MIDLAND FIS

SNAKE CREEK REVISIONS

DESIGNATED FLOODWAY

A combination of encroachment methods 1 and 4 in the HEC-2 program was used to determine encroachment stations based on an allowable surcharge of 0.1-ft.

Delineation of the 100-year flood plain and floodway is shown on the attached map.

10, 50 AND 500-YEAR PROFILES

Flows

The HEC-1 model used for the 100-year floodplain and floodway study was revised using the respective precipitation data for the other frequencies. A copy of the HEC-1 data is attached. Downstream of the confluence area, a graphical estimate of the flows was made as shown in the attached figure.

Starting Elevation

Approximate starting elevations were determined upstream of Eastman Road, similar to the work done for the 100-year profile. This is within the influence of the Tittabawassee River backwater effects. A copy of the calculations is attached.

FLOODWAY

100 YR. FLOOD

SCALE IN FEET

0 500 1000

CONTOUR INTERVAL - 5'

N

MIDLAND
MIDLAND COUNTY, MICHIGAN

3 OF 4

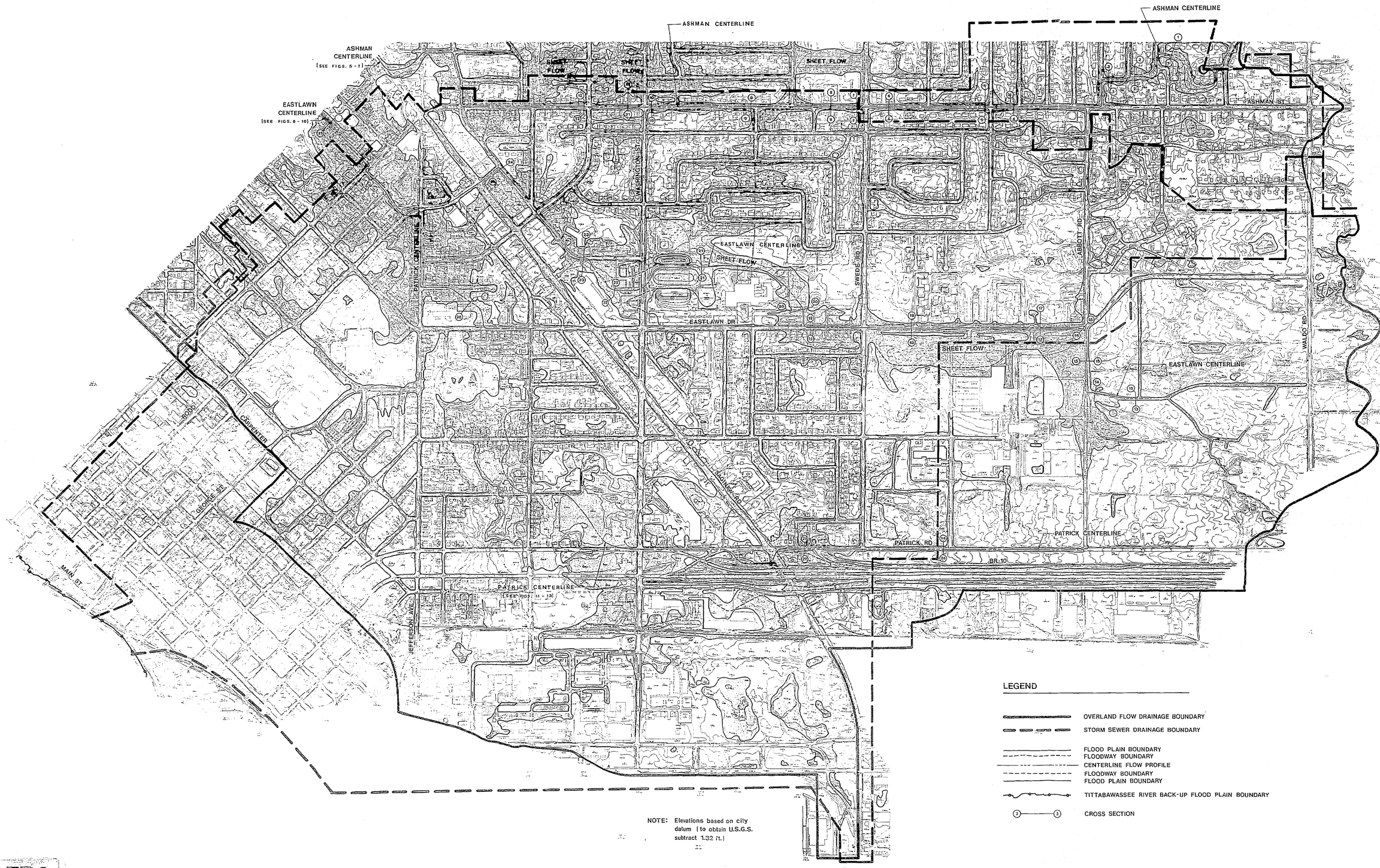


FIGURE
GEORGE
100 YEA
FLOODW

0 400
SCALE: FEET

MIDLAN
MICHIG.

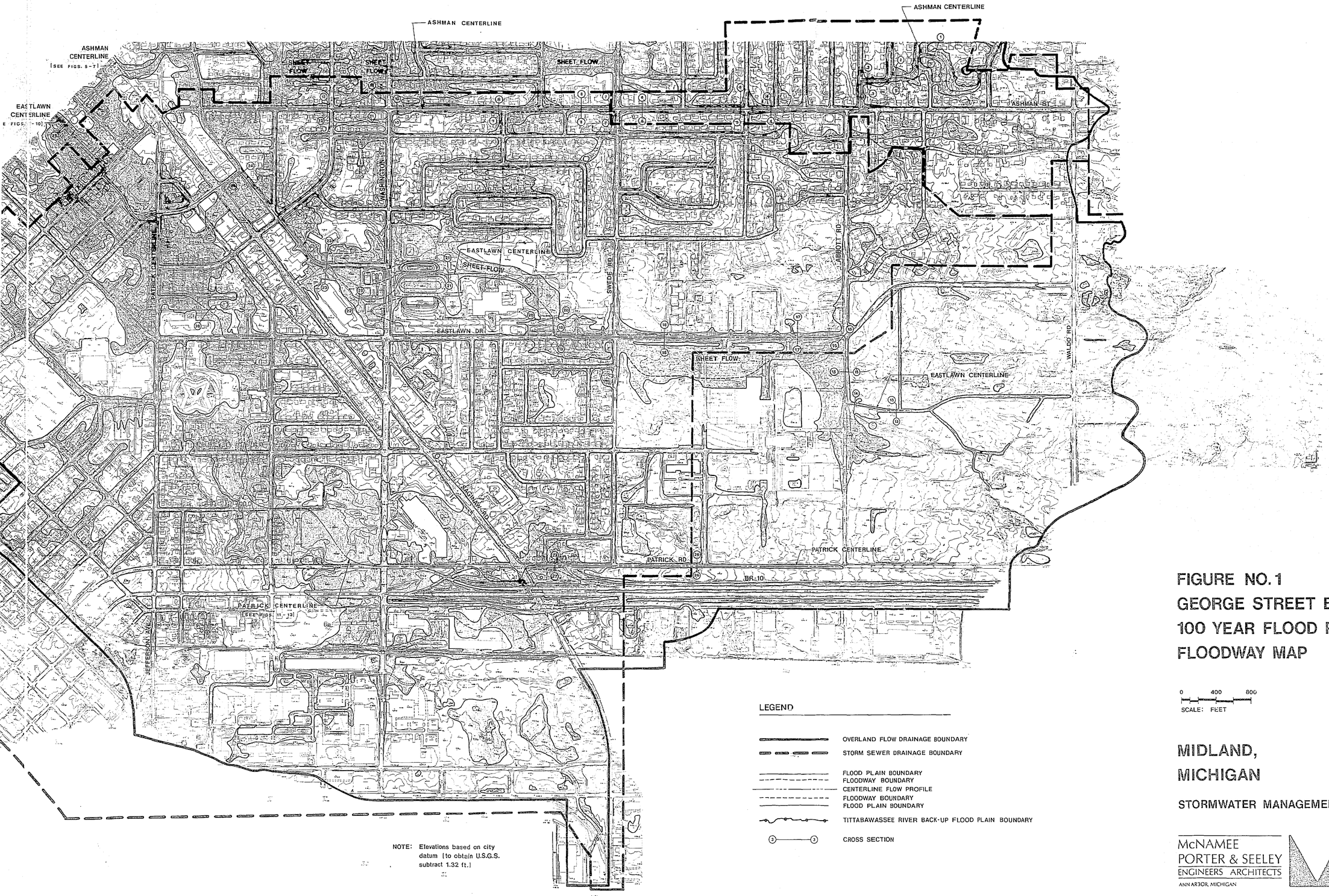
STORMWAT

McNAMEE
PORTER &
ENGINEERS A
ANN ARBOR, MICHIGAN

FR2

ABRAMS
AERIAL SURVEY CORPORATION
114 N. LAPEER ST., LANSING, MICHIGAN 48933

RP △ REFERENCE POINT
THESE SELECTED POINTS ARE PLOTTED WITH EXTREME CARE AND ARE RECOMMENDED AS BASIC TIES DURING CONSTRUCTION.



NOTE: Elevations based on city datum (to obtain U.S.G.S. subtract 1.32 ft.)

LEGEND

- OVERLAND FLOW DRAINAGE BOUNDARY
- STORM SEWER DRAINAGE BOUNDARY
- FLOOD PLAIN BOUNDARY
- FLOODWAY BOUNDARY
- CENTERLINE FLOW PROFILE
- FLOODWAY BOUNDARY
- FLOOD PLAIN BOUNDARY
- TITTABAWASSEE RIVER BACK-UP FLOOD PLAIN BOUNDARY
- CROSS SECTION

FIGURE NO. 1
GEORGE STREET BASIN - 100 YEAR FLOOD PLAIN / FLOODWAY MAP

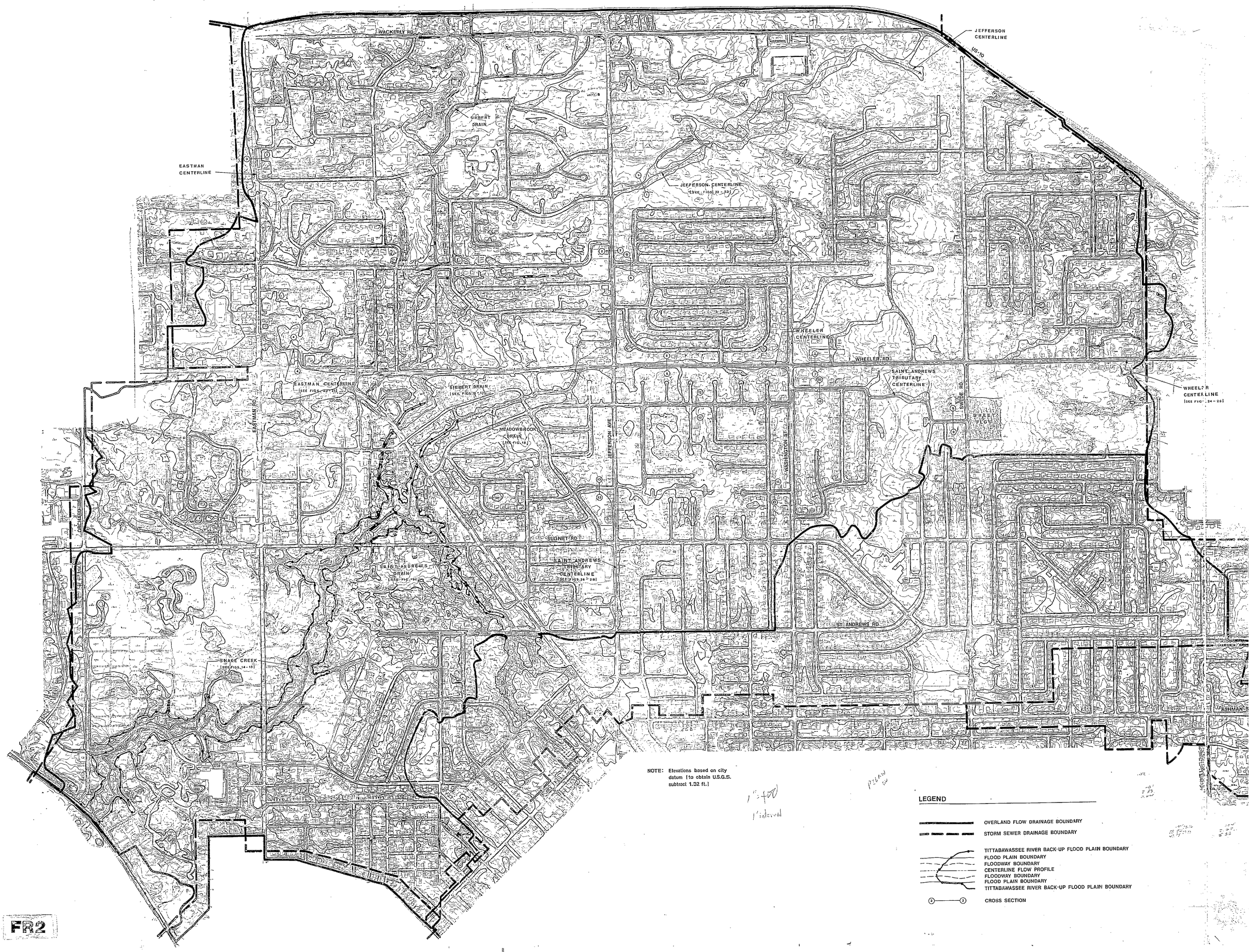
0 400 800
SCALE: FEET

MIDLAND, MICHIGAN

STORMWATER MANAGEMENT STUDY

McNAMEE PORTER & SEELEY
ENGINEERS ARCHITECTS
ANN ARBOR, MICHIGAN

FR1



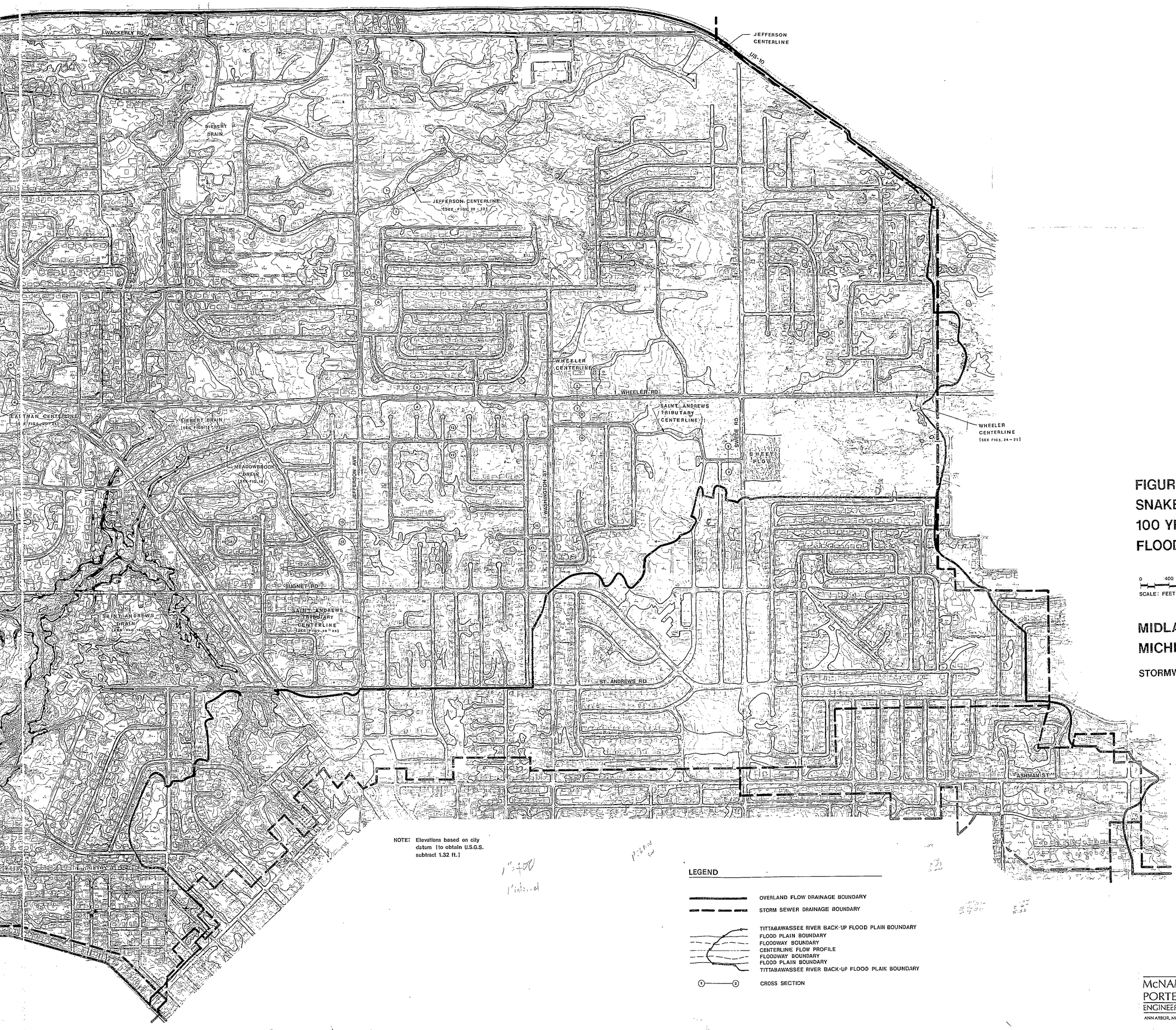
NOTE: Elevations based on city datum (to obtain U.S.G.S. subtract 1.32 ft.)

1" = 400'
1' interval

LEGEND

OVERLAND FLOW DRAINAGE BOUNDARY
STORM SEWER DRAINAGE BOUNDARY
TITTABAWASSEE RIVER BACK-UP FLOOD PLAIN BOUNDARY
FLOOD PLAIN BOUNDARY
FLOODWAY BOUNDARY
CENTERLINE FLOW PROFILE
FLOODWAY BOUNDARY
FLOOD PLAIN BOUNDARY
TITTABAWASSEE RIVER BACK-UP FLOOD PLAIN BOUNDARY
CROSS SECTION

FR2



NOTE: Elevations based on city datum (to obtain U.S.G.S. subtract 1.32 ft.)

LEGEND

OVERLAND FLOW DRAINAGE BOUNDARY
STORM SEWER DRAINAGE BOUNDARY
TITTABAWASSEE RIVER BACK-UP FLOOD PLAIN BOUNDARY
FLOOD PLAIN BOUNDARY
FLOODWAY BOUNDARY
CENTERLINE FLOW PROFILE
FLOODWAY BOUNDARY
FLOOD PLAIN BOUNDARY
TITTABAWASSEE RIVER BACK-UP FLOOD PLAIN BOUNDARY
CROSS SECTION

ABRAMS
AERIAL SURVEY CORPORATION

RP
REFERENCE POINT
THESE SELECTED POINTS ARE PLOTTED WITH EXTREME CARE AND ARE RECOMMENDED AS BASIC TIES DURING CONSTRUCTION

FIGURE NO. 3
SNAKE CREEK BASIN-
100 YEAR FLOOD PLAIN/
FLOODWAY MAP

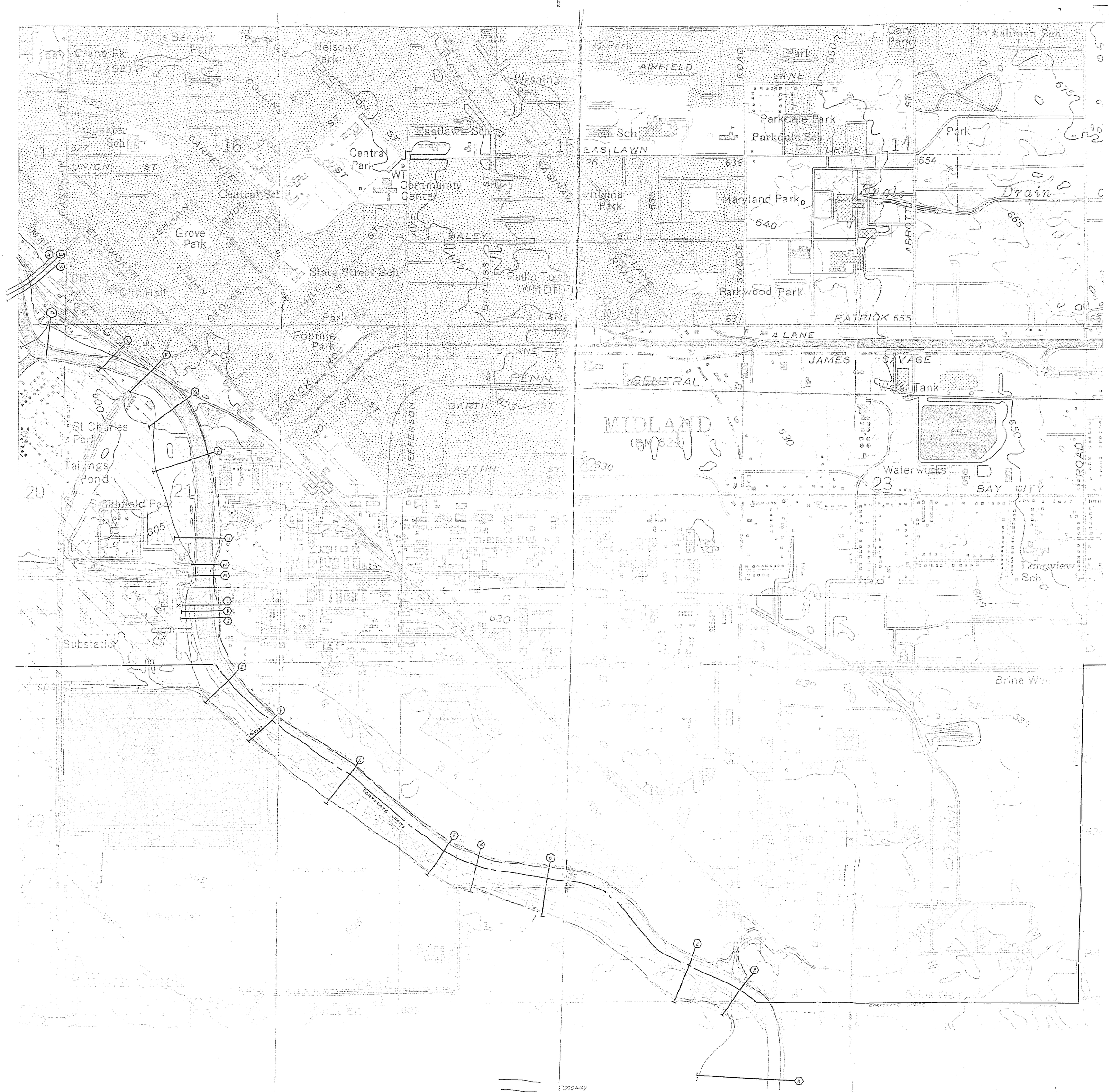
0 400 800
SCALE: FEET

MIDLAND,
MICHIGAN

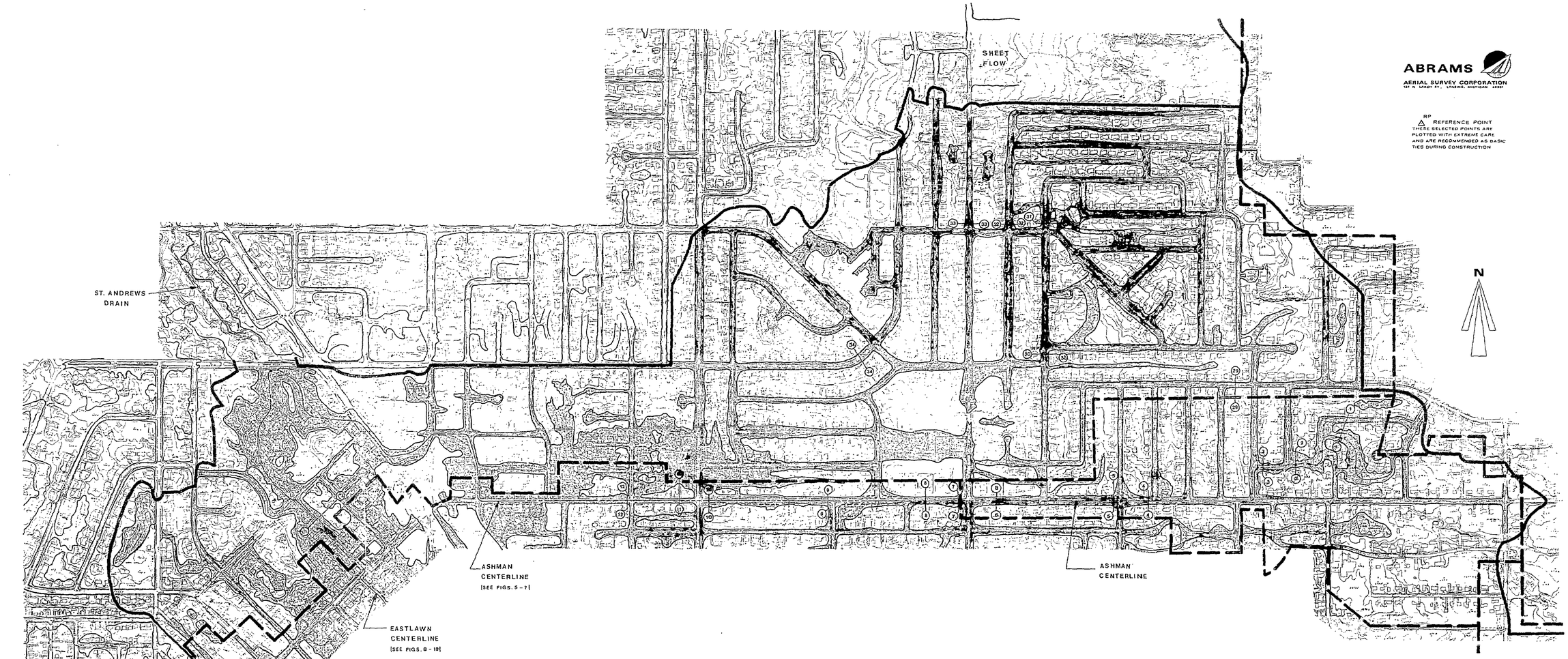
STORMWATER MANAGEMENT STUDY

McNAMEE
PORTER & SEELEY
ENGINEERS ARCHITECTS
ANN ARBOR, MICHIGAN

FR1



Crane Pk
ELIZABETH
Nelson Park
Washington Park
Eastlawn Sch
Central Park
WT
Community Center
Central Sch
Grove Park
State Street Sch
Fourmile Park
Radio Tower (WMDT)
Park
St Charles Park
Tailings Pond
Smithfield Park
Substation
Park
AIRFIELD
LANE
Parkdale Park
Parkdale Sch
EASTLAWN
DRIVE
Maryland Park
Parkwood Park
PATRICK 655
4 LANE
JAMES
SAVAGE
CENTRAL
PENN
BARTH
AUSTIN
JEFFERSON
MIDLAND
Water Tank
Waterworks
BAY CITY
Longview Sch
Brine Well
Drain
Gary Park
Ashman Sch
CORPORATE LIMITS
RECEIVED
DEC 12 1984
WATER MANAGEMENT



ABRAMS
AERIAL SURVEY CORPORATION
127 N. UNION ST., LANSING, MICHIGAN 48933

RP △ REFERENCE POINT
THESE SELECTED POINTS ARE PLOTTED WITH EXTREME CARE AND ARE RECOMMENDED AS BASIC TIES DURING CONSTRUCTION

NOTE: Elevations based on city datum ito obtain U.S.G.S subtract 1.32 ft.)

LEGEND

- OVERLAND FLOW DRAINAGE BOUNDARY
- STORM SEWER DRAINAGE BOUNDARY
- FLOOD PLAIN BOUNDARY
- FLOODWAY BOUNDARY
- CENTERLINE FLOW PROFILE
- FLOODWAY BOUNDARY
- FLOOD PLAIN BOUNDARY
- TITTABAWASSEE RIVER BACK-UP FLOOD PLAIN BOUNDARY
- (3)——(3) CROSS SECTION

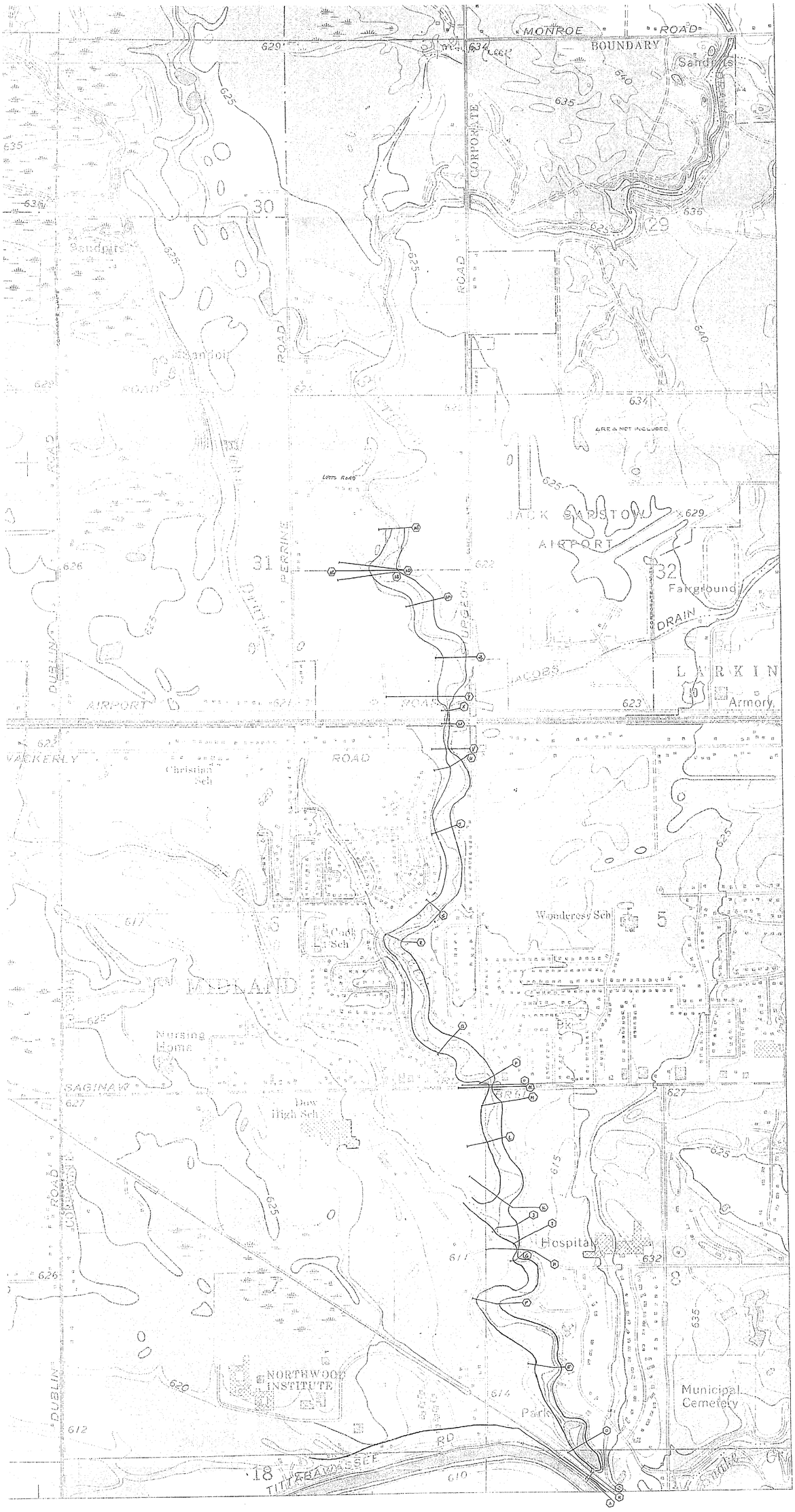
FIGURE NO. 2
GEORGE STREET BASIN - 100 YEAR FLOOD PLAIN/ FLOODWAY MAP

0 400 800
SCALE: FEET

MIDLAND, MICHIGAN

STORMWATER MANAGEMENT STUDY

McNAMEE PORTER & SEELEY
ENGINEERS ARCHITECTS
ANN ARBOR, MICHIGAN



— FLOODWAY

--- 100 YR. FLOOD

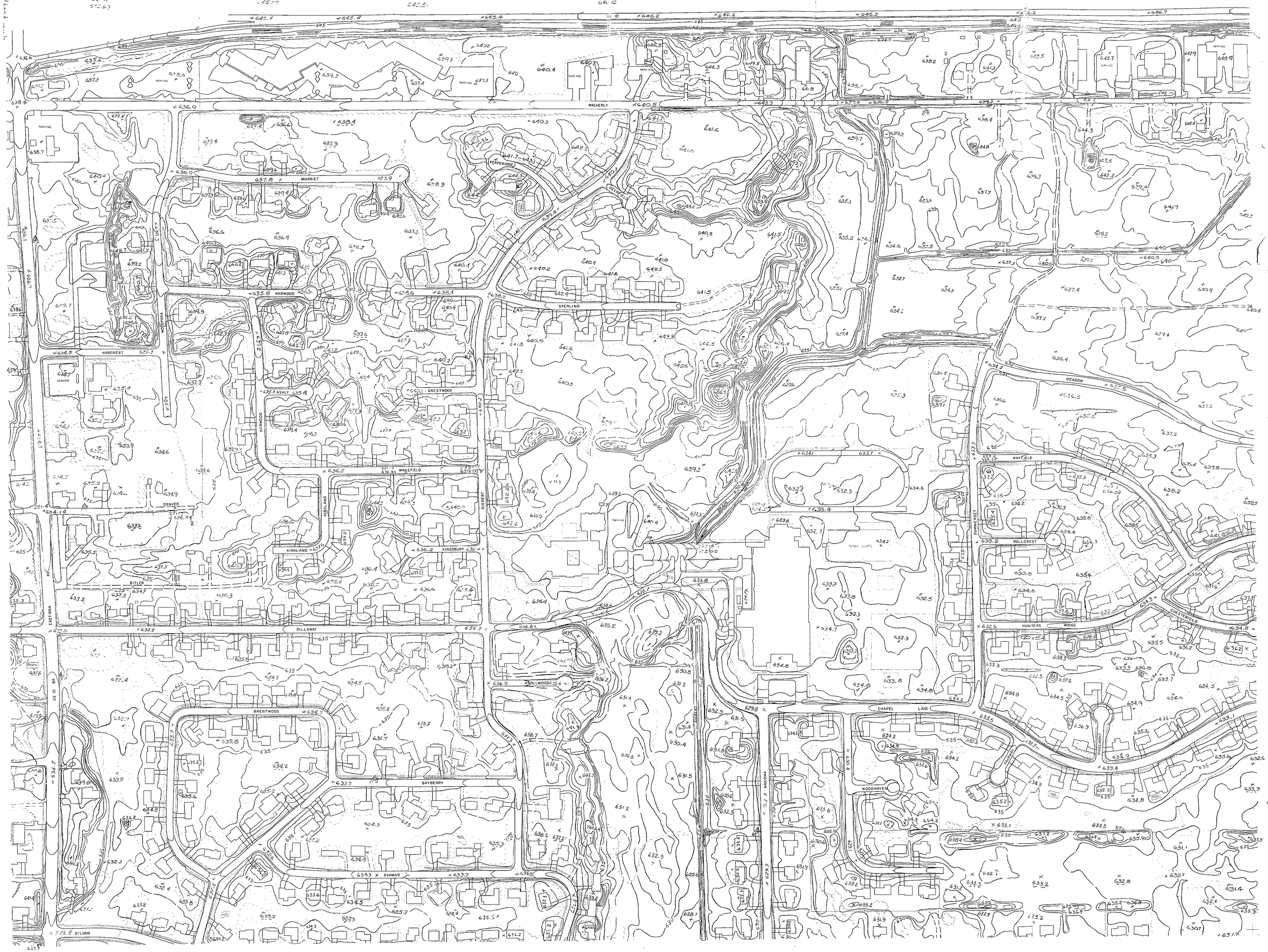
SCALE IN FEET

0 50

MIDLAND
MIDLAND COUNTY, MICH.
2 OF 4

N

REVISED 11/24/81



WACKERLY
MARRIET
PEPPERIDGE
DEERFIELD
HARWOOD
STERLING
HARCREST
WOODPARK
ASHLY
CRESTWOOD
WAKEFIELD
DENVER
KIRKLAND
KINGSBURY
BITLER
DILLOWAY
KROLLWOOD
BRENTWOOD
BAYBERRY
EVAMAR
SYLVAN
EASTMAN
US 10 BR
SIEBERT
NAKOMA
CHAPEL LANE
WOODHAVEN
MEADOW
MAYFIELD
SUMMERSET
ROLLCREST
HUNTERS RIDGE
CHESTERFIELD
RIDGEMONT
FAIRWAY

00BREAK00

1) COUNTY: Midland

2) STUDY NAME: City of Midland

3) WATERCOURSE: Tittabawassee, Chippewa, Sturgeon Cr, Inman Dr. Snake Creek

4) DOCUMENT TYPE: Summary

00BREAK00

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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY1979
  ERROR CORR =  01.02.03
  MODIFICATION -  50,51,52,53
*****************************************************
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E-3 061980

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

INMAN DRAIN

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
*	1350.000	1190.00	0.0	0.0	598.90	330.00	602.33	602.33	602.70	77.90	4.60	93.92	37.39
*	1350.000	1190.00	0.0	0.0	598.90	470.00	602.55	602.55	602.95	41.76	3.60	153.36	72.73
* A	1350.000	1190.00	0.0	0.0	598.90	540.00	602.63	602.63	603.06	37.28	3.47	177.29	88.44
*	1350.000	1190.00	0.0	0.0	598.90	700.00	602.81	602.81	603.29	29.75	3.25	234.69	128.33
	2525.000	1430.00	0.0	0.0	602.90	330.00	607.13	0.0	607.29	18.39	3.03	177.62	76.94
	2525.000	1430.00	0.0	0.0	602.90	470.00	607.27	0.0	607.56	28.07	3.85	193.76	88.72
B	2525.000	1430.00	0.0	0.0	602.90	540.00	607.35	0.0	607.71	31.65	4.16	203.24	95.98
	2525.000	1430.00	0.0	0.0	602.90	700.00	607.48	0.0	608.03	41.64	4.88	218.85	108.48
	2725.000	235.00	0.0	0.0	601.60	330.00	607.40	0.0	607.54	6.76	3.00	110.07	126.97
C	2725.000	235.00	0.0	0.0	601.60	470.00	607.71	0.0	607.97	11.39	4.04	116.34	139.26
	2725.000	235.00	0.0	0.0	601.60	540.00	607.87	0.0	608.19	13.76	4.52	119.48	145.56
	2725.000	235.00	0.0	0.0	601.60	700.00	608.19	0.0	608.67	19.39	5.56	125.96	158.97
	2726.000	1.00	615.30	615.50	601.60	330.00	607.39	0.0	607.55	15.93	3.27	101.07	82.69
	2726.000	1.00	615.30	615.50	601.60	470.00	607.69	0.0	607.99	28.93	4.45	105.55	87.39
	2726.000	1.00	615.30	615.50	601.60	540.00	607.83	0.0	608.22	36.25	5.01	107.77	89.70
	2726.000	1.00	615.30	615.50	601.60	700.00	608.13	0.0	608.74	55.24	6.24	112.10	94.18
	2727.000	94.00	615.30	615.50	601.60	330.00	607.54	0.0	607.70	15.04	3.19	103.36	85.09
	2727.000	94.00	615.30	615.50	601.60	470.00	607.98	0.0	608.26	26.19	4.28	109.83	91.83
	2727.000	94.00	615.30	615.50	601.60	540.00	608.20	0.0	608.56	32.19	4.78	113.07	95.18
	2727.000	94.00	615.30	615.50	601.60	700.00	608.71	0.0	609.24	46.88	5.83	120.01	102.24
	2728.000	1.00	0.0	0.0	601.60	330.00	607.58	0.0	607.71	6.07	2.90	113.67	133.95
	2728.000	1.00	0.0	0.0	601.60	470.00	608.05	0.0	608.28	9.42	3.82	123.15	153.10
	2728.000	1.00	0.0	0.0	601.60	540.00	608.31	0.0	608.58	10.88	4.21	128.20	163.71
	2728.000	1.00	0.0	0.0	601.60	700.00	608.90	0.0	609.28	13.63	5.00	140.02	189.63
	2825.000	80.00	0.0	0.0	602.90	330.00	607.61	0.0	607.87	33.12	4.39	101.38	57.34
D	2825.000	80.00	0.0	0.0	602.90	470.00	608.15	0.0	608.45	35.51	4.91	138.01	78.88
	2825.000	80.00	0.0	0.0	602.90	540.00	608.44	0.0	608.73	33.93	4.98	160.70	92.70
	2825.000	80.00	0.0	0.0	602.90	700.00	609.23	0.0	609.47	25.09	4.68	233.87	139.75
	3425.000	680.00	0.0	0.0	602.90	330.00	608.46	0.0	608.49	4.01	1.75	283.27	164.89
E	3425.000	680.00	0.0	0.0	602.90	470.00	609.02	0.0	609.06	3.76	1.86	419.21	242.36
	3425.000	680.00	0.0	0.0	602.90	540.00	609.28	0.0	609.32	3.59	1.89	482.78	285.16
	3425.000	680.00	0.0	0.0	602.90	700.00	609.91	0.0	609.94	2.98	1.88	639.08	405.42

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
	3925.000	560.00	0.0	0.0	603.50	330.00	608.72	0.0	608.79	6.68	2.17	190.38	127.64
F	3925.000	560.00	0.0	0.0	603.50	470.00	609.27	0.0	609.35	7.21	2.49	264.92	175.06
	3925.000	560.00	0.0	0.0	603.50	540.00	609.52	0.0	609.61	7.24	2.59	305.31	200.69
	3925.000	560.00	0.0	0.0	603.50	700.00	610.11	0.0	610.20	6.54	2.68	415.48	273.64
	4225.000	225.00	0.0	0.0	604.40	330.00	608.91	0.0	609.08	19.38	3.30	99.89	74.96
	4225.000	225.00	0.0	0.0	604.40	470.00	609.46	0.0	609.72	25.18	4.12	114.18	93.67
G	4225.000	225.00	0.0	0.0	604.40	540.00	609.69	0.0	610.01	27.88	4.49	120.35	102.27
	4225.000	225.00	0.0	0.0	604.40	700.00	610.22	0.0	610.65	32.88	5.23	133.84	122.08
	4226.000	1.00	613.00	613.80	604.40	330.00	608.89	0.0	609.09	16.53	3.59	92.05	81.17
	4226.000	1.00	613.00	613.80	604.40	470.00	609.43	0.0	609.75	25.29	4.57	102.77	93.46
	4226.000	1.00	613.00	613.80	604.40	540.00	609.66	0.0	610.05	30.16	5.04	107.18	98.33
	4226.000	1.00	613.00	613.80	604.40	700.00	610.16	0.0	610.72	41.99	6.02	116.28	108.02
	4227.000	55.00	613.00	613.80	604.40	330.00	608.99	0.0	609.18	15.67	3.51	93.95	83.36
	4227.000	55.00	613.00	613.80	604.40	470.00	609.59	0.0	609.89	23.64	4.45	105.65	96.66
	4227.000	55.00	613.00	613.80	604.40	540.00	609.85	0.0	610.22	27.92	4.87	110.77	102.20
	4227.000	55.00	613.00	613.80	604.40	700.00	610.43	0.0	610.95	38.48	5.79	120.95	112.84
	4228.000	1.00	0.0	0.0	604.40	330.00	609.04	0.0	609.20	8.24	3.20	103.25	114.98
	4228.000	1.00	0.0	0.0	604.40	470.00	609.68	0.0	609.91	10.15	3.92	119.89	147.49
	4228.000	1.00	0.0	0.0	604.40	540.00	609.97	0.0	610.25	10.93	4.24	127.45	163.33
	4228.000	1.00	0.0	0.0	604.40	700.00	610.64	0.0	611.00	11.96	4.83	144.97	202.43
	4325.000	100.00	0.0	0.0	603.50	330.00	609.24	0.0	609.29	5.91	1.98	199.10	135.78
H	4325.000	100.00	0.0	0.0	603.50	470.00	609.98	0.0	610.04	6.17	2.18	287.52	189.23
	4325.000	100.00	0.0	0.0	603.50	540.00	610.32	0.0	610.39	5.85	2.20	337.39	223.21
	4325.000	100.00	0.0	0.0	603.50	700.00	611.11	0.0	611.16	4.85	2.14	466.05	317.73
	5525.000	1200.00	0.0	0.0	604.10	330.00	610.07	0.0	610.15	8.61	2.20	154.68	112.45
I	5525.000	1200.00	0.0	0.0	604.10	470.00	610.81	0.0	610.90	8.25	2.43	235.99	163.66
	5525.000	1200.00	0.0	0.0	604.10	540.00	611.12	0.0	611.21	8.03	2.51	273.83	190.57
	5525.000	1200.00	0.0	0.0	604.10	700.00	611.79	0.0	611.87	7.27	2.60	363.57	259.62
	5725.000	660.00	0.0	0.0	604.60	330.00	610.61	0.0	610.69	7.88	2.23	148.00	117.56
J	5725.000	660.00	0.0	0.0	604.60	470.00	611.38	0.0	611.48	9.40	2.66	179.30	153.32
	5725.000	660.00	0.0	0.0	604.60	540.00	611.69	0.0	611.81	10.13	2.85	197.69	169.70
	5725.000	660.00	0.0	0.0	604.60	700.00	612.32	0.0	612.47	10.90	3.14	268.17	212.06
	5775.000	85.00	0.0	0.0	604.40	330.00	610.63	0.0	610.92	35.04	4.34	76.03	55.75
K	5775.000	85.00	0.0	0.0	604.40	470.00	611.35	0.0	611.82	52.29	5.50	85.43	64.99
	5775.000	85.00	0.0	0.0	604.40	540.00	611.64	0.0	612.21	61.77	6.06	89.14	68.70
	5775.000	85.00	0.0	0.0	604.40	700.00	612.19	0.0	613.01	84.98	7.27	96.30	75.93
	5776.000	1.00	615.70	616.50	604.40	330.00	610.60	0.0	610.95	23.70	4.75	69.54	67.79
	5776.000	1.00	615.70	616.50	604.40	470.00	611.29	0.0	611.89	40.95	6.24	75.35	73.45
	5776.000	1.00	615.70	616.50	604.40	540.00	611.55	0.0	612.31	52.59	6.99	77.22	74.46
	5776.000	1.00	615.70	616.50	604.40	700.00	612.01	0.0	613.20	86.25	8.76	79.95	75.37
	5777.000	122.00	615.70	616.50	604.40	330.00	610.91	0.0	611.24	21.82	4.57	72.28	70.64
	5777.000	122.00	615.70	616.50	604.40	470.00	611.85	0.0	612.40	39.06	5.94	79.13	75.20
	5777.000	122.00	615.70	616.50	604.40	540.00	612.27	0.0	612.96	51.31	6.65	81.15	75.39
	5777.000	122.00	615.70	616.50	604.40	700.00	613.21	0.0	614.34	98.85	8.53	82.05	70.41

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
	5778.000	1.00	0.0	0.0	604.40	330.00	611.00	0.0	611.26	14.14	4.08	80.85	87.77
	5778.000	1.00	0.0	0.0	604.40	470.00	612.07	0.0	612.45	18.96	4.96	94.76	107.95
K	5778.000	1.00	0.0	0.0	604.40	540.00	612.60	0.0	613.04	20.86	5.31	101.71	118.23
	5778.000	1.00	0.0	0.0	604.40	700.00	614.00	0.0	614.53	23.14	5.84	119.84	145.52
	5825.000	150.00	0.0	0.0	604.20	330.00	611.39	0.0	611.41	2.36	1.42	438.23	214.87
L	5825.000	150.00	0.0	0.0	604.20	470.00	612.60	0.0	612.61	1.24	1.17	738.08	422.11
	5825.000	150.00	0.0	0.0	604.20	540.00	613.20	0.0	613.21	0.95	1.08	906.29	553.30
	5825.000	150.00	0.0	0.0	604.20	700.00	614.71	0.0	614.71	0.51	0.88	1401.21	984.96
	6825.000	820.00	0.0	0.0	605.10	330.00	611.59	0.0	611.64	3.38	1.84	194.52	179.37
M	6825.000	820.00	0.0	0.0	605.10	470.00	612.72	0.0	612.77	2.75	1.88	289.03	283.25
	6825.000	820.00	0.0	0.0	605.10	540.00	613.29	0.0	613.34	2.37	1.85	349.37	350.77
	6825.000	820.00	0.0	0.0	605.10	700.00	614.75	0.0	614.79	1.49	1.66	540.73	572.72
N	8625.000	1755.00	0.0	0.0	605.10	330.00	612.09	0.0	612.12	2.23	1.58	232.82	220.78
	8625.000	1755.00	0.0	0.0	605.10	470.00	613.14	0.0	613.18	2.00	1.67	332.65	331.97
	8625.000	1755.00	0.0	0.0	605.10	540.00	613.66	0.0	613.70	1.82	1.67	393.01	400.24
	8625.000	1755.00	0.0	0.0	605.10	700.00	615.00	0.0	615.03	1.28	1.56	578.42	618.02

INMAN DRAIN

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	1350.000	330.00	602.33	0.0	0.0	-0.26	233.08	1190.00
*	1350.000	470.00	602.55	0.23	0.0	-0.04	290.55	1190.00
*	1350.000	540.00	602.63	0.08	0.0	0.04	310.69	1190.00
*	1350.000	700.00	602.81	0.17	0.0	0.22	354.38	1190.00
	2525.000	330.00	607.13	0.0	4.80	0.0	110.26	1430.00
	2525.000	470.00	607.27	0.14	4.72	0.0	116.19	1430.00
	2525.000	540.00	607.35	0.08	4.72	0.0	119.55	1430.00
	2525.000	700.00	607.48	0.13	4.67	0.0	124.87	1430.00
	2725.000	330.00	607.40	0.0	0.27	0.0	20.00	235.00
	2725.000	470.00	607.71	0.31	0.44	0.0	20.00	235.00
	2725.000	540.00	607.87	0.16	0.52	0.0	20.00	235.00
	2725.000	700.00	608.19	0.32	0.72	0.0	20.00	235.00
	2726.000	330.00	607.39	0.0	-0.01	0.0	20.00	1.00
	2726.000	470.00	607.69	0.30	-0.03	0.0	20.00	1.00
	2726.000	540.00	607.83	0.15	-0.03	0.0	20.00	1.00
	2726.000	700.00	608.13	0.30	-0.06	0.0	20.00	1.00
	2727.000	330.00	607.54	0.0	0.15	0.0	20.00	94.00
	2727.000	470.00	607.98	0.43	0.29	0.0	20.00	94.00
	2727.000	540.00	608.20	0.23	0.37	0.0	20.00	94.00
	2727.000	700.00	608.71	0.51	0.58	0.0	20.00	94.00
	2728.000	330.00	607.58	0.0	0.04	0.0	20.00	1.00
	2728.000	470.00	608.05	0.47	0.08	0.0	20.00	1.00
	2728.000	540.00	608.31	0.25	0.10	0.0	20.00	1.00
	2728.000	700.00	608.90	0.59	0.18	0.0	20.00	1.00
	2825.000	330.00	607.61	0.0	0.03	0.0	61.62	80.00
	2825.000	470.00	608.15	0.54	0.09	0.0	74.83	80.00
	2825.000	540.00	608.44	0.29	0.13	0.0	81.95	80.00
	2825.000	700.00	609.23	0.80	0.34	0.0	101.56	80.00
	3425.000	330.00	608.46	0.0	0.85	0.0	238.56	680.00
	3425.000	470.00	609.02	0.56	0.87	0.0	243.62	680.00
	3425.000	540.00	609.28	0.26	0.84	0.0	245.95	680.00
	3425.000	700.00	609.91	0.63	0.67	0.0	251.59	680.00
	3925.000	330.00	608.72	0.0	0.26	0.0	115.68	560.00
	3925.000	470.00	609.27	0.55	0.25	0.0	152.19	560.00
	3925.000	540.00	609.52	0.25	0.24	0.0	168.70	560.00
	3925.000	700.00	610.11	0.59	0.20	0.0	203.74	560.00
	4225.000	330.00	608.91	0.0	0.19	0.0	26.00	225.00
	4225.000	470.00	609.46	0.55	0.19	0.0	26.00	225.00
	4225.000	540.00	609.69	0.24	0.17	0.0	26.00	225.00
	4225.000	700.00	610.22	0.53	0.11	0.0	26.00	225.00
	4226.000	330.00	608.89	0.0	-0.01	0.0	26.00	1.00
	4226.000	470.00	609.43	0.53	-0.03	0.0	26.00	1.00
	4226.000	540.00	609.66	0.23	-0.04	0.0	26.00	1.00
	4226.000	700.00	610.16	0.50	-0.07	0.0	26.00	1.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
4227.000	330.00	608.99	0.0	0.10	0.0	26.00	55.00
4227.000	470.00	609.59	0.59	0.16	0.0	26.00	55.00
4227.000	540.00	609.85	0.26	0.19	0.0	26.00	55.00
4227.000	700.00	610.43	0.58	0.28	0.0	26.00	55.00
4228.000	330.00	609.04	0.0	0.04	0.0	26.00	1.00
4228.000	470.00	609.68	0.64	0.09	0.0	26.00	1.00
4228.000	540.00	609.97	0.29	0.12	0.0	26.00	1.00
4228.000	700.00	610.64	0.67	0.21	0.0	26.00	1.00
4325.000	330.00	609.24	0.0	0.20	0.0	100.77	100.00
4325.000	470.00	609.98	0.74	0.30	0.0	137.76	100.00
4325.000	540.00	610.32	0.35	0.36	0.0	150.18	100.00
4325.000	700.00	611.11	0.79	0.47	0.0	177.60	100.00
5525.000	330.00	610.07	0.0	0.84	0.0	101.86	1200.00
5525.000	470.00	610.81	0.74	0.83	0.0	119.49	1200.00
5525.000	540.00	611.12	0.31	0.80	0.0	126.86	1200.00
5525.000	700.00	611.79	0.67	0.68	0.0	142.84	1200.00
5725.000	330.00	610.61	0.0	0.54	0.0	37.17	660.00
5725.000	470.00	611.38	0.76	0.56	0.0	44.99	660.00
5725.000	540.00	611.69	0.31	0.57	0.0	75.91	660.00
5725.000	700.00	612.32	0.64	0.54	0.0	144.60	660.00
5775.000	330.00	610.63	0.0	0.02	0.0	13.00	85.00
5775.000	470.00	611.35	0.72	-0.02	0.0	13.00	85.00
5775.000	540.00	611.64	0.29	-0.05	0.0	13.00	85.00
5775.000	700.00	612.19	0.55	-0.14	0.0	13.00	85.00
5776.000	330.00	610.60	0.0	-0.03	0.0	13.00	1.00
5776.000	470.00	611.29	0.69	-0.06	0.0	13.00	1.00
5776.000	540.00	611.55	0.26	-0.09	0.0	13.00	1.00
5776.000	700.00	612.01	0.46	-0.18	0.0	13.00	1.00
5777.000	330.00	610.91	0.0	0.31	0.0	13.00	122.00
5777.000	470.00	611.85	0.94	0.56	0.0	13.00	122.00
5777.000	540.00	612.27	0.42	0.73	0.0	13.00	122.00
5777.000	700.00	613.21	0.94	1.20	0.0	13.00	122.00
5778.000	330.00	611.00	0.0	0.09	0.0	13.00	1.00
5778.000	470.00	612.07	1.07	0.22	0.0	13.00	1.00
5778.000	540.00	612.60	0.53	0.33	0.0	13.00	1.00
5778.000	700.00	614.00	1.40	0.78	0.0	13.00	1.00
5825.000	330.00	611.39	0.0	0.39	0.0	222.19	150.00
5825.000	470.00	612.60	1.21	0.53	1.21	272.13	150.00
5825.000	540.00	613.20	0.60	0.60	1.81	296.48	150.00
5825.000	700.00	614.71	1.50	0.71	3.32	358.66	150.00
6825.000	330.00	611.59	0.0	0.20	0.0	71.20	820.00
6825.000	470.00	612.72	1.13	0.12	0.0	98.08	820.00
6825.000	540.00	613.29	0.57	0.09	0.0	112.63	820.00
6825.000	700.00	614.75	1.46	0.04	0.0	149.69	820.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
8625.000	330.00	612.09	0.0	0.49	0.0	82.25	1755.00
8625.000	470.00	613.14	1.05	0.42	0.0	108.79	1755.00
8625.000	540.00	613.66	0.52	0.37	0.0	122.07	1755.00
8625.000	700.00	615.00	1.33	0.25	0.0	155.95	1755.00

SUMMARY OF ERRORS

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CAUTION  SECNO  1350.000  PROFILE  1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO  1350.000  PROFILE  2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO  1350.000  PROFILE  3  CRITICAL DEPTH ASSUMED
CAUTION  SECNO  1350.000  PROFILE  4  CRITICAL DEPTH ASSUMED
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GOVEA	JGOVEDSS	0548	GO.FT06F001	9.59.22	19 JUN 80	INMAN DRAIN	DRAIN
GOVEA	JGOVEDSS	0548	GO.FT06F001	9.59.22	19 JUN 80	INMAN DRAIN	DRAIN
GOVEA	JGOVEDSS	0548	GO.FT06F001	9.59.22	19 JUN 80	INMAN DRAIN	DRAIN

E-1 Inman

Flood delineation & flooding 061980

Note: Due to the backwater of Tittabawassee River, the floodway delineation should not be taken into account.

