	25.00	763.87	0.00	764.06	17.54	3.50	7.15	5.97
*	3.390	200.00	775.00	770.10	762.60	50.00	764.34	0.00	764.63	17.36	4.29	11.67	12.00
*	3.390	200.00	775.00	770.10	762.60	75.00	764.71	0.00	765.09	17.44	4.91	15.28	17.96
*	3.390	200.00	775.00	770.10	762.60	100.00	765.06	0.00	765.51	17.54	5.38	18.58	23.88
*	3.390	200.00	775.00	770.10	762.60	150.00	765.71	0.00	766.29	17.96	6.11	24.56	35.40
*	3.390	200.00	775.00	770.10	762.60	200.00	766.34	0.00	767.04	18.61	6.67	29.97	46.36
*	3.390	200.00	775.00	770.10	762.60	250.00	766.94	0.00	767.74	19.68	7.18	34.80	56.35
*	3.390	200.00	775.00	770.10	762.60	300.00	767.57	0.00	768.46	20.57	7.59	39.53	66.14
*	3.390	200.00	775.00	770.10	762.60	400.00	973.58	766.82	973.58	0.01	0.19	2100.68	4639.11
*	3.390	200.00	775.00	770.10	762.60	400.00	973.58	766.82	973.58	0.01	0.19	2100.68	4639.11

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
	3.400	30.00	775.00	770.00	762.50	25.00	764.01	0.00	764.12	8.27	2.67	9.37	8.70
	3.400	30.00	775.00	770.00	762.50	50.00	764.50	0.00	764.70	9.49	3.50	14.27	16.23
	3.400	30.00	775.00	770.00	762.50	75.00	764.89	0.00	765.16	10.93	4.18	17.93	22.69
	3.400	30.00	775.00	770.00	762.50	100.00	765.24	0.00	765.58	12.05	4.72	21.19	28.81
	3.400	30.00	775.00	770.00	762.50	150.00	765.89	0.00	766.37	13.86	5.56	27.00	40.29
	3.400	30.00	775.00	770.00	762.50	200.00	766.52	0.00	767.11	15.40	6.21	32.21	50.97
	3.400	30.00	775.00	770.00	762.50	250.00	767.11	0.00	767.83	16.98	6.78	36.89	60.67
	3.400	30.00	775.00	770.00	762.50	300.00	767.73	0.00	768.55	18.35	7.24	41.42	70.03
	3.400	30.00	775.00	770.00	762.50	400.00	973.58	766.72	973.58	0.01	0.19	2100.68	4638.63
	3.400	30.00	775.00	770.00	762.50	400.00	973.58	766.72	973.58	0.01	0.19	2100.68	4638.63
	4.000	1.00	780.00	770.00	762.50	25.00	763.96	0.00	764.18	22.11	3.73	6.70	5.32
	4.000	1.00	780.00	770.00	762.50	50.00	764.44	0.00	764.76	19.88	4.59	10.90	11.21
	4.000	1.00	780.00	770.00	762.50	75.00	764.80	0.00	765.24	20.65	5.31	14.13	16.50
	4.000	1.00	780.00	770.00	762.50	100.00	765.15	0.00	765.67	20.87	5.83	17.15	21.89
	4.000	1.00	780.00	770.00	762.50	150.00	765.80	0.00	766.47	20.61	6.55	22.90	33.04
	4.000	1.00	780.00	770.00	762.50	200.00	766.43	0.00	767.20	19.99	7.02	28.51	44.73
	4.000	1.00	780.00	770.00	762.50	250.00	767.05	0.00	767.89	19.50	7.37	33.94	56.62
	4.000	1.00	780.00	770.00	762.50	300.00	767.70	0.00	768.58	18.60	7.57	39.65	69.56
	4.000	1.00	780.00	770.00	762.50	400.00	973.58	767.18	973.58	0.00	0.22	1802.32	6986.15
	4.000	1.00	780.00	770.00	762.50	400.00	973.58	767.18	973.58	0.00	0.22	1802.32	6986.15
*	4.010	0.01	780.00	770.00	762.50	25.00	764.10	0.00	764.26	13.13	3.15	7.93	6.90
*	4.010	0.01	780.00	770.00	762.50	50.00	764.58	0.00	764.84	14.44	4.12	12.13	13.16
*	4.010	0.01	780.00	770.00	762.50	75.00	764.94	0.00	765.31	16.18	4.88	15.36	18.64
*	4.010	0.01	780.00	770.00	762.50	100.00	765.29	0.00	765.75	17.11	5.44	18.38	24.18
*	4.010	0.01	780.00	770.00	762.50	150.00	765.94	0.00	766.54	17.81	6.22	24.13	35.54
*	4.010	0.01	780.00	770.00	762.50	200.00	766.57	0.00	767.28	17.82	6.72	29.74	47.38
*	4.010	0.01	780.00	770.00	762.50	250.00	767.19	0.00	767.97	17.72	7.11	35.18	59.39
*	4.010	0.01	780.00	770.00	762.50	300.00	767.84	0.00	768.67	17.16	7.34	40.89	72.42
	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
*	4.100	30.00	780.00	771.10	763.60	25.00	764.91	764.91	765.24	41.07	4.64	5.39	3.90
*	4.100	30.00	780.00	771.10	763.60	50.00	765.30	765.30	765.80	38.70	5.71	8.76	8.04
*	4.100	30.00	780.00	771.10	763.60	75.00	765.60	765.60	766.27	38.75	6.56	11.44	12.05
*	4.100	30.00	780.00	771.10	763.60	100.00	765.88	765.88	766.68	38.75	7.21	13.88	16.06
*	4.100	30.00	780.00	771.10	763.60	150.00	766.37	766.37	767.42	39.54	8.24	18.21	23.86
	4.100	30.00	780.00	771.10	763.60	200.00	766.96	0.00	768.09	34.25	8.52	23.46	34.18
	4.100	30.00	780.00	771.10	763.60	250.00	767.57	0.00	768.74	30.41	8.68	28.79	45.33
	4.100	30.00	780.00	771.10	763.60	300.00	768.19	0.00	769.38	27.23	8.74	34.33	57.49
	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
	4.110	1.00	780.00	770.00	763.60	25.00	764.92	764.91	765.25	40.40	4.61	5.43	3.93
	4.110	1.00	780.00	770.00	763.60	50.00	765.30	765.29	765.81	38.25	5.69	8.79	8.08
	4.110	1.00	780.00	770.00	763.60	75.00	765.61	765.60	766.27	38.41	6.54	11.47	12.10
	4.110	1.00	780.00	770.00	763.60	100.00	765.89	765.88	766.69	38.48	7.19	13.91	16.12
	4.110	1.00	780.00	770.00	763.60	150.00	766.39	766.38	767.43	38.64	8.17	18.35	24.13
	4.110	1.00	780.00	770.00	763.60	200.00	766.97	0.00	768.10	34.17	8.52	23.48	34.21
	4.110	1.00	780.00	770.00	763.60	250.00	767.57	0.00	768.74	30.36	8.68	28.81	45.37
	4.110	1.00	780.00	770.00	763.60	300.00	768.20	0.00	769.38	27.19	8.73	34.35	57.53
	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5.000	1.00	780.00	771.10	763.50	25.00	765.04	0.00	765.28	18.20	3.91	6.40	5.86
*	5.000	1.00	780.00	771.10	763.50	50.00	765.27	765.27	765.89	40.23	6.36	7.87	7.88
*	5.000	1.00	780.00	771.10	763.50	75.00	765.65	765.65	766.47	41.26	7.25	10.34	11.68
*	5.000	1.00	780.00	771.10	763.50	100.00	765.98	765.98	766.98	43.30	8.01	12.48	15.20
*	5.000	1.00	780.00	771.10	763.50	150.00	766.64	766.64	767.80	44.03	8.65	17.33	22.60
*	5.000	1.00	780.00	771.10	763.50	200.00	767.13	767.13	768.53	45.34	9.47	21.11	29.70
*	5.000	1.00	780.00	771.10	763.50	250.00	767.58	767.58	769.19	46.73	10.17	24.59	36.57
*	5.000	1.00	780.00	771.10	763.50	300.00	768.01	768.01	769.80	47.92	10.75	27.91	43.34
	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
*	5.010	0.01	780.00	771.10	763.50	25.00	765.18	0.00	765.36	12.37	3.41	7.33	7.11
*	5.010	0.01	780.00	771.10	763.50	50.00	765.44	0.00	765.92	27.62	5.58	8.96	9.51
*	5.010	0.01	780.00	771.10	763.50	75.00	765.86	0.00	766.50	29.16	6.41	11.70	13.89
*	5.010	0.01	780.00	771.10	763.50	100.00	766.22	0.00	767.00	34.64	7.06	14.17	16.99
*	5.010	0.01	780.00	771.10	763.50	150.00	766.91	0.00	767.84	32.20	7.73	19.40	26.43
*	5.010	0.01	780.00	771.10	763.50	200.00	767.43	0.00	768.56	34.10	8.54	23.43	34.25
*	5.010	0.01	780.00	771.10	763.50	250.00	767.90	0.00	769.22	36.01	9.23	27.10	41.66
*	5.010	0.01	780.00	771.10	763.50	300.00	768.33	0.00	769.83	38.05	9.85	30.44	48.63
	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5.100	0.00	0.00	0.00	763.60	25.00	765.22	0.00	765.42	14.26	3.58	6.98	6.62
	5.100	0.00	0.00	0.00	763.60	50.00	765.55	0.00	766.02	26.58	5.51	9.08	9.70
	5.100	0.00	0.00	0.00	763.60	75.00	765.98	0.00	766.60	28.14	6.33	11.85	14.14
	5.100	0.00	0.00	0.00	763.60	100.00	766.45	0.00	767.13	28.78	6.61	15.12	18.64
	5.100	0.00	0.00	0.00	763.60	150.00	767.05	0.00	767.96	31.05	7.63	19.65	26.92
	5.100	0.00	0.00	0.00	763.60	200.00	767.70	0.00	768.71	29.30	8.07	24.78	36.95
	5.100	0.00	0.00	0.00	763.60	250.00	768.19	0.00	769.38	31.46	8.77	28.51	44.57
	5.100	0.00	0.00	0.00	763.60	300.00	768.69	0.00	770.01	31.98	9.22	32.52	53.05
	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
6.000	1.00	0.00	0.00	763.60	25.00	765.35	0.00	765.45	6.26	2.58	9.69	9.99
6.000	1.00	0.00	0.00	763.60	50.00	765.91	0.00	766.10	8.24	3.53	14.17	17.42
6.000	1.00	0.00	0.00	763.60	75.00	766.48	0.00	766.72	8.97	3.92	19.15	25.04
6.000	1.00	0.00	0.00	763.60	100.00	766.99	0.00	767.26	8.40	4.18	23.95	34.51
6.000	1.00	0.00	0.00	763.60	150.00	767.78	0.00	768.12	8.65	4.74	31.65	51.01
6.000	1.00	0.00	0.00	763.60	200.00	768.47	0.00	768.89	9.07	5.21	38.38	66.39
6.000	1.00	0.00	0.00	763.60	250.00	769.12	0.00	769.60	9.26	5.56	44.96	82.14
6.000	1.00	0.00	0.00	763.60	300.00	769.71	0.00	770.25	9.54	5.88	51.03	97.15
0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23.620	10.00	771.50	770.00	761.70	25.00	765.48	0.00	765.48	0.03	0.33	75.52	146.57
23.620	10.00	771.50	770.00	761.70	50.00	766.16	0.00	766.16	0.07	0.56	89.08	186.91
23.620	10.00	771.50	770.00	761.70	75.00	766.78	0.00	766.79	0.11	0.74	101.60	226.23
23.620	10.00	771.50	770.00	761.70	100.00	767.32	0.00	767.34	0.15	0.89	112.44	261.65
23.620	10.00	771.50	770.00	761.70	150.00	768.20	0.00	768.22	0.22	1.15	130.05	321.46
23.620	10.00	771.50	770.00	761.70	200.00	768.98	0.00	769.01	0.28	1.37	145.56	376.17
23.620	10.00	771.50	770.00	761.70	250.00	769.69	0.00	769.73	0.34	1.56	159.82	427.90
23.620	10.00	771.50	770.00	761.70	300.00	770.35	0.00	770.40	0.79	1.81	165.92	336.76
0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	0.100	25.00	757.50	0.00	0.00	0.00	19.96	0.00
	0.100	50.00	757.50	0.00	0.00	0.00	19.96	0.00
	0.100	75.00	757.50	0.00	0.00	0.00	19.96	0.00
	0.100	100.00	757.50	0.00	0.00	0.00	19.96	0.00
	0.100	150.00	757.50	0.00	0.00	0.00	19.96	0.00
	0.100	200.00	757.50	0.00	0.00	0.00	19.96	0.00
	0.100	250.00	757.50	0.00	0.00	0.00	19.96	0.00
	0.100	300.00	757.50	0.00	0.00	0.00	19.96	0.00
	0.100	400.00	757.50	0.00	0.00	0.00	19.96	0.00
	0.100	400.00	757.50	0.00	0.00	0.00	19.96	0.00
	1.000	25.00	757.47	0.00	-0.03	0.00	10.11	20.00
	1.000	50.00	757.35	-0.12	-0.15	0.00	10.11	20.00
*	1.000	75.00	757.40	0.05	-0.10	0.00	10.11	20.00
*	1.000	100.00	757.65	0.25	0.15	0.00	10.11	20.00
*	1.000	150.00	758.11	0.46	0.61	0.00	10.11	20.00
*	1.000	200.00	758.51	0.41	1.01	0.00	10.12	20.00
*	1.000	250.00	758.89	0.38	1.39	0.00	10.12	20.00
*	1.000	300.00	759.25	0.36	1.75	0.00	10.13	20.00
*	1.000	400.00	759.91	0.66	2.41	0.00	10.13	20.00
*	1.000	400.00	759.91	0.00	2.41	0.00	10.13	20.00
	1.100	[illegible]	757.47	0.00	0.00	0.00	10.10	100.00
*	1.100	[illegible]	757.72	0.24	0.37	0.00	10.10	100.00
*	1.100	[illegible]	758.00	0.28	0.60	0.00	10.11	100.00
*	1.100	[illegible]	758.25	0.25	0.60	0.00	10.11	100.00
*	1.100	[illegible]	758.71	0.46	0.60	0.00	10.11	100.00
*	1.100	[illegible]	759.11	0.41	0.60	0.00	10.12	100.00
*	1.100	[illegible]	759.49	0.38	0.60	0.00	10.12	100.00
*	1.100	[illegible]	759.85	0.36	0.60	0.00	10.13	100.00
	1.100	[illegible]	761.14	1.29	1.23	0.00	10.14	100.00
	1.100	[illegible]	761.14	0.00	1.23	0.00	10.14	100.00
*	1.200	[illegible]	757.99	0.00	0.51	0.00	9.98	100.00
*	1.200	[illegible]	758.32	0.33	0.60	0.00	10.10	100.00
*	1.200	[illegible]	758.60	0.28	0.60	0.00	10.11	100.00
*	1.200	[illegible]	758.85	0.25	0.60	0.00	10.11	100.00
*	1.200	[illegible]	759.31	0.46	0.60	0.00	10.11	100.00
*	1.200	[illegible]	759.71	0.41	0.60	0.00	10.12	100.00
*	1.200	[illegible]	760.09	0.38	0.60	0.00	10.12	100.00
*	1.200	[illegible]	760.45	0.36	0.60	0.00	10.13	100.00
	1.200	[illegible]	761.61	1.16	0.46	0.00	10.14	100.00
	1.200	[illegible]	761.61	0.00	0.46	0.00	10.14	100.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	1.300	25.00	758.59	0.00	0.60	0.00	9.98	100.00
*	1.300	50.00	758.92	0.33	0.60	0.00	10.10	100.00
*	1.300	75.00	759.20	0.28	0.60	0.00	10.11	100.00
*	1.300	100.00	759.45	0.25	0.60	0.00	10.11	100.00
*	1.300	150.00	759.91	0.46	0.60	0.00	10.11	100.00
*	1.300	200.00	760.31	0.41	0.60	0.00	10.12	100.00
*	1.300	250.00	760.69	0.38	0.60	0.00	10.12	100.00
*	1.300	300.00	761.05	0.36	0.60	0.00	10.13	100.00
	1.300	400.00	762.11	1.06	0.50	0.00	10.14	100.00
	1.300	400.00	762.11	0.00	0.50	0.00	10.14	100.00
*	1.400	25.00	759.19	0.00	0.60	0.00	9.98	100.00
*	1.400	50.00	759.52	0.33	0.60	0.00	10.10	100.00
*	1.400	75.00	759.80	0.28	0.60	0.00	10.11	100.00
*	1.400	100.00	760.05	0.25	0.60	0.00	10.11	100.00
*	1.400	150.00	760.51	0.46	0.60	0.00	10.11	100.00
*	1.400	200.00	760.91	0.41	0.60	0.00	10.12	100.00
*	1.400	250.00	761.29	0.38	0.60	0.00	10.12	100.00
*	1.400	300.00	761.65	0.36	0.60	0.00	10.13	100.00
	1.400	400.00	762.63	0.98	0.53	0.00	10.14	100.00
	1.400	400.00	762.63	0.00	0.53	0.00	10.14	100.00
	2.000	25.00	760.18	0.00	1.00	0.00	9.04	270.00
	2.000	50.00	760.54	0.36	1.03	0.00	9.12	270.00
	2.000	75.00	760.85	0.31	1.05	0.00	9.20	270.00
	2.000	100.00	761.15	0.30	1.10	0.00	9.26	270.00
	2.000	150.00	761.76	0.61	1.25	0.00	9.40	270.00
	2.000	[illegible]	762.40	0.63	1.48	0.00	9.55	270.00
	2.000	[illegible]	763.03	0.63	1.74	0.00	9.70	270.00
	2.000	[illegible]	763.67	0.64	2.02	0.00	9.84	270.00
	2.000	[illegible]	764.82	1.15	2.18	0.00	10.11	270.00
	2.000	[illegible]	764.82	0.00	2.18	0.00	10.11	270.00
	2.100	[illegible]	760.30	0.00	0.12	0.00	9.05	34.00
	2.100	[illegible]	760.67	0.38	0.13	0.00	9.13	34.00
	2.100	[illegible]	761.03	0.36	0.18	0.00	9.21	34.00
	2.100	[illegible]	761.29	0.25	0.13	0.00	9.27	34.00
	2.100	[illegible]	761.88	0.59	0.12	0.00	9.41	34.00
	2.100	[illegible]	762.47	0.59	0.07	0.00	9.54	34.00
	2.100	[illegible]	763.09	0.63	0.07	0.00	9.69	34.00
	2.100	[illegible]	763.73	0.63	0.06	0.00	9.83	34.00
	2.100	[illegible]	764.87	1.14	0.05	0.00	10.10	34.00
	2.100	[illegible]	764.87	0.00	0.05	0.00	10.10	34.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	3.000	25.00	760.36	0.00	0.06	0.00	8.74	1.00
	3.000	50.00	760.87	0.51	0.19	0.00	10.10	1.00
	3.000	75.00	761.24	0.37	0.21	0.00	10.11	1.00
	3.000	100.00	761.59	0.35	0.30	0.00	10.11	1.00
	3.000	150.00	762.08	0.49	0.20	0.00	10.12	1.00
	3.000	200.00	762.57	0.49	0.10	0.00	10.13	1.00
	3.000	250.00	763.08	0.51	-0.01	0.00	10.13	1.00
	3.000	300.00	763.67	0.59	-0.05	0.00	10.14	1.00
	3.000	400.00	764.73	1.06	-0.14	0.00	10.16	1.00
	3.000	400.00	764.73	0.00	-0.14	0.00	10.16	1.00
*	3.100	25.00	760.55	0.00	0.19	0.00	7.87	100.00
	3.100	50.00	761.00	0.45	0.13	0.00	9.71	100.00
	3.100	75.00	761.38	0.37	0.14	0.00	10.10	100.00
	3.100	100.00	761.72	0.34	0.13	0.00	10.11	100.00
	3.100	150.00	762.25	0.53	0.17	0.00	10.12	100.00
	3.100	200.00	762.76	0.51	0.19	0.00	10.12	100.00
	3.100	250.00	763.29	0.53	0.21	0.00	10.13	100.00
	3.100	300.00	763.89	0.60	0.22	0.00	10.14	100.00
	3.100	400.00	764.99	1.09	0.26	0.00	10.15	100.00
	3.100	400.00	764.99	0.00	0.26	0.00	10.15	100.00
*	3.150	25.00	761.65	0.00	1.10	0.00	7.87	200.00
*	3.150	50.00	762.08	0.43	1.08	0.00	9.63	200.00
*	3.150	75.00	762.37	0.28	0.99	0.00	10.10	200.00
*	3.150	100.00	762.62	0.25	0.90	0.00	10.11	200.00
*	3.150	150.00	763.06	0.44	0.81	0.00	10.11	200.00
*	3.150	[illegible]	763.46	0.40	0.70	0.00	10.12	200.00
*	3.150	[illegible]	763.84	0.38	0.55	0.00	10.12	200.00
	3.150	[illegible]	764.35	0.51	0.46	0.00	10.13	200.00
	3.150	[illegible]	765.50	1.15	0.51	0.00	10.15	200.00
	3.150	[illegible]	765.50	0.00	0.51	0.00	10.15	200.00
*	3.200	[illegible]	762.75	0.00	1.10	0.00	7.87	200.00
*	3.200	[illegible]	763.18	0.43	1.10	0.00	9.63	200.00
*	3.200	[illegible]	763.47	0.28	1.10	0.00	10.10	200.00
*	3.200	[illegible]	763.72	0.25	1.10	0.00	10.11	200.00
*	3.200	[illegible]	764.16	0.44	1.10	0.00	10.11	200.00
*	3.200	[illegible]	764.56	0.40	1.10	0.00	10.12	200.00
*	3.200	[illegible]	764.94	0.38	1.10	0.00	10.12	200.00
*	3.200	[illegible]	765.28	0.33	0.92	0.00	10.13	200.00
	3.200	400.00	766.19	0.91	0.69	0.00	10.14	200.00
	3.200	400.00	766.19	0.00	0.69	0.00	10.14	200.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	3.300	25.00	763.45	0.00	0.70	0.00	8.88	200.00
	3.300	50.00	763.91	0.46	0.72	0.00	10.10	200.00
	3.300	75.00	764.27	0.36	0.80	0.00	10.11	200.00
	3.300	100.00	764.61	0.33	0.89	0.00	10.11	200.00
	3.300	150.00	765.22	0.62	1.06	0.00	10.12	200.00
	3.300	200.00	765.79	0.57	1.24	0.00	10.13	200.00
	3.300	250.00	766.33	0.53	1.39	0.00	10.14	200.00
	3.300	300.00	766.86	0.54	1.59	0.00	10.14	200.00
	3.300	400.00	767.74	0.88	1.55	0.00	10.16	200.00
	3.300	400.00	767.74	0.00	1.55	0.00	10.16	200.00
	3.350	25.00	763.80	0.00	0.35	0.00	8.49	200.00
	3.350	50.00	764.26	0.46	0.36	0.00	10.10	200.00
	3.350	75.00	764.62	0.36	0.35	0.00	10.11	200.00
	3.350	100.00	764.96	0.34	0.35	0.00	10.11	200.00
	3.350	150.00	765.59	0.64	0.37	0.00	10.12	200.00
	3.350	200.00	766.19	0.60	0.40	0.00	10.13	200.00
	3.350	250.00	766.76	0.57	0.44	0.00	10.14	200.00
	3.350	300.00	767.35	0.59	0.49	0.00	10.14	200.00
	3.350	400.00	768.38	1.03	0.64	0.00	10.16	200.00
	3.350	400.00	768.38	0.00	0.64	0.00	10.16	200.00
*	3.390	25.00	763.87	0.00	0.07	0.00	8.77	0.10
*	3.390	50.00	764.34	0.47	0.08	0.00	10.10	0.10
*	3.390	75.00	764.71	0.37	0.09	0.00	10.11	0.10
*	3.390	100.00	765.06	0.35	0.10	0.00	10.11	0.10
*	3.390	150.00	765.71	0.66	0.12	0.00	10.12	0.10
*	3.390	[illegible]	766.34	0.63	0.15	0.00	10.13	0.10
*	3.390	[illegible]	766.94	0.60	0.18	0.00	10.14	0.10
*	3.390	[illegible]	767.57	0.63	0.22	0.00	10.15	0.10
*	3.390	[illegible]	973.58	206.01	205.20	0.00	10.31	0.10
*	3.390	[illegible]	973.58	0.00	205.20	0.00	10.31	0.10
	3.400	[illegible]	764.01	0.00	0.14	0.00	9.75	30.00
	3.400	[illegible]	764.50	0.49	0.16	0.00	10.11	30.00
	3.400	[illegible]	764.89	0.38	0.17	0.00	10.11	30.00
	3.400	[illegible]	765.24	0.35	0.18	0.00	10.12	30.00
	3.400	[illegible]	765.89	0.65	0.18	0.00	10.13	30.00
	3.400	[illegible]	766.52	0.62	0.17	0.00	10.13	30.00
	3.400	[illegible]	767.11	0.60	0.17	0.00	10.14	30.00
	3.400	[illegible]	767.73	0.62	0.16	0.00	10.15	30.00
	3.400	[illegible]	973.58	205.85	0.00	0.00	10.31	30.00
	3.400	[illegible]	973.58	0.00	0.00	0.00	10.31	30.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	4.000	25.00	763.96	0.00	-0.05	0.00	8.80	1.00
	4.000	50.00	764.44	0.48	-0.07	0.00	8.81	1.00
	4.000	75.00	764.80	0.37	-0.08	0.00	8.81	1.00
	4.000	100.00	765.15	0.34	-0.09	0.00	8.82	1.00
	4.000	150.00	765.80	0.65	-0.09	0.00	8.82	1.00
	4.000	200.00	766.43	0.64	-0.08	0.00	8.83	1.00
	4.000	250.00	767.05	0.62	-0.06	0.00	8.84	1.00
	4.000	300.00	767.70	0.65	-0.04	0.00	8.85	1.00
	4.000	400.00	973.58	205.89	0.00	0.00	9.01	1.00
	4.000	400.00	973.58	0.00	0.00	0.00	9.01	1.00
*	4.010	25.00	764.10	0.00	0.14	0.00	8.80	0.01
*	4.010	50.00	764.58	0.48	0.14	0.00	8.81	0.01
*	4.010	75.00	764.94	0.37	0.14	0.00	8.81	0.01
*	4.010	100.00	765.29	0.34	0.14	0.00	8.82	0.01
*	4.010	150.00	765.94	0.65	0.14	0.00	8.83	0.01
*	4.010	200.00	766.57	0.64	0.14	0.00	8.83	0.01
*	4.010	250.00	767.19	0.62	0.14	0.00	8.84	0.01
*	4.010	300.00	767.84	0.65	0.14	0.00	8.85	0.01
	0.000	0.00	0.00	-767.84	0.00	0.00	0.00	0.00
	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00
*	4.100	25.00	764.91	0.00	0.81	0.00	8.23	250.00
*	4.100	50.00	765.30	0.39	0.72	0.00	8.80	250.00
*	4.100	75.00	765.60	0.30	0.65	0.00	8.81	250.00
*	4.100	100.00	765.88	0.28	0.59	0.00	8.81	250.00
*	4.100	150.00	766.37	0.49	0.43	0.00	8.82	250.00
	4.100	[illegible]	766.96	0.60	0.39	0.00	8.82	250.00
	4.100	[illegible]	767.57	0.60	0.38	0.00	8.83	250.00
	4.100	[illegible]	768.19	0.63	0.36	0.00	8.84	250.00
	0.000	[illegible]	0.00	-768.19	0.00	0.00	0.00	0.00
	0.000	[illegible]	0.00	0.00	0.00	0.00	0.00	0.00
	4.110	[illegible]	764.92	0.00	0.01	0.00	8.26	1.00
	4.110	[illegible]	765.30	0.38	0.01	0.00	8.80	1.00
	4.110	[illegible]	765.61	0.30	0.01	0.00	8.81	1.00
	4.110	[illegible]	765.89	0.28	0.01	0.00	8.81	1.00
	4.110	[illegible]	766.39	0.51	0.03	0.00	8.82	1.00
	4.110	[illegible]	766.97	0.58	0.01	0.00	8.82	1.00
	4.110	[illegible]	767.57	0.60	0.00	0.00	8.83	1.00
	4.110	[illegible]	768.20	0.63	0.00	0.00	8.84	1.00
	0.000	[illegible]	0.00	-768.20	0.00	0.00	0.00	0.00
	0.000	[illegible]	0.00	0.00	0.00	0.00	0.00	0.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	5.000	25.00	765.04	0.00	0.12	0.00	6.25	1.00
*	5.000	50.00	765.27	0.22	-0.04	0.00	6.42	1.00
*	5.000	75.00	765.65	0.38	0.04	0.00	6.46	1.00
*	5.000	100.00	765.98	0.33	0.10	0.00	6.50	1.00
*	5.000	150.00	766.64	0.66	0.25	0.00	7.61	1.00
*	5.000	200.00	767.13	0.49	0.16	0.00	7.71	1.00
*	5.000	250.00	767.58	0.45	0.01	0.00	7.80	1.00
*	5.000	300.00	768.01	0.42	-0.19	0.00	7.88	1.00
	0.000	0.00	0.00	-768.01	0.00	0.00	0.00	0.00
	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00
*	5.010	25.00	765.18	0.00	0.14	0.00	6.41	0.01
*	5.010	50.00	765.44	0.25	0.17	0.00	6.44	0.01
*	5.010	75.00	765.86	0.42	0.21	0.00	6.48	0.01
*	5.010	100.00	766.22	0.36	0.24	0.00	7.52	0.01
*	5.010	150.00	766.91	0.69	0.27	0.00	7.66	0.01
*	5.010	200.00	767.43	0.52	0.30	0.00	7.77	0.01
*	5.010	250.00	767.90	0.47	0.32	0.00	7.86	0.01
*	5.010	300.00	768.33	0.42	0.32	0.00	7.95	0.01
	0.000	0.00	0.00	-768.33	0.00	0.00	0.00	0.00
	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5.100	25.00	765.22	0.00	0.04	0.00	6.40	35.00
	5.100	50.00	765.55	0.33	0.11	0.00	6.44	35.00
	5.100	75.00	765.98	0.43	0.12	0.00	6.49	35.00
	5.100	100.00	766.45	0.47	0.23	0.00	7.55	35.00
	5.100	150.00	767.05	0.60	0.14	0.00	7.67	35.00
	5.100	200.00	767.70	0.65	0.27	0.00	7.80	35.00
	5.100	250.00	768.19	0.49	0.28	0.00	7.90	35.00
	5.100	300.00	768.69	0.50	0.36	0.00	8.00	35.00
	0.000	0.00	0.00	-768.69	0.00	0.00	0.00	0.00
	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6.000	25.00	765.35	0.00	0.13	0.00	8.02	1.00
	6.000	50.00	765.91	0.56	0.36	0.00	8.10	1.00
	6.000	75.00	766.48	0.57	0.50	0.00	9.44	1.00
	6.000	100.00	766.99	0.50	0.53	0.00	9.57	1.00
	6.000	150.00	767.78	0.79	0.72	0.00	9.77	1.00
	6.000	200.00	768.47	0.69	0.77	0.00	9.94	1.00
	6.000	250.00	769.12	0.65	0.93	0.00	10.10	1.00
	6.000	300.00	769.71	0.60	1.02	0.00	10.25	1.00
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	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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23.620	200.00	768.98	0.78	0.51	0.00	20.00	10.00
23.620	250.00	769.69	0.71	0.58	0.00	20.01	10.00
23.620	300.00	770.35	0.65	0.63	0.00	20.01	10.00
0.000	0.00	0.00	-770.35	0.00	0.00	0.00	0.00
0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00

SUMMARY OF ERRORS AND SPECIAL NOTES

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  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55
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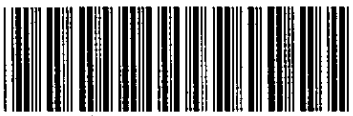


1) COUNTY: KALAMAZOO

2) STUDY NAME: KALAMAZOO, CITY OF

3) WATERCOURSE: ARCADIA CREEK

4) DOCUMENT TYPE: REPORT



Federal Emergency Management Agency

Washington, D.C. 20472

MAY 28 1992

316 AD
Case No.: 92-05-023R
Community: City of Kalamazoo, Kalamazoo County, Michigan
Community No.: 260315

Mr. James P. Gallogly
Acting Public Works Director
for the City of Kalamazoo
Department of Public Works
234 West Cedar Street
Kalamazoo, Michigan 49007-5170

Dear Mr. Gallogly:

This is in reference to the request, dated February 18, 1992, for a conditional Letter of Map Revision (LOMR) for the Arcadia Creek Redevelopment Project in the City of Kalamazoo, Michigan. Our April 9, 1992, letter regarding this request indicated that additional data might be required to complete our review of the request. The data required to complete our review is listed on the enclosure.

The required data should be submitted to the address below, within 30 days of the date of this letter.

Dewberry & Davis
8401 Arlington Boulevard
Fairfax, Virginia 22031

Attention: Mr. Joseph Chapman
Management Engineering and Technical
Services Division
(703) 849-0640

The case number referenced above should be included on any correspondence regarding the request. Further action on the request has been suspended pending receipt of the additional data.

After 90 days, the request will be treated as an original submittal and will be subject to all submittal/payment procedures, including the initial fee.

If you have any questions concerning FEMA policy, or the National Flood Insurance Program in general, please call Philip Myers of our Headquarters staff in Washington, D.C., at (202) 646-2755.

Sincerely,

William R. Locke
Chief, Risk Studies Division
Federal Insurance Administration

Enclosure

cc: The Honorable Beverly A. Moore, Mayor of the City of Kalamazoo
Mr. Thomas J. Krasovec, P.E.

Case No.: 92-05-023R
Community: City of Kalamazoo,
Kalamazoo County,
Michigan

ADDITIONAL DATA REQUIRED TO SUPPORT A
CONDITIONAL LETTER OF MAP REVISION REQUESTED

Requestor: Mr. James P. Gallogly Date: MAY 28 1992

Based on our review of the submitted data, we have identified a number of concerns that must be resolved before we can proceed with our review. The concerns are outlined below.

1. The use of the split flow methodology to analyze the flow between the junction box and the Kalamazoo River is fundamentally correct, but we have noted two discrepancies with the input data.

   - o The discharge value of 350 cubic feet per second (cfs) was not used because the value on field 2 of the J1 card changes from 9 to 11 and skips 10. This should be corrected so that the discharge value of 350 cfs will be used.

   - o Ten discharge values are defined on the QT cards, but the X5 cards contain only nine values; therefore, the final profile is unable to find an X5 value to correspond with the final discharge value, thus causing an error.

   Once these corrections have been made, please re-run the HEC-2 model for the corrected rating curve.

2. The split flow methodology used to analyze the flow between the pond and the junction box has been performed incorrectly. In order to perform the split flow analysis for this section correctly you would first have to compute values for a divided flow situation. These divided flow values would then be input as rating curves for the split flow analysis.

   The steps necessary to compute the divided flow analysis are outlined in Chapter 11, Section 9, of Ven Te Chow's Open Channel Hydraulics, dated 1959. The example discussed in that section describes flow passing an island, but that situation is similar to the two-culvert scenario described in the submitted proposal. A copy of the section has been enclosed to help you in the calculations.

3. The Westnedge Avenue culvert extension is lined with a series of collector boxes, which are designed to collect the existing overland flow. Please submit an analysis documenting that these collector boxes can adequately intake the discharges associated with the designed floods.

   In addition, please provide an explanation as to how the over 800-foot wide floodplain is to be contained in the proposed culvert system. With this explanation, include topographic mapping

showing the proposed 100-year floodplain through the transition.

4. National Flood Insurance Program (NFIP) regulations Subparagraph 65.2(a)(2) states the following:

> To avoid discontinuities between the revised and unrevised flood data, the necessary hydrologic and hydraulic analyses submitted by the map revision requestor must be extensive enough to ensure that a logical transition can be shown between the revised flood elevations, floodplain boundaries, and floodways and those developed previously for areas not affected by the revision. Unless it is demonstrated that it would not be appropriate, the revised and unrevised Base (100-year) Flood Elevations (BFEs) must match within one-half foot where such transitions occur.

The proposed project results in a BFE of 779 feet at the upstream end of the culvert extension (located at Westnedge Avenue). The BFE at Westnedge Avenue on the current effective Flood Insurance Rate Map is 786 feet. Please revise the submitted analysis to comply with the requirements of Subparagraph 65.2(a)(2) of the NFIP regulations, as noted above.

June 4, 1992

Mr. Dan Morgan
Michigan Department of Natural Resources
Land & Water Management Division
Flood Plain Regulations Section
P.O. Box 30028
Lansing, Michigan 48909

RE: MDNR Project No. 89-12-0444
Request for Permit Revision

Dear Mr. Morgan:

In reference to our telephone conversation on May 29, 1992, STS Consultants, Ltd. has prepared this letter and supporting documents to request a permit change for the project referenced above. Specifically, chanded conditions encountered during construction of the project have necessitated the need to change the original design in one area of the creek. The area of interest, stations 18+28 to 19+40, included two 7 ft. 6 in. culverts to be jacked under the existing railroad. Railroad concerns have necessitated a change to a 12 ft. x 7 ft. box culvert to be jacked under the railroad, instead of the culverts. The original design was shown on Drawing 303-1, which was submitted as part of the original permit for construction.

In addition, since the box culverts have been removed, the grade from station 18+28 to station 23+50 has also been modified to smooth the creek invert.

With this letter you will find a revised HEC-2 analysis for the entire creek, which includes the revised cross-sections. In addition, tables included in the original submittal have been revised to show the new flood elevations, taking into account the revised construction.

Finally, regarding the revised design drawings, STS will forward the revised design drawings indicating removal of the twin culvert system and the new channel inverts as soon as they are available.

As construction of the creek is currently underway, your timely review of this matter would be greatly appreciated. If you have any questions or concerns regarding this letter or the attached information, please contact me at your earliest convenience.

Sincerely,

STS CONSULTANTS, LTD.

Bernard B. Sheff, P.E.
Principal Engineer
Regional Office Manager

BBS/lch

cc: Jim Gallogly
Calvin Jones
Ken Nacci

enc: Revised HEC-2 Analysis
Revised Tables

STS Consultants Ltd.
Consulting Engineers

3340 Ranger Road
Lansing Michigan 48906
517.321 4964/Fax 517 321 2132

REVISED TABLE 1
CROSS-SECTION CROSS REFERENCE
ARCADIA CREEK PROJECT
(revised 6/1/92)

FIS Cross Section Designation	STS Feasibility Designation	STS Design Designation	Description
NA[1]	NA	0.01	(POB Phase 1) Outlet to Kalamazoo River
NA	NA	4.3	Harrison St. crossing
NA	NA	10.0	Walbridge St.
A	1.46	NA	Michigan Ave. btn Porter St. and Walbridge St.
B	2.6	NA	Michigan Ave. btn Porter St. to Pitcher St.
NA	NA	18.50	12 ft. x 7 ft. concrete box to be jacked under Conrail crossing
NA	NA	22.51	Kalamazoo St. crossing
C	4.2	NA	Between Edwards and Pitcher (100 downstream sta. 28+56)
NA	NA	28.56	Downstream limit of pond begin 12 ft. x 8 ft. concrete box culvert
D	9.0	NA	-----
NA	NA	32.07	Upstream limit of pond
E	11.0	NA	-----
NA	NA	34.71	Upstream face of Burdick mall culvert

REVISED TABLE 1
CROSS-SECTION CROSS REFERENCE
ARCADIA CREEK PROJECT
(revised 6/1/92)

Continued

FIS Cross Section Designation	STS Feasibility Designation	STS Design Designation	Description
F	19.0	--	Just downstream of sta. 35+00
NA	NA	38.05	Downstream face of Rose St. crossing
--	--	41.59	18 ft. downstream of FIS cross section F (Church St.)
NA	NA	45.87	Upstream face of Park St. crossing
G	29.0	45.97	44 ft. upstream
NA	NA	48.33	Downstream face of Cooley St. crossing
NA	NA	51.55	Downstream limit of Westnedge interceptor syustem (POE Phase II)

[1] NA = No applicable cross-section

REVISED TABLE 2
DESIGN CROSS-SECTION
FLOOD ELEVATION SUMMARY
ARCADIA CREEK PROJECT
(revised 6/1/92)

Design Cross-Section	10-year	50-year	100-year	500-year
0.01	757.50	757.50	757.50	757.50
4.3	760.49	761.54	761.83	762.59
10.0	761.72	762.93	763.35	764.22
18.50	763.48	764.88	765.33	767.40
22.51	764.33	765.49	765.95	769.14
28.56	767.26	768.58	768.99	771.38
32.07	768.29	769.34	769.92	772.48
34.71	771.91	772.92	773.37	774.32
38.05	772.83	773.87	774.31	775.13
41.59	774.45	775.49	775.92	776.88
45.87	774.52	775.59	776.05	777.32
45.97	774.53	775.59	776.05	778.33
48.33	775.96	777.01	777.44	778.31
51.55	777.17	778.22	778.66	779.63

STATE OF MICHIGAN

NATURAL RESOURCES COMMISSION
LARRY DEVUYST
PAUL EISELE
GORDON E GUYER
JAMES P HILL
DAVID HOLLI
O STEWART MYERS
JOEY M. SPANO

JOHN ENGLER, Governor
DEPARTMENT OF NATURAL RESOURCES
Stevens T Mason Building, P O Box 30028, Lansing, MI 48909
ROLAND HARMES, Director

RECEIVED
JUL 29 1992

July 27, 1992

Mr. Bernard B. Sheff
STS Consultants, Ltd.
3340 Ranger Road
Lansing, Michigan 48906

Re: MDNR Permit No. 89-12-444
Arcadia Creek
Kalamazoo County

Dear Mr. Sheff:

We have received your letter and report dated June 4, 1992, requesting an amendment to construction authorized by the above referenced Michigan Department of Natural Resources permit.

This letter serves to amend permit 89-12-444 as follows:

> Between stations 18+28 and 19+40, replace the previously authorized twin 7'-6" culverts with one 12' x 7' box culvert to be jacked under the railroad. The original design was on Drawing 303.1.

You are reminded that all conditions as set forth in the orginal permit remain in full force, and that this letter must be made part of your permit to be kept at the site of the work and available for inspection at all times during the duration of the project or until the date of expiration. This revision does not obviate the need for other federal, state and/or local permits as may be required by law.

Should you have any questions, please contact this office.

Sincerely,

Mary Ann Dolehanty

Mary Ann Dolehanty
Floodplain Regulation
Land and Water Management Division
517-335-3190

MAD:cjr
cc: Kalamazoo Downtown Development Authority
Ms. Kim Rice, District 12 LWMD Office
District 12 Law Supervisor

STS CALCULATION COVER SHEET

PROJECT ARCADIA CREEK JOB NO _____ DIVISION _____

SUBJECT HYDRAULIC MODELING REVISIONS FILE NO _____

CALC NO 72067

ORIGINATOR BAS DATE 7/28/92

CHECKER WJW DATE 8/3/92 NO OF SHEETS 7

1 of 7

RECORD OF ISSUES

NO	DESCRIPTION	BY	DATE	CHKD	DATE	APPRD		

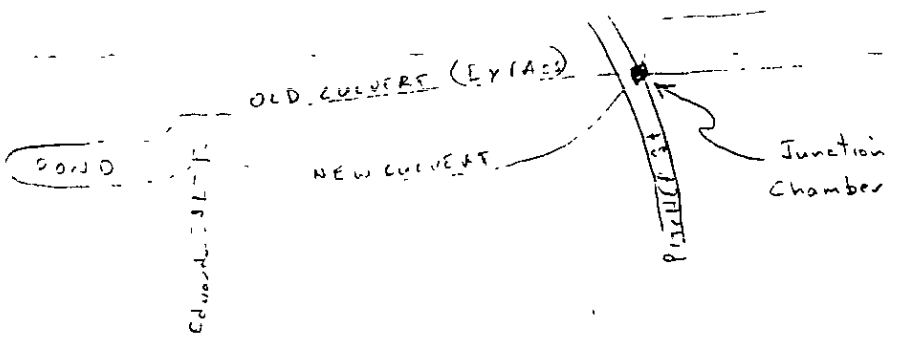
PRELIMINARY CALC ☐

SUPERSEDED CALC ☐ FINAL CALC ☒

BRIEF SUMMARY OF CALCULATIONS INCLUDING SCOPE AND RESULTS

- Hydraulic analyses for the new and old Arcadia Creek channels were updated to reflect field and design changes between Pitcher and Edwards Streets. Furthermore, these calculations incorporate comments raised by FEMA in a letter dated 5/28/92.

The enclosed calculations focus on the flow division from the Edwards Street Pond to Pitcher Street:



STS Consultants Ltd.
CALCULATION SHEET

PROJECT	STS JOB NO
Arcadia Creek	
SUBJECT	CALC NO
Hydraulic Modeling Revisions	2 of 7
DATE 7/28/92 / BY BAS / CHECKED BY W	REV NO

In response to a letter from FEMA dated 5/28/92 the following revisions were made to the Arcadia Creek hydraulic models:

1. The rating curve for the existing culvert between the Kalamazoo River and the junction chamber was corrected. The corrections included:

   a. Field 2 of the J1 cards were corrected so that all ten flows were used.

   b. Originally, there were 10 discharge values specified on the QT but only 9 values on the X5 cards. This was also corrected.

   The revised rating curve was inserted into the mainline hec-2 model and was rerun.

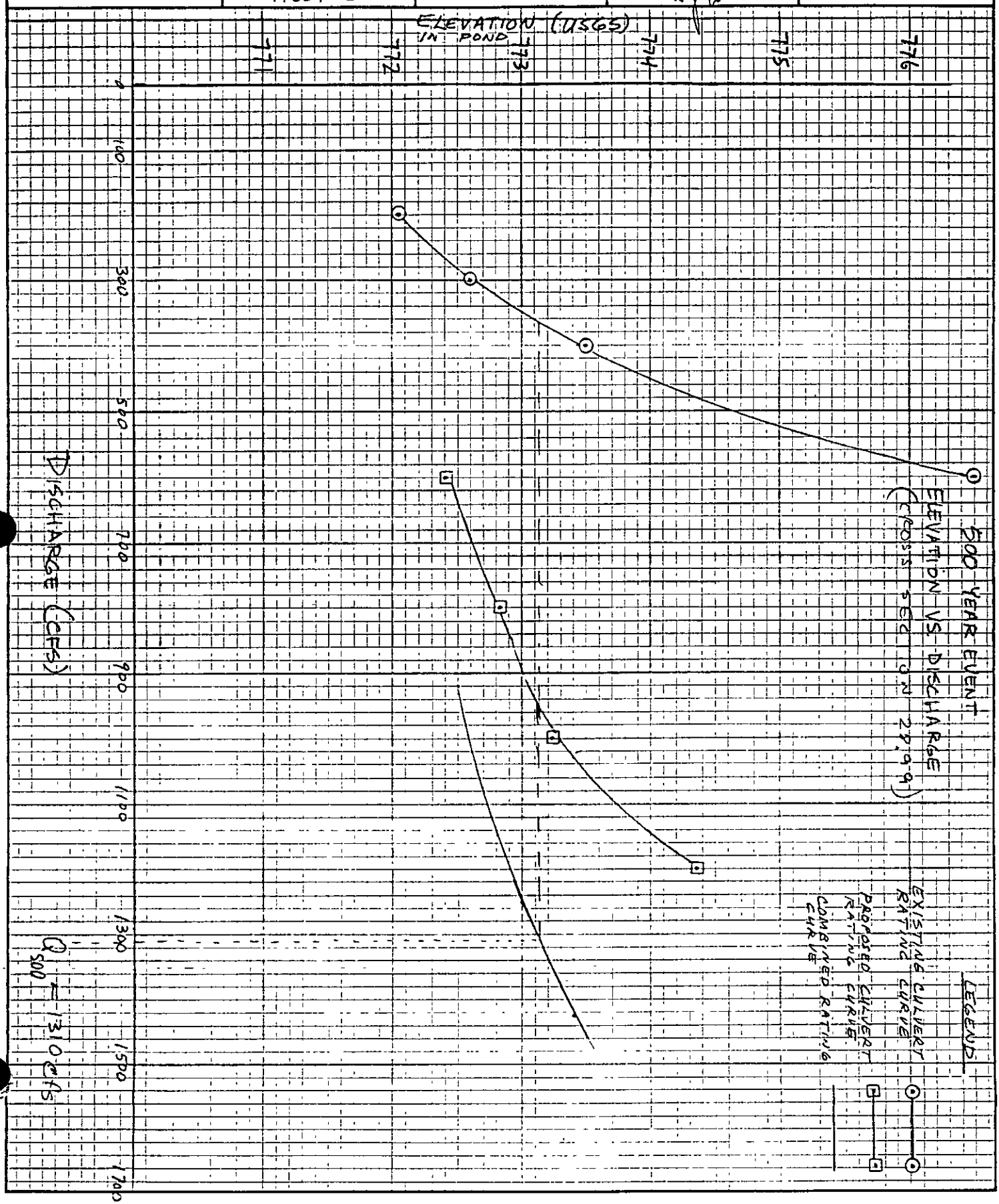
2. A diversion analysis was conducted between the junction box and pond, in place of the incorrect split flow technique.

   Two rating curve models were set up for each storm event (10yr, 50 yr, 100 yr and 500 yr): One model for the existing bypass culvert and one model for the mainline culvert. The starting water level in the junction chamber for each model was taken from the revised mainline model in step 1.

   The results of the rating curve models were graphed on the following pages. The percentage of flow through the proposed mainline was taken from these graphs. The mainline hec-2 model was then updated with this new flow distribution

Ocd Drawing Inc 80[illegible] 8639

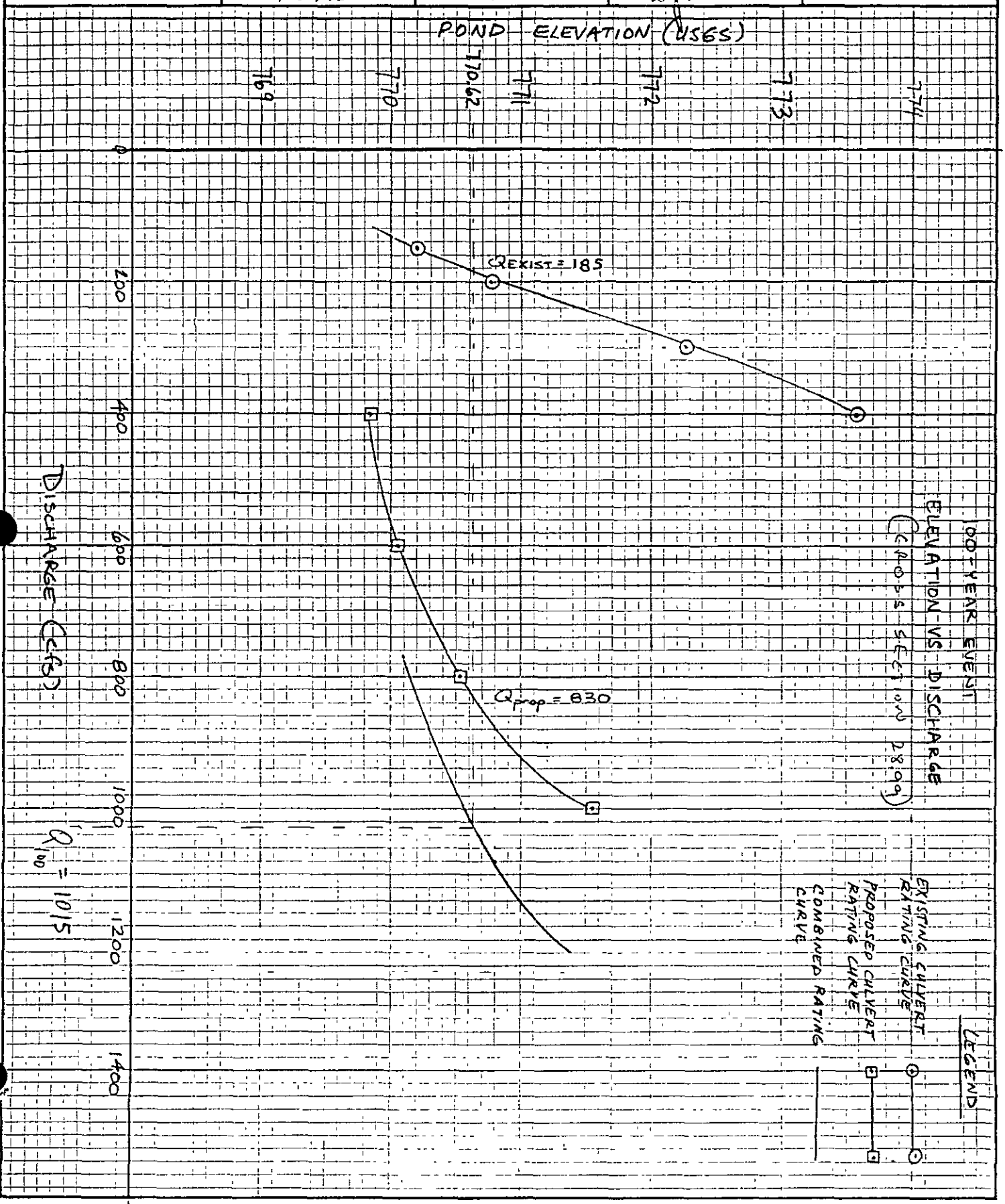
STS Consultants Ltd. CALCULATION SHEET	PROJECT: ARCADIA CREEK			STS JOB NO
	SUBJECT: DIVERSION ANALYSIS (JUNCTION CHAMBER TO POND)			CALC. NO. 3 of 7
	DATE: 7/28/92	BY: BAS	CHECKED BY: WJW	REV NO



Océ Bruning Inc Form 8639

STS Consultants Ltd.
CALCULATION SHEET

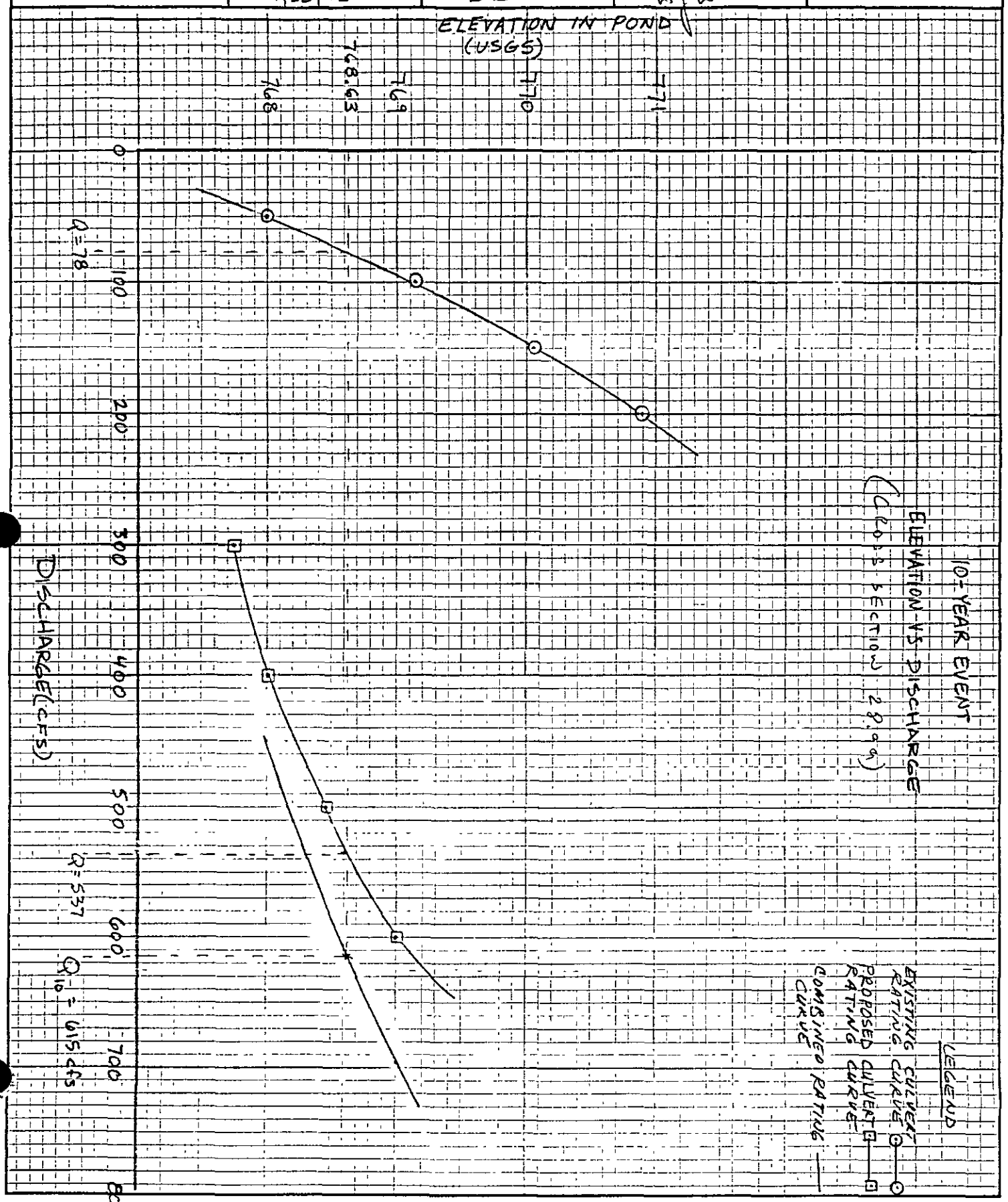
PROJECT	STS JOB NO.
ARCADIA CREEK	
SUBJECT	CALC. NO.
DIVERSION ANALYSIS (JUNCTION CHAMBER TO POND)	4 of 7
DATE 7/28/92 | BY BAS | CHECKED BY WW	REV. NO.



Oce Bruning Inc 8639

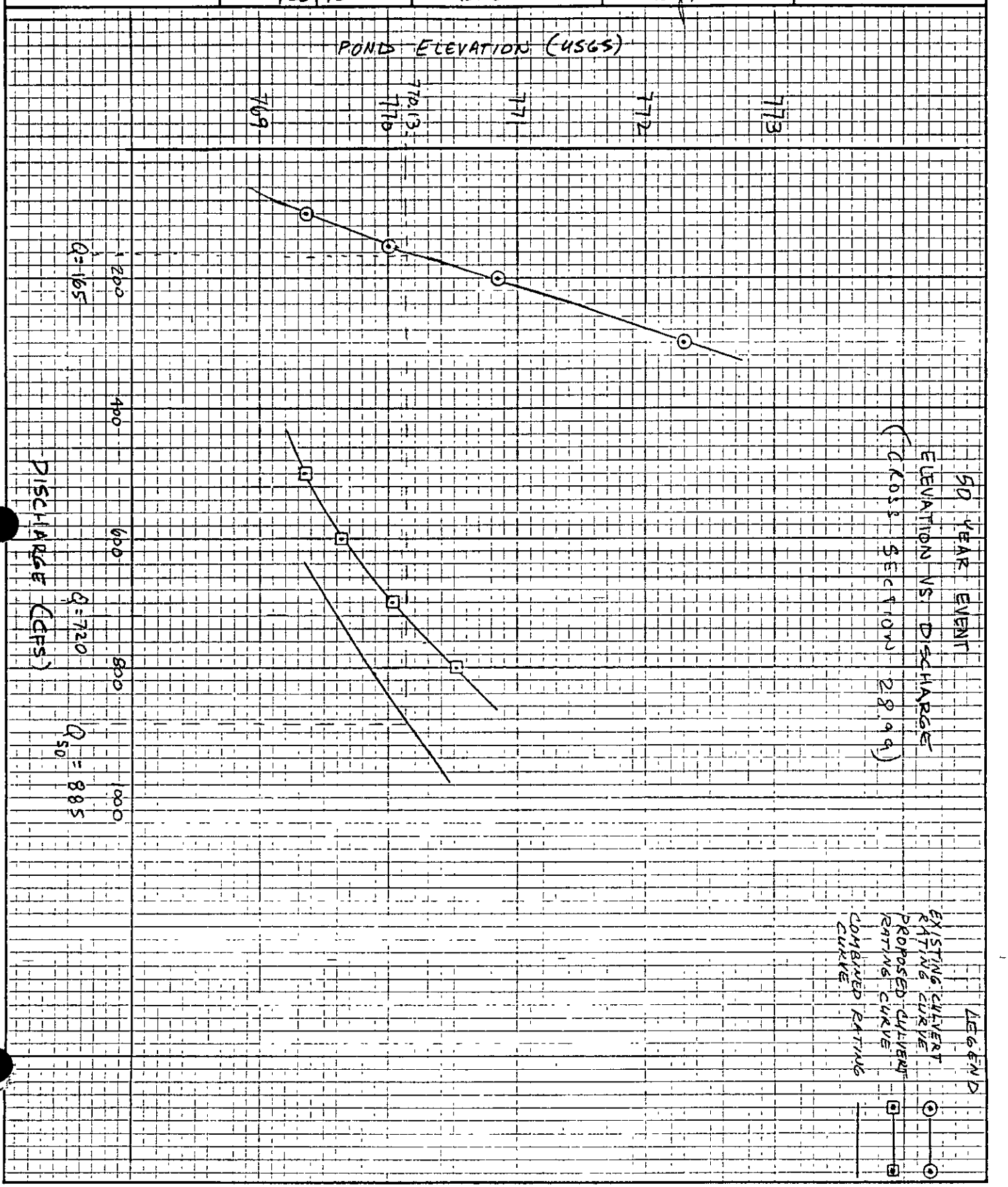
STS Consultants Ltd.
CALCULATION SHEET

PROJECT		STS JOB NO.
ARCADIA CREEK		
SUBJECT		CALC. NO.
DIVERSION ANALYSIS (JUNCTION CHAMBER TO POND)		5 of 7
DATE 7/28/92	BY BAS	CHECKED BY WJW / REV. NO



STS Consultants Ltd.
CALCULATION SHEET

PROJECT	STS JOB NO.
ARCADIA CREEK	
SUBJECT: DIVERSION ANALYSIS (JUNCTION CHAMBER TO POND)	CALC. NO. 6 of 7
DATE 7/28/92 · BY BAS · CHECKED BY [illegible]	REV. NO.



Océ Bruning Inc Form 8639

STS Consultants Ltd. CALCULATION SHEET	PROJECT: ARCADIA CREEK			STS JOB NO.
	SUBJECT: DIVERSION ANALYSIS RESULTS (JUNCTION TO POND)			CALC NO: 7 of 7
	DATE: 7/28/92	BY: BAS	CHECKED BY: UJW	REV. NO

BASED ON DIVERSION ANALYSIS RESULTS (SEE GRAPHS)

FLOW DISTRIBUTION (Edwards POND TO PITCHER)

EVENT (YR)	Q TOTAL IN POND (cfs)	Q BYPASS CULVERT (cfs)	Q MAIN LINE CULVERT (cfs)
10	615	75	540
50	885	165	720
100	1015	185	830
500	1310	360	950

Océ Bruning Inc 8 ... m 8639

Computation Sheets and Data Analysis Michigan Department of Natural Resources for Permit #89-12-0444

Westnedge Collector System
Arcadia Creek

Kalamazoo Downtown Development Authority

August 1, 1990

Mr. Dan Morgan
Flood Plain Control Unit
Land and Water Management Division
Department of Natural Resources
Mason Building
Box 30028
Lansing, Michigan 48909

RE: Arcadia Creek Project; Westnedge Collector System - Permit #89-12-0444

Dear Dan:

Following are data and computations documenting the hydraulic performance of the Westnedge Collector System for the Arcadia Creek project. These data and computations are in fulfillment of the Department of Natural Resources Permit #89-12-0444 issued September 15, 1989.

The Westnedge Collector System is the upstream limit of the Arcadia Creek project. The collector system is designed to channel overland flooding from Elm Street to Westnedge Avenue into the proposed Arcadia Creek System. Overland flow occurs between Elm Street and Westnedge Avenue during major storm events when the capacity of the existing Arcadia Creek is exceeded.

Construction drawings based upon these data and computations are being sent to you under separate cover. If you have any questions concerning this transmittal, please do not hesitate to contact me at 321-4964. We would appreciate a prompt review so that the contractor for this project can begin as soon as possible.

Sincerely,

STS CONSULTANTS LTD.

David Hendershott, E.I.T.
Assistant Project Engineer

cc: Kim Rice
Land and Water Management Division
Department of Natural Resources
P.O. Box 355
Plainwell, Michigan 48080

CALCULATION COVER SHEET

STS Consultants Ltd.

PROJECT ARCADIA CREEK JOB NO 1069-AJ DIVISION WATER RESOURCES

SUBJECT WESTNEDGE COLLECTOR SYSTEM FILE NO.

CALC NO

ORIGINATOR DEH DATE 4/12/90

CHECKER DATE NO OF SHEETS 20

RECORD OF ISSUES

NO.	DESCRIPTION	BY	DATE	CHKD	DATE	APPRD		
1	SENT OUT FOR REVIEW	DEH	4/12/90					
2	RETURNED							
3								
4								
5								
6								

PRELIMINARY CALC ☐

SUPERSEDED CALC ☐ FINAL CALC ☐

BRIEF SUMMARY OF CALCULATIONS INCLUDING SCOPE AND RESULTS

WESTNEDGE COLLECTOR SYSTEM:

Perform hydraulic analysis for Westnedge Avenue storm sewer. This sewer will channel overland flood flows into the new Arcadia Creek corridor. Flood flow distribution along the westnedge sewer was obtained from and overland flooding analysis which is the subject of a separate computation sheet package.

The system was designed to accomodate the 100-yr flood with minor ponding at inlet grates. The hydraulic analysis begins downstream of Westnedge Avenue at the central spline of the new creek.

by WJW

CALCULATION COVER SHEET

STS Consultants Ltd.

PROJECT ARCADIA CREEK JOB NO. 1069-AJ DIVISION WATER RESOURCES

SUBJECT WESTNEDGE COLLECTOR SYSTEM FILE NO

CALC NO

ORIGINATOR DEH DATE

CHECKER DATE NO OF SHEETS

RECORD OF ISSUES								
NO	DESCRIPTION	BY	DATE	CHKD	DATE	APPRD		
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PRELIMINARY CALC ☐

SUPERSEDED CALC ☐ FINAL CALC ☐

BRIEF SUMMARY OF CALCULATIONS INCLUDING SCOPE AND RESULTS

METHODLOGY:

Hand computations were performed to evaluate the necessary storm sewer size, and auxillary structures for the Westnedge Avenue sewer. The concept plan and profile views are provided on the pages 2 and 3. Follwing is a descrition of the computation methodology and procedure:

1. Evaluate tailwater where Westnedge Ave. sewer discharges to the new creek corridor.
2. Evaluate head loss relationships at all bends, confluences, transitions, etc.
3. Compute friction loss and other losses for various sewer sizes.
4. Select sewer configuration which will accomodate 100-yr discharge.
5. Provide design input to minimize losses.
6. Evaluate catch basin requirements from a hydraulic perspective.

PROJECT: Arcadia Creek
SUBJECT:Design of Westnedge Collector System
DATE:4/11/90

JOB NO.:1069
PAGE:
BY:deh CHK BY:

HYDRAULIC ANALYSIS SUMMARY

REACH DESCRIPTION	Q	SIZE	R	L	Kc	Kexp	Kb	Kp	Kf	Kjunc	Ksum	A	V	HEAD LOSS	ELEVATION
TAILWATER	985	OPEN CHANNEL													780.00
TRANSITION BOX 1	985	22'x7'	2.52	28	0.00	0.50	0.00	0.00	0.03	0.50	1.03	146.0	6.7	0.73	780.73
REACH 1	680	18'X7'	2.36	85	0.00	0.03	0.00	0.00	0.11	0.00	0.14	118.0	5.8	0.07	780.80
COLLECTOR BOX 2	680	19'X6'	2.28	25	0.00	0.00	0.00	0.15	0.03	0.00	0.19	114.0	6.0	0.10	780.91
REACH 2	448	2-8'X4'	1.30	52	0.00	0.03	0.00	0.05	0.15	0.00	0.23	62.20	7.2	0.19	781.10
COLLECTOR 1	448	22'x6'	2.36	8	0.70	0.00	0.00	0.00	0.01	0.00	0.71	132.0	3.4	0.13	781.22
REACH 3	216	8'X4'	1.30	74	0.00	0.26	0.15	0.00	0.22	0.20	0.83	31.10	6.9	0.62	781.85
REACH 4	180	8'X4'	1.30	55	0.00	0.00	0.00	0.00	0.16	0.20	0.36	31.10	5.8	0.19	782.03
REACH 5	144	8'X4'	1.30	33	0.00	0.00	0.00	0.00	0.10	0.20	0.30	31.10	4.6	0.10	782.13
REACH 6	108	8'X4'	1.30	53	0.00	0.00	0.00	0.00	0.16	0.20	0.36	31.10	3.5	0.07	782.20
REACH 8	36	36" DIA.	0.75	135	0.00	0.10	0.30	0.00	0.83	0.00	1.23	7.07	5.1	0.50	782.69
INTAKE 8	36	3'X6'	1.20	1	0.00	1.00	0.00	0.00	0.00	0.00	1.00	7.07	5.1	0.40	783.10
													SUM OF HEAD LOSS=	3.10	

Q= discharge per reach (cfs)
R= hydraulic radius (area/wetted perimeter)
L= reach length (ft.)
Kc= contraction coeficient
Kexp= expansion coeficient
Kp= pier coeficient
Kf= friction coeficient
Kmisc= miscelaneous head loss coeficients
Kjunc= jucntion loss coefiecient
Ksum= sum of K coeficients
A= cross sectional area (ft^2)
V= velocity (fps)
HEAD LOSS= Ksum * V^2/2g (ft.)
ELEVATION= elevation of hydraulic grade line (ft.)

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	0.500	4.00	763.00	762.00	755.00	544.53	759.79	0.00	761.18	18.44	9.44	57.66	126.80
*	0.500	4.00	763.00	762.00	755.00	746.15	760.16	0.00	762.41	28.33	12.02	62.06	140.18
*	0.500	4.00	763.00	762.00	755.00	841.54	760.34	760.34	763.02	33.02	13.13	64.09	146.45
*	0.500	4.00	763.00	762.00	755.00	976.33	760.88	760.88	763.85	34.28	13.83	70.59	166.76
	1.000	50.00	764.20	762.09	755.09	544.53	759.88	0.00	761.27	18.53	9.46	57.56	126.51
	1.000	50.00	764.20	762.09	755.09	746.15	760.53	0.00	762.56	24.73	11.44	65.25	150.04
	1.000	50.00	764.20	762.09	755.09	841.54	761.08	760.43	763.21	24.28	11.71	71.86	170.79
	1.000	50.00	764.20	762.09	755.09	976.33	761.73	0.00	764.06	24.84	12.25	79.70	195.89
	1.250	25.00	765.90	762.14	755.14	544.53	759.93	0.00	761.32	18.59	9.47	57.49	126.30
	1.250	25.00	765.90	762.14	755.14	746.15	760.66	0.00	762.63	23.71	11.26	66.28	153.23
	1.250	25.00	765.90	762.14	755.14	841.54	761.19	0.00	763.28	23.59	11.59	72.64	173.26
	1.250	25.00	765.90	762.14	755.14	976.33	761.81	0.00	764.12	24.56	12.20	80.04	196.99
	2.500	125.00	767.00	762.52	755.38	544.53	760.16	0.00	761.55	18.62	9.48	57.45	126.19
	2.500	125.00	767.00	762.52	755.38	746.15	761.09	0.00	762.93	21.65	10.88	68.55	160.35
	2.500	125.00	767.00	762.52	755.38	841.54	761.60	0.00	763.57	21.86	11.26	74.75	179.98
	2.500	125.00	767.00	762.52	755.38	976.33	762.28	0.00	764.43	22.38	11.77	82.92	206.37
	3.500	100.00	767.00	762.71	755.57	544.53	760.34	0.00	761.74	18.69	9.49	57.37	125.95
	3.500	100.00	767.00	762.71	755.57	746.15	761.34	0.00	763.14	21.13	10.79	69.18	162.32
	3.500	100.00	767.00	762.71	755.57	841.54	761.86	0.00	763.79	21.30	11.15	75.49	182.35
	3.500	100.00	767.00	762.71	755.57	976.33	762.54	0.00	764.66	21.92	11.68	83.59	208.56
	4.300	80.00	767.00	762.86	755.72	544.53	760.49	0.00	761.89	18.77	9.50	57.29	125.69
	4.300	80.00	767.00	762.86	755.72	746.15	761.54	0.00	763.31	20.61	10.69	69.82	164.34
	4.300	80.00	767.00	762.86	755.72	841.54	762.07	0.00	763.96	20.81	11.05	76.15	184.46
	4.300	80.00	767.00	762.86	755.72	976.33	762.76	0.00	764.83	21.31	11.55	84.49	211.51
	4.550	25.00	767.00	762.99	755.99	544.53	760.34	0.00	762.03	24.22	10.43	52.23	110.64
	4.550	25.00	767.00	762.99	755.99	746.15	761.40	0.00	763.45	25.08	11.50	64.91	148.98
	4.550	25.00	767.00	762.99	755.99	841.54	761.94	0.00	764.10	24.76	11.80	71.34	169.12
	4.550	25.00	767.00	762.99	755.99	976.33	762.64	0.00	764.97	24.77	12.24	79.79	196.16
	5.000	45.00	767.00	763.08	756.08	544.53	760.53	0.00	762.14	22.81	10.20	53.37	114.02
	5.000	45.00	767.00	763.08	756.08	746.15	761.61	0.00	763.57	23.64	11.25	66.35	153.46
	5.000	45.00	767.00	763.08	756.08	841.54	762.13	0.00	764.21	23.64	11.59	72.59	173.08
	5.000	45.00	767.00	763.08	756.08	976.33	762.82	0.00	765.08	23.88	12.07	80.91	199.80
	7.500	250.00	768.00	763.55	756.55	544.53	761.24	0.00	762.69	19.70	9.68	56.28	122.67
	7.500	250.00	768.00	763.55	756.55	746.15	762.36	0.00	764.14	20.76	10.72	69.63	163.75
	7.500	250.00	768.00	763.55	756.55	841.54	762.89	0.00	764.79	20.84	11.06	76.12	184.35
*	7.500	250.00	768.00	763.55	756.55	976.33	763.55	762.44	765.65	21.71	11.64	83.90	209.54
	10.000	250.00	769.00	764.03	757.03	544.53	761.73	0.00	763.18	19.74	9.68	56.24	122.56
	10.000	250.00	769.00	764.03	757.03	746.15	762.93	0.00	764.66	19.87	10.54	70.79	167.38
	10.000	250.00	769.00	764.03	757.03	841.54	763.44	0.00	765.31	20.30	10.95	76.87	186.76
	10.000	250.00	769.00	764.03	757.03	976.33	764.24	0.00	766.34	35.98	11.63	83.93	162.77

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*RS	VCH	AREA	.01K
	12.500	250.00	771.25	764.51	757.51	544.53	762.25	0.00	763.67	19.13	9.57	56.88	124.48
	12.500	250.00	771.25	764.51	757.51	746.15	763.45	0.00	765.15	19.53	10.47	71.25	168.84
	12.500	250.00	771.25	764.51	757.51	841.54	763.99	0.00	765.81	19.68	10.82	77.79	189.71
	12.500	250.00	771.25	764.51	757.51	976.33	765.14	0.00	767.24	35.93	11.63	83.97	162.87
	15.000	250.00	772.90	764.98	757.98	544.53	762.73	0.00	764.15	19.14	9.57	56.88	124.46
	15.000	250.00	772.90	764.98	757.98	746.15	763.94	0.00	765.64	19.47	10.46	71.33	169.09
	15.000	250.00	772.90	764.98	757.98	841.54	764.50	0.00	766.30	19.44	10.77	78.15	190.87
	15.000	250.00	772.90	764.98	757.98	976.33	766.03	0.00	768.14	36.04	11.64	83.88	162.64
	17.500	250.00	772.80	765.46	758.46	544.53	763.21	0.00	764.63	19.13	9.57	56.89	124.51
	17.500	250.00	772.80	765.46	758.46	746.15	764.45	0.00	766.12	19.14	10.39	71.79	170.55
	17.500	250.00	772.80	765.46	758.46	841.54	764.99	0.00	766.79	19.44	10.77	78.15	190.87
	17.500	250.00	772.80	765.46	758.46	976.33	766.94	0.00	769.04	35.99	11.63	83.92	162.74
	18.280	78.00	772.80	765.54	758.54	544.53	763.46	0.00	764.80	17.54	9.28	58.69	130.03
	18.280	78.00	772.80	765.54	758.54	746.15	764.67	0.00	766.29	18.28	10.22	73.02	174.54
	18.280	78.00	772.80	765.54	758.54	841.54	765.23	0.00	766.96	18.41	10.55	79.76	196.15
	18.280	78.00	772.80	765.54	758.54	976.33	767.21	0.00	769.33	36.47	11.70	83.47	161.66
	18.400	12.00	772.80	765.59	758.59	544.53	763.47	0.00	764.83	17.96	9.36	58.17	128.47
	18.400	12.00	772.80	765.59	758.59	746.15	764.68	0.00	766.32	18.58	10.28	72.57	173.11
	18.400	12.00	772.80	765.59	758.59	841.54	765.24	0.00	766.99	18.69	10.61	79.29	194.64
	18.400	12.00	772.80	765.59	758.59	976.33	767.25	0.00	769.38	36.47	11.70	83.47	161.66
	18.490	9.40	772.80	765.63	758.63	544.53	763.48	0.00	764.86	18.29	9.42	57.79	127.32
	18.490	9.40	772.80	765.63	758.63	746.15	764.69	0.00	766.34	18.83	10.33	72.20	171.94
	18.490	9.40	772.80	765.63	758.63	841.54	765.25	0.00	767.01	18.92	10.66	78.93	193.47
	18.490	9.40	772.80	765.63	758.63	976.33	767.29	0.00	769.41	36.47	11.70	83.47	161.66
*	18.500	0.01	772.80	765.63	758.63	544.53	763.68	0.00	764.95	16.38	9.05	60.18	134.55
*	18.500	0.01	772.80	765.63	758.63	746.15	764.89	0.00	766.44	17.26	10.00	74.60	179.58
*	18.500	0.01	772.80	765.63	758.63	841.54	765.45	0.00	767.11	17.49	10.35	81.32	201.20
*	18.500	0.01	772.80	765.63	758.63	976.33	767.49	0.00	769.61	36.47	11.70	83.47	161.66
	18.610	12.00	772.80	765.68	758.68	544.53	763.69	0.00	764.98	16.74	9.12	59.69	133.08
	18.610	12.00	772.80	765.68	758.68	746.15	764.90	0.00	766.47	17.55	10.06	74.14	178.10
	18.610	12.00	772.80	765.68	758.68	841.54	765.46	0.00	767.14	17.76	10.41	80.86	199.71
	18.610	12.00	772.80	765.68	758.68	976.33	767.53	0.00	769.65	36.47	11.70	83.47	161.66
	19.000	38.00	772.80	766.84	758.84	544.53	763.72	0.00	765.08	17.96	9.36	58.17	128.47
	19.000	38.00	772.80	766.84	758.84	746.15	764.93	0.00	766.57	18.51	10.27	72.67	173.43
	19.000	38.00	772.80	766.84	758.84	841.54	765.50	0.00	767.24	18.62	10.60	79.41	195.01
	19.000	38.00	772.80	766.84	758.84	976.33	768.29	0.00	769.92	25.01	10.23	95.43	195.22
	19.200	20.00	772.80	766.92	758.92	544.53	763.74	0.00	765.13	18.60	9.48	57.44	126.26
	19.200	20.00	772.80	766.92	758.92	746.15	764.96	0.00	766.62	19.00	10.37	71.96	171.19
	19.200	20.00	772.80	766.92	758.92	841.54	765.52	0.00	767.30	19.06	10.69	78.71	192.77
	19.200	20.00	772.80	766.92	758.92	976.33	768.34	0.00	769.97	25.01	10.23	95.43	195.22

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	19.250	5.00	772.80	766.94	758.94	544.53	763.75	0.00	765.15	18.66	9.49	57.37	126.06
	19.250	5.00	772.80	766.94	758.94	746.15	764.96	0.00	766.64	19.04	10.38	71.90	170.99
	19.250	5.00	772.80	766.94	758.94	841.54	765.53	0.00	767.31	19.10	10.70	78.65	192.57
	19.250	5.00	772.80	766.94	758.94	976.33	768.36	0.00	769.98	25.01	10.23	95.43	195.22
	19.300	5.00	772.80	766.96	758.96	544.53	763.75	0.00	765.16	18.80	9.52	57.21	125.58
	19.300	5.00	772.80	766.96	758.96	746.15	764.97	0.00	766.65	19.15	10.40	71.74	170.50
	19.300	5.00	772.80	766.96	758.96	841.54	765.53	0.00	767.32	19.20	10.72	78.50	192.07
	19.300	5.00	772.80	766.96	758.96	976.33	768.37	0.00	769.99	25.01	10.23	95.43	195.22
	19.350	5.00	772.80	766.98	758.98	544.53	763.76	0.00	765.17	18.96	9.55	57.04	125.05
	19.350	5.00	772.80	766.98	758.98	746.15	764.97	0.00	766.66	19.27	10.42	71.57	169 96
	19.350	5.00	772.80	766.98	758.98	841.54	765.54	0.00	767.33	19.31	10.74	78.33	191.53
	19.350	5.00	772.80	766.98	758.98	976.33	768.38	0.00	770.01	25.01	10.23	95.43	195.22
	19.400	5.00	774.00	767.00	759.00	544.53	763.78	0.00	765.19	18.76	9.50	57.29	125.71
	19.400	5.00	774.00	767.00	759.00	746.15	765.00	0.00	766.68	19.06	10.38	71.91	170.92
	19.400	5.00	774.00	767.00	759.00	841.54	765.57	0.00	767.35	19.05	10.69	78.75	192.83
	19.400	5.00	774.00	767.00	759.00	976.33	768.41	0.00	770.02	24.69	10.18	95.92	196.51
	20.000	60.00	771.50	767.25	759.25	544.53	763.84	0.00	765.36	20.93	9.89	55.06	119.02
	20.000	60.00	771.50	767.25	759.25	746.15	765.07	0.00	766.85	20.68	10.70	69.73	164.06
	20.000	60.00	771.50	767.25	759.25	841.54	765.64	0.00	767.52	20.49	10.99	76.61	185.92
	20.000	60.00	771.50	767.25	759.25	976.33	768.56	0.00	770.17	24.69	10.18	95.92	196.51
*	22.500	250.00	771.50	768.29	760.29	544.53	764.28	764.28	766.29	30.87	11.38	47.87	98.00
	22.500	250.00	771.50	768.29	760.29	746.15	765.43	0.00	767.70	28.85	12.10	61.64	138.91
	22.500	250.00	771.50	768.29	760.29	841.54	766.00	0.00	768.34	27.62	12.29	68.48	160.12
	22.500	250.00	771.50	768.29	760.29	976.33	769.18	0.00	770.79	24.69	10.18	95.92	196.51
*	22.510	0.01	771.50	768.29	760.29	544.53	764.33	764.28	766.29	29.82	11.23	48.47	99.72
*	22.510	0.01	771.50	768.29	760.29	746.15	765.49	0.00	767.71	27.97	11.97	62.35	141.09
*	22.510	0.01	771.50	768.29	760.29	841.54	766.07	0.00	768.36	26.74	12.14	69.31	162.73
*	22.510	0.01	771.50	768.29	760.29	976.33	769.26	0.00	770.87	24.69	10.18	95.92	196.51
*	22.700	20.00	771.50	768.38	760.38	544.53	764.37	764.37	766.38	30.88	11.38	47.87	98.00
	22.700	20.00	771.50	768.38	760.38	746.15	765.52	0.00	767.79	28.85	12.10	61.65	138.93
	22.700	20.00	771.50	768.38	760.38	841.54	766.10	0.00	768.44	27.50	12.27	68.59	160.48
	22.700	20.00	771.50	768.38	760.38	976.33	769.31	0.00	770.92	24.69	10.18	95.92	196.51
*	23.000	30.00	771.50	768.50	760.50	544.53	764.49	764.49	766.50	30.88	11.38	47.87	98.00
	23.000	30.00	771.50	768.50	760.50	746.15	765.58	0.00	767.91	29.77	12.25	60.93	136.75
	23.000	30.00	771.50	768.50	760.50	841.54	766.16	0.00	768.55	28.32	12.40	67.85	158.14
	23.000	30.00	771.50	768.50	760.50	976.33	769.38	0.00	770.99	24.69	10.18	95.92	196.51
*	23.100	0.01	771.50	768.50	760.50	544.53	764.56	764.49	766.50	29.41	11.18	48.71	100.41
*	23.100	0.01	771.50	768.50	760.50	746.15	765.66	0.00	767.92	28.52	12.05	61.90	139.72
*	23.100	0.01	771.50	768.50	760.50	841.54	766.25	0.00	768.56	27.14	12.21	68.93	161.55
*	23.100	0.01	771.50	768.50	760.50	976.33	769.48	0.00	771.09	24.69	10.18	95.92	196.51

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	23.500	50.00	771.50	768.71	760.71	544.53	764.70	764.70	766.71	30.88	11.38	47.87	98.00
	23.500	50.00	771.50	768.71	760.71	746.15	765.76	0.00	768.12	30.30	12.32	60.54	135.56
	23.500	50.00	771.50	768.71	760.71	841.54	766.34	0.00	768.75	28.70	12.47	67.51	157.08
	23.500	50.00	771.50	768.71	760.71	976.33	769.61	0.00	771.22	24.69	10.18	95.92	196.51
*	23.520	2.00	771.10	769.00	760.70	544.53	766.37	0.00	767.10	7.82	6.85	79.47	194.70
*	23.520	2.00	771.10	769.00	760.70	746.15	767.64	0.00	768.55	8.49	7.67	97.34	256.12
*	23.520	2.00	771.10	769.00	760.70	841.54	768.18	0.00	769.18	8.84	8.02	104.93	283.01
	23.520	2.00	771.10	769.00	760.70	976.33	770.28	0.00	771.37	14.99	8.39	116.44	252.14
*	23.620	10.00	771.50	769.00	760.70	620.00	766.80	0.00	767.20	3.34	5.08	122.09	339.35
*	23.620	10.00	771.50	769.00	760.70	890.00	768.10	0.00	768.66	4.00	6.01	148.15	444.80
*	23.620	10.00	771.50	769.00	760.70	1020.00	768.65	0.00	769.29	4.32	6.41	159.18	491.02
*	23.620	10.00	771.50	769.00	760.70	1315.00	770.45	0.00	771.42	11.45	7.93	165.92	388.57
*	23.630	0.10	771.50	769.00	760.70	620.00	767.05	0.00	767.42	2.99	4.88	126.98	358.67
*	23.630	0.10	771.50	769.00	760.70	890.00	768.35	0.00	768.88	3.66	5.82	153.03	465.13
*	23.630	0.10	771.50	769.00	760.70	1020.00	768.90	0.00	769.50	3.97	6.22	164.05	511.71
*	23.630	0.10	771.50	769.00	760.70	1315.00	770.70	0.00	771.67	11.45	7.93	165.92	388.57
	23.770	15.00	771.20	769.00	760.74	620.00	767.05	0.00	767.43	3.03	4.91	126.29	355.92
	23.770	15.00	771.20	769.00	760.74	890.00	768.36	0.00	768.89	3.71	5.84	152.35	462.30
	23.770	15.00	771.20	769.00	760.74	1020.00	768.91	0.00	769.51	4.02	6.24	163.38	508.86
	23.770	15.00	771.20	769.00	760.74	1315.00	770.71	0.00	771.69	11.59	7.96	165.21	386.25
*	23.930	16.00	771.50	768.80	760.77	540.00	766.82	0.00	767.68	9.76	7.45	72.50	172.82
*	23.930	16.00	771.50	768.80	760.77	720.00	768.11	0.00	769.15	10.42	8.18	88.03	223.09
*	23.930	16.00	771.50	768.80	760.77	830.00	768.62	0.00	769.82	11.65	8.82	94.07	243.13
*	23.930	16.00	771.50	768.80	760.77	950.00	770.47	0.00	771.98	23.16	9.87	96.23	197.40
	24.000	7.00	771.50	768.82	760.79	540.00	766.82	0.00	767.69	9.79	7.46	72.43	172.58
	24.000	7.00	771.50	768.82	760.79	720.00	768.12	0.00	769.16	10.42	8.18	88.01	223.04
	24.000	7.00	771.50	768.82	760.79	830.00	768.62	0.00	769.83	11.65	8.82	94.07	243.13
	24.000	7.00	771.50	768.82	760.79	950.00	770.49	0.00	772.00	23.16	9.87	96.23	197.40
*	24.100	0.01	771.50	768.82	760.79	540.00	766.86	0.00	767.72	9.65	7.41	72.83	173.87
*	24.100	0.01	771.50	768.82	760.79	720.00	768.16	0.00	769.19	10.31	8.15	88.37	224.23
*	24.100	0.01	771.50	768.82	760.79	830.00	768.66	0.00	769.86	11.54	8.79	94.45	244.37
*	24.100	0.01	771.50	768.82	760.79	950.00	770.53	0.00	772.04	23.16	9.87	96.23	197.40
	25.000	100.00	771.50	769.06	761.04	540.00	766.94	0.00	767.84	10.40	7.63	70.81	167.44
	25.000	100.00	771.50	769.06	761.04	720.00	768.24	0.00	769.32	10.92	8.33	86.43	217.84
	25.000	100.00	771.50	769.06	761.04	830.00	768.76	0.00	770.00	12.12	8.96	92.65	238.38
	25.000	100.00	771.50	769.06	761.04	950.00	770.76	0.00	772.27	23.16	9.87	96.23	197.40
	27.500	250.00	773.00	769.62	761.65	540.00	767.16	0.00	768.19	12.49	8.17	66.13	152.79
	27.500	250.00	773.00	769.62	761.65	720.00	768.47	0.00	769.67	12.57	8.79	81.91	203.06
	27.500	250.00	773.00	769.62	761.65	830.00	769.02	0.00	770.39	13.66	9.38	88.48	224.59
	27.500	250.00	773.00	769.62	761.65	950.00	771.33	0.00	772.86	23.59	9.94	95.61	195.61

[AC7.HEC2]

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	0.000	544.53	757.50	0.00	0.00	0.00	20.01	0.00
	0.000	746.15	757.50	0.00	0.00	0.00	20.01	0.00
	0.000	841.54	757.50	0.00	0.00	0.00	20.01	0.00
	0.000	976.33	757.50	0.00	0.00	0.00	20.01	0.00
*	0.100	544.53	757.50	0.00	0.00	0.00	20.01	9.00
*	0.100	746.15	757.50	0.00	0.00	0.00	20.01	9.00
*	0.100	841.54	757.50	0.00	0.00	0.00	20.01	9.00
*	0.100	976.33	757.50	0.00	0.00	0.00	20.01	9.00
	0.170	544.53	757.50	0.00	0.00	0.00	20.01	8.00
	0.170	746.15	757.50	0.00	0.00	0.00	20.01	8.00
	0.170	841.54	757.51	0.00	0.00	0.00	20.01	8.00
	0.170	976.33	757.51	0.00	0.00	0.00	20.01	8.00
*	0.180	544.53	757.47	0.00	-0.04	0.00	20.07	1.00
*	0.180	746.15	757.43	-0.03	-0.07	0.00	20.07	1.00
*	0.180	841.54	757.41	-0.02	-0.09	0.00	20.07	1.00
*	0.180	976.33	757.38	-0.03	-0.13	0.00	20.07	1.00
*	0.330	544.53	759.32	0.00	1.85	0.00	20.06	14.00
*	0.330	746.15	759.98	0.66	2.54	0.00	20.06	14.00
*	0.330	841.54	760.29	0.31	2.87	0.00	20.06	14.00
*	0.330	976.33	760.66	0.38	3.28	0.00	20.06	14.00
*	0.340	544.53	760.48	0.00	1.17	0.00	20.01	1.00
*	0.340	746.15	761.34	0.86	1.37	0.00	20.01	1.00
*	0.340	841.54	761.71	0.37	1.43	0.00	20.01	1.00
*	0.340	976.33	762.22	0.51	1.56	0.00	20.01	1.00
	0.380	544.53	760.41	0.00	-0.07	0.00	18.01	4.00
	0.380	746.15	761.24	0.83	-0.10	0.00	18.01	4.00
	0.380	841.54	761.60	0.36	-0.12	0.00	18.01	4.00
	0.380	976.33	762.08	0.48	-0.14	0.00	18.01	4.00
	0.420	544.53	760.31	0.00	-0.10	0.00	16.01	4.00
	0.420	746.15	761.09	0.78	-0.16	0.00	16.01	4.00
	0.420	841.54	761.42	0.33	-0.18	0.00	16.01	4.00
	0.420	976.33	761.86	0.45	-0.22	0.00	16.01	4.00
	0.460	544.53	760.14	0.00	-0.17	0.00	14.01	4.00
	0.460	746.15	760.82	0.68	-0.27	0.00	14.01	4.00
	0.460	841.54	761.10	0.28	-0.32	0.00	14.01	4.00
	0.460	976.33	761.47	0.37	-0.40	0.00	14.01	4.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	0.500	544.53	759.79	0.00	-0.34	0.00	12.01	4.00
*	0.500	746.15	760.16	0.37	-0.65	0.00	12.01	4.00
*	0.500	841.54	760.34	0.17	-0.76	0.00	12.01	4.00
*	0.500	976.33	760.88	0.54	-0.59	0.00	12.01	4.00
	1.000	544.53	759.88	0.00	0.09	0.00	12.01	50.00
	1.000	746.15	760.53	0.65	0.37	0.00	12.01	50.00
	1.000	841.54	761.08	0.55	0.74	0.00	12.01	50.00
	1.000	976.33	761.73	0.65	0.85	0.00	12.01	50.00
	1.250	544.53	759.93	0.00	0.04	0.00	12.01	25.00
	1.250	746.15	760.66	0.73	0.13	0.00	12.01	25.00
	1.250	841.54	761.19	0.53	0.11	0.00	12.01	25.00
	1.250	976.33	761.81	0.62	0.08	0.00	12.01	25.00
	2.500	544.53	760.16	0.00	0.23	0.00	12.01	125.00
	2.500	746.15	761.09	0.93	0.42	0.00	12.01	125.00
	2.500	841.54	761.60	0.52	0.41	0.00	12.01	125.00
	2.500	976.33	762.28	0.68	0.47	0.00	12.01	125.00
	3.500	544.53	760.34	0.00	0.18	0.00	12.01	100.00
	3.500	746.15	761.34	0.99	0.25	0.00	12.01	100.00
	3.500	841.54	761.86	0.52	0.26	0.00	12.01	100.00
	3.500	976.33	762.54	0.68	0.26	0.00	12.01	100.00
	4.300	544.53	760.49	0.00	0.15	0.00	12.01	80.00
	4.300	746.15	761.54	1.05	0.20	0.00	12.01	80.00
	4.300	841.54	762.07	0.53	0.20	0.00	12.01	80.00
	4.300	976.33	762.76	0.69	0.22	0.00	12.01	80.00
	4.550	544.53	760.34	0.00	-0.15	0.00	12.00	25.00
	4.550	746.15	761.40	1.06	-0.14	0.00	12.00	25.00
	4.550	841.54	761.94	0.54	-0.13	0.00	12.00	25.00
	4.550	976.33	762.64	0.70	-0.12	0.00	12.00	25.00
	5.000	544.53	760.53	0.00	0.18	0.00	12.00	45.00
	5.000	746.15	761.61	1.08	-0.21	0.00	12.00	45.00
	5.000	841.54	762.13	0.52	0.19	0.00	12.00	45.00
	5.000	976.33	762.82	0.69	0.18	0.00	12.00	45.00
	7.500	544.53	761.24	0.00	0.71	0.00	12.00	250.00
	7.500	746.15	762.36	1.12	0.75	0.00	12.00	250.00
	7.500	841.54	762.89	0.53	0.76	0.00	12.00	250.00
*	7.500	976.33	763.55	0.66	-0.73	0.00	12.00	250.00
	10.000	544.53	761.73	0.00	0.49	0.00	12.00	250.00
	10.000	746.15	762.93	1.20	0.57	0.00	12.00	250.00
	10.000	841.54	763.44	0.51	0.55	0.00	12.00	250.00
	10.000	976.33	764.24	0.79	0.69	0.00	12.00	250.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	12.500	544.53	762.25	0.00	0.52	0.00	12.00	250.00
	12.500	746.15	763.45	1.20	0.52	0.00	12.00	250.00
	12.500	841.54	763.99	0.54	0.55	0.00	12.00	250.00
	12.500	976.33	765.14	1.15	0.90	0.00	12.00	250.00
	15.000	544.53	762.73	0.00	0.48	0.00	12.00	250.00
	15.000	746.15	763.94	1.21	0.49	0.00	12.00	250.00
	15.000	841.54	764.50	0.56	0.51	0.00	12.00	250.00
	15.000	976.33	766.03	1.54	0.90	0.00	12.00	250.00
	17.500	544.53	763.21	0.00	0.48	0.00	12.00	250.00
	17.500	746.15	764.45	1.24	0.51	0.00	12.00	250.00
	17.500	841.54	764.99	0.54	0.49	0.00	12.00	250.00
	17.500	976.33	766.94	1.95	0.90	0.00	12.00	250.00
	18.280	544.53	763.46	0.00	0.25	0.00	11.94	78.00
	18.280	746.15	764.67	1.20	0.22	0.00	11.95	78.00
	18.280	841.54	765.23	0.56	0.24	0.00	11.95	78.00
	18.280	976.33	767.21	1.98	0.27	0.00	11.97	78.00
	18.400	544.53	763.47	0.00	0.01	0.00	11.94	12.00
	18.400	746.15	764.68	1.21	0.01	0.00	11.95	12.00
	18.400	841.54	765.24	0.56	0.01	0.00	11.95	12.00
	18.400	976.33	767.25	2.01	0.04	0.00	11.97	12.00
	18.490	544.53	763.48	0.00	0.01	0.00	11.94	9.40
	18.490	746.15	764.69	1.21	0.01	0.00	11.95	9.40
	18.490	841.54	765.25	0.56	0.01	0.00	11.95	9.40
	18.490	976.33	767.29	2.04	0.03	0.00	11.97	9.40
*	18.500	544.53	763.68	0.00	0.20	0.00	11.94	0.01
*	18.500	746.15	764.89	1.21	0.20	0.00	11.95	0.01
*	18.500	841.54	765.45	0.56	0.20	0.00	11.95	0.01
*	18.500	976.33	767.49	2.04	0.20	0.00	11.97	0.01
	18.610	544.53	763.69	0.00	0.01	0.00	11.94	12.00
	18.610	746.15	764.90	1.21	0.01	0.00	11.95	12.00
	18.610	841.54	765.46	0.56	0.01	0.00	11.95	12.00
	18.610	976.33	767.53	2.07	0.04	0.00	11.97	12.00
	19.000	544.53	763.72	0.00	0.03	0.00	11.94	38.00
	19.000	746.15	764.93	1.21	0.04	0.00	11.95	38.00
	19.000	841.54	765.50	0.56	0.04	0.00	11.95	38.00
	19.000	976.33	768.29	2.79	0.76	0.00	11.97	38.00
	19.200	544.53	763.74	0.00	0.02	0.00	11.94	20.00
	19.200	746.15	764.96	1.22	0.02	0.00	11.95	20.00
	19.200	841.54	765.52	0.56	0.02	0.00	11.95	20.00
	19.200	976.33	768.34	2.82	0.05	0.00	11.97	20.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	19.250	544.53	763.75	0.00	0.01	0.00	11.94	5.00
	19.250	746.15	764.96	1.22	0.01	0.00	11.95	5.00
	19.250	841.54	765.53	0.57	0.01	0.00	11.95	5.00
	19.250	976.33	768.36	2.83	0.01	0.00	11.97	5.00
	19.300	544.53	763.75	0.00	0.01	0.00	11.94	5.00
	19.300	746.15	764.97	1.22	0.01	0.00	11.95	5.00
	19.300	841.54	765.53	0.57	0.01	0.00	11.95	5.00
	19.300	976.33	768.37	2.83	0.01	0.00	11.97	5.00
	19.350	544.53	763.76	0.00	0.01	0.00	11.94	5.00
	19.350	746.15	764.97	1.22	0.01	0.00	11.95	5.00
	19.350	841.54	765.54	0.57	0.01	0.00	11.95	5.00
	19.350	976.33	768.38	2.84	0.01	0.00	11.97	5.00
	19.400	544.53	763.78	0.00	0.03	0.00	12.00	5.00
	19.400	746.15	765.00	1.22	0.03	0.00	12.00	5.00
	19.400	841.54	765.57	0.57	0.03	0.00	12.00	5.00
	19.400	976.33	768.41	2.84	0.03	0.00	12.00	5.00
	20.000	544.53	763.84	0.00	0.06	0.00	12.00	60.00
	20.000	746.15	765.07	1.23	0.07	0.00	12.00	60.00
	20.000	841.54	765.64	0.57	0.07	0.00	12.00	60.00
	20.000	976.33	768.56	2.92	0.15	0.00	12.00	60.00
*	22.500	544.53	764.28	0.00	0.44	0.00	12.00	250.00
	22.500	746.15	765.43	1.15	0.36	0.00	12.00	250.00
	22.500	841.54	766.00	0.57	0.36	0.00	12.00	250.00
	22.500	976.33	769.18	3.18	0.62	0.00	12.00	250.00
*	22.510	544.53	764.33	0.00	0.05	0.00	12.00	0.01
*	22.510	746.15	765.49	1.16	0.06	0.00	12.00	0.01
*	22.510	841.54	766.07	0.58	0.07	0.00	12.00	0.01
*	22.510	976.33	769.26	3.19	0.08	0.00	12.00	0.01
*	22.700	544.53	764.37	0.00	0.04	0.00	12.00	20.00
	22.700	746.15	765.52	1.15	0.03	0.00	12.00	20.00
	22.700	841.54	766.10	0.58	0.03	0.00	12.00	20.00
	22.700	976.33	769.31	3.21	0.05	0.00	12.01	20.00
*	23.000	544.53	764.49	0.00	0.12	0.00	12.00	30.00
	23.000	746.15	765.58	1.09	0.06	0.00	12.00	30.00
	23.000	841.54	766.16	0.58	0.06	0.00	12.00	30.00
	23.000	976.33	769.38	3.23	0.07	0.00	12.01	30.00
*	23.100	544.53	764.56	0.00	0.07	0.00	12.00	0.01
*	23.100	746.15	765.66	1.10	0.08	0.00	12.00	0.01
*	23.100	841.54	766.25	0.59	0.09	0.00	12.00	0.01
*	23.100	976.33	769.48	3.24	0.10	0.00	12.01	0.01

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	23.500	544.53	764.70	0.00	0.14	0.00	12.00	50.00
	23.500	746.15	765.76	1.06	0.10	0.00	12.00	50.00
	23.500	841.54	766.34	0.58	0.09	0.00	12.00	50.00
	23.500	976.33	769.61	3.27	0.12	0.00	12.01	50.00
*	23.520	544.53	766.37	0.00	1.67	0.00	14.05	2.00
*	23.520	746.15	767.64	1.27	1.88	0.00	14.06	2.00
*	23.520	841.54	768.18	0.54	1.84	0.00	14.07	2.00
	23.520	976.33	770.28	2.10	0.68	0.00	14.09	2.00
*	23.620	620.00	766.80	0.00	0.43	0.00	20.00	10.00
*	23.620	890.00	768.10	1.30	0.46	0.00	20.00	10.00
*	23.620	1020.00	768.65	0.55	0.48	0.00	20.00	10.00
*	23.620	1315.00	770.45	1.79	0.16	0.00	20.01	10.00
*	23.630	620.00	767.05	0.00	0.25	0.00	20.00	0.10
*	23.630	890.00	768.35	1.30	0.25	0.00	20.00	0.10
*	23.630	1020.00	768.90	0.55	0.25	0.00	20.01	0.10
*	23.630	1315.00	770.70	1.79	0.25	0.00	20.01	0.10
	23.770	620.00	767.05	0.00	0.00	0.00	20.00	15.00
	23.770	890.00	768.36	1.30	0.00	0.00	20.00	15.00
	23.770	1020.00	768.91	0.55	0.00	0.00	20.01	15.00
	23.770	1315.00	770.71	1.80	0.01	0.00	20.01	15.00
*	23.930	540.00	766.82	0.00	-0.24	0.00	12.00	16.00
*	23.930	720.00	768.11	1.29	-0.25	0.00	12.00	16.00
*	23.930	830.00	768.62	0.51	-0.29	0.00	12.00	16.00
*	23.930	950.00	770.47	1.85	-0.24	0.00	12.01	16.00
	24.000	540.00	766.82	0.00	0.01	0.00	12.00	7.00
	24.000	720.00	768.12	1.29	0.01	0.00	12.00	7.00
	24.000	830.00	768.62	0.51	0.01	0.00	12.00	7.00
	24.000	950.00	770.49	1.86	0.02	0.00	12.01	7.00
*	24.100	540.00	766.86	0.00	0.04	0.00	12.00	0.01
*	24.100	720.00	768.16	1.29	0.04	0.00	12.00	0.01
*	24.100	830.00	768.66	0.51	0.04	0.00	12.00	0.01
*	24.100	950.00	770.53	1.86	0.04	0.00	12.01	0.01
	25.000	540.00	766.94	0.00	0.08	0.00	12.00	100.00
	25.000	720.00	768.24	1.30	0.08	0.00	12.00	100.00
	25.000	830.00	768.76	0.52	0.09	0.00	12.00	100.00
	25.000	950.00	770.76	2.00	0.23	0.00	12.01	100.00
	27.500	540.00	767.16	0.00	0.22	0.00	12.00	250.00
	27.500	720.00	768.47	1.31	0.23	0.00	12.00	250.00
	27.500	830.00	769.02	0.55	0.26	0.00	12.00	250.00
	27.500	950.00	771.33	2.31	0.57	0.00	12.01	250.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	28.560	540.00	767.26	0.00	0.11	0.00	12.00	106.00
	28.560	720.00	768.58	1.32	0.11	0.00	12.00	106.00
	28.560	830.00	769.14	0.56	0.12	0.00	12.00	106.00
	28.560	950.00	771.60	2.46	0.27	0.00	12.01	106.00
	28.570	540.00	767.26	0.00	0.00	0.00	12.00	1.00
	28.570	720.00	768.58	1.32	0.00	0.00	12.00	1.00
	28.570	830.00	769.14	0.56	0.00	0.00	12.00	1.00
*	28.570	950.00	772.43	3.29	0.83	0.00	12.01	1.00
*	28.650	540.00	768.56	0.00	1.29	0.00	32.12	8.00
*	28.650	720.00	770.06	1.50	1.48	0.00	32.15	8.00
*	28.650	830.00	770.82	0.76	1.67	0.00	32.16	8.00
*	28.650	950.00	773.44	2.62	1.01	0.00	32.20	8.00
	28.660	540.00	768.61	0.00	0.05	0.00	32.00	1.00
	28.660	720.00	770.06	1.45	0.00	0.00	32.00	1.00
	28.660	830.00	770.82	0.76	0.00	0.00	32.00	1.00
	28.660	950.00	773.44	2.62	0.00	0.00	32.01	1.00
*	28.990	615.00	768.66	0.00	0.06	0.00	66.16	33.00
*	28.990	885.00	770.12	1.46	0.07	0.00	76.60	33.00
	28.990	1015.00	770.89	0.77	0.08	0.00	82.09	33.00
	28.990	1310.00	773.50	2.61	0.06	0.00	169.16	33.00
*	29.310	615.00	768.71	0.00	0.04	0.00	101.77	32.00
*	29.310	885.00	770.17	1.47	0.05	0.00	112.37	32.00
*	29.310	1015.00	770.94	0.77	0.05	0.00	117.93	32.00
*	29.310	1310.00	773.53	2.59	0.03	0.00	136.64	32.00
*	30.130	615.00	768.66	0.00	-0.05	0.00	72.88	82.00
*	30.130	885.00	770.13	1.47	-0.05	0.00	90.06	82.00
*	30.130	1015.00	770.90	0.77	-0.05	0.00	99.12	82.00
*	30.130	1310.00	773.51	2.61	-0.03	0.00	129.70	82.00
	30.630	615.00	768.67	0.00	0.02	0.00	72.96	50.00
	30.630	885.00	770.14	1.46	0.01	0.00	90.14	50.00
	30.630	1015.00	770.91	0.77	0.01	0.00	99.18	50.00
	30.630	1310.00	773.51	2.60	0.01	0.00	129.70	50.00
*	31.670	615.00	768.68	0.00	0.00	0.00	50.00	104.00
*	31.670	885.00	770.13	1.45	-0.01	0.00	50.00	104.00
*	31.670	1015.00	770.89	0.76	-0.02	0.00	50.00	104.00
*	31.670	1310.00	773.48	2.59	-0.04	0.00	50.01	104.00
	31.770	615.00	768.30	0.00	-0.37	0.00	24.99	10.00
	31.770	885.00	769.78	1.47	-0.35	0.00	24.99	10.00
	31.770	1015.00	770.55	0.78	-0.34	0.00	25.00	10.00
	31.770	1310.00	773.23	2.68	-0.25	0.00	25.01	10.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	32.060	615.00	768.27	0.00	-0.03	0.00	19.99	9.00
*	32.060	885.00	769.37	1.09	-0.41	0.00	19.99	9.00
*	32.060	1015.00	770.21	0.84	-0.35	0.00	19.99	9.00
	32.060	1310.00	773.02	2.81	-0.21	0.00	20.00	9.00
	32.070	615.00	768.28	0.00	0.01	0.00	19.99	1.00
	32.070	885.00	769.37	1.09	0.00	0.00	19.99	1.00
	32.070	1015.00	770.20	0.84	0.00	0.00	19.99	1.00
	32.070	1310.00	772.98	2.78	-0.03	0.00	20.00	1.00
*	33.150	615.00	768.60	0.00	0.32	0.00	19.99	108.00
	33.150	885.00	769.52	0.91	0.15	0.00	19.99	108.00
	33.150	1015.00	770.30	0.79	0.10	0.00	19.99	108.00
	33.150	1310.00	773.09	2.79	0.11	0.00	20.00	108.00
	33.160	615.00	768.62	0.00	0.01	0.00	19.99	1.00
	33.160	885.00	769.52	0.90	0.00	0.00	19.99	1.00
	33.160	1015.00	770.31	0.79	0.00	0.00	19.99	1.00
	33.160	1310.00	773.13	2.83	0.04	0.00	20.00	1.00
*	33.260	615.00	768.64	0.00	0.02	0.00	19.99	10.00
	33.260	885.00	769.54	0.90	0.02	0.00	19.99	10.00
	33.260	1015.00	770.32	0.78	0.01	0.00	19.99	10.00
	33.260	1310.00	773.14	2.82	0.00	0.00	20.00	10.00
*	33.270	615.00	771.89	0.00	3.25	0.00	20.00	1.00
*	33.270	885.00	772.89	1.00	3.35	0.00	20.00	1.00
*	33.270	1015.00	773.33	0.44	3.01	0.00	20.00	1.00
	33.270	1310.00	774.25	0.92	1.11	0.00	20.01	1.00
	33.740	615.00	771.89	0.00	0.01	0.00	20.00	48.00
	33.740	885.00	772.90	1.00	0.01	0.00	20.00	48.00
	33.740	1015.00	773.34	0.44	0.01	0.00	20.00	48.00
	33.740	1310.00	774.26	0.92	0.01	0.00	20.01	48.00
	33.750	615.00	771.89	0.00	0.00	0.00	20.00	1.00
	33.750	885.00	772.90	1.00	0.00	0.00	20.00	1.00
	33.750	1015.00	773.34	0.44	0.00	0.00	20.00	1.00
*	33.750	1310.00	774.17	0.83	-0.09	0.00	20.01	1.00
	34.710	610.00	771.91	0.00	0.02	0.00	20.00	96.00
	34.710	880.00	772.92	1.01	0.02	0.00	20.00	96.00
	34.710	1005.00	773.37	0.45	0.03	0.00	20.00	96.00
	34.710	1300.00	774.32	0.95	0.15	0.00	20.01	96.00
	34.720	610.00	771.91	0.00	0.00	0.00	20.00	1.00
	34.720	880.00	772.92	1.01	0.00	0.00	20.00	1.00
	34.720	1005.00	773.37	0.45	0.00	0.00	20.00	1.00
*	34.720	1300.00	774.56	1.19	0.24	0.00	20.01	1.00

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	28.560	106.00	773.50	769.93	761.91	540.00	767.26	0.00	768.36	13.49	8.40	64.27	147.01
	28.560	106.00	773.50	769.93	761.91	720.00	768.58	0.00	769.84	13.34	8.99	80.08	197.13
	28.560	106.00	773.50	769.93	761.91	830.00	769.14	0.00	770.56	14.35	9.56	86.80	219.07
	28.560	106.00	773.50	769.93	761.91	950.00	771.60	0.00	773.12	23.18	9.87	96.21	197.33
	28.570	1.00	0.00	0.00	761.91	540.00	767.26	0.00	768.36	13.50	8.40	64.26	146.99
	28.570	1.00	0.00	0.00	761.91	720.00	768.58	0.00	769.84	13.34	8.99	80.07	197.11
	28.570	1.00	0.00	0.00	761.91	830.00	769.14	0.00	770.56	14.36	9.56	86.80	219.05
*	28.570	1.00	0.00	0.00	761.91	950.00	772.43	0.00	773.31	7.24	7.52	126.29	352.05
*	28.650	8.00	0.00	0.00	762.00	540.00	768.56	0.00	768.66	0.65	2.57	210.25	670.57
*	28.650	8.00	0.00	0.00	762.00	720.00	770.06	0.00	770.18	0.63	2.79	258.47	906.26
*	28.650	8.00	0.00	0.00	762.00	830.00	770.82	0.00	770.95	0.65	2.93	282.81	1031.39
*	28.650	8.00	0.00	0.00	762.00	950.00	773.44	0.00	773.54	0.41	2.59	367.29	1491.04
	28.660	1.00	765.00	762.00	762.00	540.00	768.61	0.00	768.71	0.64	2.55	211.36	675.60
	28.660	1.00	765.00	762.00	762.00	720.00	770.06	0.00	770.18	0.64	2.79	257.84	902.69
	28.660	1.00	765.00	762.00	762.00	830.00	770.82	0.00	770.95	0.65	2.94	282.06	1026.97
	28.660	1.00	765.00	762.00	762.00	950.00	773.44	0.00	773.54	0.41	2.60	366.01	1482.77
*	28.990	33.00	0.00	0.00	760.00	615.00	768.66	0.00	768.72	1.88	1.86	344.45	448.65
*	28.990	33.00	0.00	0.00	760.00	885.00	770.12	0.00	770.19	1.98	2.09	448.68	628.94
	28.990	33.00	0.00	0.00	760.00	1015.00	770.89	0.00	770.96	1.88	2.13	509.76	740.02
	28.990	33.00	0.00	0.00	760.00	1310.00	773.50	0.00	773.55	1.04	1.88	800.39	1282.66
*	29.310	32.00	0.00	0.00	760.00	615.00	768.71	0.00	768.72	0.35	0.99	652.62	1033.68
*	29.310	32.00	0.00	0.00	760.00	885.00	770.17	0.00	770.20	0.40	1.18	809.82	1397.25
*	29.310	32.00	0.00	0.00	760.00	1015.00	770.94	0.00	770.97	0.40	1.24	898.42	1611.13
*	29.310	32.00	0.00	0.00	760.00	1310.00	773.53	0.00	773.56	0.28	1.22	1228.07	2454.89
*	30.130	82.00	0.00	0.00	760.00	615.00	768.66	0.00	768.75	3.04	2.57	288.23	352.83
*	30.130	82.00	0.00	0.00	760.00	885.00	770.13	0.00	770.23	2.77	2.79	407.68	531.30
*	30.130	82.00	0.00	0.00	760.00	1015.00	770.90	0.00	771.00	2.47	2.79	480.81	646.22
*	30.130	82.00	0.00	0.00	760.00	1310.00	773.51	0.00	773.57	1.29	2.38	779.43	1154.71
	30.630	50.00	0.00	0.00	760.00	615.00	768.67	0.00	768.77	3.02	2.57	288.77	353.61
	30.630	50.00	0.00	0.00	760.00	885.00	770.14	0.00	770.24	2.76	2.79	408.28	532.23
	30.630	50.00	0.00	0.00	760.00	1015.00	770.91	0.00	771.01	2.46	2.79	481.39	647.15
	30.630	50.00	0.00	0.00	760.00	1310.00	773.51	0.00	773.58	1.29	2.38	779.42	1154.70
*	31.670	104.00	0.00	0.00	765.00	615.00	768.68	0.00	768.85	13.15	3.35	183.78	169.63
*	31.670	104.00	0.00	0.00	765.00	885.00	770.13	0.00	770.31	9.57	3.45	256.50	286.07
*	31.670	104.00	0.00	0.00	765.00	1015.00	770.89	0.00	771.08	8.20	3.44	294.67	354.51
*	31.670	104.00	0.00	0.00	765.00	1310.00	773.48	0.00	773.63	4.52	3.09	423.94	616.11
	31.770	10.00	0.00	0.00	765.00	615.00	768.30	0.00	769.25	13.27	7.81	78.71	168.80
	31.770	10.00	0.00	0.00	765.00	885.00	769.78	0.00	770.69	8.67	7.67	115.41	300.53
	31.770	10.00	0.00	0.00	765.00	1015.00	770.55	0.00	771.43	7.22	7.53	134.83	377.87
	31.770	10.00	0.00	0.00	765.00	1310.00	773.23	0.00	773.88	3.79	6.50	201.69	672.68

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	32.060	9.00	0.00	0.00	765.00	615.00	768.27	768.27	769.83	23.87	10.02	61.39	125.87
*	32.060	9.00	0.00	0.00	765.00	885.00	769.37	0.00	771.12	19.96	10.63	83.28	198.09
*	32.060	9.00	0.00	0.00	765.00	1015.00	770.21	0.00	771.80	15.35	10.13	100.16	259.04
	32.060	9.00	0.00	0.00	765.00	1310.00	773.02	0.00	774.11	7.33	8.38	156.27	483.96
	32.070	1.00	778.00	773.00	765.00	615.00	768.28	768.27	769.83	23.74	10.00	61.50	126.22
	32.070	1.00	778.00	773.00	765.00	885.00	769.37	0.00	771.12	19.97	10.63	83.26	198.04
	32.070	1.00	778.00	773.00	765.00	1015.00	770.20	0.00	771.80	15.41	10.15	100.04	258.58
	32.070	1.00	778.00	773.00	765.00	1310.00	772.98	0.00	774.14	12.47	8.63	151.79	371.02
*	33.150	108.00	778.00	773.33	765.33	615.00	768.60	768.60	770.16	23.82	10.01	61.44	126.02
	33.150	108.00	778.00	773.33	765.33	885.00	769.52	769.46	771.43	22.70	11.10	79.71	185 75
	33.150	108.00	778.00	773.33	765.33	1015.00	770.30	0.00	772.06	17.63	10.63	95.48	241.76
	33.150	108.00	778.00	773.33	765.33	1310.00	773.09	0.00	774.28	10.54	8.73	150.06	403.56
	33.160	1.00	0.00	0.00	765.33	615.00	768.62	768.61	770.16	23.66	9.99	61.58	126.44
	33.160	1.00	0.00	0.00	765.33	885.00	769.52	769.44	771.43	22.71	11.10	79.70	185.69
	33.160	1.00	0.00	0.00	765.33	1015.00	770.31	0.00	772.06	17.66	10.64	95.42	241.54
	33.160	1.00	0.00	0.00	765.33	1310.00	773.13	0.00	774.29	7.91	8.62	151.94	465.67
*	33.260	10.00	0.00	0.00	765.36	615.00	768.64	768.64	770.19	23.78	10.01	61.47	126.11
	33.260	10.00	0.00	0.00	765.36	885.00	769.54	769.47	771.46	22.73	11.11	79.67	185.61
	33.260	10.00	0.00	0.00	765.36	1015.00	770.32	0.00	772.08	17.76	10.66	95.23	240.85
	33.260	10.00	0.00	0.00	765.36	1310.00	773.14	0.00	774.30	7.99	8.65	151.39	463.35
*	33.270	1.00	767.80	765.20	765.37	615.00	771.89	0.00	772.26	2.91	4.87	126.39	360.58
*	33.270	1.00	767.80	765.20	765.37	885.00	772.89	0.00	773.46	4.00	6.04	146.47	442.73
*	33.270	1.00	767.80	765.20	765.37	1015.00	773.33	0.00	773.99	4.47	6.54	155.31	479.90
	33.270	1.00	767.80	765.20	765.37	1310.00	774.25	0.00	775.13	5.50	7.55	173.61	558.46
	33.740	48.00	0.00	0.00	765.51	615.00	771.89	0.00	772.28	3.10	4.98	123.53	349.18
	33.740	48.00	0.00	0.00	765.51	885.00	772.90	0.00	773.49	4.22	6.16	143.60	430.80
	33.740	48.00	0.00	0.00	765.51	1015.00	773.34	0.00	774.03	4.71	6.66	152.43	467.70
	33.740	48.00	0.00	0.00	765.51	1310.00	774.26	0.00	775.18	5.74	7.66	170.93	546.83
	33.750	1.00	780.00	773.52	765.51	615.00	771.89	0.00	772.28	3.10	4.98	123.53	349.17
	33.750	1.00	780.00	773.52	765.51	885.00	772.90	0.00	773.49	4.22	6.16	143.60	430.79
	33.750	1.00	780.00	773.52	765.51	1015.00	773.34	0.00	774.03	4.60	6.66	152.34	473.13
*	33.750	1.00	780.00	773.52	765.51	1310.00	774.17	0.00	775.27	13.13	8.40	155.96	361.59
	34.710	96.00	780.00	773.81	765.81	610.00	771.91	0.00	772.33	3.48	5.17	117.89	326.89
	34.710	96.00	780.00	773.81	765.81	880.00	772.92	0.00	773.55	4.65	6.37	138.07	407.94
	34.710	96.00	780.00	773.81	765.81	1005.00	773.37	0.00	774.09	5.08	6.83	147.06	446 07
	34.710	96.00	780.00	773.81	765.81	1300.00	774.32	0.00	775.40	12.93	8.34	155.96	361.58
	34.720	1.00	0.00	0.00	765.81	610.00	771.91	0.00	772.33	3.47	5.17	118.00	327.32
	34.720	1.00	0.00	0.00	765.81	880.00	772.92	0.00	773.55	4.64	6.37	138.19	408.44
	34.720	1.00	0.00	0.00	765.81	1005.00	773.37	0.00	774.09	5.09	6.83	147.13	445.50
*	34.720	1.00	0.00	0.00	765.81	1300.00	774.56	0.00	775.45	5.65	7.61	170.93	546.84

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	34.800	8.00	0.00	0.00	765.83	610.00	771.91	0.00	772.33	3.51	5.19	117.57	325.62
	34.800	8.00	0.00	0.00	765.83	880.00	772.92	0.00	773.56	4.68	6.39	137.77	406.75
	34.800	8.00	0.00	0.00	765.83	1005.00	773.37	0.00	774.10	5.13	6.85	146.72	443.75
	34.800	8.00	0.00	0.00	765.83	1300.00	774.56	0.00	775.46	5.69	7.63	170.46	544.78
	34.810	1.00	768.67	765.77	765.83	610.00	772.79	0.00	773.10	2.38	4.52	135.03	395.52
	34.810	1.00	768.67	765.77	765.83	880.00	773.81	0.00	774.31	3.35	5.66	155.53	480.80
	34.810	1.00	768.67	765.77	765.83	1005.00	774.24	0.00	774.82	3.77	6.12	164.20	517.80
	34.810	1.00	768.67	765.77	765.83	1300.00	775.23	0.00	776.00	4.63	7.07	183.98	603.87
	36.210	140.00	0.00	0.00	766.26	610.00	772.80	0.00	773.16	2.84	4.81	126.77	362.10
	36.210	140.00	0.00	0.00	766.26	880.00	773.83	0.00	774.38	3.88	5.97	147.37	446.49
	36.210	140.00	0.00	0.00	766.26	1005.00	774.27	0.00	774.91	4.33	6.44	156.09	483.17
	36.210	140.00	0.00	0.00	766.26	1300.00	775.26	0.00	776.11	5.23	7.39	175.94	568.61
	38.050	184.00	0.00	0.00	766.81	610.00	772.83	0.00	773.25	3.62	5.25	116.29	320.61
	38.050	184.00	0.00	0.00	766.81	880.00	773.87	0.00	774.51	4.74	6.42	137.10	404.00
	38.050	184.00	0.00	0.00	766.81	1005.00	774.31	0.00	775.04	5.21	6.89	145.92	440.44
	38.050	184.00	0.00	0.00	766.81	1300.00	775.31	0.00	776.26	6.12	7.83	165.99	525.49
	38.060	1.00	780.00	774.82	766.81	610.00	772.83	0.00	773.25	3.62	5.25	116.25	320.46
	38.060	1.00	780.00	774.82	766.81	880.00	773.87	0.00	774.51	4.75	6.42	137.06	403.83
	38.060	1.00	780.00	774.82	766.81	1005.00	774.31	0.00	775.04	5.21	6.89	145.88	440.25
*	38.060	1.00	780.00	774.82	766.81	1300.00	775.22	0.00	776.35	14.08	8.55	152.07	346.48
	39 760	170.00	780.00	775.34	767.33	610.00	772.85	0.00	773.36	4.65	5.73	106.50	282.87
	39.760	170.00	780.00	775.34	767.33	880.00	773.91	0.00	774.64	5.81	6.90	127.53	365.15
	39.760	170.00	780.00	775.34	767.33	1005.00	774.35	0.00	775.19	6.27	7.37	136.44	401.27
	39.760	170.00	780.00	775.34	767.33	1300.00	775.46	0.00	776.59	14.08	8.55	152.07	346.48
	39.770	1.00	0.00	0.00	767.33	610.00	772.85	0.00	773.36	4.66	5.73	106.45	282.69
	39.770	1.00	0.00	0.00	767.33	880.00	773.91	0.00	774.65	5.81	6.90	127.48	364.94
	39.770	1.00	0.00	0.00	767.33	1005.00	774.35	0.00	775.19	6.28	7.37	136.39	401.06
*	39.770	1.00	0.00	0.00	767.33	1300.00	775.64	0.00	776.64	6.52	8.02	162.15	508.99
	39.860	9.00	0.00	0.00	767.36	610.00	772.86	0.00	773.37	4.72	5.76	105.95	280.79
	39.860	9.00	0.00	0.00	767.36	880.00	773.91	0.00	774.65	5.88	6.93	126.99	362.98
	39.860	9.00	0.00	0.00	767.36	1005.00	774.35	0.00	775.20	6.34	7.39	135.91	399.09
	39.860	9.00	0.00	0.00	767.36	1300.00	775.64	0.00	776.64	6.58	8.04	161.63	506.80
*	39.870	1.00	770.30	767.40	767.36	610.00	774.43	0.00	774.73	2.27	4.44	137.36	405.04
	39.870	1.00	770.30	767.40	767.36	880.00	775.45	0.00	775.93	3.21	5.57	157.94	491.05
	39.870	1.00	770.30	767.40	767.36	1005.00	775.89	0.00	776.45	3.62	6.03	166.65	528.34
	39.870	1.00	770.30	767.40	767.36	1300.00	776.84	0.00	777.60	4.52	7.00	185.71	611.51
	41.590	172.00	0.00	0.00	767.86	605.00	774.45	0.00	774.80	2.74	4.74	127.63	365.55
	41.590	172.00	0.00	0.00	767.86	870.00	775.49	0.00	776.02	3.73	5.87	148.30	450.37
	41.590	172.00	0.00	0.00	767.86	995.00	775.92	0.00	776.55	4.17	6.33	157.07	487.33
	41.590	172.00	0.00	0.00	767.86	1290.00	776.88	0.00	777.72	5.12	7.32	176.25	569.95

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	43.350	176.00	0.00	0.00	768.40	605.00	774.47	0.00	774.88	3.47	5.15	117.41	325.01
	43.350	176.00	0.00	0.00	768.40	870.00	775.52	0.00	776.13	4.52	6.29	138.38	409.22
	43.350	176.00	0.00	0.00	768.40	995.00	775.96	0.00	776.67	4.98	6.76	147.24	445.94
	43.350	176.00	0.00	0.00	768.40	1290.00	776.93	0.00	777.86	5.96	7.74	166.63	528.25
	43.360	1.00	780.20	776.41	768.40	605.00	774.47	0.00	774.88	3.47	5.15	117.38	324.88
	43.360	1.00	780.20	776.41	768.40	870.00	775.52	0.00	776.13	4.52	6.29	138.36	409.15
	43.360	1.00	780.20	776.41	768.40	995.00	775.96	0.00	776.67	5.30	6.76	147.10	432.23
*	43.360	1.00	780.20	776.41	768.40	1290.00	776.84	0.00	777.96	13.85	8.48	152.10	346.62
	45.860	250.00	780.20	777.17	769.16	605.00	774.51	0.00	775.05	5.03	5.87	103.05	269.86
	45.860	250.00	780.20	777.17	769.16	870.00	775.58	0.00	776.34	6.10	7.00	124.34	352.40
	45.860	250.00	780.20	777.17	769.16	995.00	776.03	0.00	776.90	6.55	7.46	133.36	388.72
	45.860	250.00	780.20	777.17	769.16	1290.00	777.19	0.00	778.30	13.85	8.48	152.10	346.61
	45.870	1.00	0.00	0.00	769.16	600.00	774.52	0.00	775.05	4.94	5.82	103.06	269.87
	45.870	1.00	0.00	0.00	769.16	865.00	775.59	0.00	776.34	6.03	6.96	124.34	352.38
	45.870	1.00	0.00	0.00	769.16	990.00	776.05	0.00	776.90	6.47	7.42	133.46	389.10
*	45.870	1.00	0.00	0.00	769.16	1285.00	777.32	0.00	778.33	6.70	8.07	159.19	496.35
	45.970	10.00	0.00	0.00	769.19	600.00	774.53	0.00	775.06	5.01	5.85	102.59	268.10
	45.970	10.00	0.00	0.00	769.19	865.00	775.59	0.00	776.35	6.09	6.98	123.88	350.54
	45.970	10.00	0.00	0.00	769.19	990.00	776.05	0.00	776.91	6.53	7.44	133.01	387.28
	45.970	10.00	0.00	0.00	769.19	1285.00	777.33	0.00	778.35	6.77	8.10	158.61	493.89
*	45.980	1.00	771.90	769.20	769.19	600.00	775.93	0.00	776.26	2.52	4.59	130.69	377.89
	45.980	1.00	771.90	769.20	769.19	865.00	776.97	0.00	777.47	3.48	5.71	151.45	463.61
	45.980	1.00	771.90	769.20	769.19	990.00	777.40	0.00	777.99	3.91	6.18	160.14	500.40
	45.980	1.00	771.90	769.20	769.19	1285.00	778.34	0.00	779.14	4.87	7.17	179.12	582.51
	48.330	235.00	0.00	0.00	769.91	600.00	775.96	0.00	776.37	3.45	5.13	116.93	323.12
	48.330	235.00	0.00	0.00	769.91	865.00	777.01	0.00	777.62	4.51	6.27	137.91	407.28
	48.330	235.00	0.00	0.00	769.91	990.00	777.44	0.00	778.15	4.98	6.75	146.68	443.60
	48.330	235.00	0.00	0.00	769.91	1285.00	778.40	0.00	779.33	5.99	7.75	165.85	524.89
	48.340	1.00	784.70	777.92	769.91	600.00	775.96	0.00	776.37	3.45	5.13	116.87	322.89
	48.340	1.00	784.70	777.92	769.91	865.00	777.01	0.00	777.62	4.52	6.28	137.84	407.01
	48.340	1.00	784.70	777.92	769.91	990.00	777.44	0.00	778.15	5.14	6.76	146.52	436.73
*	48.340	1.00	784.70	777.92	769.91	1285.00	778.31	0.00	779.42	13.76	8.45	152.05	346.42
	49.240	90.00	784.70	778.20	770.19	600.00	775.97	0.00	776.42	3.93	5.37	111.66	302.64
	49.240	90.00	784.70	778.20	770.19	865.00	777.02	0.00	777.68	5.02	6.52	132.73	386.17
	49.240	90.00	784.70	778.20	770.19	990.00	777.47	0.00	778.23	5.49	6.99	141.56	422.35
	49.240	90.00	784.70	778.20	770.19	1285.00	778.44	0.00	779.55	13.76	8.45	152.05	346.41
	49.250	1.00	0.00	0.00	770.19	600.00	775.97	0.00	776.42	3.93	5.37	111.65	302.58
	49.250	1.00	0.00	0.00	770.19	865.00	777.03	0.00	777.68	5.02	6.52	132.72	386.11
	49.250	1.00	0.00	0.00	770.19	990.00	777.47	0.00	778.23	5.50	6.99	141.56	422.32
*	49.250	1.00	0.00	0.00	770.19	1285.00	778.67	0.00	779.60	6.02	7.76	165.58	523.72

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
49.340	9.00	0.00	0.00	770.21	600.00	775.97	0.00	776.43	3.98	5.40	111.14	300.64
49.340	9.00	0.00	0.00	770.21	865.00	777.03	0.00	777.69	5.07	6.54	132.23	384.12
49.340	9.00	0.00	0.00	770.21	990.00	777.47	0.00	778.23	5.55	7.02	141.07	420.31
49.340	9.00	0.00	0.00	770.21	1285.00	778.67	0.00	779.61	6.07	7.79	165.05	521.46
49.350	1.00	773.10	770.20	770.21	600.00	777.15	0.00	777.46	2.32	4.46	134.67	394.03
49.350	1.00	773.10	770.20	770.21	865.00	778.19	0.00	778.67	3.23	5.56	155.57	480.98
49.350	1.00	773.10	770.20	770.21	990.00	778.63	0.00	779.19	3.65	6.03	164.31	518.28
49.350	1.00	773.10	770.20	770.21	1285.00	779.58	0.00	780.34	4.56	7.01	183.43	601.45
50.410	106.00	0.00	0.00	770.52	600.00	777.16	0.00	777.50	2.63	4.66	128.77	370.13
50.410	106.00	0.00	0.00	770.52	865.00	778.21	0.00	778.73	3.59	5.78	149.74	456.43
50.410	106.00	0.00	0.00	770.52	990.00	778.65	0.00	779.25	4.02	6.25	158.52	493.51
50.410	106.00	0.00	0.00	770.52	1285.00	779.60	0.00	780.42	4.97	7.23	177.68	576.21
51.550	114.00	0.00	0.00	770.92	600.00	777.17	0.00	777.55	3.13	4.96	121.05	339.34
51.550	114.00	0.00	0.00	770.92	865.00	778.22	0.00	778.80	4.15	6.09	142.12	424.67
51.550	114.00	0.00	0.00	770.92	990.00	778.66	0.00	779.33	4.60	6.56	150.95	461.48
51.550	114.00	0.00	0.00	770.92	1285.00	779.63	0.00	780.51	5.58	7.55	170.22	543.77

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	34.800	610.00	771.91	0.00	0.00	0.00	20.00	8.00
	34.800	880.00	772.92	1.01	0.00	0.00	20.00	8.00
	34.800	1005.00	773.37	0.45	0.00	0.00	20.00	8.00
	34.800	1300.00	774.56	1.19	0.00	0.00	20.01	8.00
	34.810	610.00	772.79	0.00	0.87	0.00	20.00	1.00
	34.810	880.00	773.81	1.02	0.88	0.00	20.00	1.00
	34.810	1005.00	774.24	0.43	0.87	0.00	20.00	1.00
	34.810	1300.00	775.23	0.99	0.67	0.00	20.01	1.00
	36.210	610.00	772.80	0.00	0.01	0.00	20.00	140.00
	36.210	880.00	773.83	1.03	0.02	0.00	20.00	140.00
	36.210	1005.00	774.27	0.44	0.03	0.00	20.00	140.00
	36.210	1300.00	775.26	0.99	0.03	0.00	20.01	140.00
	38.050	610.00	772.83	0.00	0.02	0.00	20.00	184.00
	38.050	880.00	773.87	1.04	0.04	0.00	20.00	184.00
	38.050	1005.00	774.31	0.44	0.04	0.00	20.00	184.00
	38.050	1300.00	775.31	1.00	0.05	0.00	20.01	184.00
	38.060	610.00	772.83	0.00	0.00	0.00	20.00	1.00
	38.060	880.00	773.87	1.04	0.00	0.00	20.00	1.00
	38.060	1005.00	774.31	0.44	0.00	0.00	20.00	1.00
*	38.060	1300.00	775.22	0.91	-0.09	0.00	20.00	1.00
	39.760	610.00	772.85	0.00	0.03	0.00	20.00	170.00
	39.760	880.00	773.91	1.05	0.04	0.00	20.00	170.00
	39.760	1005.00	774.35	0.45	0.04	0.00	20.00	170.00
	39.760	1300.00	775.46	1.11	0.24	0.00	20.00	170.00
	39.770	610.00	772.85	0.00	0.00	0.00	20.00	1.00
	39.770	880.00	773.91	1.05	0.00	0.00	20.00	1.00
	39.770	1005.00	774.35	0.45	0.00	0.00	20.00	1.00
*	39.770	1300.00	775.64	1.29	0.18	0.00	20.00	1.00
	39.860	610.00	772.86	0.00	0.00	0.00	20.00	9.00
	39.860	880.00	773.91	1.05	0.00	0.00	20.00	9.00
	39.860	1005.00	774.35	0.45	0.00	0.00	20.00	9.00
	39.860	1300.00	775.64	1.29	0.00	0.00	20.00	9.00
*	39.870	610.00	774.43	0.00	1.57	0.00	20.00	1.00
	39.870	880.00	775.45	1.03	1.54	0.00	20.00	1.00
	39.870	1005.00	775.89	0.43	1.53	0.00	20.01	1.00
	39.870	1300.00	776.84	0.95	1.20	0.00	20.01	1.00
	41.590	605.00	774.45	0.00	0.02	0.00	20.00	172.00
	41.590	870.00	775.49	1.04	0.03	0.00	20.00	172.00
	41.590	995.00	775.92	0.44	0.04	0.00	20.00	172.00
	41.590	1290.00	776.88	0.96	0.05	0.00	20.01	172.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	43.350	605.00	774.47	0.00	0.02	0.00	20.00	176.00
	43.350	870.00	775.52	1.05	0.03	0.00	20.00	176.00
	43.350	995.00	775.96	0.44	0.04	0.00	20.00	176.00
	43.350	1290.00	776.93	0.97	0.05	0.00	20.01	176.00
	43.360	605.00	774.47	0.00	0.00	0.00	20.00	1.00
	43.360	870.00	775.52	1.05	0.00	0.00	20.00	1.00
	43.360	995.00	775.96	0.44	0.00	0.00	20.00	1.00
*	43.360	1290.00	776.84	0.88	-0.09	0.00	20.00	1.00
	45.860	605.00	774.51	0.00	0.04	0.00	19.99	250.00
	45.860	870.00	775.58	1.06	0.06	0.00	20.00	250.00
	45.860	995.00	776.03	0.46	0.07	0.00	20.00	250.00
	45.860	1290.00	777.19	1.15	0.35	0.00	20.00	250.00
	45.870	600.00	774.52	0.00	0.01	0.00	19.99	1.00
	45.870	865.00	775.59	1.06	0.01	0.00	20.00	1.00
	45.870	990.00	776.05	0.46	0.01	0.00	20.00	1.00
*	45.870	1285.00	777.32	1.28	0.14	0.00	20.00	1.00
	45.970	600.00	774.53	0.00	0.00	0.00	19.99	10.00
	45.970	865.00	775.59	1.07	0.00	0.00	20.00	10.00
	45.970	990.00	776.05	0.46	0.00	0.00	20.00	10.00
	45.970	1285.00	777.33	1.28	0.00	0.00	20.00	10.00
*	45.980	600.00	775.93	0.00	1.40	0.00	20.00	1.00
	45.980	865.00	776.97	1.04	1.37	0.00	20.00	1.00
	45.980	990.00	777.40	0.43	1.35	0.00	20.00	1.00
	45.980	1285.00	778.34	0.94	1.02	0.00	20.01	1.00
	48.330	600.00	775.96	0.00	0.03	0.00	20.00	235.00
	48.330	865.00	777.01	1.05	0.04	0.00	20.00	235.00
	48.330	990.00	777.44	0.44	0.05	0.00	20.00	235.00
	48.330	1285.00	778.40	0.96	0.06	0.00	20.00	235.00
	48.340	600.00	775.96	0.00	0.00	0.00	20.00	1.00
	48.340	865.00	777.01	1.05	0.00	0.00	20.00	1.00
	48.340	990.00	777.44	0.44	0.00	0.00	20.00	1.00
*	48.340	1285.00	778.31	0.87	-0.09	0.00	20.00	1.00
	49.240	600.00	775.97	0.00	0.01	0.00	20.00	90.00
	49.240	865.00	777.02	1.05	0.02	0.00	20.00	90.00
	49.240	990.00	777.47	0.44	0.02	0.00	20.00	90.00
	49.240	1285.00	778.44	0.97	0.12	0.00	20.00	90.00
	49.250	600.00	775.97	0.00	0.00	0.00	20.00	1.00
	49.250	865.00	777.03	1.05	0.00	0.00	20.00	1.00
	49.250	990.00	777.47	0.44	0.00	0.00	20.00	1.00
*	49.250	1285.00	778.67	1.20	0.23	0.00	20.00	1.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
49.340	600.00	775.97	0.00	0.00	0.00	20.00	9.00
49.340	865.00	777.03	1.05	0.00	0.00	20.00	9.00
49.340	990.00	777.47	0.44	0.00	0.00	20.00	9.00
49.340	1285.00	778.67	1.20	0.00	0.00	20.00	9.00
49.350	600.00	777.15	0.00	1.18	0.00	20.00	1.00
49.350	865.00	778.19	1.04	1.16	0.00	20.00	1.00
49.350	990.00	778.63	0.44	1.16	0.00	20.00	1.00
49.350	1285.00	779.58	0.95	0.91	0.00	20.01	1.00
50.410	600.00	777.16	0.00	0.01	0.00	20.00	106.00
50.410	865.00	778.21	1.05	0.02	0.00	20.00	106.00
50.410	990.00	778.65	0.44	0.02	0.00	20.00	106.00
50.410	1285.00	779.60	0.96	0.03	0.00	20.01	106.00
51.550	600.00	777.17	0.00	0.01	0.00	20.00	114.00
51.550	865.00	778.22	1.05	0.02	0.00	20.00	114.00
51.550	990.00	778.66	0.44	0.02	0.00	20.00	114.00
51.550	1285.00	779.63	0.96	0.02	0.00	20.01	114.00

SUMMARY OF ERRORS AND SPECIAL NOTES

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WARNING SECNO=      0.100  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      0.100  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      0.100  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      0.100  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=      0.180  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      0.180  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      0.180  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      0.180  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=      0.330  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      0.330  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      0.330  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=      0.330  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      0.330  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      0.330  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=      0.330  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      0.330  PROFILE=  3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      0.330  PROFILE=  3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=      0.330  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      0.330  PROFILE=  4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      0.330  PROFILE=  4  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO=      0.340  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      0.340  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      0.340  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=      0.340  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=      0.500  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
CAUTION SECNO=      0.500  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      0.500  PROFILE=  3  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      0.500  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      0.500  PROFILE=  4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      0.500  PROFILE=  4  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=      7.500  PROFILE=  4  WSEL ASSUMED BASED ON MIN DIFF
CAUTION SECNO=      7.500  PROFILE=  4  20 TRIALS ATTEMPTED TO BALANCE WSEL

NOTE    SECNO=     18.500  PROFILE=  1  WSEL BASED ON X5 CARD
NOTE    SECNO=     18.500  PROFILE=  2  WSEL BASED ON X5 CARD
NOTE    SECNO=     18.500  PROFILE=  3  WSEL BASED ON X5 CARD
NOTE    SECNO=     18.500  PROFILE=  4  WSEL BASED ON X5 CARD

CAUTION SECNO=     22.500  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     22.500  PROFILE=  1  MINIMUM SPECIFIC ENERGY

NOTE    SECNO=     22.510  PROFILE=  1  WSEL BASED ON X5 CARD
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NOTE     SECNO=    22.510  PROFILE=  2  WSEL BASED ON X5 CARD
NOTE     SECNO=    22.510  PROFILE=  3  WSEL BASED ON X5 CARD
NOTE     SECNO=    22.510  PROFILE=  4  WSEL BASED ON X5 CARD

CAUTION  SECNO=    22.700  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    22.700  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=    23.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    23.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

NOTE     SECNO=    23.100  PROFILE=  1  WSEL BASED ON X5 CARD
NOTE     SECNO=    23.100  PROFILE=  2  WSEL BASED ON X5 CARD
NOTE     SECNO=    23.100  PROFILE=  3  WSEL BASED ON X5 CARD
NOTE     SECNO=    23.100  PROFILE=  4  WSEL BASED ON X5 CARD

CAUTION  SECNO=    23.500  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    23.500  PROFILE=  1  MINIMUM SPECIFIC ENERGY

WARNING  SECNO=    23.520  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=    23.520  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=    23.520  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING  SECNO=    23.620  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=    23.620  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=    23.620  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=    23.620  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

NOTE     SECNO=    23.630  PROFILE=  1  WSEL BASED ON X5 CARD
NOTE     SECNO=    23.630  PROFILE=  2  WSEL BASED ON X5 CARD
NOTE     SECNO=    23.630  PROFILE=  3  WSEL BASED ON X5 CARD
NOTE     SECNO=    23.630  PROFILE=  4  WSEL BASED ON X5 CARD

WARNING  SECNO=    23.930  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=    23.930  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=    23.930  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=    23.930  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

NOTE     SECNO=    24.100  PROFILE=  1  WSEL BASED ON X5 CARD
NOTE     SECNO=    24.100  PROFILE=  2  WSEL BASED ON X5 CARD
NOTE     SECNO=    24.100  PROFILE=  3  WSEL BASED ON X5 CARD
NOTE     SECNO=    24.100  PROFILE=  4  WSEL BASED ON X5 CARD

WARNING  SECNO=    28.570  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=    28.650  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=    28.650  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=    28.650  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=    28.650  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING  SECNO=    28.990  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING  SECNO=    28.990  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
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WARNING SECNO=    29.310  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=    29.310  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=    29.310  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=    29.310  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=    30.130  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=    30.130  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=    30.130  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=    30.130  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=    31.670  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=    31.670  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=    31.670  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=    31.670  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=    32.060  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    32.060  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    32.060  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
WARNING SECNO=    32.060  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=    32.060  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=    33.150  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    33.150  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=    33.260  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    33.260  PROFILE=  1  MINIMUM SPECIFIC ENERGY

WARNING SECNO=    33.270  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=    33.270  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=    33.270  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=    33.750  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=    34.720  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=    38.060  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=    39.770  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=    39.870  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=    43.360  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=    45.870  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=    45.980  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=    48.340  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=    49.250  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
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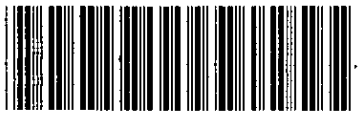

1) COUNTY: KALAMAZOO

2) STUDY NAME: KALAMAZOO, CITY OF

3) WATERCOURSE: ARCADIA CREEK

4) DOCUMENT TYPE: REPORT OUTDATED 1981



HYDRAULIC REPORT

ARCADIA CREEK

CITY OF KALAMAZOO, MICHIGAN

CAUTION

SEE

ATTACHED COMMENTS (see other side)

A new diversion + some bridge changes were made in a July 2, 1981 resubmittal by W.T.A. The report contains the new rating curves and profiles; however, some areas of the report may not have been corrected and may refer to the original submittal. The computer (HEC 2) rating curves are from the first submittal as well.