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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
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C
T1      INMAN DRAIN AT MIDLAND, PROJECT NO. 8543
T2      INMAN DRAIN
T3      INMAN DRAIN

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ
                                                                                   6030
     0.       4.        0.        0.   0.0          0.0       0.0       0.   ~~602.590~~    0.0

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     1.000     0.0      -1.000     0.0       0.0       0.0       0.0       0.0       0.0      15.000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    150.000   110.000   200.000     0.0       0.0       0.0       0.0       0.0       0.0       0.0

                 a1
NC      ~~0.010~~      0.100      0.045      0.100      0.300      0.0       0.0       0.0       0.0       0.0
QT      5.000    330.000    470.000    540.000    700.000    540.000      0.0       0.0       0.0       0.0

        A  1190 FT U/S FROM CONFLUENCE WITH STURGEON CREEK

X1   1350.000     12.000    240.000    257.000   1190.000   1190.000   1190.000      0.0       0.0       0.0
X3      0.0        0.0        0.0      120.000      0.0      500.000      0.0       0.0       0.0       0.0
GR    612.600      0.0      612.500     74.000    603.200    114.000    601.900    154.000    602.200    240.000
GR    599.500    243.000    598.900    246.000    599.500    249.000    601.800    257.000    603.100    546.000
GR    611.500    586.000    613.100    630.000      0.0        0.0        0.0       0.0       0.0       0.0

        B  MANUFACTURED

X1   2525.000      8.000    489.000    503.000   1305.000   1355.000   1430.000      0.0       0.0       0.0
GR    615.000    330.000    610.000    400.000    605.800    489.000    603.800    494.000    602.900    499.000
GR    603.800    503.000    610.000    630.000    613.100    700.000      0.0       0.0       0.0       0.0
NC      0.060      0.060      0.040      0.300      0.500      0.0        0.0       0.0       0.0       0.0

        C  SAGINAW RD. CULVERT, CROWN 611.3,TR 615.4,INVERT 601.6

        STRUCTURAL PLATE ARCH 20. X 9.7 X 94.

X1   2725.000     18.000    490.000    510.000    195.000    240.000    235.000      0.0       0.0       0.0
X3     10.000      0.0        0.0        0.0        0.0        0.0        0.0      615.400    615.400      0.0
GR    615.600      0.0      615.200    300.000    615.300    400.000    602.500    490.000    602.400    491.000
GR    602.200    492.000    601.900    494.000    601.700    496.000    601.600    498.000    601.600    500.000
GR    601.600    502.000    601.700    504.000    601.900    506.000    602.200    508.000    602.400    509.000
GR    602.500    510.000    615.500    600.000    615.500    700.000      0.0       0.0       0.0       0.0

X1   2726.000      0.0        0.0        0.0        1.000      1.000      1.000      0.0       0.0       0.0
X3     10.000      0.0        0.0        0.0        0.0        0.0        0.0      615.400    615.400      0.0
BT     15.000    400.000    615.300    615.300    490.000    615.400    602.500    491.000    615.400    605.500
BT    492.000    615.400    607.200    494.000    615.400    609.300    496.000    615.400    610.500    498.000
BT    615.400    611.000    500.000    615.400    611.300    502.000    615.400    611.000    504.000    615.400
BT    610.500    506.000    615.400    609.300    508.000    615.400    607.200    509.000    615.400    605.500
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BT	510.000	615.400	602.500	600.000	615.500	615.500	0.0	0.0	0.0	0.0
X1	2727.000	0.0	0.0	0.0	94.000	94.000	94.000	0.0	0.0	0.0
X2	0.0	0.0	0.0	0.0	0.0	0.0	1.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	615.400	615.400	0.0
X1	2728.000	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	615.400	615.400	0.0
ET	0.0	0.0	0.0	0.0	0.0	9.100	0.0	0.0	435.000	512.000

D

X1	2825.000	9.000	489.000	512.000	80.000	85.000	80.000	0.0	0.0	0.0
GR	614.300	0.0	614.000	300.000	605.800	489.000	603.800	494.000	602.900	499.000
GR	603.800	503.000	609.600	512.000	613.300	600.000	614.500	1000.000	0.0	0.0
NC	0.060	0.060	0.040	0.100	0.300	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	9.100	0.0	0.0	265.000	490.000

DE

X1	3425.000	12.000	310.000	350.000	725.000	585.000	680.000	0.0	0.0	0.0
GR	616.700	0.0	614.500	231.000	606.900	265.000	606.600	310.000	604.300	313.000
GR	603.300	320.000	602.900	327.000	604.300	334.000	608.100	350.000	608.100	495.000
GR	614.100	522.000	614.900	536.000	0.0	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	9.100	0.0	0.0	225.000	380.000

EF MANUFACTURED

X1	3925.000	10.000	310.000	350.000	540.000	595.000	560.000	0.0	0.0	0.0
GR	615.000	130.000	610.000	200.000	607.200	310.000	604.900	313.000	603.900	320.000
GR	603.500	327.000	604.900	334.000	608.100	350.000	610.000	400.000	615.000	500.000
NC	0.060	0.060	0.045	0.300	0.500	0.0	0.0	0.0	0.0	0.0

FG PERRINE RD CULVERT,CROWN 612.2,TR 613.5,INVERT 604.4

2-STRUCTURAL PLATE PIPE ARCHES 11.8 X 7.6 X 55.

X1	4225.000	27.000	494.000	520.000	230.000	200.000	225.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	613.500	613.500	0.0
GR	614.700	0.0	614.100	300.000	613.800	400.000	606.500	494.000	605.500	494.500
GR	605.200	495.000	604.900	496.000	604.500	498.000	604.400	500.000	604.500	502.000
GR	604.900	504.000	605.200	505.000	605.500	505.500	606.500	506.000	606.700	508.000
GR	605.700	508.500	605.400	509.000	605.100	510.000	604.700	512.000	604.600	514.000
GR	604.700	516.000	605.100	518.000	605.400	519.000	605.700	519.500	606.700	520.000
GR	613.000	600.000	613.700	700.000	0.0	0.0	0.0	0.0	0.0	0.0
NC	0.0	0.0	0.031	0.0	0.0	0.0	0.0	0.0	0.0	0.0
X1	4226.000	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	613.500	613.500	0.0
BT	24.000	400.000	613.800	613.800	494.000	613.500	606.500	494.500	613.500	608.300
BT	495.000	613.500	609.200	496.000	613.500	610.500	498.000	613.500	611.600	500.000
BT	613.500	612.000	502.000	613.500	611.600	504.000	613.500	610.500	505.000	613.500
BT	609.200	505.500	613.500	608.300	506.000	613.500	606.500	508.000	613.500	606.700
BT	508.500	613.500	608.500	509.000	613.500	609.500	510.000	613.500	610.600	512.000
BT	613.500	611.800	514.000	613.500	612.200	516.000	613.500	611.800	518.000	613.500
BT	610.600	519.000	613.500	609.500	519.500	613.500	608.500	520.000	613.500	606.700
BT	600.000	613.000	613.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
X1	4227.000	0.0	0.0	0.0	55.000	55.000	55.000	0.0	0.0	0.0
X2	0.0	0.0	0.0	0.0	0.0	0.0	1.000	0.0	0.0	0.0

X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	613.500	613.500	0.0
X1	4228.000	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	613.500	613.500	0.0
NC	0.0	0.0	0.045	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	9.100	0.0	0.0	385.000	520.000

H ß MANUFACTURED

X1	4325.000	10.000	479.000	523.000	60.000	115.000	100.000	0.0	0.0	0.0
GR	614.100	300.000	610.000	380.000	607.900	479.000	604.600	481.000	603.500	489.000
GR	603.800	497.000	604.600	504.000	611.500	523.000	610.000	530.000	615.000	570.000
NC	0.0	0.0	0.0	0.100	0.300	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	9.100	0.0	0.0	320.000	420.000

I H MANUFACTURED

X1	5525.000	11.000	379.000	420.000	1170.000	1200.000	1200.000	0.0	0.0	0.0
GR	620.000	200.000	615.000	250.000	610.000	320.000	610.000	379.000	605.100	383.000
GR	604.100	390.000	605.100	397.000	607.000	408.000	610.000	420.000	615.000	470.000
GR	620.000	560.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NC	0.060	0.060	0.045	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	9.100	0.0	0.0	379.000	420.000

J I

X1	5725.000	12.000	379.000	420.000	635.000	665.000	660.000	0.0	0.0	0.0
GR	617.500	0.0	615.700	336.000	610.500	379.000	605.600	383.000	604.600	390.000
GR	605.600	397.000	607.000	408.000	613.000	420.000	611.400	566.000	617.100	600.000
GR	618.300	800.000	616.800	1000.000	0.0	0.0	0.0	0.0	0.0	0.0
NC	0.0	0.0	0.0	0.300	0.500	0.0	0.0	0.0	0.0	0.0

K J MORELAND DRIVE CULVERT,CROWN 612.7,TR 615.7,INVERT 604.4

STRUCTURAL PLATE PIPE ARCH 12.8 X 8.3 X 122.

X1	5775.000	15.000	493.500	506.500	85.000	85.000	85.000	0.0	0.0	0.0
GR	616.000	0.0	616.100	300.000	615.700	493.500	606.400	493.500	605.000	494.500
GR	604.700	496.000	604.500	498.000	604.400	500.000	604.500	502.000	604.700	504.000
GR	605.000	505.500	606.400	506.500	615.700	506.500	616.500	800.000	618.100	1000.000
NC	0.0	0.0	0.031	0.0	0.0	0.0	0.0	0.0	0.0	0.0
X1	5776.000	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0
BT	11.000	300.000	616.600	616.100	493.500	615.700	606.400	494.500	615.700	609.600
BT	496.000	615.700	611.200	498.000	615.700	612.300	500.000	615.700	612.700	502.000
BT	615.700	612.300	504.000	615.700	611.200	505.500	615.700	609.600	506.500	615.700
BT	606.400	800.000	616.500	616.500	0.0	0.0	0.0	0.0	0.0	0.0
X1	5777.000	0.0	0.0	0.0	122.000	122.000	122.000	0.0	0.0	0.0
X2	0.0	0.0	0.0	0.0	0.0	0.0	1.000	0.0	0.0	0.0
X1	5778.000	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0
NC	0.0	0.0	0.045	0.0	0.0	0.0	0.0	0.0	0.0	0.0
X3	0.0	0.0	0.0	420.000	0.0	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	9.100	0.0	0.0	360.000	640.000

L

X1	5825.000	9.000	496.000	511.000	160.000	175.000	150.000	0.0	0.0	0.0
GR	615.000	300.000	610.000	440.000	608.800	496.000	605.600	497.000	604.200	503.000
GR	605.600	509.000	608.600	511.000	610.000	605.000	615.700	680.000	0.0	0.0
NC	0.100	0.040	0.035	0.100	0.300	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	9.100	0.0	0.0	55.000	185.000

M+

X1	6825.000	11.000	55.000	115.000	815.000	800.000	820.000	0.0	0.0	0.0
GR	619.900	0.0	611.900	55.000	606.000	63.000	605.100	67.000	606.000	72.000
GR	607.300	75.000	607.300	88.000	617.000	115.000	609.900	145.000	616.500	221.000
GR	619.900	409.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	9.100	0.0	0.0	55.000	185.000

N M

X1	8625.000	0.0	0.0	0.0	1740.000	1750.000	1755.000	0.0	0.0	0.0
EJ	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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*PROF 1

CCHV    0.100 CEHV    0.300
*SECNO 1350.000
  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


3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS      120.0     500.0  TYPE      1  TARGET      380.000

        A  1190 FT U/S FROM CONFLUENCE WITH STURGEON CREEK

  1350.00     3.73   602.63   602.63   602.59   603.06     0.43     0.0     0.0    602.20
     540.     356.     145.     39.      58.      42.      77.      0.      0.     601.80
     0.0      6.09     3.47     0.51    0.010    0.045    0.100    0.0    598.90   131.45
 0.003728    1190.    1190.    1190.      0        4        0     -0.03   310.69   442.14


FLOW DISTRIBUTION FOR SECNO    1350.00          CWSEL     602.63

STA       131.     154.     240.     257.     442.
  PER Q     7.1     58.8     26.9      7.2
   AREA     8.3     50.1     41.8     77.1
    VEL     4.6      6.3      3.5      0.5

*SECNO 2525.000

        B  MANUFACTURED

  2525.00     4.45   607.35     0.0      0.0    607.71     0.36     4.64     0.01   605.80
     540.     179.     203.    158.      25.      49.     129.      6.       7.     603.80
     0.09     7.05     4.16     1.22    0.010    0.045    0.100    0.047   602.90   456.16
 0.003165    1305.    1430.    1355.      4        0        0     -0.01   119.55   575.71


FLOW DISTRIBUTION FOR SECNO    2525.00          CWSEL     607.35

STA       456.     489.     503.     576.
  PER Q    33.2     37.5     29.3
   AREA    25.4     48.7    129.0
    VEL     7.0      4.2      1.2

CCHV    0.300 CEHV    0.500
*SECNO 2725.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA     615.40 ELREA     615.40


        C  SAGINAW RD. CULVERT, CROWN 611.3,TR 615.4,INVERT 601.6


        STRUCTURAL PLATE ARCH 20. X 9.7 X 94.

  2725.00     6.27   607.87     0.0      0.0    608.19     0.32     0.46     0.01   602.50
     540.       0.     540.      0.       0.     119.      0.       7.       7.     602.50
     0.10     0.0      4.52     0.0     0.060    0.040    0.060    0.047   601.60   490.00
 0.001376     195.     235.     240.       2        0        0     -0.00    20.00   510.00


FLOW DISTRIBUTION FOR SECNO    2725.00          CWSEL     607.87
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STA        490.      510.
  PER Q     100.0
   AREA     119.5
    VEL       4.5

*SECNO 2726.000

3370 NORMAL BRIDGE,NRD  15 MIN ELTRD   615.30 MAX ELLC   615.50

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       615.40 ELREA       615.40

  2726.00      6.23    607.83      0.0       0.0    608.22      0.39      0.00      0.04    602.50
     540.        0.      540.       0.        0.     108.        0.        7.        7.    602.50
     0.10       0.0      5.01      0.0     0.060    0.040     0.060     0.046    601.60    490.00
 0.003625        1.        1.       1.         2        0         0   -109.53     20.00    510.00

FLOW DISTRIBUTION FOR SECNO    2726.00          CWSEL     607.83

STA        490.      510.
  PER Q     100.0
   AREA     107.8
    VEL       5.0

*SECNO 2727.000
   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  15 MIN ELTRD   615.30 MAX ELLC   615.50

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       615.40 ELREA       615.40

  2727.00      6.60    608.20      0.0       0.0    608.56      0.35      0.32      0.01    602.50
     540.        0.      540.       0.        0.     113.        0.        7.        7.    602.50
     0.11       0.0      4.78      0.0     0.060    0.040     0.060     0.046    601.60    490.00
 0.003219       94.       94.       94.         2        0         0   -125.60     20.00    510.00

FLOW DISTRIBUTION FOR SECNO    2727.00          CWSEL     608.20

STA        490.      510.
  PER Q     100.0
   AREA     113.1
    VEL       4.8

*SECNO 2728.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       615.40 ELREA       615.40

  2728.00      6.71    608.31      0.0       0.0    608.58      0.28      0.00      0.02    602.50
     540.        0.      540.       0.        0.     128.        0.        7.        7.    602.50
     0.11       0.0      4.21      0.0     0.060    0.040     0.060     0.046    601.60    490.00
 0.001088        1.        1.       1.         2        0         0     -0.01     20.00    510.00

FLOW DISTRIBUTION FOR SECNO    2728.00          CWSEL     608.31

STA        490.      510.
  PER Q     100.0
   AREA     128.2
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   VEL        4.2
    D
*SECNO 2825.000
  2825.00      5.54    608.44      0.0       0.0     608.73      0.30      0.14      0.01    605.80
     540.      139.      401.        0.       80.       81.        0.        7.        7.    609.60
     0.11      1.73      4.98      0.0     0.060     0.040     0.060     0.046    602.90    428.25
 0.003393       80.       80.       85.         2         0         0     -0.00     81.95    510.19

FLOW DISTRIBUTION FOR SECNO     2825.00          CWSEL      608.44

STA      428.      489.      512.
  PER Q       25.7      74.3
   AREA       80.1      80.6
    VEL        1.7       5.0

CCHV     0.100 CEHV     0.300
*SECNO 3425.000

    E D

  3425.00      6.38    609.28      0.0       0.0     609.32      0.04      0.56      0.03    606.60
     540.      106.      344.       91.      126.      182.      174.       12.       10.    608.10
     0.24      0.84      1.89      0.52     0.060     0.040     0.060     0.044    602.90    254.35
 0.000359      725.      680.      585.         3         0         0     -0.01    245.95    500.31

FLOW DISTRIBUTION FOR SECNO     3425.00          CWSEL      609.28

STA      254.      265.      310.      350.      495.      500.
  PER Q        1.2      18.4      63.7      16.6       0.2
   AREA       12.7     113.8     182.1     171.0       3.1
    VEL        0.5       0.9       1.9       0.5       0.3

*SECNO 3925.000

    F E  MANUFACTURED

  3925.00      6.02    609.52      0.0       0.0     609.61      0.09      0.28      0.01    607.20
     540.       78.      448.       14.      106.      173.       27.       17.       12.    608.10
     0.31      0.74      2.59      0.53     0.060     0.040     0.060     0.043    603.50    218.74
 0.000724      540.      560.      595.         2         0         0     -0.00    168.70    387.44

FLOW DISTRIBUTION FOR SECNO     3925.00          CWSEL      609.52

STA      219.      310.      350.      387.
  PER Q       14.5      82.9       2.6
   AREA      106.0     172.7      26.6
    VEL        0.7       2.6       0.5

CCHV     0.300 CEHV     0.500
*SECNO 4225.000
  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


3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       613.50 ELREA       613.50

    G F  PERRINE RD CULVERT,CROWN 612.2,TR 613.5,INVERT 604.4
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2-STRUCTURAL PLATE PIPE ARCHES 11.8 X 7.6 X 55.

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  4225.00     5.29   609.69     0.0      0.0    610.01     0.31     0.29     0.11   606.50
     540.       0.     540.       0.       0.     120.       0.      18.      13.    606.70
     0.33      0.0     4.49     0.0    0.060    0.045    0.060    0.043   604.40   494.00
 0.002788     230.     225.     200.        2        0        0    -0.01    26.00   520.00

FLOW DISTRIBUTION FOR SECNO    4225.00          CWSEL     609.69

STA       494.      520.
  PER Q     100.0
   AREA     120.4
    VEL       4.5

*SECNO 4226.000

3370 NORMAL BRIDGE,NRD  24 MIN ELTRD   613.00 MAX ELLC   613.80

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       613.50 ELREA       613.50

  4226.00     5.26   609.66     0.0      0.0    610.05     0.39     0.00     0.04   606.50
     540.       0.     540.       0.       0.     107.       0.      18.      13.    606.70
     0.33      0.0     5.04     0.0    0.060    0.031    0.060    0.043   604.40   494.00
 0.003016       1.       1.       1.        2        0        0   -67.64    26.00   520.00

FLOW DISTRIBUTION FOR SECNO    4226.00          CWSEL     609.66

STA       494.      520.
  PER Q     100.0
   AREA     107.2
    VEL       5.0

*SECNO 4227.000

3370 NORMAL BRIDGE,NRD  24 MIN ELTRD   613.00 MAX ELLC   613.80

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       613.50 ELREA       613.50

  4227.00     5.45   609.85     0.0      0.0    610.22     0.37     0.16     0.01   606.50
     540.       0.     540.       0.       0.     111.       0.      19.      13.    606.70
     0.33      0.0     4.87     0.0    0.060    0.031    0.060    0.043   604.40   494.00
 0.002792      55.      55.      55.        2        0        0   -76.50    26.00   520.00

FLOW DISTRIBUTION FOR SECNO    4227.00          CWSEL     609.85

STA       494.      520.
  PER Q     100.0
   AREA     110.8
    VEL       4.9

*SECNO 4228.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       613.50 ELREA       613.50

  4228.00     5.57   609.97     0.0      0.0    610.25     0.28     0.00     0.03   606.50
     540.       0.     540.       0.       0.     127.       0.      19.      13.    606.70
     0.33      0.0     4.24     0.0    0.060    0.031    0.060    0.043   604.40   494.00
 0.001093       1.       1.       1.        2        0        0    -0.01    26.00   520.00

FLOW DISTRIBUTION FOR SECNO    4228.00          CWSEL     609.97
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STA        494.       520.
  PER Q      100.0
   AREA      127.5
    VEL        4.2

*SECNO 4325.000

3265 DIVIDED FLOW


    H 8  MANUFACTURED

  4325.00      6.82    610.32      0.0       0.0    610.39      0.06      0.08      0.06    607.90
     540.      101.      439.       0.      137.     200.       1.       19.       13.    611.50
     0.34      0.74      2.20      0.18     0.060    0.045     0.060     0.043    603.50    373.68
 0.000585       60.      100.      115.         2        0         0     -0.00    150.18    532.59

FLOW DISTRIBUTION FOR SECNO    4325.00          CWSEL     610.32

STA        374.       380.       479.       523.       533.
  PER Q       0.0       18.6       81.3       0.0
   AREA       1.0      136.0      199.7       0.7
    VEL       0.2        0.7        2.2       0.2

CCHV     0.100 CEHV    0.300
*SECNO 5525.000
   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

    I H  MANUFACTURED

  5525.00      7.02    611.12      0.0       0.0    611.21      0.09      0.81      0.01    610.00
     540.       54.      483.       3.       75.     193.       6.       27.       17.    610.00
     0.49      0.72      2.51      0.48     0.060    0.045     0.060     0.044    604.10    304.33
 0.000803     1170.     1200.     1200.         2        0         0     -0.00    126.86    431.19

FLOW DISTRIBUTION FOR SECNO    5525.00          CWSEL     611.12

STA        304.       320.       379.       420.       431.
  PER Q       0.8        9.3       89.4       0.6
   AREA       8.8       66.0      192.7       6.3
    VEL       0.5        0.8        2.5       0.5

*SECNO 5725.000

3265 DIVIDED FLOW

    J I

  5725.00      7.09    611.69      0.0       0.0    611.81      0.13      0.59      0.01    610.50
     540.       3.      536.       1.        6.     188.       4.       31.       18.    613.00
     0.55      0.55      2.85      0.22     0.060    0.045     0.060     0.044    604.60    369.20
 0.001013      635.      660.      665.         2        0         0     -0.00     75.91    567.70

FLOW DISTRIBUTION FOR SECNO    5725.00          CWSEL     611.69

STA        369        379        420        566        568
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 PER Q      0.6     99.2      0.1      0.0
  AREA      5.8    187.9      3.7      0.2
   VEL      0.6      2.9      0.2      0.2

CCHV    0.300 CEHV    0.500
*SECNO 5775.000

    K 4  MORELAND DRIVE CULVERT,CROWN 612.7,TR 615.7,INVERT 604.4

         STRUCTURAL PLATE PIPE ARCH 12.8 X 8.3 X 122.

  5775.00     7.24   611.64      0.0      0.0   612.21     0.57     0.17     0.22   615.70
     540.       0.     540.       0.       0.     89.       0.      31.      18.   615.70
     0.56      0.0     6.06      0.0    0.060    0.045    0.060    0.044   604.40   493.50
 0.006177      85.      85.      85.        2        0        0    -0.00    13.00   506.50

FLOW DISTRIBUTION FOR SECNO    5775.00          CWSEL     611.64

STA      494.     507.
  PER Q     100.0
   AREA      89.1
    VEL       6.1

*SECNO 5776.000

3370 NORMAL BRIDGE,NRD  11 MIN ELTRD   615.70 MAX ELLC   616.50

 5776.00     7.15   611.55      0.0      0.0   612.31     0.76     0.01     0.09   615.70
     540.       0.     540.       0.       0.     77.       0.      31.      18.   615.70
     0.56      0.0     6.99      0.0    0.060    0.031    0.060    0.044   604.40   493.50
 0.005259       1.       1.       1.        2        0        0   -10.76    13.00   506.50

FLOW DISTRIBUTION FOR SECNO    5776.00          CWSEL     611.55

STA      494.     507.
  PER Q     100.0
   AREA      77.2
    VEL       7.0

*SECNO 5777.000

3370 NORMAL BRIDGE,NRD  11 MIN ELTRD   615.70 MAX ELLC   616.50

  5777.00     7.88   612.27      0.0      0.0   612.96     0.69     0.63     0.02   615.70
     540.       0.     540.       0.       0.     81.       0.      31.      18.   615.70
     0.56      0.0     6.65      0.0    0.060    0.031    0.060    0.044   604.40   493.50
 0.005131     122.     122.     122.        2        0        0   -16.28    13.00   506.50

FLOW DISTRIBUTION FOR SECNO    5777.00          CWSEL     612.27

STA      494.     507.
  PER Q     100.0
   AREA      81.2
    VEL       6.7

*SECNO 5778.000
   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
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615.9 revised

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 5778.00     8.20   612.60     0.0     0.0   613.04     0.44     0.00     0.07   615.70
    540.       0.     540.      0.       0.     102.       0.      31.      18.   615.70
    0.56      0.0     5.31     0.0    0.060   0.031    0.060    0.044   604.40   493.50
0.002086       1.       1.       1.       2       0        0    -0.00    13.00   506.50

FLOW DISTRIBUTION FOR SECNO    5778.00          CWSEL     612.60

STA      494.     507.
  PER Q     100.0
   AREA     101.7
    VEL       5.3

*SECNO 5825.000
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 5825.00     9.00   613.20     0.0     0.0   613.21     0.01     0.04     0.13   608.80
    540.     172.     127.     241.    355.     118.    433.      33.      19.   608.60
    0.63     0.48     1.08     0.56   0.060   0.045    0.060    0.044   604.20   350.55
0.000095     160.     150.     175.       1       0        0    -0.01   296.48   647.03

FLOW DISTRIBUTION FOR SECNO    5825.00          CWSEL     613.20

STA      351.     440.     496.     511.     605.     647.
  PER Q     8.7     23.1     23.5     40.6      4.1
   AREA   142.9    212.5    117.7    366.1     67.1
    VEL     0.3      0.6      1.1      0.6      0.3

CCHV    0.100 CEHV    0.300
*SECNO 6825.000
3265 DIVIDED FLOW
```

Mx

```
 6825.00     8.19   613.29     0.0     0.0   613.34     0.05     0.12     0.01   611.90
    540.       1.     466.      73.      7.     252.      91.      45.      23.   617.00
    0.76     0.18     1.85     0.81   0.100   0.035    0.040    0.043   605.10    45.43
0.000237     815.     820.     800.       2       0        0    -0.00   112.63   184.05

FLOW DISTRIBUTION FOR SECNO    6825.00          CWSEL     613.29

STA       45.      55.     115.     145.     184.
  PER Q     0.2     86.2      3.6     10.0
   AREA     6.7    252.2     24.3     66.2
    VEL     0.2      1.8      0.8      0.8

*SECNO 8625.000

3265 DIVIDED FLOW
```

Nx

```
 8625.00     8.56   613.66     0.0     0.0   613.70     0.04     0.36     0.00   611.90
    540.       2.     453.      85.     11.     271.     111.      60.      27.   617.00
    1.08     0.18     1.67     0.76   0.100   0.035    0.040    0.041   605.10    42.88
0.000182    1740.    1755.    1750.       2       0        0    -0.01   122.07   188.34

FLOW DISTRIBUTION FOR SECNO    8625.00          CWSEL     613.66
```

STA	43.	55.	115.	145.	188.
PER Q	0.4	84.0	4.2	11.5	
AREA	10.7	270.8	29.9	81.5	
VEL	0.2	1.7	0.8	0.8	

```
*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
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```

T1
T2
T3

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0.	6.	0.	0.	0.0	0.0	0.0	0.	602.690	0.0

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	15.000	0.0	-1.000	0.0	0.0	0.0	0.0	0.0	0.0	15.000

```
*PROF 2

CCHV     0.100 CEHV     0.300
*SECNO 1350.000
   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    IDC       ICONT     CORAR     TOPWID      ENDST


3470 ENCROACHMENT STATIONS       120.0      500.0  TYPE       1  TARGET       380.000

     A  1190 FT U/S FROM CONFLUENCE WITH STURGEON CREEK

  1350.00      3.79    602.69    602.65    602.69    603.07      0.38      0.0       0.0    602.20
     540.      367.      132.       41.       65.       43.       88.       0.        0.    601.80
      0.0      5.67      3.10      0.46     0.010     0.045     0.100       0.0    598.90    129.69
 0.002872     1190.     1190.     1190.         0         5         0     -0.04    325.15    454.84

FLOW DISTRIBUTION FOR SECNO     1350.00          CWSEL      602.69

STA       130.      154.      240.      257.      455.
  PER Q       7.6      60.3      24.5       7.6
   AREA       9.6      55.0      42.8      88.0
    VEL       4.3       5.9       3.1       0.5

*SECNO 2525.000

        B  MANUFACTURED

  2525.00      4.33    607.23       0.0       0.0    607.63      0.40      4.56      0.01    605.80
     540.      163.      215.      162.       22.       47.      121.        6.        7.    603.80
     0.08      7.51      4.56      1.35     0.010     0.045     0.100     0.047    602.90    458.68
 0.003998     1305.     1430.     1355.         5         0         0     -0.00    114.59    573.27

FLOW DISTRIBUTION FOR SECNO     2525.00          CWSEL      607.23

STA       459.      489.      503.      573.
  PER Q      30.2      39.8      30.0
   AREA      21.7      47.1     120.5
    VEL       7.5       4.6       1.3

CCHV     0.300 CEHV     0.500
*SECNO 2725.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       615.40 ELREA       615.40

        C  SAGINAW RD. CULVERT, CROWN 611.3,TR 615.4,INVERT 601.6

          STRUCTURAL PLATE ARCH 20. X 9.7 X 94.

  2725.00      6.24    607.84       0.0       0.0    608.16      0.32      0.51      0.02    602.50
     540.        0.      540.        0.        0.      119.        0.        7.        7.    602.50
     0.10       0.0      4.54       0.0     0.060     0.040     0.060     0.046    601.60    490.00
 0.001396      195.      235.      240.         2         0         0     -0.00     20.00    510.00

FLOW DISTRIBUTION FOR SECNO     2725.00          CWSEL      607.84

STA       490       510.
```

```
 PER Q      100.0
 AREA       119.0
  VEL         4.5

*SECNO 2726.000

3370 NORMAL BRIDGE,NRD  15 MIN ELTRD   615.30 MAX ELLC   615.50

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       615.40 ELREA       615.40

  2726.00     6.21   607.81      0.0       0.0   608.20      0.39      0.00      0.04   602.50
     540.       0.     540.       0.        0.     107.       0.        7.        7.   602.50
     0.10      0.0     5.03      0.0     0.060    0.040     0.060     0.046    601.60   490.00
 0.003656       1.       1.       1.         2        0         0   -108.47     20.00   510.00

FLOW DISTRIBUTION FOR SECNO    2726.00          CWSEL     607.81

STA       490.      510.
 PER Q      100.0
 AREA       107.4
  VEL         5.0

*SECNO 2727.000
   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  15 MIN ELTRD   615.30 MAX ELLC   615.50

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       615.40 ELREA       615.40

  2727.00     6.58   608.18      0.0       0.0   608.54      0.36      0.32      0.01   602.50
     540.       0.     540.       0.        0.     113.       0.        7.        7.   602.50
     0.10      0.0     4.79      0.0     0.060    0.040     0.060     0.046    601.60   490.00
 0.003240      94.      94.      94.         2        0         0   -124.63     20.00   510.00

FLOW DISTRIBUTION FOR SECNO    2727.00          CWSEL     608.18

STA       490.      510.
 PER Q      100.0
 AREA       112.8
  VEL         4.8

*SECNO 2728.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       615.40 ELREA       615.40

  2728.00     6.68   608.28      0.0       0.0   608.56      0.28      0.00      0.02   602.50
     540.       0.     540.       0.        0.     128.       0.        7.        7.   602.50
     0.10      0.0     4.23      0.0     0.060    0.040     0.060     0.046    601.60   490.00
 0.001101       1.       1.       1.         2        0         0     -0.01     20.00   510.00

FLOW DISTRIBUTION FOR SECNO    2728.00          CWSEL     608.28

STA       490.      510.
 PER Q      100.0
 AREA       127.8
  VEL         4.2
```

```
*SECNO 2825.000
      D
3470 ENCROACHMENT STATIONS        435.0      512.0  TYPE       1  TARGET        77.000
  2825.00      5.52    608.42      0.0     608.44    608.71      0.29      0.14      0.01    605.80
     540.      143.      397.       0.       78.       80.        0.        7.        7.  100000.00
     0.11      1.83      4.95      0.0     0.060     0.040     0.060     0.046    602.90    435.00
 0.003365       80.       80.       85.         2         0         0     -0.00     75.17    510.17

FLOW DISTRIBUTION FOR SECNO     2825.00          CWSEL      608.42

STA       435.      489.      512.
  PER Q       26.5      73.5
   AREA       78.2      80.3
    VEL        1.8       4.9

CCHV    0.100 CEHV     0.300
*SECNO 3425.000

3470 ENCROACHMENT STATIONS        265.0      490.0  TYPE       1  TARGET       225.000

      E 8

  3425.00      6.38    609.28      0.0     609.28    609.32      0.04      0.58      0.03    606.60
     540.       98.      353.       88.      114.      182.      165.       12.       10.    608.10
     0.23      0.87      1.94      0.54     0.060     0.040     0.060     0.044    602.90    265.00
 0.000380      725.      680.      585.         3         0         0     -0.00    225.00    490.00

FLOW DISTRIBUTION FOR SECNO     3425.00          CWSEL      609.28

STA       265.      310.      350.      490.
  PER Q       18.2      65.5      16.3
   AREA      113.7     182.0     164.7
    VEL        0.9       1.9       0.5

*SECNO 3925.000

3470 ENCROACHMENT STATIONS        225.0      380.0  TYPE       1  TARGET       155.000

      F-E  MANUFACTURED

  3925.00      6.03    609.53      0.0     609.52    609.61      0.09      0.28      0.01    607.20
     540.       81.      444.       15.      106.      173.       26.       17.       12.    608.10
     0.30      0.76      2.57      0.59     0.060     0.040     0.060     0.043    603.50    225.00
 0.000710      540.      560.      595.         2         0         0     -0.00    155.00    380.00

FLOW DISTRIBUTION FOR SECNO     3925.00          CWSEL      609.53

STA       225.      310.      350.      380.
  PER Q       14.9      82.2       2.8
   AREA      105.9     172.8      25.7
    VEL        0.8       2.6       0.6

CCHV    0.300 CEHV     0.500
*SECNO 4225.000
   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

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE ELLEA        613.50 ELREA        613.50
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G F  PERRINE RD CULVERT,CROWN 612.2,TR 613.5,INVERT 604.4

        2-STRUCTURAL PLATE PIPE ARCHES 11.8 X 7.6 X 55.

  4225.00      5.30    609.70      0.0     609.69    610.01      0.31      0.28      0.11    606.50
     540.        0.      540.       0.         0.     120.        0.       18.       12.    606.70
     0.32       0.0      4.48      0.0      0.060     0.045     0.060     0.043    604.40    494.00
 0.002783      230.      225.     200.          2         0         0     -0.00     26.00    520.00

FLOW DISTRIBUTION FOR SECNO    4225.00          CWSEL     609.70

STA       494.      520.
  PER Q     100.0
   AREA     120.4
    VEL       4.5

*SECNO 4226.000

3370 NORMAL BRIDGE,NRD  24 MIN ELTRD   613.00 MAX ELLC   613.80

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       613.50 ELREA       613.50

  4226.00      5.26    609.66      0.0     609.66    610.05      0.39      0.00      0.04    606.50
     540.        0.      540.       0.         0.     107.        0.       18.       12.    606.70
     0.32       0.0      5.04      0.0      0.060     0.031     0.060     0.043    604.40    494.00
 0.003012        1.        1.       1.          2         0         0    -67.79     26.00    520.00

FLOW DISTRIBUTION FOR SECNO    4226.00          CWSEL     609.66

STA       494.      520.
  PER Q     100.0
   AREA     107.2
    VEL       5.0

*SECNO 4227.000

3370 NORMAL BRIDGE,NRD  24 MIN ELTRD   613.00 MAX ELLC   613.80

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       613.50 ELREA       613.50

  4227.00      5.45    609.85      0.0     609.85    610.22      0.37      0.16      0.01    606.50
     540.        0.      540.       0.         0.     111.        0.       18.       12.    606.70
     0.32       0.0      4.87      0.0      0.060     0.031     0.060     0.043    604.40    494.00
 0.002789       55.       55.      55.          2         0         0    -76.64     26.00    520.00

FLOW DISTRIBUTION FOR SECNO    4227.00          CWSEL     609.85

STA       494.      520.
  PER Q     100.0
   AREA     110.8
    VEL       4.9

*SECNO 4228.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       613.50 ELREA       613.50

  4228.00      5.57    609.97      0.0     609.97    610.25      0.28      0.00      0.03    606.50
     540         0       540        0          0       128         0        18        12     606.70
```

```
     0.32      0.0      4.23      0.0     0.060     0.031     0.060     0.043    604.40    494.00
 0.001091      1.       1.        1.        2         0         0      -0.01     26.00    520.00

FLOW DISTRIBUTION FOR SECNO    4228.00          CWSEL     609.97

STA       494.      520.
  PER Q     100.0
   AREA     127.5
    VEL       4.2

*SECNO 4325.000

3470 ENCROACHMENT STATIONS      385.0     520.0  TYPE      1  TARGET      135.000

     H & MANUFACTURED

  4325.00      6.83    610.33      0.0    610.32    610.39      0.06      0.07      0.06    607.90
     540.      102.      438.       0.      134.      200.        0.       19.       13. 100000.00
     0.33      0.76      2.19      0.0     0.060     0.045     0.060     0.043    603.50    385.00
 0.000583       60.      100.      115.        2         0         0      -0.01    134.77    519.77

FLOW DISTRIBUTION FOR SECNO    4325.00          CWSEL     610.33

STA       385.      479.      523.
  PER Q      18.8      81.2
   AREA     134.3     199.8
    VEL       0.8       2.2

CCHV    0.100 CEHV    0.300
*SECNO 5525.000
   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

3470 ENCROACHMENT STATIONS      320.0     420.0  TYPE      1  TARGET      100.000

     I H MANUFACTURED

  5525.00      7.04    611.14      0.0    611.12    611.23      0.09      0.83      0.01    610.00
     540.       52.      488.       0.       67.      193.        0.       27.       16. 100000.00
     0.48      0.77      2.53      0.0     0.060     0.045     0.060     0.044    604.10    320.00
 0.000840     1170.     1200.     1200.        2         0         0      -0.00    100.00    420.00

FLOW DISTRIBUTION FOR SECNO    5525.00          CWSEL     611.14

STA       320.      379.      420.
  PER Q       9.6      90.4
   AREA      67.0     193.4
    VEL       0.8       2.5

*SECNO 5725.000

3470 ENCROACHMENT STATIONS      379.0     420.0  TYPE      1  TARGET       41.000

     J A

  5725.00      7.13    611.73      0.0    611.69    611.85      0.13      0.61      0.01    610.50
     540.        0.      540.       0.        0.      189.        0.       30.       17. 100000.00
     0.54       0.0      2.85      0.0     0.060     0.045     0.060     0.044    604.60    379.00
 0.001043      635      660.      665.        2         0         0      -0.00     38.05    617.05
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FLOW DISTRIBUTION FOR SECNO    5725.00          CWSEL     611.73

STA       379.      420.
  PER Q     100.0
   AREA     189.4
    VEL       2.9

CCHV    0.300 CEHV    0.500
*SECNO 5775.000

     k-d  MORELAND DRIVE CULVERT,CROWN 612.7,TR 615.7,INVERT 604.4

          STRUCTURAL PLATE PIPE ARCH 12.8 X 8.3 X 122.

  5775.00     7.28   611.68     0.0    611.64   612.25     0.56     0.18     0.22   615.70
     540.       0.     540.       D.       0.      90.       0.      31.      17.    615.7D
     0.54      0.0     6.02     0.0     0.060    0.045    0.060    0.044   604.40   493.50
 0.006069      85.      85.      85.         2        0        0    -0.00    13.00   506.50

FLOW DISTRIBUTION FOR SECNO    5775.00          CWSEL     611.68

STA       494.      507.
  PER Q     100.0
   AREA      89.7
    VEL       6.0

*SECNO 5776.000

3370 NORMAL BRIDGE,NRD  11 MIN ELTRD   615.70 MAX ELLC   616.50

  5776.00     7.19   611.59     0.0    611.55   612.35     0.75     0.01     0.10   615.70
     540.       0.     540.       0.       0.      78.       0.      31.      17.    615.70
     0.54      0.0     6.97     0.0     0.060    0.031    0.060    0.044   604.40   493.50
 0.005239       1.       1.       1.         2        0        0   -11.06    13.00   506.50

FLOW DISTRIBUTION FOR SECNO    5776.00          CWSEL     611.59

STA       494.      507.
  PER Q     100.0
   AREA      77.5
    VEL       7.0

*SECNO 5777.000

3370 NORMAL BRIDGE,NRD  11 MIN ELTRD   615.70 MAX ELLC   616.50

  5777.00     7.92   612.32     0.0    612.27   613.00     0.68     0.63     0.02   615.70
     540.       0.     540.       0.       0.      81.       0.      31.      17.    615.70
     0.55      0.0     6.64     0.0     0.060    0.031    0.060    0.044   604.40   493.50
 0.005156     122.     122.     122.         2        0        0   -16.65    13.00   506.50

FLOW DISTRIBUTION FOR SECNO    5777.00          CWSEL     612.32

STA       494.      507.
  PER Q     100.0
   AREA      81.3
    VEL       6.6

*SECNO 5778.000
   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   IDC      ICONT    CORAR    TOPWID    ENDST

  5778.00     8.25   612.65     0.0    612.60   613.08     0.43     0.00     0.08   615.70
     540.       0.     540.       0.       0.     102.       0.      31.      17.    615.70
     0.55      0.0     5.28     0.0     0.060    0.031    0.060    0.044   604.40   493.50
 0.002055       1.       1.       1.        2        0        0    -0.00    13.00   506.50

FLOW DISTRIBUTION FOR SECNO    5778.00          CWSEL     612.65

STA       494.      507.
  PER Q     100.0
   AREA     102.3
    VEL       5.3

*SECNO 5825.000

3470 ENCROACHMENT STATIONS       360.0     640.0  TYPE      1  TARGET      280.000

     L K

  5825.00     9.04   613.24     0.0    613.20   613.25     0.01     0.04     0.13   608.80
     540.     174.     125.     241.     359.     118.     436.      33.      17.    608.60
     0.62     0.49     1.05     0.55    0.060    0.045    0.060    0.044   604.20   360.00
 0.000091     160.     150.     175.        0        0        0    -0.01   280.00   640.00

FLOW DISTRIBUTION FOR SECNO    5825.00          CWSEL     613.24

STA       360.      440.      496.      511.      605.      640.
  PER Q       9.3      23.0      23.1      40.2       4.4
   AREA     144.2     214.5     118.3     369.5      66.5
    VEL       0.3       0.6       1.1       0.6       0.4

CCHV     0.100 CEHV     0.300
*SECNO 6825.000

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS        55.0     185.0  TYPE      1  TARGET      130.000

     M t

  6825.00     8.23   613.33     0.0    613.29   613.37     0.05     0.11     0.01   611.90
     540.       0.     464.      76.       0.     254.      92.      44.      21.    617.00
     0.75      0.0     1.83     0.82    0.100    0.035    0.040    0.043   605.10    55.00
 0.000239     815.     820.     800.        2        0        0    -0.00   103.71   184.45

FLOW DISTRIBUTION FOR SECNO    6825.00          CWSEL     613.33

STA        55.      115.      145.      184.
  PER Q      86.0       3.7      10.3
   AREA     253.9      24.8      67.6
    VEL       1.8       0.8       0.8

*SECNO 8625.000

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS        55.0     185.0  TYPE      1  TARGET      130.000
```

N

8625.00	8.60	613.70	0.0	613.66	613.74	0.04	0.37	0.00	611.90
540.	0.	450.	90.	0.	273.	113.	59.	25.	617.00
1.07	0.0	1.65	0.80	0.100	0.035	0.040	0.041	605.10	55.00
0.000183	1740.	1755.	1750.	2	0	0	-0.00	106.88	185.00

FLOW DISTRIBUTION FOR SECNO 8625.00 CWSEL 613.70

STA	55.	115.	145.	185.
PER Q	83.3	4.3	12.4	
AREA	272.8	30.5	82.6	
VEL	1.6	0.8	0.8	

.0002x2700 = .54

100-yr ANNexed limits ~ 613.7 + .5 = 614.2 Tittabawassee River = 615.9

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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
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NOTE- ASTERISK * AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

INMAN DRAIN

SUMMARY PRINTOUT TABLE 110

	SECNO	CWSEL	DIFKWS	EG	TOPWID	QLOB	QCH	QROB	PERENC	STENCL	STCHL	STCHR	STENCR
*	1350.000	602.63	0.04	603.06	310.69	355.73	145.27	39.00	380.00	120.00	240.00	257.00	500.00
	1350.000	602.69	0.0	603.07	325.15	366.66	132.48	40.85	380.00	120.00	240.00	257.00	500.00
	2525.000	607.35	0.0	607.71	119.55	179.33	202.63	158.04	0.0	0.0	489.00	503.00	0.0
	2525.000	607.23	0.0	607.63	114.59	162.89	214.92	162.19	0.0	0.0	489.00	503.00	0.0
	2725.000	607.87	0.0	608.19	20.00	0.0	540.00	0.0	0.0	0.0	490.00	510.00	0.0
	2725.000	607.84	0.0	608.16	20.00	0.0	540.00	0.0	0.0	0.0	490.00	510.00	0.0
	2726.000	607.83	0.0	608.22	20.00	0.0	540.00	0.0	0.0	0.0	490.00	510.00	0.0
	2726.000	607.81	0.0	608.20	20.00	0.0	540.00	0.0	0.0	0.0	490.00	510.00	0.0
	2727.000	608.20	0.0	608.56	20.00	0.0	540.00	0.0	0.0	0.0	490.00	510.00	0.0
	2727.000	608.18	0.0	608.54	20.00	0.0	540.00	0.0	0.0	0.0	490.00	510.00	0.0
	2728.000	608.31	0.0	608.58	20.00	0.0	540.00	0.0	0.0	0.0	490.00	510.00	0.0
	2728.000	608.28	0.0	608.56	20.00	0.0	540.00	0.0	0.0	0.0	490.00	510.00	0.0
	2825.000	608.44	0.0	608.73	81.95	138.78	401.22	0.0	0.0	0.0	489.00	512.00	0.0
	2825.000	608.42	-0.02	608.71	75.17	143.09	396.91	0.0	77.00	435.00	489.00	512.00	512.00
	3425.000	609.28	0.0	609.32	245.95	105.68	343.77	90.56	0.0	0.0	310.00	350.00	0.0
	3425.000	609.28	-0.00	609.32	225.00	98.39	353.47	88.13	225.00	265.00	310.00	350.00	490.00
	3925.000	609.52	0.0	609.61	168.70	78.04	447.81	14.14	0.0	0.0	310.00	350.00	0.0
	3925.000	609.53	0.01	609.61	155.00	80.72	444.08	15.20	155.00	225.00	310.00	350.00	380.00
	4225.000	609.69	0.0	610.01	26.00	0.0	540.00	0.0	0.0	0.0	494.00	520.00	0.0
	4225.000	609.70	0.00	610.01	26.00	0.0	540.00	0.0	0.0	0.0	494.00	520.00	0.0
	4226.000	609.66	0.0	610.05	26.00	0.0	540.00	0.0	0.0	0.0	494.00	520.00	0.0
	4226.000	609.66	0.00	610.05	26.00	0.0	540.00	0.0	0.0	0.0	494.00	520.00	0.0
	4227.000	609.85	0.0	610.22	26.00	0.0	540.00	0.0	0.0	0.0	494.00	520.00	0.0
	4227.000	609.85	0.00	610.22	26.00	0.0	540.00	0.0	0.0	0.0	494.00	520.00	0.0
	4228.000	609.97	0.0	610.25	26.00	0.0	540.00	0.0	0.0	0.0	494.00	520.00	0.0
	4228.000	609.97	0.00	610.25	26.00	0.0	540.00	0.0	0.0	0.0	494.00	520.00	0.0

HOCTE BUSINESS FORMS INC 77

SECNO	CWSEL	DIFKWS	EG	TOPWID	QLOB	QCH	QROB	PERENC	STENCL	STCHL	STCHR	STENCR
4325.000	610.32	0.0	610.39	150.18	100.88	439.00	0.12	0.0	0.0	479.00	523.00	0.0
4325.000	610.33	0.00	610.39	134.77	101.59	438.41	0.0	135.00	385.00	479.00	523.00	520.00
5525.000	611.12	0.0	611.21	126.86	54.14	482.88	2.98	0.0	0.0	379.00	420.00	0.0
5525.000	611.14	0.02	611.23	100.00	51.65	488.35	0.0	100.00	320.00	379.00	420.00	420.00
5725.000	611.69	0.0	611.81	75.91	3.21	535.93	0.85	0.0	0.0	379.00	420.00	0.0
5725.000	611.73	0.04	611.85	38.45	0.0	540.00	0.0	41.00	379.00	379.00	420.00	420.00
5775.000	611.64	0.0	612.21	13.00	0.0	540.00	0.0	0.0	0.0	493.50	506.50	0.0
5775.000	611.68	0.05	612.25	13.00	0.0	540.00	0.0	0.0	0.0	493.50	506.50	0.0
5776.000	611.55	0.0	612.31	13.00	0.0	540.00	0.0	0.0	0.0	493.50	506.50	0.0
5776.000	611.59	0.05	612.35	13.00	0.0	540.00	0.0	0.0	0.0	493.50	506.50	0.0
5777.000	612.27	0.0	612.96	13.00	0.0	540.00	0.0	0.0	0.0	493.50	506.50	0.0
5777.000	612.32	0.04	613.00	13.00	0.0	540.00	0.0	0.0	0.0	493.50	506.50	0.0
5778.000	612.60	0.0	613.04	13.00	0.0	540.00	0.0	0.0	0.0	493.50	506.50	0.0
5778.000	612.65	0.04	613.08	13.00	0.0	540.00	0.0	0.0	0.0	493.50	506.50	0.0
5825.000	613.20	0.0	613.21	296.48	172.10	126.74	241.15	-420.00	0.0	496.00	511.00	0.0
5825.000	613.24	0.04	613.25	280.00	174.20	124.75	241.05	280.00	360.00	496.00	511.00	640.00
6825.000	613.29	0.0	613.34	112.63	1.19	465.67	73.14	0.0	0.0	55.00	115.00	0.0
6825.000	613.33	0.03	613.37	103.71	0.0	464.47	75.53	130.00	55.00	55.00	115.00	185.00
8625.000	613.66	0.0	613.70	122.07	1.96	453.45	84.60	0.0	0.0	55.00	115.00	0.0
8625.000	613.70	0.04	613.74	106.88	0.0	450.02	89.98	130.00	55.00	55.00	115.00	185.00

HOCKY BUSINESS FORMS INC 27

INMAN DRAIN

SUMMARY PRINTOUT TABLE 150

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
* 1350.000	1190.00	0.0	0.0	598.90	540.00	602.63	602.63	603.06	37.28	3.47	177.29	88.44
1350.000	1190.00	0.0	0.0	598.90	540.00	602.69	602.65	603.07	28.72	3.10	195.45	100.77
2525.000	1430.00	0.0	0.0	602.90	540.00	607.35	0.0	607.71	31.65	4.16	203.24	95.98
2525.000	1430.00	0.0	0.0	602.90	540.00	607.23	0.0	607.63	39.98	4.56	189.32	85.40
2725.000	235.00	0.0	0.0	601.60	540.00	607.87	0.0	608.19	13.76	4.52	119.48	145.56
2725.000	235.00	0.0	0.0	601.60	540.00	607.84	0.0	608.16	13.96	4.54	118.97	144.53
2726.000	1.00	615.30	615.50	601.60	540.00	607.83	0.0	608.22	36.25	5.01	107.77	89.70
2726.000	1.00	615.30	615.50	601.60	540.00	607.81	0.0	608.20	36.56	5.03	107.39	89.30
2727.000	94.00	615.30	615.50	601.60	540.00	608.20	0.0	608.56	32.19	4.78	113.07	95.18
2727.000	94.00	615.30	615.50	601.60	540.00	608.18	0.0	608.54	32.40	4.79	112.77	94.87
2728.000	1.00	0.0	0.0	601.60	540.00	608.31	0.0	608.58	10.88	4.21	128.20	163.71
2728.000	1.00	0.0	0.0	601.60	540.00	608.28	0.0	608.56	11.01	4.23	127.76	162.78
2825.000	80.00	0.0	0.0	602.90	540.00	608.44	0.0	608.73	33.93	4.98	160.70	92.70
2825.000	80.00	0.0	0.0	602.90	540.00	608.42	0.0	608.71	33.65	4.95	158.41	93.09
3425.000	680.00	0.0	0.0	602.90	540.00	609.28	0.0	609.32	3.59	1.89	482.78	285.16
3425.000	680.00	0.0	0.0	602.90	540.00	609.28	0.0	609.32	3.80	1.94	460.45	277.04
3925.000	560.00	0.0	0.0	603.50	540.00	609.52	0.0	609.61	7.24	2.59	305.31	200.69
3925.000	560.00	0.0	0.0	603.50	540.00	609.53	0.0	609.61	7.10	2.57	304.40	202.71
4225.000	225.00	0.0	0.0	604.40	540.00	609.69	0.0	610.01	27.88	4.49	120.35	102.27
4225.000	225.00	0.0	0.0	604.40	540.00	609.70	0.0	610.01	27.83	4.48	120.42	102.37
4226.000	1.00	613.00	613.80	604.40	540.00	609.66	0.0	610.05	30.16	5.04	107.18	98.33
4226.000	1.00	613.00	613.80	604.40	540.00	609.66	0.0	610.05	30.12	5.04	107.25	98.39
4227.000	55.00	613.00	613.80	604.40	540.00	609.85	0.0	610.22	27.92	4.87	110.77	102.20
4227.000	55.00	613.00	613.80	604.40	540.00	609.85	0.0	610.22	27.89	4.87	110.83	102.26
4228.000	1.00	0.0	0.0	604.40	540.00	609.97	0.0	610.25	10.93	4.24	127.45	163.33
4228.000	1.00	0.0	0.0	604.40	540.00	609.97	0.0	610.25	10.91	4.23	127.52	163.47
4325.000	100.00	0.0	0.0	603.50	540.00	610.32	0.0	610.39	5.85	2.20	337.39	223.21
4325.000	100.00	0.0	0.0	603.50	540.00	610.33	0.0	610.39	5.83	2.19	334.12	223.65
5525.000	1200.00	0.0	0.0	604.10	540.00	611.12	0.0	611.21	8.03	2.51	273.83	190.57
5525.000	1200.00	0.0	0.0	604.10	540.00	611.14	0.0	611.23	8.40	2.53	260.35	186.29
5725.000	660.00	0.0	0.0	604.60	540.00	611.69	0.0	611.81	10.13	2.85	197.69	169.70
5725.000	660.00	0.0	0.0	604.60	540.00	611.73	0.0	611.85	10.43	2.85	189.44	167.24
5775.000	85.00	0.0	0.0	604.40	540.00	611.64	0.0	612.21	61.77	6.06	89.14	68.70
5775.000	85.00	0.0	0.0	604.40	540.00	611.68	0.0	612.25	60.69	5.02	89.75	69.31
5776.000	1.00	615.70	616.50	604.40	540.00	611.55	0.0	612.31	52.59	6.99	77.22	74.46
5776.000	1.00	615.70	616.50	604.40	540.00	611.59	0.0	612.35	52.39	6.97	77.52	74.61