Prepared By:

Wade, Trim & Associates, Inc.
25185 Goddard Road
Taylor, Michigan 48180

HUD 2027-07
~~February~~, 1981
April

Wade, Trim & Associates, Inc.
Civil Engineers • Land Surveyors • Community Planners
Taylor, Michigan

July 2, 1981

Received
JUL 6 1981
WATER MANAGEMENT

Ms. Suzanne Elms
State of Michigan
Department of Natural Resources
P.O. Box 30028
Lansing, Michigan 48909

Re: City of Kalamazoo Flood Insurance Study
Arcadia Creek Hydraulic Report

Dear Ms. Elms:

This is with reference to your June 15, 1981 letter, which requests revisions to the above referenced analysis, associated with the City of Kalamazoo, Michigan - Flood Insurance Administration Study performed by this office.

We have investigated and resolved the problems delineated in your review letter as follows:

1. Oliver Street - Cross Section T (SECNO 51): Flow will divert over Oliver Street. Cross Sections 51 and 52 were modified to reflect this diversion and the profiles and flood plain delineation were revised.

2. Cross Section AH to AM (SECNO 73.5 to 79.5):

   a. As suggested, an "n" value of .027 was utilized for the 60-inch corrugated metal pipe at this location.

   b. The minimum road elevation at Stadium Drive is higher than the 500-year flood level; therefore, no weir flow was allowed at this location.

   c. The flood level will exceed the minimum road elevation at Howard Street; therefore, the hydraulic model was revised and the profiles and flood plain delineations were corrected at this location.

This document paid for with State funds

3. Overland flow Cross Sections A to F and G to K: The 2-foot contour interval topography was used to supplement aerial cross sections which were obtained for this study. Furthermore, actual spot elevations from this topography were utilized for interpolated cross sections. These spot elevations are listed to the nearest tenth of a foot; therefore, no changes were considered for this location.

4. Cross Section K (SECNO 28): As suggested, Cross Section K was skewed 40 degrees and the profiles were corrected.

5. Study limits: There are no flood hazards between our upstream study limit and the corporate boundary. Therefore, the hydraulic analysis was terminated.

As a result of these corrections, enclosed are the following exhibits which should be incorporated into the hydraulic report for Arcadia Creek:

1. Revised 100-year natural and multiple profile computer printouts.
2. Revised rating curves for the diversion between Cross Sections 73 and 80.
3. Revised water surface profiles.
4. Floodway/flood plain map revisions.
5. Table 3 (revised flood elevations).
6. Table 5 (revised flow distributions).

With these revisions, the hydraulic analysis for Arcadia Creek has been finalized and will be utilized for the development of the City of Kalamazoo Flood Insurance Study. If you have any questions regarding this analysis, call me at (313)291-5400.

Very truly yours,

WADE, TRIM & ASSOCIATES, INC.

William J. Weaver

William J. Weaver, P.E.

WJW:lj
HUD 2027-07
Enclosures
cc: Mr. Norb Schwartz,
Federal Emergency Management Agency
Mr. Martin Gunn,
Federal Emergency Management Agency

This document paid for with State funds

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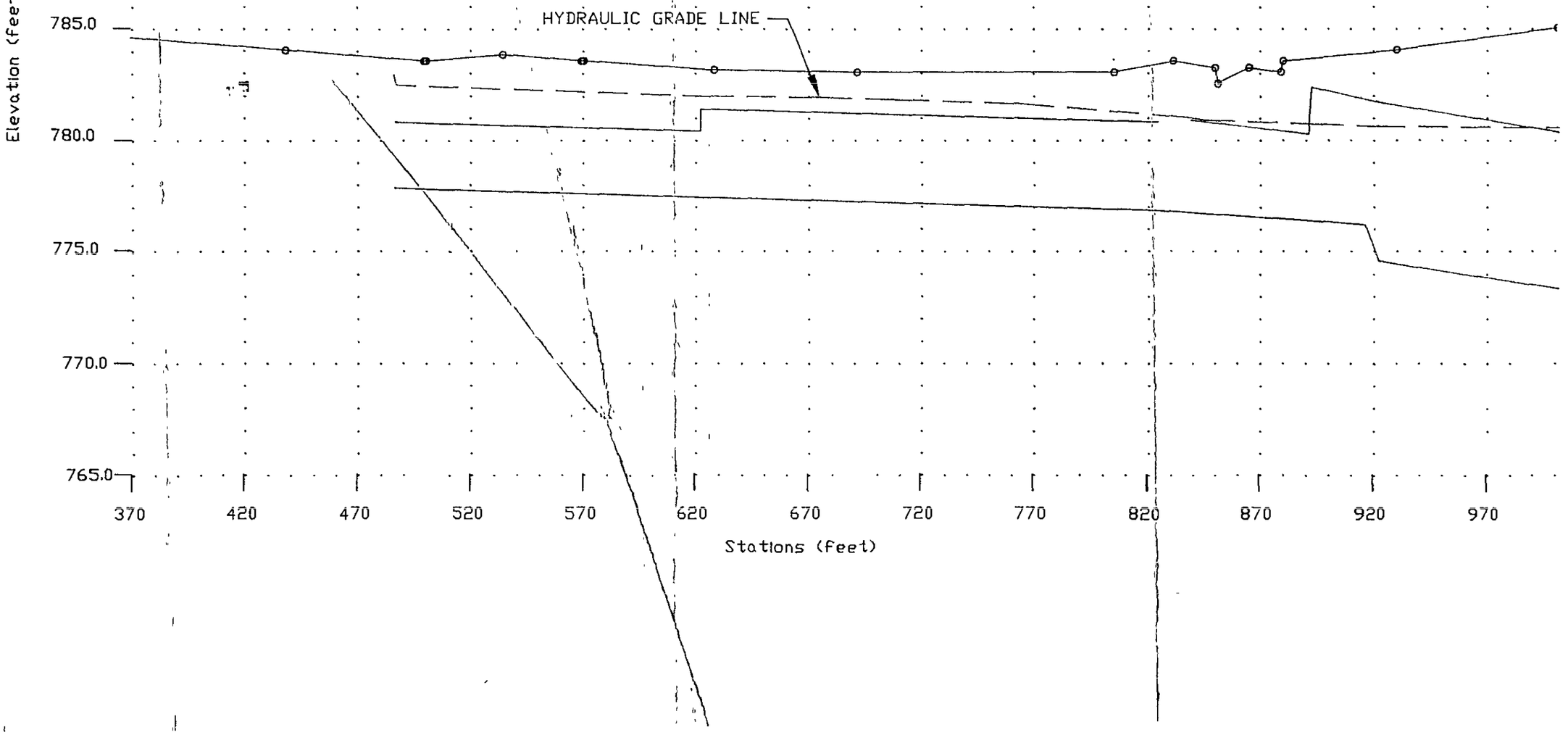
LIST OF EXHIBITS

EXHIBIT NO.	DESCRIPTION
1	Field Cross Section Location and 100-Year Flood Plain - Floodway Map
2	Computer Printouts HEC-2 Backwater Analysis with Cross Section Plots
3	Water Surface Profiles
4	Bridge Notes and Sketches
5	Enclosure Computations
6	Diversion Analyses

KALMAZOO ST.

ELEANOR ST.

CENTER LINE PROFILE OF WESTNEDGE COLLECTOR SYSTEM



THIS RUN EXECUTED 28JUL92 13:58:12

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.0; February 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

JTP 10/30/86 (RATINGEE

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	23.620	0.00	771.50	769.00	760.70	1020.00	768.65	0.00	769.29	5.76	6.42	158.98	424.82
	23.620	0.00	771.50	769.00	760.70	1020.00	768.65	0.00	769.29	5.76	6.42	158.98	424.82
	23.620	0.00	771.50	769.00	760.70	1020.00	768.65	0.00	769.29	5.76	6.42	158.98	424.82
	23.620	0.00	771.50	769.00	760.70	1020.00	768.65	0.00	769.29	5.76	6.42	158.98	424.82
*	23.630	0.10	771.50	769.00	760.70	1020.00	768.90	0.00	769.50	5.30	6.22	163.98	443.22
*	23.630	0.10	771.50	769.00	760.70	1020.00	768.90	0.00	769.50	5.30	6.22	163.98	443.22
*	23.630	0.10	771.50	769.00	760.70	1020.00	768.90	0.00	769.50	5.30	6.22	163.98	443.22
*	23.630	0.10	771.50	769.00	760.70	1020.00	768.90	0.00	769.50	5.30	6.22	163.98	443.22
*	23.930	30.00	780.00	771.67	760.70	150.00	769.44	0.00	769.51	1.18	2.12	70.68	138.22
*	23.930	30.00	780.00	771.67	760.70	200.00	769.39	0.00	769.51	2.13	2.85	70.24	137.16
*	23.930	30.00	780.00	771.67	760.70	300.00	769.22	0.00	769.52	5.02	4.36	68.88	133.95
*	23.930	30.00	780.00	771.67	760.70	400.00	768.96	0.00	769.52	9.63	5.99	66.75	128.91
*	5.000	1.00	780.00	771.67	764.13	150.00	769.19	0.00	769.51	7.90	4.59	32.67	53.35
*	5.000	1.00	780.00	771.67	764.13	200.00	768.81	0.00	769.51	18.13	6.74	29.66	46.97
*	5.000	1.00	780.00	771.67	764.13	300.00	768.59	768.59	770.38	47.92	10.75	27.91	43.34
*	5.000	1.00	780.00	771.67	764.13	400.00	769.36	769.36	771.50	50.58	11.76	34.01	56.25
	5.100	100.00	780.00	772.18	764.64	150.00	769.18	0.00	769.61	11.30	5.26	28.53	44.62
	5.100	100.00	780.00	772.18	764.64	200.00	768.77	0.00	769.74	27.60	7.89	25.34	38.07
*	5.100	100.00	780.00	772.18	764.64	300.00	769.10	769.10	770.89	47.92	10.75	27.91	43.34
*	5.100	100.00	780.00	772.18	764.64	400.00	769.86	769.86	772.01	50.61	11.76	34.00	56.23
	5.200	300.00	780.00	772.78	765.24	150.00	769.47	0.00	769.99	14.37	5.75	26.08	39.57
	5.200	300.00	780.00	772.78	765.24	200.00	769.66	0.00	770.47	21.94	7.25	27.60	42.69
*	5.200	300.00	780.00	772.78	765.24	300.00	770.83	0.00	771.85	22.84	8.11	37.01	62.78
*	5.200	300.00	780.00	772.78	765.24	400.00	771.81	0.00	773.04	24.56	8.89	45.00	80.71
	5.300	60.00	780.00	773.01	765.47	150.00	769.50	0.00	770.08	16.88	6.11	24.57	36.51
	5.300	60.00	780.00	773.01	765.47	200.00	769.71	0.00	770.61	25.32	7.64	26.17	39.74
	5.300	60.00	780.00	773.01	765.47	300.00	770.90	0.00	772.00	25.17	8.42	35.65	59.80
	5.300	60.00	780.00	773.01	765.47	400.00	771.90	0.00	773.19	26.29	9.13	43.81	78.01

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	5.400	1.00	775.00	771.90	764.90	150.00	769.86	0.00	770.08	3.27	3.78	39.74	83.01
*	5.400	1.00	775.00	771.90	764.90	200.00	770.28	0.00	770.61	4.61	4.64	43.15	93.20
*	5.400	1.00	775.00	771.90	764.90	300.00	771.50	0.00	772.00	5.90	5.67	52.91	123.53
*	5.400	1.00	775.00	771.90	764.90	400.00	772.52	0.00	773.19	6.73	6.55	61.11	154.24
*	5.500	25.00	775.00	772.70	765.70	150.00	769.94	0.00	770.24	5.11	4.42	33.95	66.35
*	5.500	25.00	775.00	772.70	765.70	200.00	770.37	0.00	770.81	6.90	5.35	37.39	76.16
*	5.500	25.00	775.00	772.70	765.70	300.00	771.61	0.00	772.23	8.02	6.34	47.31	105.91
*	5.500	25.00	775.00	772.70	765.70	400.00	772.66	0.00	773.46	9.08	7.17	55.78	132.73
	5.600	2.00	775.00	771.00	765.00	150.00	770.08	0.00	770.24	3.33	3.25	46.16	82.17
	5.600	2.00	775.00	771.00	765.00	200.00	770.57	0.00	770.82	4.64	3.95	50.69	92.88
	5.600	2.00	775.00	771.00	765.00	300.00	771.77	0.00	772.23	13.97	5.49	54.60	80.27
*	5.600	2.00	775.00	771.00	765.00	400.00	772.63	0.00	773.47	24.83	7.33	54.60	80.27
	5.700	20.00	775.00	771.00	765.00	150.00	770.09	0.00	770.25	3.32	3.24	46.23	82.34
	5.700	20.00	775.00	771.00	765.00	200.00	770.58	0.00	770.82	4.61	3.94	50.79	93.12
	5.700	20.00	775.00	771.00	765.00	300.00	771.79	0.00	772.26	13.97	5.49	54.60	80.27
	5.700	20.00	775.00	771.00	765.00	400.00	772.68	0.00	773.52	24.83	7.33	54.60	80.27
*	5.800	1.00	0.00	0.00	763.00	150.00	770.18	0.00	770.26	7.45	2.30	65.24	54.94
*	5.800	1.00	0.00	0.00	763.00	200.00	770.71	0.00	770.84	11.05	2.85	70.14	60.17
	5.800	1.00	0.00	0.00	763.00	300.00	772.09	0.00	772.29	16.49	3.62	82.80	73.89
	5.800	1.00	0.00	0.00	763.00	400.00	773.29	0.00	773.57	21.58	4.26	93.90	86.10
*	28.990	20.00	0.00	0.00	760.00	1015.00	770.19	0.00	770.27	2.61	0.00	453.68	628.14
*	28.990	20.00	0.00	0.00	760.00	1015.00	770.78	0.00	770.85	2.03	0.00	500.88	713.01
*	28.990	20.00	0.00	0.00	760.00	1015.00	772.27	0.00	772.31	1.12	0.00	631.18	958.57
*	28.990	20.00	0.00	0.00	760.00	1015.00	773.58	0.00	773.60	0.66	0.00	812.30	1246.33

JTP 10/30/86 [RATINGEE

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	23.620	1020.00	768.65	0.00	0.00	0.00	20.00	0.00
	23.620	1020.00	768.65	0.00	0.00	0.00	20.00	0.00
	23.620	1020.00	768.65	0.00	0.00	0.00	20.00	0.00
	23.620	1020.00	768.65	0.00	0.00	0.00	20.00	0.00
*	23.630	1020.00	768.90	0.00	0.25	0.00	20.01	0.10
*	23.630	1020.00	768.90	0.00	0.25	0.00	20.01	0.10
*	23.630	1020.00	768.90	0.00	0.25	0.00	20.01	0.10
*	23.630	1020.00	768.90	0.00	0.25	0.00	20.01	0.10
*	23.930	150.00	769.44	0.00	0.54	0.00	8.17	30.00
*	23.930	200.00	769.39	-0.05	0.49	0.00	8.17	30.00
*	23.930	300.00	769.22	-0.17	0.32	0.00	8.16	30.00
*	23.930	400.00	768.96	-0.26	0.06	0.00	8.16	30.00
*	5.000	150.00	769.19	0.00	-0.26	0.00	8.00	1.00
*	5.000	200.00	768.81	-0.38	-0.58	0.00	7.93	1.00
*	5.000	300.00	768.59	-0.22	-0.63	0.00	7.88	1.00
*	5.000	400.00	769.36	0.77	0.39	0.00	8.04	1.00
	5.100	150.00	769.18	0.00	-0.01	0.00	7.90	100.00
	5.100	200.00	768.77	-0.41	-0.04	0.00	7.82	100.00
*	5.100	300.00	769.10	0.33	0.51	0.00	7.88	100.00
*	5.100	400.00	769.86	0.76	0.51	0.00	8.04	100.00
	5.200	150.00	769.47	0.00	0.30	0.00	7.84	300.00
	5.200	200.00	769.66	0.18	0.89	0.00	7.88	300.00
*	5.200	300.00	770.83	1.17	1.73	0.00	8.11	300.00
*	5.200	400.00	771.81	0.98	1.95	0.00	8.31	300.00
	5.300	150.00	769.50	0.00	0.03	0.00	7.80	60.00
	5.300	200.00	769.71	0.20	0.05	0.00	7.84	60.00
	5.300	300.00	770.90	1.19	0.06	0.00	8.08	60.00
	5.300	400.00	771.90	1.00	0.09	0.00	8.28	60.00
*	5.400	150.00	769.86	0.00	0.36	0.00	8.01	1.00
*	5.400	200.00	770.28	0.42	0.57	0.00	8.02	1.00
*	5.400	300.00	771.50	1.22	0.60	0.00	8.02	1.00
*	5.400	400.00	772.52	1.03	0.63	0.00	8.02	1.00
*	5.500	150.00	769.94	0.00	0.08	0.00	8.01	25.00
*	5.500	200.00	770.37	0.43	0.09	0.00	8.01	25.00
*	5.500	300.00	771.61	1.24	0.11	0.00	8.02	25.00
*	5.500	400.00	772.66	1.06	0.14	0.00	8.02	25.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	5.600	150.00	770.08	0.00	0.14	0.00	9.17	2.00
	5.600	200.00	770.57	0.49	0.20	0.00	9.19	2.00
	5.600	300.00	771.77	1.19	0.16	0.00	9.20	2.00
*	5.600	400.00	772.63	0.87	-0.03	0.00	9.20	2.00
	5.700	150.00	770.09	0.00	0.01	0.00	9.17	20.00
	5.700	200.00	770.58	0.50	0.01	0.00	9.19	20.00
	5.700	300.00	771.79	1.21	0.03	0.00	9.20	20.00
	5.700	400.00	772.68	0.89	0.05	0.00	9.20	20.00
*	5.800	150.00	770.18	0.00	0.09	0.00	9.18	1.00
*	5.800	200.00	770.71	0.53	0.13	0.00	9.19	1.00
	5.800	300.00	772.09	1.38	0.29	0.00	9.20	1.00
	5.800	400.00	773.29	1.21	0.61	0.00	9.20	1.00
*	28.990	1015.00	770.19	0.00	0.01	0.00	77.06	20.00
*	28.990	1015.00	770.78	0.60	0.07	0.00	81.32	20.00
*	28.990	1015.00	772.27	1.49	0.18	0.00	104.16	20.00
*	28.990	1015.00	773.58	1.31	0.29	0.00	172.82	20.00

SUMMARY OF ERRORS AND SPECIAL NOTES

NOTE	SECNO=	23.630	PROFILE=	1	WSEL BASED ON X5 CARD
NOTE	SECNO=	23.630	PROFILE=	2	WSEL BASED ON X5 CARD
NOTE	SECNO=	23.630	PROFILE=	3	WSEL BASED ON X5 CARD
NOTE	SECNO=	23.630	PROFILE=	4	WSEL BASED ON X5 CARD
WARNING	SECNO=	23.930	PROFILE=	1	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO=	23.930	PROFILE=	2	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO=	23.930	PROFILE=	3	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO=	23.930	PROFILE=	4	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO=	5.000	PROFILE=	1	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO=	5.000	PROFILE=	2	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
CAUTION	SECNO=	5.000	PROFILE=	3	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	5.000	PROFILE=	3	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	5.000	PROFILE=	3	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	5.000	PROFILE=	4	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	5.000	PROFILE=	4	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	5.000	PROFILE=	4	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	5.100	PROFILE=	3	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	5.100	PROFILE=	3	PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION	SECNO=	5.100	PROFILE=	3	20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION	SECNO=	5.100	PROFILE=	4	CRITICAL DEPTH ASSUMED
CAUTION	SECNO=	5.100	PROFILE=	4	MINIMUM SPECIFIC ENERGY
WARNING	SECNO=	5.200	PROFILE=	3	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO=	5.200	PROFILE=	4	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO=	5.400	PROFILE=	1	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO=	5.400	PROFILE=	2	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO=	5.400	PROFILE=	3	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO=	5.400	PROFILE=	4	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
NOTE	SECNO=	5.500	PROFILE=	1	WSEL BASED ON X5 CARD
NOTE	SECNO=	5.500	PROFILE=	2	WSEL BASED ON X5 CARD
NOTE	SECNO=	5.500	PROFILE=	3	WSEL BASED ON X5 CARD
NOTE	SECNO=	5.500	PROFILE=	4	WSEL BASED ON X5 CARD
WARNING	SECNO=	5.600	PROFILE=	4	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO=	5.800	PROFILE=	1	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO=	5.800	PROFILE=	2	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO=	28.990	PROFILE=	1	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO=	28.990	PROFILE=	2	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO=	28.990	PROFILE=	3	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO=	28.990	PROFILE=	4	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: KALAMAZOO, CITY OF

3) WATERCOURSE: ARCADIA CREEK

4) DOCUMENT TYPE: REPORT VOLUME I

00BREAK00

THE CITY OF
Kalamazoo

DEPARTMENT OF PUBLIC WORKS
234 W Cedar Street
Kalamazoo Michigan 49007-5170
(616) 337-8002
Fax (616) 337-8922

July 1, 1991

Mr. Norbert Schwartz, Chief
Natural Hazards Branch
Natural & Technological Hazards Division
Federal Emergency Management Agency
Region V
175 W. Jackson Blvd., 4th Floor
Chicago, IL 60604

RE: ARCADIA CREEK MAP REVISION REQUEST - KALAMAZOO, MICHIGAN

Dear Mr. Schwartz:

Here are two copies of the technical reports to support this request for a Letter of Map Revision from the Federal Emergency Management Agency.

We anticipate awarding a contract for this construction in August of 1991.

Should you need further assistance, do not hesitate to contact me.

Very truly yours,

William L. Nelson
Public Works Director

a

Attachment

c W.L. Nelson
J.P. Gallogly
K. Nacci - DKI
B. Gordon

ARCADIA CREEK REDEVELOPMENT PROJECT
FINAL DESIGN AND CONCEPT AND HYDRAULIC CALCULATIONS

KALAMAZOO DOWNTOWN DEVELOPMENT AUTHORITY
132 North Kalamazoo Mall
Suite 217
Kalamazoo, Michigan 49007

1069-AO

December 17, 1990

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1.0 INTRODUCTION AND PROJECT BACKGROUND

The northern half of the City of Kalamazoo central business district in Kalamazoo County, Michigan has experienced stagnant growth and flooding problems. Improvements to the Arcadia Creek are proposed to convey the 100-year flood, and to contain the floodway and floodplain throughout the northern central business district. The project will result in a significant reduction in the floodway and flood hazard area limits illustrated on the existing City of Kalamazoo Flood Insurance Study (FIS) maps. Please consider this a formal request for a Letter of Map Revision (LOMR) to reflect these changes. Figure 1 illustrates the project location and limits.

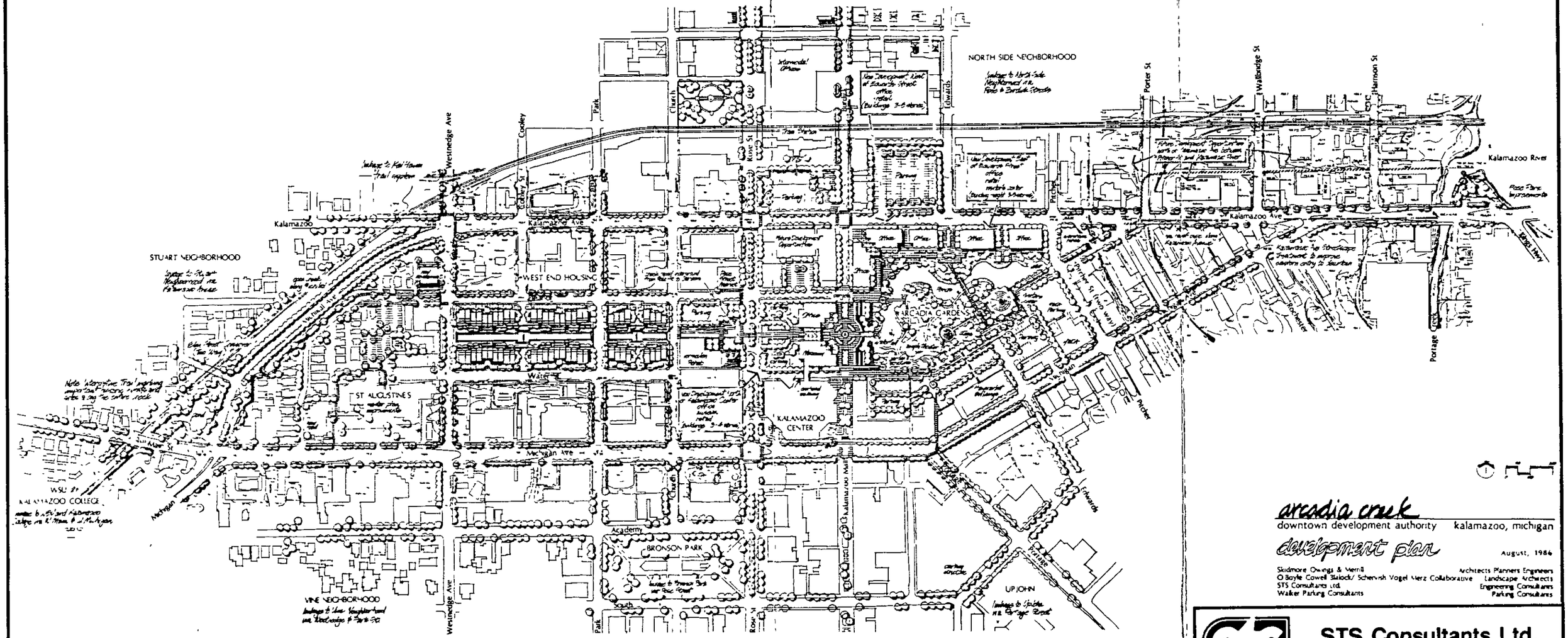
It is our understanding that the Michigan Department of Natural Resources (MDNR) has primary technical review responsibility for the proposed creek, floodway, and floodplain modifications. The MDNR completed a review and issued a conditional construction permit (Appendix A) for the proposed creek modification on September 15, 1989. Furthermore, they are currently in the process of reviewing the final design calculations to verify compliance with preliminary design documents submitted during 1989. A letter to the MDNR which provides a summary of the following information is provided in Appendix B:

a. Conditional permit submittals - a transmittal of final design calculations as required by the 1989 MDNR permit.

b. Design concept configuration - a summary of design concept differences that transpired since the time of conditional MDNR permit issuance in 1989.

c. MDNR permit extension request - a formal request to extend the construction permit expiration date.

d. Letter of Map Revision request - formal request for MDNR to begin the LOMR review process.



arcadia creek

downtown development authority kalamazoo, michigan

development plan

August, 1986

Skidmore Owings & Merrill — Architects Planners Engineers
O'Boyle Cowell Stalock/ Schervish Vogel Merz Collaborative — Landscape Architects
STS Consultants Ltd. — Engineering Consultants
Walker Parking Consultants — Parking Consultants

STS Consultants Ltd.
Consulting Engineers

PROJECT/CLIENT

ARCADIA CREEK PROJECT

PROJECT LOCATION MAP

DRAWN BY	DTH	5/87	SCALE AS SHOWN	FIGURE NO 1
CHECKED BY	JTP	5/87	STS DRAWING NO	
APPROVED BY	WJW	5/87		

79582

A review and approval of the final design calculations by MDNR is expected during the month of December. Construction of the new creek corridor is expected to begin during February of 1991. The construction of several major commercial buildings in the currently published 100-year floodplain is proposed to take place concurrent with the reconstruction of the creek. The creek construction and physical reduction of the floodplain will be accomplished concurrently with construction in adjacent floodplain areas.

The City of Kalamazoo floodplain ordinances require that a Conditional Letter of Map Revision (CLOMR) be in place prior to any floodplain construction. It is our understanding that issuance of a CLOMR can be accomplished based upon approved design basis calculations and proposed plans. Once the creek construction is complete, record drawings illustrating field conditions after construction will be prepared.

A description of the design concept, preliminary computations, and documentation of existing flooding conditions is provided in a report entitled: "Arcadia Creek Project, Preliminary Engineering Feasibility Report", January 21, 1987, Volumes I and II (Appendix C). This report includes preliminary plans and existing and preliminary proposed flood profiles. Information provided herein is an update of the 1987 feasibility report and includes final concept plans and design basis computations.

Construction drawings are scheduled to be completed during December. A copy of these drawings will be submitted when they are available. A copy of the documents attached to this report have already been submitted to the City of Kalamazoo for their review.

2.0 PROPOSED CREEK REDEVELOPMENT CONCEPT

Figures 2 and 3 illustrate a plan view of the final creek redevelopment concept. This system is nearly identical to the concept presented in the January 1987 STS Feasibility Study (Appendix C) and has the following features:

a. Station 0+00 to Station 28+56 - a variable dimensioned concrete box culvert will be constructed to supplement the existing culvert. The interconnection of the new and existing culverts at the intersection of Michigan Avenue and Pitcher Street will provide maximum capacity. This configuration also provides an opportunity to create flow diversions during dry weather for maintenance in either system.

b. Station 28+56 to Station 32+07 - an open water pond will be constructed to provide an amenity for future adjacent developments.

c. Station 32+07 to Station 51+55 - this central portion of the creek will consist of an alternating series of open and closed box conduits which will provide an aesthetic amenity for adjacent development properties, and will provide for the passage of flood flows under street corridors.

d. Westnedge Avenue Interceptor - A portion of the Westnedge Avenue interceptor has already been constructed in conjunction with a street improvement project undertaken by others. The Westnedge Ave. Interceptor was designed to intercept overland runoff at the upstream project limit for the width of the 100-year floodplain, and redirect these flows toward the new central creek corridor.

The existing creek corridor will be abandoned between Edwards Street and Westnedge Avenue when the new creek structure is completed. This section is the oldest portion of the creek. The existing creek will be maintained during construction for flow diversion purposes.

The new creek structure is designed to pass the 100-year flood discharge under free flow conditions. Thus, the existing 100-year floodplain surrounding Arcadia Creek will be eliminated between Westnedge Avenue and the outlet at the Kalamazoo River.

3.0 HYDRAULIC ANALYSIS FOR FINAL DESIGN CONCEPT

3.1 General

The final design concept remains basically unchanged from the preliminary concept presented in the July 1987 STS Report (Appendix C). Figures 2 and 3 illustrate the final design concept. These plans include creek stationing, culvert and open channel size designations, dimensions, and cross-section locations.

The 1987 Feasibility Report includes flood flow/frequency relationships (Chapters 3.0 and 4.0), a summary of analysis methodology (Chapter 6.0), and a summary of the existing floodplain condition (Chapter 8.2).

3.2 System Design Basis

The proposed creek improvements were designed to accommodate the 100-year flood discharge with free flow conditions. Starting conditions for hydraulic analyses, and the analysis methodology are fully described in the July 1987 Feasibility Study Report (Appendix C). A cross-section cross-reference table correlating locations between the Flood Insurance Study, the 1987 Feasibility Report Analysis, and the final analyses summarized herein are provided on Table 1. Computations for hydraulic losses at bends, junction chambers, weirs, and culverts are provided in Appendix D. A summary of special loss locations is as follows:

a. Station 18+50 - junction and bend losses were applied at this location. Furthermore, special losses in junction chambers upstream and downstream of the railroad crossing were accommodated.

b. Station 23+00 to Station 24+00 - bend losses, junction chamber losses, and flow convergence/divergence loss computations were applied at this location to accommodate a crossing of the existing and proposed creeks, and a bend in the proposed system.

TABLE I
CROSS SECTION CROSS REFERENCE
ARCADIA CREEK PROJECT

FIS Cross Section Designation	STS Feasibility Desgination	STS Design Designation	Description
NA*	NA	0.01	(P.O.B. Phase I) Outlet to Kalamazoo River
NA	NA	4.3	Harrison Street crossing
NA	NA	10.0	Walbridge
A	1.46	NA	Michigan Avenue btn Porter Street and Walbridge Street
B	2.6	NA	Michigan Avenue btn Porter Street to Pitcher Street
NA	NA	18.55	Two 90" concrete pipes to be jacked under Conrail crossing
NA	NA	22.51	Kalamazoo Street crossing
C	4.2	NA	Between Edwards and Pitcher (100 downstream station 28+56)
NA	NA	28.56	Downstream limit of pond begin 12 ft. x 8 ft. concrete box culvert
D	9.0	NA	---
NA	NA	32.07	Upstream limit of pond
E	11.0	NA	---
NA	NA	34.71	Upstream face of Burdick Mall culvert

* NA = No Applicable Cross Section

TABLE 1. CONTINUED
CROSS SECTION CROSS REFERENCE
ARCADIA CREEK PROJECT
Page 2

FIS Cross Section Designation	STS Feasibility Desgination	STS Design Designation	Description
F	19.0	--	Just downstream of station 35+00
NA	NA	38.05	Downstream face of Rose Street crossing
--	--	41.59	18 ft. downstream of FIS cross section F (Church Street)
NA	NA	45.87	Upstream face of Park Street crossing
G	29.0	45.97	44 ft. upstream
NA	NA	48.33	Downstream face of Cooley Sreet crossing
NA	NA	51.55	Downstream limit of Westnedge interceptor system (POE Phase II)

* NA = No Applicable Cross Section

c. Station 28+56 and Station 37+07 - entrance and exist losses were applied to the upstream and downstream limits of the pond.

d. Low Flow Control Weirs - several weirs will be constructed in the new creek corridor between Station 32+07 and the upstream limit at Westnedge Avenue. The objective of these weirs is to provide some depth of water during low flow conditions for aesthetic purposes. The weirs were designed to accommodate the 100-year flood discharge without placing upstream culverts under pressure.

A Manning's Roughness Coefficient of 0.013 was selected for all concrete structures. Expansion and contraction loss coefficients varied from 0.1 and 0.3 to 0.5 and 0.7, respectively, depending upon flow dynamics. The new creek outlet will consist of a baffled apron. The baffled apron will consist of three foot high baffles spaced four feet apart. The outlet structure will reduce velocities to less than four feet per second for 500-year events and less. A twenty-foot wide stone armored channel will outlet into the Kalamazoo River.

The 100-year flood elevation at Station 51+55 will be 779.09. This elevation provides a tailwater on the Westnedge Avenue interceptor sewer which proceeds to the north up to Kalamazoo Avenue. This tailwater elevation will allow for the efficient transport of stormwater during the design event from areas to the north and west and meets MDNR requirement of 780.00.

The existing creek corridor will be maintained from Edwards Street down to the Kalamazoo River. This system will be interconnected to the new system at two locations. As a result, a diversion analysis was performed to identify the distribution of flood flows between each system. The diversion analysis is performed within HEC-2, using the split-flow option.

Stone riprap erosion protection is provided at critical areas throughout the creek corridor to protect against erosion.

3.3 Hydraulic Analysis Results

Figure 4 illustrates 10-, 50-, 100-, and 500-year flood profiles along the entire length of the new creek corridor. These elevations are lower in every case than the existing flood profiles presented in the City of Kalamazoo's Flood Insurance Study. Furthermore, the new system will carry the 100-year design flood elevation within the boundaries of the enclosed system. Figures 5 and 6 illustrate the revised floodplain which will result from the new structure. From this map it is clear that all flood conditions are fully contained within the new system.

Table 2 presents a summary of 10-, 50-, 100-, and 500-year flood elevations at selected locations throughout the creek corridor. Comparison between existing flood elevations presented in Appendix C are illustrative of the flood reduction improvements to be provided by the new system. HEC-2 computer print-outs for each of the flood events analyzed are provided in Appendix F.

TABLE 2
DESIGN CROSS SECTION
FLOOD ELEVATION SUMMARY
ARCADIA CREEK PROJECT

Design Cross Section	10-year	50-year	100-year	500-year
0.01	757.50	757.50	757.50	757.50
4.3	760.50	761.50	761.88	762.57
10.0	761.72	762.88	763.27	763.99
18.55	764.59	765.89	766.29	767.46
22.51	765.37	766.78	767.31	769.25
28.56	767.26	768.69	769.16	771.32
32.07	768.28	769.87	770.47	772.73
34.71	771.92	773.00	773.48	774.65
38.05	773.05	774.23	774.74	776.13
41.59	774.61	775.76	776.28	777.76
45.87	774.68	775.85	776.41	778.40
45.97	774.68	775.86	776.42	778.40
48.33	776.15	777.29	777.81	779.46
51.55	777.40	778.57	779.09	780.92

4.0 SUMMARY AND CONCLUSIONS

The northern half of the City of Kalamazoo central business district has experienced stagnant growth and flooding problems. Improvements to the Arcadia Creek are proposed to resolve the flooding problems which have occurred, and to create a water amenity to provide public spaces and help spur development. A new corridor was developed to contain and transport the 100-year flood elevation from the upstream project limits at Westnedge Avenue to the downstream limits at the Kalamazoo River. Figures 2 and 3 illustrate the proposed system. Figures 5 and 6 illustrate the proposed floodplain associated with the new system.

The engineering challenge of this project was to provide a system which satisfied the aesthetic goals of the project during low flow conditions while providing for the passage of flood water. The selected alternative accomplishes the goals and provides for a system that does not flow under pressure during the design event. This report and attachments provides design computations documenting existing and proposed conditions. This report serves as a design basis summary, and as support documentation for a Letter of Map Revision (LOMR) request for the Arcadia Creek portion of the City of Kalamazoo Flood Insurance Study.

APPENDIX A

Conditional Construction Permit

STATE OF MICHIGAN
DEPARMENT OF NATURAL RESOURCES
PERMIT

CONDITIONAL PERMIT 55

ISSUED TO:
Kalamazoo Downtown
Development Authority
132 N Kalamazoo Mall, 217
Kalamazoo MI 49007

Permit No. 89-12-0444

Issued Sep 15 89
Extended
Revised
Expires Dec 31 90

This permit is granted under the provisions of:
The Inland Lakes and Streams Act, 1972 PA 346, as amended.

Flood Plain Regulatory Act, 1929 PA 245, as amended.

Permitted Activity

Permitted Activity on page 2

Water Course Affected: Arcadia Creek
County: Kalamazoo Town: 02S Range: 11W Sections: 15 0
Subdivision: Lot:

Authority granted by this permit is subject to the following limitations:

A. Initiation of any work on the permitted project confirms the permittee's acceptance and agreement to comply with all terms and conditions of this permit.
B. The permittee in exercising the authority granted by this permit shall not cause unlawful pollution as defined by Act 245 of the Public Acts of 1929, as amended.
C. This permit shall be kept at the site of the work and available for inspection at all times during the duration of the project or until its date of expiration.
D. All work shall be completed in accordance with the plans and the specifications submitted with the application and/or plans and specifications attached hereto.
E. No attempt shall be made by the permittee to forbid the full and free use by the public of public waters at or adjacent to the structure or work approved herein.
F. It is made a requirement of this permit that the permittee give notice to public utilities in accordance with Act 53 of the Public Act of 1974 and comply with each of the requirements of that act.
G. This permit does not convey property rights in either real estate or material, nor does it authorize any injury to private property or invasion of public or private rights, nor does it waive the necessity of seeking federal assent, all local permits or complying with other state statutes.
H. This permit does not prejudice or limit the right of a riparian owner or other person to institute proceedings in any circuit court of this state when necessary to protect his rights.
I. Permittee shall notify the Department of Natural Resources within one week after the completion of the activity authorized by this permit, by completing and forwarding the attached, preaddressed post card to the office addressed thereon.
J. This permit shall not be assigned or transferred without the written approval of the Department of Natural Resources.
K. Failure to comply with conditions of this permit may subject the permittee to revocation of permit and criminal and/or civil action as cited by the specific State Act, Federal Act and/or Rule under which this permit is granted.
L. Work to be done under authority of this permit is further subject to the following special instructions and specifications:

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PERMITTED ACTIVITY:

Relocate approximately 2,540 feet of enclosed creek by installing 2,540 feet of concrete box culverts of varying diameters. Create 1,910 feet of 10-foot deep, 20-foot wide, open creek area by excavating approximately 14,000 cubic yards of material from the proposed watercourse area, hauling all removed material to a licensed landfill. Enclosures and open channel shall be constructed intermittently between Portage Creek and Westnedge Avenue. Place approximately 4,650 cubic yards of rock riprap to line new creek bed and banks. Place necessary culverts as shown on attached plans and plans held on file with the Department of Natural Resources, District 12 Headquarters, Plainwell, MI.

PERMIT LIMITATIONS, continued

This permit is granted conditionally under circumstances of emergency or urgency to allow the City of Kalamazoo to apply for funding necessary for implementation of project. Should this permit result in an unreasonable encroachment, interference with adjacent riparians or the public trust, permittee agrees, in exercising the authority granted herein, to make adjustments in the project as ordered by the Department of Natural Resources. No construction shall commence prior to September 21, 1989.

Should information be received by the Department indicating a potential adverse impact to the environment, or should a request for a public hearing be received, construction shall not begin until all issues are resolved; or following the public hearing, resolution of any and all issues raised at the public hearing.

All excavated material shall be hauled to a licensed landfill unless permittee provides analysis of representative soil samples that indicates all excavated material is free of any contamination. Should permittee provide acceptable documentation that excavated material is not contaminated, all excavated material shall be placed on a Department-approved upland site and stabilized with sod, seeding, or riprap as necessary. No excavated material shall be placed in any wetlands or watercourse under any circumstances. Prior to initiation of construction, a pre-construction meeting shall be held with the contractor, permittee or her/his representative, and representatives of the Department of Natural Resources. To arrange the required meeting, contact Jeffery King, Land and Water Management Division, Department of Natural Resources, P.O. Box 355, Plainwell, MI 49080, phone: 616-685-8036. Any construction undertaken prior to a pre-construction meeting and final approval by the Department will be done at the risk of the permittee and/or its agent/contractor.

ISSUED

Kalamazoo Downtown
Development Authority
132 N Kalamazoo Mall, 217
Kalamazoo MI 49007

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All limitations, specifications and conditions contained in this permit shall be included in all construction specifications for project contractor.

This permit is valid only for construction work between Portage Creek and Westnedge Avenue. Any additional work on adjacent properties is subject to submittal of a separate permit application and Department approval.

Final design plans shall be submitted to the Department of Natural Resources, Land and Water Management Division, P.O. Box 355, Plainwell, MI 49080, prior to commencement of any construction activities.

Permittee shall request a revision of the Flood Insurance Study Map from the Federal Emergency Management Agency prior to the start of construction.

Data shall be provided to the Department that demonstrates that overland flow from Michikal Avenue will reach the upper end of the project at Westnedge, or drainage along Westnedge shall be improved to funnel flow into the new channel.

Permittee shall maintain existing road elevations on Michigan Avenue between Pitcher Street and Portage Creek.

During removal of the existing structure, every precaution shall be taken to prevent debris from entering any watercourse. Any debris reaching the watercourse during the removal and/or reconstruction of the structure shall be immediately retrieved from the water and disposed of at an upland site.

All slurry resulting from any dewatering operation shall be pumped to a sump located away from the watercourse and allowed to filter through natural vegetation or gravel filters for a sufficient distance to remove suspended particles.

The proposed channel relocation shall be constructed in the dry. Upstream and downstream plugs shall remain in place until the new channel is capable of handling flows without causing siltation.

Prior to the initiation of any permitted construction activities, a sediment basin shall be constructed immediately downstream of the construction site. The sediment basin shall be maintained in good working order throughout the duration of the project. All excavated material shall be placed on an upland site.

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The placement of the new culverts and the initial placement of fill in the stream shall be done in such a manner that all flow is immediately passed through the culverts and the major placement of fill can be done in the dry or in still water where erosion and siltation will be minimized. The material used in this initial placement of fill shall be washed gravel, coarse aggregate, or rock, and shall be placed at both ends of the culverts above normal water level before backfill material is placed. Bagged concrete riprap may be used for end fill.

Road fill side slopes terminating in the stream and any raw stream banks resulting from this construction shall be riprapped to two rows above the ordinary high water mark and all other raw areas draining directly to the stream shall be protected with riprap and/or sod and/or seed-fertilizer-mulch as is necessary to provide adequate protection.

If the project, or any portion, is stopped and lies uncompleted for any length of time other than that encountered in a normal work week, every precaution shall be taken to protect the uncompleted work from erosion, including the placement of temporary sandbag riprap or other acceptable temporary protection.

No work shall be done in the stream during periods of above-normal flows except as necessary to prevent erosion

In issuing this permit, the Department of Natural Resources has relied on the information and data which permittee has provided in connection with the permit application. If, subsequent to the issuance of this permit, such information and data prove to be false, incomplete, or inaccurate, the Department may modify, revoke, or suspend the permit, in whole or in part, in accordance with the new information.

Unless specifically stated under the "Permitted Activity" of this permit, construction pads, haul roads, temporary structures, or other structural appurtenances to be placed on or over bottomlands are not authorized by this permit and shall not be constructed unless authorized by separate permit or permit revision granted in accordance with applicable law.

Permittee covenants not to sue the State of Michigan, or any of its departments, boards, commissions, officers, employees, or agents for any claim, whether legal or equitable, arising under or in any manner related to the privileges granted in this Permit. Permittee hereby releases, waives, and discharges the State of Michigan and all of its departments, boards, commissions, officers, employees, and agents from any and all liability to permittee arising under or in any manner related to the privileges granted under this Permit.

I
S Kalamazoo Downtown
S T Development Authority
U O 132 N Kalamazoo Mall, 217
E Kalamazoo MI 49007
D

Permit No. 89-12-0444	
Issued	Sep 15 89
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Permittee agrees to indemnify the State of Michigan and all of its departments, agencies, boards, commissions, officers, employees, and agents from any and all liability arising under or in any manner related to the issuance of the Permit or the privileges granted under this Permit.

This permit shall become effective on the date of signature by Department of Natural Resources officer. Upon signing by the permittee named herein, this permit must be returned to Land & Water Management Division, Department of Natural Resources, P.O. 355, Plainwell, MI 49080, for final execution.

Permittee hereby accepts and agrees to comply with the terms and conditions of this permit.

David M. Feehan Sept. 15, 1989
Permittee signature Date

David F. Hales
Director, Department of Natural Resources
By: Kamen J. Jordan for
Jeffery A. King
Land and Water Management Division

JAK:jh

cc: LWMD, Lansing, Region III
D-12 Law
STS Consultants, Ltd.

Client : **KALAMAZOO DOWNTOWN DEVELOPMENT AUTHORITY**

KALAMAZOO, MICHIGAN

Project : **ARCADIA CREEK PROJECT**

Engineer :

STS CONSULTANTS, LTD.
3340 RANGER ROAD
LANSING, MICHIGAN 48906



VICINITY MAP

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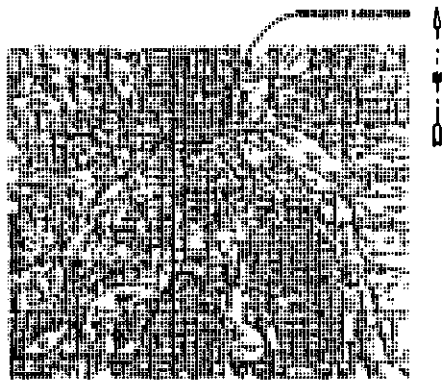
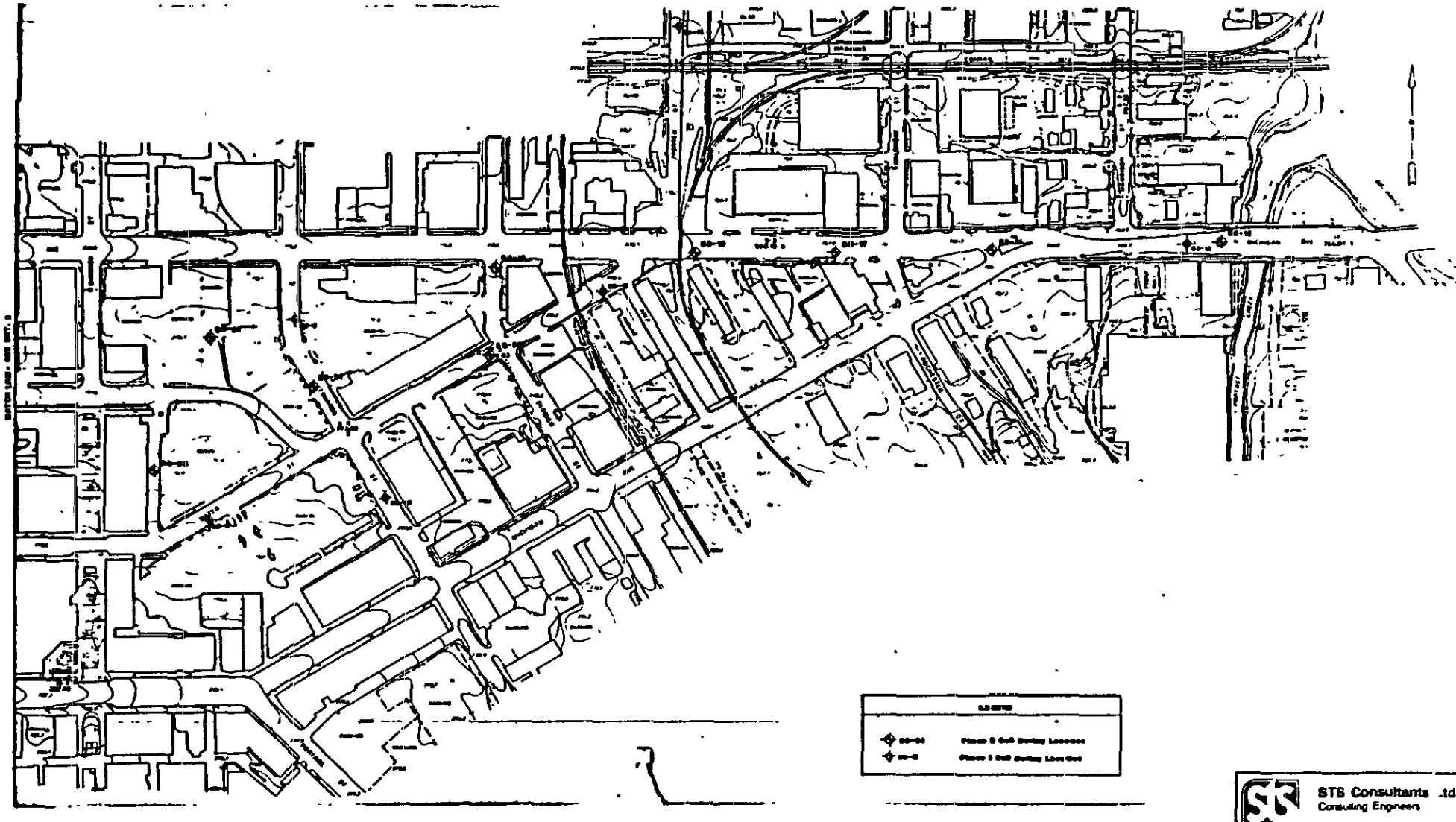


PROJECT LOCATION MAP



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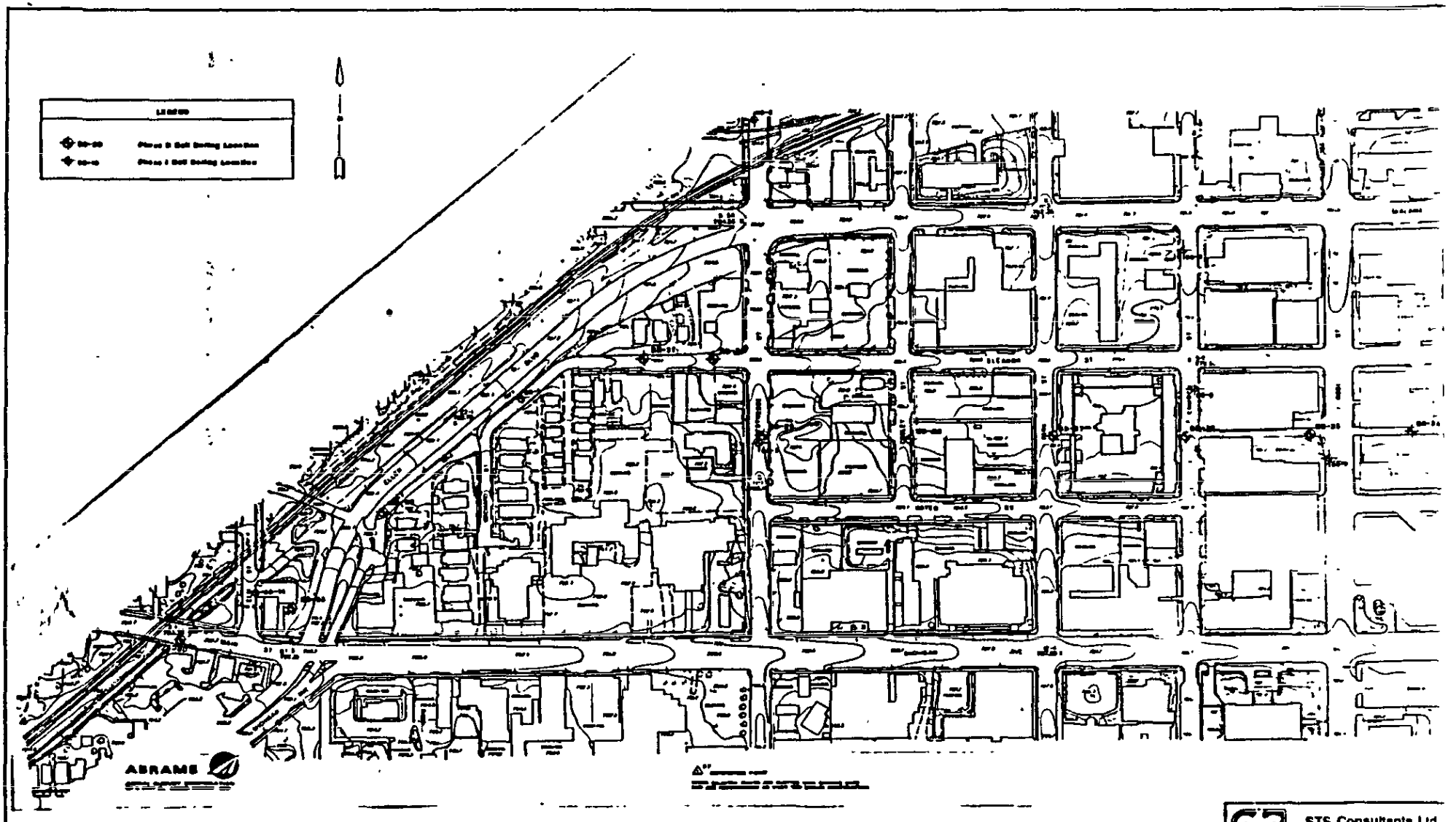

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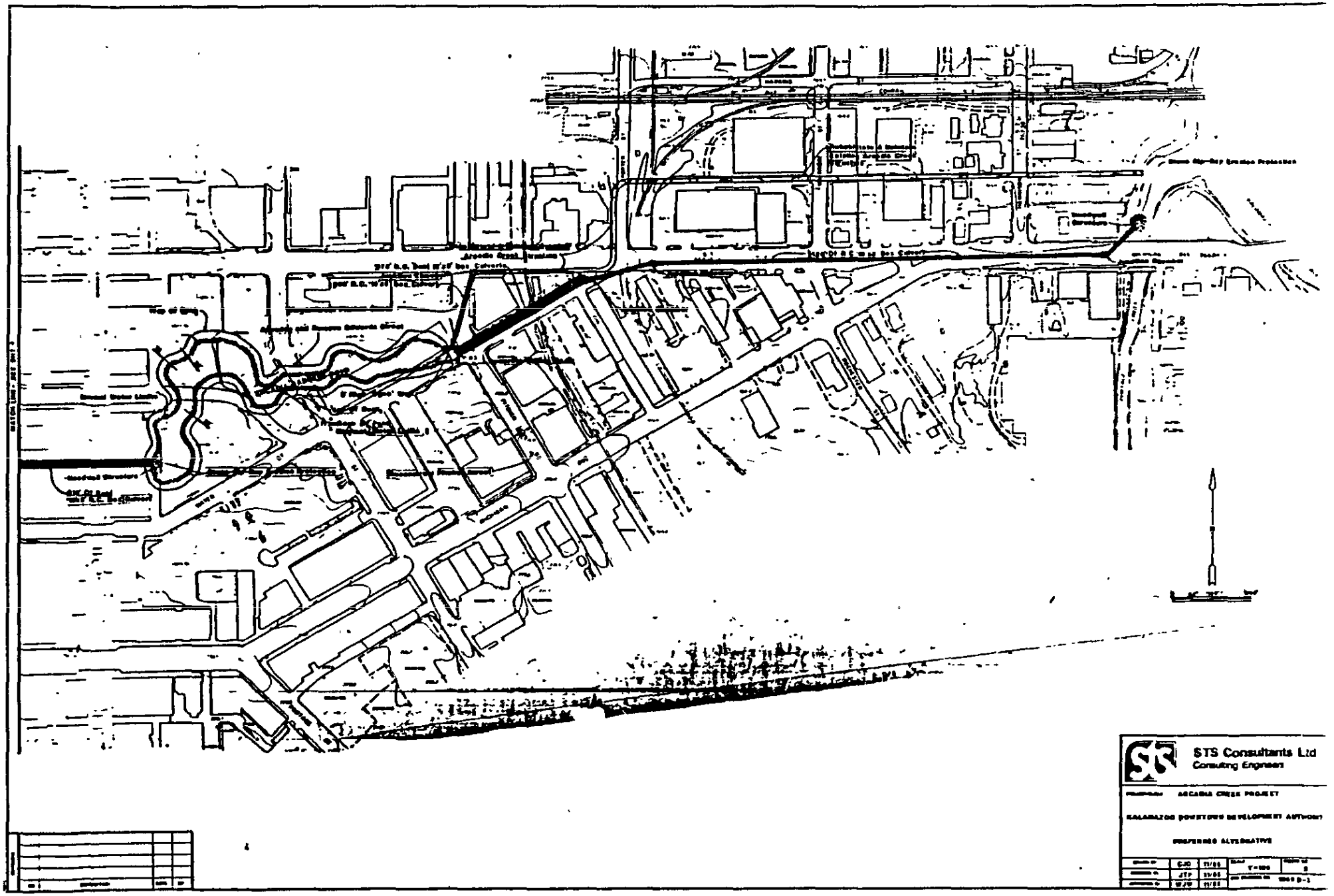
ARCADIA CREEK PROJECT

KALAMAZOO DOWNTOWN DEVELOPMENT AUTHORITY

SOIL BORING LOCATION MAP



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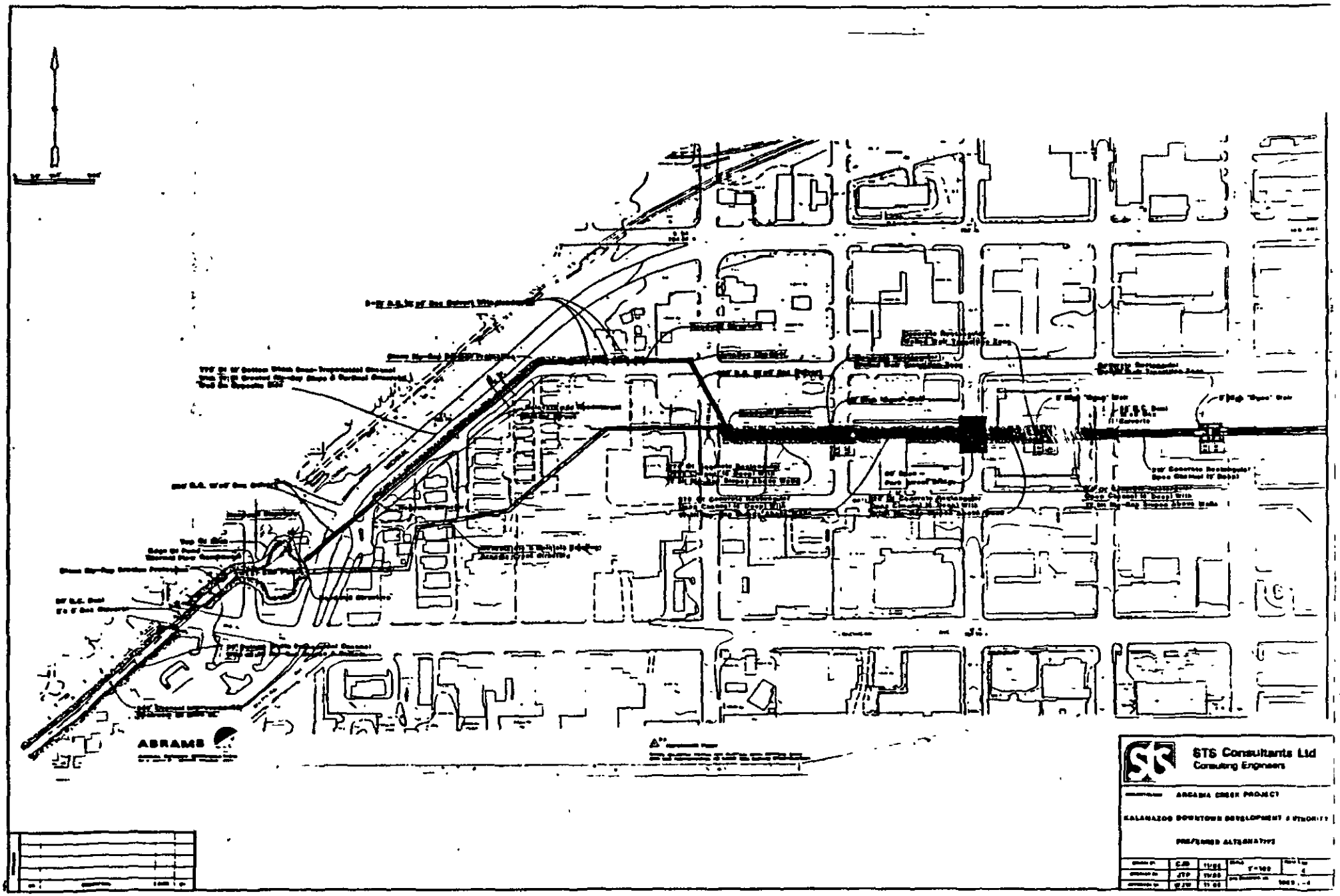
ARCADIA CREEK PROJECT