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
5777.000	122.00	615.70	616.50	604.40	540.00	612.27	0.0	612.96	51.31	6.65	81.15	75.39
5777.000	122.00	615.70	616.50	604.40	540.00	612.32	0.0	613.00	51.56	6.64	81.31	75.20
5778.000	1.00	0.0	0.0	604.40	540.00	612.60	0.0	613.04	20.86	5.31	101.71	118.23
5778.000	1.00	0.0	0.0	604.40	540.00	612.65	0.0	613.08	20.55	5.28	102.30	119.11
5825.000	150.00	0.0	0.0	604.20	540.00	613.20	0.0	613.21	0.95	1.08	906.29	553.30
5825.000	150.00	0.0	0.0	604.20	540.00	613.24	0.0	613.25	0.91	1.05	912.90	566.43
6825.000	820.00	0.0	0.0	605.10	540.00	613.29	0.0	613.34	2.37	1.85	349.37	350.77
6825.000	820.00	0.0	0.0	605.10	540.00	613.33	0.0	613.37	2.39	1.83	346.30	349.03
8625.000	1755.00	0.0	0.0	605.10	540.00	613.66	0.0	613.70	1.82	1.67	393.01	400.24
8625.000	1755.00	0.0	0.0	605.10	540.00	613.70	0.0	613.74	1.83	1.65	385.89	398.76

ESS FORMS INC 27

INMAN DRAIN

SUMMARY PRINTOUT TABLE 150

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
1350.000	540.00	602.63	0.0	0.0	0.04	310.69	1190.00
1350.000	540.00	602.69	0.06	0.0	0.0	325.15	1190.00
2525.000	540.00	607.35	0.0	4.72	0.0	119.55	1430.00
2525.000	540.00	607.23	-0.12	4.54	0.0	114.59	1430.00
2725.000	540.00	607.87	0.0	0.52	0.0	20.00	235.00
2725.000	540.00	607.84	-0.03	0.61	0.0	20.00	235.00
2726.000	540.00	607.83	0.0	-0.03	0.0	20.00	1.00
2726.000	540.00	607.81	-0.03	-0.03	0.0	20.00	1.00
2727.000	540.00	608.20	0.0	0.37	0.0	20.00	94.00
2727.000	540.00	608.18	-0.02	0.37	0.0	20.00	94.00
2728.000	540.00	608.31	0.0	0.10	0.0	20.00	1.00
2728.000	540.00	608.28	-0.02	0.10	0.0	20.00	1.00
2825.000	540.00	608.44	0.0	0.13	0.0	81.95	80.00
2825.000	540.00	608.42	-0.02	0.13	-0.02	75.17	80.00
3425.000	540.00	609.28	0.0	0.84	0.0	245.95	680.00
3425.000	540.00	609.28	-0.00	0.86	-0.00	225.00	680.00
3925.000	540.00	609.52	0.0	0.24	0.0	168.70	560.00
3925.000	540.00	609.53	0.01	0.25	0.01	155.00	560.00
4225.000	540.00	609.69	0.0	0.17	0.0	26.00	225.00
4225.000	540.00	609.70	0.00	0.17	0.00	26.00	225.00
4226.000	540.00	609.66	0.0	-0.04	0.0	26.00	1.00
4226.000	540.00	609.66	0.00	-0.04	0.00	26.00	1.00
4227.000	540.00	609.85	0.0	0.19	0.0	26.00	55.00
4227.000	540.00	609.85	0.00	0.19	0.00	26.00	55.00
4228.000	540.00	609.97	0.0	0.12	0.0	26.00	1.00
4228.000	540.00	609.97	0.00	0.12	0.00	26.00	1.00
4325.000	540.00	610.32	0.0	0.36	0.0	150.18	100.00
4325.000	540.00	610.33	0.00	0.36	0.00	134.77	100.00
5525.000	540.00	611.12	0.0	0.80	0.0	126.86	1200.00
5525.000	540.00	611.14	0.02	0.81	0.02	100.00	1200.00
5725.000	540.00	611.69	0.0	0.57	0.0	75.91	660.00
5725.000	540.00	611.73	0.04	0.59	0.04	38.45	660.00
5775.000	540.00	611.64	0.0	-0.05	0.0	13.00	85.00
5775.000	540.00	611.68	0.05	-0.04	0.05	13.00	85.00
5776.000	540.00	611.55	0.0	-0.09	0.0	13.00	1.00
5776.000	540.00	611.59	0.05	-0.09	0.05	13.00	1.00

NOTE BUSINESS FORMS INC 27

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
5777.000	540.00	612.27	0.0	0.73	0.0	13.00	122.00
5777.000	540.00	612.32	0.04	0.72	0.04	13.00	122.00
5778.000	540.00	612.60	0.0	0.33	0.0	13.00	1.00
5778.000	540.00	612.65	0.04	0.33	0.04	13.00	1.00
5825.000	540.00	613.20	0.0	0.60	0.0	296.48	150.00
5825.000	540.00	613.24	0.04	0.59	0.04	280.00	150.00
6825.000	540.00	613.29	0.0	0.09	0.0	112.63	820.00
6825.000	540.00	613.33	0.03	0.09	0.03	103.71	820.00
8625.000	540.00	613.66	0.0	0.37	0.0	122.07	1755.00
8625.000	540.00	613.70	0.04	0.38	0.04	106.88	1755.00

SUMMARY OF ERRORS

CAUTION SECNO 1350.000 PROFILE 1 CRITICAL DEPTH ASSUMED

FLOODWAY DATA, INMAN DRAIN
PROFILE NO. 2

STATION	FLOODWAY WIDTH FT	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WATER SURFACE ELEVATION WITHOUT FLOODWAY	DIFFERENCE
A 1350.000	325.	195.	2.8	602.7	602.6	0.1
B 2525.000	115.	189.	2.9	607.4	607.4	0.0
C 2725.000	20.	119.	4.5	607.9	607.9	0.0
2726.000	20.	107.	5.0	607.8	607.8	0.0
2727.000	20.	113.	4.8	608.2	608.2	0.0
2728.000	20.	128.	4.2	608.3	608.3	0.0
D 2825.000	75.	158.	3.4	608.4	608.4	0.0
E 3425.000	225.	460.	1.2	609.3	609.3	0.0
F 3925.000	155.	304.	1.8	609.5	609.5	0.0
G 4225.000	26.	120.	4.5	609.7	609.7	0.0
4226.000	26.	107.	5.0	609.7	609.7	0.0
4227.000	26.	111.	4.9	609.8	609.8	0.0
4228.000	26.	128.	4.2	610.0	610.0	0.0
H 4325.000	135.	334.	1.6	610.3	610.3	0.0
I 5525.000	100.	260.	2.1	611.1	611.1	0.0
J 5725.000	38.	189.	2.9	611.7	611.7	0.0
K 5775.000	13.	90.	6.0	611.6	611.6	0.0
5776.000	13.	78.	7.0	611.5	611.5	0.0
5777.000	13.	81.	6.6	612.3	612.3	0.0
5778.000	13.	102.	5.3	612.6	612.6	0.0
L 5825.000	280.	913.	0.6	613.2	613.2	0.0
M 6825.000	129.	346.	1.6	613.3	613.3	0.0
N 8625.000	130.	386.	1.4	613.7	613.7	0.0

BUSINESS FORMS INC 27

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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
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GOVEA	JGOVEDSS	2292	GO.FT06F001	7.32.29	15 DEC 81	STURGEON CREEK	CREEK
GOVEA	JGOVEDSS	2292	GO.FT06F001	7.32.29	15 DEC 81	STURGEON CREEK	CREEK
GOVEA	JGOVEDSS	2292	GO.FT06F001	7.32.29	15 DEC 81	STURGEON CREEK	CREEK

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*************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
*************************************************

C
T1       STURGEON CREEK AT MIDLAND, PROJECT NO.8543,STURG3
T2       STURGEON CREEK
T3       STURGEON CREEK

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

    -10.        2.        0.        0.  0.0         0.0       0.0       0.   608.000    0.0

J2  NPRDF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     1.000    0.0      -1.000     0.0       0.0       0.0       0.0       0.0       0.0       0.0

J5  LPRNT    NUMSEC                        ********REQUESTED SECTION NUMBERS********

   -10.000  -10.000     0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
```

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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
**************************************************
```

T1
T2
T3

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0.	3.	0.	0.	0.0	0.0	0.0	0.	608.000	0.0
J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	2.000	0.0	-1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0

```
**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
**************************************************
```

T1
T2
T3

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0.	4.	0.	0.	0.0	0.0	0.0	0.	608.000	0.0

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	3.000	0.0	-1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0

```
*************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
*************************************************
```

T1
T2
T3

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0.	5.	0.	0.	0.0	0.0	0.0	0.	608.000	0.0

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	15.000	0.0	-1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0

```
*************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
*************************************************
```

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

STURGEON CREEK

SUMMARY PRINTOUT TABLE 150

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	IOK*S	VCH	AREA	.01K
50.000	25.00	0.0	0.0	590.60	1050.00	608.00	0.0	608.04	0.66	1.52	692.90	1292.70
50.000	25.00	0.0	0.0	590.60	1600.00	608.00	0.0	608.08	1.53	2.31	692.90	1292.70
50.000	25.00	0.0	0.0	590.60	1850.00	608.00	0.0	608.11	2.05	2.67	692.90	1292.70
50.000	25.00	0.0	0.0	590.60	2500.00	608.00	0.0	608.20	3.74	3.61	692.90	1292.70
51.000	25.00	0.0	0.0	590.60	1050.00	608.00	0.0	608.04	0.34	1.52	692.96	1810.00
51.000	25.00	0.0	0.0	590.60	1600.00	608.00	0.0	608.09	0.78	2.31	693.05	1810.32
51.000	25.00	0.0	0.0	590.60	1850.00	608.00	0.0	608.11	1.04	2.67	693.10	1810.50
51.000	25.00	0.0	0.0	590.60	2500.00	608.01	0.0	608.21	1.91	3.61	693.28	1811.14
52.000	32.00	610.40	607.00	590.60	1050.00	608.03	0.0	608.06	0.34	1.51	693.97	1813.61
52.000	32.00	610.40	607.00	590.60	1600.00	608.06	0.0	608.14	0.77	2.30	695.46	1818.94
52.000	32.00	610.40	607.00	590.60	1850.00	608.08	0.0	608.19	1.03	2.66	696.33	1822.06
52.000	32.00	610.40	607.00	590.60	2500.00	608.15	0.0	608.35	1.86	3.58	699.24	1832.46
100.000	11.00	0.0	0.0	594.70	1050.00	608.00	0.0	608.07	0.81	2.11	497.43	1165.97
100.000	11.00	0.0	0.0	594.70	1600.00	608.01	0.0	608.17	1.88	3.22	497.63	1166.64
100.000	11.00	0.0	0.0	594.70	1850.00	608.01	0.0	608.23	2.51	3.72	497.74	1167.00
100.000	11.00	0.0	0.0	594.70	2500.00	608.02	0.0	608.41	4.58	5.02	498.16	1168.36
102.000	25.00	614.00	607.20	594.70	1050.00	608.00	0.0	608.08	1.47	2.20	476.75	864.75
102.000	25.00	614.00	607.20	594.70	1600.00	608.00	0.0	608.18	3.42	3.36	476.83	864.86
102.000	25.00	614.00	607.20	594.70	1850.00	608.01	0.0	608.24	4.58	3.88	476.88	864.92
102.000	25.00	614.00	607.20	594.70	2500.00	608.01	0.0	608.44	8.35	5.24	476.95	865.01
150.000	25.00	0.0	0.0	591.90	1050.00	608.00	0.0	608.08	0.85	2.36	445.54	1139.32
150.000	25.00	0.0	0.0	591.90	1600.00	607.99	0.0	608.19	1.97	3.59	445.47	1139.03
150.000	25.00	0.0	0.0	591.90	1850.00	607.99	0.0	608.26	2.65	4.16	445.08	1137.35
150.000	25.00	0.0	0.0	591.90	2500.00	607.98	0.0	608.47	4.84	5.62	444.86	1136.45
151.000	1.00	611.90	606.90	591.90	1050.00	608.19	0.0	608.28	0.81	2.32	451.77	1166.01
151.000	1.00	611.90	606.90	591.90	1600.00	608.46	0.0	608.65	1.77	3.47	460.50	1203.80
151.000	1.00	611.90	606.90	591.90	1850.00	608.62	0.0	608.86	2.27	3.97	465.79	1226.94
151.000	1.00	611.90	606.90	591.90	2500.00	609.16	0.0	609.58	3.66	5.17	483.75	1306.80
153.000	100.00	0.0	0.0	591.90	1050.00	608.26	0.0	608.29	0.34	1.52	946.47	1788.86
153.000	100.00	0.0	0.0	591.90	1600.00	608.61	0.0	608.67	0.72	2.24	981.51	1884.74
153.000	100.00	0.0	0.0	591.90	1850.00	608.82	0.0	608.89	0.91	2.53	1002.41	1942.83
153.000	100.00	0.0	0.0	591.90	2500.00	609.51	0.0	609.63	1.37	3.21	1071.51	2139.46

SECND	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
650.000	400.00	0.0	0.0	591.20	1050.00	608.30	0.0	608.30	0.01	0.29	3940.74	9228.92
650.000	400.00	0.0	0.0	591.20	1600.00	608.69	0.0	608.69	0.03	0.44	4078.29	9658.55
650.000	400.00	0.0	0.0	591.20	1850.00	608.91	0.0	608.92	0.03	0.50	4160.53	9912.11
650.000	400.00	0.0	0.0	591.20	2500.00	609.66	0.0	609.67	0.05	0.64	4441.65	10763.58
1950.000	1320.00	0.0	0.0	591.50	1050.00	608.30	0.0	608.30	0.03	0.33	4783.59	5976.45
1950.000	1320.00	0.0	0.0	591.50	1600.00	608.69	0.0	608.69	0.06	0.48	4967.71	6339.47
1950.000	1320.00	0.0	0.0	591.50	1850.00	608.92	0.0	608.92	0.08	0.54	5076.18	6556.79
1950.000	1320.00	0.0	0.0	591.50	2500.00	609.67	0.0	609.68	0.12	0.68	5431.68	7288.82
3825.000	1815.00	0.0	0.0	593.20	1050.00	608.31	0.0	608.31	0.10	0.50	3400.10	3379.92
3825.000	1815.00	0.0	0.0	593.20	1600.00	608.71	0.0	608.71	0.19	0.72	3618.95	3681.50
3825.000	1815.00	0.0	0.0	593.20	1850.00	608.94	0.0	608.95	0.23	0.80	3749.97	3864.93
3825.000	1815.00	0.0	0.0	593.20	2500.00	609.70	0.0	609.71	0.31	0.97	4192.06	4498.94
5550.000	1620.00	0.0	0.0	593.30	1050.00	608.32	0.0	608.34	0.54	1.29	1202.59	1433.87
5550.000	1620.00	0.0	0.0	593.30	1600.00	608.74	0.0	608.78	1.06	1.86	1290.94	1552.27
5550.000	1620.00	0.0	0.0	593.30	1850.00	608.98	0.0	609.03	1.30	2.08	1343.75	1623.35
5550.000	1620.00	0.0	0.0	593.30	2500.00	609.75	0.0	609.82	1.79	2.53	1525.43	1869.99
5700.000	135.00	0.0	0.0	595.00	1050.00	608.28	0.0	608.42	5.80	3.03	346.87	436.01
5700.000	135.00	0.0	0.0	595.00	1600.00	608.64	0.0	608.95	12.08	4.46	358.40	460.44
5700.000	135.00	0.0	0.0	595.00	1850.00	608.85	0.0	609.24	15.18	5.07	365.05	474.77
5700.000	135.00	0.0	0.0	595.00	2500.00	609.52	0.0	610.17	22.91	6.47	386.55	522.29
5701.000	5.00	610.80	611.40	595.00	1050.00	608.24	0.0	608.46	22.86	3.75	280.29	219.61
5701.000	5.00	610.80	611.40	595.00	1600.00	608.55	0.0	609.05	57.80	5.68	281.85	210.45
5701.000	5.00	610.80	611.40	595.00	1850.00	608.73	0.0	609.39	79.61	6.56	282.00	207.34
5701.000	5.00	610.80	611.40	595.00	2500.00	609.26	0.0	610.48	145.38	8.87	282.00	207.34
5702.000	67.00	610.80	611.40	595.00	1050.00	608.40	0.0	608.62	23.71	3.73	281.35	215.65
5702.000	67.00	610.80	611.40	595.00	1600.00	608.95	0.0	609.45	59.55	5.67	282.00	207.34
5702.000	67.00	610.80	611.40	595.00	1850.00	609.26	0.0	609.93	79.61	6.56	282.00	207.34
5702.000	67.00	610.80	611.40	595.00	2500.00	610.23	0.0	611.45	145.38	8.87	282.00	207.34
5703.000	5.00	0.0	0.0	595.00	1050.00	608.51	0.0	608.65	5.40	2.96	354.37	451.85
5703.000	5.00	0.0	0.0	595.00	1600.00	609.24	0.0	609.52	10.13	4.23	377.84	502.82
5703.000	5.00	0.0	0.0	595.00	1850.00	609.69	0.0	610.04	11.96	4.72	392.13	534.91
5703.000	5.00	0.0	0.0	595.00	2500.00	611.80	0.0	611.81	0.96	1.48	3134.83	2554.89
5900.000	100.00	0.0	0.0	594.90	1050.00	608.64	0.0	608.70	2.03	2.16	629.03	737.65
5900.000	100.00	0.0	0.0	594.90	1600.00	609.52	0.0	609.63	3.50	2.98	698.75	854.83
5900.000	100.00	0.0	0.0	594.90	1850.00	610.03	0.0	610.16	3.98	3.26	739.96	927.16
5900.000	100.00	0.0	0.0	594.90	2500.00	611.74	0.0	611.91	4.48	3.76	876.32	1181.47
6250.000	400.00	0.0	0.0	595.70	1050.00	608.73	0.0	608.73	0.35	0.89	2340.75	1762.87
6250.000	400.00	0.0	0.0	595.70	1600.00	609.67	0.0	609.67	0.51	1.12	2804.08	2250.83
6250.000	400.00	0.0	0.0	595.70	1850.00	610.21	0.0	610.21	0.52	1.17	3083.07	2564.30
6250.000	400.00	0.0	0.0	595.70	2500.00	611.95	0.0	611.96	0.45	1.18	4019.72	3745.50
6750.000	410.00	0.0	0.0	596.50	900.00	608.74	0.0	608.75	0.54	1.07	1676.46	1221.24
6750.000	410.00	0.0	0.0	596.50	1400.00	609.69	0.0	609.70	0.77	1.35	2087.07	1596.65
6750.000	410.00	0.0	0.0	596.50	1600.00	610.23	0.0	610.24	0.75	1.38	2342.52	1845.65
6750.000	410.00	0.0	0.0	596.50	2200.00	611.97	0.0	611.98	0.58	1.34	3468.13	2878.83

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
7875.000	1240.00	0.0	0.0	597.90	900.00	608.80	0.0	608.81	0.53	0.88	1651.56	1238.09
7875.000	1240.00	0.0	0.0	597.90	1400.00	609.78	0.0	609.79	0.78	1.15	1953.60	1580.88
7875.000	1240.00	0.0	0.0	597.90	1600.00	610.31	0.0	610.32	0.81	1.20	2122.77	1782.96
7875.000	1240.00	0.0	0.0	597.90	2200.00	612.04	0.0	612.05	0.76	1.29	2709.37	2530.76
8125.000	610.00	0.0	0.0	598.10	900.00	608.82	0.0	608.83	0.31	1.03	1691.41	1613.71
8125.000	610.00	0.0	0.0	598.10	1400.00	609.81	0.0	609.82	0.44	1.31	2102.01	2099.42
8125.000	610.00	0.0	0.0	598.10	1600.00	610.34	0.0	610.36	0.44	1.35	2338.33	2405.21
8125.000	610.00	0.0	0.0	598.10	2200.00	612.07	0.0	612.08	0.39	1.39	3094.96	3535.88
8175.000	200.00	0.0	0.0	598.30	900.00	608.81	0.0	608.87	0.94	1.93	467.30	929.92
8175.000	200.00	0.0	0.0	598.30	1400.00	609.77	0.0	609.89	1.68	2.74	511.52	1081.19
8175.000	200.00	0.0	0.0	598.30	1600.00	610.30	0.0	610.44	1.88	2.99	535.82	1168.15
8175.000	200.00	0.0	0.0	598.30	2200.00	611.99	0.0	612.19	2.26	3.59	613.57	1464.11
8176.000	1.00	617.20	617.30	598.30	900.00	608.81	0.0	608.87	0.94	1.93	467.32	930.00
8176.000	1.00	617.20	617.30	598.30	1400.00	609.77	0.0	609.89	1.68	2.74	511.52	1081.19
8176.000	1.00	617.20	617.30	598.30	1600.00	610.30	0.0	610.44	1.88	2.99	535.82	1168.15
8176.000	1.00	617.20	617.30	598.30	2200.00	611.99	0.0	612.19	2.26	3.59	613.58	1464.16
8177.000	48.00	617.20	617.30	598.30	900.00	608.81	0.0	608.87	0.94	1.93	467.52	930.67
8177.000	48.00	617.20	617.30	598.30	1400.00	609.78	0.0	609.89	1.67	2.74	511.88	1082.45
8177.000	48.00	617.20	617.30	598.30	1600.00	610.31	0.0	610.45	1.87	2.98	536.23	1169.62
8177.000	48.00	617.20	617.30	598.30	2200.00	612.00	0.0	612.20	2.25	3.58	614.08	1466.12
8178.000	1.00	0.0	0.0	598.30	900.00	608.81	0.0	608.87	0.94	1.93	467.52	930.67
8178.000	1.00	0.0	0.0	598.30	1400.00	609.78	0.0	609.89	1.67	2.73	511.90	1082.53
8178.000	1.00	0.0	0.0	598.30	1600.00	610.31	0.0	610.45	1.87	2.98	536.25	1169.70
8178.000	1.00	0.0	0.0	598.30	2200.00	612.00	0.0	612.20	2.25	3.58	614.09	1466.17
8225.000	20.00	0.0	0.0	599.60	900.00	608.80	0.0	608.89	2.98	2.40	374.91	521.74
8225.000	20.00	0.0	0.0	599.60	1400.00	609.76	0.0	609.92	4.85	3.24	431.92	635.46
8225.000	20.00	0.0	0.0	599.60	1600.00	610.29	0.0	610.47	5.09	3.44	464.60	708.95
8225.000	20.00	0.0	0.0	599.60	2200.00	611.99	0.0	612.22	5.21	3.85	571.41	964.00
8226.000	1.00	614.90	617.20	599.60	900.00	608.80	0.0	608.89	2.99	2.40	374.47	520.88
8226.000	1.00	614.90	617.20	599.60	1400.00	609.76	0.0	609.92	4.85	3.24	431.95	635.52
8226.000	1.00	614.90	617.20	599.60	1600.00	610.29	0.0	610.48	5.09	3.44	464.62	708.99
8226.000	1.00	614.90	617.20	599.60	2200.00	611.99	0.0	612.22	5.22	3.85	571.01	963.01
8227.000	6.00	614.90	617.20	599.60	900.00	608.80	0.0	608.89	2.98	2.40	374.57	521.08
8227.000	6.00	614.90	617.20	599.60	1400.00	609.76	0.0	609.93	4.85	3.24	432.13	635.92
8227.000	6.00	614.90	617.20	599.60	1600.00	610.29	0.0	610.48	5.09	3.44	464.81	709.44
8227.000	6.00	614.90	617.20	599.60	2200.00	611.99	0.0	612.22	5.21	3.85	571.17	963.43
8228.000	1.00	0.0	0.0	599.60	900.00	608.80	0.0	608.89	2.98	2.40	374.58	521.10
8228.000	1.00	0.0	0.0	599.60	1400.00	609.76	0.0	609.93	4.85	3.24	432.18	636.02
8228.000	1.00	0.0	0.0	599.60	1600.00	610.29	0.0	610.48	5.08	3.44	464.86	709.54
8228.000	1.00	0.0	0.0	599.60	2200.00	611.99	0.0	612.23	5.21	3.85	571.22	963.54
8325.000	120.00	0.0	0.0	599.10	900.00	608.92	0.0	608.93	0.86	1.66	1238.80	968.14
8325.000	120.00	0.0	0.0	599.10	1400.00	609.97	0.0	609.99	1.10	2.01	1551.47	1337.10
8325.000	120.00	0.0	0.0	599.10	1600.00	610.53	0.0	610.55	1.06	2.04	1718.54	1555.81
8325.000	120.00	0.0	0.0	599.10	2200.00	612.29	0.0	612.31	0.89	2.07	2245.96	2336.05

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
10100.000	1215.00	0.0	0.0	599.90	900.00	609.02	0.0	609.03	1.06	1.05	1697.08	875.35
10100.000	1215.00	0.0	0.0	599.90	1400.00	610.10	0.0	610.11	1.39	1.29	2088.46	1187.03
10100.000	1215.00	0.0	0.0	599.90	1600.00	610.66	0.0	610.67	1.38	1.32	2295.84	1364.09
10100.000	1215.00	0.0	0.0	599.90	2200.00	612.40	0.0	612.41	1.21	1.36	2980.12	1999.31
12100.000	1980.00	0.0	0.0	600.30	900.00	609.23	0.0	609.25	1.44	1.45	1132.34	749.92
12100.000	1980.00	0.0	0.0	600.30	1400.00	610.37	0.0	610.39	1.69	1.72	1450.25	1077.73
12100.000	1980.00	0.0	0.0	600.30	1600.00	610.92	0.0	610.94	1.63	1.76	1606.84	1254.80
12100.000	1980.00	0.0	0.0	600.30	2200.00	612.62	0.0	612.64	1.37	1.80	2115.94	1883.00
12900.000	800.00	0.0	0.0	601.40	900.00	609.40	0.0	609.45	5.06	2.46	683.29	400.27
12900.000	800.00	0.0	0.0	601.40	1400.00	610.56	0.0	610.61	4.98	2.73	935.30	627.10
12900.000	800.00	0.0	0.0	601.40	1600.00	611.09	0.0	611.15	4.57	2.73	1054.13	748.18
12900.000	800.00	0.0	0.0	601.40	2200.00	612.76	0.0	612.81	3.45	2.69	1429.95	1184.08
14400.000	1400.00	0.0	0.0	602.00	900.00	610.08	0.0	610.14	5.06	2.50	667.94	399.91
14400.000	1400.00	0.0	0.0	602.00	1400.00	611.21	0.0	611.27	4.75	2.65	940.93	642.52
14400.000	1400.00	0.0	0.0	602.00	1600.00	611.70	0.0	611.76	4.39	2.64	1062.19	763.79
14400.000	1400.00	0.0	0.0	602.00	2200.00	613.21	0.0	613.27	3.31	2.54	1458.24	1209.32
15625.000	1245.00	0.0	0.0	603.80	900.00	610.83	0.0	610.94	8.49	3.67	542.85	308.83
15625.000	1245.00	0.0	0.0	603.80	1400.00	611.90	0.0	612.01	7.79	3.97	786.91	501.56
15625.000	1245.00	0.0	0.0	603.80	1600.00	612.33	0.0	612.44	7.26	4.00	894.62	593.63
15625.000	1245.00	0.0	0.0	603.80	2200.00	613.69	0.0	613.78	5.50	3.93	1267.12	938.13
15825.000	190.00	0.0	0.0	603.70	900.00	610.96	0.0	611.24	15.19	4.23	212.56	230.92
15825.000	190.00	0.0	0.0	603.70	1400.00	611.94	0.0	612.47	25.46	5.79	241.64	277.45
15825.000	190.00	0.0	0.0	603.70	1600.00	612.33	0.0	612.95	29.23	6.33	252.90	295.95
15825.000	190.00	0.0	0.0	603.70	2200.00	613.51	0.0	614.42	38.43	7.64	287.81	354.86
15826.000	1.00	621.30	615.70	603.70	900.00	610.96	0.0	611.24	15.19	4.23	212.58	230.96
15826.000	1.00	621.30	615.70	603.70	1400.00	611.95	0.0	612.47	25.45	5.79	241.68	277.51
15826.000	1.00	621.30	615.70	603.70	1600.00	612.33	0.0	612.95	29.22	6.33	252.94	296.01
15826.000	1.00	621.30	615.70	603.70	2200.00	613.51	0.0	614.42	38.42	7.64	287.85	354.93
15827.000	96.80	621.30	615.70	603.70	900.00	611.12	0.0	611.38	14.30	4.15	217.09	238.04
15827.000	96.80	621.30	615.70	603.70	1400.00	612.23	0.0	612.71	23.14	5.60	249.93	291.04
15827.000	96.80	621.30	615.70	603.70	1600.00	612.65	0.0	613.23	26.28	6.09	262.61	312.11
15827.000	96.80	621.30	615.70	603.70	2200.00	613.96	0.0	614.79	33.86	7.30	301.23	378.06
15828.000	1.00	0.0	0.0	603.70	900.00	611.12	0.0	611.39	14.26	4.14	217.28	238.35
15828.000	1.00	0.0	0.0	603.70	1400.00	612.23	0.0	612.71	23.12	5.60	250.00	291.16
15828.000	1.00	0.0	0.0	603.70	1600.00	612.66	0.0	613.23	26.26	6.09	262.70	312.25
15828.000	1.00	0.0	0.0	603.70	2200.00	613.97	0.0	614.79	33.83	7.30	301.33	378.24
16225.000	330.00	0.0	0.0	601.80	900.00	611.56	0.0	611.66	3.91	2.52	357.43	454.96
16225.000	330.00	0.0	0.0	601.80	1400.00	612.98	0.0	613.16	6.17	3.38	414.64	563.77
16225.000	330.00	0.0	0.0	601.80	1600.00	613.54	0.0	613.74	6.97	3.67	436.20	606.14
16225.000	330.00	0.0	0.0	601.80	2200.00	615.17	0.0	615.47	8.87	4.39	501.65	738.70
16226.000	1.00	621.60	617.10	601.80	900.00	611.56	0.0	611.66	3.91	2.52	357.44	454.97
16226.000	1.00	621.60	617.10	601.80	1400.00	612.98	0.0	613.16	6.18	3.38	414.42	563.35
16226.000	1.00	621.60	617.10	601.80	1600.00	613.54	0.0	613.75	6.95	3.67	436.48	606.70
16226.000	1.00	621.60	617.10	601.80	2200.00	615.17	0.0	615.47	8.87	4.38	501.74	738.88

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	ICK*S	VCH	AREA	.01K
16227.000	118.00	621.60	617.10	601.80	900.00	611.61	0.0	611.71	3.86	2.51	359.27	458.36
16227.000	118.00	621.60	617.10	601.80	1400.00	613.06	0.0	613.23	6.05	3.35	417.30	568.97
16227.000	118.00	621.60	617.10	601.80	1600.00	613.62	0.0	613.83	6.81	3.64	439.74	613.17
16227.000	118.00	621.60	617.10	601.80	2200.00	615.28	0.0	615.57	8.66	4.35	505.88	747.45
16228.000	1.00	0.0	0.0	601.80	900.00	611.61	0.0	611.71	3.85	2.50	359.30	458.43
16228.000	1.00	0.0	0.0	601.80	1400.00	613.06	0.0	613.24	6.05	3.35	417.42	569.20
16228.000	1.00	0.0	0.0	601.80	1600.00	613.62	0.0	613.83	6.80	3.64	439.89	613.46
16228.000	1.00	0.0	0.0	601.80	2200.00	615.28	0.0	615.57	8.65	4.35	506.11	747.93
16375.000	80.00	0.0	0.0	603.40	900.00	611.63	0.0	611.75	4.19	2.78	323.19	439.58
16375.000	80.00	0.0	0.0	603.40	1400.00	613.09	0.0	613.30	6.22	3.67	381.88	561.21
16375.000	80.00	0.0	0.0	603.40	1600.00	613.66	0.0	613.90	6.88	3.96	404.55	610.07
16375.000	80.00	0.0	0.0	603.40	2200.00	615.32	0.0	615.66	8.42	4.67	470.80	758.07
16376.000	1.00	622.70	624.70	603.40	900.00	611.63	0.0	611.75	4.20	2.79	322.99	439.17
16376.000	1.00	622.70	624.70	603.40	1400.00	613.09	0.0	613.30	6.24	3.67	381.57	560.55
16376.000	1.00	622.70	624.70	603.40	1600.00	613.66	0.0	613.90	6.90	3.96	404.20	609.31
16376.000	1.00	622.70	624.70	603.40	2200.00	615.32	0.0	615.66	8.42	4.67	470.82	758.11
16377.000	29.60	622.70	624.70	603.40	900.00	611.64	0.0	611.76	4.18	2.78	323.49	440.17
16377.000	29.60	622.70	624.70	603.40	1400.00	613.11	0.0	613.32	6.20	3.66	382.29	562.09
16377.000	29.60	622.70	624.70	603.40	1600.00	613.68	0.0	613.92	6.86	3.95	405.00	611.05
16377.000	29.60	622.70	624.70	603.40	2200.00	615.35	0.0	615.69	8.37	4.66	471.82	760.39
16378.000	1.00	0.0	0.0	603.40	900.00	611.64	0.0	611.76	4.18	2.78	323.52	440.23
16378.000	1.00	0.0	0.0	603.40	1400.00	613.11	0.0	613.32	6.20	3.66	382.36	562.23
16378.000	1.00	0.0	0.0	603.40	1600.00	613.68	0.0	613.92	6.85	3.95	405.07	611.20
16378.000	1.00	0.0	0.0	603.40	2200.00	615.35	0.0	615.69	8.37	4.66	471.91	760.62
16450.000	155.00	0.0	0.0	603.70	900.00	611.79	0.0	611.82	1.51	1.85	843.62	732.01
16450.000	155.00	0.0	0.0	603.70	1400.00	613.38	0.0	613.41	1.25	1.92	1222.49	1254.62
16450.000	155.00	0.0	0.0	603.70	1600.00	613.99	0.0	614.02	1.16	1.94	1369.65	1487.53
16450.000	155.00	0.0	0.0	603.70	2200.00	615.78	0.0	615.81	0.95	1.98	1804.78	2262.75
24250.000	810.00	0.0	0.0	604.60	900.00	611.92	0.0	611.97	2.67	2.41	677.49	551.22
24250.000	810.00	0.0	0.0	604.60	1400.00	613.48	0.0	613.52	1.83	2.30	1169.02	1034.22
24250.000	810.00	0.0	0.0	604.60	1600.00	614.08	0.0	614.12	1.56	2.23	1370.47	1282.92
24250.000	810.00	0.0	0.0	604.60	2200.00	615.85	0.0	615.88	1.03	2.05	1964.01	2163.46
25500.000	1250.00	0.0	0.0	605.50	900.00	612.28	0.0	612.34	3.63	2.65	587.55	472.24
25500.000	1250.00	0.0	0.0	605.50	1400.00	613.72	0.0	613.78	2.72	2.65	1001.29	848.35
25500.000	1250.00	0.0	0.0	605.50	1600.00	614.29	0.0	614.34	2.37	2.60	1198.36	1039.32
25500.000	1250.00	0.0	0.0	605.50	2200.00	615.98	0.0	616.02	1.44	2.30	1893.82	1835.34
26350.000	810.00	0.0	0.0	606.30	900.00	612.50	0.0	612.51	1.31	1.16	1412.90	786.35
26350.000	810.00	0.0	0.0	606.30	1400.00	613.90	0.0	613.91	1.12	1.28	1981.00	1325.60
26350.000	810.00	0.0	0.0	606.30	1600.00	614.45	0.0	614.46	1.04	1.31	2213.67	1571.45
26350.000	810.00	0.0	0.0	606.30	2200.00	616.10	0.0	616.11	0.83	1.35	2919.98	2421.09
26400.000	40.00	0.0	0.0	606.50	900.00	612.45	0.0	612.55	16.07	3.73	545.62	224.52
26400.000	40.00	0.0	0.0	606.50	1400.00	613.89	0.0	613.93	6.77	2.87	1080.31	537.87
26400.000	40.00	0.0	0.0	606.50	1600.00	614.44	0.0	614.48	5.21	2.66	1313.95	701.02
26400.000	40.00	0.0	0.0	606.50	2200.00	616.09	0.0	616.11	2.79	2.25	2083.85	1317.83

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
26401.000	1.00	610.60	618.00	606.50	900.00	612.45	0.0	612.55	110.13	3.20	369.51	85.76
26401.000	1.00	610.60	618.00	606.50	1400.00	613.90	0.0	613.93	16.87	1.85	904.02	340.87
26401.000	1.00	610.60	618.00	606.50	1600.00	614.45	0.0	614.48	11.12	1.67	1133.63	479.73
26401.000	1.00	610.60	618.00	606.50	2200.00	616.09	0.0	616.12	4.54	1.35	1902.81	1032.51
26402.000	41.00	610.60	618.00	606.50	900.00	612.78	0.0	612.84	47.24	2.35	485.16	130.94
26402.000	41.00	610.60	618.00	606.50	1400.00	613.96	0.0	614.00	15.19	1.78	935.80	359.22
26402.000	41.00	610.60	618.00	606.50	1600.00	614.49	0.0	614.52	10.55	1.63	1153.83	492.61
26402.000	41.00	610.60	618.00	606.50	2200.00	616.11	0.0	616.13	4.47	1.35	1912.64	1040.30
26403.000	1.00	0.0	0.0	606.50	900.00	612.78	0.0	612.84	10.02	3.08	662.44	284.27
26403.000	1.00	0.0	0.0	606.50	1400.00	613.96	0.0	614.00	6.26	2.78	1112.67	559.67
26403.000	1.00	0.0	0.0	606.50	1600.00	614.49	0.0	614.52	5.01	2.62	1333.20	715.04
26403.000	1.00	0.0	0.0	606.50	2200.00	616.11	0.0	616.14	2.76	2.24	2090.98	1324.02
26450.000	45.00	0.0	0.0	606.50	900.00	612.82	0.0	612.88	9.58	3.02	674.41	290.71
26450.000	45.00	0.0	0.0	606.50	1400.00	613.98	0.0	614.02	6.03	2.74	1112.97	570.15
26450.000	45.00	0.0	0.0	606.50	1600.00	614.50	0.0	614.54	4.88	2.59	1315.98	724.33
26450.000	45.00	0.0	0.0	606.50	2200.00	616.12	0.0	616.15	2.80	2.26	1953.23	1314.70
27200.000	630.00	0.0	0.0	604.50	900.00	613.11	0.0	613.17	2.66	2.03	546.47	551.39
27200.000	630.00	0.0	0.0	604.50	1400.00	614.23	0.0	614.30	3.07	2.43	749.45	799.02
27200.000	630.00	0.0	0.0	604.50	1600.00	614.71	0.0	614.79	2.98	2.50	850.06	926.71
27200.000	630.00	0.0	0.0	604.50	2200.00	616.25	0.0	616.33	2.44	2.54	1211.65	1408.83

STURGEON CREEK

SUMMARY PRINTOUT TABLE 150

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
50.000	1050.00	608.00	0.0	0.0	0.0	41.00	25.00
50.000	1600.00	608.00	0.0	0.0	0.0	41.00	25.00
50.000	1850.00	608.00	0.0	0.0	0.0	41.00	25.00
50.000	2500.00	608.00	0.0	0.0	0.0	41.00	25.00
51.000	1050.00	608.00	0.0	0.00	0.0	41.00	25.00
51.000	1600.00	608.00	0.00	0.00	0.0	41.00	25.00
51.000	1850.00	608.00	0.00	0.00	0.0	41.00	25.00
51.000	2500.00	608.01	0.00	0.01	0.0	41.00	25.00
52.000	1050.00	608.03	0.0	0.03	0.0	41.00	32.00
52.000	1600.00	608.06	0.04	0.06	0.0	41.00	32.00
52.000	1850.00	608.08	0.02	0.08	0.0	41.00	32.00
52.000	2500.00	608.15	0.07	0.15	0.0	41.00	32.00
100.000	1050.00	608.00	0.0	-0.02	0.0	38.00	11.00
100.000	1600.00	608.01	0.01	-0.05	0.0	38.00	11.00
100.000	1850.00	608.01	0.00	-0.07	0.0	38.00	11.00
100.000	2500.00	608.02	0.01	-0.13	0.0	38.00	11.00
102.000	1050.00	608.00	0.0	-0.00	0.0	38.00	25.00
102.000	1600.00	608.00	0.00	-0.00	0.0	38.00	25.00
102.000	1850.00	608.01	0.00	-0.01	0.0	38.00	25.00
102.000	2500.00	608.01	0.01	-0.01	0.0	38.00	25.00
150.000	1050.00	608.00	0.0	-0.01	0.0	33.00	25.00
150.000	1600.00	607.99	-0.00	-0.01	0.0	33.00	25.00
150.000	1850.00	607.99	-0.00	-0.02	0.0	33.00	25.00
150.000	2500.00	607.98	-0.01	-0.03	0.0	33.00	25.00
151.000	1050.00	608.19	0.0	0.20	0.0	33.00	1.00
151.000	1600.00	608.46	0.26	0.46	0.0	33.00	1.00
151.000	1850.00	608.62	0.16	0.63	0.0	33.00	1.00
151.000	2500.00	609.16	0.54	1.18	0.0	33.00	1.00
153.000	1050.00	608.26	0.0	0.07	0.0	100.00	100.00
153.000	1600.00	608.61	0.35	0.15	0.0	100.00	100.00
153.000	1850.00	608.82	0.21	0.20	0.0	100.00	100.00
153.000	2500.00	609.51	0.69	0.35	0.0	100.00	100.00
650.000	1050.00	608.30	0.0	0.03	0.0	340.48	400.00
650.000	1600.00	608.69	0.39	0.07	0.0	354.93	400.00
650.000	1850.00	608.91	0.23	0.09	0.0	363.29	400.00
650.000	2500.00	609.66	0.75	0.15	0.0	390.53	400.00
1950.000	1050.00	608.30	0.0	0.00	0.0	466.84	1320.00
1950.000	1600.00	608.69	0.39	0.01	0.0	469.42	1320.00
1950.000	1850.00	608.92	0.23	0.01	0.0	470.93	1320.00
1950.000	2500.00	609.67	0.75	0.01	0.0	476.99	1320.00
3825.000	1050.00	608.31	0.0	0.01	0.0	543.70	1815.00
3825.000	1600.00	608.71	0.40	0.01	0.0	558.26	1815.00
3825.000	1850.00	608.94	0.23	0.02	0.0	566.80	1815.00
3825.000	2500.00	609.70	0.76	0.03	0.0	594.71	1815.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
5550.000	1050.00	608.32	0.0	0.02	0.0	206.18	1620.00
5550.000	1600.00	608.74	0.42	0.03	0.0	217.04	1620.00
5550.000	1850.00	608.98	0.24	0.04	0.0	223.27	1620.00
5550.000	2500.00	609.75	0.77	0.05	0.0	243.51	1620.00
5700.000	1050.00	608.28	0.0	-0.05	0.0	32.00	135.00
5700.000	1600.00	608.64	0.36	-0.10	0.0	32.00	135.00
5700.000	1850.00	608.85	0.21	-0.13	0.0	32.00	135.00
5700.000	2500.00	609.52	0.67	-0.23	0.0	32.00	135.00
5701.000	1050.00	608.24	0.0	-0.03	0.0	32.00	5.00
5701.000	1600.00	608.55	0.31	-0.08	0.0	32.00	5.00
5701.000	1850.00	608.73	0.17	-0.12	0.0	32.00	5.00
5701.000	2500.00	609.26	0.53	-0.26	0.0	32.00	5.00
5702.000	1050.00	608.40	0.0	0.16	0.0	32.00	67.00
5702.000	1600.00	608.95	0.54	0.39	0.0	32.00	67.00
5702.000	1850.00	609.26	0.31	0.53	0.0	32.00	67.00
5702.000	2500.00	610.23	0.97	0.97	0.0	32.00	67.00
5703.000	1050.00	608.51	0.0	0.11	0.0	32.00	5.00
5703.000	1600.00	609.24	0.73	0.30	0.0	32.00	5.00
5703.000	1850.00	609.69	0.45	0.43	0.0	32.00	5.00
5703.000	2500.00	611.80	2.11	1.57	0.0	1000.00	5.00
5900.000	1050.00	608.64	0.0	0.13	0.0	80.00	100.00
5900.000	1600.00	609.52	0.88	0.27	0.0	80.00	100.00
5900.000	1850.00	610.03	0.51	0.34	0.0	80.00	100.00
5900.000	2500.00	611.74	1.70	-0.06	0.0	80.00	100.00
6250.000	1050.00	608.73	0.0	0.08	0.0	476.69	400.00
6250.000	1600.00	609.67	0.94	0.15	0.0	508.66	400.00
6250.000	1850.00	610.21	0.54	0.17	0.0	523.30	400.00
6250.000	2500.00	611.95	1.74	0.21	0.0	551.19	400.00
6750.000	900.00	608.74	0.0	0.01	0.0	412.04	410.00
6750.000	1400.00	609.69	0.95	0.02	0.0	455.58	410.00
6750.000	1600.00	610.23	0.54	0.02	0.0	506.40	410.00
6750.000	2200.00	611.97	1.74	0.02	0.0	786.69	410.00
7875.000	900.00	608.80	0.0	0.06	0.0	300.30	1240.00
7875.000	1400.00	609.78	0.97	0.09	0.0	315.91	1240.00
7875.000	1600.00	610.31	0.54	0.09	0.0	324.33	1240.00
7875.000	2200.00	612.04	1.72	0.07	0.0	380.13	1240.00
8125.000	900.00	608.82	0.0	0.02	0.0	400.17	610.00
8125.000	1400.00	609.81	0.98	0.03	0.0	433.65	610.00
8125.000	1600.00	610.34	0.54	0.03	0.0	440.00	610.00
8125.000	2200.00	612.07	1.72	0.03	0.0	440.00	610.00
8175.000	900.00	608.81	0.0	-0.01	0.0	46.00	200.00
8175.000	1400.00	609.77	0.96	-0.04	0.0	46.00	200.00
8175.000	1600.00	610.30	0.53	-0.05	0.0	46.00	200.00
8175.000	2200.00	611.99	1.69	-0.08	0.0	46.00	200.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
8176.000	900.00	608.81	0.0	0.0	0.0	46.00	1.00
8176.000	1400.00	609.77	0.96	0.0	0.0	46.00	1.00
8176.000	1600.00	610.30	0.53	0.0	0.0	46.00	1.00
8176.000	2200.00	611.99	1.69	0.0	0.0	46.00	1.00
8177.000	900.00	608.81	0.0	0.00	0.0	46.00	48.00
8177.000	1400.00	609.78	0.96	0.01	0.0	46.00	48.00
8177.000	1600.00	610.31	0.53	0.01	0.0	46.00	48.00
8177.000	2200.00	612.00	1.69	0.01	0.0	46.00	48.00
8178.000	900.00	608.81	0.0	0.0	0.0	46.00	1.00
8178.000	1400.00	609.78	0.96	0.0	0.0	46.00	1.00
8178.000	1600.00	610.31	0.53	0.0	0.0	46.00	1.00
8178.000	2200.00	612.00	1.69	0.0	0.0	46.00	1.00
8225.000	900.00	608.80	0.0	-0.01	0.0	58.26	20.00
8225.000	1400.00	609.76	0.96	-0.02	0.0	61.38	20.00
8225.000	1600.00	610.29	0.53	-0.02	0.0	61.83	20.00
8225.000	2200.00	611.99	1.70	-0.01	0.0	63.29	20.00
8226.000	900.00	608.80	0.0	0.0	0.0	58.23	1.00
8226.000	1400.00	609.76	0.96	0.00	0.0	61.38	1.00
8226.000	1600.00	610.29	0.53	0.00	0.0	61.83	1.00
8226.000	2200.00	611.99	1.70	0.0	0.0	63.28	1.00
8227.000	900.00	608.80	0.0	0.00	0.0	58.24	6.00
8227.000	1400.00	609.76	0.96	0.00	0.0	61.38	6.00
8227.000	1600.00	610.29	0.53	0.00	0.0	61.83	6.00
8227.000	2200.00	611.99	1.70	0.00	0.0	63.29	6.00
8228.000	900.00	608.80	0.0	0.00	0.0	58.24	1.00
8228.000	1400.00	609.76	0.96	0.00	0.0	61.38	1.00
8228.000	1600.00	610.29	0.53	0.00	0.0	61.83	1.00
8228.000	2200.00	611.99	1.70	0.00	0.0	63.29	1.00
8325.000	900.00	608.92	0.0	0.11	0.0	292.42	120.00
8325.000	1400.00	609.97	1.06	0.21	0.0	299.81	120.00
8325.000	1600.00	610.53	0.56	0.24	0.0	300.00	120.00
8325.000	2200.00	612.29	1.76	0.29	0.0	300.00	120.00
10100.000	900.00	609.02	0.0	0.10	0.0	351.96	1215.00
10100.000	1400.00	610.10	1.09	0.13	0.0	369.81	1215.00
10100.000	1600.00	610.66	0.55	0.13	0.0	378.93	1215.00
10100.000	2200.00	612.40	1.74	0.11	0.0	407.58	1215.00
12100.000	900.00	609.23	0.0	0.22	0.0	275.42	1980.00
12100.000	1400.00	610.37	1.14	0.27	0.0	283.98	1980.00
12100.000	1600.00	610.92	0.55	0.26	0.0	288.11	1980.00
12100.000	2200.00	612.62	1.70	0.22	0.0	331.39	1980.00
12900.000	900.00	609.40	0.0	0.17	0.0	216.02	800.00
12900.000	1400.00	610.56	1.16	0.19	0.0	220.35	800.00
12900.000	1600.00	611.09	0.54	0.17	0.0	222.36	800.00
12900.000	2200.00	612.76	1.67	0.14	0.0	229.52	800.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
14400.000	900.00	610.08	0.0	0.68	0.0	235.86	1400.00
14400.000	1400.00	611.21	1.13	0.66	0.0	247.84	1400.00
14400.000	1600.00	611.70	0.48	0.60	0.0	252.98	1400.00
14400.000	2200.00	613.21	1.52	0.45	0.0	269.08	1400.00
15625.000	900.00	610.83	0.0	0.74	0.0	213.19	1245.00
15625.000	1400.00	611.90	1.07	0.69	0.0	243.14	1245.00
15625.000	1600.00	612.33	0.43	0.63	0.0	255.24	1245.00
15625.000	2200.00	613.69	1.36	0.47	0.0	293.27	1245.00
15825.000	900.00	610.96	0.0	0.13	0.0	29.52	190.00
15825.000	1400.00	611.94	0.99	0.05	0.0	29.52	190.00
15825.000	1600.00	612.33	0.38	-0.00	0.0	29.52	190.00
15825.000	2200.00	613.51	1.18	-0.18	0.0	29.52	190.00
15826.000	900.00	610.96	0.0	0.00	0.0	29.52	1.00
15826.000	1400.00	611.95	0.99	0.00	0.0	29.52	1.00
15826.000	1600.00	612.33	0.38	0.00	0.0	29.52	1.00
15826.000	2200.00	613.51	1.18	0.00	0.0	29.52	1.00
15827.000	900.00	611.12	0.0	0.16	0.0	29.52	96.80
15827.000	1400.00	612.23	1.11	0.28	0.0	29.52	96.80
15827.000	1600.00	612.65	0.43	0.33	0.0	29.52	96.80
15827.000	2200.00	613.96	1.31	0.45	0.0	29.52	96.80
15828.000	900.00	611.12	0.0	0.00	0.0	29.52	1.00
15828.000	1400.00	612.23	1.11	0.00	0.0	29.52	1.00
15828.000	1600.00	612.66	0.43	0.00	0.0	29.52	1.00
15828.000	2200.00	613.97	1.31	0.00	0.0	29.52	1.00
16225.000	900.00	611.56	0.0	0.44	0.0	40.00	330.00
16225.000	1400.00	612.98	1.42	0.76	0.0	40.00	330.00
16225.000	1600.00	613.54	0.55	0.88	0.0	40.00	330.00
16225.000	2200.00	615.17	1.63	1.20	0.0	40.00	330.00
16226.000	900.00	611.56	0.0	0.00	0.0	40.00	1.00
16226.000	1400.00	612.98	1.42	0.00	0.0	40.00	1.00
16226.000	1600.00	613.54	0.55	0.00	0.0	40.00	1.00
16226.000	2200.00	615.17	1.63	0.00	0.0	40.00	1.00
16227.000	900.00	611.61	0.0	0.05	0.0	40.00	118.00
16227.000	1400.00	613.06	1.45	0.08	0.0	40.00	118.00
16227.000	1600.00	613.62	0.56	0.09	0.0	40.00	118.00
16227.000	2200.00	615.28	1.66	0.11	0.0	40.00	118.00
16228.000	900.00	611.61	0.0	0.00	0.0	40.00	1.00
16228.000	1400.00	613.06	1.45	0.00	0.0	40.00	1.00
16228.000	1600.00	613.62	0.56	0.00	0.0	40.00	1.00
16228.000	2200.00	615.28	1.66	0.00	0.0	40.00	1.00
16375.000	900.00	611.63	0.0	0.02	0.0	40.00	80.00
16375.000	1400.00	613.09	1.46	0.03	0.0	40.00	80.00
16375.000	1600.00	613.66	0.57	0.04	0.0	40.00	80.00
16375.000	2200.00	615.32	1.67	0.05	0.0	40.00	80.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
16376.000	900.00	611.63	0.0	0.00	0.0	40.00	1.00
16376.000	1400.00	613.09	1.46	0.00	0.0	40.00	1.00
16376.000	1600.00	613.66	0.57	0.00	0.0	40.00	1.00
16376.000	2200.00	615.32	1.67	0.00	0.0	40.00	1.00
16377.000	900.00	611.64	0.0	0.01	0.0	40.00	29.60
16377.000	1400.00	613.11	1.47	0.02	0.0	40.00	29.60
16377.000	1600.00	613.68	0.57	0.02	0.0	40.00	29.60
16377.000	2200.00	615.35	1.67	0.03	0.0	40.00	29.60
16378.000	900.00	611.64	0.0	0.00	0.0	40.00	1.00
16378.000	1400.00	613.11	1.47	0.00	0.0	40.00	1.00
16378.000	1600.00	613.68	0.57	0.00	0.0	40.00	1.00
16378.000	2200.00	615.35	1.67	0.00	0.0	40.00	1.00
16450.000	900.00	611.79	0.0	0.15	0.0	237.70	155.00
16450.000	1400.00	613.38	1.58	0.26	0.0	240.39	155.00
16450.000	1600.00	613.99	0.61	0.31	0.0	241.43	155.00
16450.000	2200.00	615.78	1.79	0.43	0.0	244.47	155.00
24250.000	900.00	611.92	0.0	0.13	0.0	281.36	810.00
24250.000	1400.00	613.48	1.56	0.10	0.0	335.00	810.00
24250.000	1600.00	614.08	0.60	0.09	0.0	335.00	810.00
24250.000	2200.00	615.85	1.77	0.07	0.0	335.00	810.00
25500.000	900.00	612.28	0.0	0.35	0.0	241.08	1250.00
25500.000	1400.00	613.72	1.45	0.24	0.0	330.79	1250.00
25500.000	1600.00	614.29	0.56	0.21	0.0	365.87	1250.00
25500.000	2200.00	615.98	1.70	0.13	0.0	441.52	1250.00
26350.000	900.00	612.50	0.0	0.22	0.0	392.71	810.00
26350.000	1400.00	613.90	1.40	0.18	0.0	420.64	810.00
26350.000	1600.00	614.45	0.55	0.16	0.0	430.00	810.00
26350.000	2200.00	616.10	1.64	0.11	0.0	430.00	810.00
26400.000	900.00	612.45	0.0	-0.05	0.0	339.10	40.00
26400.000	1400.00	613.89	1.44	-0.02	0.0	403.76	40.00
26400.000	1600.00	614.44	0.55	-0.01	0.0	428.96	40.00
26400.000	2200.00	616.09	1.65	-0.01	0.0	503.15	40.00
26401.000	900.00	612.45	0.0	0.01	0.0	339.14	1.00
26401.000	1400.00	613.90	1.44	0.01	0.0	403.77	1.00
26401.000	1600.00	614.45	0.55	0.01	0.0	428.55	1.00
26401.000	2200.00	616.09	1.65	0.00	0.0	502.74	1.00
26402.000	900.00	612.78	0.0	0.33	0.0	354.12	41.00
26402.000	1400.00	613.96	1.18	0.07	0.0	407.29	41.00
26402.000	1600.00	614.49	0.53	0.05	0.0	430.66	41.00
26402.000	2200.00	616.11	1.62	0.02	0.0	503.61	41.00
26403.000	900.00	612.78	0.0	-0.00	0.0	354.24	1.00
26403.000	1400.00	613.96	1.18	-0.00	0.0	407.34	1.00
26403.000	1600.00	614.49	0.53	-0.00	0.0	430.97	1.00
26403.000	2200.00	616.11	1.62	-0.00	0.0	503.79	1.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
26450.000	900.00	612.82	0.0	0.04	0.0	355.75	45.00
26450.000	1400.00	613.98	1.17	0.02	0.0	386.01	45.00
26450.000	1600.00	614.50	0.52	0.02	0.0	395.00	45.00
26450.000	2200.00	616.12	1.61	0.01	0.0	395.00	45.00
27200.000	900.00	613.11	0.0	0.30	0.0	165.79	630.00
27200.000	1400.00	614.23	1.11	0.24	0.0	198.55	630.00
27200.000	1600.00	614.71	0.49	0.21	0.0	212.93	630.00
27200.000	2200.00	616.25	1.54	0.13	0.0	258.07	630.00

SUMMARY OF ERRORS

RECEIVED
DEC 15 1980
WATER MANAGEMENT

GCVEA	JGOVEDSS	1710	GO.FT06F001	6.37.53	15 DEC 81	STURGEON CREEK	CREEK
GCVEA	JGOVEDSS	171C	GO.FT06F001	6.37.53	15 DEC 81	STURGEON CREEK	CREEK
GCVEA	JGOVEDSS	1710	GO.FT06F001	6.37.53	15 DEC 81	STURGEON CREEK	CREEK

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  HEC2 RELEASE DATED NOV 76 UPDATED JULY1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
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C
T1       STURGEON CREEK AT MIDLAND, PROJECT NO.8543,STURG2
T2       STURGEON CREEK
T3       STURGEON CREEK

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      0.        4.        0.        0.  0.0         0.0       0.0       0.     608.000   0.0

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    1.000     0.0      -1.000     0.0       0.0       0.0       0.0       0.0       0.0       0.0

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

  150.000   110.000   200.000    0.0       0.0       0.0       0.0       0.0       0.0       0.0

NC      0.040     0.040     0.035     0.100     0.300     0.0       0.0       0.0       0.0       0.0
QT      5.000  1050.000  1600.000  1850.000  2500.000  1850.000  0.0       0.0       0.0       0.0

        A EMERSON PARK ROAD BRIDGE,LC 607,TR 610.4,WIDTH 32.

X1     50.000    10.000   505.000   546.000    25.000    25.000    25.000     0.0       0.0       0.0
GR    608.700     0.0     608.700   300.000   610.400   505.000   591.200   505.000   591.000   520.000
GR    591.400   533.000   590.600   546.000   610.500   546.000   609.800   800.000   610.100  1000.000
NC      0.0       0.0       0.025     0.0       0.0       0.0       0.0       0.0       0.0       0.0

X1     51.000     0.0       0.0       0.0      25.000    25.000    25.000     0.0       0.0       0.0
X3     10.000     0.0       0.0       0.0       0.0       0.0       0.0     609.000   609.000     0.0
SB      0.0      1.520     3.000     0.0      41.000     0.0     651.900     0.0     590.600     0.0

X1     52.000     0.0       0.0       0.0      32.000    32.000    32.000     0.0       0.0       0.0
X2      0.0       0.0       3.000   607.000   610.400     0.0       0.0       0.0       0.0       0.0
X3     10.000     0.0       0.0       0.0       0.0       0.0       0.0     610.400   610.400     0.0
BT      4.000   300.000   608.700   608.700   505.000   610.400   607.000   546.000   610.500   607.000
BT    800.000   609.800   609.800     0.0       0.0       0.0       0.0       0.0       0.0       0.0

        B C&O R.R.BRIDGE.LC 607.2,TR 614,WIDTH 10'

X1    100.000    10.000   505.000   543.000    11.000    11.000    11.000     0.0       0.0       0.0
X3     10.000     0.0       0.0       0.0       0.0       0.0       0.0     610.000   610.000     0.0
GR    614.600     0.0     614.400   300.000   614.100   505.000   595.200   505.000   594.700   518.000
GR    594.800   531.000   595.300   543.000   614.000   543.000   614.400   800.000   614.500  1000.000
SB      0.0      1.540     3.000     0.0      41.000     0.0     651.900     0.0     590.600     0.0

X1    102.000     0.0       0.0       0.0      25.000    25.000    25.000     0.0       0.0       0.0
X2      0.0       0.0       0.0     607.200   614.000     0.0       0.0       0.0       0.0       0.0
X3     10.000     0.0       0.0       0.0       0.0       0.0       0.0     614.000   614.000     0.0
BT     10.000     0.0     614.600   614.600   300.000   614.400   614.400   505.000   614.100   614.100
BT    505.100   614.000   607.200   518.000   614.000   607.200   531.000   614.000   607.200   543.000
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BT    614.000    607.200    543.100    614.000    614.000    800.000    614.400    614.400   1000.000    614.500
BT    614.500      0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0

      C MAIN ST.CULVERT,CROWN-607.6,INVERT 591.9,TR 611.6

        STRUCTURAL PLATE CORRUGATED METAL PIPE D 15FT,L 65FT

X1    150.000     26.000    492.500    525.500     25.000     25.000     25.000      0.0        0.0        0.0
X3     10.000      0.0        0.0        0.0        0.0        0.0        0.0      611.000    611.000      0.0
GR    616.200      0.0      612.500    300.000    600.100    492.500    597.600    493.000    595.700    494.000
GR    593.800    496.000    592.900    498.000    592.600    500.000    592.900    502.000    593.800    504.000
GR    595.700    506.000    597.600    507.000    600.100    507.500    599.400    510.500    596.800    511.000
GR    594.900    512.000    593.000    514.000    592.100    516.000    591.900    518.000    592.100    520.000
GR    593.000    522.000    594.900    524.000    596.800    525.000    599.400    525.500    611.600    800.000
GR    611.600   1000.000      0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
SB      0.0       2.050      3.000      0.0       26.000      0.0      353.400      0.0      591.900      0.0

X1    151.000      0.0        0.0        0.0       1.000      1.000      1.000      0.0        0.0        0.0
X2      0.0        0.0       1.000    606.900    611.900      0.0        0.0        0.0        0.0        0.0
X3     10.000      0.0        0.0        0.0        0.0        0.0        0.0      611.000    611.000      0.0
BT     24.000    300.000    612.500    612.500    492.500    611.600    600.100    493.000    611.600    602.700
BT    494.000    611.600    604.600    496.000    611.600    606.400    498.000    611.600    607.300    500.000
BT    611.600    607.600    502.000    611.600    607.300    504.000    611.600    605.400    506.000    611.600
BT    604.600    507.000    611.600    602.700    507.500    611.600    600.100    510.500    611.600    599.400
BT    511.000    611.600    602.000    512.000    611.600    603.800    514.000    611.600    605.800    516.000
BT    611.600    606.600    518.000    611.600    606.900    520.000    611.600    606.600    522.000    611.600
BT    605.800    524.000    611.600    603.800    525.000    611.600    602.000    525.500    611.600    599.400
BT    800.000    611.600    611.600      0.0        0.0        0.0        0.0        0.0        0.0        0.0

X1    153.000      0.0        0.0        0.0      100.000    100.000    100.000      0.0        0.0        0.0
X3      0.0        0.0        0.0      450.000      0.0      550.000      0.0        0.0        0.0        0.0
NC     0.060      0.060      0.035      0.300      0.500      0.0        0.0        0.0        0.0        0.0
ET      0.0        0.0        0.0        0.0        0.0      9.100      0.0        0.0      293.000    514.000

      D PONDING AREA U/S OF MAIN ST. CULVERT

X1    650.000     18.000    293.000    514.000    400.000    400.000    400.000      0.0        0.0        0.0
GR    615.000      0.0      607.400    244.000    599.100    271.000    597.300    293.000    596.600    295.000
GR    591.700    315.000    591.400    340.000    591.200    365.000    591.700    390.000    594.300    410.000
GR    596.600    433.000    592.500    450.000    591.600    470.000    592.500    490.000    596.600    510.000
GR    598.800    514.000    610.800    567.000    611.600    587.000      0.0        0.0        0.0        0.0
NC     0.060      0.060      0.045      0.100      0.300      0.0        0.0        0.0        0.0        0.0
ET      0.0        0.0        0.0        0.0        0.0      9.100      0.0        0.0       76.000    450.000

      E

X1   1950.000     13.000     76.000    117.000   1305.000   1345.000   1320.000      0.0        0.0        0.0
GR    612.100      0.0      609.500     30.000    597.000     76.000    594.800     85.000    591.500     95.000
GR    592.900    105.000    597.000    115.000    598.300    117.000    597.600    173.000    598.400    260.000
GR    597.000    273.000    597.400    470.000    609.600    505.000      0.0        0.0        0.0        0.0
ET      0.0        0.0        0.0        0.0        0.0      9.100      0.0        0.0      385.000    707.000