KALAMAZOO DOWNTOWN DEVELOPMENT AUTHORITY

PROPOSED ALTERNATIVE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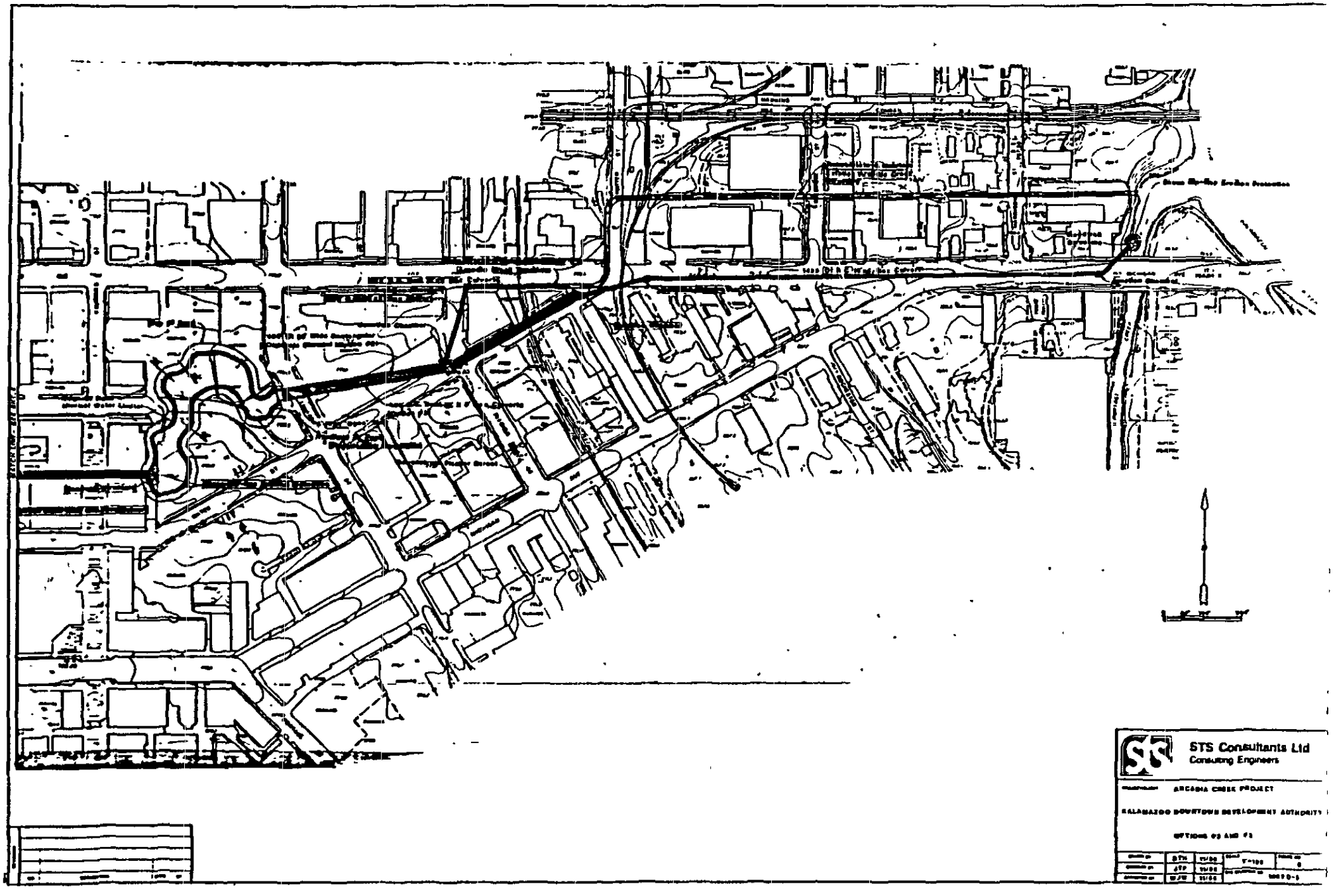
ARCADIA CREEK PROJECT
KALAMAZOO DOWNTOWN DEVELOPMENT AUTHORITY
PROPOSED ALTERNATIVE



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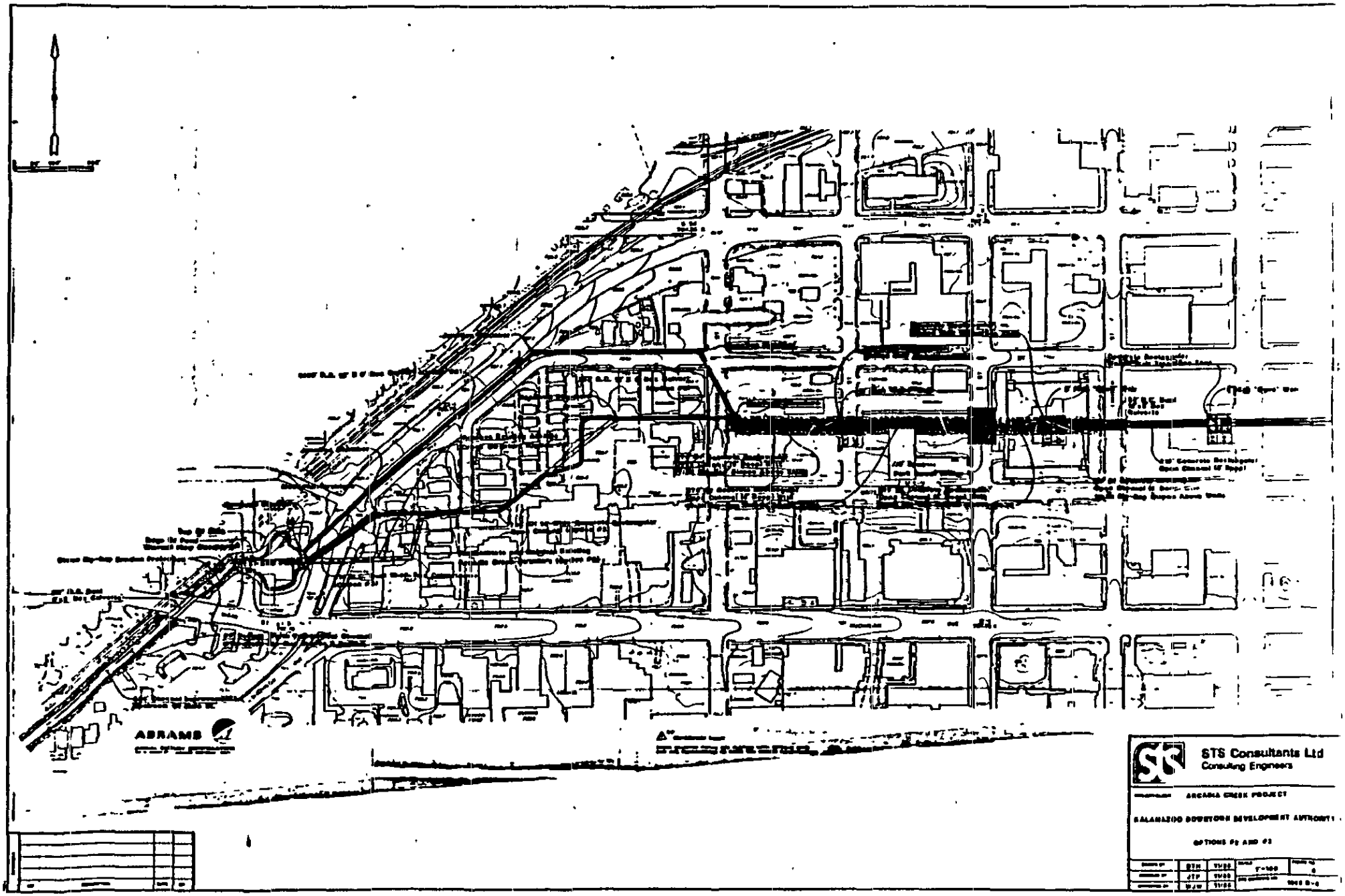
ARCADIA CREEK PROJECT

KALAMAZOO DOWNTOWN DEVELOPMENT AUTHORITY

OPTIONS #2 AND #3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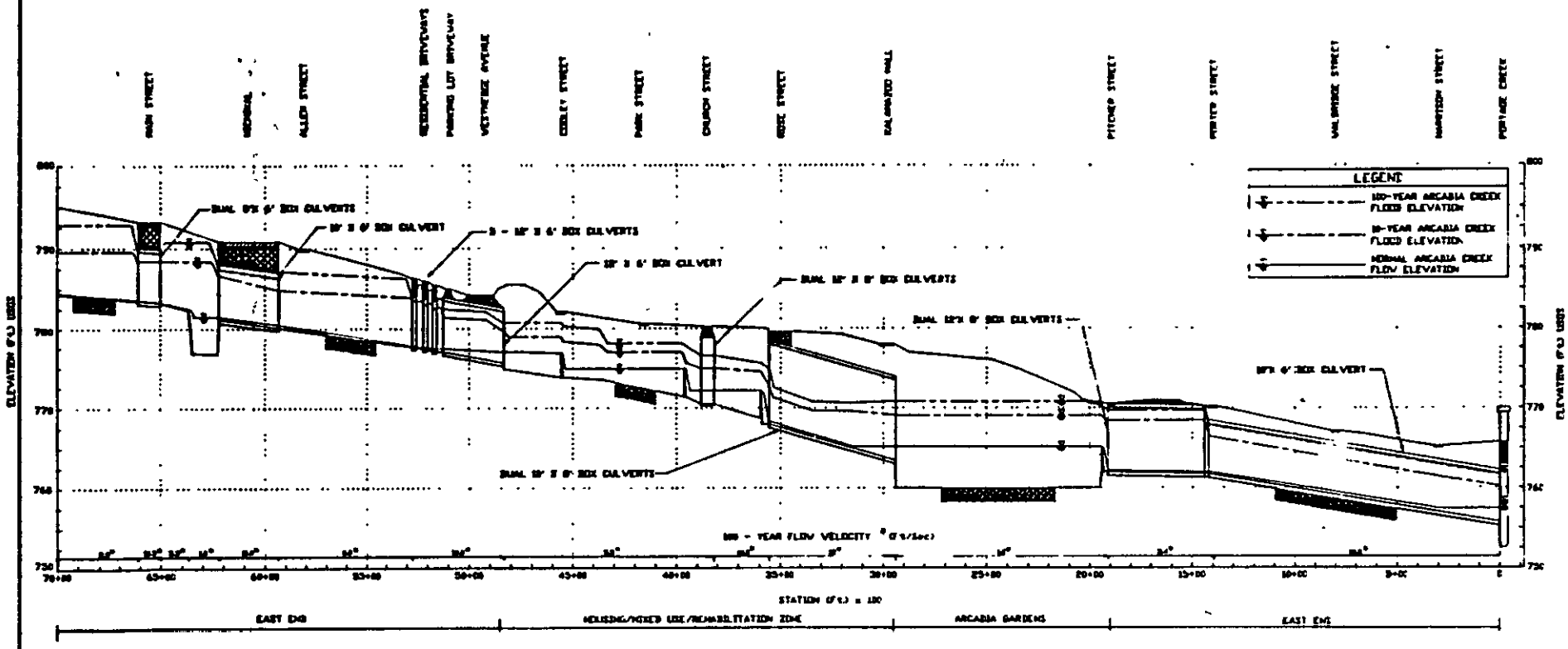
ARCADIA CREEK - PROPOSED STREAM PROFILE



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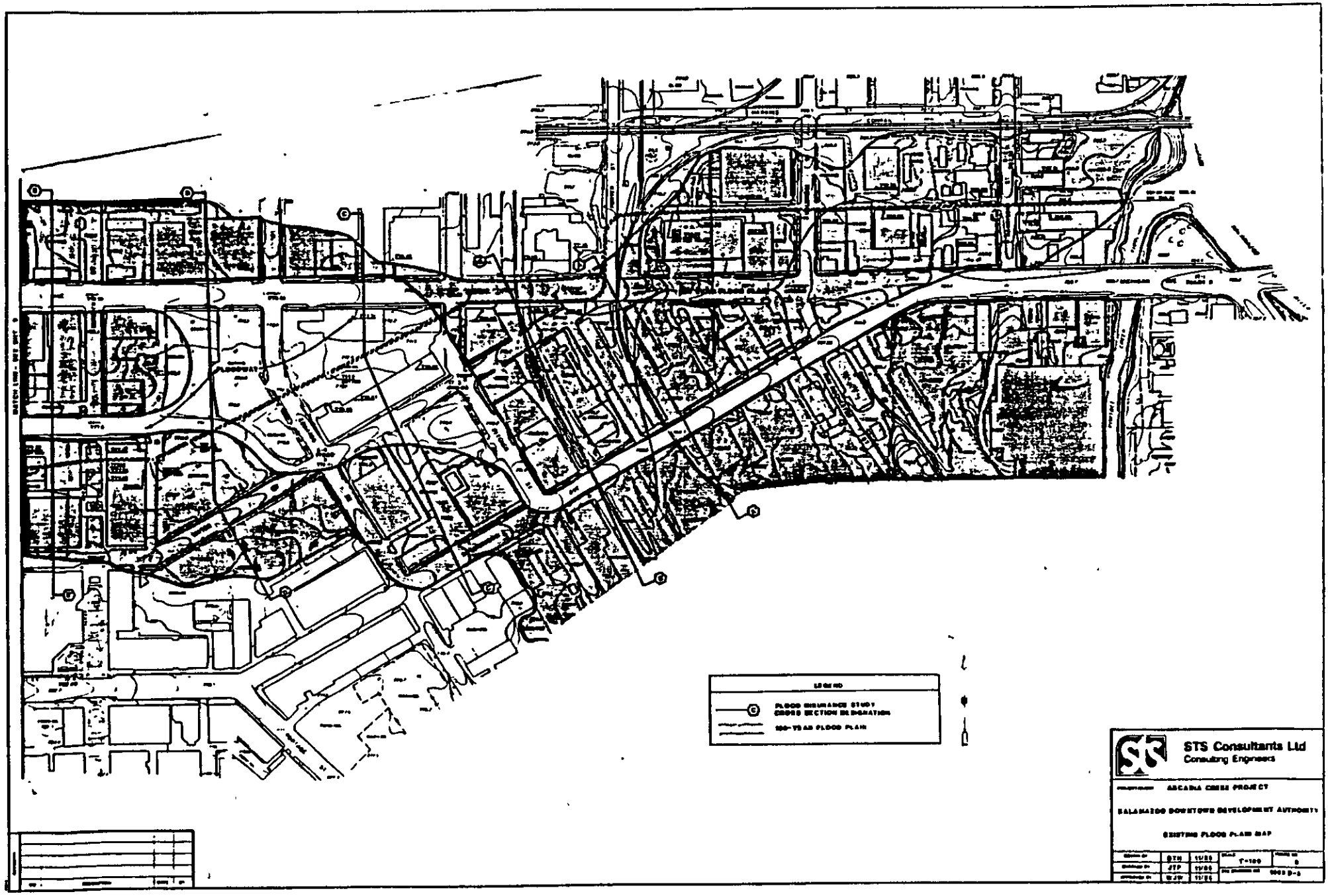
ARCADIA CREEK PROJECT

KALAMAZOO DOWNTOWN DEVELOPMENT AUTHORITY

PROPOSED STREAM PROFILE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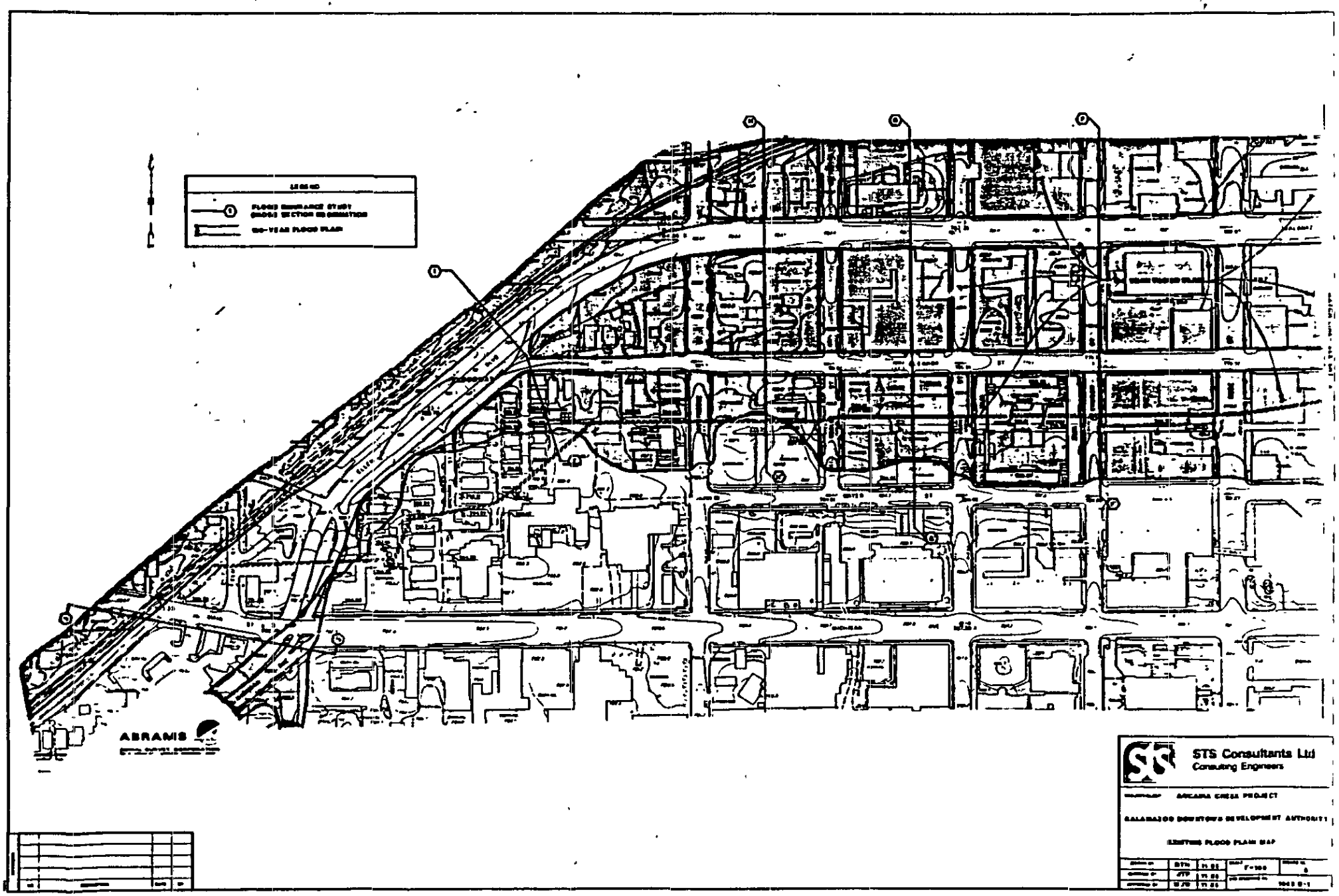
ARCADIA CREEK PROJECT
KALAMAZOO DOWNTOWN DEVELOPMENT AUTHORITY
EXISTING FLOOD PLAIN MAP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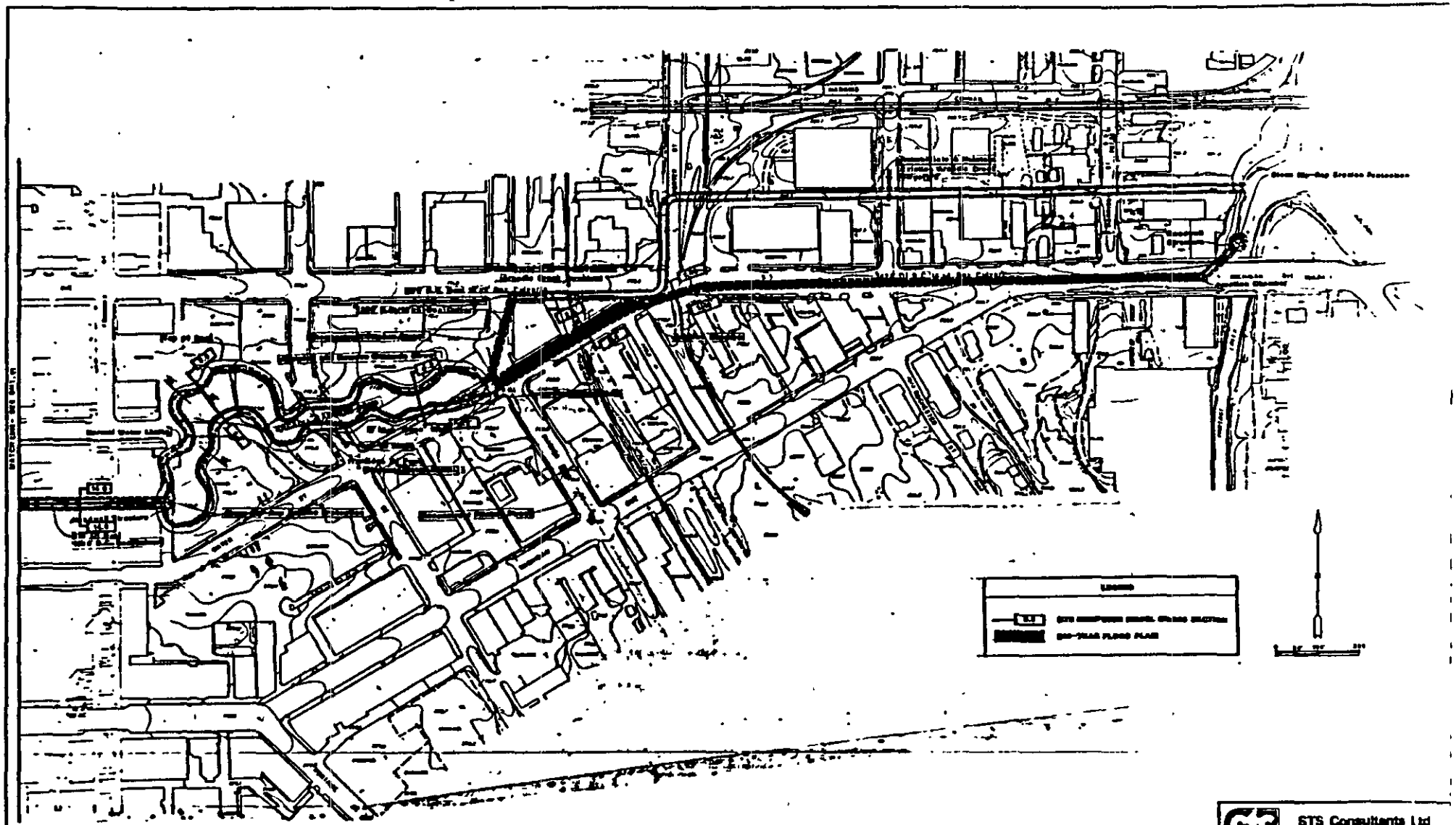

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NATURAL RESOURCES COMMISSION
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STATE OF MICHIGAN

JAMES J. BLANCHARD, Governor

DEPARTMENT OF NATURAL RESOURCES

STEVENS T MASON BUILDING
P O BOX 30028
LANSING, MI 48909

DAVID F HALES, Director

September 14, 1990

Mr. David Hendershott
STS
3340 Ranger Road
Lansing, Michigan 48906

Re: 89-12-444
Arcadia Creek
Stormwater Management Program
T2S, R11W, Section 15
City of Kalamazoo
Kalamazoo County

Dear Mr. Hendershott:

As we discussed in our September 5, 1990 meeting, your August 1, 1990 submittal of Computation Sheets and Data Analysis was to address the following point in our conditional permit (issued September 15, 1989):

> "Data shall be provided to the Department that demonstrates that overland flow from Michikal Avenue will reach the upper end of the project at Westnedge, or drainage along Westnedge shall be improved to funnel flow in the new channel".

The data submitted included several assumptions including:

1. A tailwater elevation of 780 NGVD. The existing regulatory floodplain elevation at this location is 784.9.

2. The grates for the Westnedge Interceptor will be clear of obstructions and are designed to intercept the revised 100-year discharge of 985 cfs without backing up or diverting flood waters.

Based on the accuracy of your design calculations and the new tailwater of 780, we find that your submittal addresses the above stated condition. We have no objection to the proposal to construct portions of the interceptor and leave it unattached for now. We will need to review the calculations for the new floodplain downstream of this interceptor to determine whether it meets the intent of the State's Floodplain Regulatory Authority, 1929 PA 245 as amended by 1968 PA 167.

If you have any questions, please feel free to contact me.

Sincerely,

Suzanne Elms-Barclay

Suzanne Elms-Barclay, P.E.
Floodplain Regulation
Land and Water Management Division
517-335-3187

SEB:bmw

APPENDIX B

Michigan Department of Natural Resources Letter

December 17, 1990

Ms. Suzanne Elms-Barclay, P.E.
State of Michigan Department of Natural Resources
Land and Water Management Division
Floodplain Regulations Section
Stevens T. Mason Building
P.O. Box 30028
Lansing, Michigan 48909

RE: Arcadia Creek Stormwater Management Project
MDNR PROJECT NO. 89-12-0444

Dear Ms. Elms-Barclay:

Conditional Permit No. 89-12-0444 dated September 15, 1989 issued by your office for the above referenced project requires the submittal of supplemental documentation prior to construction. This letter and attachments provide some of this information. Furthermore, please consider this a formal request for an extension of the existing permit deadline. Finally, please initiate your review of a Flood Insurance Study (FIS) Letter of Map Revision (LOMR).

A brief summary of project issues follows.

CONDITIONAL PERMIT SUBMITTALS

Permit conditions require the submittal of final design computations prior to construction. On August 1, 1990, STS submitted analyses in support of the Westnedge interceptor portion of the project. Acceptance of this submittal and approval for construction of this interceptor was provided by your office on September 14, 1990. Enclosed is a report summarizing final design calculations for the remainder of the creek system for your review.

STS Consultants Ltd.
Consulting Engineers

3340 Ranger Road
Lansing, Michigan 48906
517.321.4964/Fax 517.321.2132

Final design drawings are expected to be completed during the month of December. As required by the conditional permit, a copy of these drawings will be provided to your office when they are ready.

DESIGN CONCEPT CONFIGURATION

The basic system concept has remained unchanged from the document submitted to you as part of the September 15, 1989 Permit. However, refinements to the proposed river corridor have been incorporated into the design basis to accommodate a myriad of infrastructure conflicts. One notable conflict involved numerous utilities in Michigan Avenue at the lower reaches of the proposed river corridor. To alleviate this conflict and the traffic problems that would ensue during construction, the lower portion of the new river corridor was rerouted. The remainder of the system is essentially the same as originally proposed with minor configuration changes to accommodate right-of-way and aesthetic concerns.

The final concept has the same hydraulic conveyance as the concept which was submitted prior to issuance of the permit on September 15, 1989. It is important to note that the final concept produces a tailwater condition at the downstream end of the Westnedge interceptor which satisfies design basis assumptions as indicated in your September 14, 1990 letter.

MDNR PERMIT EXPIRATION: DEADLINE EXTENSION REQUEST

Please consider this a formal request for an extension of the expiration date for Permit No. 89-12-0444 which is scheduled to expire on December 31, 1990. Since construction of this system is likely to extend throughout 1991, and possibly into 1992, an appropriate permit expiration date is requested. Please let us know if there is any additional information which you will require to accomplish this request.

LETTER OF MAP REVISION REQUEST

Construction activities adjacent to the new creek corridor will require a Letter of Map Revision (LOMR) from the Federal Emergency Management Agency (FEMA). As you know, construction of this project will remove adjacent properties from the floodplain. It is proposed in early 1991 that construction of buildings adjacent to the creek corridor would begin concurrent with the

construction of the new creek corridor. As such, the Kalamazoo Downtown Development Authority would like to apply for a conditional LOMR based upon the documentation provided herein, and documentation previously submitted to your office. It is our understanding that your office takes part in the CLOMR review process. A separate formal request for a CLOMR will be submitted to FEMA this week. If there is anything that your office will need to expedite the CLOMR review process, please let us know.

If you have any questions regarding the enclosed information, please call Dave Hendershott at 321-4964 or Bill Weaver at 800-837-7871.

Sincerely,

STS CONSULTANTS, LTD.

David E. Hendershott
Assistant Group Manager

William J. Weaver, P.E.
Vice President
Water Resources Group

cc: Ken Nacci, KDDA
Orlin Loen, City of Kalamazoo
Ms. Kim Rice, MDNR - Plainwell District

ARCADIA CREEK PROJECT

Preliminary Engineering Feasibility Report

Volume I

Report

Project

ARCADIA CREEK PROJECT

PRELIMINARY ENGINEERING AND FEASIBILITY REPORT

Client

KALAMAZOO DOWNTOWN DEVELOPMENT AUTHORITY
132 NORTH KALAMAZOO MALL, SUITE 217
KALAMAZOO, MICHIGAN 49007

Project # 1069

Date January 21, 1987

STS Consultants Ltd.
Consulting Engineers

3340 Ranger Road
Lansing Michigan 48906
(517) 321 4964

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I

EXECUTIVE SUMMARY

The northern half of the City of Kalamazoo Central Business District has experienced stagnant growth and flooding problems. Improvements to the Arcadia Creek are proposed to resolve the flooding problems that have occurred, and to create a water amenity to create public spaces and help spur development. Preliminary engineering investigations were performed to identify the dimensions and configuration of creek improvements to meet the project goals.

The engineering challenge of this project was to provide a system which would satisfy the aesthetic goals of the project during low flow conditions, while providing for the safe passage of flood water. The difference between normal dry weather conditions and flood conditions is substantial. The resultant system is open for approximately 50% of its length and includes five ponds. The project is subdivided into five development zones: 1) East End, 2) Arcadia Gardens, 3) Rehabilitation/Mixed Use, 4) Housing Zone, and 5) West End. Each zone has a unique character with an overall objective of providing a water amenity while safely discharging flood flows.

Several alternative creek improvement options were investigated during the coarse of the project. The evaluation criteria utilized to assess each option included: water surface fluctuations, reliability, maintenance, constructability, flexibility, conformity with concept plan, stormwater management, water quality, safety, low flow character, flood flow velocity, and cost.

Following is a brief discussion of the preferred alternative for each development zone:

a. East End - The East End is proposed to consist of a box culvert relief sewer between Pitcher Street and the Portage Creek. Furthermore, the existing Arcadia Creek structure will be rehabilitated and the combination system will have the capacity to discharge the 100-year flood flow. The new structure will be constructed in the Kalamazoo and Michigan Avenues and Water Street rights-of-way.

b. Arcadia Gardens - The gardens area, which extends between Pitcher Street and the Burdick Street Mall, would consist of a lake. This lake would be approximately 6 feet deep during dry weather conditions and approximately 9 feet deep during flood flow conditions. Erosion protection in the form of stone riprap would be provided around the perimeter of the

lake to guard against the anticipated lake fluctuation. The lakes would be supported by a small dam structure located immediately upstream of Pitcher Street.

c. Rehabilitation/Mixed Use Zone - This development zone would consist of the construction of a reinforced concrete box culvert and open rectangular concrete flume. This zone extends between the Burdick Street Mall and Church Street. Note that a small dam would be constructed at Rose Street and the water surface upstream of this location would be artificially supported at a depth of approximately 3 feet during dry weather conditions.

d. Housing Zone - This zone extends between Church Street and Westnedge Avenue. The proposed creek improvement in this area would consist of a concrete flume with the completion of initial construction. The long term plan would include pedestrian walkways and extensive landscaping along the creek channel. The 10-year flood elevation would be accommodated within the flume and the 100-year flood flows would be accommodated with the entire water amenity cross section including the pedestrian areas. Two small dams would be constructed within this area to provide for the artificial support of 3 foot deep ponds during normal dry weather conditions. The fluctuation of the water surface would be limited to 3 feet during the 10-year flood and five feet during the 100-year flood. Finally, a freeboard would be provided between the 100-year flood elevation and the lowest floor elevation of develoment adjacent to the creek to provide a factor of safety.

e. West End - The West End begins at Westnedge Avenue and ends upstream of Main Street. Improvements in this area would consist of an open channel adjacent to Michikal Avenue with the existing Arcadia Creek structure serving as a flood relief system. The Main Street bridge would be upgraded and channel improvements would be constructed for approximately 500 feet upstream of Main Street to provide for the channelization of flood waters into the new Arcadia Creek system.

The resultant creek improvements would have the capacity to transport the 100-year flood event and would result in a reduction in floodway and flood plain areas throughout the northern central business district. Therefore, the developability of lands adjacent to the Arcadia Creek would be increased and flood insurance requirements would be reduced for the area. The opinion of probable cost to implement the creek improvements is $7,578,000.

It is anticipated that the construction plans and specifications would be developed during 1987 and that the construction of the creek improvements would be accomplished during 1988 and 1989.

Engineering issues which are addressed in this report include dry weather flow conditions, flood conditions, geological issues, soils, parameters, and general considerations such as utility interferences and road reconstruction. The engineering studies which form the basis of design will be utilized for the development of the final design, and in the application to Federal, State, and local governmental agencies for construction permits. Finally, the documentation provided herein will be utilized to apply to the Federal Emergency Management Agency for flood plain mapping amendments for the northern CBD.

1.0 INTRODUCTION

After many years of planning and study efforts, it was concluded that the northern half of the City of Kalamazoo's Central Business District (CBD) lags sharply behind the socio-economic vitality of the CBD located south of Michigan Avenue. Furthermore, serious infrastructure shortcomings, particularly in the stormwater management arena, have been identified. A plan was devised to address these problems with the following specific goals: 1) to stimulate new private investment in the north CBD; and, 2) to solve the flooding problems now evident in the north CBD with an effective stormwater management system. The Arcadia Creek project area is illustrated on Figure 1.

The conceptual plan for the improvement of the Arcadia Creek proposes to meet the physical and economic goals of the project by utilizing the Arcadia Creek as a focal point for development in the north CBD. Specifically, the Arcadia Creek would be redesigned as an aesthetically pleasing open channel amenity which would also provide for the control of stormwater. This channel would be open where possible in the CBD with a series of small dams to limit the variation in water surface. Attractive development sites would be created along the creek corridor, and new markets would be created for office, retail, and residential development. Furthermore, the economic vigor of the north mall would be recharged due to its strategic location in the creek corridor. Finally, a streetscape plan would be developed to enhance the north CBD environment, the north and south CBD would be fused together with an improved pedestrian network and landscape improvements, and a long term solution to the existing and projected future parking problems would be developed.

The objective of the preliminary engineering and feasibility study is to refine the conceptual ideas for the Arcadia Creek improvements. Furthermore, the physical dimensions required to manage the environmental forces to which the project will be

subjected were developed. The resultant engineering improvements to the Arcadia Creek corridor have been molded to be compatible with the aesthetic goals of the project. This report outlines the engineering studies which were performed in the development of the selected alternative and serves as the basis of design for the project. Furthermore, the technical documentation provided herein will serve as the basis for application to the Federal Emergency Management Agency to reduce the existing flood plain such that it is contained within a controlled corridor centered upon the improved Arcadia Creek.

Engineering efforts which are summarized in this report include the following:

a. Data base summary
b. Development of flood flows
c. Arcadia Creek low flow analysis
d. Geotechnical investigations
e. Development of alternatives
f. Evaluation of alternatives
g. Preferred alternative

In addition to documenting physical information which is available regarding the design of the Arcadia Creek improvements, the preferred alternative summary presents the expected hydrologic and hydraulic performance of the proposed creek, construction sequencing, construction scheduling, and anticipated soil conditions. Therefore, this report is a prelude to the final design of the Arcadia Creek improvements, and provides documentation of the physical constraints and parameters which are necessary for the design process.

2.0 DATA BASE SUMMARY

An engineering data base was compiled by STS to provide basic information to allow for the development, evaluation, and selection of sound alternative concepts to meet the objectives of the project. The Arcadia Creek project area is an urban setting; therefore, a large amount of engineering data is available. Furthermore, due to the flooding problems which occurred in the past, an extensive amount of engineering studies were available at the start of this project.

The data which was collected for the project from numerous public and private agencies and concerns, and the data which was developed as part of this project, was compiled into a comprehensive data base. A summary of the data base which is available at the offices of STS Consultants, Ltd. in Lansing, is provided in Appendix A. This data base summary includes a description of the available information, a description of the organization which provided the information, a contact phone number, and comments. Information which was collected and developed falls within one of seven general classifications: 1) governmental agency data, 2) private utility data, 3) land survey data, 4) hydrologic and hydraulic data, 5) geotechnical data, 6) mapping, and 7) miscellaneous information.

3.0 DEVELOPMENT OF FLOOD FLOWS

3.1 General

Hydrologic conditions in the Arcadia Creek watershed have been studied thoroughly as part of projects which were performed in the past (Reference No's. 1, 2, and 3). These studies provide insight to the flood discharge/frequency relationship for the creek at various locations. The objective of hydrologic analyses performed as part of this project was to compile the various studies which were performed in the past and to select flood discharges for the 10- and 100-year recurrance interval flood events for the reach of the Arcadia Creek to be improved. The accuracy and discrepancies between previous studies were addressed as part of this project.

The Arcadia Creek watershed includes an area of approximately 7.4 square miles and originates near 8th Street in Oshtemo Township. The watershed is illustrated on Figure 2. The upper reaches of the watershed are rural in nature, with some residential and commercial development in places. The central portion of the watershed is a mixture of suburban and urban character, and includes the Western Michigan University complex. These two areas of the watershed are characterized by gently rolling topography. The lower reaches of the Arcadia Creek watershed include the project area, which is fully urbanized. The Arcadia Creek discharges to the Portage Creek near its mouth at the Kalamazoo River. Approximately 90% of the creek flows underground in a tunnel through the project area.

The creek within the project area responds rapidly to rainfall as a result of the urbanized nature of downtown Kalamazoo. The creek is typical of urban areas in that it

has to transport large flood flow amounts during severe rainstorms.

Flood flow development is an important aspect of this project in that the resultant discharge rates are a determining factor for the size and configuration of improvements to the Arcadia Creek. Furthermore, it is necessary to reduce the existing flood plain and floodway of the Arcadia Creek throughout the proposed development area. Thus, new developments would not infringe upon the flood plain and the flood carrying capacity of the creek. Therefore, the hydrologic analysis performed for this project will serve as the basis of application to State and Federal regulatory authorities to reduce the Arcadia Creek flood plain through the central business district, and increase the developability of lands adjacent to the creek.

The scope of engineering analyses performed for the hydrology study was as follows: 1) identify the extent of flooding problems which currently exist in the project area, 2) investigate previous hydrology studies which were performed for the Arcadia Creek watershed to verify their accuracy and resolve discrepancies which may exist, 3) develop refined flood discharges and the distribution of flood discharges throughout the study area to be utilized as the basis of design for the project, and 4) provide documentation for the development of flood discharges for use in applications for development to State and Federal governmental agencies.

3.2 Previous Hydrology Studies

Two previous flood related hydrology studies were performed for the Arcadia Creek watershed. The first study was performed as part of the City of Kalamazoo Flood Insurance Study (Reference 1). This study serves as the governmental regulatory guide for projects to be constructed in or

adjacent to the Arcadia Creek. The second study, entitled, "Master Plan for Storm Drainage" (Reference 3), was prepared as part of a feasibility study for the improvement of the Arcadia Creek. The flood discharges generated in each of these studies were similar for given flood events; however, there were several discrepancies. Each of these studies was reviewed for content and accuracy prior to the performance of refined hydrologic studies for the Arcadia Creek project. Following is a brief description of each of these previous studies:

a. City of Kalamazoo Flood Insurance Study (FIS) - The City of Kalamazoo FIS includes flood flow/frequency relationships for the Arcadia Creek at several locations throughout the watershed. Table 3-1 summarizes the FIS flood discharges for the Arcadia Creek at its mouth downstream of the project area.

TABLE 3-1
CITY OF KALAMAZOO FLOOD INSURANCE STUDY
SUMMARY OF FLOOD FLOWS AT MOUTH OF ARCADIA CREEK

RECURRANCE INTERVAL	FLOW RATE (cfs)
10-Year	665 cfs
50-Year	920 cfs
100-Year	1,020 cfs
500-Year	1,285 cfs

The Kalamazoo FIS utilized the Soil Conservation Service TR-20 computer model (Reference 4) to estimate the flood flows. These flows were adopted by the City of Kalamazoo, the State of Michigan Department of Natural Resources (MDNR), and the Federal Emergency Management Agency (FEMA).

The Kalamazoo FIS was performed in the early 1980's, and a review of the parameters utilized in the development of flood flows indicated that the character of the watershed had not changed substantively since the FIS was published. Therefore, these flood flows would be satisfactory for the design of the Arcadia Creek improvements. However, the Kalamazoo FIS does not provide a distribution of flood flows throughout the project area. Any reduction of flood flow proceeding upstream from the mouth of the Arcadia Creek could result in reduced civil works requirements and project cost. Therefore, a refined analysis should be performed to estimate if flood discharges would reduce proceeding upstream from the mouth of the creek.

b. Master Plan for Storm Drainage - This master plan was completed in the year 1976 and utilized unit hydrograph methods to estimate the hydrologic conditions of the Arcadia Creek watershed. Results of this analysis are summarized on Table 3-2.

TABLE 3-2
MASTER PLAN FOR STORM DRAINAGE*
ARCADIA CREEK FLOW DISTRIBUTION

CREEK REACH	100-YEAR FLOW RATE (cfs)
Main St. to Westnedge Ave.	740 cfs
Westnedge Ave. to Park St.	800 cfs
Park St. to Church St.	820 cfs
Church St. to Burdick St.	940 cfs
Burdick St. to Edwards St.	970 cfs
Edwards St. to Pitcher St.	1,030 cfs
Pitcher St. to Kalamazoo River	1,075 cfs

* Reference 3

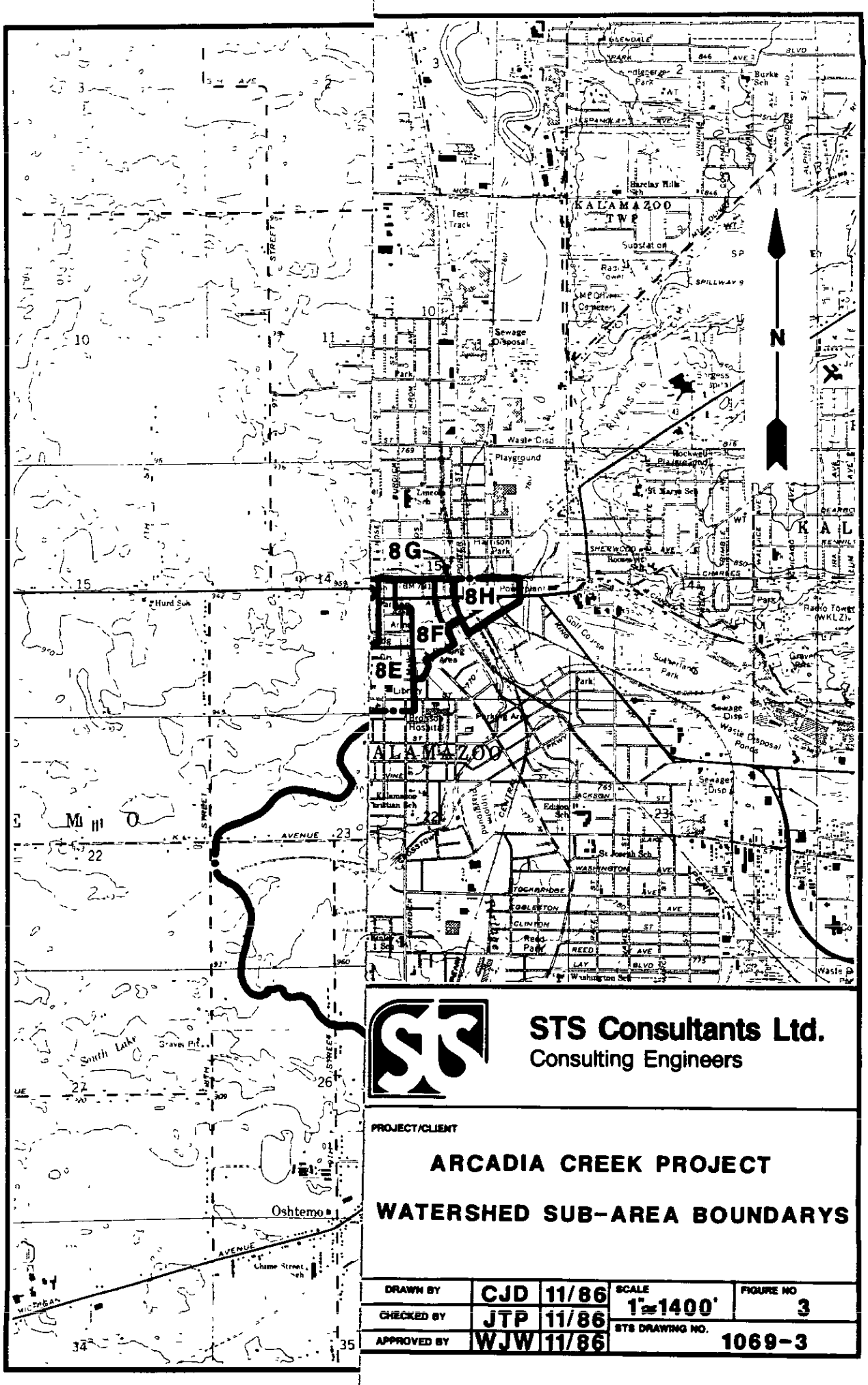
The master plan for storm drainage summarizes 100-year flood flows at various locations throughout the watershed. The hydrologic methodology which was employed for this master plan study resulted in a 100-year flood discharge of 1,075 cfs at the creek mouth, which is slightly greater than the Kalamazoo FIS discharge of 1,020 cfs at this location. Since documentation of the analysis performed for the master plan study was not readily available, and the technique utilized was different from that fostered by the State and Federal regulatory agencies, it was decided to perform a refined hydrology study for the Arcadia Creek project to document the distribution of flows throughout the study reach.

3.3 Development of Flood Discharges

A refined hydrology study was performed to identify peak flood discharges at selected locations. The Arcadia Creek watershed was subdivided into 16 sub-basin areas. Each of these areas contributes runoff to the Arcadia Creek in a unique manner. Figure 3 illustrates the delineation of each of the sub-basins. The objective of the hydrologic analysis was to obtain a refined estimate of flood flows at various locations throughout the Arcadia Creek study area. The same computer analysis methodology which was utilized in the City of Kalamazoo FIS was applied to the Arcadia Creek project. Furthermore, the watershed parameters utilized in the FIS were transferred to the refined hydrology study.

3.3.1 Hydrologic Analysis Methodology

The City of Kalamazoo FIS hydrologic study utilized the Soil Conservation Service TR-20 (Reference 4) computer program to estimate flood flows. This program



STS Consultants Ltd.
Consulting Engineers

PROJECT/CLIENT

ARCADIA CREEK PROJECT

WATERSHED SUB-AREA BOUNDARYS

DRAWN BY	CJD	11/86	SCALE 1"=1400'	FIGURE NO 3
CHECKED BY	JTP	11/86	STS DRAWING NO. 1069-3	
APPROVED BY	WJW	11/86		

79682

computes stormwater runoff which would result from a given rainstorm event. Parameters which this program considers in defining the rainfall-runoff process include precipitation, land use, soil types, topography, time of concentration, and drainage area. The FIS computer model was obtained from the technical appendices of the FIS provided by the Federal Emergency Management Agency. This computer model was input to the STS computer system and the model was refined to include a further subdivision of the portion of the watershed which includes the City of Kalamzoo CBD. Therefore, the resultant hydrologic analysis is compatible with the methodology and flood discharges which have been adopted by the local, State, and Federal governmental agencies which will regulate the flood plain aspects of the Arcadia Creek improvement project.

In developing peak flow rates throughout the Arcadia Creek watershed, time-history hydrographs, which describe the quantity of runoff which result from a rainfall event over a period of time, were developed for each of the 16 sub-basins which make up the watershed. Each of these hydrographs was then added together on a uniform timescale to account for different sub-basin characteristics and lag times between the occurrance of peak flows in each area. Hydrologic computations performed by the TR-20 computer program simulate the progression of flood flows over time as flood water proceeds from the uppermost portion of the watershed to the mouth of the creek.

3.3.2 Hydrologic Analysis Results

The storm events which were selected for the development of flood flows included the 10-, 50-, 100-, and 500-year flood events. The total precipitation depth for these events are approximately 3.75, 4.70, 5.15, and 6.15 inches, respectively, for a storm duration of 24 hours (Reference 5). Table 3-3 presents a summary of the other hydrologic parameters which were utilized in the simulation of flood flows. These parameters include drainage area, time of concentration, and runoff curve number (RCN). The RCN is an index value which reflects the land use and soil types, and is utilized in the TR-20 model to estimate the distribution of precipitation between infiltration and runoff.

A comparison of the flood discharges estimated as part of this study with the flood discharges of the Kalamazoo FIS and the "Master Plan" study is provided on Table 3-4. This comparison is for the 100-year event and illustrates that the updated Arcadia Creek hydrology study is in agreement with the Kalamazoo FIS. The "Master Plan" hydrology study results vary significantly from the values of the current study. For example, the 100-year flood discharge that applies at Main Street is 31% higher in the updated hydrology study than the master plan discharge. This would have a significant impact upon the design of proposed structures.

It was concluded that the higher flows associated with the updated hydrology study would be selected for the basis of design such that these flows are compatible with the methodology which was utilized for the Kalamazoo FIS. These flows have already been approved by the local, State, and Federal regulatory agencies which will eventually have to approve the Arcadia Creek improvements.

TABLE 3-3

ARCADIA CREEK PROJECT

SUMMARY OF HYDROLOGIC PARAMETERS

Watershed Sub-Basin Designation	Drainage Area (Acres)	Time of Concentration (Hrs.)	Runoff Curve No.*
Area 1	1550	4.4	73
Area 2	615	2.0	73
Area 3	425	1.5	86
Area 4	1450	2.6	72
Area 5	50	0.4	76
Area 6	65	0.6	83
Area 7	95	0.6	79
Area 8	215	0.8	86
Area 8A	33	0.5	83
Area 8B	52	0.4	85
Area 8C	34	0.4	88
Area 8D	16	0.3	98
Area 8E	52	0.5	88
Area 8F	30	0.4	98
Area 8G	10	0.3	98
Area 8H	20	0.4	98
TOTAL	4712	16.2	75.6**

* Index value which reflects land use and soil types.

** Weighted RCN.

TABLE 3-4

ARCADIA CREEK PROJECT

COMPARISON OF 100-YEAR FLOOD FLOWS

Creek Location	100-Year Peak Discharge (cfs) Master* Plan	Kalamazoo** FIS	Updated Study
Main St. to Westnedge Ave.	740	-	985
Westnedge Ave. to Park St.	800	-	990
Park St. to Church St.	820	-	995
Church St. to Burdick St.	940	-	1005
Burdick St. to Edwards St.	970	-	1015
Edwards St. to Pitcher St.	1030	-	1015
Pitcher St. to Kalamazoo River	1075	1020	1020

* Reference 3

** Reference 1

Table 3-5 presents a hydrologic analysis summary. The flood discharges presented in this table represent the selected flood flows for design purposes.

TABLE 3-5
ARCADIA CREEK PROJECT
HYDROLOGIC ANALYSIS SUMMARY

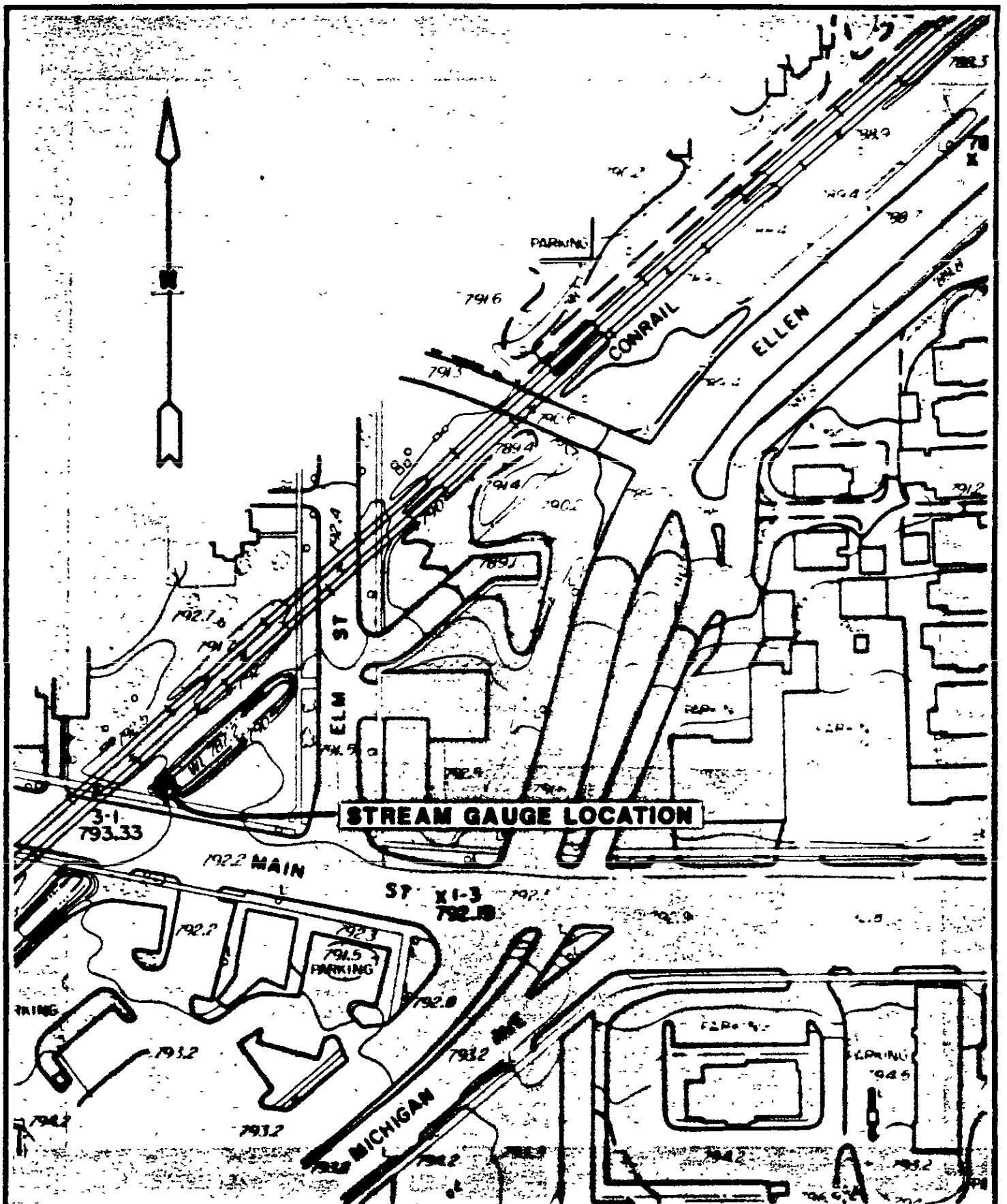
Creek Location	Flood Discharge (cfs) 10-YR	50-YR	100-YR	500-YR
Main St. to Westnedge Ave.	595	860	985	1275
Westnedge Ave. to Park St.	600	865	990	1285
Park St. to Church St.	605	870	995	1290
Church St. to Burdick St.	610	880	1005	1300
Burdick St. to Edwards St.	615	885	1015	1310
Edwards St. to Pitcher St.	620	885	1015	1310
Pitcher St. to Kalamazoo River	620	890	1020	1315

4.0 ARCADIA CREEK STREAM FLOW CHARACTER

4.1 General

Arcadia Creek discharges small amounts of water during dry weather conditions. During rainfall events, the creek reacts quickly and produces flood flows which periodically result in flooding of downtown areas. The objective of the Arcadia Creek improvement project is to develop a creek corridor which has the capacity to safely transport flood flows on the one hand, while maintaining an aesthetically pleasing flow condition during dry weather conditions. To accomplish this objective, a series of small dams are proposed throughout the creek corridor to artificially support water depth during dry weather conditions; however, these dams and associated appurtenances would have the capacity to handle the 100-year flood event.

In order to gain insight into the low flow character of the creek and the variability of base flow which would be expected throughout the year, a flow monitoring program was developed. As part of this program, flow-duration information was obtained and the relationship between precipitation and creek discharge was documented. To obtain the necessary information, a flow monitoring station was installed in the creek on the downstream side of the Main Street Bridge. The stream gauging station consists of a staff gauge and precipitation gauge. The creek gauge is located as illustrated on Figure 4. Daily readings of water surface elevations in the creek and precipitation were recorded for the period beginning December 12, 1985 and ending July 28, 1986.



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PROJECT NUMBER

ARCADIA CREEK PROJECT

STREAM GAUGE LOCATION MAP

DRAWN BY	CJD	11/86
CHECKED BY	JTP	11/86
APPROVED BY	WJW	11/86
SCALE 1"=100'	FIGURE NO. 4	
STS DRAWING NO. 1069-4		

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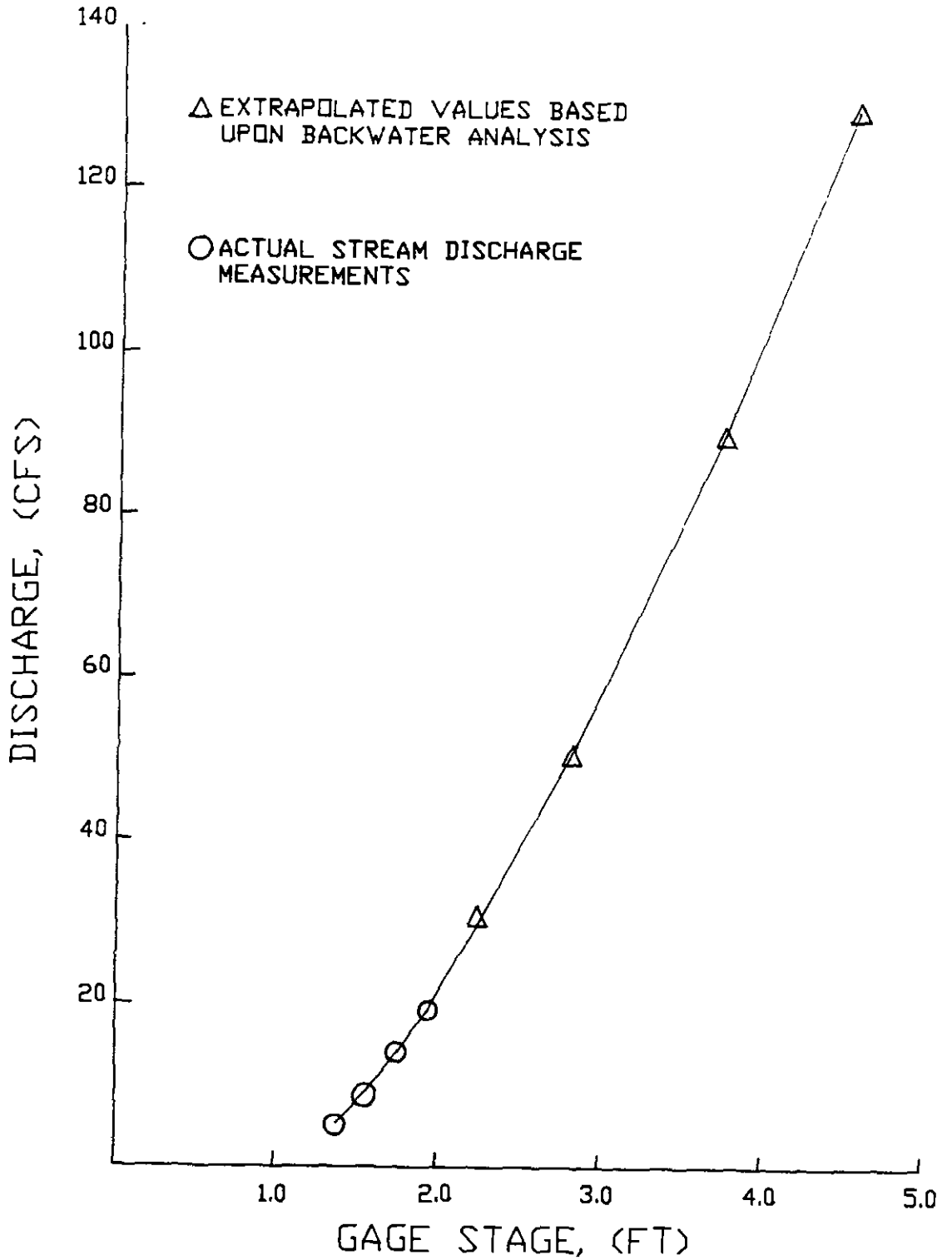
4.2 Stream Gauge Methodology

In order to convert staff gauge readings to discharge rates, the relationship between stage and discharge at the monitoring station was estimated. To accomplish this estimate, a stream discharge calibration was performed. This calibration consisted of field measurements to compute the discharge at a known stream depth. The stream cross section was divided horizontally into measured units and the water depth and velocity were measured for each unit. The results were then integrated to obtain total stream discharge. Calibration was performed at four discharge rates. The results of the calibration are illustrated on Figure 5.

The calibration process was performed up to a discharge of 20 cfs. The gauge calibration process was based upon a discrete set of four points. Stream flow never exceeded 20 cfs at the times the measurements were taken. Therefore, the stage-discharge rating curve was extended to higher discharge rates with a backwater analysis. This analysis extended between the Elm Street culvert and the stream gauge location. The U.S. Army Corp of Engineers' HEC-2 computer model (Reference 6) was utilized to establish a mathematical model for this reach of the creek. The parameters input to this computer model were adjusted until the resultant flood elevations from the backwater analysis matched the actual measured flow rates. Higher discharge rates were then input to the model to estimate the flood elevation/discharge relationship for flows above those which were actually measured. The results of this analysis are illustrated on Figure 5.



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PROJECT/CLIENT

ARCADIA CREEK PROJECT

DISCHARGE RATING CURVE

DRAWN BY	DTH	11/86
CHECKED BY	JTP	11/86
APPROVED BY	WJW	11/86
SCALE: AS SHOWN	FIGURE NO.: 5	
STS DRAWING NO.: 1069-5		

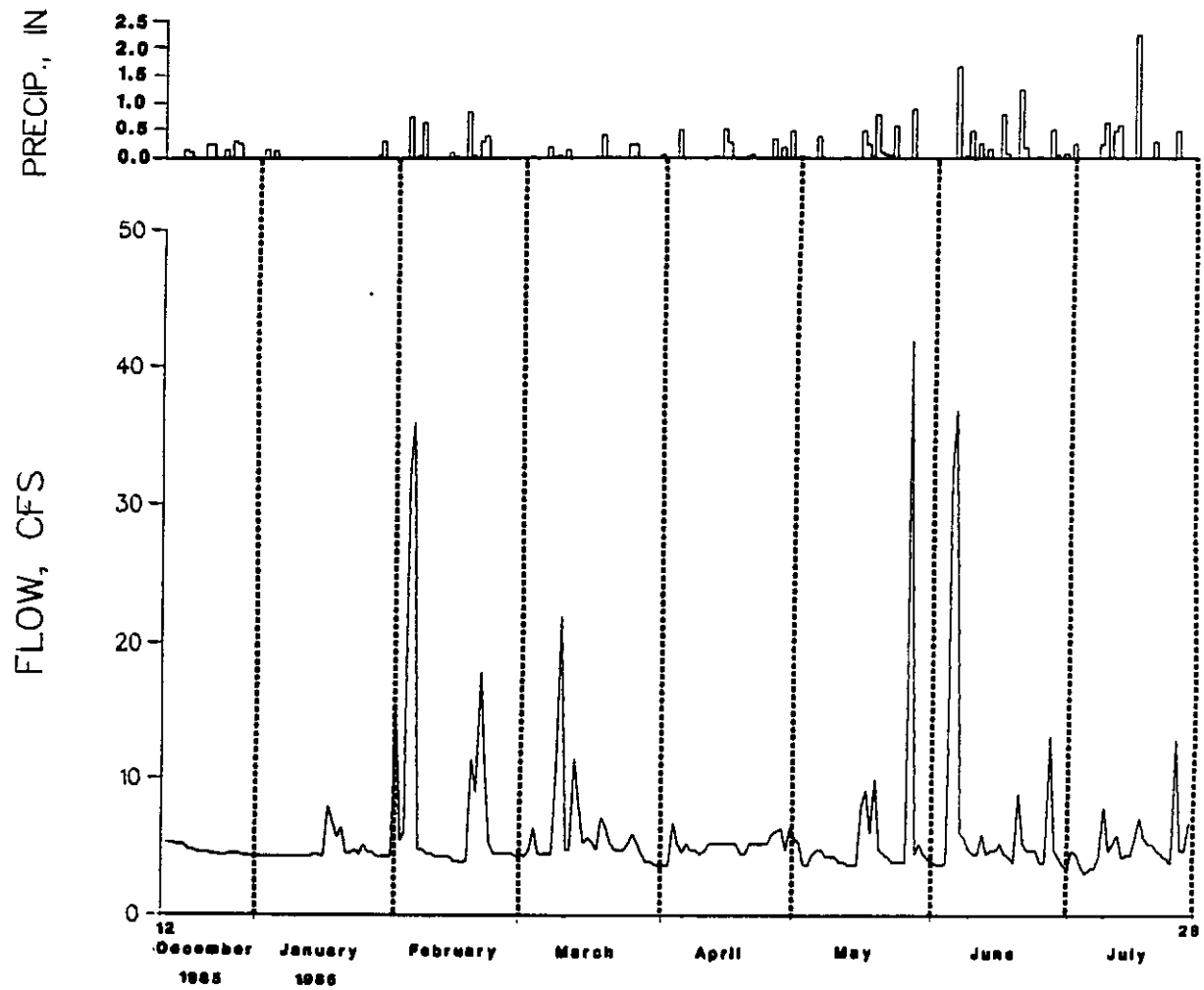
4.3 Low Flow Monitoring Results

The recorded water surface elevations were converted to discharge rates using the rating curve presented on Figure 5. A statistical analysis was then performed to estimate the probability of exceedance of a given flow on a daily basis. The daily flow and precipitation data are presented graphically on Figure 6. Note that stage readings were taken once daily; therefore, peak flows which occur between gauge readings are not represented on the discharge hydrograph. Thus, the resultant flow-duration analysis does not always reflect the peak discharges which occurred during periods of rainfall. However, the resultant flow-duration curve will be sufficiently accurate to identify the normal base flow of the creek.

The results of the flow-duration analysis are presented on Figure 7. These results indicate that the Arcadia Creek base flow is approximately 4.0 cfs the majority of the time. Therefore, it is anticipated that a reasonable base flow for providing flushing of the proposed Arcadia Creek amenity should be available in all but dry years. Furthermore, as expected, the creek responds fairly quickly to rainfall events.

4.4 Verification of Hydrologic Analysis Accuracy

As discussed in Chapter 3.0, a computerized mathematical simulation of hydrologic conditions in the Arcadia Creek watershed was utilized to estimate the frequency/discharge relationship for the watershed. In order to provide confidence in the accuracy of the computer simulations which were performed, an actual rainfall event was monitored. Following is the verification process which was peformed:



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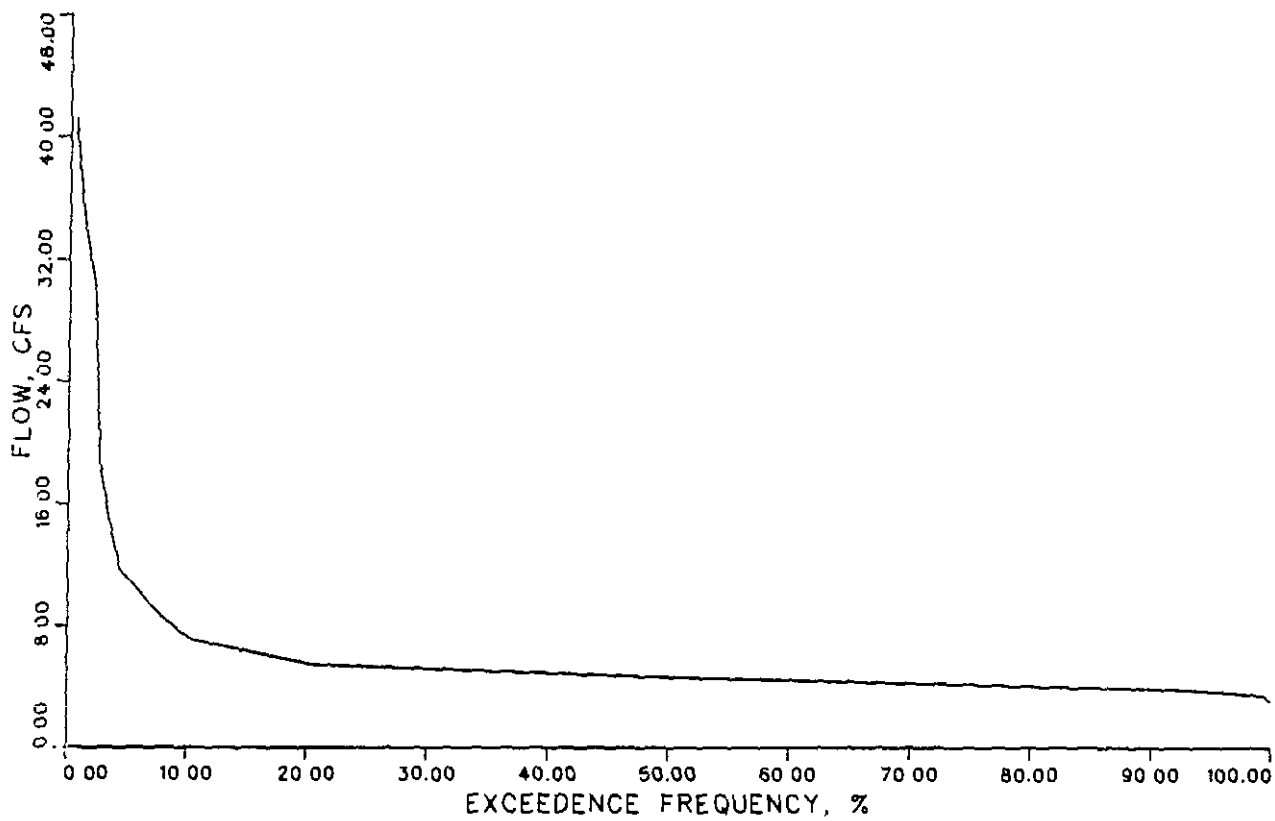
ARCADIA CREEK PROJECT
PRECIPITATION AND DISCHARGE SUMMARY

DRAWN BY	DTH	11/86
CHECKED BY	JTP	11/86
APPROVED BY	WJW	11/86
SCALE AS SHOWN	FIGURE NO. 6	
STS DRAWING NO. 1069-6		

79581



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PROJECT/CLIENT
ARCADIA CREEK PROJECT

FLOW-DURATION RELATIONSHIP

DRAWN BY	DTH	11/86
CHECKED BY	JTP	11/86
APPROVED BY	WJW	11/86
SCALE AS SHOWN	FIGURE NO. 7	
STS DRAWING NO.	1069-7	

79881

a. On June 19, 1986, approximately 1.25 inches of rain fell in the Kalamazoo area between 11:00 am and 12:15 pm. Several staff gauge readings were recorded over the next eight hours to define the time/elevation relationship of the water surface of the creek at the stream gauge.

b. The resultant water surface elevations were converted to discharge based upon the calibration curve presented in Figure 5. Thus, the shape of the stream flow hydrograph for the June 19 storm was obtained.

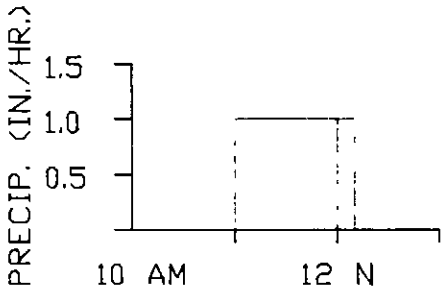
c. The TR-20 computer model for the Arcadia Creek watershed, which was developed as described in Chapter 3.0, was utilized to mathematically simulate the June 19 storm. To accomplish this, the rainfall distribution and timing was input to the computer model, and a simulated hydrograph was developed.

d. The resultant hydrographs generated by computer simulation and by actual field measurements were compared, as illustrated on Figure 8.

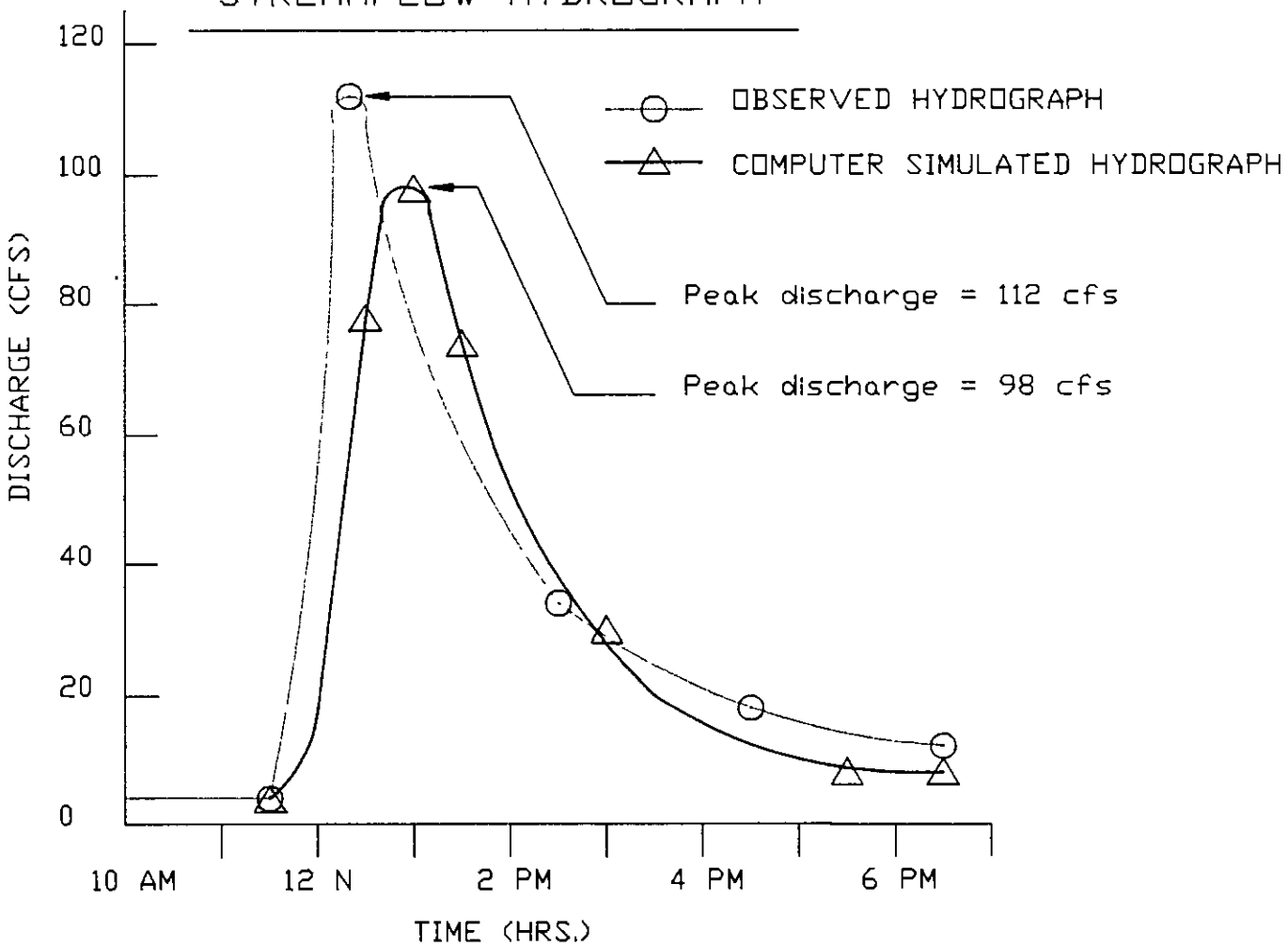
Results of this verification attempt indicate that the peak discharges for the observed hydrograph are approximately 10% higher than the computed hydrograph. Furthermore, the observed hydrograph had the peak flow occurring at approximately 12:30 pm, whereas the computer simulation of the hydrograph indicates the peak would occur at approximately 1:00 pm. Given the numerous parameters and assumptions which go into both the actual stream flow monitoring and calibration process, and the development of the TR-20 computer model, the resultant comparison is considered good. Therefore, the TR-20 model which was utilized to project the flood flow/frequency relationship for the Arcadia Creek watershed calibrates well with actual field conditions and is satisfactory without adjustments for this project.

STORM DATE: JUNE 19, 1986

HYETOGRAPH



STREAMFLOW HYDROGRAPH



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PROJECT/CLIENT

ARCADIA CREEK PROJECT

HYDROGRAPH COMPARISON

DRAWN BY	CJD	11/86
CHECKED BY	JTP	11/86
APPROVED BY	WJW	11/86
SCALE AS SHOWN	FIGURE NO. 8	
STS DRAWING NO. 1069-8		

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5.0 GEOTECHNICAL INVESTIGATION

5.1 General

The Phase II Subsurface Exploration Program for the Arcadia Creek Project in Kalamazoo, Michigan has been completed. The purpose of the geotechnical investigations was to obtain information on soil and groundwater conditions along the proposed corridor for the Arcadia Creek Project. This information supplements soils information obtained during the Phase I Subsurface Exploration Program. This information will be used to develop design and construction recommendations for foundations, structures and facilities for this project, and design and construction recommendations for project excavations. This phase of the subsurface exploration consisted of performing twenty (20) soil borings to depths ranging from 20 to 25 feet. The soil borings were located such that a generalized soil profile can be approximated along the alignment of the proposed creek project corridor.

Included in this chapter are descriptions of the field and laboratory procedures utilized. In addition, results of the investigations are summarized within.

5.2 Exploration Procedures

5.2.1 Subsurface Exploration Procedures

Soil boring locations were selected and located in the field by STS. These locations were selected with input from all project team members. Underground utility conflicts were resolved by STS, with assistance from local utility companies. STS also provided traffic control during subsurface explorations. The locations

of the soil borings are illustrated on Drawings 1 and 2. The ground surface elevation at each soil boring location was estimated from elevation information obtained from the preliminary topographic base map of the project area. This map has a horizontal scale of 1" = 40'. The approximate ground surface elevation at each soil boring location is noted at the top of the soil boring logs which are included in Appendix B.

The soil borings were performed using a truck-mounted drill rig which utilized continuous flight augers to advance the boreholes. Representative soil samples were obtained from the boring using split-barrel sampling procedures, which were performed in general accordance with ASTM specification D-1586. A brief description of this procedure is included in Appendix C. All samples obtained from the drilling operation were sealed immediately in glass jars, labeled, and returned to our Lansing, Michigan, laboratory for further examination and testing. The STS drill crew maintained a field log of the drilling operation for each soil boring. These field logs were used to develop the more detailed logs enclosed with this report.

The drill crew recorded the depth of encountered groundwater in each borehole during the drilling operation, and following the completion of each soil boring. All boreholes were filled with soil cuttings and pea gravel upon their completion. The pavement section was sealed with asphalt cold patch.

5.2.2 Laboratory Testing Procedures

The laboratory testing program consisted of a careful visual examination of each of the soil samples by a geotechnical engineer. This examination noted color, major and minor soil components, degree of saturation, presence of organics, and whether the material appeared to be naturally occurring or fill. All soils were classified on the basis of texture and plasticity, and grouped in accordance with the Unified Soil Classification System. Estimated group symbols, according to this system of classification, are shown in the parenthesis following the soil descriptions on the soil boring logs. A brief explanation of the Unified Soil Classification System is enclosed in Appendix C.

In addition to the visual soil classification outlined above, washed gradation and organic content tests were performed on selected soil samples. The washed gradation tests were run in accordance with ASTM specification D-422. The organic content tests were run in accordance with ASTM specification D-2974. The test results are enclosed in Appendix D.

Upon completion of the laboratory testing program, a geotechnical engineer grouped the various soil types into the major zones noted on the boring logs. The stratification lines indicated on the boring logs are in approximate in-situ, the transition between soil types in both the vertical and horizontal directions may be gradual.

Additional information regarding the preparation of the final boring logs and the field logs and laboratory data are included on the sheet, entitled, "Field and Laboratory Procedures", which is enclosed in

Appendix C. All samples obtained from the borings will be retained in our office in Lansing for a period of sixty days, after which they will be discarded unless other instructions as to their deposition are received.

5.3 Exploration Results

5.3.1 Regional Geology

Bedrock in Kalamazoo County consists primarily of Mississippian Age Coldwater Shale and Marshall Sandstone. The Coldwater Shale is prevalant over most of the county, except at the northeast corner, where Marshall Sandstone is found. Overlying this bedrock is a Pleistocene glacial drift, which varies from 50 feet to over 600 feet in thickness. In the Arcadia Creek corridor area, the drift thickness varies from approximately 100 to 150 feet.

Much of Kalamazoo County lies in a large outwash plain bordered by the Kalamazoo and Tekonsha morraines. Within the outwash plain lies the Kalamazoo River valley, which was formed by the Kalamazoo River. This valley lies more than 150 feet below the surrounding outwash plain.

Groundwater elevations in this area tend to increase as the distance from the Kalamazoo River increases. This result is confirmed by a regional groundwater flow pattern which is in a north-easterly direction.

5.3.2 General Site Conditions

The pavement sections encountered at the ground surface typically consisted of asphalt overlying paving bricks and sand fill. In borings SB-1 (Phase I Investigation) and SB-15, approximately one foot of concrete was encountered beneath the asphalt pavement. The brick was absent in borings SB-14 (Phase I Investigation), SB-15, SB-19, SB-22, SB-25, SB-27, SB-28, SB-31, SB-32, and SB-34. The asphalt was absent in boring SB-33.

In general, the stratigraphic profile underlying the pavement section consists of fill soils (due to earlier site developments) underlain by coarse grained soil deposits. In several soil borings, layers of silty and clayey slightly organic soils were encountered between the fill and coarse grained soils. A brief description of each major soil type encountered follows:

a. Fill Soils: The fill soils encountered generally consisted of dark brown and black sands, gravels, silty sands, and clayey sands. Traces of organics, bricks, and cinders were encountered at some boring locations. The fill soils extended to depths ranging from 2.0 feet to 7.0 feet, and were encountered in a very loose to dense condition. The fill soils were absent in borings SB-15, SB-20, and SB-3 (Phase I Exploration).

b. Silty and Clayey Soils: These soils generally consisted of dark brown and black silts, silty sands, and sands containing little to some silt and clay. Typically, these soils contain trace amounts of organics. A sandy peat layer was encountered in boring SB-12 (Phase I Exploration).

It is possible that these soils may represent an old topsoil layer which was covered with fill soils, or are fill soils with organics mixed in. These soils were encountered in a loose to medium dense condition.

c. Coarse Grained Soils: These soils constituted the major soil type encountered in the soil borings. These soils consisted of poorly to well graded sands and gravels with variable amounts of silt. The coarse grained soils were encountered directly below the pavement section in boring SB-3 (Phase I Exploration), and at depths ranging from 2.0 to 12.0 feet in the remaining borings. The coarse grained soils extended to the end of the soil borings, with the exception of borings SB-16, SB-17, and SB-6 (Phase I Exploration). A clayey fine sand layer was encountered in SBoring B-16 at a depth of 7.0 to 10.0 feet, and a brown silty sand was encountered at a depth of 18.0 feet to the end of the hole in boring SB-6. A brown sandy silt soil was encountered at a depth of 9.5 feet to 12.5 feet in boring SB-17.

The soils described above provide a general overview of the soil types encountered in the soil borings. For specific soils information, please refer to the enclosed soil boring logs presented in Appendix B.

5.3.3 Groundwater Conditions

Water level readings were obtained in the borings during the drilling operations and following their completion. Groundwater was encountered in a majority of the soil borings performed, except borings SB-1, SB-3, SB-14 (Phase I Exploration), SB-33, and SB-34, which were observed to be dry both during and after completion

of drilling. Water level observations are noted on the lower left hand corner of the enclosed soil boring logs, and are summarized in Table 5-1.

Table 5-1
ARCADIA CREEK PROJECT
GROUNDWATER LEVEL OBSERVATIONS

Boring No.	Ground Surface Elevation (ft.)	Observed Depth to Groundwater (ft.)	Observed Groundwater Elevation (ft.)
SB-15	765.7	13.0	752.7
SB-16	766.7	11.0	755.7
SB-17	767.4	13.0	754.4
SB-18	770.0	11.0	759.0
SB-19	771.5	14.5	757.0
SB-20	770.0	12.5	757.5
SB-21	772.9	15.5	757.4
SB-22	775.2	15.0	760.2
SB-23	776.4	15.0	761.4
SB-24	779.3	15.0	764.3
SB-25	781.6	15.0	766.6
SB-26	780.0	15.0	765.0
SB-27	781.1	15.0	766.1
SB-28	781.3	16.0	765.3
SB-29	784.4	21.0	763.4
SB-30	783.5	17.0	766.5
SB-31	784.6	15.0	769.6
SB-32	789.8	20.0	769.8
SB-33	792.5	-DRY-	-----
SB-34	793.3	-DRY-	-----

The groundwater elevation tends to increase with increasing ground surface elevation. This is illustrated on Figures 9, 10, 11, and 12.

It should be noted that variations in the groundwater level should be expected, due to seasonal variations in precipitation, evaporation, surface water runoff, and the level of the Kalamazoo River. A high perched water table can often occur following periods of precipitation.

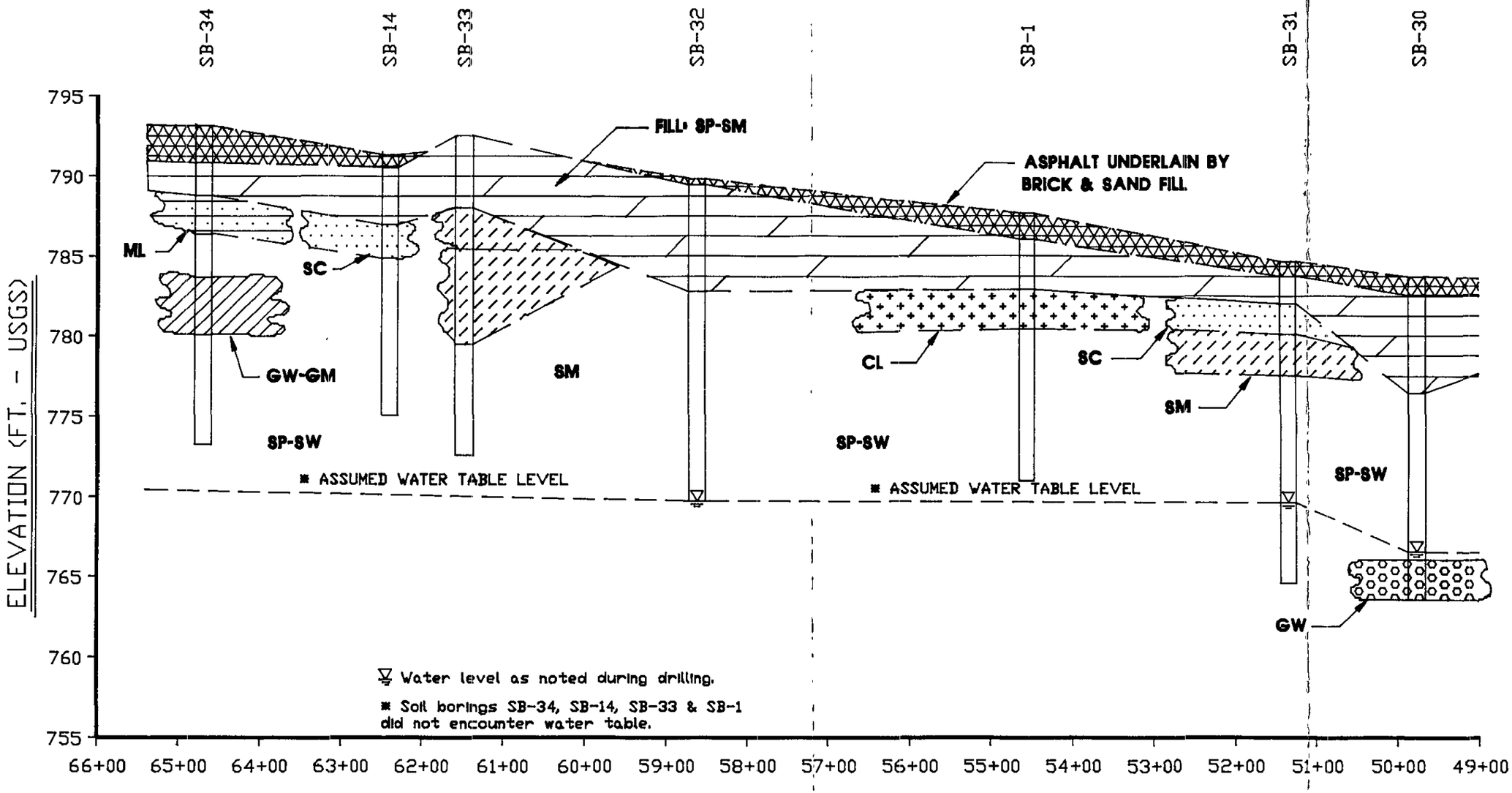
5.4 Regional Subsurface Conditions

5.4.1 West End

The subsurface conditions for the West End are defined by borings SB-1 and SB-14 (Phase I Exploration), and borings SB-30 through SB-34. The subsurface profile for this region is illustrated on Figure 9. A pavement section was encountered in all borings except boring SB-14. Below the pavement section, a layer of fill soils were encountered. These soils are generally dark brown and black in color and consist predominantly of sands and gravels with variable amounts of silts and clays. They are typically very loose to medium dense and occasionally contain trace to little amounts of organics and brick fragments.

In borings SB-1, SB-14, SB-31, SB-33, and SB-34, layers of silty and clayey soils were encountered under the fill. Those soils consisted of silts, silty sands, and sands with little to some clay and silt. Several of these soils contained trace amounts of organics. They are typically dark brown to black in color and loose to medium dense. Where encountered, they ranged in thickness from 2.0 to 8.5 feet.

WEST END



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ARCADIA CREEK PROJECT

SUBSURFACE PROFILE
WEST END

FIGURE #9

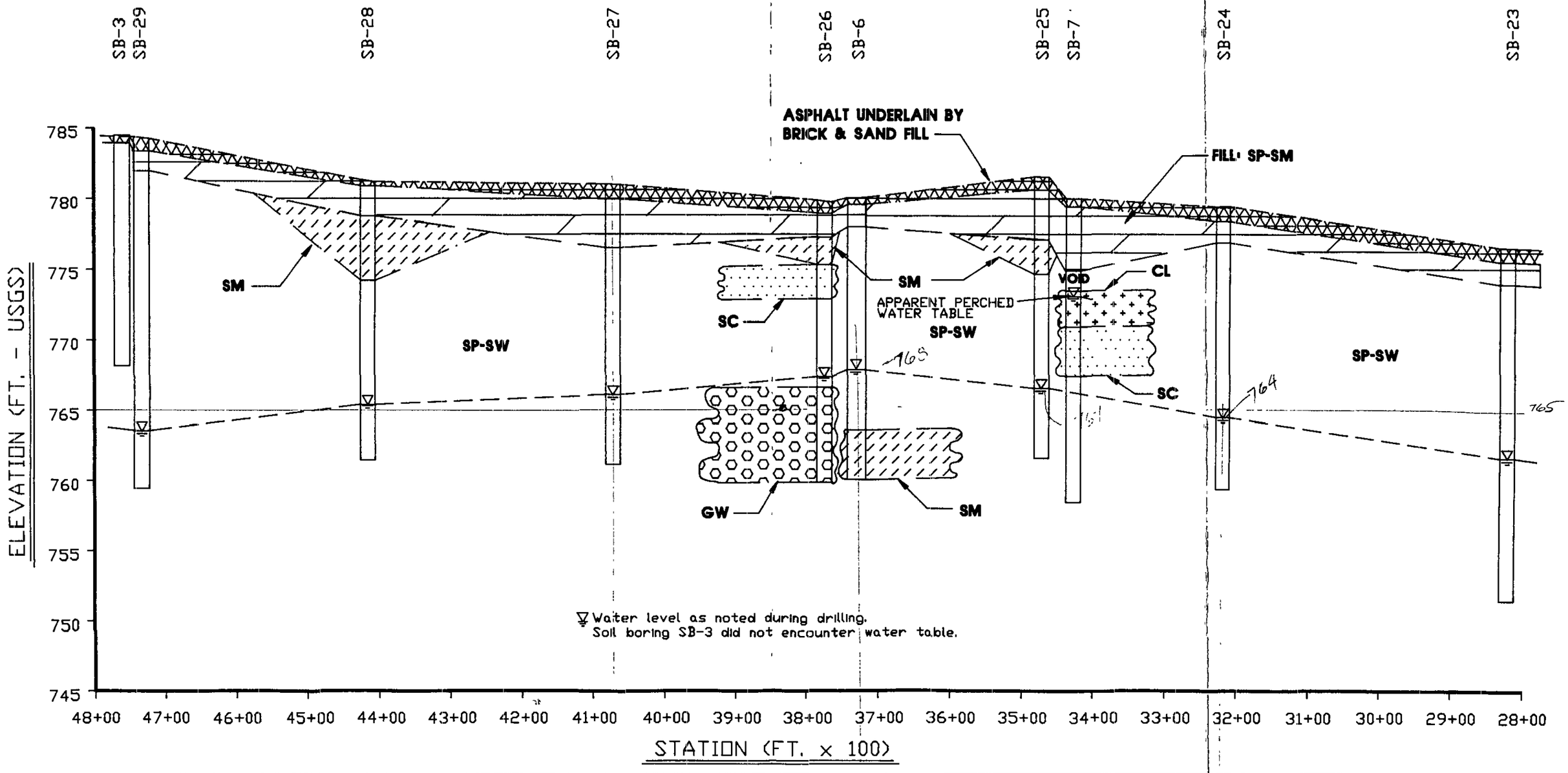
A coarse grained soil was encountered in all borings at depths of approximately 7.0 to 13.0 feet below existing grade. These soils are generally fine to coarse sand which are poorly to well graded, with variable amounts of silt and occasional gravelly layers. They are typically loose to medium dense near the top of the layer, but become medium dense to dense with depth. These soils are typically various shades of brown and reddish brown. It is anticipated that the structures in this area will be bearing on these soils.

The groundwater table was not encountered in borings SB-1, SB-4, SB-33, and SB-34. In the remaining borings, it was encountered below elevation 770.0 feet. This is below the base elevation of anticipated structures in this region. Therefore, groundwater is not anticipated to be a concern in this area. The low elevation of the groundwater encountered in this area may have an impact on the design of the proposed pond for the west end area (bottom elevation 777.0 feet). The natural granular soils are free draining. In combination with the low groundwater table, a liner may be required for the proposed lake structure.

5.4.2 Housing and Rehabilitation/Mixed Use Zone

The subsurface conditions for the housing and rehabilitation/mixed used zone are defined by borings SB-3, SB-6, and SB-7 (Phase I Exploration), and borings SB-24 through SB-29. The subsurface profile of this region is illustrated in Figure 10. A pavement section was encountered in all borings. Below the pavement section, a layer of fill soils was encountered. These soils are generally dark brown and black in color, and consist predominantly of sand, with variable amounts of

HOUSING / REHABILITATION / MIXED USE ZONE



▽ Water level as noted during drilling.
Soil boring SB-3 did not encounter water table.

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ARCADIA CREEK PROJECT
SUBSURFACE PROFILE
HOUSING / REHABILITATION / MIXED USE ZONE
FIGURE #10

silt, gravel, and clay. They are typically very loose to medium dense and occasionally contain trace to little amounts of organics and cinders. The depth of the fill soil ranged between 2 feet and 5 feet below existing grade. No fill soils were encountered in boring SB-3.

In borings SB-7 and SB-24 through SB-28, a soil layer consisting of silty sands and sands with little to some clay and silt was encountered. Some of these soils contained trace amounts of organics. They are typically dark brown to black in color, and in a loose condition. Where encountered, these soils ranged in thickness from 2.5 feet to 7.0 feet. Coarse grained soils were encountered in all borings at depths ranging from immediately below the pavement section to 11.5 feet below existing grade. These soils are generally poorly to well graded, fine to coarse sands, with variable amounts of silt and gravel. In addition, occasional gravelly layers were encountered. They are typically loose to medium dense near the top of the layer, but become medium dense to dense with depth. These soils are typically various shades of brown and grayish brown. It is anticipated that the structures in this area will be bearing on these soils.

The groundwater table was not encountered in boring SB-3. In the remaining borings, it was encountered below elevation 768 feet. However, an anomalously high groundwater table was encountered in boring SB-7. This was probably related to a void encountered in this boring. The drill crew indicated that the void appeared to be a storm sewer (Phase I Exploration). If not, a perched water table could exist; therefore, dewatering and foundation drainage may be necessary for construction. Except for the perched water table, groundwater levels in the surrounding area are at elevations below the base elevation of the anticipated

structures in this region. Therefore, groundwater is not anticipated to be a concern in this area. A possible exception to this is the eastern portion of the area where structure base elevations may be at or near the groundwater level. If the groundwater table is encountered, dewatering and foundation drainage may be necessary for construction.

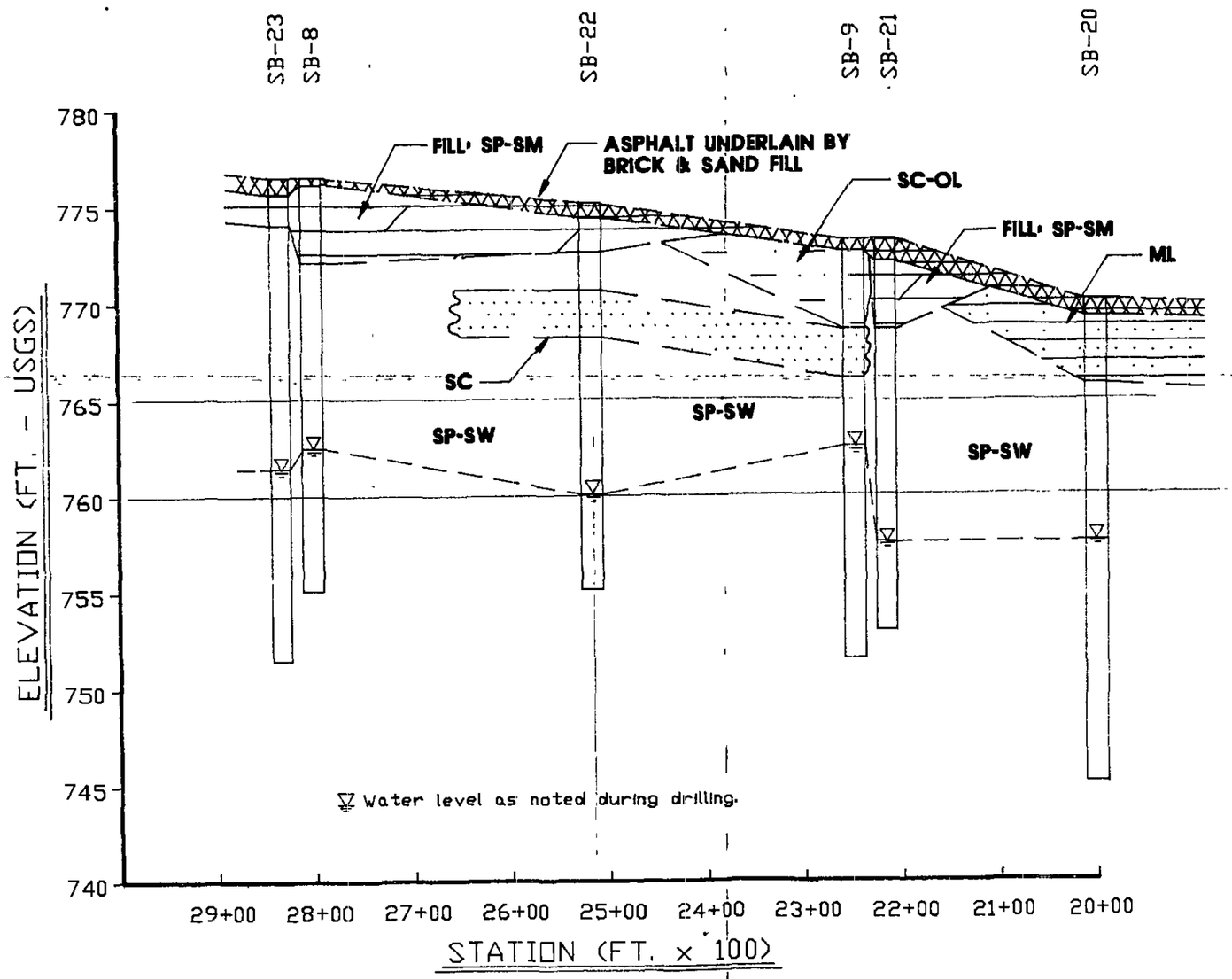
It should be noted that a volatile organic material odor was identified in a sample obtained from boring SB-24 at a depth of 20 feet. The identification of this material and its source is beyond the scope of this report.

5.4.3 Arcadia Gardens

The subsurface conditions for the Arcadia Gardens region are defined by borings SB-8 and SB-9 (Phase I Exploration) and borings SB-20 through SB-23. The subsurface profile for this region is shown on Figure 11. A pavement section was encountered in all borings. Below the pavement section, a layer of fill soils was encountered. These soils are generally dark brown and black in color and consist predominantly of sands and gravels with variable amounts of silts and clay, and are typically loose to medium dense, with occasional trace amounts of organics and brick fragments. No fill soils were encountered in boring SB-20.

In borings SB-20, SB-22 and SB-23, a layer of soil consisting of sandy silts and sands with little to some clay was encountered. In borings SB-20 and SB-23, these soils contained a trace amount of organics. They are generally dark brown to black in color, and in a loose condition. This layer ranges in thickness from 1.5 to 4.5 feet. A coarse grained soil was encountered in all borings at depths ranging from approximately 4.5 to 7.5

ARCADIA GARDENS



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ARCADIA CREEK PROJECT
SUBSURFACE PROFILE
ARCADIA GARDENS
FIGURE #11

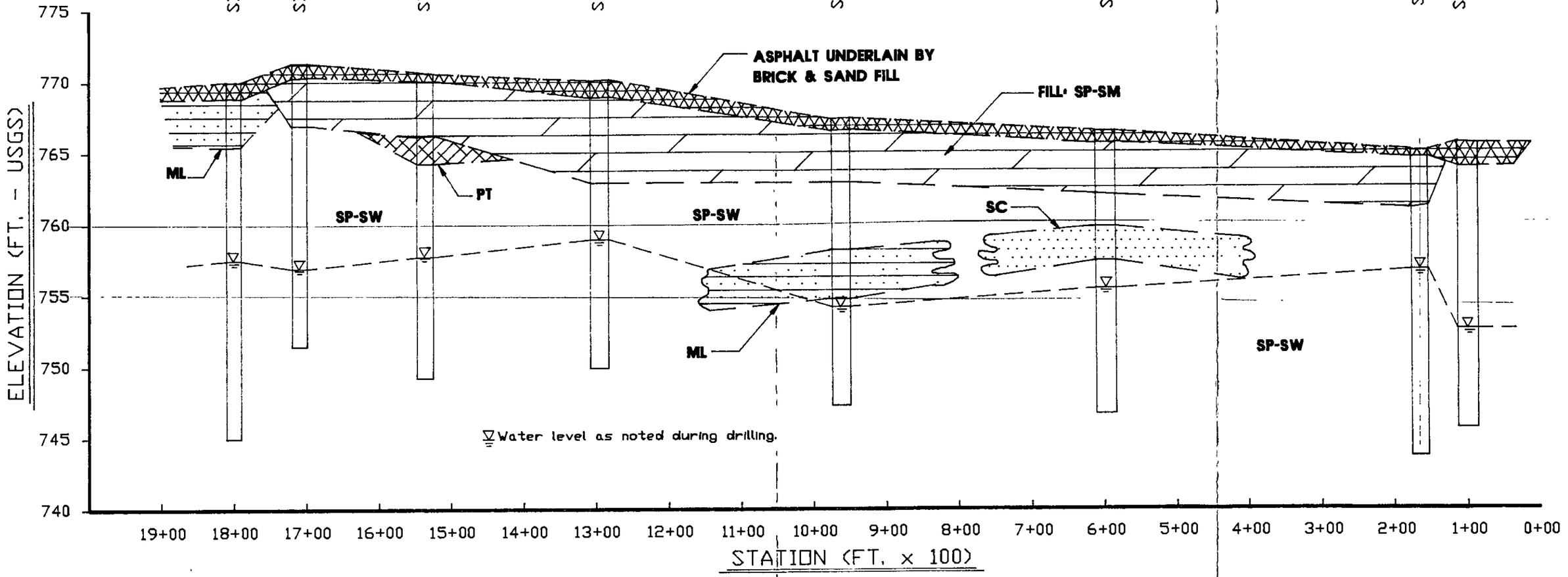
feet below existing grade. These soils are generally poorly to well graded, fine to coarse sands with variable amounts of silt and gravel. A gravelly layer was encountered in boring SB-23 at a depth of approximately 18.5 feet to the extent of the boring. These soils are typically in a very loose to medium dense condition at the top of the layer, but become medium dense to dense with depth. An exception to this was encountered in boring SB-23, where loose soils were encountered to a depth of approximately 16.5 feet. These soils are typically brown in color.

The groundwater table was encountered in all borings, at elevations below 763 feet. This is below the base elevation of anticipated structures in this region. Therefore, groundwater is not anticipated to be a concern in this area during construction. The low elevation of the groundwater encountered in this area may have an impact on the design of the lake proposed for the Arcadia Gardens area (bottom elevation 760.0 feet). The natural granular soils are free draining. In combination with the low groundwater table, a liner may be required for the proposed lake structure.

5.4.4 East End

The subsurface conditions for the East End are defined by borings SB-12 and SB-13 (Phase I Exploration), and SB-15 through SB-19. The subsurface profile for this region is shown in Figure 12. A pavement section was encountered in all borings. Below the pavement section, a layer of fill soils was encountered. These soils are generally dark brown and black in color, and consist predominantly of sand, with variable amounts of silt, clay and gravel. These soils were encountered in a loose to medium dense condition, and occasionally

EAST END



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ARCADIA CREEK PROJECT
SUBSURFACE PROFILE
EAST END
FIGURE #12

contained trace amounts of organics. No fill soils were encountered in boring SB-15. In the remainder of the borings, the fill soil extended to depths ranging between 4.5 to 7.0 feet.

A coarse grained soil was encountered underlying the fill soils in all borings except SB-20 and SB-12. In borings SB-20 a 3 foot thick layer of sandy silt with trace amounts of organics was ecountered underlying the fill. In boring SB-12, a 2 foot thick layer of sandy peat was encountered between the fill and coarse grained soils. The coarse grained soils consisted predominantly of poorly to well graded, fine to coarse sands, with variable amounts of silt, clay and gravel. However, in boring SB-16, at a depth of approximately 7 feet, a 2.5 foot thick layer of fine clayey sand was encountered. In boring SB-17, at a depth of approximately 9.5 feet, a 3 foot thick sandy silt layer was encountered.

The coarse grained soils are typically various shades of brown and grayish brown in color. They were encountered in a loose to medium dense condition near the top of the layer becoming medium dense. It is anticipated that the structures located in this area will be bearing on these soils.

The groundwater table was encountered in all borings at elevations below the base elevation of the anticipated structures in this region. Therefore, groundwater is not anticipated to be a major concern in this region during construction. A possible exception to this is the eastern portion of the area where structure base elevations may be at or near the groundwater table. If the groundwater table is encountered, dewatering and foundation drainage may be necessary for construction.

It should be noted that in boring SB-15, a gasoline odor was identified by the drilling crew during drilling. However, no odor was detected during examination of soil samples.

Note that the soil stratification lines discussed above represent approximate boundary lines between the soil types present. In-situ, the transition may be gradual and differ drastically from those presented herein. Groundwater elevations represent those observed at the time the soil borings were completed. No inference is made between these levels and the groundwater levels at any other given time. Refer to Appendix E for General Report Qualifications and Geotechnical Practice Limitations.

6.0 DEVELOPMENT OF ALTERNATIVES

6.1 General

Numerous engineering alternatives for the resolution of flooding problems in the northern half of the City of Kalamazoo CBD have been proposed over the years. These alternatives have been conceptually designed to improve the aesthetics of the area, in addition to solving flooding problems. A review of alternatives which have been proposed in the past was performed early in the preliminary engineering process (Reference 7, Section E). The objective of this review included the following:

a. Summarize in general the degree of compliance of each alternative with the concept plan which was developed for the Arcadia Creek project, and;

b. Assess operation characteristics and engineering constraints for each alternative.

The general alternative review, which is presented in Reference 4, addressed a comprehensive range of options, including the diversion of stormwater north of the CBD, accomodation of stormwater through the existing creek with improvements, etc. In total, five alternatives were investigated, as follows:

a. Alternative No. 1 - This option consists of the construction of a reinforced concrete, rectangular open channel to replace the existing Arcadia Creek within the project area. The new channel alignment would be identical to the existing channel alignment.

b. Alternative No. 2 - This option consists of the construction of a diversion pipe from the upstream project limit at Elm Street to the Kalamazoo River along the railroad right-of-way located north of Kalamazoo Avenue.

c. Alternative No. 3 - This option consists of the construction of a supplemental open channel and relief tunnel parallel to the existing Arcadia Creek.

d. Alternative No. 4 - This option is identical to Alternative No. 2 with the exception that the existing Arcadia Creek would not be open to the atmosphere.

e. Alternative No. 5 - This option is the concept plan which was set forth as outlined in the conceptual guideline for Arcadia Creek development (Reference 8). As a part of the concept plan, several variations for the lower reaches of the creek system were investigated.

Each of the alternatives listed above was evaluated based upon a fixed set of criteria to provide a basis of comparison. Following is a summary of the evaluation criteria which were utilized in the development and analysis of each alternative:

a. Water Surface Fluctuation - Vertical fluctuations of the Arcadia Creek water surface as a result of the occurrence of flood events should be minimized where possible. The goal of the project is to limit the fluctuation between the normal water surface elevation and the 10-year flood elevation to approximately 3 feet. The 100-year flood elevation should be no more than 1 or 2 feet higher than the 10-year flood elevation, where possible. Finally, the creek corridor should be capable

of transporting the 100-year flood flow with a vertical freeboard of from 1 to 2 feet. The freeboard requirements will provide a factor of safety to provide protection against uncertainties which are built into the hydrologic analysis results, and for the potential of increased runoff due to future urbanization. Finally, an objective of the project includes containing the 10-year flood limits within a controlled section. Inundation of non-critical areas such as pedestrian walkways along the creek corridor and passive park areas such as walkways around the Arcadia Gardens ponds would be allowed during the 100-year flood event.

b. System Reliability - This criteria refers to the operational reliability of the creek system for a wide range of free flow conditions. For example, a system with mechanical controls which would be subject to failure that could result in improper operation of the system, would not be rated as highly as a gravity controlled system.

c. System Maintenance - Each alternative was evaluated to assess the relative degree of maintenance which would be required to keep the system operating properly.

d. Constructibility - Each alternative was analyzed from a constructability standpoint to consider logistics, restrictions, scheduling, and phasing issues. Specific constructability considerations would include utility interference, property acquisition, unusual restrictions, creek flow maintenance during construction, soil conditions, protection of adjacent structures, and groundwater conditions.

e. System Flexibility - This evaluation criteria addresses the ease with which a specific alternative or internal component of an alternative allows for the realities of implementation strategies and phasing requirements. For example, an alternative which would require the construction of a circular pipe enclosure to be replaced at a later date by a rectangular flume would not be rated as highly as a pop top rectangular box enclosure which could be cost effectively adapted to the concept plan when ultimately implemented. Furthermore, flexibility is also an indication of a given alternative's ability to meet the concept plan objectives which, in the case of aesthetics and flood control, are at odds with one another.

f. Conformity with Updated Concept Plan - Although conformance with the concept plan is an underlying objective of all alternatives to be developed, some options conform better than others.

g. Stormwater Management - The ability of a given alternative to resolve the stormwater problems of the existing Arcadia Creek was considered. An underlying objective of all of the alternatives to be developed was to safely transport the 100-year flood flow. However, some alternatives would provide a better solution than others.

h. Community Benefits - This evaluation criterion indicates to what extent the various system components provide benefits to the community. For example, an alternative which provides the best solution to stormwater problems, low operation and maintenance concerns, and best meets the objectives of the concept plan in a cost effective manner would score highly in this category.

i. Water Quality - Several components of the proposed concept plan may have the capacity to improve water quality of the Arcadia Creek. For example, a series of cascading dams would provide beneficial aeration.

j. Life Safety Provisions - During flood events, the Arcadia Creek discharges large quantities of water with a very swift current. The ability of a given alternative to improve life safety by minimizing flood flow velocities, or by incorporating safety provisions into the structure of the creek banks would receive a high rating in the life safety category.

k. Flow Velocities - Flow velocities within the creek corridor for a variety of hydrologic conditions are an important parameter. The selected alternative would provide a low flow velocity throughout the entire system to maintain scour velocities which will keep the system clean, and reduce the potential for stagnation and associated water quality problems. Furthermore, the selected alternative should minimize flood flow velocities for safety and erosion control purposes.

l. Low Flow Character - This evaluation criterion addresses the ability of a given alternative to meet the objectives of the concept plan during low flow. Specifically, the ponds through the gardens area must be deep enough to minimize the potential for algae blooms and plant growth within the ponds. Furthermore, ponds should be designed such that their flushing characteristics during low flow conditions are adequate. Finally the cascading weirs through the residential and rehab zones should be designed such that water is fast moving and clear in shallow areas, and ponds are of appropriate depth where called for in the concept plan.

With the completion of the general alternative evaluation process in February, 1986, the Arcadia Creek project team proceeded with the development of several variations of a preferred alternative. The preferred alternative consists of improvements to the existing Arcadia Creek similar to those presented in the original concept plan (Reference 8). Public input was solicited at this stage of the evaluation process. Finally, several refined variations of the preferred alternative were developed, and a more detailed evaluation process was performed.

The variations which were developed primarily addressed alternative means of transporting flood water on the east and west ends of the project area. Furthermore, three alternatives for transporting flood water through the Arcadia Gardens area were established. Since the refined alternatives have already passed the vigorous evaluation criteria discussed above, the evaluation criteria for these options were limited to the following issues: cost, benefits, disadvantages, and preference.

Some portions of the Arcadia Creek corridor have already been reduced to one option, whereas several options apply in other areas. Therefore, the evaluation process was subdivided into four general areas, as follows: 1) East End, 2) Arcadia Gardens, 3) Housing/Rehabilitation zone, and 4) West End. The East End begins at the Arcadia Creek mouth at Portage Creek and ends at Pitcher Street. The Arcadia Gardens area begins at Pitcher Street and ends at the Burdick Street Mall. The Housing / Rehabilitation zone begins at the Mall and ends at Westnedge Avenue. Finally, the West End begins at Westnedge Avenue and ends upstream of Main Street.

This chapter of the report presents techniques and boundary conditions which were utilized to analyze the flood carrying capacity of each option, and a general description of each option for each area of the Arcadia Creek corridor. The

physical dimensions and expected performance for each option are summarized in Chapter 6. An evaluation of each of these alternatives based upon cost, benefits, and disadvantages is provided in Chapter 7. Finally, a summary of the preferred alternative is provided in Chapter 8.

6.2 Analysis of Flood Carrying Capacity

6.2.1 General

Hydraulic analyses were performed for the proposed Arcadia Creek improvement alternatives. The objective of these analyses was to identify the dimensions and configuration of each alternative creek improvement option such that the resultant system is capable of safely transporting the 100-year flood discharge. Furthermore, a hydraulic analysis was performed for the 10-year flood event and low flow conditions to identify flood elevations, flow velocities, and flood plain limits for a variety of hydrologic conditions. Flood discharges which were utilized are summarized in Chapter 3.3 of this report.

The overall goal in the development of alternatives from a flood carrying capacity standpoint was to provide a creek system which would be capable of transporting the 100-year flood discharge at a safe flow velocity. Thus, existing and new developments adjacent to the creek corridor would be protected from flooding. Furthermore, the system was designed such that the primary channel section would have the capacity to transport the 10-year flood event. Floods in excess of this amount would be carried in the overbank in some locations. These overbank areas would serve as pedestrian and park areas during normal dry weather conditions. Finally, during

low flow conditions, the project goal included providing sufficient flushing velocity throughout the system to minimize stagnation in pond areas.

6.2.2 Methodology

The Army Corps of Engineers HEC-2 computer model (Reference 6) was utilized to simulate the 10- and 100-year flood events. This program estimates water surface profiles for steady gradually varied flow in natural or manmade channels, based upon the solution of the one-dimensional energy equation. Energy losses due to friction are evaluated using Manning's equation. The program has the capability to assess the impacts of various obstructions to flow, including bridges, culverts, and weirs. The computational procedure utilized by the program is generally known as the Standard Step Method.

Parameters which were input to the HEC-2 computer model include stream, bridge, and culvert cross section dimensions and elevations, roughness coefficients associated with streambed and overbank areas, expansion and contraction loss coefficients, and the distance between cross sections and structures.

6.2.3 Starting Conditions for Backwater Analysis

The flood elevation/frequency relationship at the outlet of the proposed Arcadia Creek improvements, located at the confluence of Portage Creek and the Kalamazoo River, are well documented (Reference 1). The mean annual water surface elevation of the Kalamazoo River at this location which was extrapolated from the flood elevation / frequency relationship is 757.4. This elevation

was utilized as the starting condition for backwater analyses. Close inspection of flood conditions at the junction of Portage Creek and the Kalamazoo River indicate that these elevations are well below the elevation of Arcadia Creek and the land elevations surrounding this area. Therefore, the hydraulic control for the Arcadia Creek would be the configuration of the creek structure itself. Backwater conditions from downstream areas is not expected to cause flooding problems.

6.2.4 Hydraulic Analysis Summary

A brief descriptions of the flood carrying capacity analysis for each of the four zones of the creek improvement follows. In general, each option has been designed to transport the 100-year design flood.

6.3 East End

6.3.1 General

The east end of the Arcadia Creek improvements includes the area between Pitcher Street and the mouth of Arcadia Creek. One option was considered feasible for this portion of the project. This option includes the following features:

a. Rehabilitate and maintain the existing Arcadia Creek structure between Pitcher Street and Portage Creek.

b. Construct a relief storm sewer system between Pitcher Street and Portage Creek. This system would consist of a dual 12' x 8' box culvert between Pitcher Street and Porter Street, and a single 10' x 6' box culvert from Porter Street to the Portage Creek. In addition, a 10' x 6' box culvert would be constructed in the Pitcher Street right-of-way to connect the existing Arcadia Creek structure with the new Arcadia Creek corridor at the intersection of Water Street and Pitcher Street.

Drawing No. 3 illustrates the East End improvement option. A majority of the relief system would be constructed in the Kalamazoo Avenue and Michigan Avenue rights-of-way.

6.3.2 Flood Carrying Capacity

The resultant combined system would have the capacity to discharge up to the 100-year flood flow of 1,020 cfs. It is estimated that the box culvert relief system would flow at a depth of approximately 5.0 feet and a flow velocity of approximately 12.8 feet per second.

Table 6-1 presents a hydraulic analysis summary for the east end. This table illustrates flood elevations at various locations.

TABLE 6-1

ACARDIA CREEK PROJECT

HYDRAULIC ANALYSIS SUMMARY FOR THE EAST END

(RELIEF CULVERT FLOOD CONDITIONS*)

Location	10-YR		100-YR		Lowest Ground Elevation (ft)
	Elev. (ft)	Velocity (ft/sec)	Elev. (ft)	Velocity (ft/sec)	
Mouth @ Portage Creek	759.8	11.6	760.7	12.8	765.7
Harrison Street	761.3	11.7	762.2	12.8	764.9
Walbridge Street	763.8	11.7	764.7	12.8	767.2
Porter Street	766.4	10.0	767.5	10.9	770.1
Pitcher Street	768.3	3.3	769.8	4.4	770.0

* Note that the Existing creek structure will flow full with a velocity of 11.0 ft/sec. during the 100-year flood.

6.4 Arcadia Gardens

6.4.1 General

Three options were identified for the improvement of Arcadia Creek through the Arcadia Gardens area. This area begins at Pitcher Street and ends near the Burdick Street Mall. Following is a brief description of each option:

a. Option #1 consists of the construction of a weir and a lake between Pitcher Street and the Mall, as illustrated on Drawing No. 3. The lake would be excavated to approximately 15 feet in depth and would be lined if necessary to retain water. Furthermore, stone riprap protection would be provided around the perimeter of the lake to prevent erosion.

b. Option #2 would be similar to Option #1 with the exception that the portion of the lake between Pitcher Street and Edwards Street would be replaced with a rectangular concrete open channel. This option is illustrated on Drawing No. 5.

c. Option #3 would be similar to Option #2 with the exception that the rectangular channel would be replaced with dual 12' by 8' box culverts and the creek section would be underground. This option is illustrated on Drawing No. 5.

6.4.2 Flood Carrying Capacity

Each of the three options discussed above would have the capacity to discharge the 100-year flood. Option #1 would result in an estimated normal lake depth of 5.0 feet and the 100-year flood lake depth of approximately

10.8 feet. Normal dry weather flow velocities would be capable of flushing the lakes in approximately 8 hours. Flood flow velocities during the 10- and 100-year flood events would average approximately 1.7 and 2.2 feet per second, respectively. Table 6-2 summarizes flood elevations and flood flow velocities at various locations throughout the gardens. Note that the flood plain limits during the 100-year flood would be contained within the Arcadia Gardens area.

The 30 foot wide rectangular concrete flume of Option #2 would result in 100-year flood depths of approximately 7.4 feet, and a flow velocity of 4.6 feet per second during the 100-year flood between Edwards and Pitcher Street. The weir at Edwards Street would result in hydraulic conditions in the pond upstream of Edwards similar to those associated with Option #1. Table 6-3 summarizes the flood elevations and flood flow velocities associated with Option #2.

Option #3 would be similar to Option #2 except that the flood flows between Edwards and Pitcher Streets would be transported by an underground box culvert which would flow approximately 7.0 feet deep at a velocity of 6.1 feet per second. Table 6-4 summarizes the flood elevations and flood flow velocities associated with this option.

6.5 Housing and Rehabilitation Zone

6.5.1 General

Given the topography and physical constraints of the housing/rehabilitation zone, which is located between the Burdick Street Mall and Westnedge Avenue, only one option was considered feasible. This option, which is

TABLE 6-2

ARCADIA CREEK PROJECT

HYDRAULIC ANALYSIS SUMMARY

FOR THE ARCADIA GARDENS AREA

(OPTION #1)

Location	FLOOD RECURRANCE INTERVAL 10-YR Elev. (ft)	10-YR Velocity (ft/sec)	100-YR Elev. (ft)	100-YR Velocity (ft/sec)	Lowest Ground Elevation (ft)
Pitcher Street	768.8	3.0	770.3	4.1	771.0
Midway Between Pitcher and Edwards Streets	769.0	2.1	770.6	2.7	773.0
Edwards Street	769.1	2.1	770.7	2.7	773.0
Midway Between Edwards and Burdick Streets	769.1	0.9	770.8	1.3	775.2
Downstream of Burdick Street	769.1	5.8	770.8	7.3	776.0

TABLE 6-3

ARCADIA CREEK PROJECT

HYDRAULIC ANALYSIS SUMMARY

FOR THE ARCADIA GARDENS AREA

(OPTION #2)

Location	FLOOD RECURRANCE INTERVAL 10-YR Elev. (ft)	10-YR Velocity (ft/sec)	100-YR Elev. (ft)	100-YR Velocity (ft/sec)	Lowest Ground Elevation (ft)
Pitcher Street	768.3	3.3	769.7	4.5	771.0
Midway Between Pitcher and Edwards Streets	768.3	3.4	769.7	4.6	773.0
Edwards Street	768.9	3.0	770.7	1.3	773.0
Midway Between Edwards and Burdick Streets	769.0	0.9	770.7	1.3	775.2
Downstream of Burdick Street	769.1	5.9	770.8	7.5	776.0

TABLE 6-4

ARCADIA CREEK PROJECT

HYDRAULIC ANALYSIS SUMMARY

FOR THE ARCADIA GARDENS AREA

(OPTION #3)

Location	FLOOD RECURRENCE INTERVALS 10-YR Elev. (ft)	10-YR Velocity (ft/sec)	100-YR Elev. (ft)	100-YR Velocity (ft/sec)	Lowest Ground Elevation (ft)
Pitcher Street	768.3	4.4	769.6	5.9	771.0
Midway Between Pitcher and Edwards Streets	768.3	4.6	769.6	6.1	773.0
Edwards Street	769.0	3.0	770.6	4.0	773.0
Midway Between Edwards and Burdick Streets	769.2	0.9	771.0	1.2	775.2
Downstream of Burdick Street	769.2	5.7	771.0	7.1	776.0

illustrated on Drawing No's. 3 and 4, consists of the following features:

a. A dual 10' x 8' reinforced concrete box culvert between Burdick Street and Rose Street.

b. A small dam immediately upstream of Rose Street.

c. A 20' wide rectangular flume between Rose and Church Streets.

d. A dual 12' x 8' box culverts under Church Street.

e. A 30' wide rectangular flume between Church Street and Park Street, with a small dam in between these streets.

f. A new bridge at Park Street.

g. A 30' flume between Park Street and Westnedge Avenue.

h. A small dam at Cooley Street.

The creek improvements through the Housing / Rehabilitation zone are designed as a series of ponds supported by small dams between Rose Street and Westnedge Avenue.

6.5.2 Flood Carrying Capacity

Downstream of Rose Street, the creek would be underground until it daylights to the Arcadia Gardens pond. During normal dry weather conditions, the ponds upstream of Rose Street would be approximately 3 feet deep. During a 10-year flood, the ponds would rise to a

depth of approximately 6 feet. During a 100-year flood, the depth of water through this corridor would be approximately 9 feet. Flood flow velocities during the 10-year flood event would vary between 2.2 and 10.1 per second during the 10-year event, and between 3.0 and 12.0 feet per second during the 100-year flood event for the portion of the corridor which will be open. Table 6-5 presents a summary of flood elevations and flow velocities for the Housing/Rehabilitation zone. Note that the 100-year flood limits would be contained within a 45 foot wide corridor in the open sections of the creek. The 100-year flood would be handled within the box culverts downstream of Rose Street.

6.6 West End

6.6.1 General

The West End of the Arcadia Creek project area begins at Westnedge Avenue and ends upstream of Main Street. Three construction options for the improvement of Arcadia Creek through this area have been developed. However, the portion of the creek improvements from Michikal Avenue to 500 feet upstream of Main Street are common to all three options. This area will include a small pond to be located immediately upstream of Michikal Street and ending just downstream of Main Street. Furthermore, a dual 8' x 6' reinforced concrete box culvert would be constructed at Main Street. Finally, an improved open channel upstream of Main Street would be constructed to consist of a 20' bottom width channel with stone riprap side slopes. The objective of the improvements upstream of Main Street is to provide capacity such that flood flows originating upstream are channeled into the new Arcadia Creek corridor.

TABLE 6-5

ARCADIA CREEK PROJECT

HYDRAULIC ANALYSIS SUMMARY

FOR THE HOUSING/REHABILITATION ZONE

Location	FLOOD RECURRANCE INTERVAL 10-YR Elev. (ft)	10-YR Velocity (ft/sec)	100-YR Elev. (ft)	100-YR Velocity (ft/sec)	Lowest Ground Elevation (ft)
Burdick Street Mall	768.9	8.0	771.0	9.5	777.0
Upstream of Rose Street	772.9	4.2	774.9	4.9	779.8
Church Street	774.8	6.3	776.6	7.2	780.0
Park Street	776.9	4.6	778.0	6.2	780.4
Cooley Street	779.0	3.9	780.6	4.9	781.3
Westnedge Avenue	779.0	4.9	780.6	5.8	785.0

Following is a description of each of the three options which have been developed in the West End between Michikal Street and Westnedge Avenue:

a. Option #1 - This option is the preferred alternative which consists of the construction of a new open channel from approximately Westnedge Avenue upstream to Elm Street. Certain sections of the creek would be underground in box culverts to accommodate transportation access where necessary. Furthermore, the existing Arcadia Creek structure would be rehabilitated. Therefore, the combination of the new creek improvements and the rehabilitated structure will be designed to discharge the 100-year design flow.

b. Option #2 - This alternative would be similar to Option #1, with the exception that the new creek channel would be underground in box culverts, as opposed to an open channel. Furthermore, the existing Arcadia Creek structure would be rehabilitated and maintained as part of this option.

c. Option #3 - This alternative would include the complete removal of the existing Arcadia Creek structure and replacement with a 14' wide concrete rectangular open channel. Furthermore, box culverts would be constructed where necessary to provide transportation access into areas of severe restrictions.

Option #1 is illustrated on Drawing No's. 3 and 4. Options #2 and #3 are illustrated on Drawing No's. 5 and 6.

6.6.2 Flood Carrying Capacity

Each of the options considered were developed with a capacity to transport the 100-year flood discharge. The open channel options were developed such that the 100-year discharge would be transported at a depth of approximately 8.0 feet, at a flow velocity of approximately 5.4 feet per second. The underground conduit options would transport the flood flow at a depth of approximately 4.6 feet, at a velocity of 12.2 feet per second. Table No's. 6-6, 6-7, and 6-8 present a summary of flood elevations and flow velocities for Options #1, #2, and #3, respectively. Note that the 100-year flood plain would be contained within the channel and structures for all of these options. During low flow conditions, the water would flow at a depth of approximately 0.5 feet.

TABLE 6-6

ARCADIA CREEK PROJECT

HYDRAULIC ANALYSIS SUMMARY

FOR THE WEST END

(OPTION #1)

Location	FLOOD RECURRENCE INTERVAL 10-YR Elev. (ft)	10-YR Velocity (ft/sec)	100-YR Elev. (ft)	100-YR Velocity (ft/sec)	Lowest Ground Elevation (ft)
Westnedge Avenue	779.0	4.9	780.6	5.8	785.0
Midway Between Westnedge and Michikal Avenues	784.2	6.4	786.7	5.4	788.3
Michikal Avenue (West End Pond)	788.4	1.2	790.9	1.4	792.0
Upstream of Main Street	789.4	3.0	792.9	2.6	794.0

TABLE 6-7

ARCADIA CREEK PROJECT

HYDRAULIC ANALYSIS SUMMARY

FOR THE WEST END

(OPTION #2)

Location	FLOOD RECURRENCE INTERVAL 10-YR Elev. (ft)	10-YR Velocity (ft/sec)	100-YR Elev. (ft)	100-YR Velocity (ft/sec)	Lowest Ground Elevation (ft)
Westnedge Avenue	779.0	4.8	780.6	5.7	785.0
Midway Between Westnedge and Michikal Avenues	782.9	11.1	784.0	11.4	788.3
Michikal Avenue (West End Pond)	787.8	1.3	789.1	1.8	792.0
Upstream of Main Street	789.4	3.0	791.8	3.2	794.0

TABLE 6-8

ARCADIA CREEK PROJECT

HYDRAULIC ANALYSIS SUMMARY

FOR THE WEST END

(OPTION #3)

Location	FLOOD RECURRENCE INTERVAL 10-YR Elev. (ft)	10-YR Velocity (ft/sec)	100-YR Elev. (ft)	100-YR Velocity (ft/sec)	Lowest Ground Elevatior (ft)
Westnedge Avenue	779.0	4.8	780.6	5.7	785.0
Midway Between Westnedge and Michikal Avenues	784.8	8.5	787.8	8.8	790.0
Michikal Avenue (West End Pond)	787.5	3.5	790.9	3.8	792.0
Upstream of Main Street	789.4	3.0	793.5	2.4	794.0

7.0 EVALUATION OF ALTERNATIVES

7.1 General

Several Arcadia Creek improvement alternatives have been developed to improve the aesthetics of the central business district and to solve flooding problems. The description of the physical configuration and flood carrying capacity for each alternative is summarized in Chapter 6. Drawing No's. 3, 4, 5, and 6 illustrate the dimensions and location associated with each alternative.

An alternative review process was undertaken to accomplish the following: 1) summarize in general the degree of compliance with the concept plan for each alternative which has been developed for the Arcadia Creek project, and 2) assess the operation characteristics and engineering constraints. The overall goal of the Arcadia Creek improvement project is to provide an aesthetically pleasing water amenity which would also provide for the control of stormwater. The channel would be open where possible, and should be capable of managing a wide variation of flood conditions and normal dry weather conditions in a safe and efficient manner.

Each of the alternatives to be evaluated in this section passed an initial screening process and considered the following parameters: water surface fluctuation, reliability, maintenance, cost, constructability, flexibility, conformity with concept plan, stormwater management, community benefits, water quality, life safety provisions, flow velocities, and low flow character (Reference 7, Section E). Therefore, the review criteria for the surviving alternatives consists of cost, hydraulic performance, benefits, disadvantages, and preference.

The evaluation process is presented for each development zone of the Arcadia Creek project, as follows: East End, Arcadia Gardens, Housing/Rehabilitation Zone, and West End. As indicated previously, there is only one alternative which was considered feasible for the East End and Housing / Rehabilitation zones. The Arcadia Gardens and West End zones each have three options which were considered, and are presented herein.

7.2 East End

One alternative was considered feasible for the east end, which begins at the mouth of the Arcadia Creek at Portage Creek, and ends at Pitcher Street. The proposed improvements, which are illustrated on Drawing No. 3, include the rehabilitation and maintenance of the existing Arcadia Creek, construction of the new Arcadia Creek corridor to the existing Arcadia Creek in the Pitcher Street right-of-way, and the construction of a reinforced concrete box culvert relief system in the Water Street/Kalamazoo Avenue/ Michigan Avenue rights-of-way.

The relief system would discharge to the Portage Creek immediately downstream of the Michigan Avenue bridge. The proposed system should have the capability to transport the 100-year flood flow of 1,020 cfs without flooding the surrounding lands. This represents a substantial reduction in the existing floodway and flood plain limits (Reference 1). The opinion of probable cost for the proposed system is approximately $2,290,000 dollars. This includes the reconstruction of Pitcher Street into a 2-way system. A detailed breakdown of probable cost is provided in Appendix H.

The proposed system represents the most efficient means of transporting 100-year flood flows. Furthermore, utility interference has been minimized in the selected route.

7.3 Arcadia Gardens

Three options were considered for the Arcadia Gardens area. This area begins at Pitcher Street and ends near the Burdick Street Mall. The three options consist of a lake, and combinations of lakes, a flume, and an underground culvert. Each option has the capacity to transport the 100-year flood discharge. Drawing No. 3 illustrates Option #1, and Drawing No. 5 illustrates Options #2 and #3.

Option #1, which consists of the construction of a small dam and a lake for the entire Gardens area, is estimated to have an opinion of probable cost of $1,160,000. The opinion of probable cost for Option #2, which consists of combination structure which is an open channel in between Pitcher Street and Edwards Street, and a lake from Edwards Street to the Burdick Street Mall, is $1,475,000. The opinion of probable cost for Option #3, which is identical to Option #2 with the exception that the flume would be replaced with an underground box culvert, is $1,550,000. A detailed breakdown of probable cost is presented in Appendix H.

Since each option is equivalent from a stormwater management perspective, the selected option would be based upon aesthetics, cost, and preference.

7.4 Housing/Rehabilitation Zone

Only one Arcadia Creek improvement option was considered cost effective for the housing/rehabilitation zone. This option consists of underground culverts and open channel sections between the Burdick Street Mall and Westnedge Avenue.

Drawing No's. 3 and 4 illustrate the dimensions, configuration, and location of this alternative.

The proposed structure has been designed to transport the 100-year flood discharge within a controlled flood plain. The opinion of probable cost for the Rehabilitation/Mixed Use zone, which extends from downstream of the Burdick Street Mall and ends at Church Street, is $1,215.000. The opinion of probable cost for the Housing zone, which begins at Church Street and ends at Westnedge Avenue, is $1,538,000. A detailed breakdown of probable costs is provided in Appendix H.

This alternative was developed in such a fashion that costs and utility interferences would be minimized. Furthermore, the alternative was developed to meet the objectives of the concept plan.

7.5 West End

Three options have been developed for the transportation of flood water through the West End. This zone begins at Westnedge Avenue and ends upstream of Main Street. Drawings No's. 4 and 6 illustrate the dimensions, configuration, and location of each of the options which were evaluated. All three options have the capability to transport the 100-year flood flow. Therefore, selection of the preferred alternative should be based upon aesthetics, compatibility with the concept plan, and project cost.

The opinion of probable cost for Option #1, which includes rehabilitation of the existing creek structure and construction of an open channel parallel to Michikal and Eleanor Streets, is $1,375,000. The opinion of probable cost for Option #2, which consists of rehabilitation of the

existing Arcadia Creek structure and construction of a relief culvert parallel to Michikal and Eleanor Streets, is $1,517,000. The opinion of probable cost for Option #3, which consists of removal of the existing Arcadia Creek structure and replacement with an open channel is $2,205,000. A detailed breakdown of probable costs is provided in Appendix F.

Note that each of these options includes the construction of the west end pond upstream of Michikal, the replacement of the Main Street culvert with an upgraded box culvert, and the improvement of the Arcadia Creek channel for a distance of approximately 500 feet upstream of Main Street. All three options are equivalent in terms of minimizing utility interference and providing for the tranportation of flood water. Therefore, the selected option would be based upon aesthetics, cost, and preference.

8.0 PREFERRED ALTERNATIVE

8.1 General

The preferred alternative is the least cost option which meets the goals of the concept plan (Reference 8), and provides for the safe transportation of the 100-year flood discharge. This alternative is illustrated on Drawing No's. 3 and 4. Following is a brief description of the preferred alternative for each section of the Arcadia Creek Project:

a. East End - The existing Arcadia Creek structure will be rehabilitated and maintained, and a new relief culvert will be constructed near the Water Street/Kalamazoo Avenue/Michigan Avenue rights-of-way. The opinion of probable cost for this section of project is $2,290,000. This system has the capacity to discharge the 100-year flood. Normally, soil conditions are not expected to provide any unusual construction conditions for this portion of the creek improvements.

   This section of the Arcadia Creek Project meets the preferred selection criteria for the following reasons: 1) vertical water surface fluctuations are kept to the specified minimum, 2) reliability and maintenance are low since mechanical controls are absent, and 3) 100-year flood flows are safely transported.

b. Arcadia Gardens - This portion of the project includes the construction of a small dam at Pitcher Street and a lake which will extend to just downstream of the Burdick Street Mall. The lake will be approximately 5.0 feet deep. During the 100-year flood, it is estimated that water would flow through the ponds with a velocity on the average of approximately 2.2 feet per second, and a

water depth of 10.8 feet. The flood plain width would average approximately 70 feet, and would be contained within the park area. Stone riprap erosion protection would be provided around the edges of the pond. The opinion of probable cost for creek improvements through the Arcadia Gardens area is $1,160,000.

The Arcadia Gardens meet the selection criteria for the following reasons: 1) it is an easily constructable system that will provide community benefits of open exhibit/gathering areas for downtown visitors, 2) it conforms with the updated Arcadia Creek concept plan in offering these open areas and ponds, and 3) it provides low flood flow velocities and ponded areas to minimize life safety hazards.

c. Housing/Rehabilitation Zone - This option will include the construction of reinforced concrete box culverts between the Burdick Street Mall and upstream of Rose Street. At that point, the channel will daylight for the entire reach between Rose Street and Westnedge Avenue. The open channel will include three small dams which will artificially support a water depth of approximately 3 feet during dry weather conditions. During the 100-year flood event, it is estimated that the average water depth will be approximately 7 feet, with a velocity of 6.0 feet per second through the open portions of the system. The opinion of probable cost for Arcadia Creek improvements through the Housing / Rehabilitation zone is $2,753,000. In the open channel portions of the creek, the 100-year flood plain will average approximately 35 feet in width. The 100-year flood plain through the box culvert portion of the system will be contained within the structure.