      F

X1   3825.000     12.000    667.000    707.000   1580.000   1505.000   1815.000      0.0        0.0        0.0
GR    615.200      0.0      610.900    100.000    604.600    300.000    601.600    384.000    599.300    667.000
GR    595.700    673.000    593.900    680.000    593.200    690.000    595.700    697.000    604.400    707.000
GR    610.500    737.000    611.100    754.000      0.0        0.0        0.0        0.0        0.0        0.0
ET      0.0        0.0        0.0        0.0        0.0      9.100      0.0        0.0      125.000    220.000
```

G MANUFACTURED

X1	5550.000	10.000	170.000	210.000	1435.000	1355.000	1620.000	0.0	0.0	0.0
GR	611.400	0.0	610.000	30.000	605.000	110.000	597.800	170.000	595.500	180.000
GR	593.300	190.000	596.000	200.000	597.800	210.000	605.000	230.000	610.000	280.000
NC	0.0	0.0	0.0	0.300	0.500	0.0	0.0	0.0	0.0	0.0

H SUGNET ROAD CULVERT CROWN 608.7,TR 610.8,INVERT 595.0

STRUCTURAL PLATE PIPE D 13.5FT,L 67FT

X1	5700.000	22.000	493.000	525.000	150.000	90.000	135.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	610.000	610.000	0.0
GR	611.400	0.0	611.400	300.000	601.800	493.000	598.600	494.000	596.300	496.000
GR	595.300	498.000	595.000	500.000	595.300	502.000	596.300	504.000	598.600	506.000
GR	601.800	507.000	602.000	511.000	598.800	512.000	596.500	514.000	595.400	516.000
GR	595.200	518.000	595.400	520.000	596.500	522.000	598.800	524.000	602.000	525.000
GR	611.100	800.000	611.400	1000.000	0.0	0.0	0.0	0.0	0.0	0.0

X1	5701.000	0.0	0.0	0.0	5.000	5.000	5.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	610.000	610.000	0.0
BT	20.000	300.000	611.400	611.400	493.000	610.800	601.800	494.000	610.800	604.800
BT	496.000	610.800	607.200	498.000	610.800	608.200	500.000	610.800	608.500	502.000
BT	610.800	608.200	504.000	610.800	607.200	506.000	610.800	604.800	507.000	610.800
BT	601.800	511.000	610.800	602.000	512.000	610.800	605.000	514.000	610.800	607.400
BT	516.000	610.800	608.400	518.000	610.800	608.700	520.000	610.800	608.400	522.000
BT	610.800	607.400	524.000	610.800	605.000	525.000	610.800	602.000	800.000	611.100
BT	611.100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

X1	5702.000	0.0	0.0	0.0	67.000	67.000	67.000	0.0	0.0	0.0
X2	0.0	0.0	0.0	0.0	0.0	0.0	1.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	610.800	610.800	0.0

X1	5703.000	0.0	0.0	0.0	5.000	5.000	5.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	610.800	610.800	0.0

I

X1	5900.000	11.000	493.000	525.000	95.000	85.000	100.000	0.0	0.0	0.0
X3	0.0	0.0	0.0	470.000	0.0	550.000	0.0	0.0	0.0	0.0
GR	615.000	200.000	610.000	290.000	605.000	400.000	604.300	493.000	597.800	498.000
GR	594.900	506.000	595.500	514.000	597.800	522.000	601.000	525.000	605.000	570.000
GR	610.000	620.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NC	0.070	0.070	0.045	0.100	0.300	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	9.100	0.0	0.0	240.000	560.000

J MANUFACTURED,D/S FROM THE CONFLUENCE POINT WITH INMAN DRAIN

X1	6250.000	13.000	493.000	525.000	250.000	365.000	400.000	0.0	0.0	0.0
GR	615.000	20.000	610.000	100.000	605.000	220.000	602.000	300.000	604.300	493.000
GR	598.600	498.000	595.700	506.000	596.300	514.000	598.600	522.000	601.000	525.000
GR	603.000	550.000	605.000	570.000	610.000	620.000	0.0	0.0	0.0	0.0
QT	5.000	900.000	1400.000	1600.000	2200.000	1600.000	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	9.100	0.0	0.0	450.000	680.000

K MANUFACTURED,U/S FROM THE CONFLUENCE POINT WITH INMAN DRAIN

X1	6750.000	12.000	550.000	582.000	330.000	460.000	410.000	0.0	0.0	0.0

GR	615.000	220.000	610.000	300.000	605.000	430.000	604.300	550.000	599.400	555.000
GR	596.500	563.000	597.100	571.000	599.400	579.000	601.000	582.000	605.000	690.000
GR	610.000	770.000	612.000	1060.000	0.0	0.0	0.0	0.0	0.0	0.0
NC	0.070	0.070	0.050	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	9.100	0.0	0.0	150.000	380.000

L

X1	7875.000	13.000	200.000	220.000	850.000	1135.000	1240.000	0.0	0.0	0.0
GR	612.600	0.0	611.800	100.000	604.300	150.000	603.000	200.000	599.600	205.000
GR	597.900	210.000	599.600	215.000	601.400	220.000	600.800	300.000	606.600	400.000
GR	612.000	450.000	613.100	500.000	613.200	600.000	0.0	0.0	0.0	0.0
NC	0.060	0.060	0.035	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	9.100	0.0	0.0	370.000	680.000

M

X1	8125.000	10.000	497.000	544.000	545.000	580.000	610.000	0.0	0.0	0.0
GR	610.000	260.000	605.000	430.000	604.600	497.000	600.400	500.000	598.100	515.000
GR	598.400	530.000	600.400	540.000	601.100	544.000	605.000	640.000	607.000	700.000
NC	0.0	0.0	0.0	0.300	0.500	0.0	0.0	0.0	0.0	0.0

N SAGINAW ROAD BRIDGE,LC 613.5,TR 617.5,WIDTH 48,LENGTH 46

X1	8175.000	8.000	503.000	549.000	195.000	185.000	200.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	617.500	617.500	0.0
GR	617.400	0.0	617.300	300.000	599.500	503.000	598.400	518.000	598.300	533.000
GR	599.000	549.000	617.200	700.000	617.000	1000.000	0.0	0.0	0.0	0.0

X1	8176.000	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	617.500	617.500	0.0
BT	4.000	300.000	617.300	617.300	503.000	617.500	613.500	549.000	617.500	613.500
BT	700.000	617.200	617.200	0.0	0.0	0.0	0.0	0.0	0.0	0.0

X1	8177.000	0.0	0.0	0.0	48.000	48.000	48.000	0.0	0.0	0.0
X2	0.0	0.0	0.0	0.0	0.0	0.0	1.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	617.500	617.500	0.0

X1	8178.000	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	617.500	617.500	0.0

O 6FT WIDE FORT BRIDGE,LC 614.,TR 617.1

X1	8225.000	13.000	495.000	560.000	20.000	20.000	20.000	0.0	0.0	0.0
GR	616.000	0.0	614.900	300.000	617.100	495.000	609.700	495.000	600.400	519.000
GR	599.600	527.000	599.900	535.000	600.400	544.000	602.300	550.000	614.000	560.000
GR	617.200	562.000	617.200	700.000	616.600	1000.000	0.0	0.0	0.0	0.0

X1	8226.000	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0
BT	4.000	300.000	614.900	614.900	495.000	617.100	614.000	560.000	617.100	614.000
BT	700.000	617.200	617.200	0.0	0.0	0.0	0.0	0.0	0.0	0.0

X1	8227.000	0.0	0.0	0.0	6.000	6.000	6.000	0.0	0.0	0.0
X2	0.0	0.0	0.0	0.0	0.0	0.0	1.000	0.0	0.0	0.0

X1	8228.000	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0

ET	0.0	0.0	0.0	0.0	0.0	9.100	0.0	0.0	355.000	390.000

P MANUFACTURED

X1	8325.000	9.000	376.000	392.000	140.000	130.000	120.000	0.0	0.0	0.0
GR	610.000	300.000	605.000	335.000	601.800	376.000	600.500	378.000	599.700	383.000
GR	599.100	388.000	600.500	392.000	605.000	430.000	606.000	600.000	0.0	0.0
NC	0.100	0.100	0.045	0.100	0.300	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	9.100	0.0	0.0	100.000	420.000

Q

X1	10100.000	11.000	376.000	426.000	885.000	905.000	1215.000	0.0	0.0	0.0
GR	613.500	0.0	606.200	100.000	603.800	200.000	603.100	300.000	602.600	376.000
GR	601.300	378.000	600.500	383.000	599.900	388.000	601.300	392.000	613.600	426.000
GR	614.800	495.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NC	0.070	0.070	0.045	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	9.100	0.0	0.0	155.000	405.000

R

X1	12100.000	13.000	360.000	392.000	1725.000	1995.000	1980.000	0.0	0.0	0.0
GR	617.700	0.0	616.600	100.000	605.800	158.000	605.100	300.000	605.300	360.000
GR	602.100	364.000	600.800	373.000	600.300	380.000	602.100	390.000	605.100	392.000
GR	605.100	406.000	613.400	424.000	612.100	500.000	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	9.100	0.0	0.0	25.000	230.000

S

X1	12900.000	14.000	34.000	60.000	745.000	790.000	800.000	0.0	0.0	0.0
GR	617.700	0.0	616.900	9.000	612.600	18.000	604.000	25.000	604.600	34.000
GR	602.800	39.000	601.400	44.000	601.800	49.000	602.800	54.000	606.700	60.000
GR	606.800	229.000	612.600	246.000	617.600	283.000	618.000	296.000	0.0	0.0
NC	0.070	0.070	0.035	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	9.100	0.0	0.0	75.000	335.000

T

X1	14400.000	10.000	264.000	335.000	1390.000	1230.000	1400.000	0.0	0.0	0.0
GR	616.600	0.0	615.800	33.000	607.300	90.000	607.700	264.000	604.400	270.000
GR	602.800	275.000	602.000	280.000	604.400	285.000	617.200	335.000	621.700	406.000
ET	0.0	0.0	0.0	0.0	0.0	9.100	0.0	0.0	210.000	410.000

U MANUFACTURED

X1	15625.000	10.000	264.000	285.000	1245.000	1070.000	1245.000	0.0	0.0	0.0
GR	615.000	170.000	610.000	210.000	607.700	264.000	606.200	270.000	604.600	275.000
GR	603.800	280.000	606.200	285.000	610.000	400.000	615.000	500.000	620.000	620.000
NC	0.070	0.070	0.040	0.300	0.500	0.0	0.0	0.0	0.0	0.0

V PROPOSED WACKERLY ROAD BRIDGE,LC 615.7,TR 621.3

WIDTH 96.8FT,LENGTH 41.FT

X1	15825.000	8.000	300.000	341.000	175.000	215.000	190.000	0.720	0.0	0.0
GR	621.300	200.000	621.300	300.000	604.900	300.000	603.700	302.000	603.700	339.000
GR	604.900	341.000	621.300	341.000	621.300	400.000	0.0	0.0	0.0	0.0

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X1   15828.000      0.0        0.0        0.0        1.000      1.000      1.000      0.0        0.0        0.0
X2       0.0        0.0        0.0      615.700    621.300      0.0        0.0        0.0        0.0        0.0

X1   15827.000      0.0        0.0        0.0       96.800     96.800     96.800      0.0        0.0        0.0
X2       0.0        0.0        0.0      615.700    621.300      0.0        0.0        0.0        0.0        0.0

X1   15828.000      0.0        0.0        0.0        1.000      1.000      1.000      0.0        0.0        0.0

        W M-11 HIGHWAY BRIDGE,LC 617.1,TR 621.6

          WIDTH 118FT WITH 25FT OPEN AREA IN MIDDLE - SIDE WALLS

          ARE CONTINUOUS

X1   16225.000      7.000    103.000    143.000    330.000    330.000    330.000      0.0        0.0        0.0
GR     621.600    100.000    621.600    103.000    603.100    103.000    601.800    123.000    603.800    143.000
GR     621.600    143.000    621.600    150.000      0.0        0.0        0.0        0.0        0.0        0.0

X1   16226.000      0.0        0.0        0.0        1.000      1.000      1.000      0.0        0.0        0.0
X2       0.0        0.0        0.0      617.100    621.600      0.0        0.0        0.0        0.0        0.0

X1   16227.000      0.0        0.0        0.0      118.000    118.000    118.000      0.0        0.0        0.0
X2       0.0        0.0        0.0      617.100    621.600      0.0        0.0        0.0        0.0        0.0

X1   16228.000      0.0        0.0        0.0        1.000      1.000      1.000      0.0        0.0        0.0
NC       0.060      0.040      0.035      0.0        0.0        0.0        0.0        0.0        0.0        0.0

        X AIRPORT ROAD BRIDGE,MAX LC 620.6,MIN TR 622.7,WIDTH 29.6 ,LENGTH 40.

X1   16375.000      8.000     53.000     93.000     80.000     80.000     80.000      0.0        0.0        0.0
GR     624.700     50.000    624.600     53.000    603.500     53.000    603.500     65.000    603.700     80.000
GR     603.400     93.000    622.800     93.000    622.700     96.000      0.0        0.0        0.0        0.0

X1   16376.000      0.0        0.0        0.0        1.000      1.000      1.000      0.0        0.0        0.0
BT       4.000     50.000    624.700    624.700     53.000    624.600    620.600     93.000    622.800    618.800
BT      96.000    622.700    622.700      0.0        0.0        0.0        0.0        0.0        0.0        0.0

X1   16377.000      0.0        0.0        0.0       29.600     29.600     29.600      0.0        0.0        0.0
X2       0.0        0.0        0.0        0.0        0.0        0.0      1.000      0.0        0.0        0.0

X1   16378.000      0.0        0.0        0.0        1.000      1.000      1.000      0.0        0.0        0.0

        Y

X1   16450.000     10.000    258.000    292.000    135.000    130.000    155.000      0.0        0.0        0.0
X3       0.0        0.0        0.0      100.000      0.0      370.000      0.0        0.0        0.0        0.0
GR     632.000     98.000    610.200    135.000    607.600    258.000    605.700    262.000    603.700    270.000
GR     604.000    280.000    605.700    290.000    607.500    292.000    617.300    640.000    622.400   1170.000
NC       0.0        0.0        0.0        0.100      0.300      0.0        0.0        0.0        0.0        0.0

        Z MANUFACTURED

X1   24250.000      9.000    315.000    345.000    675.000    625.000    810.000      0.0        0.0        0.0
X3       0.0        0.0        0.0      145.000      0.0      480.000      0.0        0.0        0.0        0.0
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GR     615.000       0.0     615.000     250.000     606.800     315.000     604.800     325.000     604.900     335.000
GR     606.600     345.000   610.000     370.000     615.000     540.000     620.000     650.000       0.0         0.0
ET       0.0         0.0       0.0         0.0         0.0         9.100       0.0         0.0       110.000     430.000

         AA MANUFACTURED

X1   25500.000      10.000   310.000     340.000    1110.000    1085.000    1250.000       0.0         0.0         0.0
GR     620.000       0.0     615.000      50.000     610.000     270.000     607.500     310.000     605.500     320.000
GR     605.800     330.000   607.500     340.000     610.000     370.000     615.000     460.000     620.000     570.000
NC       0.070       0.070     0.040       0.0         0.0         0.0         0.0         0.0         0.0         0.0

         AB

X1   26350.000       9.000   354.000     386.000     765.000     765.000     810.000       0.0         0.0         0.0
X3       0.0         0.0       0.0        60.000       0.0       490.000       0.0         0.0         0.0         0.0
GR     609.200       0.0     608.000     180.000     609.500     354.000     606.300     366.000     609.500     386.000
GR     609.500     400.000   613.200     465.000     617.900     570.000     619.800    1016.000       0.0         0.0
ET       0.0         0.0       0.0         0.0         0.0         9.100       0.0         0.0       110.000     475.000

         AC CULVERT-SOUTH OF MOBILE HOME PARK, CROWN 609.5,TR 611.6

           CORRUGATED METAL PIPE,3-36IN X 41FT

X1   26400.000      22.000   338.500     357.500      25.000      35.000      40.000       0.0         0.0         0.0
GR     618.000       0.0     610.600     180.000     611.800     316.000     608.000     333.500     606.900     339.000
GR     606.500     340.000   606.900     341.000     608.000     341.500     608.000     347.500     606.900     348.000
GR     606.500     349.000   606.900     350.000     608.000     350.500     608.000     354.500     606.900     355.000
GR     606.500     356.000   606.900     357.000     608.000     357.500     611.100     400.000     612.000     465.000
GR     617.100     570.000   620.200    1016.000       0.0         0.0         0.0         0.0         0.0         0.0

X1   26401.000       0.0       0.0         0.0         1.000       1.000       1.000       0.0         0.0         0.0
BT      19.000       0.0     618.000     618.000     180.000     610.600     610.600     316.000     611.800     611.800
BT     338.500     611.600   608.000     339.000     611.600     609.000     340.000     611.600     609.500     341.000
BT     611.600     609.000   341.500     611.600     608.000     347.500     611.600     608.000     348.000     611.600
BT     609.000     349.000   611.600     609.900     350.000     611.600     609.000     350.500     611.600     608.000
BT     354.500     611.600   608.000     355.000     611.600     609.000     356.000     611.600     609.500     357.500
BT     611.600     608.000   400.000     611.100     611.100     465.000     612.000     612.000       0.0         0.0

X1   26402.000       0.0       0.0         0.0        41.000      41.000      41.000       0.0         0.0         0.0
X2       0.0         0.0       0.0         0.0         0.0         0.0         1.000       0.0         0.0         0.0

X1   26403.000       0.0       0.0         0.0         1.000       1.000       1.000       0.0         0.0         0.0

         AD

X1   26450.000       0.0       0.0         0.0        25.000      45.000      45.000       0.0         0.0         0.0
X3       0.0         0.0       0.0       120.000       0.0       515.000       0.0         0.0         0.0         0.0
NC       0.035       0.060     0.040       0.100       0.300       0.0         0.0         0.0         0.0         0.0
ET       0.0         0.0       0.0         0.0         0.0         9.100       0.0         0.0       120.000     490.000

         AE

X1   27200.000      10.000   146.000     205.000     635.000     665.000     630.000       0.0         0.0         0.0
GR     622.000       0.0     616.300      86.000     612.000     110.000     609.400     146.000     608.100     149.000
GR     604.500     159.000   606.600     182.000     608.100     195.000     610.400     205.000     621.400     467.000
EJ       0.0         0.0       0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0
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*PROF 1

CCHV    0.100 CEHV    0.300
*SECNO 50.000
   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


        A EMERSON PARK ROAD BRIDGE,LC 607,TR 610.4,WIDTH 32.

    50.00     17.40    608.00      0.0     608.00    608.11      0.11      0.0       0.0     610.40
    1850.        0.     1850.        0.        0.      693.        0.        0.        0.     610.50
     0.0       0.0      2.67      0.0      0.040     0.035     0.040      0.0     590.60     505.00
 0.000205       25.       25.       25.         0         0         0     -0.00     41.00     546.00

*SECNO 51.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       609.00 ELREA       609.00

    51.00     17.40    608.00      0.0       0.0     608.11      0.11      0.00      0.00     610.40
    1850.        0.     1850.        0.        0.      693.        0.        0.        0.     610.50
     0.00       0.0      2.67      0.0      0.040     0.025     0.040     0.024    590.60     505.00
 0.000104       25.       25.       25.         0         0         0     -0.00     41.00     546.00


SPECIAL BRIDGE

SB  XK         XKOR       COFQ       RDLEN      BWC        BWP        BAREA      SS         ELCHU      ELCHD
     0.0        1.52       3.00       0.0       41.00       0.0      651.90      0.0       590.60      0.0

*SECNO 52.000
PRESSURE FLOW

 EGPRS       EGLWC        H3        QWEIR       QPR        BAREA    TRAPEZOID       ELLC      ELTRD
                                                                       AREA
   608.19     608.11       0.0          0.      1850.       652.       672.       607.00     610.40


3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       610.40 ELREA       610.40

    52.00     17.48    608.08      0.0       0.0     608.19      0.11      0.08      0.0     610.40
    1850.        0.     1850.        0.        0.      696.        0.        1.        0.     610.50
     0.01       0.0      2.66      0.0      0.040     0.025     0.040     0.024    590.60     505.00
 0.000103       32.       32.       32.         2         0         0     -0.00     41.00     546.00

*SECNO 100.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       610.00 ELREA       610.00


        B C&O R.R.BRIDGE.LC 607.2,TR 614,WIDTH 10'

   100.00     13.31    608.01      0.0       0.0     608.23      0.21      0.00      0.03     614.10
    1850.        0.     1850.        0.        0.      498.        0.        1.        0.     614.00
     0.01       0.0      3.72      0.0      0.040     0.025     0.040     0.024    594.70     505.00
 0.000251       11.       11.       11.         2         0         0     -0.00     38.00     543.00
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SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.0	1.54	3.00	0.0	41.00	0.0	651.90	0.0	590.60	0.0

*SECNO 102.000

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 10 MIN ELTRD 614.00 MAX ELLC 607.20

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA 614.00 ELREA 614.00

102.00	13.31	608.01	0.0	0.0	608.24	0.23	0.01	0.01	614.10
1850.	0.	1850.	0.	0.	477.	0.	1.	0.	614.00
0.01	0.0	3.88	0.0	0.040	0.025	0.040	0.024	594.70	505.00
0.000458	25.	25.	25.	0	0	0	-21.03	38.00	543.00

*SECNO 150.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA 611.00 ELREA 611.00

C MAIN ST.CULVERT,CROWN-607.6,INVERT 591.9,TR 611.6

STRUCTURAL PLATE CORRUGATED METAL PIPE D 15FT,L 65FT

150.00	16.09	607.99	0.0	0.0	608.26	0.27	0.01	0.01	600.10
1850.	0.	1850.	0.	0.	445.	0.	2.	0.	599.40
0.01	0.0	4.16	0.0	0.040	0.025	0.040	0.024	591.90	492.50
0.000265	25.	25.	25.	2	0	0	-0.03	33.00	525.50

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.0	2.05	3.00	0.0	26.00	0.0	353.40	0.0	591.90	0.0

*SECNO 151.000
PRESSURE FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
608.86	608.26	0.0	0.	1850.	353.	390.	606.90	611.90

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA 611.00 ELREA 611.00

151.00	16.72	608.62	0.0	0.0	608.86	0.24	0.60	0.0	600.10
1850.	0.	1850.	0.	0.	466.	0.	2.	0.	599.40
0.01	0.0	3.97	0.0	0.040	0.025	0.040	0.024	591.90	492.50
0.000227	1.	1.	1.	2	0	0	-0.00	33.00	525.50

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*SECNO 153.000

3470 ENCROACHMENT STATIONS        450.0      550.0  TYPE        1  TARGET        100.000
   153.00     16.92    608.82      0.0        0.0    608.89      0.07      0.01      0.02    600.10
    1850.      382.     1196.     271.       312.     472.      217.        3.        0.    599.40
     0.02      1.22      2.53     1.25      0.040    0.025     0.040     0.024    591.90    450.00
 0.000091      100.      100.     100.          2        0         0     -0.01    100.00    550.00


CCHV     0.300 CEHV     0.500
*SECNO 650.000

        D PONDING AREA U/S OF MAIN ST. CULVERT

   650.00     17.71    608.91      0.0        0.0    608.92      0.00      0.00      0.02    597.30
    1850.      76.     1744.      30.       425.     3509.     226.       27.        2.    598.80
     0.26      0.18      0.50     0.13      0.060    0.035     0.060     0.031    591.20    195.38
 0.000003      400.      400.     400.          2        0         0     -0.02    363.29    558.67


CCHV     0.100 CEHV     0.300
*SECNO 1950.000
   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


        E

  1950.00     17.42    608.92      0.0        0.0    608.92      0.00      0.01      0.00    597.00
    1850.      59.      328.     1464.      262.     604.     4210.      168.       15.    598.30
     1.23      0.22      0.54     0.35      0.060    0.045     0.060     0.040    591.50     32.13
 0.000008     1305.     1320.    1345.          2        0         0     -0.02    470.93    503.05


*SECNO 3825.000

        F

  3825.00     15.74    608.94      0.0        0.0    608.95      0.00      0.02      0.00    599.30
    1850.     1431.      409.      10.      3188.     512.       50.      328.       34.    604.40
     2.08      0.45      0.80     0.20      0.060    0.045     0.060     0.045    593.20    162.49
 0.000023     1580.     1815.    1505.          0        0         0     -0.04    566.80    729.29


*SECNO 5550.000

        G MANUFACTURED

  5550.00     15.68    608.98      0.0        0.0    609.03      0.05      0.07      0.01    597.80
    1850.      548.     1108.     193.       581.     533.      230.      413.       47.    597.80
     2.34      0.94      2.08     0.84      0.060    0.045     0.060     0.046    593.30     46.45
 0.000130     1435.     1620.    1355.          1        0         0     -0.03    223.27    269.72


CCHV     0.300 CEHV     0.500
*SECNO 5700.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       610.00 ELREA       610.00


        H SUGNET ROAD CULVERT CROWN 608.7,TR 610.8,INVERT 595.0
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STRUCTURAL PLATE PIPE D 13.5FT,L 67FT

5700.00	13.85	608.85	0.0	0.0	609.24	0.40	0.04	0.18	601.80
1850.	0.	1850.	0.	0.	365.	0.	416.	47.	602.00
2.34	0.0	5.07	0.0	0.060	0.045	0.060	0.046	595.00	493.00
0.001518	150.	135.	90.	2	0	0	-0.00	32.00	525.00

*SECNO 5701.000

3370 NORMAL BRIDGE,NRD 20 MIN ELTRD 610.80 MAX ELLC 611.40

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA 610.00 ELREA 610.00

5701.00	13.73	608.73	0.0	0.0	609.39	0.67	0.01	0.13	601.80
1850.	0.	1850.	0.	0.	282.	0.	416.	47.	602.00
2.34	0.0	6.56	0.0	0.060	0.045	0.060	0.046	595.00	493.00
0.007961	5.	5.	5.	2	0	0	-762.69	32.00	525.00

*SECNO 5702.000

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 20 MIN ELTRD 610.80 MAX ELLC 611.40

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA 610.80 ELREA 610.80

5702.00	14.26	609.26	0.0	0.0	609.93	0.67	0.53	0.0	601.80
1850.	0.	1850.	0.	0.	282.	0.	416.	47.	602.00
2.35	0.0	6.56	0.0	0.060	0.045	0.060	0.046	595.00	493.00
0.007961	67.	67.	67.	2	0	0	-892.42	32.00	525.00

*SECNO 5703.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA 610.80 ELREA 610.80

5703.00	14.69	609.69	0.0	0.0	610.04	0.35	0.01	0.10	601.80
1850.	0.	1850.	0.	0.	392.	0.	417.	47.	602.00
2.35	0.0	4.72	0.0	0.060	0.045	0.060	0.046	595.00	493.00
0.001196	5.	5.	5.	2	0	0	-0.00	32.00	525.00

*SECNO 5900.000
3280 CROSS SECTION 5900.00 EXTENDED 0.03 FEET

3470 ENCROACHMENT STATIONS 470.0 550.0 TYPE 1 TARGET 80.000

I

5900.00	15.13	610.03	0.0	0.0	610.16	0.13	0.06	0.06	604.30
1850.	176.	1343.	331.	130.	412.	198.	418.	47.	601.00
2.36	1.36	3.26	1.67	0.060	0.045	0.060	0.046	594.90	470.00
0.000398	95.	100.	85.	2	0	0	-0.01	80.00	550.00

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CCHV     0.100 CEHV     0.300
*SECNO 6250.000
3280 CROSS SECTION    6250.00 EXTENDED       0.21 FEET


        J MANUFACTURED,D/S FROM THE CONFLUENCE POINT WITH INMAN DRAIN

  6250.00     14.51    610.21      0.0       0.0    610.21      0.01      0.04      0.01    604.30
    1850.     1156.     463.     232.     2223.     395.     465.      431.       49.    601.00
     2.50      0.52     1.17     0.50     0.070    0.045    0.070     0.046    595.70     96.70
 0.000052      250.     400.     365.         2        0        0     -0.03    523.30    620.00


*SECNO 6750.000

        K MANUFACTURED,U/S FROM THE CONFLUENCE POINT WITH INMAN DRAIN

  6750.00     13.73    610.23      0.0       0.0    610.24      0.01      0.02      0.00    604.30
    1600.      470.     516.     615.      967.     373.    1002.      454.       54.    601.00
     2.63      0.49     1.38     0.61     0.070    0.045    0.070     0.046    596.50    296.38
 0.000075      330.     410.     460.         2        0        0     -0.01    506.40    802.78


*SECNO 7875.000
   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


        L

  7875.00     12.41    610.31      0.0       0.0    610.32      0.01      0.09      0.00    603.00
    1600.      271.     252.    1077.      453.     210.    1460.      509.       64.    601.40
     3.01      0.60     1.20     0.74     0.070    0.050    0.070     0.048    597.90    109.97
 0.000081      850.    1240.    1135.         1        0        0     -0.03    324.33    434.30


*SECNO 8125.000
3280 CROSS SECTION    8125.00 EXTENDED       3.35 FEET


        M

  8125.00     12.24    610.34      0.0       0.0    610.36      0.01      0.03      0.00    604.60
    1600.      352.     703.     545.      857.     520.     962.      538.       69.    601.10
     3.20      0.41     1.35     0.57     0.060    0.035    0.060     0.047    598.10    260.00
 0.000044      545.     610.     580.         1        0        0     -0.00    440.00    700.00


CCHV     0.300 CEHV     0.500
*SECNO 8175.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       617.50 ELREA       617.50


        N SAGINAW ROAD BRIDGE,LC 613.5,TR 617.5,WIDTH 48,LENGTH 46

  8175.00     12.00    610.30      0.0       0.0    610.44      0.14      0.02      0.06    599.50
    1600.        0.     1600.       0.        0.     536.       0.       544.       70.    599.00
     3.22       0.0      2.99     0.0      0.060    0.035    0.060     0.047    598.30    503.00
 0.000188      195.     200.     185.         2        0        0     -0.02     46.00    549.00
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*SECNO 8176.000

3370 NORMAL BRIDGE,NRD   4 MIN ELTRD   617.20 MAX ELLC   617.30


3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       617.50 ELREA       617.50

  8176.00     12.00   610.30      0.0       0.0    610.44      0.14      0.00      0.00   599.50
    1600.       0.    1600.       0.        0.     536.        0.      545.       70.    599.00
     3.22      0.0     2.99      0.0     0.060    0.035     0.060    0.047   598.30   503.00
 0.000188       1.      1.        1.         0        0         0    -0.00    46.00   549.00


*SECNO 8177.000

3370 NORMAL BRIDGE,NRD   4 MIN ELTRD   617.20 MAX ELLC   617.30


3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       617.50 ELREA       617.50

  8177.00     12.01   610.31      0.0       0.0    610.45      0.14      0.01      0.00   599.50
    1600.       0.    1600.       0.        0.     536.        0.      545.       70.    599.00
     3.22      0.0     2.98      0.0     0.060    0.035     0.060    0.047   598.30   503.00
 0.000187      48.      48.       48.         0        0         0    -0.00    46.00   549.00


*SECNO 8178.000
   SECNO     DEPTH     CASEL     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


3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       617.50 ELREA       617.50

  8178.00     12.01   610.31      0.0       0.0    610.45      0.14      0.00      0.00   599.50
    1600.       0.    1600.       0.        0.     536.        0.      545.       70.    599.00
     3.22      0.0     2.98      0.0     0.060    0.035     0.060    0.047   598.30   503.00
 0.000187       1.      1.        1.         0        0         0    -0.00    46.00   549.00


*SECNO 8225.000

        0 6FT WIDE FORT BRIDGE,LC 614.,TR 617.1

  8225.00     10.69   610.29      0.0       0.0    610.47      0.18      0.01      0.02   617.10
    1600.       0.    1600.       0.        0.     465.        0.      545.       70.    614.00
     3.22      0.0     3.44      0.0     0.060    0.035     0.060    0.047   599.60   495.00
 0.000509      20.      20.       20.         2        0         0    -0.00    61.83   556.83


*SECNO 8226.000

3370 NORMAL BRIDGE,NRD   4 MIN ELTRD   614.90 MAX ELLC   617.20

  8226.00     10.69   610.29      0.0       0.0    610.48      0.18      0.00      0.00   617.10
    1600.       0.    1600.       0.        0.     465.        0.      545.       70.    614.00
     3.22      0.0     3.44      0.0     0.060    0.035     0.060    0.047   599.60   495.00
 0.000509       1.      1.        1.         0        0         0    -0.00    61.83   556.83


*SECNO 8227.000

3370 NORMAL BRIDGE,NRD   4 MIN ELTRD   614.90 MAX ELLC   617.20
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  8227.00     10.69    610.29      0.0       0.0    610.48      0.18      0.00      0.00    617.10
    1600.        0.    1600.        0.        0.     465.        0.      545.       70.    614.00
     3.22       0.0      3.44       0.     0.060     0.035     0.060     0.047    599.60    495.00
 0.000509        6.        6.        6.         0         0         0    -0.00     61.83    556.83

*SECNO 8228.000
  8228.00     10.69    610.29      0.0       0.0    610.48      0.18      0.00      0.00    617.10
    1600.        0.    1600.        0.        0.     465.        0.      545.       70.    614.00
     3.22       0.0      3.44       0.     0.060     0.035     0.060     0.047    599.60    495.00
 0.000508        1.        1.        1.         0         0         0    -0.00     61.83    556.83

*SECNO 8325.000
3280 CROSS SECTION    8325.00 EXTENDED       4.53 FEET

   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


        P MANUFACTURED

  8325.00     11.43    610.53      0.0       0.0    610.55      0.02      0.02      0.05    601.80
    1600.      331.     347.     923.      398.     169.     1151.      549.       70.    600.50
     3.25      0.83     2.04     0.80     0.060     0.035     0.060     0.047    599.10    300.00
 0.000106      140.     120.     130.         2         0         0    -0.01    300.00    600.00

CCHV    0.100 CEHV    0.300
*SECNO 10100.000

        Q

 10100.00     10.76    610.66      0.0       0.0    610.67      0.01      0.12      0.00    602.60
    1600.     1229.     371.        0.     2016.     280.        0.      591.       78.    613.60
     3.60      0.61     1.32       0.     0.100     0.045     0.100     0.048    599.90     38.93
 0.000138      885.    1215.     905.         2         0         0    -0.02    378.93    417.87

*SECNO 12100.000

        R

 12100.00     10.62    610.92      0.0       0.0    610.94      0.02      0.27      0.00    605.30
    1600.      985.     525.       90.     1190.     299.      118.      671.       91.    605.10
     4.04      0.83     1.76      0.76     0.070     0.045     0.070     0.048    600.30    130.51
 0.000163     1725.    1980.    1995.         2         0         0    -0.03    288.11    418.62

*SECNO 12900.000

        S

 12900.00      9.69    611.09      0.0       0.0    611.15      0.06      0.20      0.01    604.60
    1600.      115.     578.     907.       82.     211.      761.      694.       96.    606.70
     4.17      1.41     2.73     1.19     0.070     0.045     0.070     0.048    601.40     19.23
 0.000457      745.     800.     790.         2         0         0    -0.00    222.36    241.58

*SECNO 14400.000
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 14400.00      9.70    611.70      0.0       0.0    611.76      0.06      0.60      0.00    607.70
    1600.      893.     707.       0.       795.     267.       C.       727.      103.     617.20
     4.38      1.12     2.64      0.0      0.070    0.035     0.070     0.047    602.00     60.52
 0.000439     1390.    1400.    1230.        2         0         0     -0.01    252.98    313.50

*SECNO 15625.000
   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


        U MANUFACTURED

 15625.00      8.53    612.33      0.0       0.0    612.44      0.11      0.67      0.01    607.70
    1600.      260.     577.      762.      210.     144.      541.      754.      110.     606.20
     4.52      1.24     4.00      1.41     0.070    0.035     0.070     0.046    603.80    191.36
 0.000726     1245.    1245.    1070.        2         0         0     -0.03    255.24    446.60

CCHV    0.300 CEHV    0.500
*SECNO 15825.000

3301 HV CHANGED MORE THAN HVINS

        V PROPOSED WACKERLY ROAD BRIDGE,LC 615.7,TR 621.3

          WIDTH 96.8FT,LENGTH 41.FT

 15825.00      8.63    612.33      0.0       0.0    612.95      0.62      0.25      0.26    621.30
    1600.        0.     1600.       0.        0.     253.       0.       756.      110.     621.30
     4.53      0.0      6.33      0.0      0.070    0.040     0.070     0.046    603.70    272.00
 0.002923      175.     190.     215.        2         0         0     -0.00     29.52    301.52

*SECNO 15826.000

3370 NORMAL BRIDGE,NRD    0 MIN ELTRD    621.30 MAX ELLC    615.70

 15826.00      8.63    612.33      0.0       0.0    612.95      0.62      0.00      0.00    621.30
    1600.        0.     1600.       0.        0.     253.       0.       756.      110.     621.30
     4.53      0.0      6.33      0.0      0.070    0.040     0.070     0.046    603.70    272.00
 0.002922        1.       1.        1.        0         0         0     -0.00     29.52    301.52

*SECNO 15827.000

3370 NORMAL BRIDGE,NRD    0 MIN ELTRD    621.30 MAX ELLC    615.70

 15827.00      8.95    612.65      0.0       0.0    613.23      0.58      0.27      0.01    621.30
    1600.        0.     1600.       0.        0.     263.       0.       757.      110.     621.30
     4.53      0.0      6.09      0.0      0.070    0.040     0.070     0.046    603.70    272.00
 0.002628       97.      97.       97.        2         0         0     -0.00     29.52    301.52

*SECNO 15828.000
 15828.00      8.96    612.66      0.0       0.0    613.23      0.58      0.00      0.00    621.30
    1600.        0.     1600.       0.        0.     263.       0.       757.      110.     621.30
     4.53      0.0      6.09      0.0      0.070    0.040     0.070     0.046    603.70    272.00
 0.002626        1.       1.        1.        0         0         0     -0.00     29.52    301.52
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*SECNO 16225.000
   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


        W M-11 HIGHWAY BRIDGE,LC 617.1,TR 621.6

          WIDTH 118FT WITH 25FT OPEN AREA IN MIDDLE - SIDE WALLS

          ARE CONTINUOUS

 16225.00     11.74    613.54      0.0       0.0    613.74      0.21      0.40      0.11    621.60
    1600.        0.     1600.       0.        0.     436.        0.      759.      111.     621.60
     4.56       0.0      3.67      0.0     0.070     0.040     0.070     0.045    601.80    103.00
 0.000697      330.      330.      330.         1         0         0    -0.00     40.00    143.00

*SECNO 16226.000

3370 NORMAL BRIDGE,NRD   0 MIN ELTRD   621.60 MAX ELLC   617.10

 16226.00     11.74    613.54      0.0       0.0    613.75      0.21      0.00      0.00    621.60
    1600.        0.     1600.       0.        0.     436.        0.      759.      111.     621.60
     4.56       0.0      3.67      0.0     0.070     0.040     0.070     0.045    601.80    103.00
 0.000695        1.        1.        1.         0         0         0    -0.00     40.00    143.00

*SECNO 16227.000

3370 NORMAL BRIDGE,NRD   0 MIN ELTRD   621.60 MAX ELLC   617.10

 16227.00     11.82    613.62      0.0       0.0    613.83      0.21      0.08      0.00    621.60
    1600.        0.     1600.       0.        0.     440.        0.      761.      111.     621.60
     4.57       0.0      3.64      0.0     0.070     0.040     0.070     0.045    601.80    103.00
 0.000681      118.      118.      118.         0         0         0    -0.00     40.00    143.00

*SECNO 16228.000
 16228.00     11.82    613.62      0.0       0.0    613.83      0.21      0.00      0.00    621.60
    1600.        0.     1600.       0.        0.     440.        0.      761.      111.     621.60
     4.57       0.0      3.64      0.0     0.070     0.040     0.070     0.045    601.80    103.00
 0.000680        1.        1.        1.         0         0         0    -0.00     40.00    143.00

*SECNO 16375.000

        X AIRPORT ROAD BRIDGE,MAX LC 620.6,MIN TR 622.7,WIDTH 29.6 ,LENGTH 40.

 16375.00     10.26    613.66      0.0       0.0    613.90      0.24      0.05      0.02    624.60
    1600.        0.     1600.       0.        0.     405.        0.      761.      111.     622.80
     4.57       0.0      3.96      0.0     0.060     0.035     0.040     0.045    603.40     53.00
 0.000688       80.       80.       80.         1         0         0    -0.00     40.00     93.00

*SECNO 16376.000
   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
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3370 NORMAL BRIDGE,NRD   4 MIN ELTRD   622.70 MAX ELLC   624.70

 16376.00     10.26    613.66      0.0       0.0    613.90      0.24      0.00      0.00    624.60
    1600.        0.    1600.       0.        0.      404.        0.      761.      111.    622.80
     4.57       0.0      3.96      0.0     0.060     0.035     0.040     0.045    603.40     53.00
 0.000690        1.        1.       1.         0         0         0     -0.00     40.00     93.00

*SECNO 16377.000

3370 NORMAL BRIDGE,NRD   4 MIN ELTRD   622.70 MAX ELLC   624.70

 16377.00     10.28    613.68      0.0       0.0    613.92      0.24      0.02      0.00    624.60
    1600.        0.    1600.       0.        0.      405.        0.      762.      111.    622.80
     4.57       0.0      3.95      0.0     0.060     0.035     0.040     0.045    603.40     53.00
 0.000686       30.       30.      30.         0         0         0     -0.00     40.00     93.00

*SECNO 16378.000
 16378.00     10.28    613.68      0.0       0.0    613.92      0.24      0.00      0.00    624.60
    1600.        0.    1600.       0.        0.      405.        0.      762.      111.    622.80
     4.57       0.0      3.95      0.0     0.060     0.035     0.040     0.045    603.40     53.00
 0.000685        1.        1.       1.         0         0         0     -0.00     40.00     93.00

*SECNO 16450.000

3470 ENCROACHMENT STATIONS       100.0      370.0  TYPE       1  TARGET       270.000

        Y

 16450.00     10.29    613.99      0.0       0.0    614.02      0.03      0.03      0.06    607.60
    1600.      498.      604.    498.      638.      311.      420.      765.      111.    607.50
     4.61       0.78      1.94     1.19    0.060     0.035     0.040     0.045    603.70    128.57
 0.000116      135.      155.     130.         2         0         0     -0.03    241.43    370.00

CCHV    0.100 CEHV    0.300
*SECNO 24250.000

3470 ENCROACHMENT STATIONS       145.0      480.0  TYPE       1  TARGET       335.000

        Z MANUFACTURED

 24250.00      9.48    614.08      0.0       0.0    614.12      0.04      0.09      0.00    606.60
    1600.      577.      582.    442.      694.      261.      415.      786.      116.    606.60
     4.75       0.83      2.23     1.06    0.060     0.035     0.040     0.045    604.60    145.00
 0.000156      675.      810.     625.         2         0         0     -0.03    335.00    480.00

*SECNO 25500.000
   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

        AA MANUFACTURED

 25500.00      8.79    614.29      0.0       0.0    614.34      0.05      0.22      0.00    607.50
    1600.      520.      626.    454.      626.      241.      332.      820.      125.    607.50
     4.94       0.83      2.60     1.37    0.060     0.035     0.040     0.044    605.50     81.32
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 0.000237    1110.    1250.    1085.        2        0        0    0.00    365.87    447.19

*SECNO 26350.000

3470 ENCROACHMENT STATIONS        60.0      490.0  TYPE       1  TARGET       430.000

        AB

 26350.00     8.15   614.45     0.0      0.0    614.46     0.01     0.12     0.00   609.50
    1600.    1188.     273.     139.    1717.     209.     288.     850.     132.    609.50
     5.22     0.69     1.31     0.48    0.070    0.040    0.070    0.044   606.30    60.00
 0.000104     765.     810.     765.        1        0        0    -0.01   430.00   490.00

*SECNO 26400.000

        AC CULVERT-SOUTH OF MOBILE HOME PARK, CROWN 609.5,TR 611.6

          CORRUGATED METAL PIPE,3-36IN X 41FT

 26400.00     7.94   614.44     0.0      0.0    614.48     0.04     0.01     0.01   608.00
    1600.     739.     351.     510.     724.     132.     458.     851.     132.    608.00
     5.22     1.02     2.66     1.11    0.070    0.040    0.070    0.044   606.50    86.42
 0.000521      25.      40.      35.        1        0        0    -0.04   428.96   515.38

*SECNO 26401.000

3370 NORMAL BRIDGE,NRD  19 MIN ELTRD   610.60 MAX ELLC   618.00

 26401.00     7.95   614.45     0.0      0.0    614.48     0.03     0.00     0.00   608.00
    1600.     964.     121.     516.     681.      72.     380.     851.     132.    608.00
     5.22     1.41     1.67     1.36    0.070    0.040    0.070    0.044   606.50    86.64
 0.001112       1.       1.       1.        0        0        0  -176.40   428.55   515.19

*SECNO 26402.000

3370 NORMAL BRIDGE,NRD  19 MIN ELTRD   610.60 MAX ELLC   618.00

 26402.00     7.99   614.49     0.0      0.0    614.52     0.03     0.04     0.00   608.00
    1600.     963.     120.     517.     693.      73.     388.     852.     133.    608.00
     5.23     1.39     1.63     1.33    0.070    0.040    0.070    0.044   606.50    85.50
 0.001055      41.      41.      41.        1        0        0  -176.40   430.66   516.16

*SECNO 26403.000
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        CLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       ARCB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

 26403.00     7.99   614.49     0.0      0.0    614.52     0.04     0.00     0.00   608.00
    1600.     741.     348.     511.     735.     133.     465.     852.     133.    608.00
     5.23     1.01     2.62     1.10    0.070    0.040    0.070    0.044   606.50    85.33
 0.000501       1.       1.       1.        0        0        0    -0.04   430.97   516.30

*SECNO 26450.000

3470 ENCROACHMENT STATIONS       120.0      515.0  TYPE       1  TARGET       395.000

        AD
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 26450.00      8.00    614.50      0.0       0.0    614.54      0.04      0.02      0.00    608.00
    1600.      745.     345.     509.      715.     133.      468.      853.      133.     608.00
     5.24      1.04     2.59     1.09     0.070    0.040     0.070     0.044    606.50    120.00
 0.000488       25.      45.      45.         1        0         0     -0.03    395.00    515.00

CCHV     0.100 CEHV     0.300
*SECNO 27200.000

        AE

 27200.00     10.21    614.71      0.0       0.0    614.79      0.08      0.24      0.01    609.40
    1600.      285.    1156.     158.      165.     463.      222.      869.      137.     610.40
     5.32      1.73     2.50     0.71     0.035    0.040     0.060     0.044    604.50     94.85
 0.000298      635.     630.     665.         2        0         0     -0.01    212.93    307.77
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$S_f \sim .0003$

Annexed limits ~ 3400' u/s ⟹ 100 ~ 614.8 + .0003×3400 = 615.8 Tittabawassee River ~ 615.9

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**************************************************
  HEC2 RELEASE DATEO NOV 76 UPDATED JULY1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
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```

T1
T2
T3

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	EQ
	0.	6.	0.	0.	0.0	0.0	0.0	0.	608.000	0.0

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	15.000	0.0	-1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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*PROF 2

CCHV    0.100 CEHV    0.300
*SECNO 50.000
   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    IDC       ICONT     CORAR     TOPWID      ENDST


        A EMERSON PARK ROAD BRIDGE,LC 607,TR 610.4,WIDTH 32.

    50.00     17.40    608.00      0.0     608.00    608.11      0.11      0.0       0.0     610.40
    1850.       0.     1850.        0.        0.      693.        0.        0.        0.     610.50
     0.0       0.0      2.67      0.0      0.040     0.035     0.040     0.0      590.60    505.00
 0.000205      25.       25.       25.         0         0         0     -0.00     41.00    546.00

*SECNO 51.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       609.00 ELREA       609.00

    51.00     17.40    608.00      0.0       0.0     608.11      0.11      0.00      0.00     610.40
    1850.       0.     1850.        0.        0.      693.        0.        0.        0.     610.50
     0.00       0.0      2.67      0.0      0.040     0.025     0.040     0.024    590.60    505.00
 0.000104      25.       25.       25.         0         0         0     -0.00     41.00    546.00


SPECIAL BRIDGE

SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     0.0       1.52      3.00      0.0      41.00      0.0      651.90     0.0      590.60     0.0

*SECNO 52.000
PRESSURE FLOW

 EGPRS      EGLWC       H3       QWEIR      QPR       BAREA    TRAPEZOID      ELLC      ELTRD
                                                                  AREA
   608.19    608.11      0.0        0.      1850.      652.      672.      607.00     610.40


3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       610.40 ELREA       610.40

    52.00     17.48    608.08      0.0       0.0     608.19      0.11      0.08      0.0     610.40
    1850.       0.     1850.        0.        0.      696.        0.        1.        0.     610.50
     0.01       0.0      2.66      0.0      0.040     0.025     0.040     0.024    590.60    505.00
 0.000103      32.       32.       32.         2         0         0     -0.00     41.00    546.00

*SECNO 100.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       610.00 ELREA       610.00

        B C&O R.R.BRIDGE.LC 607.2,TR 614,WIDTH 10'

   100.00     13.31    608.01      0.0       0.0     608.23      0.21      0.00      0.03     614.10
    1850.       0.     1850.        0.        0.      498.        0.        1.        0.     614.00
     0.01       0.0      3.72      0.0      0.040     0.025     0.040     0.024    594.70    505.00
 0.000251      11.       11.       11.         2         0         0     -0.00     38.00    543.00
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SPECIAL BRIDGE

SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     0.0       1.54      3.00      0.0      41.00      0.0     651.90      0.0     590.60      0.0

*SECNO 102.000
   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  10 MIN ELTRD   614.00 MAX ELLC   607.20


3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       614.00 ELREA       614.00

   102.00    13.31    608.01     0.0       0.0    608.24     0.23      0.01      0.01    614.10
    1850.      0.     1850.      0.        0.     477.       0.        1.        0.     614.00
     0.01     0.0      3.88     0.0      0.040    0.025    0.040    0.024    594.70    505.00
 0.000458     25.      25.      25.        0        0        0    -21.03     38.00    543.00


*SECNO 150.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       611.00 ELREA       611.00


        C MAIN ST.CULVERT,CROWN-607.6,INVERT 591.9,TR 611.6

        STRUCTURAL PLATE CORRUGATED METAL PIPE D 15FT,L 65FT

   150.00    16.09    607.99     0.0       0.0    608.26     0.27      0.01      0.01    600.10
    1850.      0.     1850.      0.        0.     445.       0.        2.        0.     599.40
     0.01     0.0      4.16     0.0      0.040    0.025    0.040    0.024    591.90    492.50
 0.000265     25.      25.      25.        2        0        0    -0.03     33.00    525.50


SPECIAL BRIDGE

SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     0.0       2.05      3.00      0.0      26.00      0.0     353.40      0.0     591.90      0.0

*SECNO 151.000
PRESSURE FLOW

 EGPRS     EGLWC     H3        QWEIR     QPR       BAREA   TRAPEZOID     ELLC      ELTRD
                                                             AREA
 608.86    608.26    0.0         0.      1850.     353.      390.      606.90    611.90


3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       611.00 ELREA       611.00

   151.00    16.72    608.62     0.0       0.0    608.86     0.24      0.60      0.0     600.10
    1850.      0.     1850.      0.        0.     466.       0.        2.        0.     599.40
     0.01     0.0      3.97     0.0      0.040    0.025    0.040    0.024    591.90    492.50
 0.000227      1.       1.       1.        2        0        0    -0.00     33.00    525.50
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*SECNO 153.000

3470 ENCROACHMENT STATIONS        450.0      550.0  TYPE       1  TARGET       100.000
   153.00     16.92    608.82      0.0        0.0    608.89      0.07       0.01       0.02    600.10
    1850.      382.     1196.     271.      312.      472.     217.         3.         0.    599.40
     0.02      1.22      2.53     1.25     0.040     0.025    0.040      0.024     591.90    450.00
 0.000091      100.      100.     100.         2         0        0      -0.01     100.00    550.00


CCHV     0.300 CEHV     0.500
*SECNO 650.000

3470 ENCROACHMENT STATIONS        293.0      514.0  TYPE       1  TARGET       221.000

        D PONDING AREA U/S OF MAIN ST. CULVERT

   650.00     17.71    608.91      0.0    608.91    608.92      0.00       0.00       0.02    597.30
    1850.        0.     1850.       0.        0.     3509.       0.        24.         2. 100000.00
     0.23      0.0       0.53     0.0     0.060     0.035    0.060      0.031     591.20    293.00
 0.000004      400.      400.     400.         2         0        0      -0.01     221.00    514.00


CCHV     0.100 CEHV     0.300
*SECNO 1950.000
   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


3470 ENCROACHMENT STATIONS         76.0      450.0  TYPE       1  TARGET       374.000

        E

  1950.00     17.42    608.92      0.0    608.92    608.93      0.00       0.01       0.00    597.00
    1850.        0.      324.     1526.       0.      605.     3790.      145.        11.    598.30
     1.10      0.0       0.54     0.40     0.060     0.045    0.060      0.040     591.50     76.00
 0.000011     1305.     1320.    1345.         2         0        0      -0.03     374.00    450.00


*SECNO 3825.000

3470 ENCROACHMENT STATIONS        385.0      707.0  TYPE       1  TARGET       322.000

        F

  3825.00     15.75    608.95      0.0    608.94    608.96      0.01       0.03       0.00    599.30
    1850.     1390.      460.        0.     2396.      512.       0.       277.        23. 100000.00
     1.78      0.58      0.90     0.0     0.060     0.045    0.060      0.045     593.20    385.00
 0.000033     1580.     1815.    1505.         1         0        0      -0.04     322.00    707.00


*SECNO 5550.000

3470 ENCROACHMENT STATIONS        125.0      220.0  TYPE       1  TARGET        95.000

        G MANUFACTURED

  5550.00     15.70    609.00      0.0    608.98    609.07      0.07       0.10       0.02    597.80
    1850.      476.     1282.       91.      383.      534.      94.       344.        30.    597.80
     1.98      1.24      2.40     0.97     0.060     0.045    0.060      0.046     593.30    125.00
 0.000173     1435.     1620.    1355.         2         0        0      -0.01      95.00    220.00
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CCHV     0.300 CEHV     0.300
*SECNO 5700.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       610.00 ELREA       610.00


        H SUGNET ROAD CULVERT CROWN 608.7,TR 610.8,INVERT 595.0


          STRUCTURAL PLATE PIPE D 13.5FT,L 67FT

  5700.00     13.89    608.89      0.0     608.85    609.29      0.40      0.05      0.16    601.80
    1850.        0.     1850.       0.         0.     367.        0.     346.       31.     602.00
     1.99       0.0      5.05      0.0      0.060     0.045     0.060     0.046    595.00    493.00
 0.001498      150.      135.      90.          2         0         0     -0.03     32.00    525.00


*SECNO 5701.000

3370 NORMAL BRIDGE,NRD  20 MIN ELTRD   610.80 MAX ELLC   611.40


3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       610.00 ELREA       610.00

  5701.00     13.77    608.77      0.0     608.73    609.44      0.67      0.01      0.14    601.80
    1850.        0.     1850.       0.         0.     282.        0.     346.       31.     602.00
     1.99       0.0      6.56      0.0      0.060     0.045     0.060     0.046    595.00    493.00
 0.007961        5.        5.       5.          2         0         0  -773.02     32.00    525.00


*SECNO 5702.000
   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  20 MIN ELTRD   610.80 MAX ELLC   611.40


3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       610.80 ELREA       610.80

  5702.00     14.30    609.30      0.0     609.26    609.97      0.67      0.53       0.0    601.80
    1850.        0.     1850.       0.         0.     282.        0.     346.       31.     602.00
     1.99       0.0      6.56      0.0      0.060     0.045     0.060     0.046    595.00    493.00
 0.007961       67.       67.      67.          2         0         0  -903.46     32.00    525.00


*SECNO 5703.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       610.80 ELREA       610.80

  5703.00     14.74    609.74      0.0     609.69    610.08      0.34      0.01      0.10    601.80
    1850.        0.     1850.       0.         0.     394.        0.     346.       31.     602.00
     1.99       0.0      4.70      0.0      0.060     0.045     0.060     0.046    595.00    493.00
 0.001181        5.        5.       5.          2         0         0     -0.03     32.00    525.00


*SECNO 5900.000
3280 CROSS SECTION   5900.00 EXTENDED      0.08 FEET


3470 ENCROACHMENT STATIONS      470.0      550.0  TYPE      1  TARGET       80.000
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      1

  5900.00    15.18   610.08     0.0    610.03   610.21     0.13     0.06     0.06   604.30
    1850.     177.    1342.     331.     131.     413.     199.     348.      31.    601.00
     2.00     1.35     3.25     1.66    0.060    0.045    0.060    0.046   594.90   470.00
 0.000393      95.     100.      85.        2        0        0    -0.01    80.00   550.00


CCHV    0.100 CEHV    0.300
*SECNO 6250.000
3280 CROSS SECTION   6250.00 EXTENDED      0.25 FEET


3470 ENCROACHMENT STATIONS      240.0     560.0  TYPE      1  TARGET      320.000

        J MANUFACTURED,D/S FROM THE CONFLUENCE POINT WITH INMAN DRAIN

  6250.00    14.55   610.25     0.0    610.21   610.26     0.01     0.05     0.01   604.30
    1850.    1143.     530.     177.    1798.     397.     274.     359.      32.    601.00
     2.12     0.64     1.34     0.65    0.070    0.045    0.070    0.046   595.70   240.00
 0.000068     250.     400.     365.        2        0        0    -0.03   320.00   560.00


*SECNO 6750.000

3470 ENCROACHMENT STATIONS      450.0     680.0  TYPE      1  TARGET      230.000

        K MANUFACTURED,U/S FROM THE CONFLUENCE POINT WITH INMAN DRAIN

  6750.00    13.78   610.28     0.0    610.23   610.30     0.02     0.03     0.00   604.30
    1600.     381.     624.     595.     563.     375.     731.     377.      34.    601.00
     2.21     0.68     1.66     0.81    0.070    0.045    0.070    0.046   596.50   450.00
 0.000109     330.     410.     460.        2        0        0    -0.01   230.00   680.00


*SECNO 7875.000
   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


3470 ENCROACHMENT STATIONS      150.0     380.0  TYPE      1  TARGET      230.000

        L

  7875.00    12.50   610.40     0.0    610.31   610.41     0.01     0.11     0.00   603.00
    1600.     228.     274.    1099.     337.     211.    1326.     421.      40.    601.40
     2.56     0.67     1.29     0.83    0.070    0.050    0.070    0.048   597.90   150.00
 0.000092     850.    1240.    1135.        2        0        0    -0.03   230.00   380.00


*SECNO 8125.000
3280 CROSS SECTION   8125.00 EXTENDED      3.43 FEET


3470 ENCROACHMENT STATIONS      370.0     680.0  TYPE      1  TARGET      310.000

        M

  8125.00    12.33   610.43     0.0    610.34   610.45     0.02     0.04     0.00   604.60
    1600.     325.     733.     542.     650.     523.     899.     447.      44.    601.10
     2.73     0.50     1.40     0.60    0.060    0.035    0.060    0.047   598.10   370.00
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 0.000047     543.     610.     580.        2        0        0    -0.01   510.00   680.00

CCHV    0.300 CEHV    0.500
*SECNO 8175.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       617.50 ELREA       617.50

        N SAGINAW ROAD BRIDGE,LC 613.5,TR 617.5,WIDTH 48,LENGTH 46

  8175.00    12.09   610.39     0.0    610.30   610.53     0.14     0.02     0.06   599.50
    1600.       0.    1600.       0.       0.     540.       0.     453.      44.    599.00
     2.75      0.0     2.96     0.0     0.060    0.035    0.060    0.047   598.30   503.00
 0.000183     195.     200.     185.        2        0        0    -0.00    46.00   549.00

*SECNO 8176.000

3370 NORMAL BRIDGE,NRD   4 MIN ELTRD   617.20 MAX ELLC   617.30

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       617.50 ELREA       617.50

  8176.00    12.09   610.39     0.0    610.30   610.53     0.14     0.00     0.00   599.50
    1600.       0.    1600.       0.       0.     540.       0.     453.      44.    599.00
     2.75      0.0     2.96     0.0     0.060    0.035    0.060    0.047   598.30   503.00
 0.000183       1.       1.       1.        0        0        0    -0.00    46.00   549.00

*SECNO 8177.000

3370 NORMAL BRIDGE,NRD   4 MIN ELTRD   617.20 MAX ELLC   617.30

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       617.50 ELREA       617.50

  8177.00    12.10   610.40     0.0    610.31   610.53     0.14     0.01     0.00   599.50
    1600.       0.    1600.       0.       0.     540.       0.     453.      44.    599.00
     2.76      0.0     2.96     0.0     0.060    0.035    0.060    0.047   598.30   503.00
 0.000182      48.      48.      48.        0        0        0    -0.02    46.00   549.00

*SECNO 8178.000
   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

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       617.50 ELREA       617.50

  8178.00    12.10   610.40     0.0    610.31   610.53     0.14     0.00     0.00   599.50
    1600.       0.    1600.       0.       0.     540.       0.     453.      44.    599.00
     2.76      0.0     2.96     0.0     0.060    0.035    0.060    0.047   598.30   503.00
 0.000182       1.       1.       1.        0        0        0    -0.02    46.00   549.00

*SECNO 8225.000

        O 6FT WIDE FORT BRIDGE,LC 614.,TR 617.1

  8225.00    10.78   610.38     0.0    610.29   610.56     0.18     0.01     0.02   617.10
    1600.       0.    1600.       0.       0.     471.       0.     453.      44.    614.00
     2.76      0.0     3.40     0.0     0.060    0.035    0.060    0.047   599.60   495.00
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 0.000489      20.      20.      20.        1        0        0    -0.00    61.92   556.92

*SECNO 8226.000

3370 NORMAL BRIDGE,NRD   4 MIN ELTRD   614.90 MAX ELLC   617.20

  8226.00    10.78   610.38     0.0    610.29   610.56     0.18     0.00     0.00   617.10
    1600.       0.    1600.       0.       0.     470.       0.     454.      44.    614.00
     2.76      0.0     3.40     0.0     0.060    0.035    0.060    0.047   599.60   495.00
 0.000491       1.       1.       1.        0        0        0    -0.00    61.91   556.91

*SECNO 8227.000

3370 NORMAL BRIDGE,NRD   4 MIN ELTRD   614.90 MAX ELLC   617.20

  8227.00    10.79   610.39     0.0    610.29   610.56     0.18     0.00     0.00   617.10
    1600.       0.    1600.       0.       0.     470.       0.     454.      44.    614.00
     2.76      0.0     3.40     0.0     0.060    0.035    0.060    0.047   599.60   495.00
 0.000491       6.       6.       6.        0        0        0    -0.00    61.91   556.91

*SECNO 8228.000
  8228.00    10.79   610.39     0.0    610.29   610.57     0.18     0.00     0.00   517.10
    1600.       0.    1600.       0.       0.     471.       0.     454.      44.    614.00
     2.76      0.0     3.40     0.0     0.060    0.035    0.060    0.047   599.60   495.00
 0.000490       1.       1.       1.        0        0        0    -0.00    61.91   556.91

*SECNO 8325.000
3280 CROSS SECTION   8325.00 EXTENDED      4.60 FEET

   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


3470 ENCROACHMENT STATIONS      350.0     550.0  TYPE      1  TARGET      200.000

        P MANUFACTURED

  8325.00    11.50   610.60     0.0    610.53   610.64     0.04     0.03     0.04   601.80
    1600.     214.     433.     952.     202.     171.     928.     456.      45.    600.50
     2.78     1.06     2.54     1.03    0.060    0.035    0.060    0.046   599.10   350.00
 0.000162     140.     120.     130.        2        0        0    -0.02   200.00   550.00

CCHV    0.100 CEHV    0.300
*SECNO 10100.000

3470 ENCROACHMENT STATIONS      100.0     420.0  TYPE      1  TARGET      320.000

        Q

 10100.00    10.88   610.78     0.0    610.66   610.79     0.01     0.15     0.00   602.60
    1600.    1219.     381.       0.    1913.     285.       0.     494.      50. 100000.00
     3.12     0.64     1.34     0.0     0.100    0.045    0.100    0.047   599.90   100.00
 0.000139     885.    1215.     905.        2        0        0    -0.02   318.20   418.20

*SECNO 12100.000
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3470 ENCROACHMENT STATIONS 135.0 405.0 TYPE 1 TARGET 250.000

R

12100.00	10.74	611.04	0.0	610.92	611.07	0.02	0.27	0.00	605.30
1600.	1003.	543.	54.	1159.	302.	77.	570.	62.	605.10
3.55	0.87	1.80	0.70	0.070	0.045	0.070	0.048	600.30	155.00
0.000167	1725.	1980.	1995.	2	0	0	-0.03	250.00	405.00

*SECNO 12900.000

3470 ENCROACHMENT STATIONS 25.0 230.0 TYPE 1 TARGET 205.000

S

12900.00	9.82	611.22	0.0	611.09	611.28	0.06	0.20	0.01	604.60
1600.	70.	595.	936.	62.	215.	760.	592.	66.	606.70
3.67	1.12	2.77	1.23	0.070	0.045	0.070	0.048	601.40	25.00
0.000461	745.	800.	790.	2	0	0	-0.00	205.00	230.00

*SECNO 14400.000

3470 ENCROACHMENT STATIONS 75.0 335.0 TYPE 1 TARGET 260.000

T

14400.00	9.81	611.81	0.0	611.70	611.86	0.06	0.58	0.00	607.70
1600.	897.	703.	0.	800.	273.	0.	625.	73.	100000.00
3.88	1.12	2.58	0.0	0.070	0.035	0.070	0.046	602.00	75.00
0.000410	1390.	1400.	1230.	2	0	0	-0.01	238.93	313.93

*SECNO 15625.000

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

3470 ENCROACHMENT STATIONS 210.0 410.0 TYPE 1 TARGET 200.000

U MANUFACTURED

15625.00	8.61	612.41	0.0	612.33	612.52	0.11	0.64	0.02	607.70
1600.	248.	586.	766.	192.	146.	517.	651.	79.	606.20
4.02	1.29	4.02	1.48	0.070	0.035	0.070	0.046	603.80	210.00
0.000721	1245.	1245.	1070.	2	0	0	-0.02	200.00	410.00

CCHV 0.300 CEHV 0.500
*SECNO 15825.000

V PROPOSED WACKERLY ROAD BRIDGE,LC 615.7,TR 621.3

WIDTH 96.8FT,LENGTH 41.FT

15825.00	8.71	612.41	0.0	612.33	613.02	0.61	0.25	0.25	621.30
1600.	0.	1600.	0.	0.	255.	0.	654.	79.	621.30
4.03	0.0	6.27	0.0	0.070	0.040	0.070	0.045	603.70	272.00
0.002844	175.	190.	215.	2	0	0	-0.00	29.52	301.52

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*SECNO 15826.000

3370 NORMAL BRIDGE,NRD   0 MIN ELTRD   621.30 MAX ELLC   615.70

 15826.00      3.71    612.41      0.0     612.33    613.02      0.61      0.00      0.00    621.30
    1600.        0.    1600.        0.        0.     255.        0.      654.       79.    621.30
     4.03       0.0      6.26       0.0     0.070     0.040     0.070     0.045    603.70    272.00
 0.002843        1.        1.        1.         0         0         0     -0.00     29.52    301.52

*SECNO 15827.000

3370 NORMAL BRIDGE,NRD   0 MIN ELTRD   621.30 MAX ELLC   615.70

 15827.00      9.03    612.73      0.0     612.65    613.29      0.57      0.26      0.01    621.30
    1600.        0.    1600.        0.        0.     265.        0.      654.       79.    621.30
     4.03       0.0      6.04       0.0     0.070     0.040     0.070     0.045    603.70    272.00
 0.002568       97.       97.       97.         2         0         0     -0.00     29.52    301.52

*SECNO 15828.000
 15828.00      9.03    612.73      0.0     612.66    613.30      0.57      0.00      0.00    621.30
    1600.        0.    1600.        0.        0.     265.        0.      654.       79.    621.30
     4.03       0.0      6.04       0.0     0.070     0.040     0.070     0.045    603.70    272.00
 0.002566        1.        1.        1.         0         0         0     -0.00     29.52    301.52

*SECNO 16225.000
   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

        W M-11 HIGHWAY BRIDGE,LC 617.1,TR 621.6

          WIDTH 118FT WITH 25FT OPEN AREA IN MIDDLE - SIDE WALLS

          ARE CONTINUOUS

 16225.00     11.79    613.59      0.0     613.54    613.80      0.21      0.39      0.11    621.60
    1600.        0.    1600.        0.        0.     438.        0.      657.       80.    621.60
     4.06       0.0      3.65       0.0     0.070     0.040     0.070     0.045    601.80    103.00
 0.000687      330.      330.      330.         1         0         0     -0.00     40.00    143.00

*SECNO 16226.000

3370 NORMAL BRIDGE,NRD   0 MIN ELTRD   621.60 MAX ELLC   617.10

 16226.00     11.79    613.59      0.0     613.54    613.80      0.21      0.00      0.00    621.60
    1600.        0.    1600.        0.        0.     439.        0.      657.       80.    621.60
     4.06       0.0      3.65       0.0     0.070     0.040     0.070     0.045    601.80    103.00
 0.000685        1.        1.        1.         0         0         0     -0.00     40.00    143.00

*SECNO 16227.000

3370 NORMAL BRIDGE,NRD   0 MIN ELTRD   621.60 MAX ELLC   617.10

 16227.00     11.88    613.68      0.0     613.62    613.88      0.20      0.08      0.00    621.60
    1600.        0.    1600.        0.        0.     442.        0.      658.       80.    621.60
     4.07       0.0      3.62       0.0     0.070     0.040     0.070     0.045    601.80    103.00
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 0.000671     118.     118.     118.        0        0        0    -0.00    40.00   143.00

*SECNO 16228.000
 16228.00    11.88   613.68      0.0   613.62   613.88     0.20     0.00     0.00   621.60
    1600.       0.    1600.       0.       0.     442.       0.     658.      80.    621.60
     4.07      0.0     3.62      0.0    0.070    0.040    0.070    0.045   601.80   103.00
 0.000671       1.       1.       1.        0        0        0    -0.00    40.00   143.00

*SECNO 16375.000

        X AIRPORT ROAD BRIDGE,MAX LC 620.6,MIN TR 622.7,WIDTH 29.6 ,LENGTH 40.

 16375.00    10.31   613.71      0.0   613.66   613.95     0.24     0.05     0.02   624.60
    1600.       0.    1600.       0.       0.     407.       0.     659.      80.    622.80
     4.07      0.0     3.93      0.0    0.060    0.035    0.040    0.045   603.40    53.00
 0.000677      80.      80.      80.        1        0        0    -0.00    40.00    93.00

*SECNO 16376.000
   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   4 MIN ELTRD   622.70 MAX ELLC   624.70

 16376.00    10.31   613.71      0.0   613.66   613.95     0.24     0.00     0.00   624.60
    1600.       0.    1600.       0.       0.     406.       0.     659.      80.    622.80
     4.07      0.0     3.94      0.0    0.060    0.035    0.040    0.045   603.40    53.00
 0.000679       1.       1.       1.        0        0        0    -0.00    40.00    93.00

*SECNO 16377.000

3370 NORMAL BRIDGE,NRD   4 MIN ELTRD   622.70 MAX ELLC   624.70

 16377.00    10.33   613.73      0.0   613.68   613.97     0.24     0.02     0.00   624.60
    1600.       0.    1600.       0.       0.     407.       0.     659.      80.    622.80
     4.07      0.0     3.93      0.0    0.060    0.035    0.040    0.045   603.40    53.00
 0.000675      30.      30.      30.        0        0        0    -0.00    40.00    93.00

*SECNO 16378.000
 16378.00    10.34   613.74      0.0   613.68   613.97     0.24     0.00     0.00   624.60
    1600.       0.    1600.       0.       0.     407.       0.     659.      80.    622.80
     4.07      0.0     3.93      0.0    0.060    0.035    0.040    0.045   603.40    53.00
 0.000675       1.       1.       1.        0        0        0    -0.00    40.00    93.00

*SECNO 16450.000

3470 ENCROACHMENT STATIONS      100.0     370.0  TYPE      1  TARGET      270.000

        Y

 16450.00    10.34   614.04      0.0   613.99   614.07     0.03     0.03     0.06   607.60
    1600.     499.     602.     499.     645.     313.     424.     662.      80.    607.50
     4.10      0.77     1.92     1.18    0.060    0.035    0.040    0.045   603.70   128.48
 0.000113     135.     155.     130.        2        0        0    -0.03   241.52   370.00

CCHV    0.100 CEHV    0.300
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*SECNO 24250.000

3470 ENCROACHMENT STATIONS       145.0      480.0  TYPE       1  TARGET       335.000

        Z MANUFACTURED

 24250.00      9.53    614.13      0.0     614.08    614.16      0.04      0.09      0.00    606.60
    1600.      578.      577.     445.      702.      263.     422.      684.       85.     606.60
     4.25      0.32      2.20     1.05     0.060     0.035    0.040     0.045    604.60    145.00
 0.000151      675.      810.     625.         2         0        0     -0.03    335.00    480.00

*SECNO 25500.000
   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


3470 ENCROACHMENT STATIONS       110.0      430.0  TYPE       1  TARGET       320.000

        AA MANUFACTURED

 25500.00      8.83    614.33      0.0     614.29    614.38      0.05      0.21      0.00    607.50
    1600.      531.      610.     458.      625.      242.     327.      718.       93.     607.50
     4.44      0.85      2.52     1.40     0.060     0.035    0.040     0.044    605.50    110.00
 0.000222     1110.     1250.    1085.         2         0        0     -0.01    320.00    430.00

*SECNO 26350.000

3470 ENCROACHMENT STATIONS        60.0      490.0  TYPE       1  TARGET       430.000

        AB

 26350.00      8.18    614.48      0.0     614.45    614.49      0.01      0.11      0.00    609.50
    1600.     1187.      273.     140.     1726.      211.     291.      748.      100.     609.50
     4.72      0.69      1.30     0.48     0.070     0.040    0.070     0.044    606.30     60.00
 0.000102      765.      810.     765.         1         0        0     -0.01    430.00    490.00

*SECNO 26400.000

3470 ENCROACHMENT STATIONS       110.0      475.0  TYPE       1  TARGET       365.000

        AC CULVERT-SOUTH OF MOBILE HOME PARK, CROWN 609.5,TR 611.6


          CORRUGATED METAL PIPE,3-36IN X 41FT

 26400.00      7.97    614.47      0.0     614.44    614.51      0.04      0.01      0.01    608.00
    1600.      755.      351.     494.      720.      133.     422.      749.      100.     608.00
     4.73      1.05      2.65     1.17     0.070     0.040    0.070     0.044    606.50    110.00
 0.000511       25.       40.       35.         1         0        0     -0.03    365.00    475.00

*SECNO 26401.000

3370 NORMAL BRIDGE,NRD  19 MIN ELTRD   610.60 MAX ELLC   618.00

 26401.00      7.98    614.48      0.0     614.45    614.51      0.03      0.00      0.00    608.00
    1600.      963.      120.     517.      689.       73.     385.      749.      100.     608.00
     4.73      1.40      1.64     1.34     0.070     0.040    0.070     0.044    606.50     85.87
 0.001073        1.        1.        1.         0         0        0   -176.40    429.97    515.85
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*SECNO 26402.000

3370 NORMAL BRIDGE,NRD  19 MIN ELTRD   610.60 MAX ELLC   618.00

 26402.00      8.02   614.52      0.0   614.49   614.55      0.03      0.04      0.00   608.00
    1600.      963.     119.     518.     701.      74.     393.      750.      100.   608.00
     4.74      1.37     1.61     1.32    0.070    0.040    0.070     0.044    606.50    84.72
 0.001018       41.      41.      41.        1        0        0   -176.40    432.11   516.82

*SECNO 26403.000
   SECNO     DEPTH     CASEL     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

 26403.00      8.02   614.52      0.0   614.49   614.55      0.04      0.00      0.00   608.00
    1600.      743.     346.     511.     743.     133.     470.      750.      100.   608.00
     4.74      1.00     2.59     1.09    0.070    0.040    0.070     0.044    606.50    84.56
 0.000487        1.       1.       1.        0        0        0     -0.04    432.40   516.96

*SECNO 26450.000

3470 ENCROACHMENT STATIONS      120.0     515.0  TYPE      1  TARGET      395.000

        AD

 26450.00      8.04   614.54      0.0   614.50   614.57      0.04      0.02      0.00   608.00
    1600.      747.     343.     510.     721.     134.     473.      751.      101.   608.00
     4.74      1.04     2.57     1.08    0.070    0.040    0.070     0.044    606.50   120.00
 0.000475       25.      45.      45.        1        0        0     -0.03    395.00   515.00

CCHV    0.100 CEHV    0.300
*SECNO 27200.000

3470 ENCROACHMENT STATIONS      120.0     490.0  TYPE      1  TARGET      370.000

        AE

 27200.00     10.25   614.75      0.0   614.71   614.84      0.09      0.25      0.02   609.40
    1600.      217.    1215.     168.     115.     465.     225.      767.      105.   610.40
     4.82      1.89     2.61     0.75    0.035    0.040    0.060     0.044    604.50   120.00
 0.000325      635.     630.     665.        2        0        0     -0.02    188.54   308.54
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  HEC2 RELEASE DATED NOV 76 UPDATED JULY1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
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NOTE- ASTERISK * AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

STURGEON CREEK

SUMMARY PRINTOUT TABLE 110

SECNO	CWSEL	DIFKWS	EG	TOPWID	QLOB	QCH	QROB	PERENC	STENCL	STCHL	STCHR	STENCR
50.000	608.00	0.0	608.11	41.00	0.0	1850.00	0.0	0.0	0.0	505.00	546.00	0.0
50.000	608.00	0.0	608.11	41.00	0.0	1850.00	0.0	0.0	0.0	505.00	546.00	0.0
51.000	608.00	0.0	608.11	41.00	0.0	1850.00	0.0	0.0	0.0	505.00	546.00	0.0
51.000	608.00	0.0	608.11	41.00	0.0	1850.00	0.0	0.0	0.0	505.00	546.00	0.0
52.000	608.08	0.0	608.19	41.00	0.0	1850.00	0.0	0.0	0.0	505.00	546.00	0.0
52.000	608.08	0.0	608.19	41.00	0.0	1850.00	0.0	0.0	0.0	505.00	546.00	0.0
100.000	608.01	0.0	608.23	38.00	0.0	1850.00	0.0	0.0	0.0	505.00	543.00	0.0
100.000	608.01	0.0	608.23	38.00	0.0	1850.00	0.0	0.0	0.0	505.00	543.00	0.0
102.000	608.01	0.0	608.24	38.00	0.0	1850.00	0.0	0.0	0.0	505.00	543.00	0.0
102.000	608.01	0.0	608.24	38.00	0.0	1850.00	0.0	0.0	0.0	505.00	543.00	0.0
150.000	607.99	0.0	608.26	33.00	0.0	1850.00	0.0	0.0	0.0	492.50	525.50	0.0
150.000	607.99	0.0	608.26	33.00	0.0	1850.00	0.0	0.0	0.0	492.50	525.50	0.0
151.000	608.62	0.0	608.86	33.00	0.0	1850.00	0.0	0.0	0.0	492.50	525.50	0.0
151.000	608.62	0.0	608.86	33.00	0.0	1850.00	0.0	0.0	0.0	492.50	525.50	0.0
153.000	608.82	0.0	608.89	100.00	382.35	1196.45	271.21	100.00	450.00	492.50	525.50	550.00
153.000	608.82	0.0	608.89	100.00	382.35	1196.45	271.21	100.00	450.00	492.50	525.50	550.00
650.000	608.91	0.0	608.92	363.29	76.05	1743.69	30.26	0.0	0.0	293.00	514.00	0.0
650.000	608.91	0.0	608.92	221.00	0.0	1850.00	0.0	221.00	293.00	293.00	514.00	514.00
1950.000	608.92	0.0	608.92	470.93	58.68	327.58	1463.75	0.0	0.0	76.00	117.00	0.0
1950.000	608.92	0.00	608.93	374.00	0.0	324.33	1525.67	374.00	76.00	76.00	117.00	450.00
3825.000	608.94	0.0	608.95	566.80	1430.64	409.17	10.19	0.0	0.0	667.00	707.00	0.0
3825.000	608.95	0.01	608.96	322.00	1390.47	459.52	0.0	322.00	385.00	667.00	707.00	707.00
5550.000	608.98	0.0	609.03	223.27	548.36	1108.31	193.33	0.0	0.0	170.00	210.00	0.0
5550.000	609.00	0.02	609.07	95.00	476.28	1282.41	91.31	95.00	125.00	170.00	210.00	220.00
5700.000	608.85	0.0	609.24	32.00	0.0	1850.00	0.0	0.0	0.0	493.00	525.00	0.0
5700.000	608.89	0.05	609.29	32.00	0.0	1850.00	0.0	0.0	0.0	493.00	525.00	0.0

SECNO	CWSEL	DIFKWS	EG	TOPWID	QLOB	QCH	QROB	PERENC	STENCL	STCHL	STCHR	STENCR
5701.000	608.73	0.0	609.39	32.00	0.0	1850.00	0.0	0.0	0.0	493.00	525.00	0.0
5701.000	608.77	0.04	609.44	32.00	0.0	1850.00	0.0	0.0	0.0	493.00	525.00	0.0
5702.000	609.26	0.0	609.93	32.00	0.0	1850.00	0.0	0.0	0.0	493.00	525.00	0.0
5702.000	609.30	0.04	609.97	32.00	0.0	1850.00	0.0	0.0	0.0	493.00	525.00	0.0
5703.000	609.69	0.0	610.04	32.00	0.0	1850.00	0.0	0.0	0.0	493.00	525.00	0.0
5703.000	609.74	0.05	610.08	32.00	0.0	1850.00	0.0	0.0	0.0	493.00	525.00	0.0
5900.000	610.03	0.0	610.16	80.00	176.19	1343.23	330.58	80.00	470.00	493.00	525.00	550.00
5900.000	610.08	0.04	610.21	80.00	177.10	1341.81	331.10	80.00	470.00	493.00	525.00	550.00
6250.000	610.21	0.0	610.21	523.30	1155.87	462.58	231.55	0.0	0.0	493.00	525.00	0.0
6250.000	610.25	0.05	610.26	320.00	1142.74	530.21	177.05	320.00	240.00	493.00	525.00	560.00
6750.000	610.23	0.0	610.24	506.40	469.51	515.52	614.98	0.0	0.0	550.00	582.00	0.0
6750.000	610.28	0.05	610.30	230.00	380.63	624.33	595.03	230.00	450.00	550.00	582.00	680.00
7875.000	610.31	0.0	610.32	324.33	271.49	251.81	1076.70	0.0	0.0	200.00	220.00	0.0
7875.000	610.40	0.08	610.41	230.00	227.55	273.60	1098.85	230.00	150.00	200.00	220.00	380.00
8125.000	610.34	0.0	610.36	440.00	352.50	702.52	544.99	0.0	0.0	497.00	544.00	0.0
8125.000	610.43	0.09	610.45	310.00	325.22	732.85	541.93	310.00	370.00	497.00	544.00	680.00
8175.000	610.30	0.0	610.44	46.00	0.0	1600.00	0.0	0.0	0.0	503.00	549.00	0.0
8175.000	610.39	0.09	610.53	46.00	0.0	1600.00	0.0	0.0	0.0	503.00	549.00	0.0
8176.000	610.30	0.0	610.44	46.00	0.0	1600.00	0.0	0.0	0.0	503.00	549.00	0.0
8176.000	610.39	0.09	610.53	46.00	0.0	1600.00	0.0	0.0	0.0	503.00	549.00	0.0
8177.000	610.31	0.0	610.45	46.00	0.0	1600.00	0.0	0.0	0.0	503.00	549.00	0.0
8177.000	610.40	0.09	610.53	46.00	0.0	1600.00	0.0	0.0	0.0	503.00	549.00	0.0
8178.000	610.31	0.0	610.45	46.00	0.0	1600.00	0.0	0.0	0.0	503.00	549.00	0.0
8178.000	610.40	0.09	610.53	46.00	0.0	1600.00	0.0	0.0	0.0	503.00	549.00	0.0
8225.000	610.29	0.0	610.47	61.83	0.0	1600.00	0.0	0.0	0.0	495.00	560.00	0.0
8225.000	610.38	0.09	610.56	61.92	0.0	1600.00	0.0	0.0	0.0	495.00	560.00	0.0
8226.000	610.29	0.0	610.48	61.83	0.0	1600.00	0.0	0.0	0.0	495.00	560.00	0.0
8226.000	610.38	0.09	610.56	61.91	0.0	1600.00	0.0	0.0	0.0	495.00	560.00	0.0
8227.000	610.29	0.0	610.48	61.83	0.0	1600.00	0.0	0.0	0.0	495.00	560.00	0.0
8227.000	610.39	0.09	610.56	61.91	0.0	1600.00	0.0	0.0	0.0	495.00	560.00	0.0
8228.000	610.29	0.0	610.48	61.83	0.0	1600.00	0.0	0.0	0.0	495.00	560.00	0.0
8228.000	610.39	0.09	610.57	61.91	0.0	1600.00	0.0	0.0	0.0	495.00	560.00	0.0
8325.000	610.53	0.0	610.55	300.00	330.89	346.57	922.54	0.0	0.0	376.00	392.00	0.0
8325.000	610.60	0.07	610.64	200.00	214.27	433.24	952.48	200.00	350.00	376.00	392.00	550.00
10100.000	610.66	0.0	610.67	378.93	1229.38	370.62	0.0	0.0	0.0	376.00	426.00	0.0
10100.000	610.78	0.12	610.79	318.20	1218.75	381.25	0.0	320.00	100.00	376.00	426.00	420.00
12100.000	610.92	0.0	610.94	288.11	984.91	524.74	90.35	0.0	0.0	360.00	392.00	0.0
12100.000	611.04	0.12	611.07	250.00	1003.15	542.84	54.01	250.00	155.00	360.00	392.00	405.00

SECNO	CWSEL	DIFKWS	EG	TOPWID	QLOB	QCH	QROB	PERENC	STENCL	STCHL	STCHR	STENCR
12900.000	611.09	0.0	611.15	222.36	115.33	577.79	906.87	0.0	0.0	34.00	60.00	0.0
12900.000	611.22	0.13	611.28	205.00	69.52	594.94	935.54	205.00	25.00	34.00	60.00	230.00
14400.000	611.70	0.0	611.76	252.98	893.05	706.95	0.0	0.0	0.0	264.00	335.00	0.0
14400.000	611.81	0.11	611.86	238.93	897.15	702.85	0.0	260.00	75.00	264.00	335.00	335.00
15625.000	612.33	0.0	612.44	255.24	260.47	577.40	762.13	0.0	0.0	264.00	285.00	0.0
15625.000	612.41	0.08	612.52	200.00	247.88	586.21	765.91	200.00	210.00	264.00	285.00	410.00
15825.000	612.33	0.0	612.95	29.52	0.0	1600.00	0.0	0.0	0.0	272.00	301.52	0.0
15825.000	612.41	0.08	613.02	29.52	0.0	1600.00	0.0	0.0	0.0	272.00	301.52	0.0
15826.000	612.33	0.0	612.95	29.52	0.0	1600.00	0.0	0.0	0.0	272.00	301.52	0.0
15826.000	612.41	0.08	613.02	29.52	0.0	1600.00	0.0	0.0	0.0	272.00	301.52	0.0
15827.000	612.65	0.0	613.23	29.52	0.0	1600.00	0.0	0.0	0.0	272.00	301.52	0.0
15827.000	612.73	0.07	613.29	29.52	0.0	1600.00	0.0	0.0	0.0	272.00	301.52	0.0
15828.000	612.66	0.0	613.23	29.52	0.0	1600.00	0.0	0.0	0.0	272.00	301.52	0.0
15828.000	612.73	0.07	613.30	29.52	0.0	1600.00	0.0	0.0	0.0	272.00	301.52	0.0
16225.000	613.54	0.0	613.74	40.00	0.0	1600.00	0.0	0.0	0.0	103.00	143.00	0.0
16225.000	613.59	0.06	613.80	40.00	0.0	1600.00	0.0	0.0	0.0	103.00	143.00	0.0
16226.000	613.54	0.0	613.75	40.00	0.0	1600.00	0.0	0.0	0.0	103.00	143.00	0.0
16226.000	613.59	0.06	613.80	40.00	0.0	1600.00	0.0	0.0	0.0	103.00	143.00	0.0
16227.000	613.62	0.0	613.83	40.00	0.0	1600.00	0.0	0.0	0.0	103.00	143.00	0.0
16227.000	613.68	0.06	613.88	40.00	0.0	1600.00	0.0	0.0	0.0	103.00	143.00	0.0
16228.000	613.62	0.0	613.83	40.00	0.0	1600.00	0.0	0.0	0.0	103.00	143.00	0.0
16228.000	613.68	0.06	613.88	40.00	0.0	1600.00	0.0	0.0	0.0	103.00	143.00	0.0
16375.000	613.66	0.0	613.90	40.00	0.0	1600.00	0.0	0.0	0.0	53.00	93.00	0.0
16375.000	613.71	0.05	613.95	40.00	0.0	1600.00	0.0	0.0	0.0	53.00	93.00	0.0
16376.000	613.66	0.0	613.90	40.00	0.0	1600.00	0.0	0.0	0.0	53.00	93.00	0.0
16376.000	613.71	0.05	613.95	40.00	0.0	1600.00	0.0	0.0	0.0	53.00	93.00	0.0
16377.000	613.68	0.0	613.92	40.00	0.0	1600.00	0.0	0.0	0.0	53.00	93.00	0.0
16377.000	613.73	0.05	613.97	40.00	0.0	1600.00	0.0	0.0	0.0	53.00	93.00	0.0
16378.000	613.68	0.0	613.92	40.00	0.0	1600.00	0.0	0.0	0.0	53.00	93.00	0.0
16378.000	613.74	0.05	613.97	40.00	0.0	1600.00	0.0	0.0	0.0	53.00	93.00	0.0
16450.000	613.99	0.0	614.02	241.43	497.67	604.11	498.22	270.00	100.00	258.00	292.00	370.00
16450.000	614.04	0.05	614.07	241.52	499.32	601.56	499.12	270.00	100.00	258.00	292.00	370.00
24250.000	614.08	0.0	614.12	335.00	576.54	581.61	441.85	335.00	145.00	315.00	345.00	480.00
24250.000	614.13	0.05	614.16	335.00	577.60	577.45	444.94	335.00	145.00	315.00	345.00	480.00
25500.000	614.29	0.0	614.34	365.87	520.49	625.52	453.99	0.0	0.0	310.00	340.00	0.0
25500.000	614.33	0.04	614.38	320.00	531.32	610.39	458.28	320.00	110.00	310.00	340.00	430.00
26350.000	614.45	0.0	614.46	430.00	1187.95	273.44	138.61	430.00	60.00	354.00	386.00	490.00
26350.000	614.48	0.03	614.49	430.00	1187.37	273.05	139.58	430.00	60.00	354.00	386.00	490.00

SECNO	CWSEL	DIFKWS	EG	TOPWID	QLOB	QCH	QROB	PERENC	STENCL	STCHL	STCHR	STENCR
26400.000	614.44	0.0	614.48	428.96	738.80	351.33	509.87	0.0	0.0	338.50	357.50	0.0
26400.000	614.47	0.03	614.51	365.00	754.95	350.83	494.22	365.00	110.00	338.50	357.50	475.00
26401.000	614.45	0.0	614.48	428.55	963.51	120.55	515.94	0.0	0.0	338.50	357.50	0.0
26401.000	614.48	0.03	614.51	429.97	963.27	120.06	516.67	0.0	0.0	338.50	357.50	0.0
26402.000	614.49	0.0	614.52	430.66	963.16	119.82	517.02	0.0	0.0	338.50	357.50	0.0
26402.000	614.52	0.03	614.55	432.11	962.92	119.33	517.75	0.0	0.0	338.50	357.50	0.0
26403.000	614.49	0.0	614.52	430.97	741.26	348.16	510.59	0.0	0.0	338.50	357.50	0.0
26403.000	614.52	0.03	614.55	432.40	742.96	345.94	511.09	0.0	0.0	338.50	357.50	0.0
26450.000	614.50	0.0	614.54	395.00	745.49	345.25	509.26	395.00	120.00	338.50	357.50	515.00
26450.000	614.54	0.03	614.57	395.00	746.88	343.12	510.01	395.00	120.00	338.50	357.50	515.00
27200.000	614.71	0.0	614.79	212.93	285.48	1156.30	158.23	0.0	0.0	146.00	205.00	0.0
27200.000	614.75	0.03	614.84	188.54	216.53	1215.04	168.43	370.00	120.00	146.00	205.00	490.00

STURGEON CREEK

SUMMARY PRINTOUT TABLE 150

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
50.000	25.00	0.0	0.0	590.60	1850.00	608.00	0.0	608.11	2.05	2.67	692.90	1292.70
50.000	25.00	0.0	0.0	590.60	1850.00	608.00	0.0	608.11	2.05	2.67	692.90	1292.70
51.000	25.00	0.0	0.0	590.60	1850.00	608.00	0.0	608.11	1.04	2.67	693.10	1810.50
51.000	25.00	0.0	0.0	590.60	1850.00	608.00	0.0	608.11	1.04	2.67	693.10	1810.50
52.000	32.00	610.40	607.00	590.60	1850.00	608.08	0.0	608.19	1.03	2.66	696.33	1822.06
52.000	32.00	610.40	607.00	590.60	1850.00	608.08	0.0	608.19	1.03	2.66	696.33	1822.06
100.000	11.00	0.0	0.0	594.70	1850.00	608.01	0.0	608.23	2.51	3.72	497.74	1167.00
100.000	11.00	0.0	0.0	594.70	1850.00	608.01	0.0	608.23	2.51	3.72	497.74	1167.00
102.000	25.00	614.00	607.20	594.70	1850.00	608.01	0.0	608.24	4.58	3.88	476.88	864.92
102.000	25.00	614.00	607.20	594.70	1850.00	608.01	0.0	608.24	4.58	3.88	476.88	864.92
150.000	25.00	0.0	0.0	591.90	1850.00	607.99	0.0	608.26	2.65	4.16	445.08	1137.35
150.000	25.00	0.0	0.0	591.90	1850.00	607.99	0.0	608.26	2.65	4.16	445.08	1137.35
151.000	1.00	611.90	606.90	591.90	1850.00	608.62	0.0	608.86	2.27	3.97	465.79	1226.94
151.000	1.00	611.90	606.90	591.90	1850.00	608.62	0.0	608.86	2.27	3.97	465.79	1226.94
153.000	100.00	0.0	0.0	591.90	1850.00	608.82	0.0	608.89	0.91	2.53	1002.41	1942.83
153.000	100.00	0.0	0.0	591.90	1850.00	608.82	0.0	608.89	0.91	2.53	1002.41	1942.83
650.000	400.00	0.0	0.0	591.20	1850.00	608.91	0.0	608.92	0.03	0.50	4160.53	9912.11
650.000	400.00	0.0	0.0	591.20	1850.00	608.91	0.0	608.92	0.04	0.53	3509.15	8782.12
1950.000	1320.00	0.0	0.0	591.50	1850.00	608.92	0.0	608.92	0.08	0.54	5076.18	6556.79
1950.000	1320.00	0.0	0.0	591.50	1850.00	608.92	0.0	608.93	0.11	0.54	4394.28	5628.48
3825.000	1815.00	0.0	0.0	593.20	1850.00	608.94	0.0	608.95	0.23	0.80	3749.97	3864.93
3825.000	1815.00	0.0	0.0	593.20	1850.00	608.95	0.0	608.96	0.33	0.90	2908.17	3232.12
5550.000	1620.00	0.0	0.0	593.30	1850.00	608.98	0.0	609.03	1.30	2.08	1343.75	1623.35
5550.000	1620.00	0.0	0.0	593.30	1850.00	609.00	0.0	609.07	1.73	2.40	1010.70	1408.26
5700.000	135.00	0.0	0.0	595.00	1850.00	608.85	0.0	609.24	15.18	5.07	365.05	474.77
5700.000	135.00	0.0	0.0	595.00	1850.00	608.89	0.0	609.29	14.98	5.05	366.53	477.98
5701.000	5.00	610.80	611.40	595.00	1850.00	608.73	0.0	609.39	79.61	6.56	282.00	207.34
5701.000	5.00	610.80	611.40	595.00	1850.00	608.77	0.0	609.44	79.61	6.56	282.00	207.34
5702.000	67.00	610.80	611.40	595.00	1850.00	609.26	0.0	609.93	79.61	6.56	282.00	207.34
5702.000	67.00	610.80	611.40	595.00	1850.00	609.30	0.0	609.97	79.61	6.56	282.00	207.34
5703.000	5.00	0.0	0.0	595.00	1850.00	609.69	0.0	610.04	11.96	4.72	392.13	534.91
5703.000	5.00	0.0	0.0	595.00	1850.00	609.74	0.0	610.08	11.81	4.70	393.63	538.34
5900.000	100.00	0.0	0.0	594.90	1850.00	610.03	0.0	610.16	3.98	3.26	739.96	927.16
5900.000	100.00	0.0	0.0	594.90	1850.00	610.08	0.0	610.21	3.93	3.25	743.48	933.43
6250.000	400.00	0.0	0.0	595.70	1850.00	610.21	0.0	610.21	0.52	1.17	3083.07	2564.30
6250.000	400.00	0.0	0.0	595.70	1850.00	610.25	0.0	610.26	0.68	1.34	2468.78	2251.16

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
6750.000	410.00	0.0	0.0	596.50	1600.00	610.23	0.0	610.24	0.75	1.38	2342.52	1845.65
6750.000	410.00	0.0	0.0	596.50	1600.00	610.28	0.0	610.30	1.09	1.66	1669.03	1535.09
7875.000	1240.00	0.0	0.0	597.90	1600.00	610.31	0.0	610.32	0.81	1.20	2122.77	1782.96
7875.000	1240.00	0.0	0.0	597.90	1600.00	610.40	0.0	610.41	0.92	1.29	1875.03	1665.55
8125.000	610.00	0.0	0.0	598.10	1600.00	610.34	0.0	610.36	0.44	1.35	2338.33	2405.21
8125.000	610.00	0.0	0.0	598.10	1600.00	610.43	0.0	610.45	0.47	1.40	2073.32	2334.10
8175.000	200.00	0.0	0.0	598.30	1600.00	610.30	0.0	610.44	1.88	2.99	535.82	1168.15
8175.000	200.00	0.0	0.0	598.30	1600.00	610.39	0.0	610.53	1.83	2.96	540.01	1183.41
8176.000	1.00	617.20	617.30	598.30	1600.00	610.30	0.0	610.44	1.88	2.99	535.82	1168.15
8176.000	1.00	617.20	617.30	598.30	1600.00	610.39	0.0	610.53	1.83	2.96	540.00	1183.37
8177.000	48.00	617.20	617.30	598.30	1600.00	610.31	0.0	610.45	1.87	2.98	536.23	1169.62
8177.000	48.00	617.20	617.30	598.30	1600.00	610.40	0.0	610.53	1.82	2.96	540.40	1184.81
8178.000	1.00	0.0	0.0	598.30	1600.00	610.31	0.0	610.45	1.87	2.98	536.25	1169.70
8178.000	1.00	0.0	0.0	598.30	1600.00	610.40	0.0	610.53	1.82	2.96	540.42	1184.89
8225.000	20.00	0.0	0.0	599.60	1600.00	610.29	0.0	610.47	5.09	3.44	464.60	708.95
8225.000	20.00	0.0	0.0	599.60	1600.00	610.38	0.0	610.56	4.89	3.40	470.89	723.36
8226.000	1.00	614.90	617.20	599.60	1600.00	610.29	0.0	610.48	5.09	3.44	464.62	708.99
8226.000	1.00	614.90	617.20	599.60	1600.00	610.38	0.0	610.56	4.91	3.40	470.30	721.99
8227.000	6.00	614.90	617.20	599.60	1600.00	610.29	0.0	610.48	5.09	3.44	464.81	709.44
8227.000	6.00	614.90	617.20	599.60	1600.00	610.39	0.0	610.56	4.91	3.40	470.46	722.37
8228.000	1.00	0.0	0.0	599.60	1600.00	610.29	0.0	610.48	5.08	3.44	464.86	709.54
8228.000	1.00	0.0	0.0	599.60	1600.00	610.39	0.0	610.57	4.90	3.40	470.51	722.48
8325.000	120.00	0.0	0.0	599.10	1600.00	610.53	0.0	610.55	1.06	2.04	1718.54	1555.81
8325.000	120.00	0.0	0.0	599.10	1600.00	610.60	0.0	610.64	1.62	2.54	1301.19	1258.55
10100.000	1215.00	0.0	0.0	599.90	1600.00	610.66	0.0	610.67	1.38	1.32	2295.84	1364.09
10100.000	1215.00	0.0	0.0	599.90	1600.00	610.78	0.0	610.79	1.39	1.34	2197.58	1358.64
12100.000	1980.00	0.0	0.0	600.30	1600.00	610.92	0.0	610.94	1.63	1.76	1606.84	1254.80
12100.000	1980.00	0.0	0.0	600.30	1600.00	611.04	0.0	611.07	1.67	1.80	1538.82	1239.40
12900.000	800.00	0.0	0.0	601.40	1600.00	611.09	0.0	611.15	4.57	2.73	1054.13	748.18
12900.000	800.00	0.0	0.0	601.40	1600.00	611.22	0.0	611.28	4.61	2.77	1036.52	745.43
14400.000	1400.00	0.0	0.0	602.00	1600.00	611.70	0.0	611.76	4.39	2.64	1062.19	763.79
14400.000	1400.00	0.0	0.0	602.00	1600.00	611.81	0.0	611.86	4.10	2.58	1072.95	790.25
15625.000	1245.00	0.0	0.0	603.80	1600.00	612.33	0.0	612.44	7.26	4.00	894.62	593.63
15625.000	1245.00	0.0	0.0	603.80	1600.00	612.41	0.0	612.52	7.21	4.02	855.23	595.98
15825.000	190.00	0.0	0.0	603.70	1600.00	612.33	0.0	612.95	29.23	6.33	252.90	295.95
15825.000	190.00	0.0	0.0	603.70	1600.00	612.41	0.0	613.02	28.44	6.27	255.36	300.03
15826.000	1.00	621.30	615.70	603.70	1600.00	612.33	0.0	612.95	29.22	6.33	252.94	296.01
15826.000	1.00	621.30	615.70	603.70	1600.00	612.41	0.0	613.02	28.43	6.26	255.40	300.10

SECNO	XLCH	ELTRO	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
15827.000	96.80	621.30	615.70	603.70	1600.00	612.65	0.0	613.23	26.28	6.09	262.61	312.11
15827.000	96.80	621.30	615.70	603.70	1600.00	612.73	0.0	613.29	25.68	6.04	264.79	315.76
15828.000	1.00	0.0	0.0	603.70	1600.00	612.66	0.0	613.23	26.26	6.09	262.70	312.25
15828.000	1.00	0.0	0.0	603.70	1600.00	612.73	0.0	613.30	25.66	6.04	264.85	315.86
16225.000	330.00	0.0	0.0	601.80	1600.00	613.54	0.0	613.74	6.97	3.67	436.20	606.14
16225.000	330.00	0.0	0.0	601.80	1600.00	613.59	0.0	613.80	6.87	3.65	438.39	610.48
16226.000	1.00	621.60	617.10	601.30	1600.00	613.54	0.0	613.75	6.95	3.67	436.48	606.70
16226.000	1.00	621.60	617.10	601.80	1600.00	613.59	0.0	613.80	6.85	3.65	438.74	611.18
16227.000	118.00	621.60	617.10	601.80	1600.00	613.62	0.0	613.83	6.81	3.64	439.74	613.17
16227.000	118.00	621.60	617.10	601.80	1600.00	613.68	0.0	613.88	6.71	3.62	441.96	617.58
16228.000	1.00	0.0	0.0	601.80	1600.00	613.62	0.0	613.83	6.80	3.64	439.89	613.46
16228.000	1.00	0.0	0.0	601.80	1600.00	613.68	0.0	613.88	6.71	3.62	442.10	617.85
16375.000	80.00	0.0	0.0	603.40	1600.00	613.66	0.0	613.90	6.88	3.96	404.55	610.07
16375.000	80.00	0.0	0.0	603.40	1600.00	613.71	0.0	613.95	6.77	3.93	406.73	614.83
16376.000	1.00	622.70	624.70	603.40	1600.00	613.66	0.0	613.90	6.90	3.96	404.20	609.31
16376.000	1.00	622.70	624.70	603.40	1600.00	613.71	0.0	613.95	6.79	3.94	406.39	614.07
16377.000	29.60	622.70	624.70	603.40	1600.00	613.68	0.0	613.92	6.86	3.95	405.00	611.05
16377.000	29.60	622.70	624.70	603.40	1600.00	613.73	0.0	613.97	6.75	3.93	407.19	615.82
16378.000	1.00	0.0	0.0	603.40	1600.00	613.68	0.0	613.92	6.85	3.95	405.07	611.20
16378.000	1.00	0.0	0.0	603.40	1600.00	613.74	0.0	613.97	6.75	3.93	407.26	615.97
16450.000	155.00	0.0	0.0	603.70	1600.00	613.99	0.0	614.02	1.16	1.94	1369.65	1487.53
16450.000	155.00	0.0	0.0	603.70	1600.00	614.04	0.0	614.07	1.13	1.92	1381.97	1507.74
24250.000	810.00	0.0	0.0	604.60	1600.00	614.08	0.0	614.12	1.56	2.23	1370.47	1282.92
24250.000	810.00	0.0	0.0	604.60	1600.00	614.13	0.0	614.16	1.51	2.20	1386.74	1304.19
25500.000	1250.00	0.0	0.0	605.50	1600.00	614.29	0.0	614.34	2.37	2.60	1198.36	1039.32
25500.000	1250.00	0.0	0.0	605.50	1600.00	614.33	0.0	614.38	2.22	2.52	1193.25	1073.69
26350.000	810.00	0.0	0.0	606.30	1600.00	614.45	0.0	614.46	1.04	1.31	2213.67	1571.45
26350.000	810.00	0.0	0.0	606.30	1600.00	614.48	0.0	614.49	1.02	1.30	2227.58	1586.65
26400.000	40.00	0.0	0.0	606.50	1600.00	614.44	0.0	614.48	5.21	2.66	1313.95	701.02
26400.000	40.00	0.0	0.0	606.50	1600.00	614.47	0.0	614.51	5.11	2.65	1274.67	707.47
26401.000	1.00	610.60	618.00	606.50	1600.00	614.45	0.0	614.48	11.12	1.67	1133.63	479.73
26401.000	1.00	610.60	618.00	606.50	1600.00	614.48	0.0	614.51	10.73	1.64	1147.26	488.41
26402.000	41.00	610.60	618.00	606.50	1600.00	614.49	0.0	614.52	10.55	1.63	1153.83	492.61
26402.000	41.00	610.60	618.00	606.50	1600.00	614.52	0.0	614.55	10.18	1.61	1167.74	501.53
26403.000	1.00	0.0	0.0	606.50	1600.00	614.49	0.0	614.52	5.01	2.62	1333.20	715.04
26403.000	1.00	0.0	0.0	606.50	1600.00	614.52	0.0	614.55	4.87	2.59	1346.90	725.06
26450.000	45.00	0.0	0.0	606.50	1600.00	614.50	0.0	614.54	4.88	2.59	1315.98	724.33
26450.000	45.00	0.0	0.0	606.50	1600.00	614.54	0.0	614.57	4.75	2.57	1328.28	734.24

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
27200.000	630.00	0.0	0.0	604.50	1600.00	614.71	0.0	614.79	2.98	2.50	850.06	926.71
27200.000	630.00	0.0	0.0	604.50	1600.00	614.75	0.0	614.84	3.25	2.61	804.77	887.92

STURGEON CREEK

SUMMARY PRINTOUT TABLE 150

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
50.000	1850.00	608.00	0.0	0.0	0.0	41.00	25.00
50.000	1850.00	608.00	0.0	0.0	0.0	41.00	25.00
51.000	1850.00	608.00	0.0	0.00	0.0	41.00	25.00
51.000	1850.00	608.00	0.0	0.00	0.0	41.00	25.00
52.000	1850.00	608.08	0.0	0.08	0.0	41.00	32.00
52.000	1850.00	608.08	0.0	0.08	0.0	41.00	32.00
100.000	1850.00	608.01	0.0	-0.07	0.0	38.00	11.00
100.000	1850.00	608.01	0.0	-0.07	0.0	38.00	11.00
102.000	1850.00	608.01	0.0	-0.01	0.0	38.00	25.00
102.000	1850.00	608.01	0.0	-0.01	0.0	38.00	25.00
150.000	1850.00	607.99	0.0	-0.02	0.0	33.00	25.00
150.000	1850.00	607.99	0.0	-0.02	0.0	33.00	25.00
151.000	1850.00	608.62	0.0	0.63	0.0	33.00	1.00
151.000	1850.00	608.62	0.0	0.63	0.0	33.00	1.00
153.000	1850.00	608.82	0.0	0.20	0.0	100.00	100.00
153.000	1850.00	608.82	0.0	0.20	0.0	100.00	100.00
650.000	1850.00	608.91	0.0	0.09	0.0	363.29	400.00
650.000	1850.00	608.91	0.0	0.09	0.0	221.00	400.00
1950.000	1850.00	608.92	0.0	0.01	0.0	470.93	1320.00
1950.000	1850.00	608.92	0.00	0.01	0.00	374.00	1320.00
3825.000	1850.00	608.94	0.0	0.02	0.0	566.80	1815.00
3825.000	1850.00	608.95	0.01	0.02	0.01	322.00	1815.00
5550.000	1850.00	608.98	0.0	0.04	0.0	223.27	1620.00
5550.000	1850.00	609.00	0.02	0.05	0.02	95.00	1620.00
5700.000	1850.00	608.85	0.0	-0.13	0.0	32.00	135.00
5700.000	1850.00	608.89	0.05	-0.11	0.05	32.00	135.00
5701.000	1850.00	608.73	0.0	-0.12	0.0	32.00	5.00
5701.000	1850.00	608.77	0.04	-0.12	0.04	32.00	5.00
5702.000	1850.00	609.26	0.0	0.53	0.0	32.00	67.00
5702.000	1850.00	609.30	0.04	0.53	0.04	32.00	67.00
5703.000	1850.00	609.69	0.0	0.43	0.0	32.00	5.00
5703.000	1850.00	609.74	0.05	0.44	0.05	32.00	5.00
5900.000	1850.00	610.03	0.0	0.34	0.0	80.00	100.00
5900.000	1850.00	610.08	0.04	0.34	0.04	80.00	100.00
6250.000	1850.00	610.21	0.0	0.17	0.0	523.30	400.00
6250.000	1850.00	610.25	0.05	0.17	0.05	320.00	400.00

SECNO	Q	CWSEL	DIFWSP	DIFJSX	DIFKWS	TOPWID	XLCH
6750.000	1600.00	610.23	0.0	0.02	0.0	506.40	410.00
6750.000	1600.00	610.28	0.05	0.02	0.05	230.00	410.00
7875.000	1600.00	610.31	0.0	0.09	0.0	324.33	1240.00
7875.000	1600.00	610.40	0.08	0.12	0.08	230.00	1240.00
8125.000	1600.00	610.34	0.0	0.03	0.0	440.00	610.00
8125.000	1600.00	610.43	0.09	0.03	0.09	310.00	610.00
8175.000	1600.00	610.30	0.0	-0.05	0.0	46.00	200.00
8175.000	1600.00	610.39	0.09	-0.04	0.09	46.00	200.00
8176.000	1600.00	610.30	0.0	0.0	0.0	46.00	1.00
8176.000	1600.00	610.39	0.09	0.0	0.09	46.00	1.00
8177.000	1600.00	610.31	0.0	0.01	0.0	46.00	48.00
8177.000	1600.00	610.40	0.09	0.01	0.09	46.00	48.00
8178.000	1600.00	610.31	0.0	0.0	0.0	46.00	1.00
8178.000	1600.00	610.40	0.09	0.0	0.09	46.00	1.00
8225.000	1600.00	610.29	0.0	-0.02	0.0	61.83	20.00
8225.000	1600.00	610.38	0.09	-0.02	0.09	61.92	20.00
8226.000	1600.00	610.29	0.0	0.00	0.0	61.83	1.00
8226.000	1600.00	610.38	0.09	0.0	0.09	61.91	1.00
8227.000	1600.00	610.29	0.0	0.00	0.0	61.83	6.00
8227.000	1600.00	610.39	0.09	0.00	0.09	61.91	6.00
8228.000	1600.00	610.29	0.0	0.00	0.0	61.83	1.00
8228.000	1600.00	610.39	0.09	0.00	0.09	61.91	1.00
8325.000	1600.00	610.53	0.0	0.24	0.0	300.00	120.00
8325.000	1600.00	610.60	0.07	0.21	0.07	200.00	120.00
10100.000	1600.00	610.66	0.0	0.13	0.0	378.93	1215.00
10100.000	1600.00	610.78	0.12	0.18	0.12	318.20	1215.00
12100.000	1600.00	610.92	0.0	0.26	0.0	288.11	1980.00
12100.000	1600.00	611.04	0.12	0.26	0.12	250.00	1980.00
12900.000	1600.00	611.09	0.0	0.17	0.0	222.36	800.00
12900.000	1600.00	611.22	0.13	0.18	0.13	205.00	800.00
14400.000	1600.00	611.70	0.0	0.60	0.0	252.98	1400.00
14400.000	1600.00	611.81	0.11	0.59	0.11	238.93	1400.00
15625.000	1600.00	612.33	0.0	0.63	0.0	255.24	1245.00
15625.000	1600.00	612.41	0.08	0.60	0.08	200.00	1245.00
15825.000	1600.00	612.33	0.0	-0.00	0.0	29.52	190.00
15825.000	1600.00	612.41	0.08	-0.00	0.08	29.52	190.00
15826.000	1600.00	612.33	0.0	0.00	0.0	29.52	1.00
15826.000	1600.00	612.41	0.08	0.00	0.08	29.52	1.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
15827.000	1600.00	612.65	0.0	0.33	0.0	29.52	96.80
15827.000	1600.00	612.73	0.07	0.32	0.07	29.52	96.80
15828.000	1600.00	612.66	0.0	0.00	0.0	29.52	1.00
15828.000	1600.00	612.73	0.07	0.00	0.07	29.52	1.00
16225.000	1600.00	613.54	0.0	0.88	0.0	40.00	330.00
16225.000	1600.00	613.59	0.06	0.86	0.06	40.00	330.00
16226.000	1600.00	613.54	0.0	0.00	0.0	40.00	1.00
16226.000	1600.00	613.59	0.06	0.00	0.06	40.00	1.00
16227.000	1600.00	613.62	0.0	0.09	0.0	40.00	118.00
16227.000	1600.00	613.68	0.06	0.08	0.06	40.00	118.00
16228.000	1600.00	613.62	0.0	0.00	0.0	40.00	1.00
16228.000	1600.00	613.68	0.06	0.00	0.06	40.00	1.00
16375.000	1600.00	613.66	0.0	0.04	0.0	40.00	80.00
16375.000	1600.00	613.71	0.05	0.04	0.05	40.00	80.00
16376.000	1600.00	613.66	0.0	0.00	0.0	40.00	1.00
16376.000	1600.00	613.71	0.05	0.00	0.05	40.00	1.00
16377.000	1600.00	613.68	0.0	0.02	0.0	40.00	29.60
16377.000	1600.00	613.73	0.05	0.02	0.05	40.00	29.60
16378.000	1600.00	613.68	0.0	0.00	0.0	40.00	1.00
16378.000	1600.00	613.74	0.05	0.00	0.05	40.00	1.00
16450.000	1600.00	613.99	0.0	0.31	0.0	241.43	155.00
16450.000	1600.00	614.04	0.05	0.30	0.05	241.52	155.00
24250.000	1600.00	614.08	0.0	0.09	0.0	335.00	810.00
24250.000	1600.00	614.13	0.05	0.09	0.05	335.00	810.00
25500.000	1600.00	614.29	0.0	0.21	0.0	365.87	1250.00
25500.000	1600.00	614.33	0.04	0.20	0.04	320.00	1250.00
26350.000	1600.00	614.45	0.0	0.16	0.0	430.00	810.00
26350.000	1600.00	614.48	0.03	0.16	0.03	430.00	810.00
26400.000	1600.00	614.44	0.0	-0.01	0.0	428.96	40.00
26400.000	1600.00	614.47	0.03	-0.01	0.03	365.00	40.00
26401.000	1600.00	614.45	0.0	0.01	0.0	428.55	1.00
26401.000	1600.00	614.48	0.03	0.01	0.03	429.97	1.00
26402.000	1600.00	614.49	0.0	0.05	0.0	430.66	41.00
26402.000	1600.00	614.52	0.03	0.04	0.03	432.11	41.00
26403.000	1600.00	614.49	0.0	-0.00	0.0	430.97	1.00
26403.000	1600.00	614.52	0.03	-0.00	0.03	432.40	1.00
26450.000	1600.00	614.50	0.0	0.02	0.0	395.00	45.00
26450.000	1600.00	614.54	0.03	0.02	0.03	395.00	45.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
27200.000	1600.00	614.71	0.0	0.21	0.0	212.93	630.00
27200.000	1600.00	614.75	0.03	0.21	0.03	188.54	630.00

SUMMARY OF ERRORS

FLOODWAY DATA, STURGEON CREEK
PROFILE NO. 2

STATION	FLOODWAY WIDTH FT	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WATER SURFACE ELEVATION WITHOUT FLOODWAY	DIFFERENCE
50.000	41.	693.	2.7	608.0	608.0	0.0
51.000	41.	693.	2.7	608.0	608.0	0.0
52.000	41.	696.	2.7	608.1	608.1	0.0
100.000	38.	498.	3.7	608.0	608.0	0.0
102.000	38.	477.	3.9	608.0	608.0	0.0
150.000	33.	445.	4.2	608.0	608.0	0.0
151.000	33.	466.	4.0	608.6	608.6	0.0
153.000	100.	1002.	1.8	608.8	608.8	0.0
650.000	221.	3509.	0.5	608.9	608.9	0.0
1950.000	374.	4394.	0.4	608.9	608.9	0.0
3825.000	322.	2908.	0.6	608.9	608.9	0.0
5550.000	95.	1011.	1.8	609.0	609.0	0.0
5700.000	32.	367.	5.0	608.8	608.8	0.0
5701.000	32.	282.	6.6	608.7	608.7	0.0
5702.000	32.	282.	6.6	609.3	609.3	0.0
5703.000	32.	394.	4.7	609.7	609.7	0.0
5900.000	80.	743.	2.5	610.0	610.0	0.0
6250.000	320.	2469.	0.7	610.2	610.2	0.0
6750.000	230.	1669.	1.0	610.3	610.2	0.1
7875.000	230.	1875.	0.9	610.4	610.3	0.1
8125.000	310.	2073.	0.8	610.4	610.3	0.1
8175.000	46.	540.	3.0	610.4	610.3	0.1
8176.000	46.	540.	3.0	610.4	610.3	0.1
8177.000	46.	540.	3.0	610.4	610.3	0.1
8178.000	46.	540.	3.0	610.4	610.3	0.1
8225.000	62.	471.	3.4	610.4	610.3	0.1
8226.000	62.	470.	3.4	610.4	610.3	0.1
8227.000	62.	470.	3.4	610.4	610.3	0.1
8228.000	62.	471.	3.4	610.4	610.3	0.1
8325.000	200.	1301.	1.2	610.6	610.5	0.1
10100.000	318.	2198.	0.7	610.8	610.7	0.1
12100.000	250.	1539.	1.0	611.0	610.9	0.1
12900.000	205.	1037.	1.5	611.2	611.1	0.1
14400.000	239.	1073.	1.5	611.8	611.7	0.1
15625.000	200.	855.	1.9	612.4	612.3	0.1
15825.000	30.	255.	6.3	612.4	612.3	0.1
15826.000	30.	255.	6.3	612.4	612.3	0.1
15827.000	30.	265.	6.0	612.8	612.7	0.1
15828.000	30.	265.	6.0	612.8	612.7	0.1
16225.000	40.	438.	3.6	613.6	613.5	0.1
16226.000	40.	439.	3.6	613.6	613.5	0.1
16227.000	40.	442.	3.6	613.7	613.6	0.1
16228.000	40.	442.	3.6	613.7	613.6	0.1
16375.000	40.	407.	3.9	613.8	613.7	0.1
16376.000	40.	406.	3.9	613.8	613.7	0.1
16377.000	40.	407.	3.9	613.8	613.7	0.1
16378.000	40.	407.	3.9	613.8	613.7	0.1
16450.000	242.	1382.	1.2	614.1	614.0	0.1
24250.000	335.	1387.	1.2	614.1	614.1	0.0
25500.000	320.	1193.	1.3	614.3	614.3	0.0

FLOODWAY DATA, STURGEON CREEK
PROFILE NO. 2

STATION	FLOODWAY WIDTH FT	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WATER SURFACE ELEVATION WITHOUT FLOODWAY	DIFFERENCE
26350.000	430.	2228.	0.7	614.5	614.5	0.0
26400.000	365.	1275.	1.3	614.4	614.4	0.0
26401.000	430.	1147.	1.4	614.4	614.4	0.0
26402.000	432.	1168.	1.4	614.5	614.5	0.0
26403.000	432.	1347.	1.2	614.5	614.5	0.0
26450.000	395.	1328.	1.2	614.5	614.5	0.0
27200.000	189.	805.	2.0	614.7	614.7	0.0

~~GOVEA~~	~~JGOVEDSS~~	~~1383~~	~~GO.FT06F001~~	~~8.46.09~~	~~13 OCT 80~~	~~CHIPPEWA RIVER~~	~~RIVER~~
GOVEA	JGOVEDSS	1383	GO.FT06F001	8.46.09	13 OCT 80	CHIPPEWA RIVER	RIVER
GOVEA	JGOVEDSS	1383	GO.FT06F001	8.46.09	13 OCT 80	CHIPPEWA RIVER	RIVER

B-1 10-, 50-, 100-, & 500- gen flowed

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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
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Caution: Profile has been lowered due to Revision to Tittabawassee 100yr stages lowered .5ft

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C
T1      CHIPPEWA RIVER AT MIDLAND, PROJECT NO. 8543
T2      CHIPPEWA RIVER-MIDLAND
T3      CHIPPEWA RIVER-MIDLAND

J1   ICHECK     INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ
       0.        2.        0.        0.      0.0       0.0       0.0       0.      610.410     0.0

J2   NPROF      IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE
     1.000      0.0      -1.000     0.0       0.0       0.0       0.0       0.0       0.0       0.0

NC     0.060     0.060     0.030     0.100     0.300     0.0       0.0       0.0       0.0       0.0
QT     4.000 27500.000 41000.000 47000.000 61600.000     0.0       0.0       0.0       0.0       0.0

          D/S OF CONFLUENCE WITH TITTABAWASSEE RIVER

X1 129100.000    11.000   413.000   669.000     0.0       0.0       0.0       0.0       0.0       0.0
X3       0.0       0.0       0.0   150.000     0.0       0.0       0.0       0.0       0.0       0.0
GR   607.200       0.0   607.000   368.000 600.300   413.000   596.500   418.000   591.500   455.000
GR   588.500   490.000   584.100   530.000 586.800   565.000   589.400   605.000   596.500   640.000
GR   613.000   669.000       0.0       0.0     0.0       0.0       0.0       0.0       0.0       0.0
NC     0.060     0.060     0.035       0.0     0.0       0.0       0.0       0.0       0.0       0.0
QT     4.000 10500.000 15000.000 16900.000 21700.000     0.0       0.0       0.0       0.0       0.0

          A   U/S OF CONFLUENCE WITH TITTABAWASSEE RIVER

X1   675.000    15.000  1043.000  1196.000   500.000   750.000   600.000       0.0       0.0       0.0
X3       0.0       0.0       0.0       0.0       0.0  1216.000       0.0       0.0       0.0       0.0
GR   600.000   600.000   600.000   850.000   603.400  1000.000   597.300  1017.000   598.200  1043.000
GR   596.800  1048.000   593.500  1075.000   591.900  1100.000   590.700  1125.000   590.200  1150.000
GR   592.300  1175.000   596.800  1196.000   613.200  1216.000   607.500  1250.000   608.000  1530.000

          B

X1  2625.000    23.000   177.000   427.000  2400.000  2600.000  2650.000       0.0       0.0       0.0
X3       0.0       0.0       0.0       0.0       0.0  1400.000       0.0       0.0       0.0       0.0
GR   618.000       0.0   616.700    45.000   604.200    75.000   601.400   177.000   595.800   186.000
GR   592.600   230.000   592.400   270.000   594.400   315.000   594.400   360.000   594.500   400.000
GR   595.800   403.000   610.500   427.000   602.300   456.000   596.300   467.000   596.300   669.000
GR   601.400   684.000   603.700   705.000   602.300   770.000   607.300   783.000   607.800  1168.000
GR   608.000  1200.000   608.000  1350.000   607.500  1500.000       0.0       0.0       0.0       0.0

          C

X1  5425.000    23.000  1799.000  1970.000  2750.000  2000.000  2700.000       0.0       0.0       0.0
GR   616.000       0.0   615.000    50.000   610.000   500.000   600.000   620.000   610.000   740.000
GR   610.300   800.000   604.200   860.000   603.600  1360.000   604.300  1680.000   602.100  1700.000
GR   601.000  1760.000   599.400  1787.000   600.800  1799.000   595.900  1815.000   593.900  1840.000
GR   593.100  1869.000   591.800  1895.000   592.400  1925.000   595.900  1952.000   601.700  1970.000
```

D

X1	7925.000	15.000	1620.000	1794.000	1850.000	2550.000	2550.000	0.0	0.0	0.0
X3	0.0	0.0	0.0	100.000	0.0	2450.000	0.0	0.0	0.0	0.0
GR	607.000	0.0	610.000	960.000	611.300	1200.000	605.500	1320.000	608.200	1578.000
GR	599.700	1604.000	599.000	1620.000	596.100	1625.000	593.700	1655.000	591.600	1685.000
GR	591.300	1720.000	591.600	1750.000	596.100	1782.000	605.400	1794.000	600.000	2600.000

E

X1	11525.000	30.000	31.000	267.000	2700.000	2400.000	3350.000	0.0	0.0	0.0
X3	0.0	0.0	0.0	0.0	0.0	2750.000	0.0	0.0	0.0	0.0
GR	612.500	0.0	609.500	13.000	607.800	31.000	597.500	56.000	592.300	95.000
GR	595.100	135.000	595.900	175.000	595.800	210.000	597.500	250.000	600.800	267.000
GR	608.400	290.000	608.000	365.000	603.200	400.000	606.500	440.000	603.800	480.000
GR	602.500	540.000	604.000	580.000	608.500	610.000	602.000	690.000	606.000	780.000
GR	608.100	860.000	610.200	880.000	605.000	1040.000	608.000	1120.000	610.000	1210.000
GR	611.000	1580.000	610.000	1850.000	610.000	2030.000	611.000	2400.000	610.000	2840.000
EJ	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

```
*PROF 1

CCHV     0.100 CEHV     0.300
*SECNO 129100.000
   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


3470 ENCROACHMENT STATIONS       150.0      669.0  TYPE       1  TARGET      -150.000

          D/S OF CONFLUENCE WITH TITTABAWASSEE RIVER

129100.00    26.31    610.41      0.0    610.41    610.85      0.44      0.0       0.0    600.30
   27500.     1027.    26473.       0.     1035.     4893.        0.       0.        0. 100000.00
     0.0      0.99      5.41      0.0     0.060     0.030     0.060      0.0    584.10    150.00
 0.000236       0.        0.        0.         0         0         0    -0.05    514.45    664.45

*SECNO 675.000
3280 CROSS SECTION    675.00 EXTENDED      2.92 FEET


3470 ENCROACHMENT STATIONS         0.0     1216.0  TYPE       1  TARGET      1215.999

          A   U/S OF CONFLUENCE WITH TITTABAWASSEE RIVER

   675.00    20.72    610.92      0.0       0.0    610.97      0.05      0.08      0.04    598.20
   10500.     4164.     6264.      72.     4634.     2786.      122.       86.        7.    596.80
     0.09      0.90      2.25     0.59     0.060     0.035     0.060     0.036    590.20    600.00
 0.000059      500.      600.     750.         2         0         0    -0.01    613.22   1213.22

*SECNO 2625.000
3280 CROSS SECTION    2625.00 EXTENDED      3.56 FEET


3470 ENCROACHMENT STATIONS         0.0     1400.0  TYPE       1  TARGET      1399.999

          B

  2625.00    18.66    611.06      0.0       0.0    611.08      0.02      0.11      0.00    601.40
   10500.      500.     6124.    3876.      899.     4043.     6282.      638.       64.    610.50
     0.73      0.56      1.51     0.62     0.060     0.035     0.060     0.036    592.40     58.54
 0.000032     2400.     2650.    2600.         2         0         0    -0.04   1341.46   1400.00

*SECNO 5425.000

          C

  5425.00    19.35    611.15      0.0       0.0    611.18      0.03      0.09      0.00    600.80
   10500.     5206.     5004.     290.     8923.     2862.      461.     1316.      149.    601.70
     1.35      0.58      1.75     0.63     0.060     0.035     0.060     0.036    591.80    396.44
 0.000040     2750.     2700.    2000.         2         0         0    -0.13   1635.06   2031.50

*SECNO 7925.000

3265 DIVIDED FLOW
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3280 CROSS SECTION 7925.00 EXTENDED 11.23 FEET

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

3470 ENCROACHMENT STATIONS 100.0 2450.0 TYPE 1 TARGET 2350.000

D

7925.00	19.94	611.24	0.0	0.0	611.27	0.03	0.09	0.00	599.00
10500.	1537.	5631.	3332.	4208.	3084.	5269.	1937.	242.	605.40
1.88	0.37	1.83	0.63	0.060	0.035	0.060	0.037	591.30	100.00
0.000041	1850.	2550.	2550.	0	0	0	-0.16	2336.42	2450.00

*SECNO 11525.000
3280 CROSS SECTION 11525.00 EXTENDED 1.38 FEET

3470 ENCROACHMENT STATIONS 0.0 2750.0 TYPE 1 TARGET 2749.999

E

11525.00	19.08	611.38	0.0	0.0	611.43	0.05	0.15	0.00	607.80
10500.	20.	7198.	3282.	57.	3545.	6250.	2641.	392.	600.80
2.41	0.36	2.03	0.53	0.060	0.035	0.060	0.037	592.30	4.84
0.000063	2700.	3350.	2400.	2	0	0	-0.12	2745.15	2750.00

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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
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T1
T2
T3

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0.	3.	0.	0.	0.0	0.0	0.0	0.	614.200	0.0

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	2.000	0.0	-1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0

```
*PROF 2

CCHV     0.100 CEHV     0.300
*SECNO 129100.000
3280 CROSS SECTION 129100.00 EXTENDED     1.20 FEET


    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


3470 ENCROACHMENT STATIONS       150.0      669.0  TYPE      1  TARGET      -150.000

          D/S OF CONFLUENCE WITH TITTABAWASSEE RIVER

129100.00     30.10    614.20      0.0     614.20    614.80      0.60       0.0        0.0     600.30
   41000.      3236.   37764.       0.      2031.     5857.        0.        0.         0.  100000.00
      0.0      1.59      6.45      0.0      0.060     0.030     0.060       0.0     584.10     150.00
 0.000272        0.        0.        0.          0         0         0     -0.04     519.00     669.00


*SECNO 675.000
3280 CROSS SECTION    675.00 EXTENDED     6.88 FEET


3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS         0.0     1216.0  TYPE      1  TARGET      1215.999

          A    U/S OF CONFLUENCE WITH TITTABAWASSEE RIVER

    675.00     24.68    614.88      0.0       0.0    614.94      0.06      0.09       0.05     598.20
   15000.      6659.    8209.     132.      6390.    3392.       198.      114.        7.      596.80
      0.09      1.04      2.42      0.67      0.060     0.035     0.060     0.036     590.20     600.00
  0.000053     500.      600.      750.          2         0         0     -0.01     616.00    1216.00


*SECNO 2625.000
3280 CROSS SECTION    2625.00 EXTENDED     7.51 FEET


3470 ENCROACHMENT STATIONS         0.0     1400.0  TYPE      1  TARGET      1399.999

          B

   2625.00     22.61    615.01      0.0       0.0    615.03      0.02      0.09       0.00     601.40
   15000.       856.    7663.     6481.     1386.    5030.     10124.      892.       65.      610.50
      0.75      0.62      1.52      0.64      0.060     0.035     0.060     0.036     592.40      49.06
  0.000024     2400.     2650.     2600.          2         0         0     -0.04    1350.94    1400.00


*SECNO 5425.000
3280 CROSS SECTION    5425.00 EXTENDED     2.08 FEET


          C

   5425.00     23.28    615.08      0.0       0.0    615.09      0.02      0.06       0.00     600.80
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   15000.    8832.    5617.     551.   15121.    3533.    1251.    1940.     167.    601.70
     1.49     0.58     1.59     0.44    0.060    0.035    0.060    0.036   591.80    46.22
 0.000025    2750.    2700.    2000.        2        0        0    -0.13  2253.78  2300.00


*SECNO 7925.000
3280 CROSS SECTION    7925.00 EXTENDED      15.13 FEET

   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


3470 ENCROACHMENT STATIONS       100.0     2450.0  TYPE       1  TARGET      2350.000

        D

  7925.00    23.83   615.13      0.0       0.0    615.15      0.02      0.05      0.00   599.00
   15000.     4369.    5847.    4785.   10134.    3762.    7826.     2955.      275.   605.40
     2.16     0.43     1.55     0.61    0.060    0.035    0.060     0.037   591.30   100.00
 0.000023    1850.    2550.    2550.        0        0        0    -0.20  2350.00  2450.00


*SECNO 11525.000
3280 CROSS SECTION  11525.00 EXTENDED       5.20 FEET


3470 ENCROACHMENT STATIONS         0.0     2750.0  TYPE       1  TARGET      2749.999

        E

 11525.00    22.90   615.20      0.0       0.0    615.22      0.02      0.07      0.00   607.80
   15000.      72.    7188.    7740.     172.    4445.   15724.     4239.      426.   600.80
     2.93     0.42     1.62     0.49    0.060    0.035    0.060     0.038   592.30     0.00
 0.000029    2700.    3350.    2400.        0        0        0    -0.12  2749.99  2750.00
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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
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T1
T2
T3

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0.	4.	0.	0.	0.0	0.0	0.0	0.	615.780	0.0

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	3.000	0.0	1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0

```
*PROF 3

CCHV    0.100 CEHV    0.300
*SECNO 129100.000
3280 CROSS SECTION 129100.00 EXTENDED      2.78 FEET


   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


3470 ENCROACHMENT STATIONS      150.0     669.0  TYPE      1  TARGET     -150.000

          D/S OF CONFLUENCE WITH TITTABAWASSEE RIVER

129100.00    31.68   615.78     0.0    615.78   616.43     0.65      0.0       0.0    600.30
   47000.     4432.   42568.      0.     2447.    6262.       0.       0.        0. 100000.00
     0.0      1.81     6.80     0.0     0.060    0.030    0.060      0.0    584.10    150.00
 0.000279       0.       0.       0.         0        0        0    -0.04    519.00    669.00

*SECNO 675.000
3280 CROSS SECTION    675.00 EXTENDED      8.52 FEET


3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS        0.0    1216.0  TYPE      1  TARGET     1215.999

        A   U/S OF CONFLUENCE WITH TITTABAWASSEE RIVER

   675.00    26.32   616.52     0.0      0.0   616.58     0.06      0.09      0.06    598.20
   16900.     7737.    9003.    160.    7116.    3643.     230.      125.        7.    596.80
     0.09     1.09     2.47     0.69    0.060    0.035    0.060     0.037    590.20    600.00
 0.000050     500.     600.     750.        2        0        0    -0.01    616.00   1216.00

*SECNO 2625.000
3280 CROSS SECTION   2625.00 EXTENDED      9.14 FEET


3470 ENCROACHMENT STATIONS        0.0    1400.0  TYPE      1  TARGET     1399.999

        B

  2625.00    24.24   616.64     0.0      0.0   616.67     0.02      0.08      0.00    601.40
   16900.     1009.    8261.   7630.    1598.    5439.   11715.      998.       65.    610.50
     0.75     0.63     1.52     0.65    0.060    0.035    0.060     0.036    592.40     45.13
 0.000022     2400.    2650.    2600.        2        0        0    -0.05   1354.86   1400.00

*SECNO 5425.000
3280 CROSS SECTION   5425.00 EXTENDED      3.70 FEET


        C

  5425.00    [illegible]   616.72     0.0      0.0   616.72     0.02      0.05      0.00    600.80
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   16900.   10355.    5784.     761.   18029.    3812.    1788.    2214.     169.    601.70
     1.55     0.57     1.52     0.43    0.060    0.035    0.060    0.037   591.80      0.0
 0.000021    2750.    2700.    2000.        2        0        0    -0.13  2300.00  2300.00

*SECNO 7925.000
3280 CROSS SECTION    7925.00 EXTENDED      16.75 FEET

   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

3470 ENCROACHMENT STATIONS       100.0     2450.0  TYPE       1  TARGET      2350.000

        D

  7925.00    25.45   616.75      0.0       0.0   616.76      0.01      0.04      0.00    599.00
   16900.     5610.    5956.    5334.    12597.    4044.    8889.     3407.      278.    605.40
     2.27      0.45     1.47     0.60    0.060    0.035    0.060     0.038   591.30    100.00
 0.000019    1850.    2550.    2550.        0        0        0    -0.20  2350.00  2450.00

*SECNO 11525.000
3280 CROSS SECTION   11525.00 EXTENDED       6.80 FEET

3470 ENCROACHMENT STATIONS         0.0     2750.0  TYPE       1  TARGET      2749.999

        E

 11525.00    24.50   616.80      0.0       0.0   616.82      0.02      0.06      0.00    607.80
   16900.       93.    7196.    9611.      222.    4824.   19713.     4933.      428.    600.80
     3.12      0.42     1.49     0.49    0.060    0.035    0.060     0.039   592.30      0.00
 0.000022    2700.    3350.    2400.        0        0        0    -0.12  2749.99  2750.00
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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY1979
  ERROR CORR - 01,02,03
  MODIFICATION -  50,51,52,53
**************************************************
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T1
T2
T3

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0.	5.	0.	0.	0.0	0.0	0.0	0.	619.570	0.0

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	15.000	0.0	-1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0

```
*PROF 4

CCHV    0.100 CEHV    0.300
*SECNO 129100.000
3280 CROSS SECTION 129100.00 EXTENDED    6.57 FEET


  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


3470 ENCROACHMENT STATIONS      150.0     669.0  TYPE      1  TARGET     -150.000

      D/S OF CONFLUENCE WITH TITTABAWASSEE RIVER

129100.00    35.47   619.57     0.0    619.57   620.33     0.76     0.0      0.0    600.30
   61600.     7757.   53843.     0.     3444.    7232.     0.       0.       0.   100000.00
     0.0      2.25     7.44     0.0     0.060    0.030    0.060    0.0    584.10    150.00
 0.000282       0.       0.       0.        0        0        0   -0.04   519.00    669.00

*SECNO 675.000
3280 CROSS SECTION    675.00 EXTENDED     12.42 FEET


3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS        0.0    1216.0  TYPE      1  TARGET     1215.999

      A   U/S OF CONFLUENCE WITH TITTABAWASSEE RIVER

   675.00    30.22   620.42     0.0      0.0    620.48     0.06     0.08     0.07    598.20
   21700.    10477.  10996.     227.     8844.   4240.     308.     152.     7.      596.80
     0.08     1.18     2.59     0.74    0.060    0.035    0.060    0.037   590.20    600.00
 0.000045     500.     600.     750.        2        0        0   -0.01   616.00   1216.00

*SECNO 2625.000
3280 CROSS SECTION   2625.00 EXTENDED    13.04 FEET


3470 ENCROACHMENT STATIONS        0.0    1400.0  TYPE      1  TARGET     1399.999

      B

  2625.00    28.14   620.54     0.0      0.0    620.56     0.02     0.07     0.00    601.40
  21700.     1442.   9727.     10531.    2255.   6412.   15502.    1254.    66.      610.50
     0.76     0.64     1.52     0.68    0.060    0.035    0.060    0.036   592.40      0.00
 0.000017    2400.    2650.    2600.        2        0        0   -0.04  1400.00   1400.00

*SECNO 5425.000
3280 CROSS SECTION   5425.00 EXTENDED     7.58 FEET

      C

  5425.00    28.78   620.58     0.0      0.0    620.60     0.01     0.04     0.00    600.80
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   21700.   14111.    6243.    1346.   25010.    4475.    3069.    2878.     171.   601.70
    1.64     0.56     1.40     0.44    0.060    0.035    0.060    0.037   591.80     0.0
0.000014    2750.    2700.    2000.        2        0        0    -0.13  2300.00  2300.00


*SECNO 7925.000
3280 CROSS SECTION   7925.00 EXTENDED     20.62 FEET


   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       WIN       ELMIN      SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID     ENDST


3470 ENCROACHMENT STATIONS      100.0    2450.0  TYPE      1  TARGET     2350.000

       D

 7925.00    29.31   620.61      0.0       0.0    620.63     0.01      0.03      0.00   599.00
   21700.    8673.    6358.    6670.   18477.    4717.   11427.    4495.      281.   605.40
    2.44     0.47     1.35     0.58    0.060    0.035    0.060    0.038   591.30   100.00
0.000013    1850.    2550.    2550.        0        0        0    -0.20  2350.00  2450.00


*SECNO 11525.000
3280 CROSS SECTION  11525.00 EXTENDED     10.65 FEET


3470 ENCROACHMENT STATIONS        0.0    2750.0  TYPE      1  TARGET     2749.999

       E

11525.00    28.35   620.65      0.0       0.0    620.66     0.01      0.04      0.00   607.80
   21700.     140.    7466.   14094.      342.    5732.   29269.    6601.      431.   600.80
    3.45     0.41     1.30     0.48    0.060    0.035    0.060    0.039   592.30     0.00
0.000014    2700.    3350.    2400.        0        0        0    -0.12  2749.99  2750.00
```

GOVEA	JGOVEDSS	0162	GO.FT06F001	15.28.31	17	NOV 30	CHIPPEWA RIVER	RIVER
GOVEA	JGOVEDSS	0162	GO.FT06F001	15.28.31	17	NOV 30	CHIPPEWA RIVER	RIVER
GOVEA	JGOVEDSS	0162	GO.FT06F001	15.28.31	17	NOV 30	CHIPPEWA RIVER	RIVER

Chippewa River - Midland 111880

100-year flood floodway delineation

```
*****************************************************
  HEC2 RELEASE DATED NOV 75 UPDATED JULY1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
*****************************************************
```

Caution: Reduce 100yr stage by .5ft due to revisions to the Tittabawassee Study

```
C
T1      CHIPPEWA RIVER AT MIDLAND, PROJECT NO. 8543
T2      CHIPPEWA RIVER-MIDLAND
T3      CHIPPEWA RIVER-MIDLAND

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      0.        4.        0.        0.  0.0         0.0       0.0       0.   615.780    0.0

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLOC     IBW       CHNIM     ITRACE

     1.000     0.0      -1.000     0.0       0.0       0.0       0.0       0.0       0.0       0.0

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    110.000   200.000   150.000     0.0       0.0       0.0       0.0       0.0       0.0       0.0

NC      0.060     0.060     0.030     0.100     0.300     0.0       0.0       0.0       0.0       0.0
QT      5.000 27500.000 41000.000 47000.000 61600.000 47000.000     0.0       0.0       0.0       0.0

          D/S OF CONFLUENCE WITH TITTABAWASSEE RIVER

X1 129100.000    11.000   413.000   569.000     0.0       0.0       0.0       0.0       0.0       0.0
X3      0.0       0.0       0.0     150.000     0.0       0.0       0.0       0.0       0.0       0.0
GR    607.200     0.0     607.000   368.000   600.300   413.000   596.500   410.000   591.500   455.000
GR    582.500   490.000   584.100   530.000   586.300   565.000   589.400   605.000   596.500   640.000
GR    613.000   669.000     0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
NC      0.060     0.060     0.035     0.0       0.0       0.0       0.0       0.0       0.0       0.0
QT      5.000 10500.000 15000.000 16900.000 21700.000 16900.000     0.0       0.0       0.0       0.0
ET      0.0       0.0       0.0       0.0       0.0       9.100     0.0       0.0     600.000  1216.000

        A   U/S OF CONFLUENCE WITH TITTABAWASSEE RIVER

X1    675.000    15.000  1043.000  1196.000   500.000   750.000   600.000     0.0       0.0       0.0
X3      0.0       0.0       0.0       0.0       0.0    1216.000     0.0       0.0       0.0       0.0
GR    600.000   600.000   600.000   850.000   603.400  1000.000   597.300  1017.000   593.200  1043.000
GR    596.800  1048.000   593.500  1075.000   591.900  1100.000   590.700  1125.000   590.200  1150.000
GR    592.300  1175.000   596.300  1196.000   613.200  1216.000   607.500  1250.000   608.000  1530.000
ET      0.0       0.0       0.0       0.0       0.0       9.100     0.0       0.0      45.000  1400.000

        B

X1   2625.000    23.000   177.000   427.000  2400.000  2500.000  2650.000     0.0       0.0       0.0
X3      0.0       0.0       0.0       0.0       0.0    1400.000     0.0       0.0       0.0       0.0
GR    618.000     0.0     615.700    45.000   604.200    75.000   601.400   177.000   595.800   185.000
GR    592.600   230.000   592.400   270.000   594.400   315.000   594.400   360.000   594.500   400.000
GR    595.800   403.000   610.500   427.000   602.300   456.000   596.300   467.000   596.300   569.000
GR    601.400   684.000   600.700   705.000   602.300   770.000   607.300   783.000   607.800  1168.000
GR    608.000  1200.000   600.000  1350.000   607.500  1500.000     0.0       0.0       0.0       0.0

        C
```

X1	5425.000	23.000	1799.000	1970.000	2750.000	2000.000	2700.000	0.0	0.0	0.0
GR	616.000	0.0	615.000	50.000	610.000	500.000	600.000	620.000	610.000	740.000
GR	610.300	800.000	604.200	860.000	603.600	1360.000	604.300	1680.000	602.100	1700.000
GR	601.000	1760.000	597.400	1787.000	600.800	1799.000	595.900	1815.000	593.900	1840.000
GR	593.100	1859.000	591.800	1895.000	592.400	1925.000	595.900	1952.000	601.700	1970.000
GR	601.400	2004.000	613.100	2037.000	613.000	2300.000	0.0	0.0	0.0	0.0

D

X1	7925.000	15.000	1620.000	1794.000	1850.000	2550.000	2550.000	0.0	0.0	0.0
X3	0.0	0.0	0.0	100.000	0.0	2450.000	0.0	0.0	0.0	0.0
GR	607.000	0.0	610.000	950.000	611.300	1200.000	605.500	1320.000	608.200	1574.000
GR	599.700	1604.000	599.000	1620.000	596.100	1625.000	593.700	1655.000	591.600	1685.000
GR	591.300	1720.000	591.600	1750.000	596.100	1782.000	605.400	1794.000	600.000	2600.000

E

X1	11525.000	30.000	31.000	267.000	2700.000	2400.000	3350.000	0.0	0.0	0.0
X3	0.0	0.0	0.0	0.0	0.0	2750.000	0.0	0.0	0.0	0.0
GR	612.500	0.0	609.500	13.000	607.800	31.000	597.500	55.000	592.300	95.000
GR	595.100	135.000	595.900	175.000	595.800	210.000	597.500	250.000	600.800	267.000
GR	608.400	290.000	608.000	365.000	603.200	400.000	606.500	440.000	603.800	430.000
GR	602.500	540.000	604.000	580.000	608.500	610.000	602.000	690.000	606.000	780.000
GR	606.100	860.000	610.200	830.000	605.000	1040.000	608.000	1120.000	610.000	1210.000
GR	611.000	1500.000	610.000	1850.000	610.000	2030.000	611.000	2400.000	610.000	2840.000
EJ	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

```
*PROF 1

CCHV    0.100 CEHV    0.300
*SECNO 129100.000
3230 CROSS SECTION 129100.00 EXTENDED      2.70 FEET

   SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       GLOSS    BANK ELEV
   Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      T A    LEFT/RIGHT
   TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      XTN      ELMIN      SSTA
   SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST

3470 ENCROACHMENT STATIONS      150.0     669.0  TYPE      1  TARGET     -150.000

          D/S OF CONFLUENCE WITH TITTABAWASSEE RIVER

129100.00    31.68   615.73     0.0    615.73   616.43     0.65     0.0      0.0    600.30
   47000.    4432.   42568.      0.     2447.    6262.       0.       0.       0.  100000.00
     0.0      1.81     6.80     0.0     0.060    0.030    0.060     0.0    584.10   150.00
 0.000279       0.       0.       0.        0        0        0    -0.04    519.00   669.00

*SECNO 675.000
3280 CROSS SECTION    675.00 EXTENDED      8.52 FEET

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS        0.0    1215.0  TYPE      1  TARGET     1215.999

        A    U/S OF CONFLUENCE WITH TITTABAWASSEE RIVER

   675.00    25.32   616.52     0.0      0.0    616.58     0.06     0.09     0.06    590.20
   16900.    7737.    7003.     160.    7116.    3343.     240.     125.       7.    596.80
     0.09     1.09     2.47     0.69    0.060    0.035    0.060    0.037   590.20   600.00
 0.000050     500.     600.     750.        2        0        0    -0.01   616.00  1216.00

*SECNO 2625.000
3280 CROSS SECTION    2625.00 EXTENDED      9.14 FEET

3470 ENCROACHMENT STATIONS        0.0    1400.0  TYPE      1  TARGET     1399.999

        B

  2625.00    24.24   616.64     0.0      0.0    616.67     0.02     0.08     0.00    601.40
   16900.    1009.    3261.    7630.    1598.    5439.   11715.     998.      65.    610.50
     0.75     0.63     1.52     0.65    0.060    0.035    0.060    0.036   592.40    45.13
 0.000022    2400.    2650.    2600.        2        0        0    -0.05  1354.86  1400.00

*SECNO 5425.000
3230 CROSS SECTION    5425.00 EXTENDED      3.70 FEET

        C

  5425.00    24.90   616.70     0.0      0.0    616.72     0.02     0.05     0.00    600.00
```

use WSEL = 616.1

```
  10000.   10050.    5704     761.   13029.    3812.    1718.    2214.     169.    601.70
    1.55     0.57     1.52     0.43    0.060    0.035    0.060    0.037   591.80     0.0
0.000021    2750.    2700.    2000.        2        0        0    -0.13  2300.00  2300.00
```

use WSEL = 616.2

```
*SECNO 7925.000
3280 CROSS SECTION    7925.00 EXTENDED      16.75 FEET

   SECNO     DEPTH     CMSEL     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    IDC       ICONT     COPAR     TOPWID      ENDST

3470 ENCROACHMENT STATIONS       100.0     2450.0  TYPE       1  TARGET      2350.000
        D

  7925.00    25.45   616.75      0.0       0.0    616.75      0.01      0.04      0.00    599.00
  16900.     5610.    5956.    5334.   12597.     4044.    8839.     3407.     278.    605.40
    2.27      0.45     1.47     0.60    0.060     0.035    0.060     0.038   591.30    100.00
0.000019    1850.    2550.    2550.        0        0        0    -0.20  2350.00  2450.00
```

use WSEL = 616.2

```
*SECNO 11525.000
3230 CROSS SECTION  11525.00 EXTENDED       6.80 FEET

3470 ENCROACHMENT STATIONS         0.0     2750.0  TYPE       1  TARGET      2749.999
        E

 11525.00    24.50   616.80      0.0       0.0    616.82      0.02      0.06      0.00    607.80
  16900.      93.     7196.    9611.     222.     4824.   19713.     4733.     428.    600.80
    3.12      0.42     1.49     0.49    0.060     0.035    0.060     0.039   592.30      0.00
0.000022    2700.    3350.    2400.        0        0        0    -0.12  2749.99  2750.00
```

use WSEL = 616.3

```
*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
*****************************************************

T1
T2
T3

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      0.        5.        0.        0.   0.0          0.0       0.0       0.   615.880     0.0

J2  NPROF     IPLOT     PREVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    15.000     0.0      -1.000     0.0       0.0       0.0       0.0       0.0       0.0       0.0
```

```
*PROF 2

CCHV    0.100 CEHV    0.300
*SECNO 129100.000
3280 CROSS SECTION 129100.00 EXTENDED      2.83 FEET

   SECNO     DEPTH     CNSEL     CRIMS     WSELK     FO        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       NTY       ELMIN      SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID     ENDST

3470 ENCROACHMENT STATIONS      150.0      669.0  TYPE      1  TARGET      -150.000

          D/S OF CONFLUENCE WITH TITTABAWASSEE RIVER

129100.00    31.73   615.83     0.0    615.83   615.53     0.65      0.0       0.0    600.30
   47000.    4475.   42525.      0.     2473.    6287.       0.       0.        0.  100000.00
     0.0      1.51     6.75     0.0     0.060    0.030    0.060     0.0     584.10    150.00
 0.000275       0.       0.       0.        0        0        0    -0.04    519.00    669.00

*SECNO 675.000
3280 CROSS SECTION    675.00 EXTENDED      2.61 FEET

3301 HV CHANGED MORE THAN -VINS

3470 ENCROACHMENT STATIONS        0.0     1215.0  TYPE      1  TARGET      1215.999

        A    D/S OF CONFLUENCE WITH TITTABAWASSEE RIVER

   675.00    25.41   616.61     0.0    616.52   616.57     0.06      0.09      0.06    598.20
   16900.    7749.    6991.     160.     7157.    3657.     232.      125.       7.     596.80
     0.09     1.08     2.45     0.69     0.060    0.035    0.060     0.037    590.20    600.00
 0.000049     500.     500.     750.         2        0        0    -0.01    616.00   1215.00

*SECNO 2625.000
3280 CROSS SECTION   2625.00 EXTENDED      9.23 FEET

3470 ENCROACHMENT STATIONS        0.0     1400.0  TYPE      1  TARGET      1399.999

        B

  2625.00    24.33   616.73     0.0    616.64   616.75     0.02      0.08      0.00    601.40
   16900.    1012.    8242.    7646.     1610.    5461.   11803.     1004.      65.     610.50
     0.76     0.63     1.51     0.65     0.060    0.035    0.060     0.036    592.40     43.32
 0.000021    2400.    2650.    2600.         2        0        0    -0.04   1356.10   1400.00