This section of the Arcadia Creek Project meets selection criteria in the following manner: 1) it could enhance the Arcadia Creek water quality by cascading water over the proposed dams, 2) it is low maintenance and highly reliable due to gravity controls, and 3) it is flexible in that future revisions to creek bank treatment could be incorporated.

d. West End - The preferred alternative for the West End includes the rehabilitation and maintenance of the existing Arcadia Creek structure, and the construction of a new open channel parallel to Michikal and Eleanor Street from Westnedge Avenue proceeding approximately 1,000 feet upstream. Furthermore, a small pond would be excavated upstream of Michikal, the Main Street bridge would be increased in size, and the Arcadia Creek channel would be improved for a distance of approximately 500 feet upstream of Main Street.

The opinion of probable cost for the creek improvements through the West End is $1,375,000. The new open channel portion of the creek adjacent to Michikal Avenue is proposed to flow at a depth of 8.0 feet and a velocity of 5.4 feet per second during the 100-year flood event. During normal low flow conditions, this section of the creek will flow approximately 0.5 feet deep.

The West End meets the preferred alternative selection criteria for these reasons: 1) it provides stormwater management and the associated community benefits, 2) the updated concept plan is met by providing open space and a ponded area, and 3) vertical water surface fluctuations meet the specified criteria.

The hydraulic performance of the preferred alternative for low flow conditions, and during the 10- and 100-year flood events, is illustrated on Figure No. 13 and Drawing No. 7. These graphics depict flood elevations for various events throughout the Arcadia Creek project area. Furthermore, the proposed structure dimensions and configurations including invert elevations are illustrated on these graphics. Finally, the 100-year flood flow velocities are identified. These velocities indicate the anticipated flood water current at various locations throughout the project area.

8.2 Flood Plain Considerations

Drawing No's. 8 and 9 illustrate the existing condition 100-year flood plain which is published in the City of Kalamazoo FIS (Reference 1). Drawing No's. 10 and 11 illustrate the 100-year flood plain associated with the proposed creek improvements. Comparison of these two drawings clearly illustrates the effectiveness of the proposed creek to accommodate the 100-year flood event. Table 8-1 presents a comparison between existing and proposed flood conditions. Furthermore, a cross section cross reference between the Kalamazoo FIS and the STS hydrology summary is provided. The creek improvements should resolve the flooding problems throughout the central business district and increase the developability of adjacent lands.

This engineering report and associated technical appendices should be utilized to apply to the Federal Emergency Management Agency to modify the floodway and flood plain of the Arcadia Creek.

TABLE 8-2

ARCADIA CREEK PROJECT

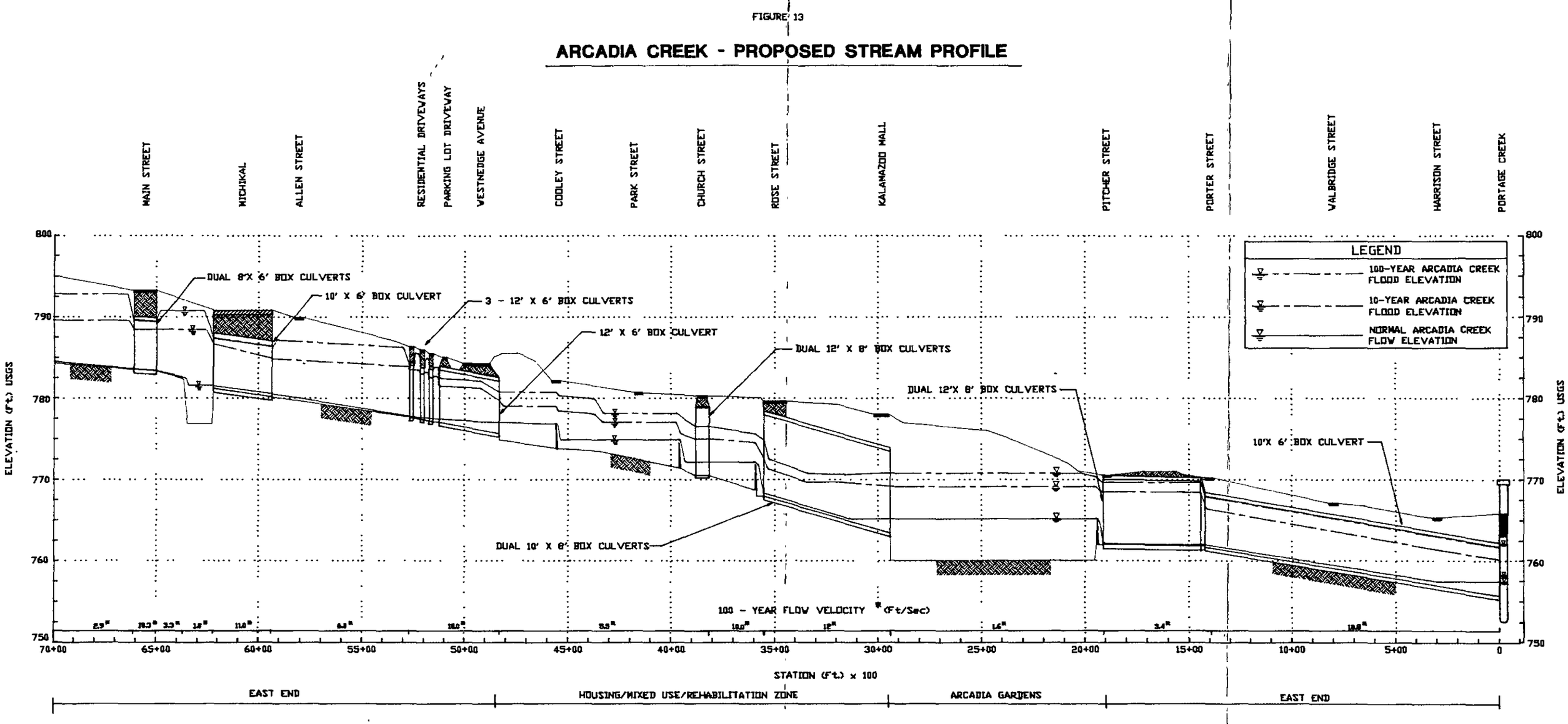
CROSS SECTION CROSS REFERENCE &

FLOOD ELEVATION SUMMARY

FIS Cross Section Designation	STS Cross Section Designation	Existing 100-Yr. Flood Elev. (ft)	Proposed 100-Yr. Flood Elev. (ft)	Flood Stage Reduction (ft)
A	1.46	769.0	767.3	1.7
B	2.6	771.4	769.7	1.7
C	4.2	772.4	770.6	1.8
D	9.0	776.7	770.8	5.9
E	14.0	779.5	770.8	8.7
F	19.0	781.8	776.5	5.3
G	29.0	782.7	778.0	4.7
H	37.0	785.0	780.6	4.4
I	58.0	788.4	786.6	1.8
J	73.0	794.5	792.9	1.6

FIGURE 13

ARCADIA CREEK - PROPOSED STREAM PROFILE



8.3 Geotechnical Considerations

Results of subsurface explorations provide regional soil profiles in the Arcadia Creek corridor. Based upon the subsurface explorations and laboratory analyses, the following geotechnical considerations are presented for the various components of the Arcadia Creek preferred alternative.

8.3.1 Project Structures

Based upon the results of the exploration program and the proposed structure locations and elevations, it is anticipated that the structures will be bearing in the natural sandy soils located below the surficial fill and slightly organic soils. Depending on structure loads and settlement requirements, spread footings appear to be a feasible foundation alternative for the project structures. Based upon comparison between the observed groundwater elevations and the proposed structure base elevations, groundwater is not expected to contribute to major construction problems. However, if the groundwater table is encountered during excavation dewatering and foundation drainage may be required.

Careful monitoring and inspection will be required during the performance of structure excavations. The natural sandy soils at the proposed bearing levels are susceptible to disturbance, especially near the water table. Construction procedures should be utilized to prevent excessive disturbance including the use of mud mats or work mats composed of crushed stone fill and installation of dewatering systems and foundation drainage where required.

Where new construction excavations encroach upon existing building foundations, care will have to be exercised so as not to undermine foundations. If new excavations, located within the zone of influence of existing footings, generally taken as a zone included with a 1 horizontal to 1 vertical plane extending outward and downward from the outside edge of the footings, are expected to occur, sheeting and bracing will most likely be required. We strongly recommend that prior to excavation, construction drawings of adjacent buildings be reviewed so that depth and location of all footings can be defined prior to any below grade construction activity within the area.

8.3.2 Project Lakes

Based upon the results of the exploration program and the proposed lake locations and bottom elevations, it is anticipated that a large portion of the lake excavations will be located in the natural sandy soils. A comparison between the observed groundwater elevations and the proposed bottom elevations indicates that the entire West End lake and a majority of the Arcadia Gardens lake will be situated above the groundwater table. Those conditions combined with the expected relatively high permeability of the natural coarse grained soils may necessitate the use of a liner system for the proposed lake structures.

8.4 Construction Issues

A preliminary construction sequence and schedule for the implementation of the Arcadia Creek improvements have been developed for the preferred alternative. In general, construction would be organized to five separate construction

zones: 1) East End, 2) Arcadia Gardens, 3) Rehabilitation / Mixed Use Zone, 4) Housing Zone, and 5) West End. It is anticipated that construction would extend over a two year period of time beginning with easement and permit issues, and construction bidding in January, 1988. Figure 14 illustrates the proposed conceptual construction schedule.

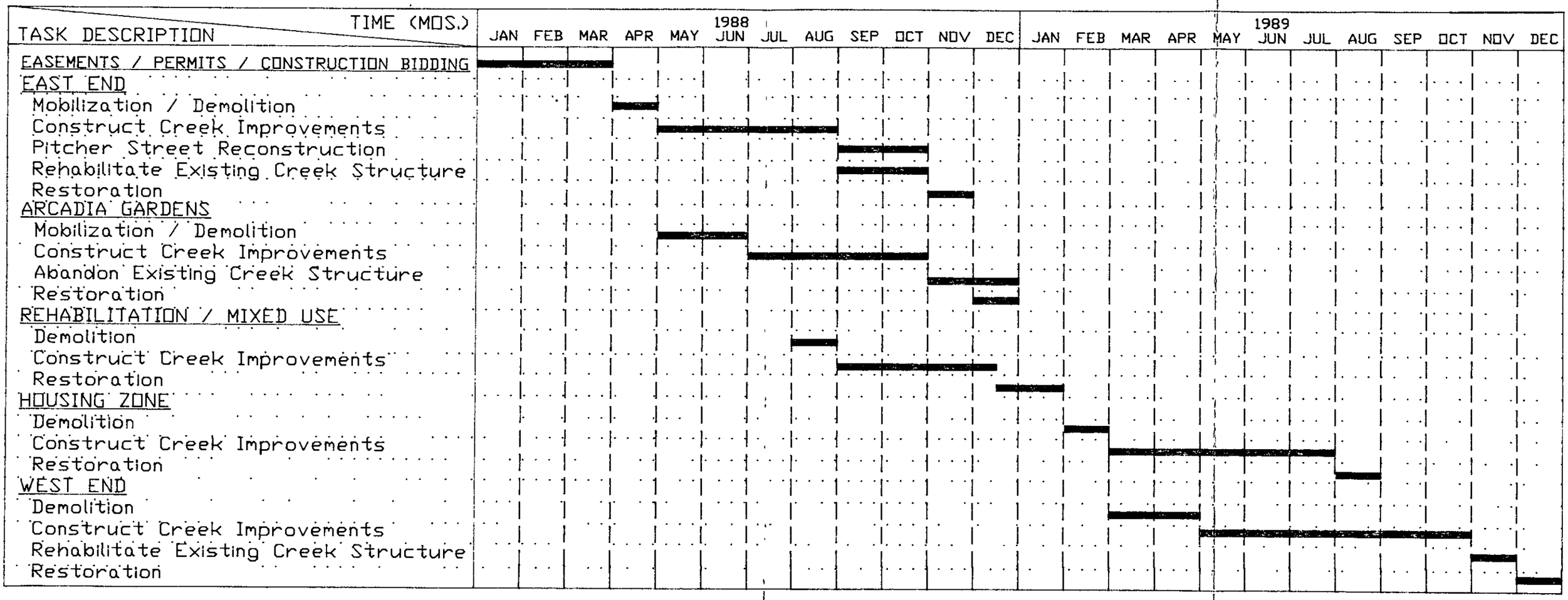
It is anticipated that the East End, the Rehabilitation/Mixed Use Zone, and the Arcadia Gardens area would be constructed during 1988. The Housing Zone and West End would be constructed in 1989.

The construction schedule and sequence has been set up to maximize the use of existing structures for the diversion of stormwater during construction. It is not anticipated that any special diversion structures will be necessary at any time during the construction, with the exception of localized storm sewers.

From a traffic interference perspective, construction within the East End will be the most critical. The sequencing of the construction of the creek in the Michigan Avenue and Kalamazoo Avenue rights-of-way will have to be coordinated to allow for the continued flow of traffic on this major traffic artery.

Rehabilitation of the existing Arcadia Creek for the portions which are proposed to remain between Pitcher Street and the Arcadia Creek mouth, and between Main Street and Westnedge Avenue, would be performed after the new relief systems are constructed. Therefore, stormwater diversion facilities will be on line, and rehabilitation could be performed with no flow in the creek. The improved Arcadia Creek corridor could be brought into operation in stages. For example, upon completion of construction in the East End, this segment

FIGURE 14
ARCADIA CREEK PROJECT
CONCEPTUAL CONSTRUCTION SCHEDULE



00BREAK00

1) COUNTY: KALAMAZOO

2) STUDY NAME: KALAMAZOO, CITY OF

3) WATERCOURSE: ARCADIA CREEK

4) DOCUMENT TYPE: REPORT VOLUME II

00BREAK00

APPENDIX D

Hydraulic Computations

CALCULATION COVER SHEET

STS Consultants Ltd.

PROJECT Arcadia Creek JOB NO 1069 DIVISION WR

SUBJECT Hydraulic [illegible] FILE NO

CALC NO

ORIGINATOR DEH DATE 11/20/90

CHECKER DATE NO OF SHEETS

RECORD OF ISSUES

NO	DESCRIPTION	BY	DATE	CHKD	DATE	APPRD		
1								
2								
3								
4								
5								
6								

PRELIMINARY CALC ☐

SUPERSEDED CALC ☐ FINAL CALC ☐

BRIEF SUMMARY OF CALCULATIONS INCLUDING SCOPE AND RESULTS

Following are calculations relating to the hydraulic analysis of the proposed [illegible] from Westnedge Ave. to [illegible] (PhaseI & II). These calculations are supplemental to the calculations prepared by HEC-2. These calculations include:

1. Starting Conditions
2. Bend Losses
3. Junction Losses
4. Weir Coefficients.

STS Consultants Ltd.
CALCULATION SHEET

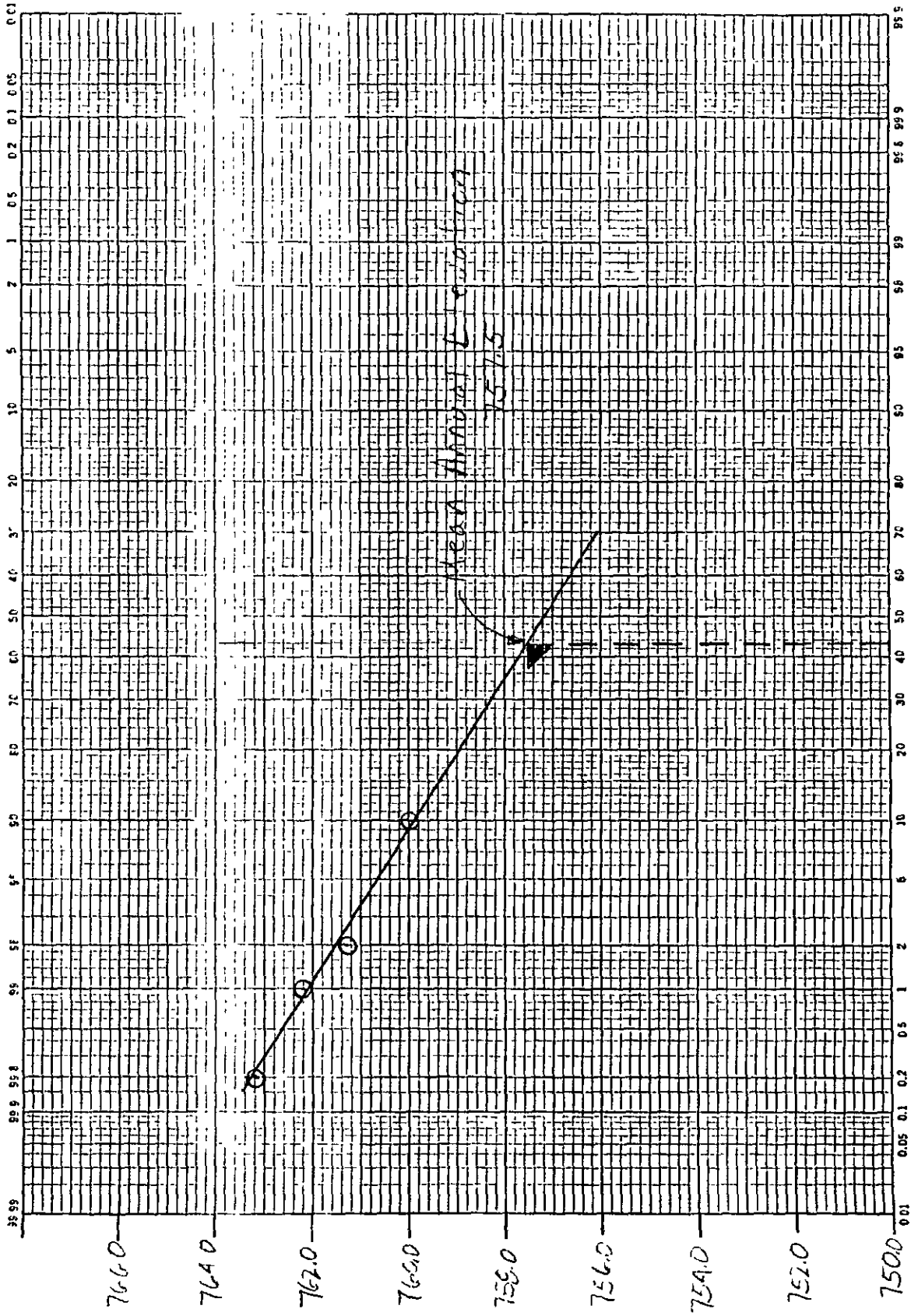
PROJECT	STS JOB NO.
Arcadia Creek	1069
SUBJECT	CALC NO
Purpose	
DATE 11/20/90 BY L.E.H	CHECKED BY / REV. NO.

Purpose: The purpose of these calculations is to supplement calculations performed by HEC-2. Calculations not directly made in HEC-2 include:

1. Starting conditions
2. Bend Losses
3. Junction Losses
4. Weir Coefficients.

STS Consultants Ltd CALCULATION SHEET	PROJECT: Arcadia Creek	STS JOB NO.: 1064
	SUBJECT: Mean Annual Elevation	CALC. NO.
	DATE: 5/2/90 BY: DEH	CHECKED BY	REV. NO.

Mean Annual Elevation Just Downstream of Conrail Bridge



STS Consultants Ltd. CALCULATION SHEET	PROJECT: Arcadia Creek			STS JOB NO.: 1069 AT
	SUBJECT: Starting Conditions			CALC. NO
	DATE: 9/25/99	BY: DEH	CHECKED BY	REV NO.

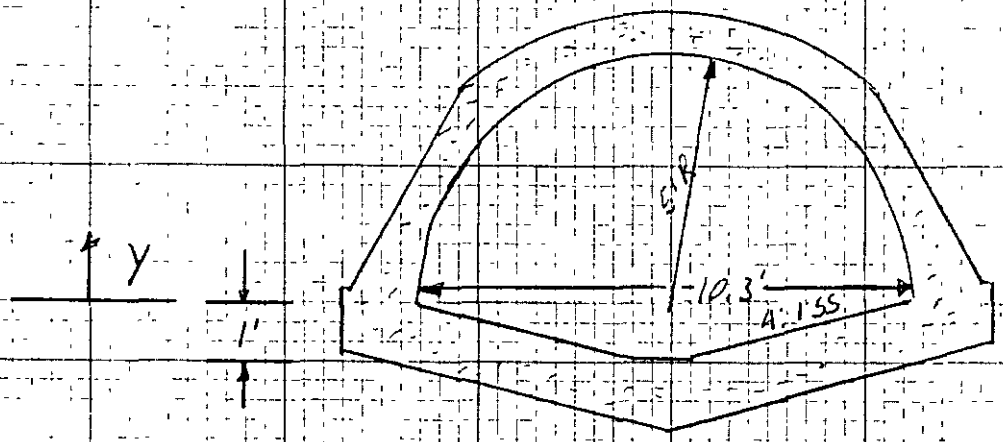
Starting Conditions (cont) Existing Culvert

Discharge (cfs)	Critical Depth (ft)	EHGL ($\frac{D_c+D}{2}$)	EHGL Elevation
100	1.94	3.97	759.6
150	2.39	4.19	759.9
200	2.79	4.39	760.1
250	3.15	4.58	760.2
300	3.49	4.74	760.4
350	3.80	4.90	760.6
400	4.09	5.04	760.7
450	4.36	5.18	760.8
500	4.60	5.30	761.0
550	4.83	5.41	761.1
600	5.02	5.51	761.2
650	5.20	5.60	761.3
700	5.34	5.67	761.33

STS Consultants Ltd.
CALCULATION SHEET

PROJECT	STS JOB NO
Arcadia Creek	1069-11J
SUBJECT	**CALC NO.**
Starting Conditions	
DATE 9/25/99 **BY** DEH	**CHECKED BY** **REV. NO.**

∴ Existing System (outlet to Portage creek)
starting conditions



Typ Cross-Section at confluence with Portage Creek
scale 1/4" = 1'-0"

Area = ⌓ + ◠

$= \frac{1}{2}(10.3)(1) + \left[R^2(\theta - \sin\theta\cos\theta) - \frac{\pi}{2}R^2\right]$

T = Top width = $d \sin\theta$

$P = \frac{R}{2}\theta - \pi R$

$\theta = \cos^{-1}\left[1 - \frac{Y}{R}\right]$

could be immediately mobilized by connecting the existing creek at the intersection of Pitcher Street and Kalamazoo Avenue into the new structure. The Arcadia Gardens segment could be implemented immediately upon completion of construction in this zone.

Once the excavation of the lakes is complete and the new dam is in place, the existing creek could be diverted into the gardens pond and the portions of the existing creek, which are slated for abandonment within the Arcadia Gardens area, could be demolished. It is anticipatd that portions of the existing creek would remain intact between the Burdick Street Mall and Westnedge Avenue to perform as a local stormwater collector pipe. This existing system would be connected into the new Arcadia Creek structure at selected locations.

An outline specification was prepared to provide an indication of the various construction issues which will be addressed in the project. Furthermore, this outline specification, which is presented in Appendix G, provides the foundation from which the detailed specifications will be prepared. These specifications should be married with the architectural and landscape architecture outline specification.

REFERENCES

1.0 Federal Emergency Management Agency, Flood Insurance Study, City of Kalamazoo, Kalamazoo County, Michigan, November, 1984.

2.0 Wade Trim & Associates, Inc., Detailed Hydrology Study of Arcadia Creek Basin, February, 1980.

3.0 Jones and Henry Engineers, Limited, Master Plan of Storm Drainage, City of Kalamazoo, April, 1976.

4.0 United States Department of Agriculture, Soil Conservation Service, Computer Program for Project Formulation - Hydrology, Technical Release No. 20, Washington, D.C.

5.0 U.S. National Weather Service and National Oceanographic and Atmospheric Administration, Five to 60 Minute Precipitation Frequency for East and Central United States, 1977.

6.0 U.S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-2 Water Surface Profiles, Generalized Computer Program, Davis, California, November, 1976.

7.0 STS Consultants, Ltd., Arcadia Creek Project, Composite Engineering Report, Lansing, Michigan, February 4, 1986.

8.0 Skidmore, Owings, and Merrill, Arcadia Creek An Urban Design and Development Guide for North Downtown Kalamazoo, Chicago, Illinois, January, 1984.

ARCADIA CREEK PROJECT

Preliminary Engineering Feasibility Report

Volume II
Appendices A-G

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ARCADIA CREEK PROJECT
PRELIMINARY FEASIBILITY & INVESTIGATION REPORT

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ARCADIA CREEK PROJECT
ENGINEERING DATA BASE SUMMARY

STS JOB NO. 1069

FEBRUARY 5, 1986

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I. GOVERNMENT DATA BASE

Organization	Phone Number	Information Provided	Comments
A. Federal Agencies:			
United States Geologic Survey	517-377-1608	Allen, W.B., et.al., 1972, Availability of Water in Kalamazoo County, Southwestern Michigan: U.S. Geol. Survey Water Supply Paper 1973, 129 p.	A study to guide the management of water resources in Kalamazoo County. Includes quantitative appraisal of ground water reservoirs. Only copy available.
		Deutsch, M., et.al., 1960, Groundwater hydrology and glacial geology of the Kalamazoo area, Michigan: Michigan Geol. Survey Prog. Rept. 23, 122 p.	Investigation of the increased ground water use in Kalamazoo County. Only copy available.
		Reed, J.E., et.al., 1966, Induced recharge of an artesian glacial-drift aquifer at Kalamazoo Michigan: U.S. Geol. Survey Water Supply Paper 1594-D, 62 p.	Study of artificial recharge to ground water aquifers in Kalamazoo County. Only copy available.
		Spicer, T.J., compiler, 1985, Water resources activities in Michigan, 1985: U.S. Geol. Survey Open File Report 85-566, 67 p.	Information on the water resources activities of the U.S. Geological Survey in Michigan.
		Huffman, G.C., 1985, Ground-Water data for Michigan: U.S. Geol. Survey Open File Report 85-420, 50 p.	Records of water levels and related data for the principal aquifers of Michigan.

Organization	Phone Number	Information Provided	Comments
		U.S. Geol. Survey, 7.5 Minute Series Topographic Maps, Kalamazoo and Kalamazoo SW Quadrangles, Scale 1:24000, contour interval 10 feet, photorevised 1973.	
		Miller, J.B., et.al., 1985, Water resources data, Michigan, Water year 1984: U.S. Geol. Survey Water Data Report MI-84-1, 276 p.	Records of stage, discharge, and water quality of streams; stage, contents, and water quality of lakes and reservoirs; and water levels and water temperature of ground water.
		Mean daily discharge tables for the Kalamazoo River at Comstock (Water years 1933-1980) and Portage Creek at Kalamazoo River (Water years 1948-58, 1975-85).	
Soil Conservation Service	517-337-6904	U.S. Dept. of Agriculture, Watershed Investigation Reports, Appendix E, Michigan Tributaries of the St. Joseph River Basin.	A report on water resource concerns, and potential solutions for the St. Joseph River Basin.
		U.S. Dept. of Agriculture, Soil Survey of Kalamazoo County, Michigan, Nov., 1978.	
		U.S. Dept. of Agriculture, Flood Hazard Analyses, Portage Creek, Kalamazoo County, Michigan, June 1978	This report identifies and delineates flood hazard areas within portions of the Portage Creek Watershed in Kalamazoo County.

Organization	Phone Number	Information Provided	Comments
U.S. Dept. of Commerce	313-668-2235	U.S. Dept. of Commerce, Publications by the Staff of the Great Lakes Environmental Research Laboratory, April 1974 - March 1985, June 1985.	
U.S. Army Corps of Engineers, Detroit District	313-226-6440	U.S. Army Engineer District, Detroit Corps of Engineers, Kalamazoo River Flood Control Project, Kalamazoo, Michigan and Vicinity, Detroit, Michigan, Jan. 1970.	This flood control project was never implemented.
Federal Emergency Management Agency		Federal Emergency Management Agency, Flood Insurance Study, City of Kalamazoo, Michigan, Nov. 1984.	Study to investigate the existence and severity of flood hazards in the City of Kalamazoo, Kalamazoo County, Michigan.
		Federal Emergency Management Agency, Flood Insurance Study Township of Kalamazoo, Michigan, Dec., 1981.	
B. State Agencies:			
Michigan Dept. of Natural Resources:			
Ground Water Division	517-373-1947	Scattered well log data for the city of Kalamazoo.	

Organization	Phone Number	Information Provided	Comments
Land Resource Programs	517-373-1170	Report on land use/cover in Kalamazoo will be available in approximately 1 year.	
Surface Water Quality Division	517-373-1949	Michigan Department of Natural Resources, Water Quality Station Inventory, Publication No. 3730-0032, Sept. 1983.	Catalogue of 3,900 past and present water quality monitoring stations in Michigan.
Water Management Division		Michigan Department of Natural Resources, Michigan Water Resources Data: An Inventory of Existing Data and a Collection of Identifed Data Needs, Vol. 4, Oct., 1985.	Description of physical, chemical, and biological data that are pertinent to Michigan's water resources.
State of Michigan Health Department	517-373-1376	Scattered well log data for the city of Kalamazoo.	
Michigan Dept. of Agriculture	517-373-2620	No information available.	
C. Local Agencies:			
Ionia County Extension Office	616-527-5357	Plat Book of Kalamazoo County.	
City of Kalamazoo:			
Clerk's Office	616-385-8017	Zoning maps of downtown Kalamazoo.	Scale: 1" = 2000'

Organization	Phone Number	Information Provided	Comments
Assessor's Office	616-385-8011	Tax maps of downtown Kalamazoo.	Scale: 1" = 200'
Dept. of Public Utilities	616-385-8149	Reproduceable maps of the water main location.	Scale: 1" = 50'
		Soil borings in downtown Kalamazoo.	Borings taken for sewer and water main construction.
Dept. of Public Works	616-385-8002	Sepias of the location of sanitary and storm sewers.	Scale: 1" = 200'
		Soil Borings from MDOT Test Holes and the Rail Consolidation Project.	
Drain Commission	616-384-8117	No information for Arcadia Creek.	
Planning Dept.	616-383-8780	A list of reports submitted to the KDDA is presented in Table 1.	
Kalamazoo Public Library	616-342-9837	U.S. DOT, FHA, and City of Kalamazoo, Final Environmental Impact/Section 4 (f) Statement for the Kalamazoo Rail Consolidation Program, Feb. 1981	

TABLE 1

REFERENCE MATERIAL PROVIDED BY THE KDDA

1. Report on Arcadia Creek Stormwater Problems and Aesthetic Use for Redevelopment, May 1983.

2. Report of the Arcadia Creek Study Group, January 10, 1983.

3. Parking Supply/Demand Study: Central Business District, October 22, 1984.

4. Arcadia Creek Project: Goals, Objectives and Milestones, August 7, 1985.

5. Arcadia Creek: An Urban Design and Development Guide for North Downtown Kalamazoo, January 1984.

6. Arcadia Creek: Concept Plan Update, September 1985.

7. Master Plan of Storm Drainage: Arcadia Creek Section, April 1976.

8. "Arcadia Creek Urban Design Plan", Progressive Architecture, January 1984.

9. "Arcadia Creek Adds to Kalamazoo's Foresight in Planning", Michigan Planner, Summer 1985.

10. "Flood Boundary and Floodway Map: Kalamazoo, Michigan", Revised Preliminary National Flood Insurance Program, Federal Emergency Agency, 1985.

11. Economic Research Associates: Stage I Report for an Economic Feasibility Study of the Central Business District of Kalamazoo, Michigan, December 1980.

12. Northside Association for Community Development, Northside Charette Design Plan, 1984.

13. Haymarket Historic District Streetscape Plan, 1985.

Organization	Phone Number	Information Provided	Comments
Kalamazoo County Planning Department	616-384-8112	Passero, R.N., ed., Information for the Evaluation of Location Criteria for Sanitary Landfills, Jan., 1983.	
		Geologic and Hydrogeologic maps of Kalamazoo County, See section VI.	Scale: 1.5 " = 1 Mile
Kalamazoo County Health Dept.	616-383-8802	No information obtained.	
Kalamazoo Conservation District	616-327-1258	No information obtained.	

II. PRIVATE UTILITY DATA BASE

Organization	Phone Number	Information Provided	Comments
Consumers Power Company	616-381-6130	Blueprints of the location of gas and electric utilities.	Scale: 1" = 100'
Fetzer Cablevision	616-345-5025	Blueprints of the location of cable utilities.	Scale: 1" = 100'
Michigan Bell Telephone	616-384-4478	Blueprint with hand-sketched location of telephone utilities.	Scale: 1" = 200'
Skidmore, Owings, & Merrill	312-641-5959	Blueprints of utility information in the Arcadia project area.	
Michigan Gas Utilities	616-692-6351	No utilities in the project area.	
The Upjohn Company	616-323-5893	No utilities in the project area.	
General Telephone	616-273-0460	No utilities in the project area.	

III. LAND SURVEY DATA BASE

Organization	Phone Number	Information Provided	Comments
STS Consultants, Ltd	517-321-4964	Base map of the Arcadia Creek Corridor Area (scale 1 in. = 40 ft.) (scale 1 in. = 100 ft.) [both from Jan. 27, 1986 Photography]	 Available February 21, 1986. Available March 6, 1986
O'Boyle, Cowell, Blalock & Associates, Inc.	616-381-3357	Base map of the Arcadia Creek Corridor Area with 4 ft. contour intervals (scale 1 in. = 100 ft.) [1968 Vintage]	Available from OCBA.

IV. HYDROLOGY AND HYDRAULICS DATA BASE

Organization	Phone Number	Information Provided	Comments
U.S. Geol. Survey	517-377-1608	Mean daily discharge tables for the Kalamazoo River at Comstock (Water years 1933-1980) and Portage Creek at Kalamazoo River (Water years 1948 - 58, 1975-85).	
Michigan Dept. of Natural Resources	517-373-3930	City of Kalamazoo Flood Insurance Study, Hydraulics and Hydrology technical appendices, and floodway and insurance rate maps.	
Dept. of Entomology - Michigan State University		Can provide precipitation data from April through October for some stations.	
KDDA	616-344-0795	Technical appendices to the Jones & Henry reports:	To be obtained.
Kalamazoo Regional Psychiatric Hospital	616-385-1593	Daily precipitation and high/low temperature records.	STS is compiling this data for the duration of the project.
Kalamazoo Gazette	616-345-3511	No weather records.	
STS Consultants, Ltd	517-321-4964	Staff gage for flow measurement in the Arcadia Creek.	Staff gage is installed and will be monitored for the project duration.

Organization	Phone Number	Information Provided	Comments
STS Consultants, Ltd.	517-321-4964	Soil borings in the City of Kalamazoo.	
MDNR - Water Management	517-373-0208	City of Kalamazoo Flood Insurance Study Hydrology Report.	Hydrologic Study report utilizing TR-20 model.
Western Michigan University	616-383-0988	Micklin, P.P., and Hodler, T.W., Stormwater Management in a Small Michigan Watershed, Physical Geography, 1983, p. 38-52.	A qualitative study examining stormwater flooding problems on Arcadia Creek.

Organization	Phone Number	Information Provided	Comments
Michigan Dept. of Natural Resources:			
Geol. Survey	517-373-7860	No information for the City of Kalamazoo.	
Ground Water	517-373-1947	Scattered well log data for the City of Kalamazoo.	
Soil Conservation Service	517-337-6904	U.S. Dept. of Agriculture, Soil Survey of Kalamazoo County, Michigan, Nov. 1978.	
Kalamazoo Department of Public Utilities	616-385-8149	Shallow soil borings done for sewer projects adjacent to Arcadia Creek.	
Kalamazoo Department of Public Works	616-385-8002	Soil borings from MDOT Test Holes and the Rail Consolidation Program.	
Kalamazoo County Planning Dept.	616-384-8112	Various geologic maps for Kalamazoo County.	See Table 2 for a description of maps.
Western Michigan University	616-383-0067	Passero, R.N., et. al., Kalamazoo County Geology and the Environment, Western Michigan University, 1978.	
Michigan Dept. of Transportation		Highway reconstruction plans for Kalamazoo Ave.	Some soil borings on the Arcadia Creek.

VI. MAP DATA BASE

Organization	Phone Number	Title of Map	Scale	Comments
Federal Emergency Management Agency		Floodway - Flood Boundary and Floodway Map, City of Kalamazoo, Michigan, May 1985.	1" = 400'	
		Firm - Flood Insurance Rate Map, City of Kalamazoo, Michigan, May, 1985.	1" = 400'	
U.S. Geol. Survey	517-377-1608	Kalamazoo and Kalamazoo SW Quadrangles, 1973.	1" = 2000'	
STS Consultants, Ltd	517-321-4964	Reproducible enlargement of the Kalamazoo Quadrangle in the Arcadia Corridor area.	1" = 200'	
City of Kalamazoo:				
Clerk's Office	616-385-8017	Zoning maps of downtown Kalamazoo.	1" = 2000'	
Assessor's Office	616-385-8011	Tax maps of downtown Kalamazoo.	1" = 200'	
Dept. of Public Utilities	616-385-8149	Reproducible maps of the water main location.	1" = 50'	

TABLE 2

MAPS PROVIDED BY KALAMAZOO COUNTY PLANNING DEPARTMENT

* Flood Plains and Floodways, Kalamazoo County, 1982
* Bedrock Geology and Topography of Kalamazoo County 25' Contour Intervals, 1982
* Generalized Thickness of Glacial Drift, Kalamazoo County 50' Contour Interval, 1982
* Generalized Water-Table Contours, Kalamazoo County 20' Countour Interval
* Glacial Geology of Kalamazoo County Michigan, 1982
* Municipal & Industrial Water Supply Well Fields and Service Areas, Kalamazoo County, Michigan, 1982
* Generalized Depth to Water Table, Kalamazoo County, Michigan, 1982
* Population: 1980 Census Tracts and Blocks, Kalamazoo County, Michigan, 1982
* Sanitary Sewer Service Areas, Kalamazoo County, Michigan, 1982
* Kalamazoo County Transportation Routes, 1982
* Prime Agricultural Soils of Kalamazoo County, Michigan, 1982
* Surface Waters and Wetlands of Kalamazoo County, Michigan, 1982
* Areas with Significant Depth and Thickness of Clay and Clay Till Layers, Kalamazoo County, Michigan, 1982

Organization	Phone Number	Title of Map	Scale	Comments
Dept. of Public Works	616-385-8002	Reproducible maps of the sanitary and storm sewer location.	1" = 200'	
Kalamazoo County Planning Department	616-384-8112	A partial list of maps available from the KCPD is presented in Table 2.	1.5"=1 mi.	
KDDA	616-344-0795	Base Map of the Arcadia Corridor Area.	1" = 100'	
Consumer's Power Company	616-381-6130	Blueprints of gas and electric utility locations.	1" = 100'	
Fetzer Cablevision	616-345-5025	Blueprints of TV cable location.	1" = 200'	
Michigan Bell Telephone	616-384-4478	Blueprint with hand-sketched location of telephone utilities.	1" = 200'	
Jones & Henry		A list of maps prepared by Jones & Henry is presented in Table 3.		

TABLE 3

MAPS PREPARED BY JONES & HENRY ENGINEERS

Title	Scale	Date
Profile 1, Existing Arcadia Creek, Kalamazoo River to Elm Street	1" = 200'	April 1983
Profile 2, Existing Arcadia Creek, Elm Street to Oliver Street	1" = 200'	--
Profile 3, Required Channel - All flow in new open channel following existing route, Kalamazoo River to Michikal	1" = 200'	April 1983
Profile 4, Proposed Channel Improvements	1" = 200'	--
Profile 5, Required Conduit - Relief Drain Following Railroad Route, Kalamazoo River to Elm Street	1" = 200'	April 1983
Map 1, Michikal to Kalamazoo River Location of existing Arcadia Creek and of proposed improvements	1" = 200'	April 1983
Map 2, Oliver Street to Michikal Location of Existing Arcadia Creek	1" = 200'	--
Map 3, Oliver Street to Michikal Location of Proposed Improvements for Arcadia Creek	1" = 200'	--

Organization	Phone Number	Title of Map	Scale	Comments
O'Boyle, Cowell, Blalock & Associates, Inc.	616-381-3357	1968 Topographic Base Map, 4 ft. contour interval.	1" = 100'	
Skidmore, Owings, & Merrill	312-641-5959	Concept Map, Arcadia Corridor Area.	1" = 100'	
		Utility maps.		Scattered utility information.
STS Consultants, Ltd	517-321-4964	Final Base Maps		
		1 ft. Contour Interval.	1" = 40'	
		1 ft. Contour Interval.	1" = 100'	
		Utility Overlay Map	1" = 40'	

VII. OTHER

Organization	Phone Number	Information Provided	Comments
STS Consultants, Ltd	517-321-4964	Arcadia Creek Hydrograph and Hyetograph. Arcadia Creek Flow-Duration Curve.	Information through February 2, 1986.

Report



OWNER Kalamazoo Downtown Development Authority	LOG OF BORING NUMBER SB-15
PROJECT NAME Arcadia Creek	ARCHITECT ENGINEER Skidmore, Owings & Merrill
SITE LOCATION Kalamazoo, Michigan	STS Consultants Ltd.

SURFACE ELEVATION 765.7

ELEVATION / DEPTH	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT LBS/FT³
					Driller's observation: 4" asphalt, 12" concrete, 8" gravel.	
5	1	SS			Fine to med. sand, little to some gravel - brown loose to med. dense - moist. (SW)	
	2	SS				
	3	SS				
10	4	SS			Med. sand, little silt, trace gravel - dk. brown-medium dense-moist (SP-SI)	
15	5	SS			Fine to coarse sand, trace silt & gravel-brown-med. dense to dense-wet. (SP)	
20	6	SS				
25					END OF BORING Boring advanced to 18.5' using solid stem auger. Borehole backfilled with soil cuttings. Note: Drillers noted a gasoline odor in groundwater.	

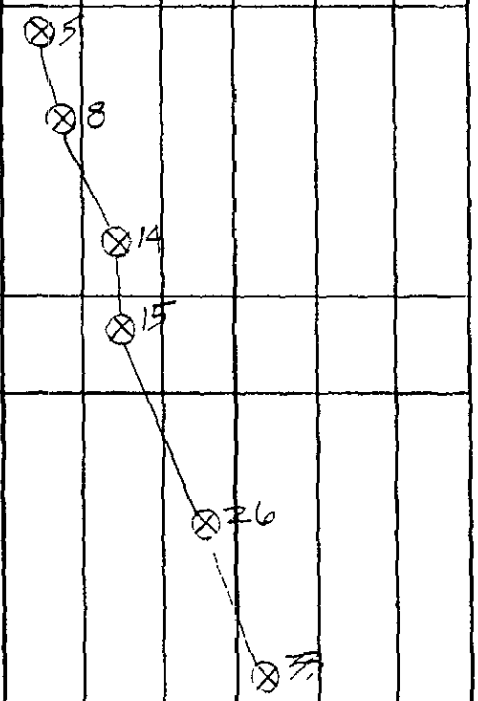
UNCONFINED COMPRESSIVE STRENGTH TONS FT⁻² : 1 2 3 4 5

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT %

10 20 30 40 50

STANDARD PENETRATION BLOWS FT

10 20 30 40 50



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN SITU THE TRANSITION MAY BE GRADUAL

WL 13.0 WS OR WD	BORING STARTED 9-25-06		
WL BCR ACR	BORING COMPLETED 9-25-06		
WL	RIG B-53 FOREMAN J.F.	APP'D BY WEH	STS JOB NO 1069R

BLI

OWNER: Kalamazoo Downtown Development Authority	LOG OF BORING NUMBER: SB-16
PROJECT NAME: Arcadia Creek	ARCHITECT-ENGINEER: Skidmore, Owings & Merrill

STS Consultants Ltd.

SITE LOCATION: Kalamazoo, Michigan

SURFACE ELEVATION: 766.7

ELEVATION / DEPTH	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT LBS/FT³	UNCONFINED COMPRESSIVE STRENGTH TONS/FT² (PLASTIC LIMIT % / WATER CONTENT % / LIQUID LIMIT %) STANDARD PENETRATION BLOWS/FT
					Driller's observation: 4" asphalt, 8" brick & sand fill.		
	1	SS			Fine to coarse sand fill, little silt, trace clay, gravel & organics-dk. grayish brown-loose to med.dense-moist. (Fill: SP-SM)		6
	2	SS					17
5	3	SS			Fine to med. sand, some gray & brown clay seams, trace silt-brown-loose-moist. (SP)		10
	4	SS			Clayey fine sand, little silt-brown-loose-moist. (SC)		5
10	5	SS			Fine sand, trace coarse & med.sand-brown-med.dense-moist to wet. (SP)		14
15	6	SS					10
20	7	SS					26
					END OF BORING Boring advanced to 18.5' using solid stem auger. Boring backfilled with soil cuttings and patched.		

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN SITU THE TRANSITION MAY BE GRADUAL

WL 11.0 WS ~~XXXX~~	BORING STARTED 9-25-86		
WL BCR ACR	BORING COMPLETED 9-25-86		
WL	RIG B-53 FOREMAN JF	APP'D BY WEH	STS JOB NO 1069R

BL1

OWNER: Kalamazoo Downtown Development Authority	LOG OF BORING NUMBER: SB-17
PROJECT NAME: Arcadia Creek	ARCHITECT-ENGINEER: Skidmore, Owings & Merrill
SITE LOCATION: Kalamazoo, Michigan	STS Consultants Ltd.

UNCONFINED COMPRESSIVE STRENGTH TONS FT²: 1 2 3 4 5

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT %: 10 20 30 40 50

STANDARD PENETRATION BLOWS FT: 10 20 30 40 50

ELEVATION / DEPTH	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT LBS/FT³	STANDARD PENETRATION BLOWS FT
					SURFACE ELEVATION 767.4		
					Driller's observation: 4" asphalt, 8" brick & sand fill.		
	1	SS			Fine to coarse sand, some gravel, trace silt & organic-dk.brown-loose -moist. (Fill: SP)		9
	2	SS					9
	3	SS			Fine to med. sand, trace coarse sand-brown-loose to med.dense- moist (SP)		6
	4	SS					19
	5	SS			Sandy silt-grayish brown-med.dense-moist-w/some sand seams. (ML)		12
	6	SS			Fine to med.sand, trace coarse sand -brown-med.dense-wet. (SW)		24
	7	SS					24
					END OF BORING Boring advanced to 18.5' using solid stem auger. Borehole backfilled with soil cuttings and patched.		

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN SITU THE TRANSITION MAY BE GRADUAL

WL 13.0 WD	BORING STARTED 9-25-86		
WL BCR ACR	BORING COMPLETED 9-25-86		
WL	RIG B-53 FOREMAN J.F.	APP'D BY WEH	STS JOB NO 1069R

BL I

OWNER Kalamazoo Downtown Development Authority	LOG OF BORING NUMBER SB-18
PROJECT NAME Arcadia Creek	ARCHITECT-ENGINEER Skidmore, Owings & Merrill
SITE LOCATION Kalamazoo, Michigan	STS Consultants Ltd.

SURFACE ELEVATION 770.0

ELEVATION / DEPTH	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT LBS/FT³
					Driller's observation: 4" asphalt, 8" brick & sand fill.	
	1	SS			Fine to med.sand, little to some silt & gravel, trace organics – dk. brown-med.dense-moist. (Fill: SP-SM)	
5	2	SS				
	3	SS				
	4	SS			Fine to med. sand, some clayey & silty seams, trace silt-brown-med. dense-moist to wet. (SP-SM)	
10	5	SS				
15	6	SS			Fine sand-brown-medium dense-wet. (SP)	
20	7	SS				
25					END OF BORING Boring advanced to 18.5' using solid stem auger. Borehole backfilled with soil cuttings and patched.	

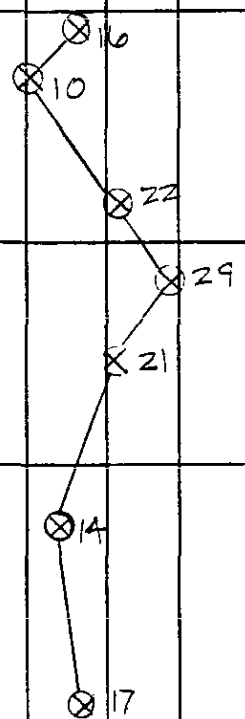
UNCONFINED COMPRESSIVE STRENGTH TONS FT² — 1 2 3 4 5

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT %

10 20 30 40 50

STANDARD PENETRATION BLOWS FT

10 20 30 40 50



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN SITU THE TRANSITION MAY BE GRADUAL

WL 11.0 WS ~~DRY~~	BORING STARTED 9-25-86		
WL BCR ACR	BORING COMPLETED 9-25-86		
WL	RIG B-53 FOREMAN J.F.	APP'D BY WEH	STS JOB NO 1069R

BL.I

OWNER: Kalamazoo Downtown Development Authority	LOG OF BORING NUMBER: SB-19
PROJECT NAME: Arcadia Creek	ARCHITECT ENGINEER: Skidmore, Owings & Merrill
SITE LOCATION: Kalamazoo, Michigan	STS Consultants Ltd.

SURFACE ELEVATION 771.5

ELEVATION / DEPTH	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL
					Driller's observation: 4" asphalt, 8" brick and sand fill.
	1	SS			Fine to coarse sand, trace to little silt, trace organics, gravel & brick fragments-dk. brown & black-med. dense-moist. (Fill: SP)
5	2	SS			
	3	SS			Fine to coarse sand, little gravel and silt-brownish gray-med.dense -moist. (SW-SM)
	4	SS			Fine to med. sand-trace to little gravel-brown-loose to medium dense-moist to wet. (SP)
10	5	SS			
15	6	SS			
20	7	SS			
25					END OF BORING Boring advanced to 18.5' using solid stem auger. Borehole backfilled with soil cuttings.

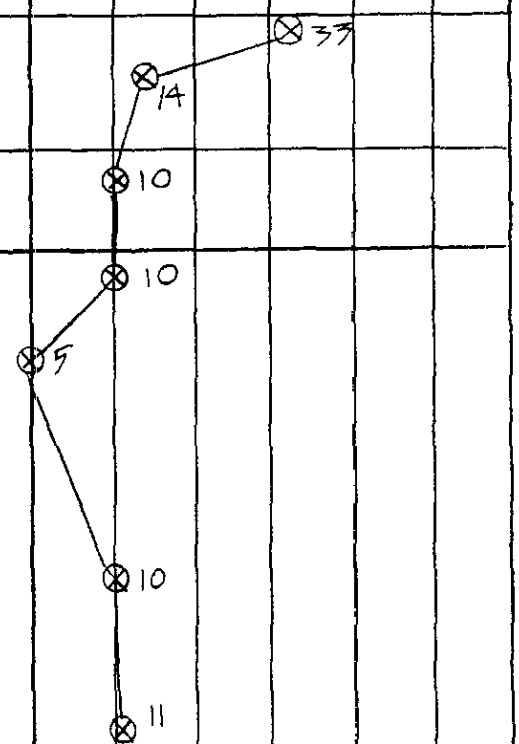
UNIT DRY WT LBS/FT³

UNCONFINED COMPRESSIVE STRENGTH TONS FT² — 1 2 3 4 5

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT %

10 20 30 40 50

STANDARD PENETRATION BLOWS FT — 10 20 30 40 50



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN SITU THE TRANSITION MAY BE GRADUAL

WL 14.5 ~~WS~~ OR WD	BORING STARTED 9-24-86		
WL BCR ACR	BORING COMPLETED 9-24-86		
WL	RIG B-53 FOREMAN JF	APP'D BY WEH	STS JOB NO 1069R

BLI

OWNER: Kalamazoo Downtown Development Authority	LOG OF BORING NUMBER: SB-20
PROJECT NAME: Arcadia Creek	ARCHITECT-ENGINEER: Skidmore, Owings & Merrill
SITE LOCATION: Kalamazoo, Michigan	STS Consultants Ltd.

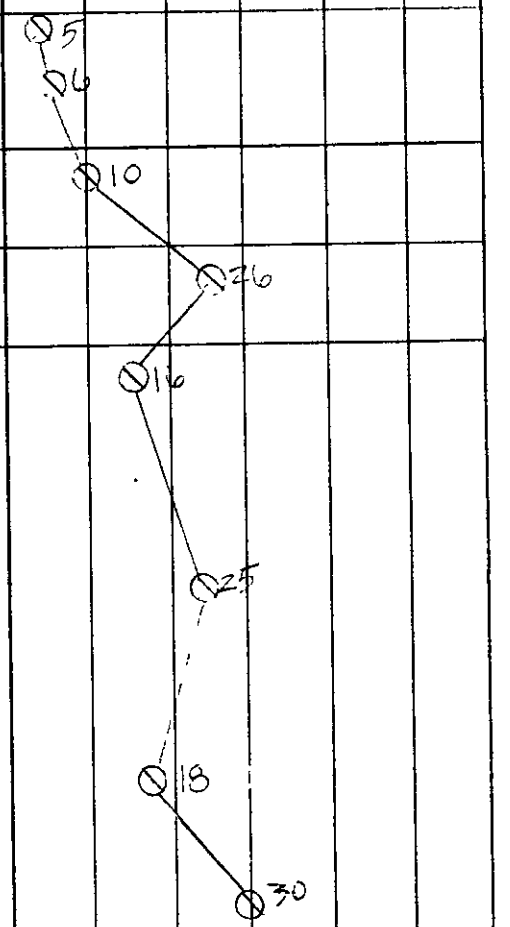
UNCONFINED COMPRESSIVE STRENGTH TONS FT² — 1 2 3 4 5

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT %

10 20 30 40 50

STANDARD PENETRATION BLOWS FT — 10 20 30 40 50

ELEVATION / DEPTH	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT LBS/FT³
					SURFACE ELEVATION 770.0	
					Driller's observation: 4" asphalt, 8" brick & sand fill.	
	1	SS			Sandy silt, some clay, trace organics -black & dk.brown-loose-moist.(ML)	
	2	SS				
5	3	SS			Fine to med.sand, trace gravel & silt-brown-med.dense-moist.(SP)	
	4	SS			Fine to coarse sand, little gravel & silt-dk.brown-med.dense-moist.(SW-SM)	
10	5	SS			Fine to med. sand, trace gravel-brown-med.dense to dense-wet. (SW)	
15	6	SS				
20	7	SS				
25	8	SS				
30					END OF BORING Boring advanced to 23.5' using solid stem auger. Borehole backfilled with soil cuttings. Note: Driller moved boring 3 times because of obstructions encountered at 5', 7.5' and 2.5'.	



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN SITU THE TRANSITION MAY BE GRADUAL

WL 12.5 WS ~~CAVED~~	BORING STARTED 9-24-86	STS Consultants Ltd.	
WL BCR ACR	BORING COMPLETED 9-24-86		
WL	RIG B-53 FOREMAN JF	APP'D BY WEH	STS JOB NO 1069R

BLI

OWNER: Kalamazoo Downtown Development Authority	LOG OF BORING NUMBER: SB-21
PROJECT NAME: Arcadia Creek	ARCHITECT ENGINEER: Skidmore, Owings & Merrill
SITE LOCATION: Kalamazoo, Michigan	STS Consultants Ltd.

SURFACE ELEVATION: 772.9

ELEVATION / DEPTH	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT LBS/FT³	UNCONFINED COMPRESSIVE STRENGTH TONS FT² (1 2 3 4 5) / PLASTIC LIMIT % / WATER CONTENT % / LIQUID LIMIT % (10 20 30 40 50) / STANDARD PENETRATION BLOWS FT (10 20 30 40 50)
					Driller's observation: 6" asphalt, 6" brick & sand fill.		
	1	SS			Fine to coarse sand, trace to little silt, trace organics-dk. brown and black-loose-moist. (Fill: SP-SM)		5
	2	SS					4
5					Fine to med.sand, trace silt & gravel- dk.brown-med.dense-moist.(SP)		
	3	SS					10
							12
	4	SS			Fine to med.sand, trace to little gravel, trace fossils at 17.5'- brown-medium dense-moist to wet. (SP)		
10							11
	5	SS					
15							13
	6	SS					
							22
20	7	SS					
					END OF BORING		
					Boring advanced to 18.5' using solid stem auger. Borehole backfilled with soil cuttings.		
25							

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN SITU THE TRANSITION MAY BE GRADUAL

WL 15.5 WS~~XXXXX~~	BORING STARTED 9-24-86	STS Consultants Ltd.	
WL BCR ACR	BORING COMPLETED 9-24-86		
WL	RIG B-53 FOREMAN JF	APP'D BY WEH	STS JOB NO 1069R

BL.I

OWNER	Kalamazoo Downtown Development Authority	LOG OF BORING NUMBER	SB-22
PROJECT NAME	Arcadia Creek	ARCHITECT-ENGINEER	Skidmore, Owings & Merrill

STS Consultants Ltd.

SITE LOCATION: Kalamazoo, Michigan

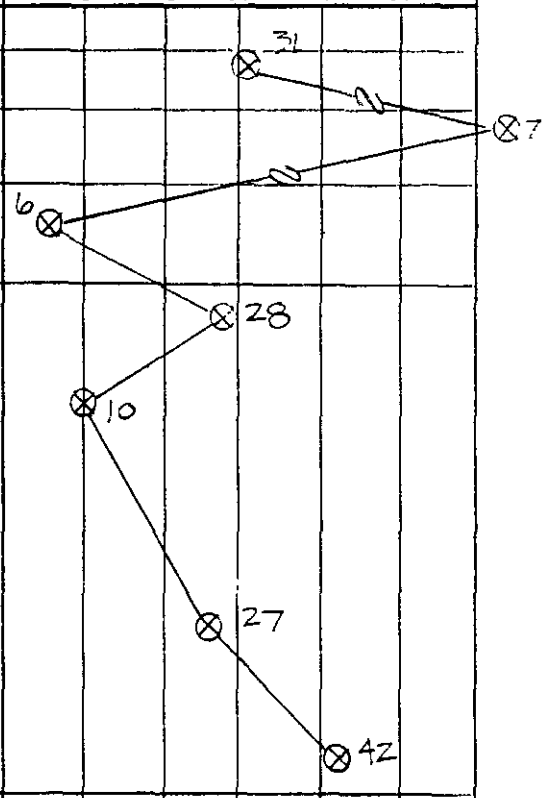
UNCONFINED COMPRESSIVE STRENGTH TONS FT² (1, 2, 3, 4, 5)

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT % (10, 20, 30, 40, 50)

STANDARD PENETRATION BLOWS FT (10, 20, 30, 40, 50)

SURFACE ELEVATION 775.2

ELEVATION	DEPTH	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT LBS/FT³
						Driller's observation: 4" asphalt, 8" gravel.	
		1	SS				
		2	SS			Sand & gravel fill, trace organics, brick fragments & silt-red, black & brown-dense-moist. (Fill: SP-GP)	
	5	3	SS			Fine to coarse sand, some gravel, trace silt-tan-very dense-moist (SW)	
		4	SS			Fine to med. sand, some clay, trace coarse sand-dark grayish brown-loose-moist. (SC)	
	10	5	SS			Fine to med.sand, trace to some coarse sand & gravel, trace silt-dk.brown-med.dense to dense-moist. (SP)	
	15	6	SS				
	20	7	SS				
						END OF BORING	
	25					Boring advanced to 18.5' using solid stem auger. Borehole backfilled with soil cuttings and patched.	



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN SITU THE TRANSITION MAY BE GRADUAL

WL	15.0	WS	BORING STARTED	9-24-86	
WL	BCR	ACR	BORING COMPLETED	9-24-86	
WL			RIG B-53	FOREMAN JF	APP'D BY WEH — STS JOB NO 1069R

BLI

OWNER: Kalamazoo Downtown Development Authority	LOG OF BORING NUMBER: SB-23
PROJECT NAME: Arcadia Creek	ARCHITECT-ENGINEER: Skidmore, Owings & Merrill
SITE LOCATION: Kalamazoo, Michigan	STS Consultants Ltd.

SURFACE ELEVATION 776.4

UNCONFINED COMPRESSIVE STRENGTH TONS FT² (1 2 3 4 5)

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT % (10 20 30 40 50)

STANDARD PENETRATION BLOWS FT (10 20 30 40 50)

ELEVATION / DEPTH	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT LBS/FT³	STANDARD PENETRATION BLOWS FT
					Driller's observation: 4" asphalt, 8" rock & brick.		
	1	SS			Sand & gravel fill, trace silt & organics - dk.brown & black-med.dense -moist. (Fill: SP-GP)		12
	2	SS					3
5	3	SS			Fine sand, little silt, trace organics - dk.brown-very loose - moist.(SP-SM)		11
	4	SS			Fine to med.sand, trace coarse sand & silt-brown-med. dense-moist. (SP)		3
10	5	SS			Fine to coarse sand, trace to little silt and gravel - brown - very loose to loose - moist to wet (SW-SM)		4
15	6	SS					7
20	7	SS			Gravelly fine to coarse sand - brown-dense-wet. (SW)		30
25	8	SS					48
30					END OF BORING Boring advanced to 23.5' using solid stem auger. Borehole backfilled with soil cuttings and patched.		

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN SITU THE TRANSITION MAY BE GRADUAL

WL 15.0 WS ~~ORW~~		BORING STARTED 9-24-86	STS Consultants Ltd.
WL BCR ACR		BORING COMPLETED 9-24-86	
WL		RIG B-53 FOREMAN JF	APP'D BY WEH STS JOB NO 1069R

BLI

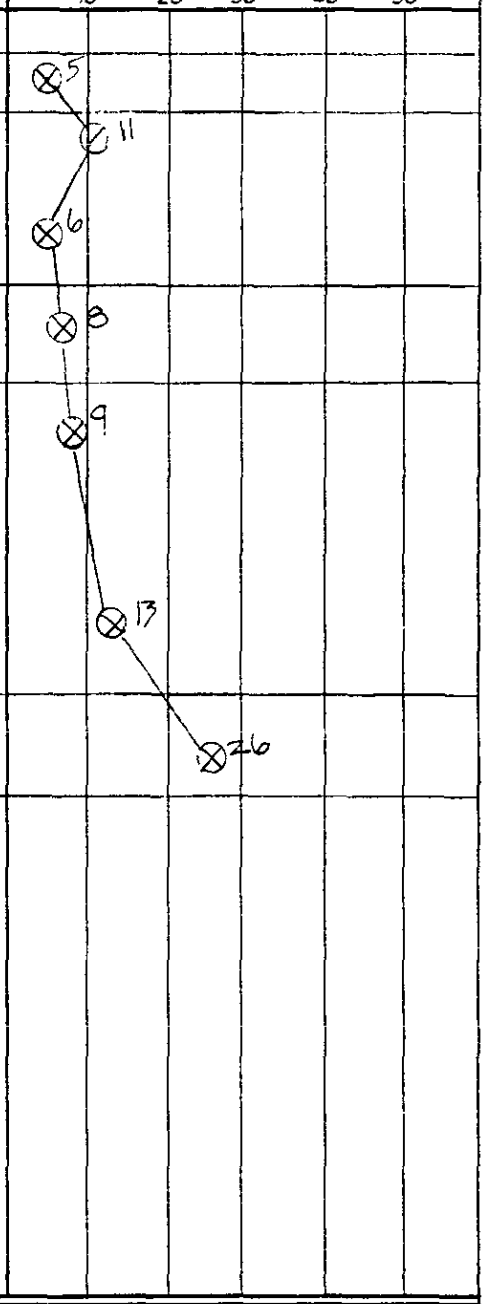
OWNER: Kalamazoo Downtown Development Authority	LOG OF BORING NUMBER: SB-24
PROJECT NAME: Arcadia Creek	ARCHITECT-ENGINEER: Skidmore, Owings & Merrill

STS Consultants Ltd.

SITE LOCATION: Kalamazoo, Michigan

SURFACE ELEVATION: 779.3

ELEVATION / DEPTH	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT LBS/FT³
					Driller's observation: 4" asphalt, 8" brick & sand fill.	
	1	SS				
	2	SS			Sand fill, trace to some silt & clay, trace gravel & brick fragment - dk. brown - loose to med.dense - moist, (Fill: SM)	
5	3	SS				
	4	SS			Fine to coarse sand, little gravel, trace silt & organics-black-loose to med.dense-moist. (SW)	
10	5	SS			Fine to coarse sand, some gravel, trace clay-dk.grayish brown-loose-moist. (SW-SC)	
					Fine to medium sand, trace gravel & course sand - brown - loose to med. dense - moist to wet. (SP)	
15	6	SS				
	7	SS			Fine to coarse sand, little gravel - brownish gray - med.dense - wet. (SW)	
20						
					END OF BORING	
					Boring advanced to 18.5' using solid stem auger. Borehole backfilled with soil cuttings and patched.	
25					Note: Volatile contaminate noted in Sample #7.	



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN SITU THE TRANSITION MAY BE GRADUAL

WL 15.0 WS XXXX WD	BORING STARTED 9-24-86		
WL BCR ACR	BORING COMPLETED 9-24-86		
WL	RIG B-53 FOREMAN J.F.	APP'D BY WEH	STS JOB NO 1069R

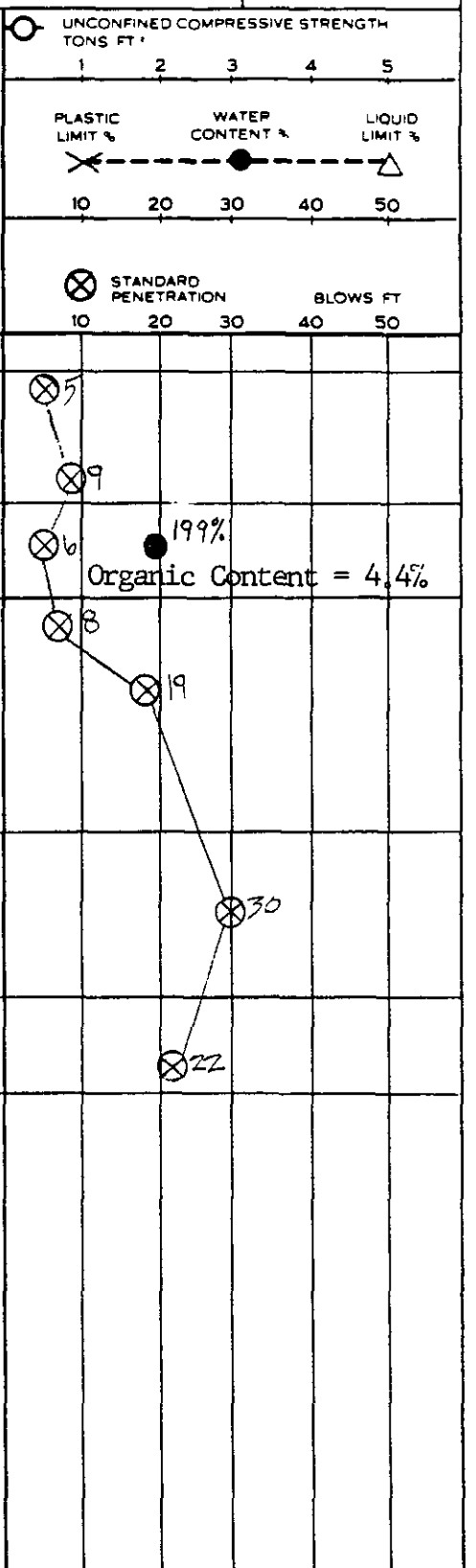
BL1

OWNER: Kalamazoo Downtown Development Authority	LOG OF BORING NUMBER: SB-25
PROJECT NAME: Arcadia Creek	ARCHITECT-ENGINEER: Skidmore, Owings & Merrill

STS Consultants Ltd.

SITE LOCATION: Kalamazoo, Michigan

ELEVATION / DEPTH	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT LBS/FT³
					SURFACE ELEVATION 781.6	
					Driller's observation: 4" brick, 8" gravel & sand.	
	1	SS				
	2	SS			Sand, gravel & bricks, little to some silt & cinders - dk.brown & black - loose-moist. (Fill: SP-SM)	
5						
	3	SS			Fine to med. sand, little silt, trace gravel & organics-dk. brown to black - loose-moist (SM)	
	4	SS			Fine to coarse sand, trace to little silt & gravel - grayish brown - loose to med.dense - moist. (SW-SM)	
10						
	5	SS				
					Fine to med.sand, trace silt & gravel - brown - dense - moist. (SP)	
15	6	SS				
					Fine to coarse sand, trace gravel - grayish brown - med.dense - wet. (SW)	
20	7	SS				
					END OF BORING	
					Boring advanced to 18.5' using solid stem auger. Borehole backfilled with soil cuttings and patched.	
25						



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN SITU THE TRANSITION MAY BE GRADUAL

WL 15.0 WS ~~GRAVEL~~	BORING STARTED 9-24-86		
WL BCR ACR	BORING COMPLETED 9-24-86		
WL	RIG B-53 FOREMAN JF	APP'D BY WEH	STS JOB NO 1069R

BL1

OWNER Kalamazoo Downtown Development Authority	LOG OF BORING NUMBER SB-26
PROJECT NAME Arcadia Creek	ARCHITECT ENGINEER Skidmore, Owings & Merrill
SITE LOCATION Kalamazoo, Michigan	STS Consultants Ltd.

UNCONFINED COMPRESSIVE STRENGTH TONS FT² 1 2 3 4 5

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT %

10 20 30 40 50

STANDARD PENETRATION BLOWS FT 10 20 30 40 50

ELEVATION / DEPTH	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT LBS/FT³
					SURFACE ELEVATION 780'	
					Driller's observation: 4" asphalt, 8" gravel and brick.	
	1	SS			Fine to coarse sand fill, trace gravel & silt - reddish brown - med. dense - moist (Fill: SW)	
	2	SS				
5					Silty fine sand, trace clay & organics - black - med. dense - moist (SM)	
	3	SS			Fine to med. sand, some clay, trace organics & coarse sand-black-med. dense-moist. (SC)	
	4	SS			Fine to med. sand, little silt trace gravel - med. dense to dense - dk. grayish brown - moist. (SP-SM)	
10	5	SS				
15	6	SS			Sandy gravel, trace silt - brown - med. dense to extremely dense - wet. (GW)	
20	7	SS				
					END OF BORING Boring advance to 18.5' using solid stem auger. Borehole backfilled with soil cuttings and patched.	