*SECNO 5425.000
3280 CROSS SECTION   5425.00 EXTENDED      3.79 FEET

        C

  5425.00    24.99   616.79     0.0    616.70   616.81     0.02      0.05      0.00    600.90
```

use 616.1

use WSEL = 616.1

use WSEL = 616.2

```
   16900.   10374.    5755.     764.   18158     3327.    1817     2229.     169.    601.70
     1.55     0.57     1.50     0.42   0.060     0.035   0.060    0.037   591.80      0.0
 0.000020    2750.    2700.    2000.       2         0       0    -0.13  2300.00  2300.00

*SECNO 7925.000
3280 CROSS SECTION   7925.00 EXTENDED      16.34 FEET

   SECNO    DEPTH    CNSEL    CRIMS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
   Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VCL      T.A   LEFT/RIGHT
   TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
   SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST

3470 ENCROACHMENT STATIONS      100.0    2450.0  TYPE      1  TARGET     2350.000

        D

  7925.00    25.34   616.84      0.0   616.75   616.85     0.01     0.04     0.00   599.00
   16900.    5643.    5926.    5331.   12730.    4060.    8947.    3432.     278.   605.40
     2.29     0.44     1.45     0.60   0.060     0.035   0.060    0.038   591.30   100.00
 0.000013    1350.    2550.    2550.       0         0       0    -0.20  2350.00  2450.00

*SECNO 11525.000
3280 CROSS SECTION  11525.00 EXTENDED       6.39 FEET

3470 ENCROACHMENT STATIONS        0.0    2750.0  TYPE      1  TARGET     2749.999

        E

 11525.00    24.59   616.89      0.0   616.80   616.91     0.02     0.06     0.00   607.80
   16900.      93.    7155.    9652.     225.    4744.   10927.    4971.     429.   600.80
     3.15     0.42     1.46     0.48   0.060     0.035   0.060    0.039   592.30      0.00
 0.000022    2700.    3350.    2400.       0         0       0    -0.12  2749.99  2750.00
```

use WSEL = 616.2

use WSEL = 616.3

```
*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
*****************************************************
```

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

CHIPPEWA RIVER-MIDLAND

SUMMARY PRINTOUT TABLE 110

SECNO	CNSEL	DIFKWS	EC	TOP ID	PLOB	OCH	OROB	PERENC	STENCL	STCHL	STCHR	STENCR
129100.000	615.73	0.0	615.43	519.00	4431.65	42568.34	0.0	-150.00	150.00	413.00	669.00	669.00
129100.000	615.38	0.0	616.53	519.00	4475.20	42524.79	0.0	-150.00	150.00	413.00	669.00	669.00
675.000	615.52	0.0	616.58	615.00	7735.77	9003.39	159.33	1215.00	0.00	1043.00	1196.00	1216.00
675.000	615.61	0.09	616.67	615.00	7743.72	8990.41	160.37	1215.00	0.00	1043.00	1196.00	1216.00
2625.000	615.64	0.0	616.67	1354.36	1009.44	8260.73	7629.82	1400.00	0.00	177.00	427.00	1400.00
2625.000	615.73	0.09	615.75	1355.18	1011.81	8242.04	7646.14	1400.00	0.00	177.00	427.00	1400.00
5425.000	615.70	0.0	616.72	2300.00	10354.79	5784.41	760.79	0.0	0.0	1799.00	1970.00	0.0
5425.000	615.79	0.09	616.81	2300.00	10373.39	5757.33	769.27	0.0	0.0	1799.00	1970.00	0.0
7925.000	615.75	0.0	616.76	2350.00	5609.93	5955.76	5334.30	2350.00	100.00	1620.00	1794.00	2450.00
7925.000	615.34	0.09	616.85	2350.00	5642.75	5926.18	5331.06	2350.00	100.00	1620.00	1794.00	2450.00
11525.000	615.80	0.0	616.82	2749.99	92.07	7195.00	9611.11	2750.00	0.00	31.00	267.00	2750.00
11525.000	615.89	0.09	616.91	2749.99	93.40	7154.57	9652.02	2750.00	0.00	31.00	267.00	2750.00

CHIPPEWA RIVER- IDLAID

SUMMARY PRINTOUT TABLE 150

SECND	XLOW	ELEPT	ELLC	ELTIP	Q	CUSEL	CRIWS	ES	IOW#S	VOH	AREA	VOLK
129100.000	0.0	0.0	0.0	534.10	47000.00	615.78	0.0	616.43	2.79	5.80	8708.91	23130.45
129100.000	0.0	0.0	0.0	534.10	47000.00	615.38	0.0	616.53	2.75	5.76	8760.73	23344.02
675.000	600.00	0.0	0.0	590.20	16900.00	616.52	0.0	616.59	0.50	2.47	10989.87	23924.15
675.000	600.00	0.0	0.0	590.20	16900.00	616.51	0.0	616.57	0.49	2.46	11045.41	24111.50
2625.000	2550.00	0.0	0.0	592.40	16900.00	616.74	0.0	616.57	0.22	1.52	18752.01	35225.26
2625.000	2550.00	0.0	0.0	592.40	16900.00	616.73	0.0	616.75	0.21	1.51	18873.77	36557.71
5425.000	2700.00	0.0	0.0	591.30	16900.00	616.70	0.0	616.72	0.21	1.52	23528.36	37162.60
5425.000	2700.00	0.0	0.0	591.30	16900.00	616.79	0.0	616.81	0.20	1.50	23832.20	37531.85
7925.000	2500.00	0.0	0.0	591.30	16900.00	616.75	0.0	616.76	0.19	1.47	25530.57	39025.43
7925.000	2500.00	0.0	0.0	591.30	16900.00	616.84	0.0	616.85	0.18	1.46	25735.97	39456.43
11525.000	3350.00	0.0	0.0	592.30	16900.00	616.80	0.0	616.82	0.22	1.49	24759.09	35678.84
11525.000	3350.00	0.0	0.0	592.30	16900.00	616.89	0.0	616.91	0.22	1.48	24995.10	35139.03

CHIPPEWA RIVER-MIDLAND

SUMMARY PRINTOUT TABLE 150

SECND	Q	CONSEL	DIF SP	DIF SR	DIF MS	TOP.ID	PLCH
129100.000	47000.00	615.79	0.0	0.0	0.0	519.00	0.0
129100.000	47000.00	615.88	0.10	0.0	0.0	519.00	0.0
675.000	16900.00	616.52	0.0	0.74	0.0	616.00	600.00
675.000	16900.00	616.61	0.09	0.73	0.09	616.00	600.00
2625.000	16900.00	616.64	0.0	0.12	0.0	1354.06	2650.00
2625.000	16900.00	616.73	0.09	0.12	0.09	1356.18	2650.00
5425.000	16900.00	616.70	0.0	0.06	0.0	2300.00	2700.00
5425.000	16900.00	616.79	0.09	0.06	0.09	2300.00	2700.00
7925.000	16900.00	616.75	0.0	0.04	0.0	2350.00	2550.00
7925.000	16900.00	616.84	0.09	0.04	0.09	2350.00	2550.00
11525.000	16900.00	616.80	0.0	0.06	0.0	2749.99	3350.00
11525.000	16900.00	616.89	0.09	0.05	0.09	2749.99	3350.00

SUMMARY OF ERRORS

FLOODWAY DATA, CHIPPEWA RIVER-MIDLAND
PROFILE NO. 2

STATION	FLOODWAY WIDTH FT	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WITHOUT FLOODWAY	DIFFERENCE
129100.000	519.	3761.	5.4	615.9	615.8	0.1
675.000	615.	11046.	1.5	616.6	616.5	0.1
2625.000	1355.	13974	0.9	616.7	615.6	0.1
5425.000	2300.	23832.	0.7	616.8	616.7	0.1
7925.000	2350.	25705.	0.7	616.8	616.7	0.1
11525.000	2750.	24906.	0.7	616.9	616.8	0.1

```
*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
*****************************************************
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B-2 Summary printout

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

CHIPPEWA RIVER-MIDLAND

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
	129100.000	0.0	0.0	0.0	584.10	27500.00	610.41	0.0	610.85	2.36	5.41	5927.72	17906.18
	129100.000	0.0	0.0	0.0	584.10	41000.00	614.20	0.0	614.80	2.72	6.45	7888.85	24846.32
	129100.000	0.0	0.0	0.0	584.10	47000.00	615.78	0.0	616.43	2.79	6.80	8708.91	28130.46
	129100.000	0.0	0.0	0.0	584.10	61600.00	619.57	0.0	620.33	2.82	7.44	10675.93	36710.80
	675.000	600.00	0.0	0.0	590.20	10500.00	610.92	0.0	610.97	0.59	2.25	7541.73	13661.34
	675.000	600.00	0.0	0.0	590.20	15000.00	614.88	0.0	614.94	0.53	2.42	9979.39	20676.48
A	675.000	600.00	0.0	0.0	590.20	16900.00	616.52	0.0	616.58	0.50	2.47	10989.87	23924.15
	675.000	600.00	0.0	0.0	590.20	21700.00	620.42	0.0	620.48	0.45	2.59	13392.20	32386.80
	2625.000	2650.00	0.0	0.0	592.40	10500.00	611.06	0.0	611.08	0.32	1.51	11223.21	18517.96
	2625.000	2650.00	0.0	0.0	592.40	15000.00	615.01	0.0	615.03	0.24	1.52	16539.34	30428.78
B	2625.000	2650.00	0.0	0.0	592.40	16900.00	616.64	0.0	616.67	0.22	1.52	18752.01	36225.26
	2625.000	2650.00	0.0	0.0	592.40	21700.00	620.54	0.0	620.56	0.17	1.52	24169.53	51970.83
	5425.000	2700.00	0.0	0.0	591.80	10500.00	611.15	0.0	611.18	0.40	1.75	12245.11	16555.16
C	5425.000	2700.00	0.0	0.0	591.80	15000.00	615.08	0.0	615.09	0.25	1.59	19904.93	29933.11
	5425.000	2700.00	0.0	0.0	591.80	16900.00	616.70	0.0	616.72	0.21	1.52	23628.36	37162.60
	5425.000	2700.00	0.0	0.0	591.80	21700.00	620.58	0.0	620.60	0.14	1.40	32554.34	57772.82
	7925.000	2550.00	0.0	0.0	591.30	10500.00	611.24	0.0	611.27	0.41	1.83	12560.72	16323.02
D	7925.000	2550.00	0.0	0.0	591.30	15000.00	615.13	0.0	615.15	0.23	1.55	21722.73	31280.90
	7925.000	2550.00	0.0	0.0	591.30	16900.00	616.75	0.0	616.76	0.19	1.47	25530.57	39025.45
	7925.000	2550.00	0.0	0.0	591.30	21700.00	620.61	0.0	620.63	0.13	1.35	34620.75	60673.27
	11525.000	3350.00	0.0	0.0	592.30	10500.00	611.38	0.0	611.43	0.63	2.03	9851.68	13258.20
E	11525.000	3350.00	0.0	0.0	592.30	15000.00	615.20	0.0	615.22	0.29	1.62	20341.38	27660.94
	11525.000	3350.00	0.0	0.0	592.30	16900.00	616.80	0.0	616.82	0.22	1.49	24759.09	35678.84
	11525.000	3350.00	0.0	0.0	592.30	21700.00	620.65	0.0	620.66	0.14	1.30	35342.83	58863.64

CHIPPEWA RIVER-MIDLAND

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	129100.000	27500.00	610.41	0.0	0.0	0.0	514.45	0.0
	129100.000	41000.00	614.20	3.79	0.0	0.0	519.00	0.0
	129100.000	47000.00	615.78	1.58	0.0	0.0	519.00	0.0
	129100.000	61600.00	619.57	3.79	0.0	0.0	519.00	0.0
	675.000	10500.00	610.92	0.0	0.51	0.0	613.22	600.00
A	675.000	15000.00	614.88	3.96	0.68	0.0	616.00	600.00
	675.000	16900.00	616.52	1.64	0.74	0.0	616.00	600.00
	675.000	21700.00	620.42	3.90	0.85	0.0	616.00	600.00
	2625.000	10500.00	611.06	0.0	0.14	0.0	1341.46	2650.00
B	2625.000	15000.00	615.01	3.95	0.13	0.0	1350.94	2650.00
	2625.000	16900.00	616.64	1.64	0.12	0.0	1354.86	2650.00
	2625.000	21700.00	620.54	3.89	0.12	0.0	1400.00	2650.00
	5425.000	10500.00	611.15	0.0	0.09	0.0	1635.06	2700.00
C	5425.000	15000.00	615.08	3.93	0.07	0.0	2253.78	2700.00
	5425.000	16900.00	616.70	1.63	0.06	0.0	2300.00	2700.00
	5425.000	21700.00	620.58	3.88	0.05	0.0	2300.00	2700.00
	7925.000	10500.00	611.24	0.0	0.09	0.0	2336.42	2550.00
D	7925.000	15000.00	615.13	3.89	0.05	0.0	2350.00	2550.00
	7925.000	16900.00	616.75	1.62	0.04	0.0	2350.00	2550.00
	7925.000	21700.00	620.61	3.87	0.03	0.0	2350.00	2550.00
	11525.000	10500.00	611.38	0.0	0.14	0.0	2745.15	3350.00
E	11525.000	15000.00	615.20	3.82	0.07	0.0	2749.99	3350.00
	11525.000	16900.00	616.80	1.60	0.06	0.0	2749.99	3350.00
	11525.000	21700.00	620.65	3.85	0.04	0.0	2749.99	3350.00

SUMMARY OF ERRORS

```
IEF142I JGOVEDSS GO - STEP WAS EXECUTED - COND CODE 0000
IEF373I STEP /GO      / START 80253.1241
IEF374I STEP /GO      / STOP  80253.1241 VIRT   224K SYS   212K
*************************************************************************************************************
IEF375I  JOB /JGOVEDSS/ START 80253.1241
IEF376I  JOB /JGOVEDSS/ STOP  30253.1242
```

[illegible]

A-1 [illegible]
A-2 10-, 50-, 100-, [illegible] flows
A-3 Summary printout
A 4 Iplot

Chippewa River

B-1 10, 50, 100, and [illegible] flows
B-2 Summary printout
B-3 Iplot

[illegible] Creek

C-1 100-year flood
C-2 Iplot
C-3 Summary printout

[illegible] Creek

D-1 100-year flood
D-2 Iplot
D-3 Summary printout

[illegible]

E-1 100-year flood
E-2 Iplot
E-3 Summary printout

Caution: Profile has been revised upstream of xxx123500, see report by MPS enclosed

Revised see separate binder
~~enclosed hydraulics~~

GOVEA	JGOVEDSS	2998	GO.FT06F001	12.42.10	9 SEP 80	SHINASSEE-CHESAN	HESAN
GOVEA	JGOVEDSS	2998	GO.FT06F001	12.42.10	9 SEP 80	SHINASSEE-CHESAN	HESAN
GOVEA	JGOVEDSS	2998	GO.FT06F001	12.42.10	9 SEP 80	SHINASSEE-CHESAN	HESAN

*PROF 1 A-1 1948 Calibration 101080

CCHV= 0.100 CEHV= 0.300

*SECNO 111550.000

SECNO	DEPTH	CNSEL	CRINS	USELK	FG	HV	HL	QLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WT	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

111550.00	24.30	608.70	0.0	608.70	608.79	0.09	0.0	0.0	596.80
34000.	252.	23748.	10000.	164.	8930.	7119.	0.	0.	603.50
0.0	1.54	2.66	1.40	0.035	0.035	0.035	0.0	584.40	197.83
0.000065	0.	0.	0.	0	0	0	-0.02	1306.11	1503.93

*SECNO 112950.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 620.50 ELREA= 620.50

3 CONSUMER POWER R, R, BRIDGE, MAX LC=618, MIN TR=621.7, WIDTH=14

LENGTH=497

112950.00	24.34	608.74	0.0	0.0	608.95	0.21	0.13	0.04	595.70
34000.	0.	34000.	0.	0.	9213.	0.	388.	26.	612.10
0.10	0.0	3.69	0.0	0.035	0.035	0.035	0.036	584.40	210.00
0.000143	1500.	1400.	1150.	2	0	0	-0.02	466.55	676.55

*SECNO 112951.000

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 620.50 MAX ELLC= 627.20

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 620.50 ELREA= 620.50

112951.00	24.34	608.74	0.0	0.0	608.95	0.21	0.00	0.00	595.70
34000.	0.	34000.	0.	0.	9213.	0.	390.	26.	612.10
0.10	0.0	3.69	0.0	0.035	0.035	0.035	0.036	584.40	210.00
0.000143	10.	10.	10.	0	0	0	-0.02	466.56	676.56

*SECNO 112952.000

3370 NORMAL BRIDGE,NRD= 2 MIN ELTRD= 620.50 MAX ELLC= 627.20

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 626.30 ELREA= 621.70

112952.00	24.34	608.74	0.0	0.0	608.95	0.21	0.00	0.00	595.70
34000.	0.	34000.	0.	0.	9214.	0.	393.	26.	612.10
0.10	0.0	3.69	0.0	0.035	0.035	0.035	0.036	584.40	210.00
0.000143	14.	14.	14.	0	0	0	-0.02	466.57	676.57

*SECNO 112953.000

SECNO	DEPTH	CNSEL	CRINS	USELK	FG	HV	HL	QLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT

```
 TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WT        ELMIN     SSTA
 SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE.ELLEA=      626.30 ELREA=      621.70

112953.00    24.04    608.74     0.0       0.0     608.96     0.21      0.00      0.00    595.70
   34000.       0.    34000.      0.        0.      9215.       0.      396.       26.     612.10
     0.11      0.0      3.69     0.0      0.035     0.035     0.035     0.036    534.40    210.00
 0.000143      10.      10.      10.         0         0         0     -0.02    466.58    676.58

*SECNO 113700.000
3230 CROSS SECTION 113700.00 EXTENDED      4.58 FEET

        C    RATING CURVE DEVELOPED BY COE 1977   608.9 FOR 1948

113700.00    24.03    608.89     0.0       0.0     609.08     0.19      0.12      0.00    596.30
   34000.     1114.    31216.    1670.      534.     8619.     1206.      596.       38.     603.10
     0.18      2.08      3.62     1.38     0.035     0.035     0.035     0.036    584.80    158.70
 0.000122      900.      900.     800.         1         0         0     -0.06    691.30    850.00

*SECNO 116450.000

3265 DIVIDED FLOW

3230 CROSS SECTION 116450.00 EXTENDED      4.20 FEET

        D    NUCLEAR POWER PLANT, RATING CURVE DEVELOPED BY CONSUMER POWER.MICH

116450.00    24.00    609.20     0.0       0.0     609.38     0.18      0.30      0.00    595.00
   34000.      272.    30740.    2988.      151.     8764.     1754.     1218.       78.     595.00
     0.32      1.80      3.51     1.70     0.035     0.035     0.035     0.035    585.20    119.12
 0.000111     2700.     2600.    2400.         2         0         0     -0.03    673.05    800.00

*SECNO 117600.000

3265 DIVIDED FLOW

        F    DOW CHEMICAL PIPELINE BRIDGE, MAX LC=617.4, MIN TR=618.9, WIDTH=23

            LENGTH=510

117600.00    24.63    609.33     0.0       0.0     609.61     0.28      0.20      0.03    619.00
   34000.       0.    34000.      0.        0.      8014.       0.     1463.       93.     618.90
     0.47      0.0      4.24     0.0      0.035     0.035     0.035     0.035    584.70     93.00
 0.000330     1130.     1140.    1170.         0         0         0     -0.03    492.00    597.00

*SECNO 117601.000

3265 DIVIDED FLOW

3370 NORMAL BRIDGE,NRD=  4 MIN ELTRD=  616.50 MAX ELLC=  617.50

117601.00    24.64    609.33     0.0       0.0     609.61     0.28      0.00      0.0     619.00
```

1986 = 38,300
GRYE

34000.	0.	34000.	0.	0.	8014.	0.	1465.	93.	618.90
0.47	0.0	4.24	0.0	0.035	0.035	0.035	0.035	584.70	93.00
0.000330	10.	10.	10.	0	0	0	-0.03	492.00	597.00

*SECNO 117602.000

3265 DIVIDED FLOW

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	CCRAR	TOPWID	ENDST

3370 NORMAL BRIDGE,NRD= 4 MIN ELTRD= 616.50 MAX ELLC= 617.50

117602.00	24.64	609.34	0.0	0.0	609.52	0.23	0.01	0.00	619.00
34000.	0.	34000.	0.	0.	8019.	0.	1469.	93.	618.90
0.47	0.0	4.24	0.0	0.035	0.035	0.035	0.035	584.70	93.00
0.000330	23.	23.	23.	0	0	0	-0.03	492.00	597.00

*SECNO 117603.000

3265 DIVIDED FLOW

117603.00	24.65	609.35	0.0	0.0	609.53	0.28	0.00	0.00	619.00
34000.	0.	34000.	0.	0.	8020.	0.	1471.	94.	618.90
0.47	0.0	4.24	0.0	0.035	0.035	0.035	0.035	584.70	93.00
0.000329	10.	10.	10.	0	0	0	-0.03	492.00	597.00

*SECNO 118100.000

E

118100.00	24.58	609.49	0.0	0.0	609.76	0.28	0.13	0.00	617.90
34000.	0.	29821.	4179.	0.	6792.	1555.	1573.	100.	595.20
0.51	0.0	4.39	2.69	0.035	0.035	0.035	0.035	584.90	73.26
0.000191	650.	550.	500.	2	0	0	-0.04	504.08	577.34

*SECNO 119940.000

G

119940.00	23.50	609.90	0.0	0.0	610.03	0.13	0.26	0.01	616.40
34000.	0.	19899.	14101.	0.	6331.	5393.	2011.	125.	592.70
0.69	0.0	3.14	2.61	0.035	0.035	0.035	0.035	586.40	34.72
0.000101	1900.	1900.	1900.	2	0	0	-0.03	673.59	708.32

*SECNO 121440.000

H USGS GAGE 1560 RATING CURVE HAS BEEN DEVELOPED 609.8 FOR 1948

measured

Gage: 33.58' Q=38,300
580.28
613.76

121440.00	23.54	609.94	0.0	0.0	610.37	0.43	0.25	0.09	616.40
34000.	0.	27233.	6767.	0.	4811.	2049.	2331.	145.	592.70
0.77	0.0	5.66	3.30	0.035	0.035	0.035	0.035	586.40	31.57
0.000331	1500.	1500.	1500.	2	0	0	-0.02	483.13	514.69

*SECNO 122300.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	QLOSS	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   IDC      ICONT    CORAR    TOPWID    ENDST

      I

 122300.00   23.34   610.24    0.0      0.0    610.82    0.38     0.24     0.01   602.30
   34000.    841.    26459.   6690.    398.    4856.    2559.    2483.    157.    601.60
     0.82     2.11     5.45    2.61   0.035    0.030   0.035    0.035   586.90    10.43
 0.000224    900.     900.    900.       2        0        0    -0.02   617.82   628.25

*SECNO 123300.000

      J

 123300.00   23.59   610.49    0.0      0.0    610.81    0.32     0.19     0.01   592.20
   34000.   1592.    30615.   1793.    639.    6430.     893.    2670.    171.    592.20
     0.88     2.49     4.76    2.01   0.035    0.030   0.035    0.034   586.90    37.43
 0.000151    900.    1000.   1200.       2        0        0    -0.03   529.41   566.84

*SECNO 123400.000

      K    DOW CHEMICAL DAM, TOP CREST=599.12

 123400.00   15.21   610.31    0.0      0.0    610.92    0.62     0.03     0.09   598.50
   34000.   2245.    23478.   3276.    560.    4258.     937.    2686.    172.    598.70
     0.89     4.01     6.69    3.50   0.035    0.030   0.035    0.034   595.10    39.51
 0.000500    100.     100.    100.       2        0        0    -0.01   526.62   566.13

*SECNO 123401.000
 123401.00   15.21   610.31    0.0      0.0    610.93    0.62     0.00     0.00   593.50
   34000.   2245.    23477.   3277.    560.    4259.     938.    2687.    172.    598.70
     0.89     4.01     6.69    3.50   0.035    0.030   0.035    0.034   595.10    39.49
 0.000500      8.       8.      8.       2        0        0    -0.01   526.65   566.14

*SECNO 123500.000

      L

 123500.00   19.34   610.44    0.0      0.0    610.98    0.54     0.04     0.01   595.60
   34000.   2283.    29443.   2274.    605.    4771.     787.    2701.    173.    596.70
     0.89     3.77     6.17    2.89   0.035    0.030   0.035    0.034   591.10    37.93
 0.000383    100.     100.    100.       2        0        0    -0.02   528.75   566.67

*SECNO 124100.000
   SECNO    DEPTH    CHSEL    CRIWS    XSELK    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

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,FLUEA=      614.90 FLREA=      614.90

      DOW CHEMICAL R.R. AND VEHICLE BRIDGE, MAX LC=611.95, MIN TR=614.9

      WIDTH=20, LENGTH=304
```

```
124100.00    19.30   610.50    0.0      0.0    611.25    0.75     0.21     0.07   607.20
   34000.       0.   34000.     0.       0.     4333.     0.     2759.     178.    596.80
     0.91      0.0     6.96    0.0    0.035    0.030    0.035    0.034   590.70   102.00
 0.000549     500.     450.    500.       2        0        0    -0.03   296.00   398.00
```

SPECIAL BRIDGE

```
SB   XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHJ     ELCHD
     1.15      1.50      2.50      0.0     256.00     6.00    5310.00     0.90    595.00    595.00
```

*SECNO 124101.000
CLASS A LOW FLOW

3420 BRIDGE W.S.= 610.44 BRIDGE VELOCITY=, 8.34 CALCULATED CHANNEL AREA=, 4076.

```
 EGPRS      EGLWC      H3       QWEIR      QPR       BAREA    TRAPEZOID      ELLC      ELTRD
                                                                AREA
     0.0    611.29     0.04       0.     34000.     5310.     4510.      612.00    618.60
```

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 614.90 ELREA= 614.90

```
124101.00    19.84   610.54    0.0      0.0    611.29    0.75     0.04     0.0    607.20
   34000.       0.   34000.     0.       0.     4894.     0.     2762.     178.    596.80
     0.91      0.0     6.95    0.0    0.035    0.030    0.035    0.034   590.70   102.00
 0.000544     29.      29.     29.       0        0        0    -0.02   296.00   398.00
```

*SECNO 124300.000

3265 DIVIDED FLOW

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 613.40 ELREA= 604.30

N DOW CHEMICAL PIPELINE BRIDGE, LC=618.96,TR=622, WIDTH=25, LENGTH=264

```
124300.00    24.96   610.88    0.0      0.0    611.37    0.50     0.06     0.03   613.40
   34000.       0.   33831.    169.       0.     5969.    103.     2781.     179.    604.30
     0.92      0.0     5.67    1.64    0.035    0.030    0.035    0.034   585.90   116.11
 0.000312     100.     150.    100.       2        0        0    -0.02   334.34   454.45
```

*SECNO 124301.000

3265 DIVIDED FLOW

3370 NORMAL BRIDGE,NRD= 4 MIN ELTRD= 620.40 MAX ELLC= 621.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 614.90 ELREA= 614.90

```
124301.00    24.97   610.87    0.0      0.0    611.38    0.50     0.00     0.00   613.40
   34000.       0.   34000.     0.       0.     5971.     0.     2782.     179.    604.30
     0.92      0.0     5.69    0.0    0.035    0.030    0.035    0.034   585.90   116.09
 0.000315     10.      10.     10.       0        0        0    -0.01   302.91   423.00
```

*SECNO 124301.000

```
3265 DIVIDED FLOW

3370 NORMAL BRIDGE,NRD=  4 MIN ELTRD=  620.40 MAX ELLC=  621.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      622.00 ELREA=      622.00

124301.00    24.98   610.88     0.0      0.0   611.39     0.50     0.01     0.00   613.40
   34000.       0.   34000.      0.       0.    5972.       0.    2787.     179.    604.30
     0.92      0.0     5.69     0.0    0.035    0.030    0.035    0.034   535.90   116.07
 0.000315      33.      33.      33.        0        0        0    -0.01   302.93   423.00

*SECNO 124303.000

3265 DIVIDED FLOW

   SECNO    DEPTH    CWSEL    CRIWS    WSELK    FG       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   IOC      ICONT    CORAR    TOPWID     ENDST

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      622.00 ELREA=      622.00

124303.00    24.99   610.89     0.0      0.0   611.39     0.50     0.00     0.00   613.40
   34000.       0.   34000.      0.       0.    5973.       0.    2788.     179.    604.30
     0.92      0.0     5.69     0.0    0.035    0.030    0.035    0.034   585.90   116.06
 0.000315      10.      10.      10.        0        0        0    -0.01   302.94   423.00

*SECNO 124700.000
3280 CROSS SECTION 124700.00 EXTENDED      4.07 FEET

        Q

124700.00    24.27   611.07     0.0      0.0   611.51     0.44     0.11     0.01   613.70
   34000.       0.   33069.     931.       0.    6121.     664.    2847.     183.    605.00
     0.94      0.0     5.40     1.40    0.035    0.030    0.035    0.034   586.80   122.30
 0.000247     400.     400.     400.        2        0        0    -0.03   547.70   670.00

*SECNO 126000.000
3280 CROSS SECTION 126000.00 EXTENDED     11.55 FEET

        P

126000.00    25.25   611.55     0.0      0.0   611.73     0.18     0.19     0.03   623.40
   34000.       0.   22519.   11481.       0.    5823.    5434.    3088.     201.    604.70
     1.04      0.0     3.86     2.11    0.035    0.030    0.035    0.034   586.30   109.58
 0.000115    1300.    1200.    1100.        2        0        0    -0.03   840.43   950.00

*SECNO 126800.000
3280 CROSS SECTION 126800.00 EXTENDED     11.55 FEET

3470 ENCROACHMENT STATIONS=       0.0     750.0  TYPE=     1  TARGET=     749.999
```

```
126800.00    25.25   611.55     0.0      0.0    611.88     0.33     0.11     0.04   623.40
   34000.       0.   27314.    4085.       0.    6020.    2303.    3259.     214.    600.00
     1.09      0.0     4.87     2.03    0.035    0.030    0.035    0.033   586.30   109.56
 0.000182     900.     800.     700.        2        0        0    -0.01   640.44   750.00

*SECNO 127550.000

3265 DIVIDED FLOW

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      637.90 ELREA=      624.70

        R   GEORGE ST. BRIDGE, MAX LC=639.2, MIN TR=631.5, WIDTH=64, LENGTH=694

127550.00    27.37   611.67     0.0      0.0    612.06     0.39     0.16     0.02   624.70
   34000.       0.   34000.      0.       0.    6754.       0.    3363.     222.    620.00
     1.12      0.0     5.03     0.0    0.035    0.030    0.035    0.033   534.30   285.07
 0.000420     600.     600.     600.        2        0        0    -0.02   462.78   767.85

*SECNO 127551.000

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     XNR      XTN      ELMIN      SSTA
   SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST

3370 NORMAL BRIDGE,NRD= 11 MIN ELTRD=  631.50 MAX ELLC=  641.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      637.90 ELREA=      624.70

127551.00    27.37   611.67     0.0      0.0    612.06     0.39     0.00     0.00   624.70
   34000.       0.   34000.      0.       0.    6755.       0.    3365.     222.    620.00
     1.12      0.0     5.03     0.0    0.035    0.030    0.035    0.033   534.30   285.06
 0.000420      10.      10.      10.        0        0        0    -0.01   462.79   767.86

*SECNO 127552.000

3265 DIVIDED FLOW

3370 NORMAL BRIDGE,NRD= 11 MIN ELTRD=  631.50 MAX ELLC=  641.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      637.90 ELREA=      624.70

127552.00    27.40   611.70     0.0      0.0    612.09     0.39     0.03     0.00   624.70
   34000.       0.   34000.      0.       0.    6769.       0.    3375.     222.    620.00
     1.13      0.0     5.02     0.0    0.035    0.030    0.035    0.033   534.30   285.04
 0.000418      64.      64.      64.        0        0        0    -0.01   462.90   767.94

*SECNO 127553.000

3265 DIVIDED FLOW
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```
3495 OVERBANK AREA ASSUMED NON-EFFECTIVE.ELLEA=      637.90 ELREA=      624.70

127553.00    27.40   611.70     0.0      0.0    612.09     0.39     0.00     0.00   624.70
   34000.       0.   34000.      0.       0.     6772.       0.     3376.     272.   620.00
     1.13     0.0     5.02     0.0    0.035     0.030    0.035    0.033   534.30   285.04
 0.000417      10.     10.      10.        0         0        0    -0.02   462.92   767.95

*SECNO 128100.000

3470 ENCROACHMENT STATIONS=      252.0     523.3  TYPE=     1  TARGET=    -300.000

        S

128100.00    26.21   611.71     0.0      0.0    612.40     0.69     0.22     0.09   615.40
   34000.       0.   34000.      0.       0.     5096.       0.     3451.     227. 100000.00
     1.15     0.0     6.67     0.0    0.035     0.030    0.035    0.033   585.50   271.49
 0.000372     700.    550.     500.        2         0        0    -0.02   249.70   521.19

1490 NH CARD USED
*SECNO 129100.000

3470 ENCROACHMENT STATIONS=      150.0     669.0  TYPE=     1  TARGET=    -150.000

        T    D/S OF CONFLUENCE WITH CHIPPEWA RIVER

129100.00    28.17   612.27     0.0      0.0    612.66     0.39     0.23     0.03   600.30
   34000.     6270.   27730.      0.     1525.     5365.       0.     3577.     235. 100000.00
     1.20     4.11     5.17     0.0    0.016     0.050    0.035    0.033   584.10   150.00
 0.000183     1000.    900.     850.        2         0        0    -0.05   517.72   667.72

*SECNO 129350.000
3280 CROSS SECTION 129350.00 EXTENDED      12.60 FEET

   SECNO     DEPTH     CNSEL     CRINS     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

        U    U/S OF CONFLUENCE WITH CHIPPEWA RIVER

129350.00    28.50   612.60     0.0      0.0    612.72     0.12     0.03     0.03   600.30
   21000.     3522.   15868.    1610.     2426.     5220.     765.     3614.     237.   596.50
     1.23     1.45     5.04     2.11    0.030     0.035    0.030    0.033   584.10     0.0
 0.000080      90.     250.     300.        2         0        0    -0.06   700.00   700.00

*SECNO 130175.000
3280 CROSS SECTION 130175.00 EXTENDED      11.65 FEET

3470 ENCROACHMENT STATIONS=      490.0    1030.0  TYPE=     1  TARGET=     540.000

        V

130175.00    27.45   612.65     0.0      0.0    612.79     0.13     0.07     0.00   606.20
   21000.     1548.   17055.    2397.      938.     5503.    1272.     3752.     248.   604.80
     1.30     1.85     3.10     1.98    0.030     0.035    0.030    0.033   585.20   490.00
 0.000098     750.    750.     750.        2         0        0    -0.05   540.00  1030.00
```

*SECNO 130225.000

3265 DIVIDED FLOW

-20 BRIDGE, MAX LC=634.5, MIN TR=626.5, WIDTH=68, LENGTH=671

130225.00	24.45	612.65	0.0	0.0	612.80	0.15	0.01	0.01	595.60
21000.	3946.	14200.	2854.	1857.	4148.	1133.	3760.	249.	601.80
1.30	2.13	3.42	2.41	0.030	0.035	0.030	0.033	588.20	292.00
0.000184	50.	50.	50.	1	0	0	-0.04	610.00	964.00

*SECNO 130225.000

3265 DIVIDED FLOW

3370 NORMAL BRIDGE,NRD= 15 MIN ELTRD= 625.60 MAX ELLC= 634.90

130226.00	24.45	612.65	0.0	0.0	612.80	0.15	0.00	0.00	595.60
21000.	3944.	14203.	2853.	1856.	4147.	1183.	3762.	249.	601.80
1.30	2.13	3.42	2.41	0.030	0.035	0.030	0.033	588.20	292.00
0.000184	10.	10.	10.	0	0	0	-0.04	610.00	964.00

*SECNO 130226.000

3265 DIVIDED FLOW

3370 NORMAL BRIDGE,NRD= 15 MIN ELTRD= 625.60 MAX ELLC= 634.90

130226.00	24.46	612.66	0.0	0.0	612.81	0.15	0.01	0.00	595.60
21000.	3950.	14195.	2855.	1859.	4150.	1134.	3773.	250.	601.80
1.31	2.12	3.42	2.41	0.030	0.035	0.030	0.033	588.20	292.00
0.000184	68.	68.	68.	0	0	0	-0.04	610.00	964.00

*SECNO 130227.000

3265 DIVIDED FLOW

SECNO	DEPTH	CUSEL	CRIKS	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

130227.00	24.47	612.67	0.0	0.0	612.81	0.15	0.00	0.00	595.60
21000.	3951.	14194.	2855.	1860.	4150.	1135.	3775.	250.	601.80
1.31	2.12	3.42	2.41	0.030	0.035	0.030	0.033	588.20	292.00
0.000184	10.	10.	10.	0	0	0	-0.04	610.00	964.00

*SECNO 130275.000

3280 CROSS SECTION 130275.00 EXTENDED 7.42 FEET

3470 ENCROACHMENT STATIONS= 460.0 1020.0 TYPE= 1 TARGET= 560.000

X

```
130275.00    25.62   612.67     0.0      0.0    612.84     0.22     0.01     0.02   610.90
   21000.     327.   13743.    1930.     287.    4764.    1008.    3782.     251.   607.10
     1.31     1.14     3.93     1.92    0.037    0.035    0.030    0.033   587.00   460.00
 0.000169      50.      50.      50.        2        0        0    -0.02   560.00  1020.00

*SECNO 130750.000
3280 CROSS SECTION 130750.00 EXTENDED      7.73 FEET

3470 ENCROACHMENT STATIONS=       0.0     650.0  TYPE=     1  TARGET=     649.999

        Y

130750.00    24.63   612.78     0.0      0.0    612.91     0.13     0.06     0.01   607.40
   21000.     170.   12975.    7354.     236.    4023.    3473.    3850.     257.   602.90
     1.36     0.72     3.23     2.26    0.050    0.035    0.030    0.033   588.10     9.66
 0.000103     430.     430.     430.        2        0        0    -0.04   640.33   550.00

*SECNO 131700.000
3280 CROSS SECTION 131700.00 EXTENDED      4.41 FEET

3470 ENCROACHMENT STATIONS=       0.0    1250.0  TYPE=     1  TARGET=    1249.999

        Z

131700.00    25.82   612.92     0.0      0.0    613.00     0.08     0.09     0.00   612.20
   21000.       1.   11606.    9394.       5.    4193.    6110.    4042.     277.   604.90
     1.47     0.14     2.77     1.54    0.050    0.035    0.030    0.033   587.10    41.74
 0.000084     900.     900.     950.        1        0        0    -0.09  1208.26  1250.00

*SECNO 131750.000

3265 DIVIDED FLOW

3280 CROSS SECTION 131750.00 EXTENDED      5.39 FEET

3470 ENCROACHMENT STATIONS=       0.0    1260.0  TYPE=     1  TARGET=    1259.999

        AA   CURRIE PARKWAY BRIDGE, MAX LC=612.8, MIN TR=614, WIDTH=18.

             LENGTH=136

131750.00    25.19   612.89     0.0      0.0    613.02     0.13     0.01     0.02   614.00
   21000.       0.   10459.   10541.       0.    2821.    5707.    4053.     278.   614.10
     1.48     0.0      3.71     1.85    0.035    0.035    0.035    0.033   586.70   104.00
 0.000172      50.      50.      50.        2        0        0    -0.06  1125.50  1260.00

*SECNO 131751.000

3265 DIVIDED FLOW

3280 CROSS SECTION 131751.00 EXTENDED      5.43 FEET

   SECNO     DEPTH     CUSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         OLOB      OCH       ROB       ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
```

```
   ELEV      VLOB      VCH       VROB      XCL       XCH       XCR       STY       ELMEN     SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TUPAID    ENDST


3370 NORMAL BRIDGE,NRD=  9  MIN ELTRD=  605.40 MAX ELLC=  615.60


3470 ENCROACHMENT STATIONS=        0.0    1260.0  TYPE=     1  TARGET=    1259.999
131751.00    26.23    612.93      0.0       0.0    613.03      0.09      0.00      0.00    614.00
  21000.        0.     6558.   14442.        0.     2902.    5750.     4053.      278.    614.10
    1.43      0.0      2.34      2.51     0.035     0.050     0.035     0.033    586.70    104.00
 0.000315       1.        1.        1.         ?         0         0    -24.96   1126.59   1260.00


*SECNO 131752.000

3265 DIVIDED FLOW

3280 CROSS SECTION 131752.00 EXTENDED      5.44 FEET


3370 NORMAL BRIDGE,NRD=  9  MIN ELTRD=  605.40 MAX ELLC=  615.60


3470 ENCROACHMENT STATIONS=        0.0    1260.0  TYPE=     1  TARGET=    1259.999
131752.00    26.24    612.94      0.0       0.0    613.03      0.09      0.01      0.00    614.00
  21000.        0.     6553.   14447.        0.     2902.    5754.     4057.      278.    614.10
    1.48      0.0      2.34      2.51     0.035     0.050     0.035     0.033    586.70    104.00
 0.000315      13.       13.       13.         0         0         0    -25.52   1126.69   1260.00


*SECNO 131753.000

3265 DIVIDED FLOW

3280 CROSS SECTION 131753.00 EXTENDED      5.44 FEET


3470 ENCROACHMENT STATIONS=        0.0    1260.0  TYPE=     1  TARGET=    1259.999
131753.00    26.23    612.93      0.0       0.0    613.03      0.10      0.00      0.00    614.00
  21000.        0.     6557.   12443.        0.     2902.    5756.     4057.      278.    614.10
    1.48      0.0      3.03      2.16     0.035     0.050     0.035     0.033    586.70    104.00
 0.000233       1.        1.        1.         0         0         0    -0.07   1126.73   1260.00


*SECNO 131800.000
3280 CROSS SECTION 131800.00 EXTENDED      4.49 FEET


AB

131800.00    23.69    612.93      0.0       0.0    613.05      0.05      0.01      0.00    611.40
  21000.       10.     6516.   12474.       27.     3346.    7947.     4069.      230.    599.20
    1.49      0.36      2.21      1.57     0.035     0.050     0.035     0.033    584.30     42.92
 0.000099       50.       50.       50.         2         0         0    -0.09   1357.08   1400.00


1490 NH CARD USED
*SECNO 133600.000
3280 CROSS SECTION 133600.00 EXTENDED      2.90 FEET
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3470 ENCROACHMENT STATIONS=      80.0     1560.0  TYPE=      1  TARGET=     1580.000

        AC

133600.00    23.40    613.10      0.0       0.0    613.15      0.05      0.11      0.00    602.60
   21000.     8275.    10108.    2617.     9947.     4135.     1824.     4503.      324.    603.90
    1.73      0.33      2.44      1.43     0.055     0.050     0.030     0.035    584.70     80.30
0.000056     1200.     1700.     1300.         2         0         0     -0.13   1590.00   1660.00


*SECNO 135700.000
3280 CROSS SECTION 135700.00 EXTENDED      1.69 FEET


    SECNO     DEPTH     C.SEL     CRIWS     WSELK     EG        HV        HL        OLOSS     BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       ARCH      VOL       TWA     LEFT/RIGHT
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST


3470 ENCROACHMENT STATIONS=     200.0     1760.0  TYPE=      1  TARGET=     1560.000

        AD   U/S OF CONFLUENCE WITH SNAKE CREEK

135700.00    21.58    613.18      0.0       0.0    613.22      0.04      0.07      0.00    605.90
   21000.     3214.    10463.    7323.     2228.     5145.     9648.     4989.      369.    606.80
    1.97      1.44      2.03      0.76     0.030     0.035     0.060     0.035    591.60    200.00
0.000046     1200.     1400.     1250.         1         0         0     -0.06   1560.00   1760.00


1490 NH_CARD USED
*SECNO 136100.000
3230 CROSS SECTION 136100.00 EXTENDED      2.33 FEET


3470 ENCROACHMENT STATIONS=       0.0     1700.0  TYPE=      1  TARGET=     1699.999

        AE

136100.00    21.63    613.23      0.0       0.0    613.27      0.04      0.05      0.00    605.90
   21000.      505.     9115.   11380.      498.     4230.    13716.     5369.      404.    603.40
    2.16      1.01      2.15      0.93     0.030     0.059     0.060     0.035    591.60      6.92
0.000050     1000.     1000.      900.         0         0         0     -0.15   1693.08   1700.00


1490 NH CARD USED
*SECNO 137500.000
3230 CROSS SECTION 137500.00 EXTENDED      3.30 FEET


3470 ENCROACHMENT STATIONS=       0.0     1800.0  TYPE=      1  TARGET=     1799.999

        AE   U/S OF CONFLUENCE WITH STURGEON CREEK

137500.00    23.10    613.30      0.0       0.0    613.34      0.04      0.07      0.00    610.00
   21000.     469.    10259.   10272.      610.     4522.    11604.     5860.      451.    604.80
    2.39      0.77      2.22      0.89     0.030     0.059     0.060     0.035    590.20      4.01
0.000064     1500.     1500.     1100.         0         0         0     -0.13   1795.99   1900.00