18.8% Organic Content = 3.1%

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN SITU THE TRANSITION MAY BE GRADUAL

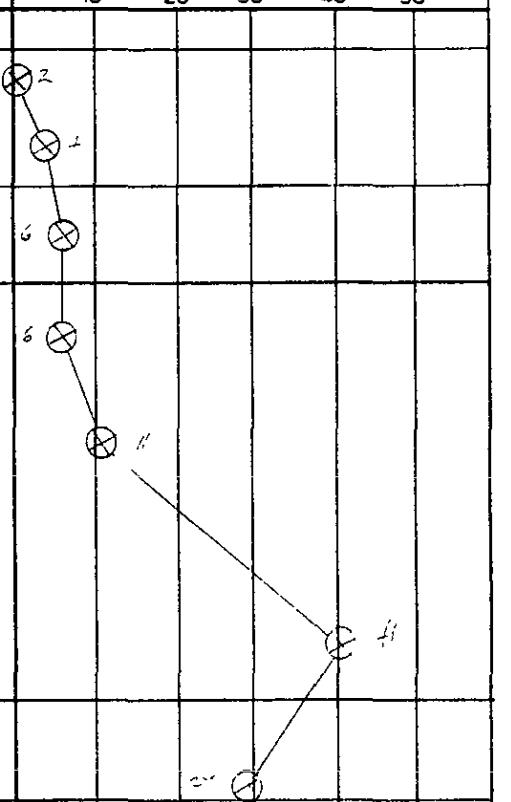
WL 15.0 WS ~~XXXX~~	BORING STARTED 9-24-86		
WL BCR ACR	BORING COMPLETED 9-24-86		
WL 12.5 AB	RIG B-53 FOREMAN JF	APP'D BY WEH	STS JOB NO 1069-R

BLI

OWNER	Kalamazoo Downtown Development Authority
LOG OF BORING NUMBER	SB-27
PROJECT NAME	Arcadia Creek
ARCHITECT ENGINEER	Skidmore, Owings & Merrill
SITE LOCATION	Kalamazoo, Michigan

STS Consultants Ltd.

ELEVATION / DEPTH	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT LBS/FT³
					SURFACE ELEVATION 781.1	
					Driller's observation: 4"asphalt, 8" sand & gravel fill.	
	1	SS			Silty fine to coarse sand fill, trace gravel & organics – dk.brown & black – very loose to loose – moist. (Fill:SM)	
	2	SS				
5						
	3	SS			Silty fine to coarse sand, trace gravel – brownish gray – loose moist. (SP-SM)	
	4	SS				
10						
	5	SS			Fine to coarse sand, trace gravel and silt-brown-loose to dense-moist to wet. (SP-SM)	
15						
	6	SS				
					Gravelly fine to coarse sand, trace silt – brown – med.dense – wet. (SW)	
20	7	SS				
					END OF BORING	
					Boring advanced to 18.5' using solid stem auger. Borehole backfilled with soil cuttings and patched.	



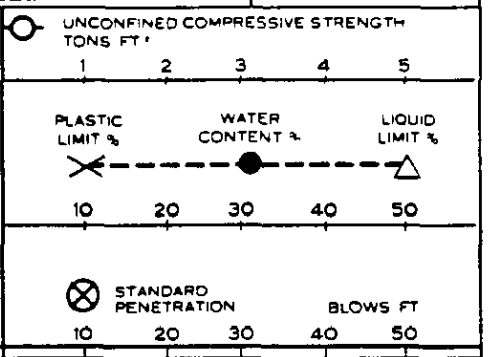
THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN SITU THE TRANSITION MAY BE GRADUAL

WL 15.0	WS	BORING STARTED	9-23-86
WL	BCR ACR	BORING COMPLETED	9-23-86
WL		RIG B-53 FOREMAN JF	APP'D BY WEH STS JOB NO 1069R

BLI

OWNER Kalamazoo Downtown Development Authority	LOG OF BORING NUMBER SB-28
PROJECT NAME Arcadia Creek	ARCHITECT-ENGINEER Skidmore, Owings & Merrill
SITE LOCATION Kalamazoo, Michigan	STS Consultants Ltd.

ELEVATION / DEPTH	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT LBS/FT³
					SURFACE ELEVATION 781.3	
					Driller's observation: 4" asphalt	
	1	SS			Fine to coarse sand little silt & gravel, trace organics-black & dk. brownish gray-loose-moist. (Fill: SM)	
	2	SS				
5	3	SS			Silty fine sand, trace to little organics, trace gravel – black & dk. brownish gray – loose – moist. (SM)	
	4	SS			Fine to med. sand, trace coarse sand, silt & gravel – brown – med. dense – moist. (SW)	
10	5	SS				
15	6	SS			Fine to coarse sand, little to some gravel, trace silt – brown – med. dense – wet. (SW)	
20	7	SS				
25					END OF BORING Boring advanced to 18.5' using solid stem auger. Borehole backfilled with soil cuttings and patched.	



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN SITU THE TRANSITION MAY BE GRADUAL

WL 16.0	WS ~~RECVR~~	BORING STARTED	9-23-86
WL	BCR ACR	BORING COMPLETED	9-26-86
WL		RIG B-53 FOREMAN JF	APP'D BY WEH STS JOB NO 1069R

BL1

OWNER: Kalamazoo Downtown Development Authority	LOG OF BORING NUMBER: SB-29
PROJECT NAME: Arcadia Creek	ARCHITECT ENGINEER: Skidmore, Owings & Merrill
SITE LOCATION: Kalamazoo, Michigan	STS Consultants Ltd.

SURFACE ELEVATION 784.4

ELEVATION / DEPTH	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL
					Driller's observation: asphalt, brick & sand fill.
	1	SS			Fine to med.sand fill, little silt, trace gravel & organics – dk.brown – loose – moist. (Fill: SP-SM)
	2	SS			
5	3	SS			Fine to coarse sand, little gravel, trace silt – brown – loose – moist. (SP)
	4	SS			Fine to coarse sand, trace to some gravel, trace silt-brown-med.dense-moist. (SP)
10	5	SS			
15	6	SS			
20	7	SS			Fine to coarse sand, trace to little gravel – brown-med.dense to dense – moist to wet. (SW)
25	8	SS			
					END OF BORING Boring advanced to 23.5' using solid stem auger. Borehole backfilled with soil cuttings and patched.

UNIT DRY WT LBS/FT³

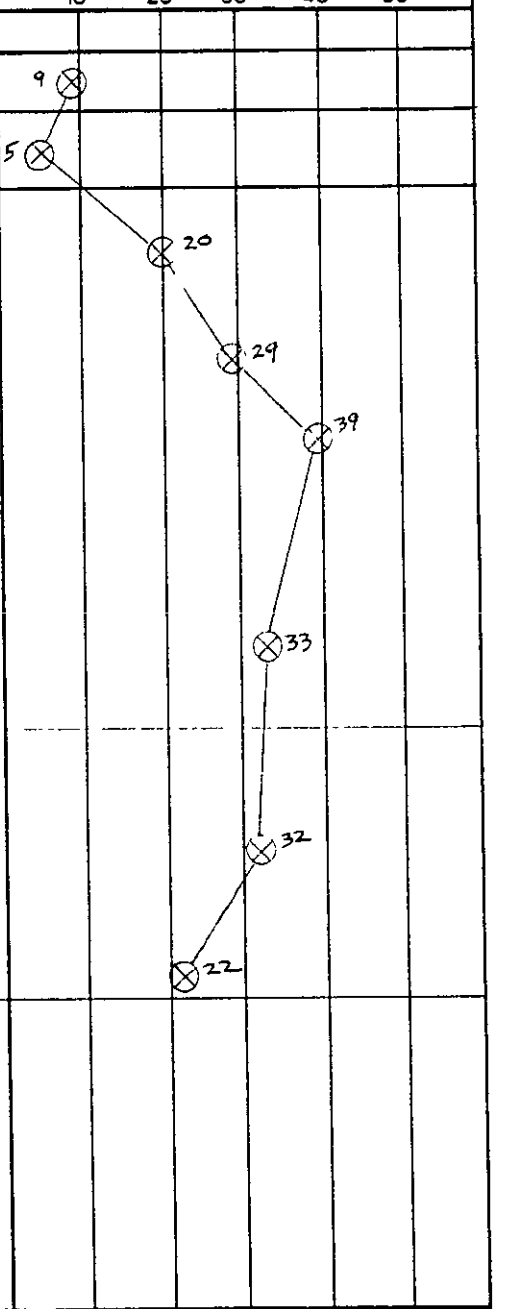
UNCONFINED COMPRESSIVE STRENGTH TONS FT² — 1 2 3 4 5

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT %

10 20 30 40 50

STANDARD PENETRATION BLOWS FT

10 20 30 40 50



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN SITU THE TRANSITION MAY BE GRADUAL

WL 21.0 WS ~~OR WD~~	BORING STARTED 9-23-86		
WL BCR ACR	BORING COMPLETED 9-23-86		
WL	RIG B-53 FOREMAN JF	APP'D BY WEH	STS JOB NO 1069R

BL1

OWNER: Kalamazoo Downtown Development Authority	LOG OF BORING NUMBER: SB-30
PROJECT NAME: Arcadia Creek	ARCHITECT-ENGINEER: Skidmore, Owings & Merrill
SITE LOCATION: Kalamazoo, Michigan	STS Consultants Ltd.

UNCONFINED COMPRESSIVE STRENGTH TONS FT² : 1 2 3 4 5

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT %: 10 20 30 40 50

STANDARD PENETRATION BLOWS FT: 10 20 30 40 50

SURFACE ELEVATION 783.5

ELEVATION / DEPTH	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT LBS/FT³	STANDARD PENETRATION BLOWS FT
					Driller's observation: 1' asphalt, brick and fill.		
	1	SS			Silty fine to coarse sand fill, little organics, trace gravel and clay - dk.brown & black - very loose to loose - moist. (Fill: SM)		7
	2	SS					3
5	3	SS					3
	4	SS			Fine to coarse sand, some gravel, trace organics-dark brown and black - med.dense - moist. (SW-SM)		24
10	5	SS			Fine to coarse sand, trace silt & gravel - brown - med.dense - moist. (SP)		22
15	6	SS			Fine to coarse sand, little silt & gravel - dk.brown - dense - moist. (SP)		32
20	7	SS			Sandy gravel, trace silt - brown - med. dense - saturated. (GW)		4
					END OF BORING Boring advanced to 18.8' using solid stem auger. Borehole backfilled with soil cuttings and patched.		

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN SITU THE TRANSITION MAY BE GRADUAL

WL 17.0 ~~WS~~ WD	BORING STARTED 9-23-86		
WL BCR ACR	BORING COMPLETED 9-23-86		
WL	RIG B-53 FOREMAN JF	APP'D BY WEH	STS JOB NO 1069R

BLI

OWNER: Kalamazoo Downtown Development Authority	LOG OF BORING NUMBER: SB-31
PROJECT NAME: Arcadia Creek	ARCHITECT ENGINEER: Skidmore, Owings & Merrill

STS Consultants Ltd.

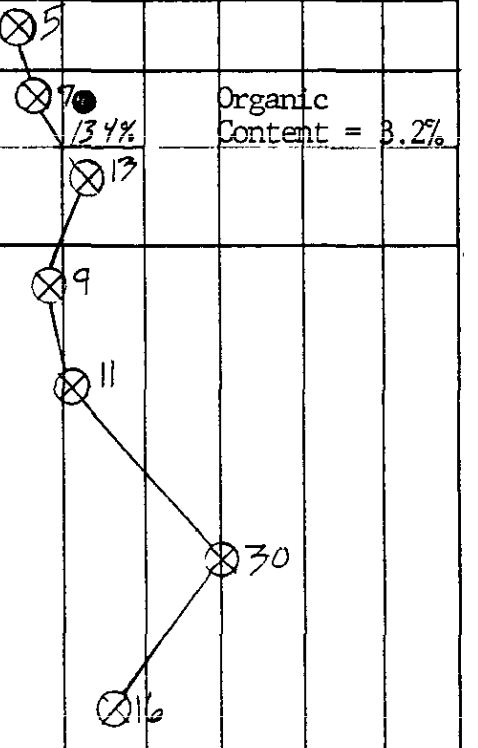
SITE LOCATION: Kalamazoo, Michigan

ELEVATION / DEPTH	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT LBS/FT³
					SURFACE ELEVATION 784.6	
					Driller's observation: Asphalt with crushed stone base.	
	1	SS			Gravelly sand fill, some silt, little organics, trace clay & brick fragments – dk. brown & black – loose – moist (Fill: SM)	
5	2	SS				
	3	SS			Fine to med. sand, some clay, trace organics – dk. brown to black – loose – moist (SC)	
	4	SS			Silty fine to coarse sand, trace gravel, clay, roots & organics – grayish brown – med. dense – moist (SM)	
10	5	SS				
					Fine to coarse sand, trace to little gravel, trace silt – brown – med. dense – moist to saturated (SP) with occasional silt pockets	
15	6	SS				
20	7	SS				
					END OF BORING	
25					Boring advanced to 18.5' using solid stem auger. Borehole backfilled with soil cuttings and patched.	

UNCONFINED COMPRESSIVE STRENGTH TONS FT² (1 2 3 4 5)

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT % (10 20 30 40 50)

STANDARD PENETRATION BLOWS FT (10 20 30 40 50)



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN SITU THE TRANSITION MAY BE GRADUAL

WL 15.0 WS OR WD	BORING STARTED 9-23-86		
WL BCR ACR	BORING COMPLETED 9-23-86		
WL	RIG B-53 FOREMAN JF	APP'D BY WEH	STS JOB NO 1069R

BLI

OWNER: Kalamazoo Downtown Development Authority	LOG OF BORING NUMBER: SB-32
PROJECT NAME: Arcadia Creek	ARCHITECT ENGINEER: Skidmore, Owings & Merrill
SITE LOCATION: Kalamazoo, Michigan	STS Consultants Ltd.

SURFACE ELEVATION 789.8

ELEVATION / DEPTH	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL
	1	SS			Driller's observation: asphalt underlain by sand & gravel fill.
	2	SS			Fine to coarse sand fill, little to some silt, trace to little brick fragments & gravel, trace cinders & organics - dk.brown & black - very loose to med.dense - moist. (Fill: SP-SM)
5	3	SS			
	4	SS			Fine to course sand, little silt & gravel - dk.reddish brown - loose moist. (SP-SM)
10	5	SS			Fine to coarse sand, some gravel, little silt-brown and dk. brown-loose to med. dense-moist to wet (SP-SM) with some silty zones and occasional brown med. sand seams
15	6	SS			
20	7	SS			
					END OF BORING Boring advanced to 18.5' using solid stem auger. Borehole backfilled with soil cuttings and patched.

UNIT DRY WT LBS/FT³

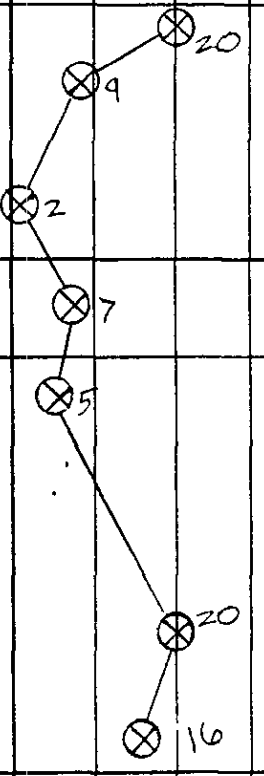
UNCONFINED COMPRESSIVE STRENGTH TONS FT² — 1 2 3 4 5

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT %

10 20 30 40 50

STANDARD PENETRATION BLOWS FT

10 20 30 40 50



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN SITU THE TRANSITION MAY BE GRADUAL

WL 20.0 WS ~~OBWD~~ ACR	BORING STARTED 9-23-86		
WL BCR ACR	BORING COMPLETED 9-23-86		
WL 20.0 AB	RIG B-53 FOREMAN JF	APP'D BY WEH	STS JOB NO 1069R

BLI

OWNER: Kalamazoo Downtown Development Authority	LOG OF BORING NUMBER: SB-33
PROJECT NAME: Arcadia Creek	ARCHITECT ENGINEER: Skidmore, Owings & Merrill
SITE LOCATION: Kalamazoo, Michigan	STS Consultants Ltd.

UNCONFINED COMPRESSIVE STRENGTH TONS FT²: 1 2 3 4 5

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT %: 10 20 30 40 50

STANDARD PENETRATION BLOWS FT: 10 20 30 40 50

ELEVATION / DEPTH	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT LBS/FT³	STANDARD PENETRATION BLOWS FT
					SURFACE ELEVATION 792.5		
	1	SS			Fine to coarse sand fill, little silt & gravel, trace to little organics, trace roots - brown & dk.brown - med.dense - moist. (Fill: SW-SM)		10
	2	SS					14
5	3	SS			Fine to med.sand, little silt, trace organics - black - loose - moist. (SM)		7
	4	SS			Fine to coarse sand, some silt, trace gravel - dk.reddish brown - med.dense - moist. (SM)		12
10	5	SS					19
15	6	SS			Fine to coarse sand, trace to some gravel, trace silt-brown-med.dense to dense-moist. (SP)		21
20	7	SS					39
					END OF BORING Boring advanced to 18.5' using solid stem auger. Borehole backfilled with soil cuttings and patched.		

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN SITU THE TRANSITION MAY BE GRADUAL

WL	WS OR WD	BORING STARTED 9-23-86	
WL	BCR ACR	BORING COMPLETED 9-23-86	
WL Dry AB		RIG B-53 FOREMAN J.F.	APP'D BY WEH STS JOB NO 1069R

BL1

OWNER	LOG OF BORING NUMBER
Kalamazoo Downtown Development Authority	SB-34
PROJECT NAME	**ARCHITECT ENGINEER**
Arcadia Creek	Skidmore, Owings & Merrill

STS Consultants Ltd.

SITE LOCATION: Kalamazoo, Michigan

SURFACE ELEVATION: 793.3

UNCONFINED COMPRESSIVE STRENGTH TONS FT² (1 2 3 4 5)

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT % (10 20 30 40 50)

STANDARD PENETRATION BLOWS FT (10 20 30 40 50)

ELEVATION / DEPTH	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT LBS/FT³	STANDARD PENETRATION BLOWS FT
					Driller's observation: 1' asphalt, 1.5' crushed stone base.		
	1	SS			Silty fine to coarse sand fill, trace gravel & brick fragments - dk. brown - very loose - moist. (Fill: SM)		3
5	2	SS			Silt, little fine sand, trace clay - black - loose - moist. (ML)		7
	3	SS			Fine to med. sand, little silt, trace gravel - reddish brown to brown - med. dense - moist (SP) w/occasional silt pockets.		11
10	4	SS					42
					Sandy gravel, little silt - dk. brown - dense - moist. (GW-GM)		
15	5	SS			Fine to coarse sand, trace to some gravel, trace silt-brown-med. dense to dense-moist. (SW)		26
20	6	SS					37
					END OF BORING Boring advanced to 18.5' using solid stem auger. Borehole backfilled with soil cuttings and patched.		

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES IN SITU THE TRANSITION MAY BE GRADUAL

WL	WS OR WD	BORING STARTED 9-23-86	
WL	BCR ACR	BORING COMPLETED 9-23-86	
WL Dry AB		RIG B-53 FOREMAN JF	APP'D BY WEH / STS JOB NO 1069-R

BL1

Report

AMERICAN SOCIETY FOR TESTING AND MATERIALS

Standard Method for

PENETRATION TEST AND SPLIT-BARREL SAMPLING OF SOILS[1]

This standard is issued under the fixed designation D 1586, the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision A number in parentheses indicates the year of last reapproval A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval

This method has been approved for use by agencies of the Department of Defense and for listing in the DOD Index of Specifications and Standards

1. Scope

1.1 This method describes the procedure, generally known as the Standard Penetration Test (SPT), for driving a split-barrel sampler to obtain a representative soil sample and a measure of the resistance of the soil to penetration of the sampler.

1.2 This standard may involve hazardous materials, operations, and equipment This standard does not purport to address all of the safety problems associated with its use. It is the responsibility of whoever uses this standard to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use. For a specific precautionary statement, see 5.4.1

1.3 The values stated in inch-pound units are to be regarded as the standard.

2. Applicable Documents

2.1 ASTM Standards:

D2487 Test Method for Classification of Soils for Engineering Purposes[2]

D2488 Practice for Description and Identification of Soils (Visual-Manual Procedure)[2]

D4220 Practices for Preserving and Transporting Soil Samples[2]

3. Descriptions of Terms Specific to This Standard

3.1 anvil—that portion of the drive-weight assembly which the hammer strikes and through which the hammer energy passses into the drill rods.

3.2 cathead—the rotating drum or windlass in the rope-cathead lift system around which the operator wraps a rope to lift and drop the hammer by successively tightening and loosening the rope turns around the drum.

3.3 drill rods—rods used to transmit downward force and torque to the drill bit while drilling a borehole.

3.4 drive-weight assembly—a device consisting of the hammer, hammer fall guide, the anvil, and any hammer drop system.

3.5 hammer—that portion of the drive-weight assembly consisting of the 140 ± 2 lb (63.5 ± 1 kg) impact weight which is successively lifted and dropped to provide the energy that accomplishes the sampling and penetration

3.6 hammer drop system—that portion of the drive-weight assembly by which the operator accomplishes the lifting and dropping of the hammer to produce the blow

3.7 hammer fall guide—that part of the drive-weight assembly used to guide the fall of the hammer.

3.8 N-value—the blowcount representation of the penetration resistance of the soil The N-value, reported in blows per foot, equals the sum of the number of blows required to drive the sampler over the depth interval of 6 to 18 in (150 to 450 mm) (see 7 3).

3.9 ΔN—the number of blows obtained from each of the 6-in. (150-mm) intervals of sampler penetration (see 7.3).

3.10 number of rope turns—the total contact angle between the rope and the cathead at the beginning of the operator's rope slackening to drop the hammer, divided by 360° (see Fig. 1).

3.11 sampling rods—rods that connect the drive-weight assembly to the sampler. Drill rods are often used for this purpose.

3.12 SPT—abbreviation for Standard Penetration Test, a term by which engineers commonly refer to this method.

4. Significance and Use

4.1 This method provides a soil sample for identification purposes and for laboratory tests appropriate for soil obtained from a sampler that may produce large shear strain disturbance in the sample.

4.2 This method is used extensively in a great variety of geotechnical exploration projects. Many local correlations and widely published correlations which relate SPT blowcount, or N-value, and the engineering behavior of earthworks and foundations are available.

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[1] This method is under the jurisdiction of ASTM Committee D-18 on Soil and Rock and is the direct responsibility of Subcommittee D18 02 on Sampling and Related Field Testing for Soil Investigations

Current edition approved Sept 11, 1984 Published November 1984 Originally published as D1586—58T Last previous edition D1586—67 (1974)

[2] Annual Book of ASTM Standards, Vol 04.08

so that the advance of the sampler under the impact of the hammer can be easily observed for each 6-in. (0.15-m) increment.

7.2 Drive the sampler with blows from the 140-lb (63.5-kg) hammer and count the number of blows applied in each 6-in. (0.15-m) increment until one of the following occurs:

7.2.1 A total of 50 blows have been applied during any one of the three 6-in. (0.15-m) increments described in 7.1.4.

7.2.2 A total of 100 blows have been applied.

7.2.3 There is no observed advance of the sampler during the applicaion of 10 successive blows of the hammer

7.2.4 The sampler is advanced the complete 18 in. (0.45 m) without the limiting blow counts occurring as described in 7.2.1, 7.2.2, or 7.2.3.

7.3 Record the number of blows required to effect each 6 in. (0.15 m) of penetration or fraction thereof. The first 6 in. is considered to be a seating drive. The sum of the number of blows required for the second and third 6 in. of penetration is termed the "standard penetration resistance", or the "N-value". If the sampler is driven less than 18 in. (0.45 m), as permitted in 7.2.1, 7.2.2, or 7 2.3, the number of blows per each complete 6-in. (0.15-m) increment and per each partial increment shall be recorded on the boring log. For partial increments, the depth of penetration shall be reported to the nearest 1 in. (25 mm), in addition to the number of blows. If the sampler advances below the bottom of the boring under the static weight of the drill rods or the weight of the drill rods plus the static weight of the hammer, this information should be noted on the boring log.

7.4 The raising and dropping of the 140-lb (63.5-kg) hammer shall be accomplished using either of the following two methods:

7.4.1 By using a trip, automatic, or semi-automatic hammer drop system which lifts the 140-lb (63.5-kg) hammer and allows it to drop 30 ± 1.0 in (0.76 m ± 25 mm) unimpeded.

7.4.2 By using a cathead to pull a rope attached to the hammer. When the cathead and rope method is used the system and operation shall conform to the following:

7.4.2.1 The cathead shall be essentially free of rust, oil, or grease and have a diameter in the range of 6 to 10 in. (150 to 250 mm)

7.4.2.2 The cathead should be operated at a minimum speed of rotation of 100 RPM, or the approximate speed of rotation shall be reported on the boring log.

7.4.2.3 No more than 2¼ rope turns on the cathead may be used during the performance of the penetration test, as shown in Fig. 1.

NOTE 4—The operator should generally use either 1¾ of 2¼ rope turns, depending upon whether or not the rope comes off the top (1¾ turns) or the bottom (2¼ turns) of the cathead. It is generally known and accepted that 2¾ or more rope turns considerably impedes the fall of the hammer and should not be used to perform the test The cathead rope should be maintained in a relatively dry, clean, and unfrayed condition

7.4.2.4 For each hammer blow, a 30-in. (0.76-m) lift and drop shall be employed by the operator The operation of pulling and throwing the rope shall be performed rhythmically without holding the rope at the top of the stroke.

7.5 Bring the sampler to the surface and open. Record the percent recovery or the length of sample recovered. Describe the soil samples recovered as to composition, color, stratification, and condition, then place one or more representative portions of the sample into sealable moisture-proof containers (jars) without ramming or distorting any apparent stratification. Seal each container to prevent evaporation of soil moisture. Affix labels to the containers bearing job designation, boring number, sample depth, and the blow count per 6-in. (0.15-m) increment. Protect the samples against extreme temperature changes. If there is a soil change within the sampler, make a jar for each stratum and note its location in the sampler barrel.

8. Report

8 1 Drilling information shall be recorded in the field and shall include the following:

8 1.1 Name and location of job,

8.1.2 Names of crew,

8.1.3 Type and make of drilling machine,

8.1.4 Weather conditions,

8.1 5 Date and time of start and finish of boring,

8.1.6 Boring number and location (station and coordinates, if available and applicable),

6.1.7 Surface elevation, if available,

8.1.8 Method of advancing and cleaning the boring,

8.1.9 Method of keeping boring open,

8.1.10 Depth of water surface and drilling depth at the time of a noted loss of drilling fluid, and time and date when reading or notation was made,

8.1.11 Location of strata changes,

8.1.12 Size of casing, depth of cased portion of boring,

8.1.13 Equipment and method of driving sampler,

8.1.14 Type of sampler and length and inside diameter of barrel (note use of liners),

8.1.15 Size, type, and section length of the sampling rods, and

8.1.16 Remarks.

8.2 Data obtained for each sample shall be recorded in the field and shall include the following:

8.2.1 Sample depth and, if utilized, the sample number,

8.2.2 Description of soil,

8.2.3 Strata changes within sample,

8.2.4 Sampler penetration and recovery lengths, and

8.2.5 Number of blows per 6-in. (0.15-m) or partial increment.

9. Precision and Bias

9.1 Variations in N-values of 100% or more have been observed when using different standard penetration test apparatus and drillers for adjacent borings in the same soil formation. Current opinion, based on field experience, indicates that when using the same apparatus and driller, N-values in the same soil can be reproduced with a coefficient of variation of about 10%.

9.2 The use of faulty equipment, such as an extremely massive or damaged anvil, a rusty cathead, a low speed cathead, an old, oily rope, or massive or poorly lubricated rope sheaves can significantly contribute to differences in N-values obtained between operator-drill rig systems.

9.3 The variability in N-values produced by different drill rigs and operators may be reduced by measuring that part of the hammer energy delivered into the drill rods from the sampler and adjustng N on the basis of comparative energies. A method for energy measurement and N-value adjustment is currently under development.

STS Field and Laboratory Procedures

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In the process of obtaining and testing samples and preparing this report, standard procedures are followed regarding field logs, laboratory data sheets and samples.

Specifically, field logs are prepared during performance of the drilling and sampling operations which are intended to portray essentially field occurrences, sampling locations and other information.

Samples obtained in the field are frequently subjected to additional testing and reclassification in the laboratory by more experienced soil engineers, and differences between the field logs and the final logs exist.

The engineer preparing the report reviews the field and laboratory logs, classifications and test data, and in his judgement in interpreting this data, may make further changes.

Samples taken in the field, some of which are later subjected to laboratory tests, are retained in our laboratory for sixty days and are then destroyed unless special disposition is requested by our client. Samples retained over a long period of time, even in sealed jars, are subject to moisture loss which changes the apparent strength of cohesive soil, generally increasing the strength from what was originally encountered in the field. Since they are then no longer representative of the moisture conditions initially encountered, an inspection of these samples should recognize this factor.

It is common practice in the soil and foundation engineering profession that field logs and laboratory data sheets not be included in engineering reports, because they do not represent the engineer's final opinions as to appropriate descriptions for conditions encountered in the exploration and testing work. On the other hand, we are aware that perhaps certain contractors and subcontractors submitting bids or proposals on work might have an interest in studying these documents before submitting a bid or proposal. For this reason, the field logs will be retained in our office for inspection by all contractors submitting a bid or proposal. We would welcome the opportunity to explain any changes that have and typically are made in the preparation of our final reports, to the contractor or subcontractors, before the firm submits its bid or proposal, and to describe how the information was obtained to the extent the contractor or subcontractor wishes. Results of laboratory tests are generally shown on the boring logs or are described in the text of the report, as appropriate.

The descriptive terms and symbols used on the logs are described on the attached sheet, entitled, General Notes.

SUBSURFACE EXPLORATION PROCEDURES

Hand-Auger Drilling (HA)

In this procedure, a sampling device is driven into the soil by repeated blows of a sledge hammer. When the sampler is driven to the desired sample depth, the soil sample is retrieved. The hole is then advanced by manually turning the hand auger until the next sampling depth increment is reached. The hand auger drilling between sampling intervals also helps to clean and enlarge the bore hole in preparation for obtaining the next sample.

Power Auger Drilling (PA)

In this type of drilling procedure, continuous flight augers are used to advance the bore holes. They are turned and hydraulically advanced by a truck or track-mounted unit as site accessiblility dictates. In auger drilling, casing and drilling mud are not required to maintain open bore holes.

Hollow Stem Auger Drilling (HS)

In this drilling procedure, continuous flight augers having an open stem are used to advance the bore holes. The open stem allows the sampling tool to be used without removing the augers from the bore hole. Hollow stem augers thus provide support to the sides of the bore hole during the sampling operations.

Rotary Drilling (RB)

In employing rotary drilling methods, various cutting bits are used to advance the bore holes. In this process, surface casing and/or drilling fluids are used to maintain open bore holes.

Diamond Core Drilling (DB)

Diamond core drilling is used to sample cemented formations. In this procedure, a double tube (triple tube) core barrel with a diamond bit cuts an annular space around a cylindrical prism of the material sampled. The sample is retrieved by a catcher just above the bit. Samples recovered by this procedure are placed in sturdy containers in sequential order.

LABORATORY PROCEDURES

Water Content (Wc)

The water content of a soil is the ratio of the weight of water in a given soil mass to the weight of the dry soil. Water content is generally expressed as a percentage.

Hand Penetrometer (Qp)

In the hand penetrometer test, the unconfined compressive strength of a soil is determined to a maximum value of 4.5 tons per square foot (tsf), by measuring the resistance of the soil sample to penetration by a small, spring-calibrated cylinder. The hand penetrometer test has been carefully correlated with unconfined compressive strength tests, and thereby provides a useful and a relatively simple testing procedure in which soil strength can be quickly and easily estimated.

Unconfined Compression Tests (Qu)

In the unconfined compression strength test, a soil is loaded axially until failure or until 20% strain has been reached, whichever occurs first. This test is performed on undisturbed samples obtained from the shelby tube sampling procedure.

Classification of Samples

In conjunction with the sample testing program, all soil samples are examined in our laboratory and classified on the basis of their texture and plasticity in accordance with the Unified Soil Classification System (USCS). The soil descriptions on the boring logs are in conformance with this system and the estimated group symbols according to this system are included in parentheses following the soil descriptions on the boring logs. Included on a separate sheet is a brief explanation of this system of soil classification.

UNIFIED SOIL CLASSIFICATION SYSTEM

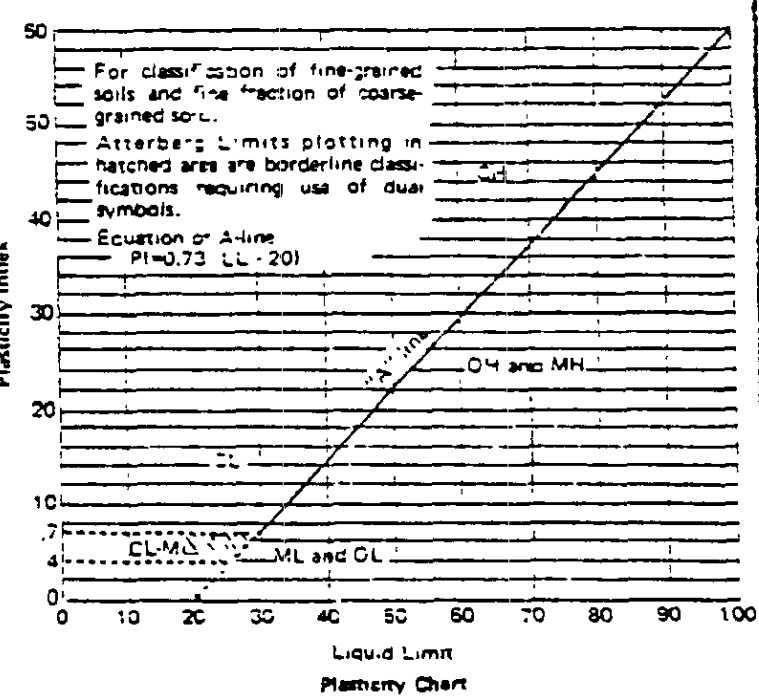
Major divisions			Group symbols	Typical names	Laboratory classification criteria
Coarse-grained soils (More than half of material is *larger* than No. 200 sieve size)	Gravels (More than half of coarse fraction larger than No. 4 sieve size)	Clean gravels (Little or no fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4, $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3
			GP	Poorly graded gravels, gravel-sand mixtures, little or no fines	Not meeting all gradation requirements for GW
		Gravels with fines (Appreciable amount of fines)	GM d, u	Silty gravels, gravel-sand-silt mixtures	Atterberg limits below "A" line or P.I. less than 4
			GC	Clayey gravels, gravel-sand-clay mixtures	Atterberg limits above "A" line with P.I. greater than 7
	Sands (More than half of coarse fraction is smaller than No. 4 sieve size)	Clean sands (Little or no fines)	SW	Well-graded sands, gravelly sands, little or no fines	$C_u = \frac{D_{60}}{D_{10}}$ greater than 6, $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3
			SP	Poorly graded sands, gravelly sands, little or no fines	Not meeting all gradation requirements for SW
		Sands with fines (Appreciable amount of fines)	SM d, u	Silty sands, sand-silt mixtures	Atterberg limits below "A" line or P.I. less than 4
			SC	Clayey sands, sand-clay mixtures	Atterberg limits above "A" line with P.I. greater than 7
Fine-grained soils (More than half of material is *smaller* than No. 200 sieve)	Silts and clays (Liquid limit less than 50)		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity	
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays	
			OL	Organic silts and organic silty clays of low plasticity	
	Silts and clays (Liquid limit greater than 50)		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts	
			CH	Inorganic clays of high plasticity, fat clays	
			OH	Organic clays of medium to high plasticity, organic silts	
Highly organic soils			Pt	Peat and other highly organic soils	

Determine percentages of sand and gravel from grain size curve.
Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:

Less than 5 per cent	GW, GP, SW, SP
More than 12 per cent	GM, GC, SM, SC
5 to 12 per cent	*Borderline* cases requiring dual symbols

Above "A" line with P.I. between 4 and 7 are *borderline* cases requiring use of dual symbols

Limits plotting in hatched zone with P.I. between 4 and 7 are *borderline* cases requiring use of dual symbols.



Plasticity Chart

Report

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REPORT OF SIEVE ANALYSIS

STS Job No. 1069R Project: Arcadia Creek

Date: 11/5/86 Client: Kalamazoo Downtown Development Authority

Sample Description: Brown fine to medium sand, little coarse sand, trace silt, clay & gravel

Sample Location/Identification: B-15 S-5 15.0'-16.5'

Sieve Size Number	Weight Retained (grams)	Percent Retained	Cumulative Percent Passing	Specifications
2 1/2-Inch				
2-Inch				
1 1/2-Inch				
1-Inch				
3/4-Inch				
1/2-Inch	0.0	0.0	100.0	
3/8-Inch	1.5	0.9	99.1	
No. 4	8.1	5.0	94.1	
No. 8	11.0	6.8	87.3	
No. 10				
No. 16	9.0	5.5	81.8	
No. 30	12.4	7.6	74.2	
No. 50	48.1	29.5	44.7	
No. 80				
No. 100	57.8	35.5	9.2	
No. 200	10.8	6.6	2.6	
Pan	0.7 + 3.5 = 4.2	2.6		
Total Weight	162.9			

Weight of oven dry soil before washing: 162.9 gr

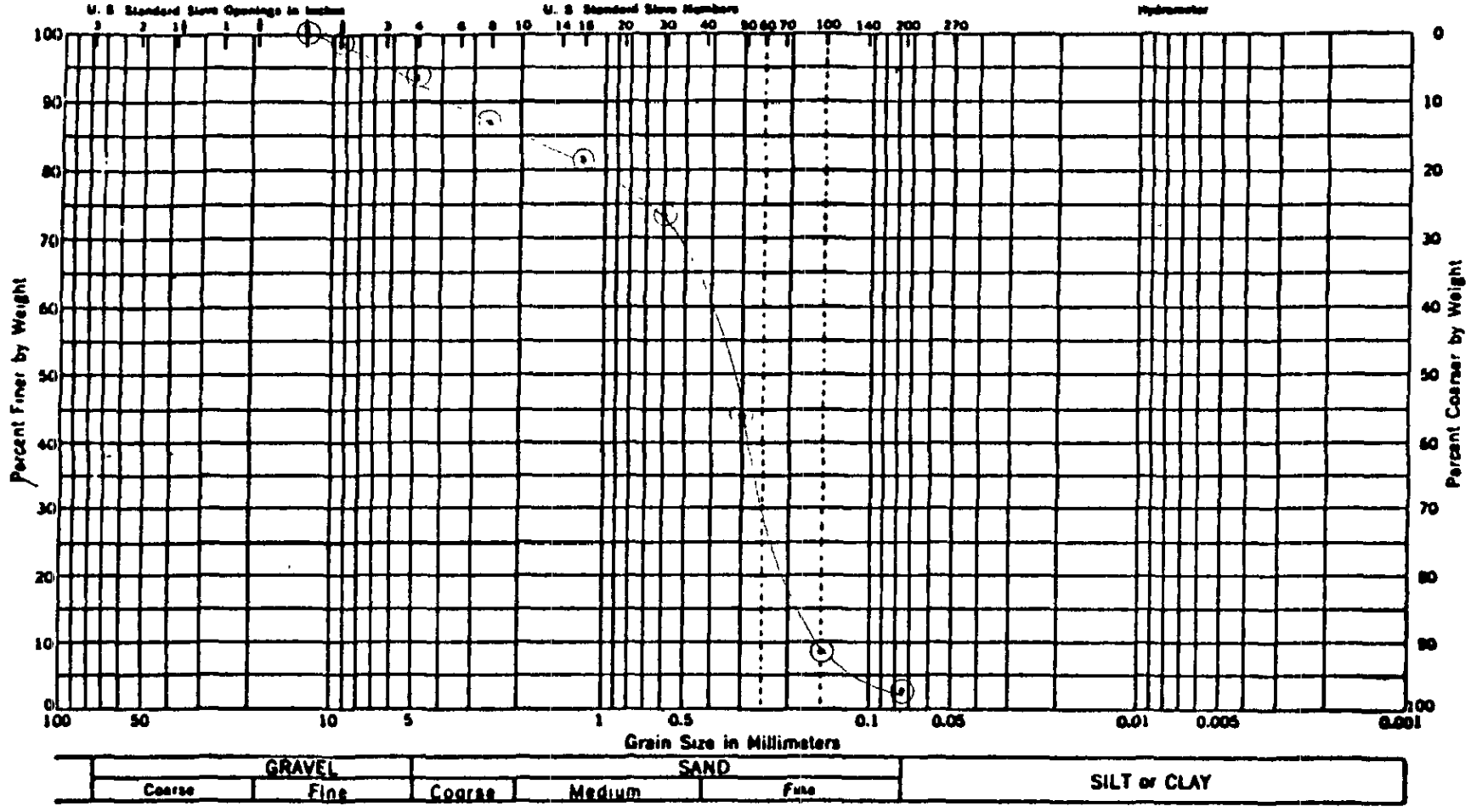
Weight of oven dry soil after washing: 159.4 gr

Weight loss by wash: 3.5 gr

Remarks:

Checked by: Bob Andrews Technician: Tom Miller

UNIFIED CLASSIFICATION SYSTEM



SAMPLE NO.	W.C.	LL	PL	PI	CLASSIFICATION
B-15					Brown fine to coarse sand, trace silt,
S-5					and gravel. (SP)

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REPORT OF SIEVE ANALYSIS

STS Job No. 1069R Project: Arcadia Creek
Date: 11/5/86 Client: Kalamazoo Downtown Development Authority
Sample Description: Brown fine sand, trace medium to coarse sand, silt, & clay
Sample Location/Identification: B-16 S-6 15.0'-16.5'

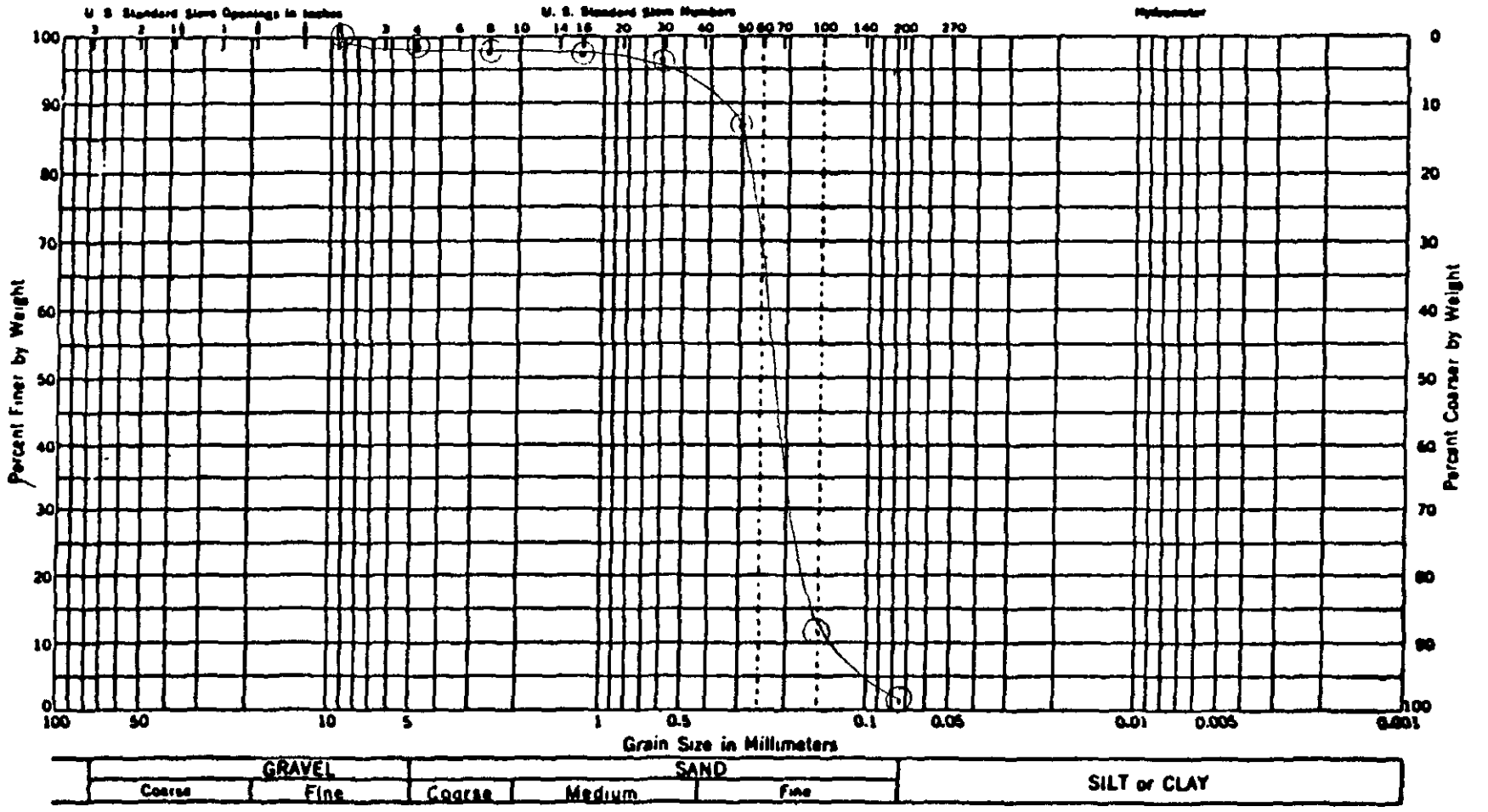
Sieve Size Number	Weight Retained (grams)	Percent Retained	Cumulative Percent Passing	Specifications
2 1/2-Inch				
2-Inch				
1 1/2-Inch				
1-Inch				
3/4-Inch				
1/2-Inch				
3/8-Inch	0.0	0.0	100.0	
No. 4	2.4	1.5	98.5	
No. 8	0.4	0.2	98.3	
No. 10				
No. 16	1.0	0.6	97.7	
No. 30	2.0	1.2	96.5	
No. 50	16.3	9.9	86.6	
No. 80				
No. 100	125.0	75.7	10.9	
No. 200	16.4	9.9	1.0	
Pan	0.4 + 1.3 = 1.7	1.0		
Total Weight	165.2			

Weight of oven dry soil before washing: 165.2 gr
Weight of oven dry soil after washing: 163.9 gr
Weight loss by wash: 1.3 gr

Remarks:

Checked by: Bob Andrews Technician: Tom Miller

UNIFIED CLASSIFICATION SYSTEM



SAMPLE NO.	W.C.	LL	PL	PI	CLASSIFICATION
B-16					Brown fine sand, trace medium to coarse
S-6					sand, silt. (SP)

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REPORT OF SIEVE ANALYSIS

STS Job No. 1069R Project: Arcadia Creek
Date: 11-04-86 Client: Kalamazoo Downtown Development Authority
Sample Description: Brown fine sandy clay, some silt, trace medium sand
Sample Location/Identification: B-17 S-5 10'-11.5'

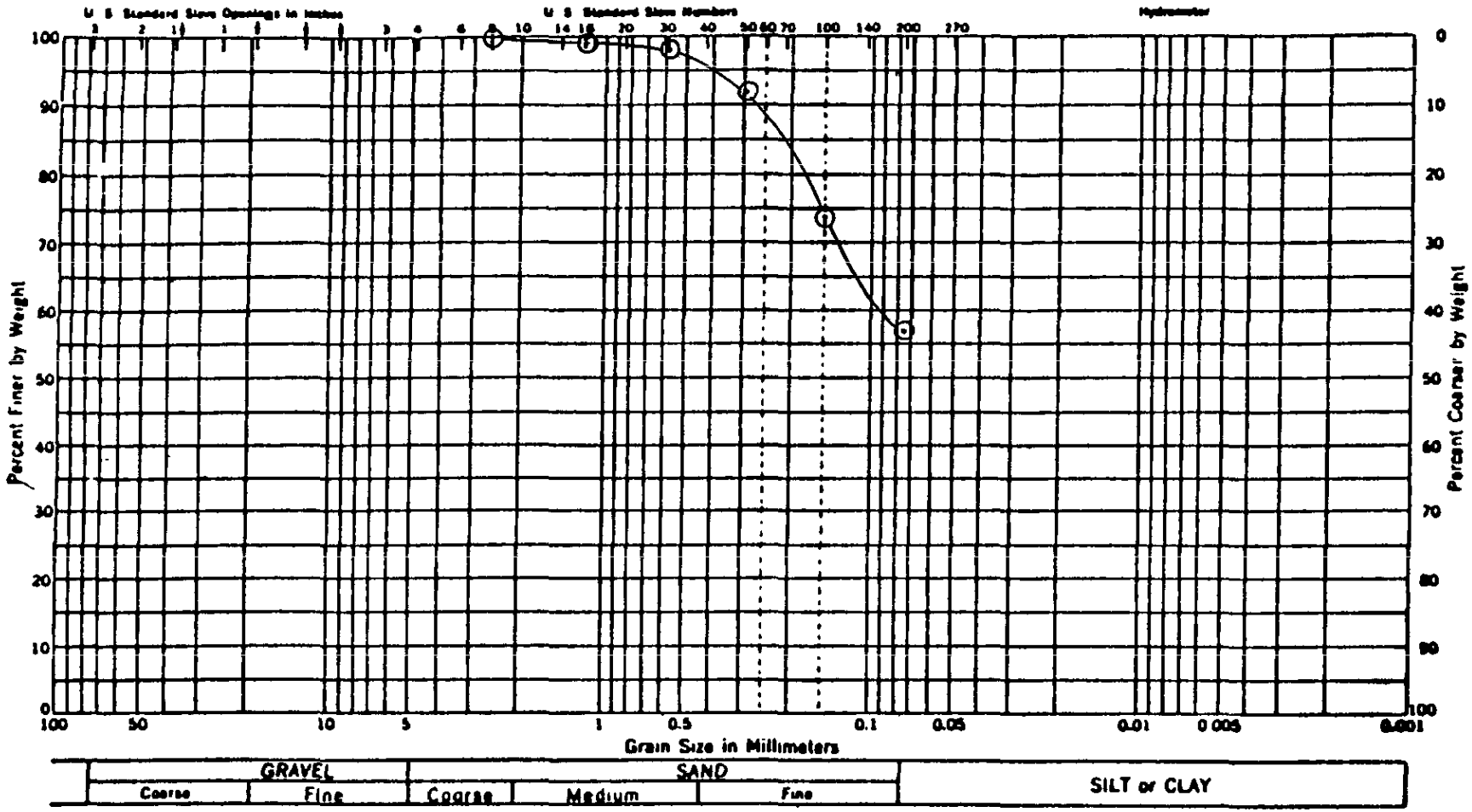
Sieve Size Number	Weight Retained (grams)	Percent Retained	Cumulative Percent Passing	Specifications
2 1/2-Inch				
2-Inch				
1 1/2-Inch				
1-Inch				
3/4-Inch				
1/2-Inch				
3/8-Inch				
No. 4				
No. 8	0	0	100	
No. 10				
No. 16	0.7	0.7	99.3	
No. 30	1.0	1.0	98.3	
No. 50	6.7	6.9	91.4	
No. 80				
No. 100	17.3	17.7	73.7	
No. 200	16.1	16.5	57.2	
Pan	1.3+54.4=55.7	57.2		
Total Weight	97.5			

Weight of oven dry soil before washing: 97.5 g
Weight of oven dry soil after washing: 43.1 g
Weight loss by wash: 54.4 g

Remarks:

Checked by: Bob Andrews Technician: Tom Miller

UNIFIED CLASSIFICATION SYSTEM



SAMPLE NO.	W.C.	LL	PL	PI	CLASSIFICATION
B-17					Sandy silt-grayish brown (ML)
S-5					

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REPORT OF SIEVE ANALYSIS

STS Job No. 1069R Project: Arcadia Creek
Date: 11/5/86 Client: Kalamazoo Downtown Development Authority
Sample Description: Brown fine to medium sand, some silt & clay, trace coarse sand
Sample Location/Identification: B-18 S-4 7.5'-9.0'

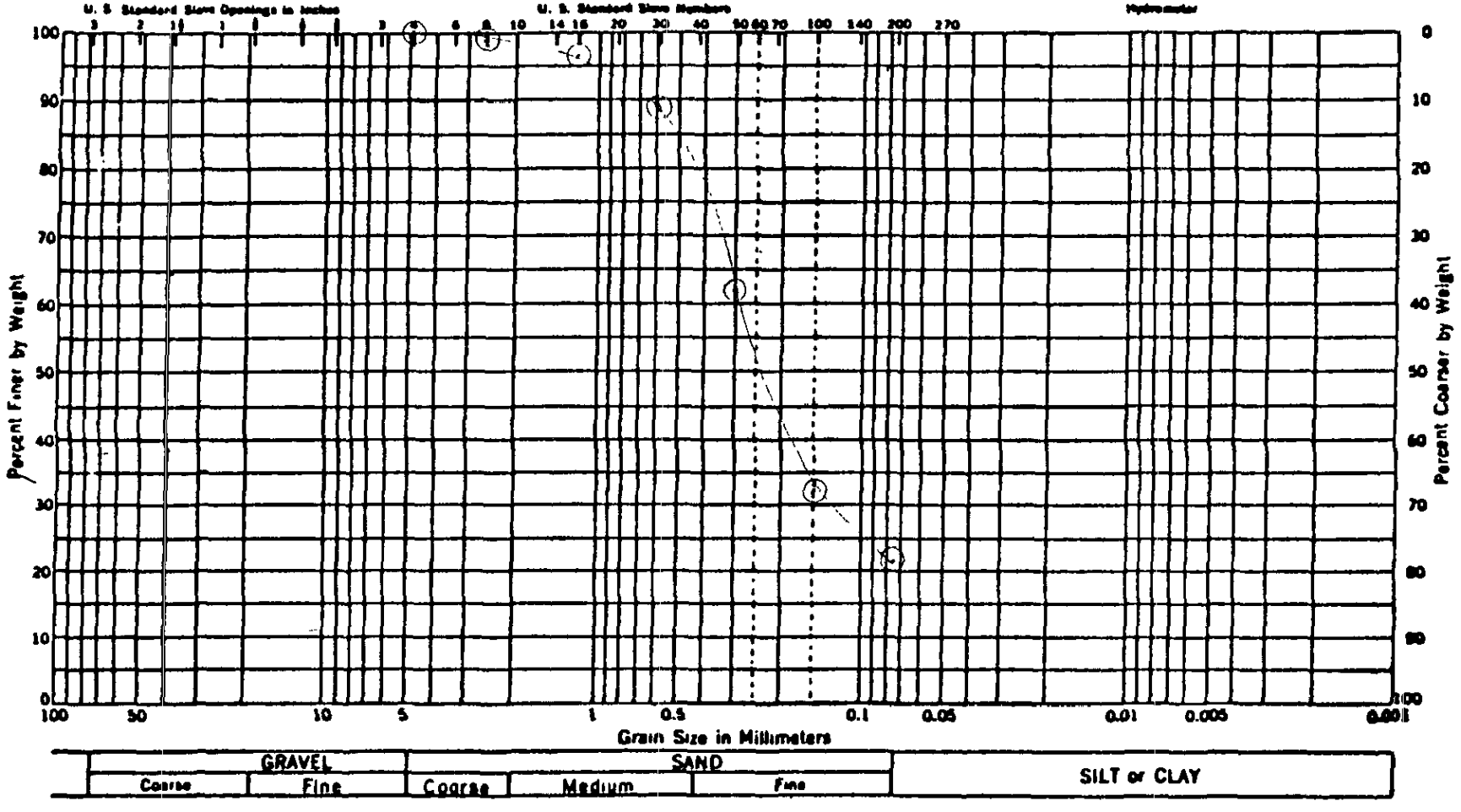
Sieve Size Number	Weight Retained (grams)	Percent Retained	Cumulative Percent Passing	Specifications
2 1/2-Inch				
2-Inch				
1 1/2-Inch				
1-Inch				
3/4-Inch				
1/2-Inch				
3/8-Inch				
No. 4	0.0	0.0	100.0	
No. 8	1.9	1.3	98.7	
No. 10				
No. 16	3.6	2.5	96.2	
No. 30	9.9	6.8	89.4	
No. 50	41.1	28.2	61.2	
No. 80				
No. 100	41.6	28.5	32.7	
No. 200	18.0	12.4	20.3	
Pan	1.8 + 27.8 = 29.6	20.3		
Total Weight	145.7			

Weight of oven dry soil before washing: 145.7 gr
Weight of oven dry soil after washing: 117.9 gr
Weight loss by wash: 27.8 gr

Remarks:

Checked by: Bob Andrews Technician: Tom Miller

UNIFIED CLASSIFICATION SYSTEM



SAMPLE NO.	W.C.	LL	PL	PI	CLASSIFICATION
B-18					Brown fine to medium sand, some silt &
S-4					clay, trace coarse sand. (SM)

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TSP	WEH	11-12-86	1069R

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REPORT OF SIEVE ANALYSIS

STS Job No. 1069R Project: Arcadia Creek
Date: 11/5/86 Client: Kalamazoo Downtown Development Authority
Sample Description: Brown fine to coarse sand, little silt, clay, & fine gravel
Sample Location/Identification: B-19 S-3 5.0'-6.5'

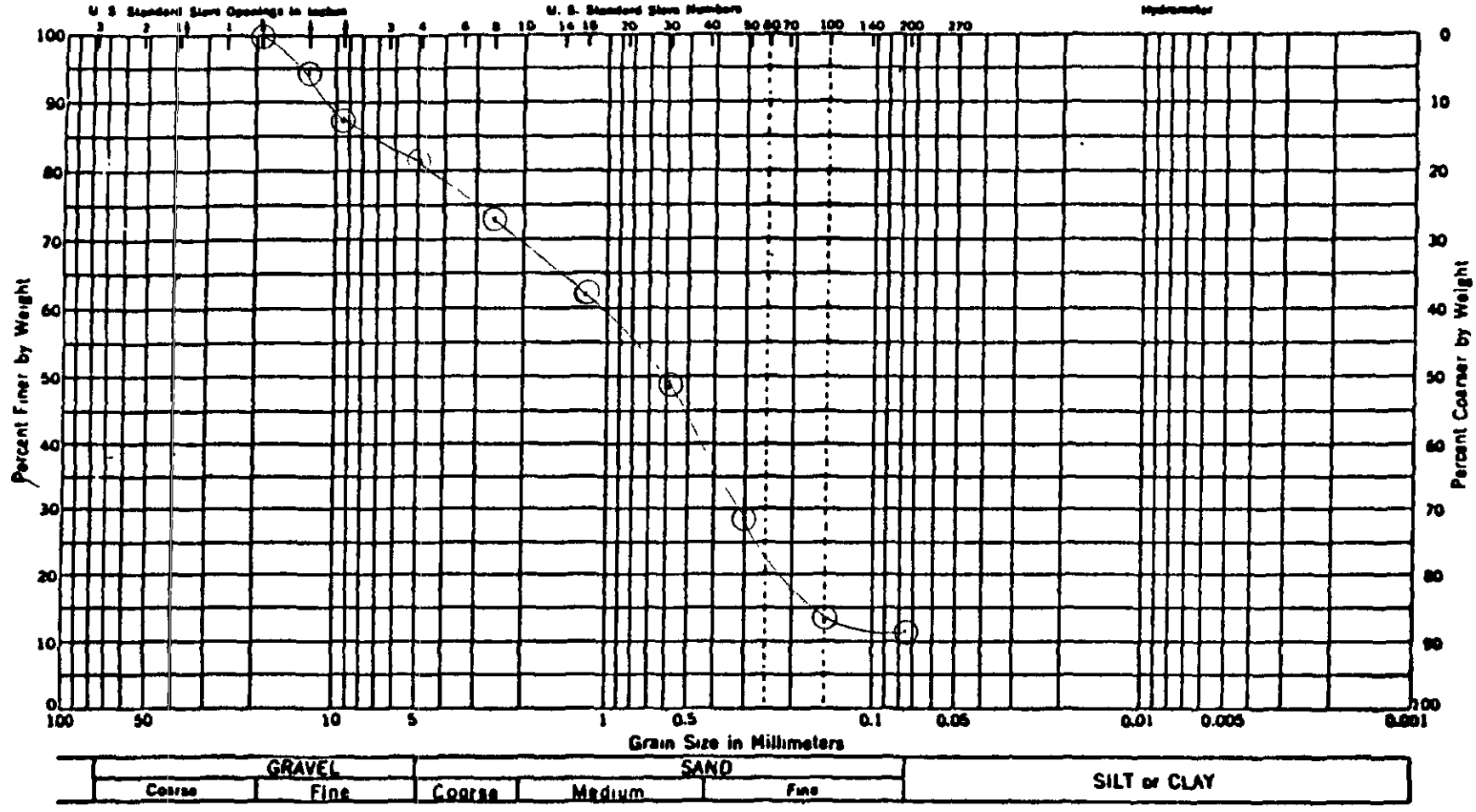
Sieve Size Number	Weight Retained (grams)	Percent Retained	Cumulative Percent Passing	Specifications
2 1/2-Inch				
2-Inch				
1 1/2-Inch				
1-Inch				
3/4-Inch	0.0	0.0	100.0	
1/2-Inch	7.5	5.1	94.9	
3/8-Inch	12.2	8.3	86.6	
No. 4	8.2	5.6	81.0	
No. 8	10.7	7.3	73.7	
No. 10				
No. 16	17.4	11.8	61.9	
No. 30	18.7	12.7	49.2	
No. 50	29.1	19.8	29.4	
No. 80				
No. 100	20.0	13.6	13.8	
No. 200	7.3	5.0	10.8	
Pan	3.1 + 12.7 = 15.8	10.8		
Total Weight	146.9			

Weight of oven dry soil before washing: 146.9 gr
Weight of oven dry soil after washing: 134.2 gr
Weight loss by wash: 12.7 gr

Remarks:

Checked by: Bob Andrews Technician: Tom Miller

UNIFIED CLASSIFICATION SYSTEM



SAMPLE NO.	W.C.	LL	PL	PI	CLASSIFICATION
B-19					Brownish gray, fine to coarse sand,
S-3					little silt, and fine gravel. (SW-SM)

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DRAWN	APPROVED	DATE	JOB No.
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REPORT OF SIEVE ANALYSIS

STS Job No. 1069R Project: Arcadia Creek
Date: 11-04-86 Client: Kalamazoo Downtown Development Authority
Sample Description: Brown fine sand, some silt and clay, little medium to coarse sand
Sample Location/Identification: B-22 S-3 5'-6.5'

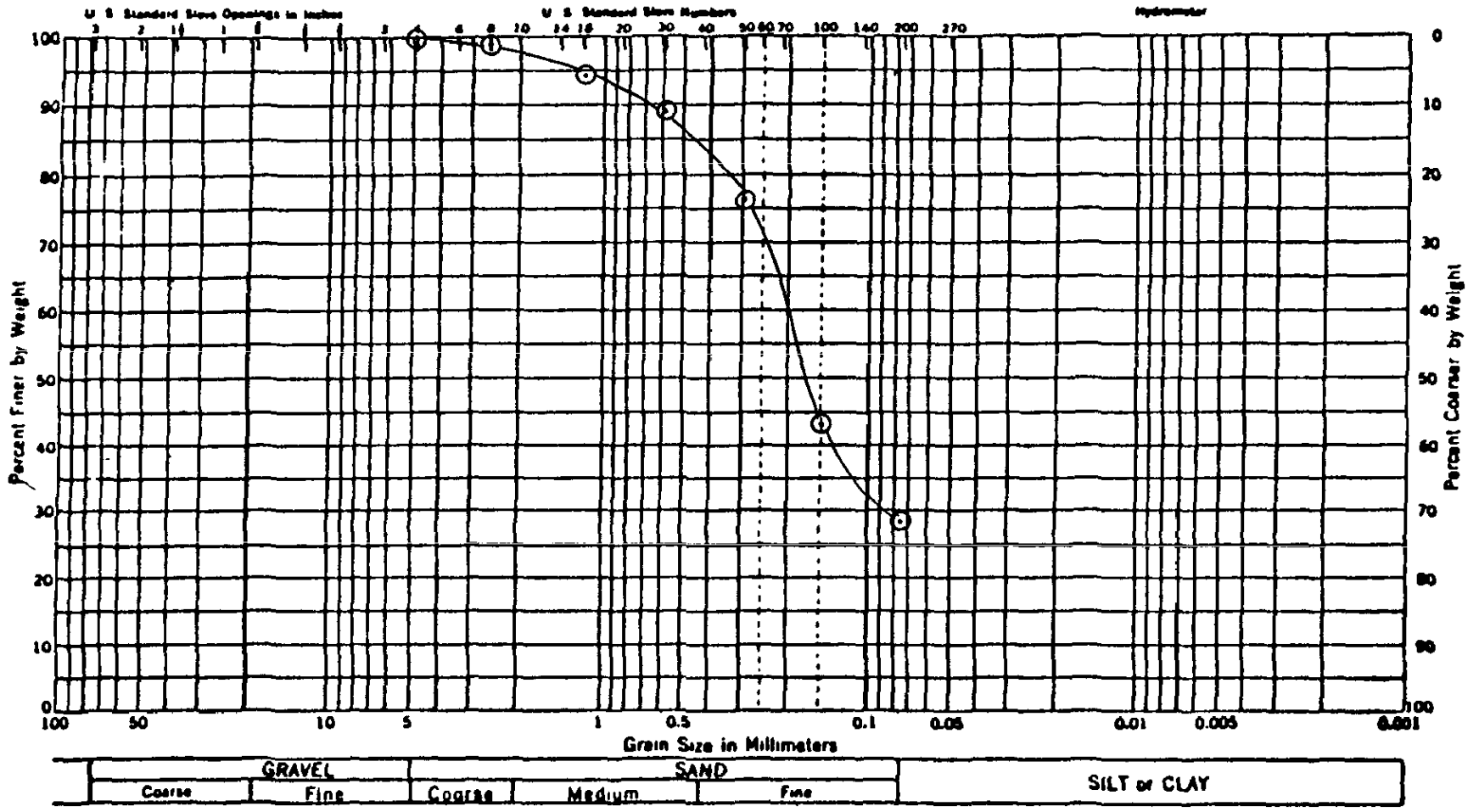
Sieve Size Number	Weight Retained (grams)	Percent Retained	Cumulative Percent Passing	Specifications
2 1/2-Inch				
2-Inch				
1 1/2-Inch				
1-Inch				
3/4-Inch				
1/2-Inch				
3/8-Inch				
No. 4	0	0	100	
No. 8	0.8	0.9	99.1	
No. 10				
No. 16	4.2	4.6	94.5	
No. 30	5.0	5.4	89.1	
No. 50	11.8	12.8	76.3	
No. 80				
No. 100	30.5	33.2	43.1	
No. 200	13.2	14.4	28.7	
Pan	3.5+22.9=26.4	28.7		
Total Weight	91.9			

Weight of oven dry soil before washing: 91.9 g
Weight of oven dry soil after washing: 69.0 g
Weight loss by wash: 22.9 g

Remarks:

Checked by: Bob Andrews Technician: Tom Miller

UNIFIED CLASSIFICATION SYSTEM



SAMPLE NO.	W.C.	LL	PL	PI	CLASSIFICATION
B-22					Fine to medium sand, some clay, trace
S-3					coarse sand-dark grayish brown (SC)

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DRAWN	APPROVED	DATE	JOB No.
MLY	WEH	11-12-86	1069R

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REPORT OF SIEVE ANALYSIS

STS Job No. 1069R Project: Arcadia Creek

Date: 11/5/86 Client: Kalamazoo Downtown Development Authority

Sample Description: Brown fine to medium sand, trace coarse sand, silt, & clay

Sample Location/Identification: B-22 S-5 10.0'-11.5'

Sieve Size Number	Weight Retained (grams)	Percent Retained	Cumulative Percent Passing	Specifications
2 1/2-Inch				
2-Inch				
1 1/2-Inch				
1-Inch				
3/4-Inch				
1/2-Inch	0.0	0.0	100.0	
3/8-Inch	1.5	0.7	99.3	
No. 4	6.7	3.3	96.0	
No. 8	6.2	3.1	92.9	
No. 10				
No. 16	7.7	3.8	89.1	
No. 30	18.4	9.2	79.9	
No. 50	66.1	33.1	46.8	
No. 80				
No. 100	76.0	38.1	8.7	
No. 200	12.1	6.0	2.7	
Pan	1.0 + 4.5 = 5.5	2.7		
Total Weight	200.2			

Weight of oven dry soil before washing: 200.2 gr

Weight of oven dry soil after washing: 195.7 gr

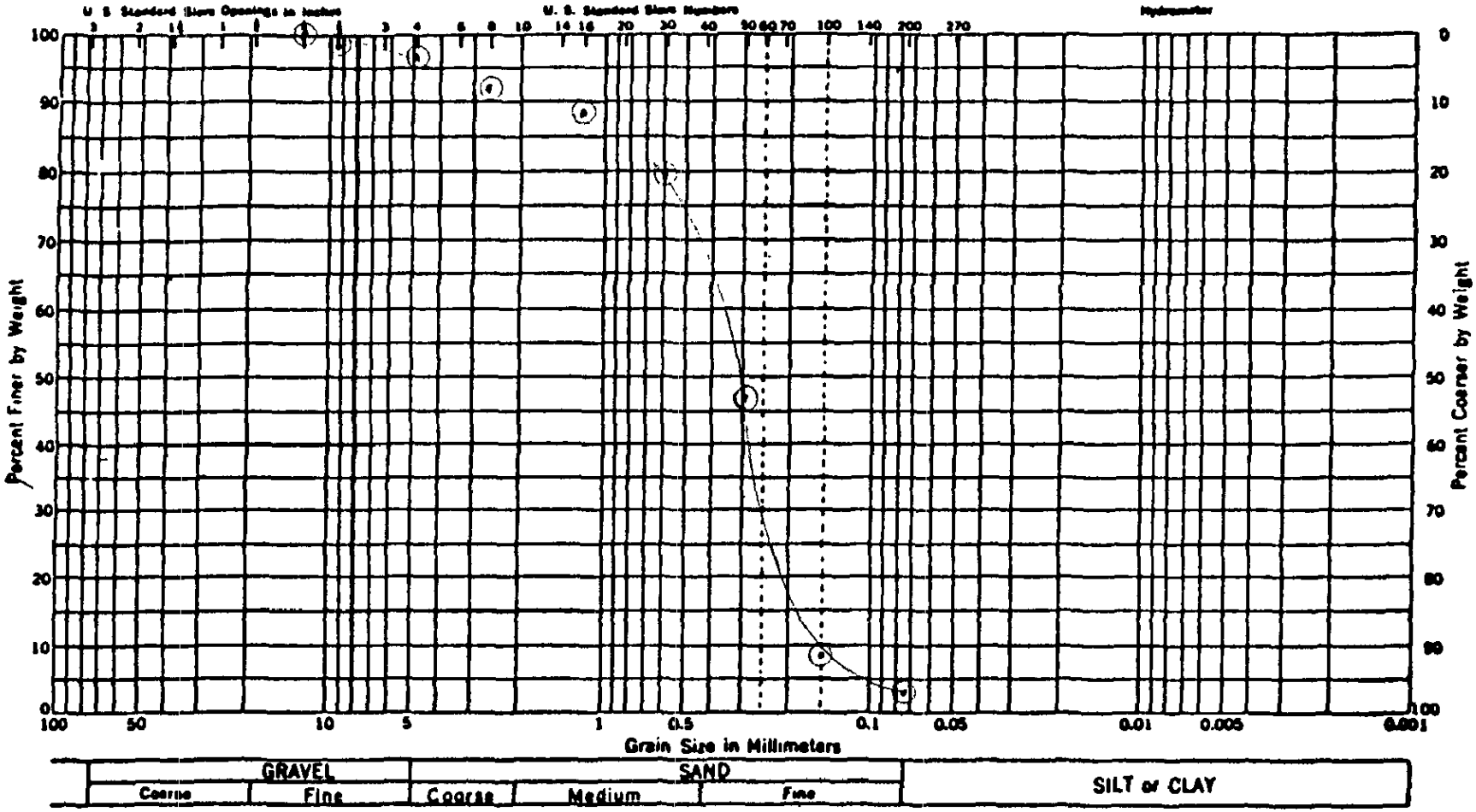
Weight loss by wash: 4.5 gr

Remarks:

Checked by: Bob Andrews

Technician: Tom Miller

[redacted] CLASSIFICATION [redacted] SYSTEM



SAMPLE NO.	W.C.	LL	PL	PI	CLASSIFICATION
B-22					Brown fine to medium sand, trace coarse
S-5					sand, silt. (SP)

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DRAWN	APPROVED	DATE	JOB No.
TSP	WEH	11-12-86	1069R

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REPORT OF SIEVE ANALYSIS

STS Job No. 1069R Project: Arcadia Creek
Date: 11-04-86 Client: Kalamazoo Downtown Development Authority
Sample Description: Brown fine to coarse sand, little silt, clay and gravel
Sample Location/Identification: B-22 S-6 15'-16.5'

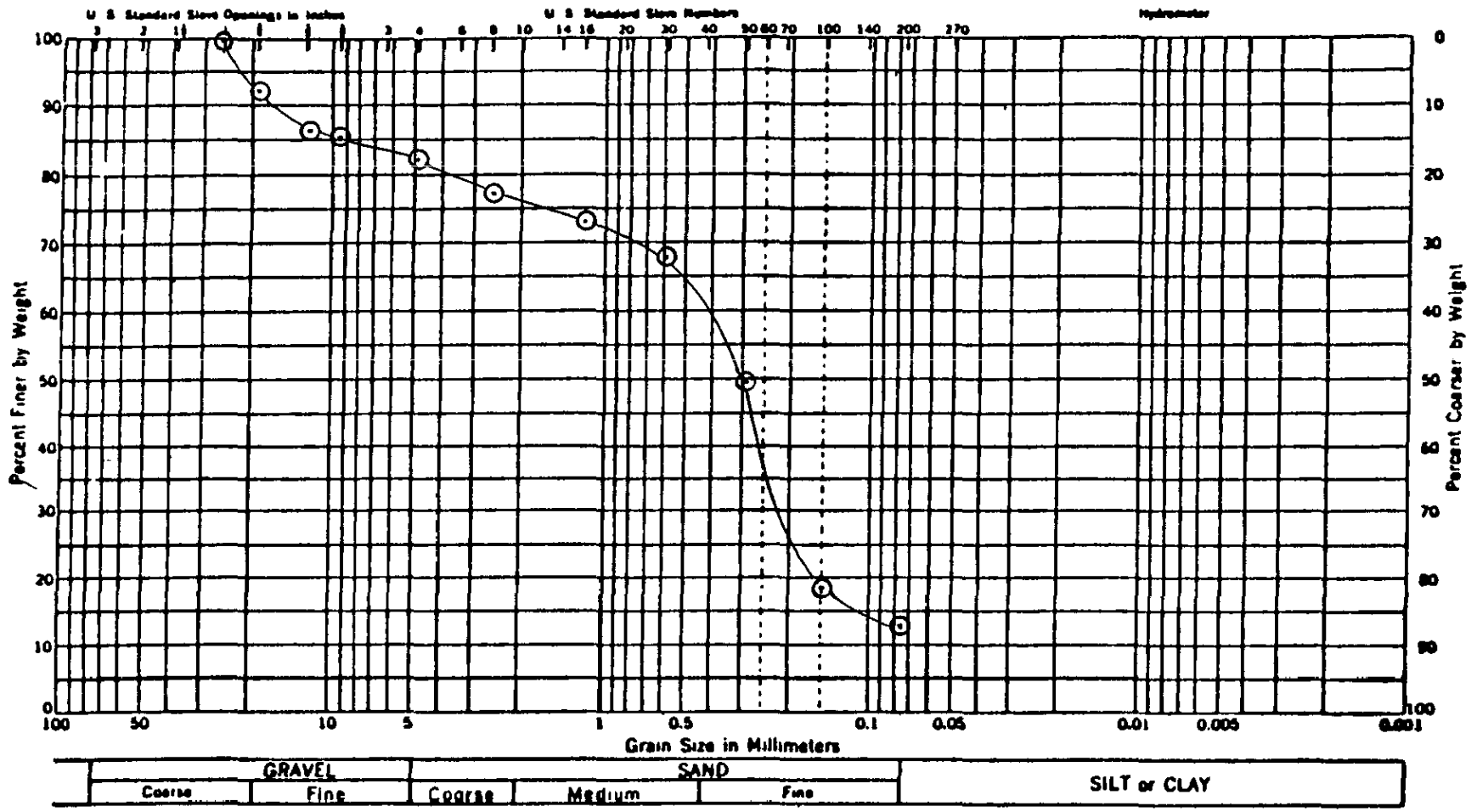
Sieve Size Number	Weight Retained (grams)	Percent Retained	Cumulative Percent Passing	Specifications
2 1/2-Inch				
2-Inch				
1 1/2-Inch				
1-Inch	0	0	100	
3/4-Inch	11.9	7.9	92.1	
1/2-Inch	8.6	5.7	86.4	
3/8-Inch	1.7	1.1	85.3	
No. 4	5.2	3.4	81.9	
No. 8	6.7	4.4	77.5	
No. 10				
No. 16	6.4	4.2	73.3	
No. 30	8.0	5.3	68.0	
No. 50	27.2	18.1	49.9	
No. 80				
No. 100	46.9	31.1	18.8	
No. 200	8.9	5.9	12.9	
Pan	1.1+18.3=19.4	12.9		
Total Weight	150.9			

Weight of oven dry soil before washing: 150.9 g
Weight of oven dry soil after washing: 132.6 g
Weight loss by wash: 18.3 g

Remarks:

Checked by: Bob Andrews Technician: Tom Miller

UNIFIED CLASSIFICATION SYSTEM



SAMPLE NO.	W.C.	LL	PL	PI	CLASSIFICATION
B-22					Fine to coarse sand, trace to little
S-6					silt and gravel-brown (SW-SM)

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DRAWN	APPROVED	DATE	JOB No.
MLY	WEH	11-12-86	1069R

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REPORT OF SIEVE ANALYSIS

STS Job No. 1069R Project: Arcadia Creek
Date: 11/5/86 Client: Kalamazoo Downtown Development Authority
Sample Description: Brown fine to medium sand, trace coarse sand, fine gravel, silt & clay
Sample Location/Identification: B-23 S-3 5.0'-6.5'

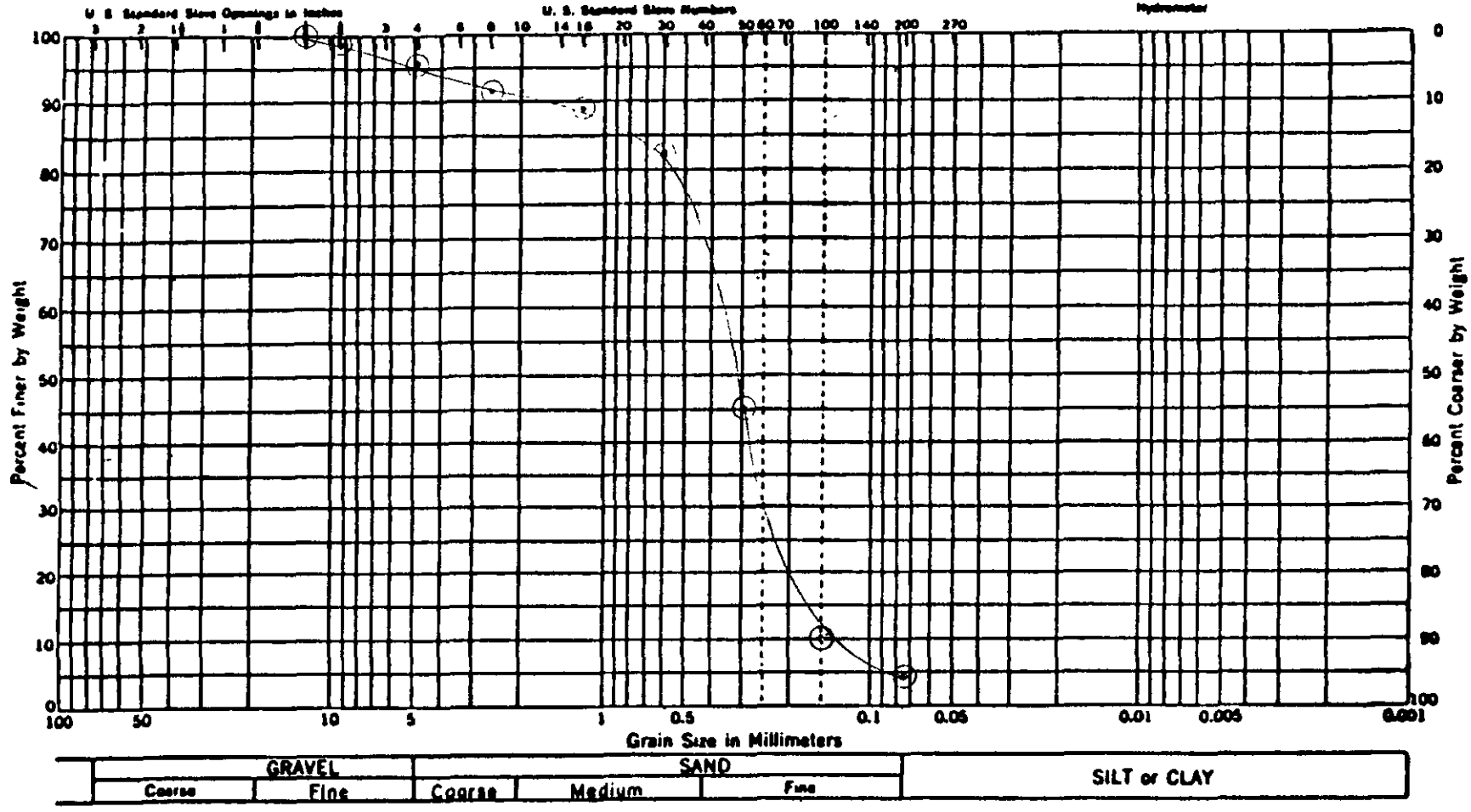
Sieve Size Number	Weight Retained (grams)	Percent Retained	Cumulative Percent Passing	Specifications
2 1/2-Inch				
2-Inch				
1 1/2-Inch				
1-Inch				
3/4-Inch				
1/2-Inch	0.0	0.0	100.0	
3/8-Inch	1.5	1.0	99.0	
No. 4	5.6	3.7	95.3	
No. 8	5.9	3.9	91.4	
No. 10				
No. 16	4.0	2.6	88.8	
No. 30	9.0	5.9	82.9	
No. 50	57.3	37.5	45.4	
No. 80				
No. 100	54.5	35.7	9.7	
No. 200	7.4	4.9	4.8	
Pan	1.3 + 6.0 = 7.3	4.8		
Total Weight	152.5			

Weight of oven dry soil before washing: 152.5 gr
Weight of oven dry soil after washing: 146.5 gr
Weight loss by wash: 6.0 gr

Remarks:

Checked by: Bob Andrews Technician: Tom Miller

UNIFIED CLASSIFICATION SYSTEM



SAMPLE NO.	W.C.	LL.	PL.	PI	CLASSIFICATION
B-23					Brown fine to medium sand, trace
S-3					coarse sand, fine gravel & silt. (SP)

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DRAWN	APPROVED	DATE	JOB No.
TSP	WEH	11-12-86	1069R

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REPORT OF SIEVE ANALYSIS

STS Job No. 1069R Project: Arcadia Creek
Date: 11/5/86 Client: Kalamazoo Downtown Development Authority
Sample Description: Brown fine to coarse sand, some fine gravel, trace silt & clay
Sample Location/Identification: B-24 S-4 7.5'-9.0'

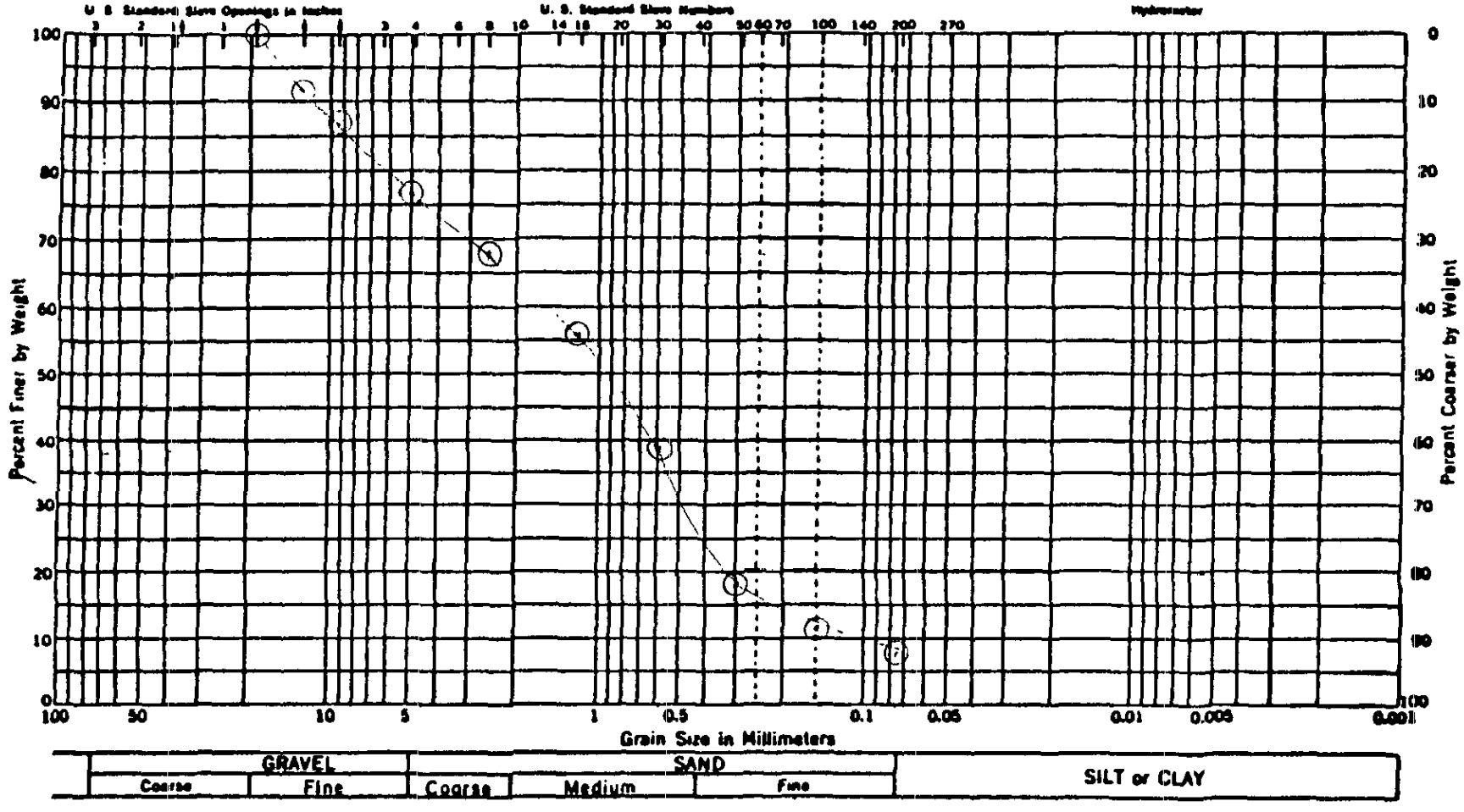
Sieve Size Number	Weight Retained (grams)	Percent Retained	Cumulative Percent Passing	Specifications
2 1/2-Inch				
2-Inch				
1 1/2-Inch				
1-Inch				
3/4-Inch	0.0	0.0	100.0	
1/2-Inch	12.1	9.0	91.0	
3/8-Inch	5.5	4.1	86.9	
No. 4	12.9	9.6	77.3	
No. 8	12.8	9.5	67.8	
No. 10				
No. 16	16.6	12.3	55.5	
No. 30	22.0	16.3	39.2	
No. 50	28.2	20.7	18.5	
No. 80				
No. 100	10.5	7.8	10.7	
No. 200	3.2	2.4	8.3	
Pan	1.3 + 9.9 = 11.2	8.3		
Total Weight	135.0			

Weight of oven dry soil before washing: 135.0 gr
Weight of oven dry soil after washing: 125.1 gr
Weight loss by wash: 9.9 gr

Remarks:

Checked by: Bob Andrews Technician: Tom Miller

UNIFIED CLASSIFICATION SYSTEM



SAMPLE NO.	W.C.	LL	PL	PI	CLASSIFICATION
B-24					Dark grayish brown fine to coarse sand,
S-4					some fine gravel, trace silt. (SW-SC)

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DRAWN	APPROVED	DATE	JOB No.
TSP	WEH	11-12-86	1069R

STS CONSULTANTS, LTD
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REPORT OF SIEVE ANALYSIS

STS Job No. 1069R Project: Arcadia Creek

Date: 11/4/86 Client: Kalamazoo Downtown Development Authority

Sample Description: Dark brown fine to medium sand, little clay & silt, trace coarse sand, fine gravel & organics

Sample Location/Identification: B-25 S-3 5.0'-6.5'

Sieve Size Number	Weight Retained ( )	Percent Retained	Cumulative Percent Passing	Specifications
2 1/2-Inch				
2-Inch				
1 1/2-Inch				
1-Inch				
3/4-Inch				
1/2-Inch	0.0	0.0	100.0	
3/8-Inch	1.7	2.0	98.0	
No. 4	0.6	0.7	97.3	
No. 8	1.3	1.5	95.8	
No. 10				
No. 16	2.7	3.1	92.7	
No. 30	11.1	12.7	80.0	
No. 50	25.7	29.5	50.5	
No. 80				
No. 100	22.7	26.1	24.4	
No. 200	9.5	10.9	13.5	
Pan	6.5 + 5.3 = 11.8	13.5		
Total Weight	87.1			

Weight of oven dry soil before washing: 87.1 gr

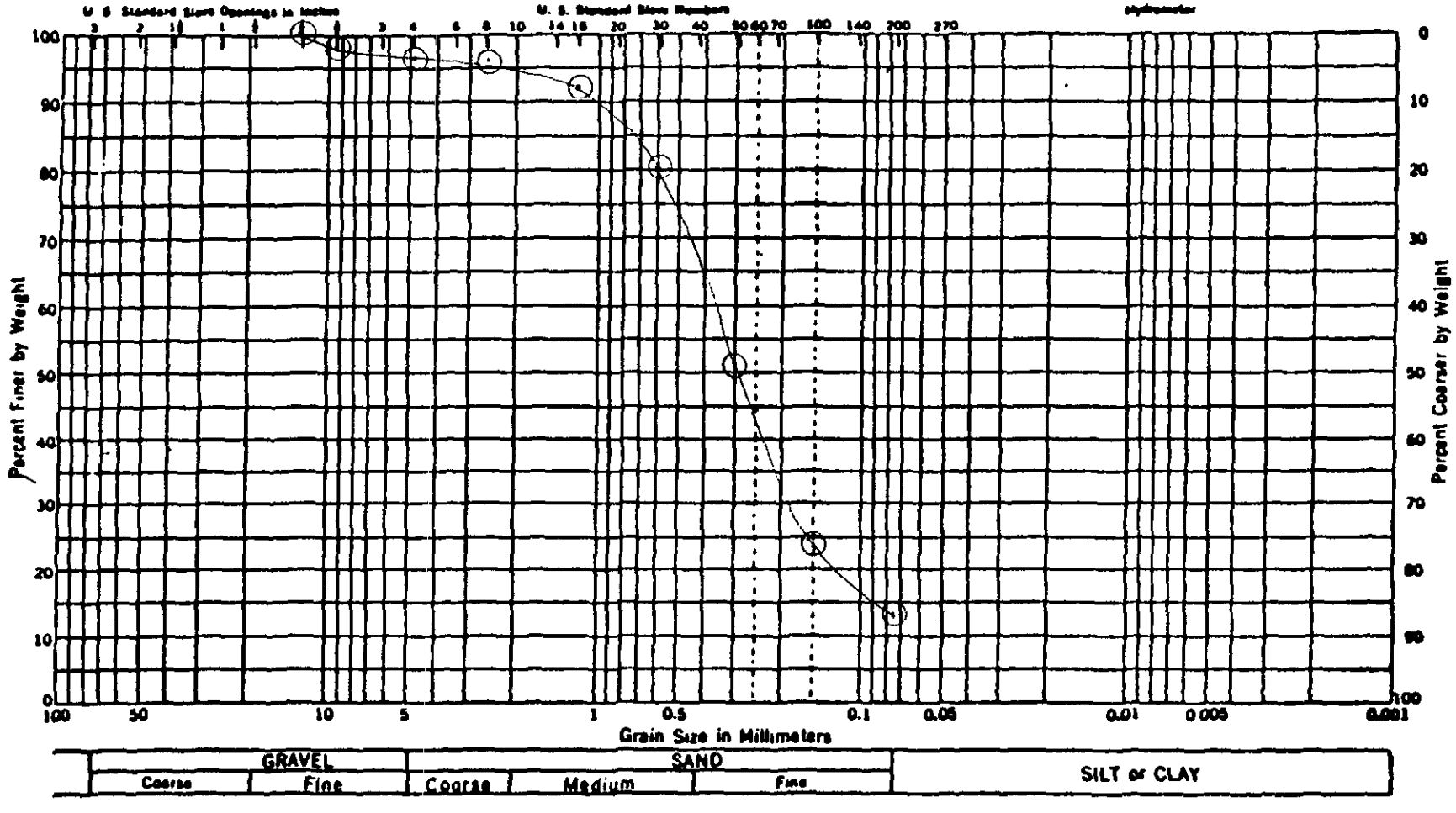
Weight of oven dry soil after washing: 81.8 gr

Weight loss by wash: 5.3 gr

Remarks:

Checked by: Bob Andrews Technician: Tom Miller

UNIFIED CLASSIFICATION SYSTEM



SAMPLE NO.	W.C.	LL	PL	PI	CLASSIFICATION
B-25					Dark brown fine to medium sand, little
S-3					silt, trace coarse sand, fine gravel &
					organics. (SM)

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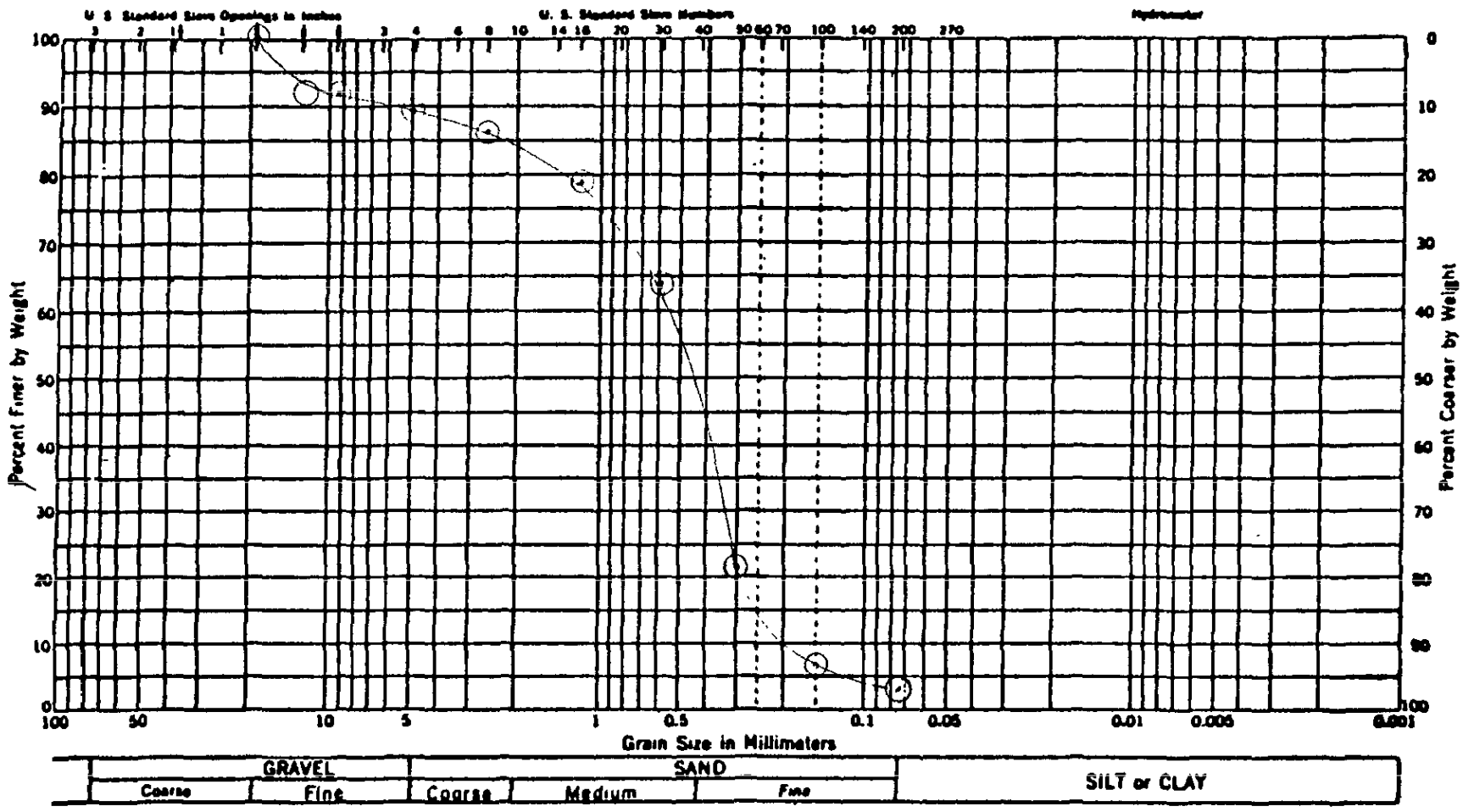
DRAWN	APPROVED	DATE	JOB No.
TSP	WEH	11-12-86	1069R

UNIFIED CLASSIFICATION SYSTEM



SAMPLE NO.	W.C.	LL	PL	PI	CLASSIFICATION
B-33					Brown fine to coarse sand trace silt,
S-6					and fine gravel. (SP)

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DRAWN	APPROVED	DATE	JOB No.
TSP	WEH	11-12-86	1069R

Report

STS Report Qualifications

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This report has been prepared in order to aid in the evaluation of this property and to assist the architect and/or engineer in the design of this project. The scope is limited to the specific project and location described herein, and our description of the project represents our understanding of the significant aspects relevant to soil and foundation characteristics. In the event that any changes in the design or location of the structure(s) as oulined in this report are planned, we should be informed so the changes can be reviewed and the conclusions of this report modified as necessary in writing by the soil and foundation engineer. As a check, we recommend that we be authorized to review the project plans and specifications to confirm that the recommendations contained in this report have been interpreted in accordance with our intent. Without this review, we will not be responsible for misinterpretation of our data, our analysis, and/or our recommendations, nor how these are incorporated into the final design.

It is recommended that all construction operations dealing with earthwork and foundations be reviewed by an experienced soil engineer to provide information on which to base a decision whether the design requirements are fulfilled in the actual construction. If you wish, we would welcome the opportunity to provide field construction services for you during construction.

The analysis and recommendations submitted in this report are based upon the data obtained from the soil borings performed at the locations indicated on the location diagram and from any other information discussed in this report. This report does not reflect any variations which may occur between these borings. In the performance of subsurface explorations, specific information is obtained at specific locations at specific times. However, it is a well-known fact that variations in soil and rock conditions exist on most sites between boring locations and also such situations as ground water levels vary from time to time. The nature and extent of variations may not become evident until the course of construction. If variations then appear evident, it will be necessary for a re-evaluation of the recommendations of this report after performing on-site observations during the construction period and noting the characteristics of any variations.

Because of the possibility of these unanticipated subsurface conditions occurring, we recommend that a "changed conditions" clause be provided in the contract both with the general contractor and in contracts with sub-contractors involved in the foundation and earthwork construction. It is felt that the inclusion of this clause will permit contractors to give lower prices because they will not need to provide as much in contingencies as they normally would if equitable adjustment of changed conditions will minimize conflicts and litigation with the attendant delays and costs. Furthermore, by the immediate recognition and adjustment in contract price at the time any changed conditions are encountered, the immense problem of trying to recreate facts when litigation develops later is eliminated. A mediation/arbitration procedure is recommended in the event that the owner, contractor and professionals do not agree on the changed conditions at the moment they are disclosed. If you wish, we would be pleased to furnish additional information pertaining to this procedure. A suggested wording for a changed conditions clause is given in the Appendix.

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STANDARD CLAUSE FOR UNANTICIPATED SUBSURFACE CONDITIONS

"The owner has had a subsurface exploration performed by a foundation consultant, the results of which are contained in the consultant's report. The consultant's report presents his conclusions on the subsurface conditions based on his interpretation of the data obtained in the exploration. The contractor acknowledges that he has reviewed the consultant's report and any addenda thereto, and that his bid for earthwork operations is based on the subsurface conditions, as described in that report. It is recognized that a subsurface exploration may not disclose all conditions as they actually exist and further, conditions may change, particularly groundwater conditions, between the time of subsurface exploration and the time of earthwork operations. In recognition of these facts, this clause is entered in the contract to provide a means of equitable additional compensation for the contractor if adverse unanticipated conditions are encountered and to provide a means of rebate to the owner if the conditions are more favorable than anticipated.

At any time during earthwork, paving and foundation construction operations that the contractor encounters conditions that are different than those anticipated by the foundation consultant's report, he shall immediately (within 24 hours) bring this fact to the owner's attention. If the owner's representative on the construction site observes subsurface conditions which are different than those anticipated by the foundation consultant's report, he shall immediately (within 24 hours) bring this fact to the contractor's attention. Once a fact of unanticipated conditions has been brought to the attention of either the owner or the contractor, and the consultant has concurred, immediate negotiations will be undertaken between the owner and the contractor to arrive at a change in contract price for additional work or reduction in work because of the unanticipated conditions. The contractor agrees that the following unit prices would apply for additional or reduced work under the contract. For changed conditions for which unit prices are not provided, the additional work shall be paid for on a time and material basis."

Another example of a changed conditions clause can be found in paper No. 4035 by Robert F. Borg, published in ASCE Construction Division Journal, No. CO2, September 1964, page 37.

CHANNEL U/S OF BOX CULVERT

X1	64.000	4.000	200.000	210.000	1.000	1.000	1
GR	792.000	200.000	781.200	200.100	781.200	209.900	792
QT	3.000	970.000	585.000	4.000	0.000	0.000	0.

CHANNEL SECTION IN POND

X1	65.000	6.000	200.000	250.000	10.000	30.000	20
GR	792.000	180.000	783.000	200.000	777.000	218.000	777.
GR	792.000	270.000	0.000	0.000	0.000	0.000	0

CHANNEL SECTION IN POND

X1	66.000	6.000	200.000	270.000	60.000	60.000	40
GR	792.000	180.000	783.000	200.000	777.000	218.000	777
GR	792.000	370.000	0.000	0.000	0.000	0.000	0.

CHANNEL SECTION IN POND

X1	67.000	6.000	200.000	270.000	60.000	40.000	40
GR	792.000	180.000	783.000	200.000	777.000	218.000	777.
GR	792.000	290.000	0.000	0.000	0.000	0.000	0

TRAPEZOIDAL OPEN CHANNEL

X1	68.000	4.000	200.000	260.000	40.000	40.000	40
GR	792.000	200.000	782.500	220.000	782.500	240.000	792

TRAPEZOIDAL OPEN CHANNEL

X1	69.000	0.000	0.000	0.000	40.000	40.000	40

TRAPEZOIDAL OPEN CHANNEL

X1	70.000	0.000	0.000	0.000	130.000	130.000	130

DUAL 8'X6' BOX CULVERTS UNDER MAIN ST.

X1	71.000	8.000	200.000	217.000	1.000	1.000	1.
X3	10.000	0.000	0.000	0.000	0.000	0.000	0
GR	793.000	200.000	783.200	200.100	783.200	207.900	783
GR	783.200	209.100	783.200	216.900	793.000	217.000	0.

DUAL 8'X6' BOX CULVERTS UNDER MAIN ST.

X1	72.000	0.000	0.000	0.000	1.000	1.000	1.
BT	8.000	200.000	793.500	789.200	200.100	793.500	789
BT	208.000	793.500	783.200	209.000	793.500	783.200	209
BT	793.500	789.200	217.000	793.500	789.200	0.000	0.
X1	72.100	0.000	0.000	0.000	90.000	90.000	90
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.

TRAPEZOIDAL OPEN CHANNEL

X1	73.000	4.000	200.000	260.000	1.000	1.000	1
GR	794.000	200.000	783.200	220.000	783.200	240.000	794.

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Consulting Engineers

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Lansing, Michigan
48906

PROJECT: Arcadia Creek Summary
Cost Estimate: X Preliminary ___ Final

Date: 14NOV86
Sheet 1 of 1

ITEM	QUANTITY	UNIT	UNIT PRICE	COST
West end				
Preferred option (North route, open channel)				$1,370,000
Option #2 (North route, closed channel)				1,564,000
Option #3 (Existing route, open channel)				2,205,000
Housing zone				$1,538,000
Rehab/Mixed use zone				$1,210,000
Arcadia Gardens				
Preferred option (Ponds throughout)				$1,160,000
Option #2 (Pond W. of Edwards, open flume E. of Edwards)				1,425,000
Option #3 (Pond W. of Edwards, culverts E. of Edwards)				1,550,000
East end				$2,090,000
Pitcher Street reconstruction				$ 700,000
PREFERRED ALTERNATIVE TOTAL ESTIMATED COST				$ 7,578,000
West End Option #2			add	140,000
West End Option #3			add	840,000
Arcadia Gardens Option #2			add	315,000
Arcadia Gardens Option #3			add	390,000

*** NOTE: Estimates do not include land acquisition costs

8-NOV-86 10:39:31

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOS
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMI
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IBC	ICONT	CORAR	TOPW

3301 HV CHANGED MORE THAN HVINS

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 800.00 ELREA= 800.00

U/S FACE DUAL 10'X8' BOX CULVERTS

16.10	6.76	774.86	0.00	0.00	775.24	0.38	0.00	0.
995.	0.	995.	0.	0.	202.	0.	19.	3
0.25	0.00	4.93	0.00	0.000	0.013	0.000	0.000	768.1
0.000239	1.	1.	1.	4	0	0	0.00	29.

*SECNO 16.200

D/S FACE OF WIER

16.20	7.03	775.13	0.00	0.00	775.30	0.17	0.01	0.0
995.	0.	995.	0.	0.	301.	0.	19.	4
0.26	0.00	3.30	0.00	0.000	0.013	0.000	0.000	768.
0.000089	40.	40.	40.	2	0	0	0.00	45.8

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS
	0.00	1.50	3.40	50.00	0.10	0.00	0.10	0.00

*SECNO 16.300
PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	EL
306734.00	776.30	0.00	993.	1.	0.	0.	767.

50' WEIR

16.30	6.59	775.69	0.00	0.00	775.83	0.14	0.53	0.
995.	0.	995.	0.	0.	328.	0.	19.	3
0.26	0.00	3.03	0.00	0.000	0.013	0.000	0.000	769.1
0.000078	1.	1.	1.	2	0	8	0.00	49.

*SECNO 17.000

STS CONSULTANTS, LTD. 3340 Ranger Road Lansing, Michigan
Consulting Engineers (517) 321-4964 48906

PROJECT: Arcadia Creek (West end preferred option) Date: 14NOV86
Cost Estimate: .X. Preliminary .. Final Sheet 2 of 11

ITEM	QUANTITY	UNIT	UNIT PRICE	COST
Channel Improvements upstream of Main St.	500	L.F.	180	9000
Demolition	1	L.S.	211000	211000
Creek structure (culverts, pond, open channel through north route)	1800	L.F.	368	662400
Utilities	1	L.S.	55000	55000
Resurfacing	1	L.S.	76000	76000
Traffic control	1	L.S.	5000	5000

PAGE TOTAL 1099400
SAY 1100000
+ 25% (Engineering, contingencies, etc.) 275000

TOTAL ESTIMATED COST 1375000

8-NOV-86 10:39:31

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOS
Q	QLOB	QCH	QROB	ALOB	ALCH	AROB	VOL	TWA
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMI
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	INC	ICONT	CORAR	TOPW

*SECNO 14.000

3370 NORMAL BRIDGE,NRD= 10 MIN ELTRD= 777.50 MAX ELLC= 775.00

200' IN DUAL 10'X8' BOX CULVERTS

14.00	5.49	770.49	0.00	0.00	771.91	1.42	0.31	0.2
995.	0.	995.	0.	0.	104.	0.	18.	
0.24	0.00	9.55	0.00	0.000	0.013	0.000	0.000	765.
0.002071	200.	200.	200.	2	0	0	-4.94	19.8

*SECNO 15.100

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE,NRD= 10 MIN ELTRD= 779.00 MAX ELLC= 776.50

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

400' IN DUAL 10'X8' BOX CULVERTS

15.10	4.33	770.83	770.83	0.00	773.08	2.24	0.55	0.
995.	0.	995.	0.	0.	83.	0.	19.	3.
0.25	0.00	12.02	0.00	0.000	0.013	0.000	0.000	766.
0.003796	200.	200.	200.	3	12	0	-3.16	19.

*SECNO 16.000

3370 NORMAL BRIDGE,NRD= 10 MIN ELTRD= 780.60 MAX ELLC= 778.10

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

610' INSIDE DUAL 10'x8' BOX CULVERTS

16.00	4.33	772.43	772.43	0.00	774.68	2.24	0.80	0.0
995.	0.	995.	0.	0.	83.	0.	19.	3.
0.25	0.00	12.02	0.00	0.000	0.013	0.000	0.000	768.
0.003796	210.	210.	210.	20	12	0	-3.16	19.

*SECNO 16.100

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Consulting Engineers (517) 321-4964 48906

PROJECT: Arcadia Creek (West end option #2) Date: 14NOV86
Cost Estimate: X Preliminary Final Sheet 3 of 11

ITEM	QUANTITY	UNIT	UNIT PRICE	COST
Channel Improvements upstream of Main St.	500	L.F.	180	9000
Demolition	1	L.S.	145000	145000
Creek structure (Culverts, pond, culverts through north route)	1800	S.F.	485	87300
Utilities	1	L.S.	55000	55000
Resurfacing	1	L.S.	45000	45000
Traffic control	1	L.S.	5000	5000

PAGE TOTAL 131300

SAY 123000

+ 25% (Engineering, contingencies, etc.) 30400

TOTAL ESTIMATED COST 153400

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	QLOSS
Q	QLOB	QCH	QROR	ALOB	ACH	AROR	VOL	TWA LE
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IBC	ICONT	CORAR	TOPWID

*SECNO 4.300
- CHANNEL SECTION IN LAKE

4.30	10.69	770.69	0.00	0.00	770.73	0.03	0.01	0.02
1020.	15.	989.	15.	31.	658.	31.	7.	1.
0.11	0.49	1.50	0.49	0.030	0.025	0.030	0.000	760.00
0.000034	110.	110.	110.	2	0	0	0.00	96.81

*SECNO 5.000
- CHANNEL SECTION IN LAKE

5.00	10.66	770.66	0.00	0.00	770.77	0.11	0.00	0.04
1020.	44.	963.	13.	46.	354.	15.	8.	1.
0.12	0.96	2.72	0.85	0.030	0.025	0.030	0.000	760.00
0.000125	70.	70.	70.	2	0	0	0.00	66.43

*SECNO 6.000
- CHANNEL SECTION IN LAKE

6.00	10.67	770.67	0.00	0.00	770.78	0.11	0.01	0.00
1015.	30.	954.	30.	33.	355.	33.	9.	1.
0.13	0.93	2.69	0.93	0.030	0.025	0.030	0.000	760.00
0.000122	80.	80.	80.	0	0	0	0.00	67.99

*SECNO 7.000
- CHANNEL SECTION IN LAKE

7.00	10.73	770.73	0.00	0.00	770.80	0.06	0.01	0.01
1015.	26.	963.	26.	37.	465.	37.	10.	1.
0.14	0.70	2.07	0.70	0.030	0.025	0.030	0.000	760.00
0.000067	70.	80.	90.	2	0	0	0.00	81.56

*SECNO 8.000
CHANNEL SECTION IN LAKE

8.00	10.79	770.79	0.00	0.00	770.81	0.02	0.00	0.01
1015.	14.	988.	14.	34.	791.	34.	12.	2.
0.17	0.40	1.25	0.40	0.030	0.025	0.030	0.000	760.00
0.000022	120.	120.	120.	2	0	0	0.00	108.74

*SECNO 9.000
CHANNEL SECTION IN LAKE

9.00	10.79	770.79	0.00	0.00	770.82	0.02	0.00	0.00
1015.	4.	997.	14.	11.	792.	34.	14.	2.
0.19	0.33	1.26	0.40	0.030	0.025	0.030	0.000	760.00
0.000022	140.	100.	60.	0	0	0	0.00	99.18

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3340 Ranger Road
(517) 321-4964

Lansing, Michigan
48906

PROJECT: Arcadia Creek (West end option #3)

Date: 14NOV86

Cost Estimate: X Preliminary ___ Final

Sheet 4 of 11

ITEM	QUANTITY	UNIT	UNIT PRICE	COST
Channel Improvements upstream of Main St.	500	L.F.	180	90000
Demolition	1	L.S.	330000	330000
Creek structure (Culverts and flume through existing route)	1600	L.F.	800	1280000
Utilities	1	L.S.	16000	16000
Resurfacing	1	L.S.	43000	43000
Traffic control	1	L.S.	5000	5000
PAGE TOTAL				1764000
			SAY	1764000
+ 25% (Engineering, contingencies, etc.)				441000
TOTAL ESTIMATED COST				2205000

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA LEF
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IBC	ICONT	CORAR	TOPWID

ECIAL BRIDGE

XR	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS
0.00	1.50	3.40	30.00	0.10	0.00	0.10	0.00

ECNO 3.100
ESSURE AND WEIR FLOW

QPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC
4061.50	769.97 -	0.00	1019.	1.	0.	0.	762.10

- 3' WEIR JUST U/S OF PITCHER ST.

3.10	8.31	770.31	0.00	0.00	770.57	0.26	0.60	0.00
1020.	0.	1020.	0.	0.	248.	0.	4.	1.
0.07	0.00	4.11	0.00	0.000	0.020	0.000	0.000	762.00
.000326	1.	1.	1.	2	0	8	0.00	29.98

HV= 0.300 CEHV= 0.500
ECNO 4.000
- CHANNEL SECTION IN LAKE

4.00	10.51	770.51	0.00	0.00	770.62	0.11	0.00	0.04
1020.	29.	962.	29.	30.	348.	30.	4.	1.
0.07	0.94	2.76	0.94	0.030	0.025	0.030	0.000	760.00
.000132	20.	20.	20.	2	0	0	0.00	67.05

ECNO 4.100
- CHANNEL SECTION IN LAKE

4.10	10.62	770.62	0.00	0.00	770.65	0.02	0.00	0.03
1020.	13.	994.	13.	32.	778.	32.	5.	1.
0.08	0.40	1.28	0.40	0.030	0.025	0.030	0.000	760.00
.000023	60.	60.	60.	2	0	0	0.00	107.75

ECNO 4.200
- CHANNEL SECTION IN LAKE

4.20	10.59	770.59	0.00	0.00	770.70	0.11	0.00	0.04
1020.	28.	964.	28.	30.	351.	30.	6.	1.
0.09	0.94	2.74	0.94	0.030	0.025	0.030	0.000	760.00
.000129	80.	80.	80.	2	0	0	0.00	66.20

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PROJECT: Arcadia Creek (Housing Zone)
Cost Estimate: X Preliminary ___ Final

Date: 14NOV86
Sheet 5 of 11

ITEM	QUANTITY	UNIT	UNIT PRICE	COST
Park St. bridge	1	L.S.	250000	250000
Demolition	1	L.S.	88500	88500
Utilities	1	L.S.	21000	21000
Creek structure (open channel, including weirs)	960	L.F.	865	830400
Resurfacing	1	L.S.	7000	7000
Traffic control	1	L.S.	50000	50000

PAGE TOTAL 1226900

SAY 1230000

+ 25% (Engineering, contingencies, etc.) 408000

TOTAL ESTIMATED COST 1638000

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IUC	ICONT	CORAR	TOPWI

3370 NORMAL BRIDGE,NRD= 10 MIN ELTRD= 800.00 MAX ELLC= 769.80

- 120' IN DUAL BOX CULVERTS IN WATER ST.

2.60	7.89	769.69	0.00	0.00	769.87	0.18	0.02	0.0
630.	0.	630.	0.	0.	187.	0.	2.	0.
0.05	0.00	3.37	0.00	0.000	0.013	0.000	0.000	761.8
0.000172	120.	120.	120.	0	0	0	-9.40	24.9

*SECNO 2.700

3370 NORMAL BRIDGE,NRD= 10 MIN ELTRD= 800.00 MAX ELLC= 769.90

- 240' IN DUAL BOX CULVERTS IN WATER ST.

2.70	7.81	769.71	0.00	0.00	769.89	0.18	0.02	0.00
630.	0.	630.	0.	0.	185.	0.	3.	0
0.06	0.00	3.40	0.00	0.000	0.013	0.000	0.000	761.9
0.000176	120.	120.	120.	0	0	0	-9.28	24.98

*SECNO 2.800

3370 NORMAL BRIDGE,NRD= 10 MIN ELTRD= 800.00 MAX ELLC= 770.00

- 370' IN DUAL BOX CULVERTS IN WATER ST.

2.80	7.73	769.73	0.00	0.00	769.92	0.18	0.02	0.0
630.	0.	630.	0.	0.	183.	0.	4.	1
0.07	0.00	3.44	0.00	0.000	0.013	0.000	0.000	762.0
0.000181	130.	130.	130.	0	0	0	-9.16	24.98

*SECNO 2.900

- 1' U/S OF ENTRANCE TO DUAL BOX CULVERTS IN WATER ST.

2.90	7.70	769.70	0.00	0.00	769.94	0.24	0.00	0.0
630.	0.	630.	0.	0.	161.	0.	4.	1.
0.07	0.00	3.92	0.00	0.000	0.013	0.000	0.000	762.0
0.000161	1.	1.	1.	2	0	0	0.00	20.98

*SECNO 3.000

- 3' WEIR JUST U/S OF PITCHER ST.

3.00	7.67	769.67	0.00	0.00	769.97	0.31	0.01	0.03
1020.	0.	1020.	0.	0.	229.	0.	4.	1
0.07	0.00	4.45	0.00	0.000	0.020	0.000	0.000	762.0
0.000412	20.	20.	20.	2	0	0	0.00	29.97

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PROJECT: Arcadia Creek (Rehab/Mixed use zone)

Date: 14NOV86

Cost Estimate: X Preliminary ___ Final

Sheet 6 of 11

ITEM	QUANTITY	UNIT	UNIT PRICE	COST
Demolition	1	L.S.	80000	80000
Utilities	1	L.S.	49000	49000
Creek structure (open/closed channel)	850	L.F.	940	79900
Resurfacing	1	L.S.	19970	20000
Traffic control	1	L.S.	10000	20000

PAGE TOTAL 968000

SAY 970000

+ 25% (Engineering, contingencies, etc.) 245000

TOTAL ESTIMATED COST 1215000

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	QLOSS
Q	QLOB	QCH	QROB	ALOB	ACH	AROR	VOL	TWA LE
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IBC	ICONT	CORAR	TOPWID

(SECNO 1.480
- JUNCTION CHAMBER

1.48	6.17	767.87	0.00	0.00	769.53	1.67	0.00	0.04
630.	0.	630.	0.	0.	61.	0.	2.	0.
0.04	0.00	10.36	0.00	0.000	0.013	0.000	0.000	761.70
0.002135	1.	1.	1.	3	0	0	0.00	9.92

)PECIAL BRIDGE

SB XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS
0.00	1.00	0.00	0.00	10.00	0.00	60.00	0.00

'SECNO 2.000

,070,LOW FLOW BY NORMAL BRIDGE

:GPRS= 0.000 EGLWC= 768.129 ELLC= 769.700 PCWSE= 767.867 ELTRD= 770

3301 HV CHANGED MORE THAN HVINS

;370 NORMAL BRIDGE,NRD= 0 MIN ELTRD= 770.20 MAX ELLC= 769.70

- 1' D/S FROM 12X8 DUAL BOX CULVERTS IN WATER ST.

2.00	7.99	769.69	0.00	0.00	769.84	0.16	0.01	0.30
630.	0.	630.	0.	0.	199.	0.	2.	0.
0.04	0.00	3.17	0.00	0.000	0.015	0.000	0.000	761.70
0.000124	20.	20.	20.	3	0	0	0.00	24.99

:SECNO 2.500

;370 NORMAL BRIDGE,NRD= 10 MIN ELTRD= 800.00 MAX ELLC= 769.70

- D/S END OF 12X8 DUAL BOX CULVERTS IN WATER ST.

2.50	7.98	769.68	0.00	0.00	769.85	0.17	0.00	0.01
630.	0.	630.	0.	0.	189.	0.	2.	0.
0.04	0.00	3.33	0.00	0.000	0.013	0.000	0.000	761.70
0.000167	1.	1.	1.	1	0	0	-9.53	24.99

SECNO 2.600

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Consulting Engineers (517) 321-4964 48906

PROJECT: Arcadia Creek (Gardens preferred option) Date: 14NOV86
Cost Estimate: X Preliminary Final Sheet / of 11

ITEM	QUANTITY	UNIT	UNIT PRICE	COST
Demolition	1	L.S.	22/4000	22/4000
Creek structure	1050	L.F.	3-470	493500
Ponds throughout Arcadia Gardens area				
Utilities			160000	160000

PAGE TOTAL 92/500
SAY 92/8000
+ 25% (Engineering, contingencies, etc.) 23/000
TOTAL ESTIMATED COST 1160000

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEF
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	

SECNO 1.440

370 NORMAL BRIDGE,NRD= 6 MIN ELTRD= 800.00 MAX ELLC= 767.20

1.44	5.45	766.65	0.00	0.00	768.85	2.20	0.32	0.10
630.	0.	630.	0.	0.	53.	0.	2.	0.
0.03	0.00	11.91	0.00	0.000	0.013	0.000	0.000	761.20
0.003107	110.	110.	110.	2	0	0	-0.79	9.91

SECNO 1.450
WATER EL=X5 CARD= 766.845

370 NORMAL BRIDGE,NRD= 6 MIN ELTRD= 800.00 MAX ELLC= 767.34

- 1260' IN 10X6 BOX CULVERT IN KALAMAZOO AVE.

1.45	5.51	766.85	0.00	0.00	769.00	2.16	0.18	0.01
630.	0.	630.	0.	0.	53.	0.	2.	0.
0.03	0.00	11.79	0.00	0.000	0.013	0.000	0.000	761.34
0.003023	60.	60.	60.	0	0	0	-0.81	9.91

SECNO 1.460

370 NORMAL BRIDGE,NRD= 6 MIN ELTRD= 800.00 MAX ELLC= 767.52

1.46	5.81	767.33	0.00	0.00	769.27	1.94	0.23	0.04
630.	0.	630.	0.	0.	56.	0.	2.	0.
0.03	0.00	11.18	0.00	0.000	0.013	0.000	0.000	761.52
0.002635	80.	80.	80.	3	0	0	-0.90	9.92

SECNO 1.470

370 NORMAL BRIDGE,NRD= 6 MIN ELTRD= 800.00 MAX ELLC= 767.70

- JUNCTION CHAMBER

1.47	5.93	767.63	0.00	0.00	769.49	1.86	0.20	0.02
630.	0.	630.	0.	0.	58.	0.	2.	0.
0.04	0.00	10.94	0.00	0.000	0.013	0.000	0.000	761.70
0.002490	80.	80.	80.	2	0	0	-0.94	9.92

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48906

PROJECT: Arcadia Creek (Gardens option #2)
Cost Estimate: .X. Preliminary ... Final

Date: 14NOV86
Sheet 8 of 11

ITEM	QUANTITY	UNIT	UNIT PRICE	COST
Demolition	1	L.S.	275000	275000
Creek structure	1050	L.F.	705	740250
Ponds west of Edwards St., flume east of Edwards St.				
Utilities	1	L.S.	160000	160000
PAGE TOTAL				1175250
			SAY	1180000
+ 25% (Engineering, contingencies, etc.)				295000
TOTAL ESTIMATED COST				1475000

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SECNO	DEPTH	CWSEL	CRTWS	WSELK	EG	HV	HL	OLOSS
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IUC	ICONT	CORAR	TOPWI

*SECNO 1.350

3370 NORMAL BRIDGE,NRD= 6 MIN ELTRD= 800.00 MAX ELLC= 765.20

1.35	6.14	765.34	0.00	0.00	767.16	1.82	0.43	0.0
630.	0.	630.	0.	0.	58.	0.	1.	0.
0.02	0.00	10.82	0.00	0.000	0.013	0.000	0.000	759.2
0.003939	110.	110.	110.	0	0	0	-2.33	9.9

*SECNO 1.390

3370 NORMAL BRIDGE,NRD= 6 MIN ELTRD= 800.00 MAX ELLC= 765.70

- 870' IN 10X6 BOX CULVERT IN KALAMAZOO AVE.

1.39	6.07	765.77	0.00	0.00	767.59	1.82	0.43	0.00
630.	0.	630.	0.	0.	58.	0.	1.	0
0.02	0.00	10.82	0.00	0.000	0.013	0.000	0.000	759.7
0.003939	110.	110.	110.	0	0	※	※92	209.96
※ ※21	0.00	0.00	768.02	1.82	0.43	0.00	770.20	
630.	0.	630.	0.	0.	58.	0.	1.	0
0.03	0.00	10.82	0.00	0.000	0.013	0.000	0.000	760.2
0.003939	110.	110.	110.	0	0	0	-1.01	9.92

*SECNO 1.410

3370 NORMAL BRIDGE,NRD= 6 MIN ELTRD= 800.00 MAX ELLC= 766.70

- 1090' IN 10X6 BOX CULVERT IN KALAMAZOO AVE.

1.41	5.77	766.47	0.00	0.00	768.44	1.96	0.35	0.0
630.	0.	630.	0.	0.	56.	0.	1.	0
0.03	0.00	11.24	0.00	0.000	0.013	0.000	0.000	760.70
0.002673	110.	110.	110.	2	0	0	-0.89	9.9

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PROJECT: Arcadia Creek (Gardens option #3)
Cost Estimate: X Preliminary ___ Final

Date: 14NOV86
Sheet 9 of 11

ITEM	QUANTITY	UNIT	UNIT PRICE	COST
Demolition	1	L.S.	274000	274000
Creek structure	1050	L.F.	760	798000
Ponds west of Edwards St., closed channel east of Edwards St.				
Utilities	1	L.S.	160000	160000

PAGE TOTAL 1232000

SAY 1240000

+ 25% (Engineering, contingencies, etc.) 310000

TOTAL ESTIMATED COST 1550000.00

	SEMI-TRAPEZOIDAL OPEN CHANNEL						
X1	46.000	0.000	0.000	0.000	15.000	15.000	15.00
	DRIVEWAY BOX CULVERT						
X1	47.000	6.000	200.000	212.000	5.000	5.000	5.00
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.00
GR	784.700	200.000	777.300	200.100	777.300	200.200	777.30
GR	784.700	212.000	0.000	0.000	0.000	0.000	0.00
	DRIVEWAY BOX CULVERT						
X1	48.000	0.000	0.000	0.000	1.000	1.000	1.00
BT	6.000	200.000	784.800	700.000	200.100	784.800	777.30
BT	211.800	784.800	783.300	211.900	784.800	777.300	212.00
X1	48.100	0.000	0.000	0.000	14.000	14.000	14.00
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.00
X1	48.200	0.000	0.000	0.000	1.000	1.000	1.00
	SEMI-TRAPEZOIDAL OPEN CHANNEL						
X1	49.000	4.000	200.000	220.000	5.000	5.000	5.00
GR	785.500	200.000	777.300	208.000	777.300	219.900	785.50
	SEMI- TRAPEZIODAL OPEN CHANNEL						
X1	50.000	0.000	0.000	0.000	25.000	25.000	25.00
	DRIVEWAY BOX CULVERT						
X1	51.000	6.000	200.000	212.000	5.000	5.000	5.00
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.00
GR	785.500	200.000	777.400	200.100	777.400	200.200	777.40
GR	785.500	212.000	0.000	0.000	0.000	0.000	0.00
	DRIVEWAY BOX CULVERT						
X1	52.000	0.000	0.000	0.000	1.000	1.000	1.00
BT	6.000	200.000	785.500	700.000	200.100	785.500	777.40
BT	211.800	785.500	783.400	211.900	785.500	777.400	212.00
X1	52.100	0.000	0.000	0.000	14.000	14.000	14.00
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.00
X1	52.200	0.000	0.000	0.000	1.000	1.000	1.00
	SEMI-TRAPEZOIDAL OPEN CHANNEL						
X1	53.000	4.000	200.000	218.000	5.000	5.000	5.00
GR	786.000	200.000	777.400	208.000	777.400	217.900	786.00
	SEMI-TRAPEZOIDAL OPEN CHANNEL						
X1	54.000	0.000	0.000	0.000	35.000	35.000	35.00

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PROJECT: Arcadia Creek (East end)
Cost Estimate: X Preliminary ___ Final

Date: 14NOV86
Sheet 10 of 13

ITEM	QUANTITY	UNIT	UNIT PRICE	COST
Demolition	1	L.S.	124000	124000
Utilities	1	L.S.	1400000	1400000
Creek-structure	180	L.F.	480	86400
Construction premium	1	L.S.	340000	340000
Resurfacing	1	L.S.	100000	100000
Traffic control	1	L.S.	100000	100000
PAGE TOTAL				166800
			SAY	167000
+ 25% (Engineering, contingencies, etc.)				42000
TOTAL ESTIMATED COST				209000

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IBC	ICONT	CORAR	TOPWID

PROF 1

CHV= 0.200 CEHV= 0.400
SECNO 1.000
- DISCHARGE AT PORTAGE CREEK

1.00	6.40	762.10	0.00	762.10	763.65	1.55	0.00	0.00
630.	0.	630.	0.	0.	63.	0.	0.	0.
0.00	0.00	9.98	0.00	0.000	0.013	0.000	0.000	755.70
0.001937	0.	0.	0.	0	0	0	0.00	9.93

SECNO 1.100

370 NORMAL BRIDGE,NRD= 6 MIN ELTRD= 800.00 MAX ELLC= 761.70

- 1' U/S OF SECTION 1.0

1.10	6.24	761.94	0.00	0.00	763.76	1.82	0.00	0.11
630.	0.	630.	0.	0.	58.	0.	0.	0.
0.00	0.00	10.82	0.00	0.000	0.013	0.000	0.000	755.70
0.003939	1.	1.	1.	2	0	0	-3.33	9.92

SECNO 1.140
WATER EL=XS CARD= 762.739

370 NORMAL BRIDGE,NRD= 6 MIN ELTRD= 800.00 MAX ELLC= 762.20

1.14	6.54	762.74	0.00	0.00	764.56	1.82	0.39	0.00
630.	0.	630.	0.	0.	58.	0.	0.	0.
0.00	0.00	10.82	0.00	0.000	0.013	0.000	0.000	756.20
0.003939	100.	100.	100.	0	0	0	-6.31	9.93

SECNO 1.150

370 NORMAL BRIDGE,NRD= 6 MIN ELTRD= 800.00 MAX ELLC= 762.70

- 210' IN 10X6 BOX CULVERT IN KALAMAZOO AVE.

1.15	6.47	763.17	0.00	0.00	764.99	1.82	0.43	0.00
630.	0.	630.	0.	0.	58.	0.	0.	0.
0.01	0.00	10.82	0.00	0.000	0.013	0.000	0.000	756.70
0.003939	110.	110.	110.	0	0	0	-5.64	9.93

STS CONSULTANTS, LTD.
Consulting Engineers

3340 Ranger Road
(517) 321-4964

Lansing, Michigan
48906

PROJECT: Arcadia Creek (Pitcher St)
Cost Estimate: _X_ Preliminary ___ Final

Date: 14NOV86
Sheet 11 of 11

ITEM	QUANTITY	UNIT	UNIT PRICE	COST
Demolition	1	L.S.	60000.00	60000
Utilities	1	L.S.	12000.00	12000
Resurface road	3350	S.Y.	17.00	56950
Curbs (new)	1300	L.F.	15.00	19500
Sidewalks (new)	720	S.Y.	15.00	10800

PAGE TOTAL 159250

SAY 160000

+ 25% (Engineering, contingencies, etc.) 40000

TOTAL ESTIMATED COST 200000

Report

Report

PRELIMINARY TECHNICAL SPECIFICATIONS
FOR
ARCADIA CREEK RELOCATION

Division 1 - General Requirements

01010 SUMMARY OF THE WORK

A. Summary of the work to include a brief description of the work to be performed under each Contract, and items not included in the Contract or to be furnished by the Owner.

B. Special construction procedures or schedules will be outlined.

01031 ALTERATIONS

This section will include a description of alterations to existing facilities, utilities and roadways to accomodate the rerouted creek.

01100 ALTERNATIVES

A. This section will emunerate the alternatives to the basic contract documents and will be established as the Contract Documents are developed.

01200 PROJECT MEETINGS

A. This section will include a statement regarding required preconstruction meetings.

B. This section will cover regularly- and emergency-scheduled project meetings.

01300 SUBMITTALS

A. This section will include definitions, methods of submission, identification, approvals, resubmission, and execution of the work.

B. Items to be included under submittals are: certification of lines and levels by a licensed surveyor, progress schedules, material and equipment lists, material samples, and progress photographs.

01400 QUALITY CONTROL

A. Provisions for testing laboratory services; ie, concrete, structural steel, soil compaction, others.

01500 TEMPORARY FACILITIES AND CONTROLS

A. Construction equipment shall be furnished by Contractors.

B. Temporary heat, light, power, water, and sanitary facilities to be provided by Contractors.

C. Enclosures and signs to be provided by Contractors.

D. Each Contractor will provide field office with telephone.

01550 PROJECT IDENTIFICATION AND SIGNAGE

A. Party responsible for quality and quantity of project signs.

01530 BARRIERS

A. Statements regarding barriers or fences to be provided by contractor.

01540 SECURTIY

A. Provide for site security and define party responsible for payment thereof.

01550 ACCESS ROADS AND PARKING AREAS

A. Section regarding contractor access and parking for equipment.

B. Public parking - coordinate with parking consultant.

01560 TEMPORARY CONTROLS

A. Contractor to provide controls for noise, dust, water, pests, rodents, and pollution.

01700 PROJECT CLOSEOUT

A. This section includes instructions for submission of guarantees, maintenance instructions, record drawings, etc.

B. A statement including instructions for protection and repair of damaged facilities and surfaces, cleaning up prior to finishing work, final cleaning, and disposal of debris.

Division 2 - Site Work

02010 SUBSURFACE INVESTIGATIONS

A. Results of subsurface investigtions available from Engineer.

B. Soil and groundwater conditions not shown in results may be encountered at project site. Contractor may perform additional investigations at Contractor's own cost.

02050 DEMOLITION

A. List items to be demolished and location (buildings, bridges, roadways, etc.)

B. Demolition methods.

C. Disposal of demolished materials.

02100 SITE PREPARATION

A. Clearing -

1. Limits of clearing
2. Trees, other items to be protected
3. Stripping and stockpiling of topsoil

02120 STRUCTURES MOVING

A. Statements regarding materials and equipment to be removed by owner or contractor should be included in this section.

02150 UNDERPINNING

A. Special foundation concerns and underpinning can be included in this section.

02200 EARTHWORK

A. Define limits of construction, grading, easements, rights-of-way, and other restrictions. Provisions for shoring, dewatering, blasting, and protection. Porous fill under slab on grade.

1. Filter - describe type and method of placement.
2. Stone - describe location of placement, source of stone, and method of placement.

02210 SITE GRADING

A. Define general requirements, methods, equipment, and materials, backfill, and compaction requirements.

02220 EXCAVATION

A. Define variations in excavations, disposition of excess excavated material, and required subdrainage.

02300 TUNNELING

A. Provide requirements for tunneling.

02350 PILES, CAISSONS, AND COFFERDAMS

A. Provide piles, caissons, or cofferdams for problem construction areas; define methods, materials, and location.

02400 DRAINAGE

A. Define water conditions per previous investigations, required de-watering, and subsurface drainage requirements.

02430 DRAINAGE STRUCTURES

A. Define drainage structures; ie, pipes, box culverts, manhole structures, junction boxes, channel structures, headwall structures, dams, others.

02440 SITE IMPROVEMENTS - Coordinate with landscape architects.

02480 LANDSCAPING - Coordinate with landscape architects.

02500 PAVING AND SURFACING

A. Define limits of roadways, parking areas, approaches, walkways, and others to be paved.

B. Deine methods and materials of paving and surfacing.

02590 PONDS AND RESERVOIRS

A. Excavate to limits shown on drawings; see section 02200.

B. Liner placement and material.

C. Riprap placement; see section 02400-E.

02600 PIPED UTILITIES MATERIALS AND METHOD

A. Provide for materials and methods for utilities.

02700 PIPED UTILITIES

A. Provide for reconstruction and relocation of public and private utilities.

02800 POWER AND COMUNICATION UTILITIES

A. Provide for reconstruction relocation of these utilities.

02850 RAILROAD WORK

A. Provide for protection of railroad facilities during construction.

Division 3 - Concrete

03150 FORMS

A. Chamfers and bevels.

B. Form ties

C. Form surface and cleaning

D. Form removal

03200 CONCRETE REINFORCEMENT

A. Steel reinforcing bars shall be placed as shown on the drawings.

B. Reinforcing bars shall be billet steel for concrete reinforcement, ASTM A645, grade 60.

C. Cleaning of reinforcing bars

D. Minimum splice length

03300 CAST IN PLACE CONCRETE

A. Materials -

1. Cement - type IA, ASTM C150
2. Water
3. Sand and coarse aggregate
4. Air-entraining agent
5. Sealing compound

B. Composition -

1. Performance spec - 28-day strength, slump limits
2. Admixtures - calcium chloride, air-entraining agent, water-reducing admixture.

C. Batching and Mixing

D. Placement -

1. Condition of concrete when placed
2. Vibratory compaction
3. Surface finish

E. Protection and Curing -

1. Contractor shall protect concrete against injury until final acceptance by Owner.
2. Curing method

F. Temperature of Concrete

G. Testing and Inspection

03350 SPECIAL CONCRETE FINISHES

A. Special treatment to certain concrete surfaces.

03400 PRE-CAST CONCRETE

A. Specify types - decks, beams, culverts, or others.

B. Materials -

1. Controlled air-entrained concrete with minimum compressive strength of 2,800 PSI after 28 days.
2. Galvanized reinforcing steel

03700 CONCRETE RESTORATION AND CLEANING

A. Location of Work

B. Method of Restoration

Division 4 - Masonry

04100 MORTAR

A. Provide type of mortar, coloring, and special requirements.

04150 MASONRY ACCESSORIES

A. Include other necessities; joint reinforcement, anchors, ties, control joints, or others.

04400 STONE

A. Define type, sources, pattern to be laid, size and grout or finish.

04500 MASONRY RESTORATION AND CLEANING

A. Provide for cleaning, restoration and corrossion resistance, as well as work limits and locations.

Division 5 - Metals

05100 STRUCTURAL METAL FRAMING

A. Provide for structural steel types for columns, beams, or others.

B. Field connection type: welded or bolted.

05500 METAL FABRICATIONS

A. Provide for hangars, bridge railway and other metal pieces.

05800 EXPANSION CONTROL

A. Provide manufacturer and type.

05900 METAL FINISHES

A. Provide type, manufacturer and methods of application.