*SECNO 140000.000
3280 CROSS SECTION 140000.00 EXTENDED      3.93 FEET
```

3470 ENCROACHMENT STATIONS= 0.0 1200.0 TYPE= 1 TARGET= 1199.999

AG

140000.00	23.[illegible]4	613.44	0.0	0.0	613.54	0.10	0.18	0.02	505.00
21000.	3268.	13574.	4158.	2855.	4377.	4498.	6579.	525.	604.50
2.66	1.14	3.10	0.92	0.060	0.035	0.060	0.036	590.20	0.00
0.000101	2400.	2450.	2000.	1	0	0	-0.05	1200.00	1200.00

*SECNO 142550.000
3260 CROSS SECTION 142550.00 EXTENDED 6.23 FEET

AH

142550.00	23.49	613.69	0.0	0.0	613.73	0.04	0.18	0.01	603.30
21000.	10707.	8779.	1514.	13313.	3904.	3190.	7482.	626.	609.30
3.16	0.80	2.25	0.47	0.060	0.035	0.060	0.036	590.20	0.0
0.000054	2400.	2500.	2500.	2	0	0	-0.07	2400.00	2400.00

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*****************************************
HEC2 RELEASE DATED NOV 75 UPDATED JULY1979
ERROR CORR -  01.02.03
MODIFICATION -  50.51.52.53
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

TITTABAWASSEE RIVER AT

SUMMARY PRINTOUT TABLE 150

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
111550.000	0.0	0.0	0.0	584.40	34000.00	608.70	0.0	608.79	0.66	2.66	16212.98	41841.25
112950.000	1400.00	0.0	0.0	584.40	34000.00	608.74	0.0	608.95	1.43	3.69	9213.09	28392.08
112951.000	10.00	620.50	627.20	584.40	34000.00	608.74	0.0	608.95	1.43	3.69	9213.31	28393.10
112952.000	14.00	620.50	627.20	584.40	34000.00	608.74	0.0	608.95	1.43	3.69	9214.34	28397.91
112953.000	10.00	0.0	0.0	584.40	34000.00	608.74	0.0	608.96	1.43	3.69	9215.03	28401.15
113700.000	900.00	0.0	0.0	584.80	34000.00	608.89	0.0	609.08	1.22	3.62	10359.24	30793.38
116450.000	2600.00	0.0	0.0	585.20	34000.00	609.20	0.0	609.38	1.11	3.51	10669.04	32292.48
117600.000	1140.00	0.0	0.0	584.70	34000.00	609.33	0.0	609.61	3.30	4.24	8013.75	18711.05
117601.000	10.00	615.50	617.50	584.70	34000.00	609.33	0.0	609.61	3.30	4.24	8013.75	18711.05
117602.000	23.00	615.50	617.50	584.70	34000.00	609.34	0.0	609.62	3.30	4.24	8017.95	18726.08
117603.000	10.00	0.0	0.0	584.70	34000.00	609.35	0.0	609.63	3.29	4.24	8019.63	18732.04
118100.000	550.00	0.0	0.0	584.90	34000.00	609.48	0.0	609.76	1.91	4.39	8346.91	24579.35
119940.000	1900.00	0.0	0.0	586.40	34000.00	609.90	0.0	610.03	1.01	3.14	11723.78	33902.86
121440.000	1500.00	0.0	0.0	586.40	34000.00	609.94	0.0	610.37	3.31	5.66	6860.32	18697.25
122300.000	900.00	0.0	0.0	586.90	34000.00	610.24	0.0	610.62	2.24	5.45	7813.81	22704.54
123300.000	1000.00	0.0	0.0	586.90	34000.00	610.49	0.0	610.81	1.51	4.76	7962.02	27644.61
123400.000	100.00	0.0	0.0	595.10	34000.00	610.31	0.0	610.92	5.00	6.69	5754.69	15205.03
123401.000	8.00	0.0	0.0	595.10	34000.00	610.31	0.0	610.93	5.00	6.69	5755.86	15209.35
123500.000	100.00	0.0	0.0	591.10	34000.00	610.44	0.0	610.98	3.33	6.17	6163.40	17365.47
124100.000	450.00	0.0	0.0	590.70	34000.00	610.50	0.0	611.25	5.49	6.96	4882.52	14515.66

SECND	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
124101.000	20.00	618.00	612.00	590.70	34000.00	610.54	0.0	611.29	5.44	6.95	4894.26	14573.85
124300.000	150.00	0.0	0.0	585.90	34000.00	610.88	0.0	611.37	3.12	5.67	6072.66	19238.38
124301.000	10.00	620.40	621.00	585.90	34000.00	610.87	0.0	611.38	3.15	5.69	5970.61	19148.82
124301.000	33.00	620.40	621.00	585.90	34000.00	610.88	0.0	611.39	3.15	5.69	5971.87	19154.61
124303.000	10.00	0.0	0.0	585.90	34000.00	610.89	0.0	611.39	3.15	5.69	5972.93	19159.00
124700.000	400.00	0.0	0.0	586.30	34000.00	611.07	0.0	611.51	2.47	5.40	6785.12	21636.46
126000.000	1200.00	0.0	0.0	586.30	34000.00	611.55	0.0	611.73	1.15	3.86	11262.23	31768.43
126800.000	800.00	0.0	0.0	585.30	34000.00	611.55	0.0	611.98	1.82	4.87	8323.18	25219.35
127550.000	600.00	0.0	0.0	584.30	34000.00	611.67	0.0	612.06	4.20	5.03	6754.44	16584.20
127551.000	10.00	631.50	641.00	584.30	34000.00	611.67	0.0	612.06	4.20	5.03	6755.79	16598.93
127552.000	64.00	631.50	641.00	584.30	34000.00	611.70	0.0	612.09	4.18	5.02	6768.90	16635.35
127553.000	10.00	0.0	0.0	584.30	34000.00	611.70	0.0	612.09	4.17	5.02	6771.51	16644.55
128100.000	550.00	0.0	0.0	585.50	34000.00	611.71	0.0	612.40	3.72	6.67	5095.89	17630.09
129100.000	900.00	0.0	0.0	584.10	34000.00	612.27	0.0	612.56	1.83	5.17	6990.15	25117.95
129350.000	250.00	0.0	0.0	584.10	21000.00	612.60	0.0	612.72	0.80	3.04	8409.81	23518.71
130175.000	750.00	0.0	0.0	585.20	21000.00	612.65	0.0	612.79	0.98	3.10	7613.68	21228.58
130225.000	50.00	0.0	0.0	583.20	21000.00	612.65	0.0	612.80	1.34	3.42	7187.94	15482.96
130226.000	10.00	625.60	634.00	583.20	21000.00	612.65	0.0	612.80	1.84	3.42	7185.48	15476.16
130226.000	63.00	625.60	634.90	589.20	21000.00	612.66	0.0	612.91	1.84	3.42	7193.37	15497.96
130227.000	10.00	0.0	0.0	530.20	21000.00	612.67	0.0	612.81	1.34	3.42	7194.56	15501.26
130275.000	50.00	0.0	0.0	587.00	21000.00	612.62	0.0	612.84	1.69	3.93	6059.57	16172.93
130750.000	430.00	0.0	0.0	588.10	21000.00	612.78	0.0	612.91	1.08	3.23	7731.75	20227.89
131700.000	900.00	0.0	0.0	587.10	21000.00	612.92	0.0	613.00	0.84	2.77	10308.13	22892.81
131750.000	50.00	0.0	0.0	586.70	21000.00	612.89	0.0	613.02	1.72	3.71	8528.41	16020.05
131751.000	1.00	605.40	615.60	586.70	21000.00	612.93	0.0	613.03	3.15	2.34	8551.96	11831.65
131752.000	13.00	605.40	615.60	586.70	21000.00	612.94	0.0	613.03	3.15	2.34	8556.05	11840.84
131753.000	1.00	0.0	0.0	586.70	21000.00	612.93	0.0	613.03	2.33	3.03	8583.43	13754.61
131800.000	50.00	0.0	0.0	584.30	21000.00	612.99	0.0	613.05	0.99	2.21	11820.04	21054.82
133600.000	1700.00	0.0	0.0	584.70	21000.00	613.10	0.0	613.15	0.56	2.44	15905.79	27939.31

BUSINESS FORMS INC 27

SECND	XLCH	ELTRD	ELLC	FLMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
135700.000	1400.00	0.0	0.0	591.60	21000.00	613.18	0.0	613.22	0.46	2.03	17020.77	30944.41
136100.000	1000.00	0.0	0.0	591.60	21000.00	613.23	0.0	613.27	0.50	2.15	18440.14	29569.89
137500.000	1500.00	0.0	0.0	590.20	21000.00	613.30	0.0	613.34	0.54	2.22	16836.04	26235.38
140000.000	2450.00	0.0	0.0	590.20	21000.00	613.44	0.0	613.54	1.01	3.10	11729.17	20869.30
142550.000	2500.00	0.0	0.0	590.20	21000.00	613.69	0.0	613.73	0.54	2.25	20407.71	28513.98

TITTABAWASSEE RIVER AT "

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CHSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
A	111550.000	34000.00	608.70	0.0	0.0	0.0	1306.11	0.0
B	112950.000	34000.00	608.74	0.0	0.04	0.0	466.55	1400.00
	112951.000	34000.00	608.74	0.0	0.00	0.0	465.56	10.00
	112952.000	34000.00	608.74	0.0	0.00	0.0	465.57	14.00
	112953.000	34000.00	608.74	0.0	0.00	0.0	465.58	10.00
C	113700.000	34000.00	608.89	0.0	0.14	0.0	691.30	900.00
D	116450.000	34000.00	609.20	0.0	0.32	0.0	673.05	2600.00
E	117600.000	34000.00	609.33	0.0	0.13	0.0	492.00	1140.00
	117601.000	34000.00	609.33	0.0	0.00	0.0	492.00	10.00
	117602.000	34000.00	609.34	0.0	0.01	0.0	492.00	23.00
	117603.000	34000.00	609.35	0.0	0.00	0.0	492.00	10.00
F	118100.000	34000.00	609.48	0.0	0.14	0.0	504.08	550.00
G	119940.000	34000.00	609.90	0.0	0.41	0.0	673.59	1900.00
H	121430.000	34000.00	609.94	0.0	0.04	0.0	483.13	1500.00
I	122300.000	34000.00	610.24	0.0	0.30	0.0	617.82	900.00
J	123300.000	34000.00	610.49	0.0	0.25	0.0	529.41	1000.00
K	123400.000	34000.00	610.31	0.0	-0.18	0.0	526.62	100.00
	123401.000	34000.00	610.31	0.0	0.00	0.0	526.65	3.00
L	123500.000	34000.00	610.44	0.0	0.13	0.0	528.75	100.00
M	124100.000	34000.00	610.50	0.0	0.05	0.0	296.00	450.00
	124101.000	34000.00	610.54	0.0	0.04	0.0	296.00	29.00
N	124300.000	34000.00	610.88	0.0	0.34	0.0	334.34	150.00
	124301.000	34000.00	610.87	0.0	-0.00	0.0	302.91	10.00
	124302.000	34000.00	610.88	0.0	0.01	0.0	302.93	33.00
	124303.000	34000.00	610.89	0.0	0.00	0.0	302.94	10.00
O	124700.000	34000.00	611.07	0.0	0.18	0.0	547.70	400.00
P	126000.000	34000.00	611.55	0.0	0.48	0.0	940.43	1200.00

WORTH BUSINESS FORMS INC 27

	SECNO	D	CASEL	DIFASP	DIFASX	DIFKWS	TOPWID	XLCH
Q	126800.000	34000.00	611.55	0.0	0.01	0.0	540.44	800.00
R	127550.000	34000.00	611.57	0.0	0.11	0.0	462.78	500.00
	127551.000	34000.00	611.57	0.0	0.00	0.0	462.79	10.00
	127552.000	34000.00	611.70	0.0	0.03	0.0	462.90	64.00
	127553.000	34000.00	611.70	0.0	0.00	0.0	462.92	10.00
S	128100.000	34000.00	611.71	0.0	0.01	0.0	249.70	550.00
T	129100.000	34000.00	612.27	0.0	0.57	0.0	517.72	900.00
U	129350.000	21000.00	612.50	0.0	0.32	0.0	700.00	250.00
V	130175.000	21000.00	612.55	0.0	0.06	0.0	540.00	750.00
W	130225.000	21000.00	612.55	0.0	-0.01	0.0	610.00	50.00
	130226.000	21000.00	612.55	0.0	0.00	0.0	610.00	10.00
	130227.000	21000.00	612.55	0.0	0.01	0.0	610.00	60.00
	130228.000	21000.00	612.57	0.0	0.00	0.0	610.00	10.00
X	130275.000	21000.00	612.62	0.0	-0.04	0.0	560.00	50.00
Y	130750.000	21000.00	612.78	0.0	0.16	0.0	640.33	430.00
Z	131700.000	21000.00	612.92	0.0	0.14	0.0	1208.26	900.00
AA	131750.000	21000.00	612.89	0.0	-0.03	0.0	1125.50	50.00
	131751.000	21000.00	612.93	0.0	0.04	0.0	1126.59	1.00
	131752.000	21000.00	612.94	0.0	0.01	0.0	1126.69	18.00
	131753.000	21000.00	612.93	0.0	-0.00	0.0	1126.73	1.00
AB	131800.000	21000.00	612.99	0.0	0.06	0.0	1357.08	50.00
AC	133600.000	21000.00	613.10	0.0	0.11	0.0	1580.00	1700.00
AD	135700.000	21000.00	613.18	0.0	0.08	0.0	1560.00	1400.00
AE	136100.000	21000.00	613.23	0.0	0.05	0.0	1693.08	1000.00
AF	137500.000	21000.00	613.30	0.0	0.07	0.0	1795.99	1500.00
AG	140000.000	21000.00	613.44	0.0	0.14	0.0	1200.00	2450.00
AH	142550.000	21000.00	613.59	0.0	0.15	0.0	2400.00	2500.00

SUMMARY OF ERRORS

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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY1979
  ERROR CORR - 01,02,03
  MODIFICATION -  50,51,52,53
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A-2 10-, 50-, 100-, & 500-year floods

Profiles revised w/s of 123500

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C
T1      TITTABAWASSEE RIVER AT MIDLAND, PROJECT NO. 8543
T2      TITTABAWASSEE RIVER AT MIDLAND
T3      TITTABAWASSEE RIVER AT MIDLAND

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ
      0.      2.       0.       0.     0.0        0.0      0.0      0.     607.200    0.0

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE
     1.000     0.0     -1.000    0.0      0.0      0.0      0.0      0.0      0.0      0.0

QT      5.000  28000.000  41700.000  47800.000  62700.000  34000.000     0.0      0.0      0.0      0.0
NC      0.035      0.035      0.035      0.100      0.300      0.0       0.0      0.0      0.0      0.0

        A

X1 111550.000     17.000    215.000    624.000      0.0       0.0       0.0      0.0      0.0      0.0
GR     620.000    195.000    600.000    200.000    596.800   215.000   589.800  224.000  586.800  280.000
GR     586.100    335.000    586.400    390.000    584.400   445.000   585.500  500.000  585.500  555.000
GR     589.800    610.000    603.500    624.000    600.000   780.000   599.000 1000.000  600.000 1200.000
GR     603.000   1500.000    632.000   1520.000      0.0       0.0       0.0      0.0      0.0      0.0

        B   CONSUMER POWER R. R. BRIDGE, MAX LC 618, MIN TR 621.7, WIDTH 14

        LENGTH 497

X1 112950.000     26.000    210.000    694.000   1500.000  1150.000  1400.000    0.0      0.0      0.0
X3      10.000     0.0       0.0        0.0        0.0       0.0       0.0     620.500  620.500    0.0
GR     620.500    50.000    595.700    210.000    589.800   234.000   586.600  253.000  585.600  272.000
GR     584.900   282.000    584.400    300.000    585.100   320.000   585.400  342.000  584.500  352.000
GR     584.500   370.000    584.600    390.000    584.700   412.000   585.200  422.000  585.800  450.000
GR     587.100   482.000    587.100    492.000    587.300   520.000   587.500  552.000  588.200  580.000
GR     589.800   603.000    601.000    624.000    601.000   630.000   606.900  667.000  612.100  694.000
GR     627.200   800.000      0.0        0.0        0.0       0.0       0.0      0.0      0.0      0.0

X1 112951.000     0.0       0.0        0.0       10.000    10.000    10.000    0.0      0.0      0.0
X3      10.000    0.0       0.0        0.0        0.0       0.0       0.0     620.500  620.500    0.0
BT       2.000   50.000    620.500    620.500    800.000   627.200   627.200    0.0      0.0      0.0

X1 112952.000     0.0       0.0        0.0       14.000    14.000    14.000    0.0      0.0      0.0
X2       0.0      0.0       0.0        0.0        0.0       0.0       1.000    0.0      0.0      0.0
X3      10.000    0.0       0.0        0.0        0.0       0.0       0.0     626.300  621.700    0.0

X1 112953.000     0.0       0.0        0.0       10.000    10.000    10.000    0.0      0.0      0.0
X3      10.000    0.0       0.0        0.0        0.0       0.0       0.0     626.300  621.700    0.0

        C   RATING CURVE DEVELOPED BY COE 1977   608.9 FOR 1948
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X1 113700.000    13.000   221.000   617.000   900.000   800.000   900.000     0.0       0.0       0.0
GR     625.000   120.000   600.000   180.000   596.300   221.000   589.800   234.000   587.400   285.000
GR     586.900   335.000   585.100   385.000   584.800   440.000   584.900   490.000   585.200   540.000
GR     589.800   594.000   603.100   617.000   604.300   850.000     0.0       0.0       0.0       0.0

        D   NUCLEAR POWER PLANT, RATING CURVE DEVELOPED BY CONSUMER POWER,MICH

X1 116450.000   -21.000   139.000   536.000  2700.000  2400.000  2600.000     0.0       0.0       0.0
GR     615.000     0.0     610.000   118.000   605.000   125.000   600.000   130.000   595.000   139.000
GR     590.900   160.000   585.300   222.000   585.500   284.000   585.200   345.000   585.500   406.000
GR     587.600   467.000   590.900   528.000   595.000   536.000   600.000   543.000   605.000   568.000
GR     610.000   598.000   605.000   617.000   600.000   676.000   599.000   696.000   600.000   740.000
GR     605.000   800.000     0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0

        E   DOW CHEMICAL PIPELINE BRIDGE, MAX LC 617.4, MIN TR 618.9, WIDTH 23

            LENGTH 510

X1 117600.000    28.000    93.000   597.000  1130.000  1170.000  1140.000     0.0       0.0       0.0
GR     617.500     0.0     619.000    93.000   596.800    93.000   590.600   114.000   588.200   143.000
GR     587.200   172.000   586.800   203.000   614.400   203.000   614.400   207.000   586.800   207.000
GR     586.500   210.000   585.800   243.000   585.000   276.000   584.700   308.000   585.600   343.000
GR     614.400   343.000   614.400   347.000   585.600   347.000   586.700   364.000   590.600   383.000
GR     598.900   400.000   603.600   483.000   614.400   483.000   614.400   487.000   603.600   487.000
GR     600.000   597.000   618.900   597.000   616.500   700.000     0.0       0.0       0.0       0.0

X1 117601.000     0.0       0.0       0.0      10.000    10.000    10.000     0.0       0.0       0.0
BT       4.000     0.0     617.500   617.500    93.000   619.000   617.400   597.000   618.900   617.300
BT     700.000   616.500   616.500     0.0       0.0       0.0       0.0       0.0       0.0       0.0

X1 117602.000     0.0       0.0       0.0      23.000    23.000    23.000     0.0       0.0       0.0
X2       0.0      0.0       0.0       0.0       0.0       0.0     1.000       0.0       0.0       0.0

X1 117603.000     0.0       0.0       0.0      10.000    10.000    10.000     0.0       0.0       0.0

        F

X1 118100.000    14.000    56.000   400.000   650.000   500.000   550.000     0.0       0.0       0.0
GR     618.000     0.0     617.900    56.000   590.600   112.000   587.500   152.000   586.800   192.000
GR     585.400   232.000   584.900   272.000   586.400   311.000   587.000   350.000   590.600   389.000
GR     595.200   400.000   600.000   480.000   600.000   510.000   616.900   630.000     0.0       0.0

        G

X1 119940.000    14.000    26.000   344.000  1900.000  1900.000  1900.000     0.0       0.0       0.0
GR     620.200     0.0     616.800     8.000   616.400    26.000   591.800    59.000   589.600   106.000
GR     588.200   153.000   586.800   200.000   586.400   246.000   587.400   292.000   591.800   338.000
GR     592.700   344.000   594.800   595.000   597.700   681.000   616.900   724.000     0.0       0.0
QT       5.000 27500.000 41000.000 47000.000 61600.000 34000.000     0.0       0.0       0.0       0.0

        H   USGS GAGE 1560  RATING CURVE HAS BEEN DEVELOPED  609.8 FOR 1948

X1 121440.000    14.000    25.000   266.000  1500.000  1500.000  1500.000     0.0       0.0       0.0
GR     620.200     0.0     616.400    25.000   591.800    50.000   589.600    85.000   588.200   120.000
GR     586.800   156.000   586.400   191.000   587.400   226.000   591.800   262.000   592.700   266.000
GR     600.000   300.000   603.000   400.000   600.000   450.000   616.900   560.000     0.0       0.0
NC       0.035     0.035     0.030     0.0       0.0       0.0       0.0       0.0       0.0       0.0
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I

X1	122300.000	13.000	80.000	318.000	900.000	900.000	900.000	0.0	0.0	0.0
GR	614.600	0.0	605.400	22.000	602.300	80.000	592.200	102.000	589.000	136.000
GR	588.000	170.000	587.100	204.000	586.900	238.000	588.500	272.000	592.200	306.000
GR	601.600	318.000	601.900	611.000	613.500	635.000	0.0	0.0	0.0	0.0

J

X1	123300.000	13.000	132.000	426.000	900.000	1200.000	1000.000	0.0	0.0	0.0
GR	613.700	0.0	605.800	92.000	596.400	112.000	592.200	132.000	589.000	181.000
GR	588.000	230.000	587.100	279.000	586.900	328.000	588.500	377.000	592.200	426.000
GR	603.900	457.000	607.000	553.000	613.800	580.000	0.0	0.0	0.0	0.0

K DOW CHEMICAL DAM, TOP CREST 599.12

X1	123400.000	13.000	132.000	412.000	100.000	100.000	100.000	0.0	0.0	0.0
GR	613.700	0.0	605.800	92.000	596.400	112.000	598.500	132.000	595.100	132.000
GR	595.100	412.000	598.700	412.000	598.700	420.000	598.600	420.000	598.600	428.000
GR	603.900	457.000	607.000	553.000	613.800	580.000	0.0	0.0	0.0	0.0

X1	123401.000	0.0	0.0	0.0	8.000	8.000	8.000	0.0	0.0	0.0

L

X1	123500.000	14.000	132.000	429.000	100.000	100.000	100.000	0.0	0.0	0.0
GR	613.700	0.0	605.800	92.000	596.400	112.000	595.200	132.000	596.800	184.000
GR	595.700	225.000	593.200	266.000	591.100	307.000	592.600	348.000	594.900	389.000
GR	596.700	429.000	603.900	457.000	607.000	553.000	613.800	580.000	0.0	0.0

M DOW CHEMICAL R.R. AND VEHICLE BRIDGE, MAX LC 611.95, MIN TR 614.9

WIDTH 20, LENGTH 304

X1	124100.000	18.000	102.000	398.000	500.000	500.000	450.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	614.900	614.900	0.0
GR	614.900	0.0	607.200	102.000	595.200	134.000	596.800	150.000	592.200	175.000
GR	591.600	195.000	591.300	214.000	590.900	233.000	590.900	249.000	607.500	249.000
GR	607.500	255.000	590.900	255.000	590.700	281.000	591.100	309.000	593.500	337.000
GR	594.600	365.000	596.800	398.000	614.800	500.000	0.0	0.0	0.0	0.0
SB	1.150	1.500	2.500	0.0	256.000	6.000	5310.000	0.900	595.000	595.000

DO NOT USE

X1	124101.000	0.0	0.0	0.0	29.000	29.000	29.000	0.0	0.0	0.0
X2	0.0	0.0	1.000	612.000	618.600	0.0	0.0	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	614.900	614.900	0.0
BT	4.000	0.0	614.900	614.900	102.000	618.600	611.800	398.000	618.700	612.000
BT	500.000	614.800	614.800	0.0	0.0	0.0	0.0	0.0	0.0	0.0

N DOW CHEMICAL PIPELINE BRIDGE, LC 618.96, TR 622, WIDTH 25, LENGTH 264

X1	124300.000	23.000	105.000	423.000	100.000	100.000	150.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	620.000	620.000	0.0
GR	613.800	0.0	614.100	42.000	621.000	54.000	613.400	105.000	608.400	127.000
GR	594.700	154.000	596.300	174.000	591.500	174.000	588.700	192.000	588.200	210.000
GR	587.800	228.000	586.900	246.000	586.900	262.000	618.800	262.000	618.800	266.000
GR	586.900	266.000	586.600	292.000	585.900	320.000	586.200	348.000	587.800	376.000
GR	596.300	403.000	604.300	423.000	620.400	500.000	0.0	0.0	0.0	0.0

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  HEC2 RELEASE DATED NOV 76 UPDATED JULY1979
  ERROR CORR - 01,02,03
  MODIFICATION -  50,51,52,53
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Profile Revised uls of XSEC 123500 see Enclosed Report by MPS

T1
T2
T3

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0.	4.	0.	0.	0.0	0.0	0.0	0.	610.500	0.0

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	3.000	0.0	-1.00D	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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*PROF 3

CCHV    0.100 CEHV    0.300
*SECNO 111550.000
   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

        A

111550.00   26.10   610.50    0.0    610.50   610.62    0.13     0.0      0.0     596.80
   47800.     382.   31323.   16095.    195.    9666.    8704.     0.       0.      603.50
     0.0      1.96     3.24     1.85   0.035    0.035    0.035    0.0     584.40    197.37
 0.000088      0.       0.       0.       0        0        0    -0.02   1307.80   1505.17

*SECNO 112950.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       620.50 ELREA       620.50

        B   CONSUMER POWER R. R. BRIDGE, MAX LC 618, MIN TR 621.7, WIDTH 14

            LENGTH 497

112950.00   26.12   610.52    0.0      0.0    610.87    0.35     0.18     0.07    595.70
   47800.      0.   47800.      0.       0.   10052.      0.     435.      26.     612.10
     0.08     0.0     4.76    0.0    0.035    0.035    0.035    0.036    584.40    210.00
 0.000218    1500.    1400.   1150.       2        0        0    -0.02    475.80    685.80

*SECNO 112951.000

3370 NORMAL BRIDGE,NRD   2 MIN ELTRD   620.50 MAX ELLC   627.20

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       620.50 ELREA       620.50

112951.00   26.12   610.52    0.0      0.0    610.87    0.35     0.00     0.00    595.70
   47800.      0.   47800.      0.       0.   10053.      0.     437.      26.     612.10
     0.08     0.0     4.75    0.0    0.035    0.035    0.035    0.036    584.40    210.00
 0.000218     10.      10.     10.       0        0        0    -0.02    475.80    685.80

*SECNO 112952.000

3370 NORMAL BRIDGE,NRD   2 MIN ELTRD   620.50 MAX ELLC   627.20

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       626.30 ELREA       621.70

112952.00   26.13   610.53    0.0      0.0    610.88    0.35     0.00     0.00    595.70
   47800.      0.   47800.      0.       0.   10054.      0.     441.      26.     612.10
     0.08     0.0     4.75    0.0    0.035    0.035    0.035    0.036    584.40    210.00
 0.000217     14.      14.     14.       0        0        0    -0.02    475.82    685.82

*SECNO 112953.000
   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
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SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       626.30 ELREA       621.70

112953.00    26.13    610.53      0.0       0.0    610.88      0.35      0.00      0.00    595.70
   47800.       0.    47800.       0.        0.    10055.       0.      443.       27.    612.10
    0.08       0.0     4.75       0.0     0.035     0.035     0.035     0.036    584.40    210.00
 0.000217      10.       10.       10.         0         0         0     -0.02    475.83    685.83

*SECNO 113700.000
3280 CROSS SECTION 113700.00 EXTENDED      6.46 FEET

      C  RATING CURVE DEVELOPED BY COE 1977   608.9 FOR 1948

113700.00    25.96    610.76      0.0       0.0    611.06      0.30      0.17      0.01    596.30
   47800.     1786.    42696.    3319.      656.     9364.     1645.      665.       38.    603.10
     0.14      2.72      4.56      2.02     0.035     0.035     0.035     0.036    584.80    154.18
 0.000173      900.      900.      800.         2         0         0     -0.07    695.82    850.00

*SECNO 116450.000
3280 CROSS SECTION 116450.00 EXTENDED      6.21 FEET

        D   NUCLEAR POWER PLANT, RATING CURVE DEVELOPED BY CONSUMER POWER,MICH

116450.00    26.01    611.21      0.0       0.0    611.48      0.27     -0.42      0.00    595.00
   47800.      455.    42095.    5250.      210.     9560.     2281.     1365.       79.    595.00
     0.31      2.16      4.40      2.30     0.035     0.035     0.035     0.035    585.20     89.51
 0.000156     2700.     2600.     2400.         2         0         0     -0.03    710.49    800.00

*SECNO 117600.000

3265 DIVIDED FLOW

        E   DOW CHEMICAL PIPELINE BRIDGE, MAX LC 617.4, MIN TR 618.9, WIDTH 23

            LENGTH 510

117600.00    26.68    611.38      0.0       0.0    611.81      0.44      0.28      0.05    619.00
   47800.       0.    47800.       0.        0.     9024.       0.     1642.       95.    618.90
     0.37       0.0     5.30       0.0     0.035     0.035     0.035     0.035    584.70     93.00
 0.000455     1130.     1140.     1170.         1         0         0     -0.03    492.00    597.00

*SECNO 117601.000

3265 DIVIDED FLOW

3370 NORMAL BRIDGE,NRD    4 MIN ELTRD   616.50 MAX ELLC    617.50

117601.00    26.68    611.38      0.0       0.0    611.82      0.44      0.00      0.00    619.00
   47800.       0.    47800.       0.        0.     9021.       0.     1644.       95.    618.90
     0.37       0.0     5.30       0.0     0.035     0.035     0.035     0.035    584.70     93.00
 0.000455      10.       10.       10.         0         0         0     -0.03    492.00    597.00
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*SECNO 117602.000

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      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

3370 NORMAL BRIDGE,NRD   4 MIN ELTRD   616.50 MAX ELLC   617.50

117602.00    26.69    611.39     0.0       0.0     611.83     0.44      0.01      0.00     619.00
   47800.       0.    47800.       0.        0.      9026.       0.     1649.       96.     618.90
     0.37      0.0      5.30      0.0     0.035     0.035     0.035     0.035    584.70      93.00
 0.000454      23.      23.       23.        0         0         0     -0.03    492.00     597.00

*SECNO 117603.000

3265 DIVIDED FLOW

117603.00    26.70    611.40     0.0       0.0     611.83     0.44      0.00      0.00     619.00
   47800.       0.    47800.       0.        0.      9029.       0.     1651.       96.     618.90
     0.37      0.0      5.29      0.0     0.035     0.035     0.035     0.035    584.70      93.00
 0.000454      10.      10.       10.        0         0         0     -0.03    492.00     597.00

*SECNO 118100.000

        F

118100.00    26.69    611.59     0.0       0.0     612.02     0.43      0.19      0.00     617.90
   47800.       0.    41002.    6798.        0.      7487.     1945.    1766.      102.     595.20
     0.40      0.0      5.48     3.50     0.035     0.035     0.035     0.035    584.90      68.93
 0.000267     650.     550.      500.        2         0         0     -0.02    523.39     592.33

*SECNO 119940.000

        G

119940.00    25.79    612.19     0.0       0.0     612.39     0.21      0.35      0.02     616.40
   47800.       0.    27236.   20564.        0.      7042.     6233.    2261.      128.     592.70
     0.55      0.0      3.87     3.30     0.035     0.035     0.035     0.035    586.40      31.65
 0.000134    1900.    1900.    1900.        2         0         0     -0.03    681.79     713.44

*SECNO 121440.000

        H   USGS GAGE 1560  RATING CURVE HAS BEEN DEVELOPED  609.8 FOR 1948

121440.00    25.83    612.23     0.0       0.0     612.83     0.60      0.32      0.12     616.40
   47000.       0.    35965.   11035.        0.      5352.     2637.    2627.      149.     592.70
     0.62      0.0      6.72     4.18     0.035     0.035     0.035     0.035    586.40      29.23
 0.000412    1500.    1500.    1500.        2         0         0     -0.03    500.40     529.63

*SECNO 122300.000
   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
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64.

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        I

122300.00    25.73   612.63     0.0      0.0    613.14     0.50     0.29     0.01   602.30
   47000.     1585.   34418.   10997.     572.     5427.    3309.    2806.     160.   601.60
     0.66      2.77     6.34     3.32    0.035    0.030    0.035    0.035   586.90     4.70
 0.000262      900.     900.     900.        2        0        0    -0.02   628.51   633.21

*SECNO 123300.000

        J

123300.00    26.00   612.90     0.0      0.0    613.37     0.47     0.23     0.00   592.20
   47000.     2594.   41147.    3259.     902.     7140.    1245.    3028.     175.   592.20
     0.72      2.88     5.76     2.62    0.035    0.030    0.035    0.034   586.90     9.28
 0.000193      900.    1000.    1200.        2        0        0    -0.03   567.16   576.44

*SECNO 123400.000

        K   DOW CHEMICAL DAM, TOP CREST 599.12

123400.00    17.61   612.71     0.0      0.0    613.50     0.79     0.03     0.10   598.50
   47000.     3569.   37793.    5638.     815.     4930.    1318.    3047.     176.   598.70
     0.72      4.38     7.67     4.28    0.035    0.030    0.035    0.034   595.10    11.57
 0.000540      100.     100.     100.        2        0        0    -0.02   564.08   575.66

*SECNO 123401.000
123401.00    17.61   612.71     0.0      0.0    613.50     0.79     0.00     0.00   598.50
   47000.     3570.   37791.    5639.     815.     4930.    1319.    3048.     176.   598.70
     0.72      4.38     7.66     4.28    0.035    0.030    0.035    0.034   595.10    11.54
 0.000540        8.       8.       8.        0        0        0    -0.01   564.12   575.67

*SECNO 123500.000

        L

123500.00    21.75   612.85     0.0      0.0    613.56     0.70     0.05     0.01   595.20
   47000.     3572.   39302.    4126.     866.     5487.    1130.    3065.     177.   596.70
     0.72      4.13     7.16     3.65    0.035    0.030    0.035    0.034   591.10     9.87
 0.000429      100.     100.     100.        2        0        0    -0.02   566.37   576.24

*SECNO 124100.000
   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

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       614.90 ELREA       614.90

        M   DOW CHEMICAL R.R. AND VEHICLE BRIDGE, MAX LC 611.95, MIN TR 614.9

            WIDTH 20, LENGTH 304

124100.00    22.11   612.81     0.0      0.0    613.92     1.11     0.24     0.12   607.20
   47000.       0.   47000.       0.       0.     5568.       0.    3134.     182.   596.80
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Profile revised u/s of 123500 See Enclosed report by MPS

GOVEA	JGOVEDSS	0024	GO.FTOSF001	15.21.3[illegible]	17 NOV 80	TITTABAWASSEE RIVER	RIVER
GOVEA	JGOVEDSS	0024	GO.FTOSF001	15.21.33	17 NOV 80	TITTABAWASSEE RIVER	RIVER
GOVEA	JGOVEDSS	0024	GO.FTOSF001	15.21.38	17 NOV 80	TITTABAWASSEE RIVER	RIVER

Tittabawassee R [illegible] - [illegible] 111800

[illegible] - flow distribution & floodway delineation

Profile revised u/s of

XSEC 123500

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  HEC2 RELEASE DATED NOV 75 UPDATED JULY1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
*****************************************************

C
T1      TITTABAWASSEE RIVER AT MIDLAND, PROJECT NO. 8543
T2      TITTABAWASSEE RIVER AT MIDLAND
T3      TITTABAWASSEE RIVER AT MIDLAND

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

      0.       4.       0.       0.  0.0          0.0      0.0      0.   610.500   0.0

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLOC    IBW      CHNIM    ITRACE

     1.000     0.0     -1.000    0.0      0.0      0.0      0.0      0.0      0.0     15.000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    110.000  200.000  150.000    0.0      0.0      0.0      0.0      0.0      0.0      0.0

QT      6.000  23000.000  41700.000  47800.000  62700.000  34000.000  47800.000      0.0      0.0      0.0
NC      0.035      0.035      0.035      0.100      0.300      0.0        0.0        0.0      0.0      0.0

        A

X1 111550.000     17.000    215.000    624.000      0.0        0.0        0.0        0.0      0.0      0.0
GR    620.000    195.000    600.000    200.000    596.800    215.000    589.800    224.000    586.300    280.000
GR    586.100    335.000    586.400    390.000    584.400    445.000    585.500    500.000    535.500    555.000
GR    589.300    610.000    603.500    624.000    600.000    780.000    599.000   1000.000    600.000   1200.000
GR    603.000   1500.000    632.000   1520.000      0.0        0.0        0.0        0.0      0.0      0.0

        B   CONSUMER POWER R. R. BRIDGE, MAX LC 618, MIN TR 621.7, WIDTH 14

            LENGTH 497

X1 112950.000     26.000    210.000    694.000   1500.000   1150.000   1400.000      0.0      0.0      0.0
X3     10.000      0.0       0.0        0.0        0.0        0.0        0.0      620.500    620.500    0.0
GR    620.500     50.000    595.700    210.000    589.300    234.000    586.600    253.000    585.600    272.000
GR    584.900    232.000    584.400    300.000    585.100    320.000    585.400    342.000    584.500    352.000
GR    584.500    370.000    584.600    390.000    584.700    412.000    585.200    422.000    585.400    450.000
GR    587.100    432.000    587.100    492.000    587.300    520.000    587.500    552.000    588.200    580.000
GR    589.300    603.000    601.000    624.000    601.000    630.000    606.700    657.000    612.100    694.000
GR    627.200    800.000      0.0        0.0        0.0        0.0        0.0        0.0      0.0      0.0

X1 112951.000      0.0       0.0        0.0       10.000     10.000     10.000      0.0      0.0      0.0
X3     10.000      0.0       0.0        0.0        0.0        0.0        0.0      620.500    620.500    0.0
BT      2.000     50.000    620.500    620.500    800.000    627.200    627.200      0.0      0.0      0.0

X1 112952.000      0.0       0.0        0.0       14.000     14.000     14.000      0.0      0.0      0.0
X2      0.0        0.0       0.0        0.0        0.0        0.0        1.000      0.0      0.0      0.0
X3     10.000      0.0       0.0        0.0        0.0        0.0        0.0      625.300    621.700    0.0

X1 112953.000      0.0       0.0        0.0       10.000     10.000     10.000      0.0      0.0      0.0
X3     10.000      0.0       0.0        0.0        0.0        0.0        0.0      625.300    621.700    0.0
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C   RATING CURVE DEVELOPED BY COE 1977   608.9 FOR 1948

X1 113700.000     13.000    221.000    617.000    900.000    800.000    900.000      0.0        0.0        0.0
GR     625.000    120.000    600.000    180.000    596.300    221.000    589.300    234.000    587.400    285.000
GR     586.900    335.000    585.100    585.000    584.300    440.000    584.900    490.000    585.200    540.000
GR     589.300    594.000    600.100    617.000    604.300    850.000      0.0        0.0        0.0        0.0

D   NUCLEAR POWER PLANT, RATING CURVE DEVELOPED BY CONSUMER POWER, MICH

X1 116450.000     21.000    139.000    536.000   2700.000   2400.000   2600.000      0.0        0.0        0.0
GR     615.000      0.0     610.000    114.000    605.000    125.000    600.000    130.000    595.000    139.000
GR     590.900    160.000    585.300    222.000    585.500    284.000    585.200    345.000    585.500    406.000
GR     587.500    467.000    590.900    528.000    595.000    536.000    600.000    543.000    605.000    568.000
GR     610.000    598.000    605.000    617.000    600.000    676.000    599.000    696.000    600.000    740.000
GR     605.000    800.000      0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0

E   OIL CHEMICAL PIPELINE BRIDGE, MAX LC 617.4, MIN TR 618.9,   WIDTH 23

    LENGTH 510

X1 117600.000     28.000     93.000    597.000   1130.000   1170.000   1145.000      0.0        0.0        0.0
GR     617.500      0.0     619.000     93.000    596.600     93.000    590.600    114.000    588.200    143.000
GR     587.200    172.000    585.300    203.000    614.400    203.000    614.400    207.000    586.300    207.000
GR     586.500    210.000    585.800    243.000    585.000    276.000    584.700    303.000    585.600    343.000
GR     614.400    343.000    614.400    347.000    585.600    347.000    586.700    364.000    590.600    393.000
GR     598.900    400.000    605.600    483.000    614.400    483.000    614.400    487.000    603.600    487.000
GR     600.000    597.000    613.900    597.000    616.500    700.000      0.0        0.0        0.0        0.0

X1 117601.000      0.0        0.0        0.0       10.000     10.000     10.000      0.0        0.0        0.0
BT       4.000      0.0     617.500    617.500     93.000    619.000    617.400    597.000    618.900    617.300
BT     700.000    615.500    615.500      0.0        0.0        0.0        0.0        0.0        0.0        0.0

X1 117602.000      0.0        0.0        0.0       23.000     23.000     23.000      0.0        0.0        0.0
X2       0.0       0.0        0.0        0.0        0.0        0.0       1.000      0.0        0.0        0.0

X1 117603.000      0.0        0.0        0.0       10.000     10.000     10.000      0.0        0.0        0.0

F

X1 118100.000     14.000     55.000    400.000    650.000    500.000    550.000      0.0        0.0        0.0
GR     610.000      0.0     617.900     56.000    597.600    112.000    587.600    152.000    586.600    192.000
GR     585.400    232.000    584.900    272.000    586.400    311.000    587.000    350.000    590.600    389.000
GR     595.200    430.000    600.000    480.000    600.000    510.000    615.900    630.000      0.0        0.0

G

X1 119940.000     14.000     25.000    344.000   1500.000   1900.000   1400.000      0.0        0.0        0.0
GR     620.200      0.0     615.800      5.000    615.400     25.000    591.800    595.000    589.600    105.000
GR     583.200    153.000    585.800    200.000    586.400    245.000    587.400    292.000    591.800    333.000
GR     592.700    344.000    594.800    595.000    597.700    681.000    615.900    724.000      0.0        0.0
GT       6.000  27500.000  41000.000  47000.000  61600.000  34000.000  47000.000      0.0        0.0        0.0

H   USGS GAGE 1550   RATING CURVE HAS BEEN DEVELOPED   609.8 FOR 1943

X1 121440.000     14.000     25.000    266.000   1500.000   1500.000   1500.000      0.0        0.0        0.0
GR     620.200      0.0     615.400     25.000    591.600     50.000    589.600     85.000    587.200    120.000
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GR     586.300     150.000     585.400     191.000     587.400     226.000     591.300     262.000     592.700     255.000
GR     600.000     330.000     603.300     400.000     600.000     450.000     616.900     560.000       0.0       0.0
NC       0.035       0.035       0.030       0.0         0.0         0.0         0.0         0.0         0.0         0.0

         I

X1 122300.000      13.000      80.000     513.000     900.000     900.000     900.000       0.0         0.0         0.0
GR     614.000       0.0       605.400      22.000     602.300      80.000     592.200     102.000     589.000     135.000
GR     588.000     170.000     587.100     204.000     586.900     238.000     588.500     272.000     592.200     305.000
GR     601.600     318.000     601.900     611.000     613.500     635.000       0.0         0.0         0.0         0.0

         J

X1 123300.000      13.000     132.000     426.000     900.000    1200.000    1000.000       0.0         0.0         0.0
GR     613.700       0.0       605.300      92.000     596.400     112.000     592.200     132.000     589.000     181.000
GR     583.000     230.000     587.100     279.000     586.900     328.000     583.500     377.000     592.200     426.000
GR     603.900     457.000     607.000     553.000     613.700     580.000       0.0         0.0         0.0         0.0

         K    DOJ CHEMICAL DATA, TOP CREST 599.12

X1 123400.000      13.000     132.000     412.000     100.000     100.000     100.000       0.0         0.0         0.0
GR     613.700       0.0       605.300      92.000     596.400     112.000     593.500     132.000     595.100     132.000
GR     595.100     412.000     593.700     412.000     593.700     420.000     593.600     420.000     593.600     421.000
GR     603.900     457.000     607.000     553.000     613.800     580.000       0.0         0.0         0.0         0.0

X1 123401.000       0.0         0.0         0.0         8.000       8.000       8.000       0.0         0.0         0.0

         L

X1 123500.000      14.000     132.000     429.000     100.000     100.000     100.000       0.0         0.0         0.0
GR     613.700       0.0       605.800      92.000     596.400     112.000     595.200     132.000     596.800     184.000
GR     595.700     225.000     591.200     265.000     591.100     307.000     592.500     343.000     594.900     389.000
GR     596.700     429.000     603.900     457.000     607.000     553.000     613.800     580.000       0.0         0.0

         M    DOJ CHEMICAL R.R. AND VEHICLE BRIDGE, MAX LC 611.95, MIN TR 614.9

                 WIDTH 20, LENGTH 304

X1 124100.000      18.000     102.000     398.000     500.000     500.000     450.000       0.0         0.0         0.0
X3      10.000       0.0         0.0         0.0         0.0         0.0         0.0       614.900     614.900       0.0
GR     614.900       0.0       607.200     102.000     595.200     134.000     596.800     150.000     592.200     175.000
GR     591.600     195.000     591.300     214.000     590.900     233.000     590.900     249.000     607.500     249.000
GR     607.300     255.000     590.900     255.000     590.700     291.000     591.100     307.000     593.500     337.000
GR     594.600     305.000     590.600     393.000     614.300     500.000       0.0         0.0         0.0         0.0
SB       1.150       1.500       2.500       0.0       256.000       6.000    5310.000       0.900     595.000     595.000

X1 124101.000       0.0         0.0         0.0        29.000      29.000      29.000       0.0         0.0         0.0
X2       0.0         0.0         1.000     512.000     618.600       0.0         0.0         0.0         0.0         0.0
X3      10.000       0.0         0.0         0.0         0.0         0.0         0.0       614.900     614.900       0.0
BT       4.000       0.0       614.900     614.900     102.000     618.600     611.300     393.000     614.700     612.000
BT     500.000     614.800     614.800       0.0         0.0         0.0         0.0         0.0         0.0         0.0

         N    DOJ CHEMICAL PIPELINE BRIDGE, LC 618.95, TR 622, WIDTH 25, LENGTH 264

X1 124300.000      23.000     105.000     423.000     100.000     100.000     150.000       0.0         0.0         0.0
X3      10.000       0.0         0.0         0.0         0.0         0.0         0.0       620.000     620.000       0.0
GR     613.300       0.0       614.100      42.000     621.000      54.000     613.400     105.000     603.400     127.000
GR     594.700     154.000     595.300     174.000     591.500     174.000     583.700     192.000     598.200     210.000
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  HEC2 RELEASE DATED NOV 76 UPDATED JULY1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
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T1
T2
T3

J1  ICHECK    IND       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      0.        7.        0.        0.   0.0          0.0       0.0       0.   610.600     0.0

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIV     ITRACE

    15.000     0.0      -1.000     0.0       0.0       0.0       0.0       0.0       0.0       0.0
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*PROF 2

CCHV     0.100 CEHV     0.300
*SECNO 111550.000
   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      XML       XNCH      XMR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

        A

111550.00    25.20    610.60      0.0    610.60    610.72      0.12      0.0       0.0     595.80
   47800.      384.    31220.    16197.     197.     9707.     8793.       0.        0.     603.50
     0.0       1.95      3.22      1.84    0.035     0.035     0.035     0.0     584.40     197.35
 0.000086        0.        0.        0.        0         0         0     -0.02   1307.89    1505.24

*SECNO 112950.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA        620.50 ELREA        620.50

        B   CONSUMER POWER R. R. BRIDGE, MAX LC 618, MIN TR 621.7, WIDTH 14

            LENGTH 497

112950.00    26.22    610.62      0.0       0.0    610.97      0.35      0.18      0.07     595.70
   47800.        0.    47800.       0.        0.    10097.       0.       436.       26.     612.10
     0.08      0.0      4.73      0.0     0.035     0.035     0.035     0.036    584.40     210.00
 0.000215     1500.     1400.     1150.         2         0         0     -0.02    476.30     686.30

*SECNO 112951.000

3370 NORMAL BRIDGE,NRD    2 MIN ELTRD    620.50  MAX ELLC    627.20

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA        620.50 ELREA        620.50

112951.00    26.22    610.62      0.0       0.0    610.97      0.35      0.00      0.00     595.70
   47800.        0.    47800.       0.        0.    10097.       0.       440.       26.     612.10
     0.08      0.0      4.73      0.0     0.035     0.035     0.035     0.036    584.40     210.00
 0.000215       10.       10.       10.         0         0         0     -0.02    476.31     686.31

*SECNO 112952.000

3370 NORMAL BRIDGE,NRD    2 MIN ELTRD    620.50 MAX ELLC    627.20

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA        626.30 ELREA        621.70

112952.00    26.22    610.62      0.0       0.0    610.97      0.35      0.00      0.00     595.70
   47800.        0.    47800.       0.        0.    10101.       0.       443.       26.     612.10
     0.08      0.0      4.73      0.0     0.035     0.035     0.035     0.036    584.40     210.00
 0.000214       14.       14.       14.         0         0         0     -0.02    476.33     686.33

*SECNO 112953.000
   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      XML       XNCH      XMR       WTN       ELMIN       SSTA
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   SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID    ENDST

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA        626.30 ELREA        621.70

112953.00    26.23   610.62     0.0      0.0    610.97     0.35     0.00     0.00   595.70
   47800.       0.   47800.      0.       0.    10102.      0.     446.      27.    612.10
     0.08     0.0     4.73     0.0    0.035    0.035    0.035    0.036   584.40   210.00
 0.000214      10.     10.      10.        0        0        0    -0.02   476.34   686.34

*SECNO 113700.000
3280 CROSS SECTION 113700.00 EXTENDED       6.55 FEET

        C   RATING CURVE DEVELOPED BY COE 1977   608.9 FOR 1948

113700.00    26.06   610.85     0.0      0.0    611.15     0.29     0.17     0.01   596.30
   47800.     1795.   42538.    3366.     652.    9402.    1667.     669.      38.    603.10
     0.14     2.71     4.53     2.02    0.035    0.035    0.035    0.036   584.80   153.95
 0.000170     900.     900.     800.        2        0        0    -0.07   696.05   850.00

*SECNO 116450.000
3280 CROSS SECTION 116450.00 EXTENDED       6.30 FEET

        D   NUCLEAR POWER PLANT, RATING CURVE DEVELOPED BY CONSUMER POWER,MICH

116450.00    26.10   611.30     0.0      0.0    611.57     0.27     0.42     0.00   595.00
   47800.     459.   42046.    5295.     215.    9595.    2304.    1373.      79.    595.00
     0.31     2.14     4.35     2.30    0.035    0.035    0.035    0.035   585.20    87.42
 0.000153    2700.    2600.    2400.        2        0        0    -0.03   712.58   300.00

*SECNO 117600.000

3265 DIVIDED FLOW

        E   DOW CHEMICAL PIPELINE BRIDGE, MAX LC 617.4, MIN TR 618.9, WIDTH 23

            LENGTH 510

117600.00    26.76   611.45     0.0      0.0    611.89     0.43     0.28     0.05   619.00
   47800.       0.   47800.      0.       0.    9066.      0.    1651.      95.    618.90
     0.37     0.0     5.27     0.0    0.035    0.035    0.035    0.035   584.70    93.00
 0.000449    1130.    1140.    1170.        1        0        0    -0.03   492.00   597.00

*SECNO 117601.000

3265 DIVIDED FLOW

3370 NORMAL BRIDGE,NRD   4 MIN ELTRD   616.50 MAX ELLC   617.50

117601.00    26.77   611.47     0.0      0.0    611.90     0.43     0.00     0.00   619.00
   47800.       0.   47800.      0.       0.    9063.      0.    1653.      95.    618.90
     0.37     0.0     5.27     0.0    0.035    0.035    0.035    0.035   584.70    93.00
 0.000449      10.     10.      10.        0        0        0    -0.03   492.00   597.00
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*SECNO 117602.000

3265 DIVIDED FLOW

   SECNO     DEPTH     C.SEL     CRIWS     WSELK     EG        HV        HL        GLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       T.A    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       TN        ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST


3370 NORMAL BRIDGE,NRD   4 MIN ELTRD   616.50 MAX ELLC   617.50

117602.00    26.78    611.43      0.0       0.0    611.91      0.43      0.01      0.00    519.00
   47800.       0.    47800.       0.        0.     9068.        0.     1558.       96.    618.90
     0.38      0.0      5.27      0.0     0.035     0.035     0.035     0.035    584.70     93.00
 0.000443      23.       23.       23.         0         0         0     -0.03    492.00    597.00


*SECNO 117603.000

3265 DIVIDED FLOW

117603.00    26.78    611.43      0.0       0.0    611.91      0.43      0.00      0.00    519.00
   47800.       0.    47800.       0.        0.     9071.        0.     1560.       96.    618.90
     0.38      0.0      5.27      0.0     0.035     0.035     0.035     0.035    584.70     93.00
 0.000443      10.       10.       10.         0         0         0     -0.03    492.00    597.00


*SECNO 118100.000

        F

118100.00    26.78    611.63      0.0       0.0    612.10      0.42      0.18      0.00    617.90
   47800.       0.    40963.     6332.        0.     7514.     1960.     1775.      102.    595.20
     0.41      0.0      5.45      3.49     0.035     0.035     0.035     0.035    534.90     63.77
 0.000263     650.      550.      500.         2         0         0     -0.04    524.14    592.91


*SECNO 119940.000

        G

119940.00    25.36    612.25      0.0       0.0    612.47      0.20      0.34      0.02    616.40
   47800.       0.    27214.    20586.        0.     7066.     6261.     2273.      128.    592.70
     0.55      0.0      3.85      3.29     0.035     0.035     0.035     0.035    586.40     31.55
 0.000133    1900.     1900.     1900.         2         0         0     -0.03    682.06    713.61


*SECNO 121440.000

        H   USGS GAGE 1560  RATING CURVE HAS BEEN DEVELOPED  609.8 FOR 1943

121440.00    25.91    612.31      0.0       0.0    612.90      0.59      0.32      0.12    616.40
   47000.       0.    35915.    11085.        0.     5369.     2657.     2641.      149.    592.70
     0.62      0.0      6.69      4.17     0.035     0.035     0.035     0.035    586.40     29.16
 0.000406    1500.     1500.     1500.         2         0         0     -0.02    500.96    530.12


*SECNO 122300.000
            DEPTH     C.SEL     CRIWS     WSELK     EG        HV        HL        GLOSS    BANK ELEV
            QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       T.A    LEFT/RIGHT
            VLOB      VCH       VROB      XNL       XNCH      XNR       NTN       ELMIN       SSTA
            XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST
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                                                                                  0.29      0.01    502.30
   47000.   1597.   34352.   11041.     577.    5444.    3330.    2820.     150.    601.60
       0.67     2.77     8.31     5.22   0.035    0.030    0.035    0.035   516.90      4.53
  0.000258     900.     900.     900.       2        0        0    -0.02   628.82    533.35

*SECNO 123300.000

        J

 123300.00    20.07   612.97     0.0      0.0   613.43     0.46     0.23     0.00   592.20
   47000.    2603.   41115.   3279.     910.    7159.    1255.    3043.     175.   592.20
       0.72     2.86     5.74     2.61   0.035    0.030    0.035    0.034   586.90      8.53
  0.000191     900.    1000.    1200.       2        0        0    -0.03   568.17    576.70

*SECNO 123400.000

        K   DOW CHEMICAL DAM, TOP CREST 599.12

 123400.00    17.67   612.77     0.0      0.0   613.56     0.78     0.03     0.10   593.50
   47000.    3583.   37751.   5665.     823.    4949.    1329.    3062.     176.   598.70
       0.72     4.35     7.63     4.26   0.035    0.030    0.035    0.034   595.10     10.78
  0.000532     100.     100.     100.       2        0        0    -0.01   555.14    575.93

*SECNO 123401.000
 123401.00    17.68   612.78     0.0      0.0   613.56     0.78     0.00     0.00   593.50
   47000.    3584.   37749.   5667.     824.    4949.    1330.    3063.     176.   598.70
       0.72     4.35     7.63     4.26   0.035    0.030    0.035    0.034   595.10     10.75
  0.000532       8.       8.       8.       0        0        0    -0.01   555.19    575.94

*SECNO 123500.000

        L

 123500.00    21.82   612.92     0.0      0.0   613.52     0.70     0.05     0.01   595.20
   47000.    3584.   39265.   4150.     874.    5508.    1140.    3080.     178.   596.70
       0.73     4.10     7.13     3.54   0.035    0.030    0.035    0.034   591.10      9.10
  0.000423     100.     100.     100.       2        0        0    -0.02   557.39    576.50

*SECNO 124100.000
    SECNO    DEPTH    CLSEL    CRINS    SSELK       EG       HV       HL    OLOSS   BANK ELEV
    Q        ALOB     QCH      QROB     ALOB     ACH      AROB     VOL      T.A   LEFT/RIGHT
    TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      ATN      ELMIN     SSTA
    SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID    ENDST

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA        614.90 ELREA        614.90

        M   DOW CHEMICAL R.R. AND VEHICLE BRIDGE, MAX LC 611.95, MIN TR 614.9

            WIDTH 20, LENGTH 304

 124100.00    22.18   612.88     0.0      0.0   613.97     1.10     0.24     0.12   607.20
   47000.       0.   47000.       0.       0.    5587.       0.    3149.     182.   596.80
       0.74     0.0      8.41     0.1   0.035    0.030    0.035    0.034   590.73   102.30
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*****************************************************
  HEC2 RELEASE DATED NOV 75 UPDATED JULY1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
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NOTE- ASTERISK * AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

TITTABAWASSEE RIVER AT

SUMMARY PRINTOUT TABLE 110

SECNO	CWSEL	DIFKES	EG	TOPWID	VLOB	QCH	QROB	PERENC	STENCL	STCHL	STCHR	STENCR
111550.000	610.50	0.0	610.62	1307.80	382.32	31322.80	16094.86	0.0	0.0	215.00	624.00	0.0
111550.000	610.50	0.0	610.72	1307.89	383.69	31219.78	16195.50	0.0	0.0	215.00	624.00	0.0
112950.000	610.52	0.0	610.87	475.30	0.0	47799.98	0.0	0.0	0.0	210.00	694.00	0.0
112950.000	610.62	0.0	610.97	475.30	0.0	47800.00	0.0	0.0	0.0	210.00	694.00	0.0
112951.000	610.52	0.0	610.87	475.30	0.0	47799.98	0.0	0.0	0.0	210.00	694.00	0.0
112951.000	610.62	0.0	610.97	475.31	0.0	47799.98	0.0	0.0	0.0	210.00	694.00	0.0
112952.000	610.53	0.0	610.88	475.82	0.0	47799.98	0.0	0.0	0.0	210.00	694.00	0.0
112952.000	610.62	0.0	610.97	475.33	0.0	47799.99	0.0	0.0	0.0	210.00	694.00	0.0
112953.000	610.53	0.0	610.88	475.83	0.0	47799.99	0.0	0.0	0.0	210.00	694.00	0.0
112953.000	610.62	0.0	610.97	476.34	0.0	47799.98	0.0	0.0	0.0	210.00	694.00	0.0
113700.000	610.76	0.0	611.06	695.82	1785.55	42695.54	3318.91	0.0	0.0	221.00	617.00	0.0
113700.000	610.86	0.0	611.15	695.05	1795.15	42637.82	3365.02	0.0	0.0	221.00	617.00	0.0
116450.000	611.21	0.0	611.48	710.49	454.73	42094.94	5250.31	0.0	0.0	139.00	536.00	0.0
116450.000	611.30	0.0	611.57	712.58	458.39	42046.33	5294.76	0.0	0.0	139.00	536.00	0.0
117600.000	611.38	0.0	611.81	492.00	0.0	47799.99	0.0	0.0	0.0	93.00	597.00	0.0
117600.000	611.46	0.0	611.89	492.00	0.0	47799.99	0.0	0.0	0.0	93.00	597.00	0.0
117601.000	611.33	0.0	611.82	492.00	0.0	47799.97	0.0	0.0	0.0	93.00	597.00	0.0
117601.000	611.47	0.0	611.90	492.00	0.0	47799.98	0.0	0.0	0.0	93.00	597.00	0.0
117602.000	611.39	0.0	611.83	492.00	0.0	47800.00	0.0	0.0	0.0	93.00	597.00	0.0
117602.000	611.48	0.0	611.91	492.00	0.0	47799.98	0.0	0.0	0.0	93.00	597.00	0.0
117603.000	611.40	0.0	611.83	492.00	0.0	47799.98	0.0	0.0	0.0	93.00	597.00	0.0
117603.000	611.48	0.0	611.91	492.00	0.0	47799.99	0.0	0.0	0.0	93.00	597.00	0.0
118100.000	611.59	0.0	612.02	523.39	0.0	41001.82	6798.16	0.0	0.0	56.00	400.00	0.0
118100.000	611.60	0.0	612.10	524.14	0.0	40967.71	6832.28	0.0	0.0	56.00	400.00	0.0
119940.000	612.19	0.0	612.39	681.79	0.0	27235.12	20563.86	0.0	0.0	26.00	344.00	0.0
119940.000	612.26	0.0	612.47	682.06	0.0	27214.29	20585.68	0.0	0.0	26.00	344.00	0.0

SECND	CASEL	DIFR/S	ES	TOP TS	ELOR	GCH	TRJB	PERENC	STENCL	STCHL	STCHR	STENCR
121440.000	612.23	0.0	612.33	500.40	0.0	35965.04	11034.75	0.0	0.0	25.00	266.00	0.0
121440.000	612.31	0.0	612.90	500.96	0.0	35914.76	11085.23	0.0	0.0	25.00	266.00	0.0
122300.000	612.63	0.0	613.14	623.51	1585.13	34413.11	10795.73	0.0	0.0	80.00	318.00	0.0
122300.000	612.70	0.0	613.20	623.82	1593.53	34352.23	11041.19	0.0	0.0	80.00	318.00	0.0
123300.000	612.90	0.0	613.37	567.16	2594.36	41145.59	3259.05	0.0	0.0	132.00	426.00	0.0
123300.000	612.97	0.0	613.43	563.17	2605.64	41115.15	3279.20	0.0	0.0	132.00	426.00	0.0
123400.000	612.71	0.0	613.50	564.08	3569.46	37792.71	5537.82	0.0	0.0	132.00	412.00	0.0
123400.000	612.77	0.0	613.56	565.14	3583.33	37750.66	5565.00	0.0	0.0	132.00	412.00	0.0
123401.000	612.71	0.0	613.50	564.12	3569.99	37791.10	5533.90	0.0	0.0	132.00	412.00	0.0
123401.000	612.78	0.0	613.56	565.19	3583.91	37743.89	5567.19	0.0	0.0	132.00	412.00	0.0
123500.000	612.35	0.0	613.56	566.37	3571.98	39302.27	4125.75	0.0	0.0	132.00	429.00	0.0
123500.000	612.92	0.0	613.62	567.59	3584.16	39263.49	4150.34	0.0	0.0	132.00	429.00	0.0
124100.000	612.31	0.0	613.92	296.00	0.0	47000.00	0.0	0.0	0.0	102.00	398.00	0.0
124100.000	612.38	0.0	613.97	295.00	0.0	46999.99	0.0	0.0	0.0	102.00	398.00	0.0
124101.000	613.02	0.0	614.64	295.00	0.0	47000.00	0.0	0.0	0.0	102.00	398.00	0.0
124101.000	613.09	0.0	614.70	295.00	0.0	46999.98	0.0	0.0	0.0	102.00	398.00	0.0
124300.000	614.03	0.0	614.74	314.00	0.0	46999.98	0.0	0.0	0.0	105.00	423.00	0.0
124300.000	614.09	0.0	614.80	314.00	0.0	46999.98	0.0	0.0	0.0	105.00	423.00	0.0
124301.000	614.03	0.0	614.74	314.00	0.0	46999.99	0.0	0.0	0.0	105.00	423.00	0.0
124301.000	614.10	0.0	614.80	314.00	0.0	47000.00	0.0	0.0	0.0	105.00	423.00	0.0
124302.000	614.04	0.0	614.75	314.00	0.0	46999.99	0.0	0.0	0.0	105.00	423.00	0.0
124302.000	614.11	0.0	614.82	314.00	0.0	46999.98	0.0	0.0	0.0	105.00	423.00	0.0
124303.000	614.05	0.0	614.76	314.00	0.0	46999.98	0.0	0.0	0.0	105.00	423.00	0.0
124303.000	614.12	0.0	614.32	314.00	0.0	46999.98	0.0	0.0	0.0	105.00	423.00	0.0
124700.000	614.36	0.0	614.90	670.00	35.09	43791.39	3173.51	0.0	0.0	110.00	450.00	0.0
124700.000	614.43	0.0	614.96	670.00	41.37	43749.86	3203.77	0.0	0.0	110.00	450.00	0.0
126000.000	614.92	0.0	615.13	845.05	0.0	28632.13	18367.86	0.0	0.0	87.00	393.00	0.0
126000.000	614.98	0.0	615.18	845.97	0.0	28594.83	18405.14	0.0	0.0	87.00	393.00	0.0
126800.000	614.91	0.0	615.29	646.82	0.0	37834.11	9165.87	750.00	0.00	87.00	410.00	750.00
126800.000	614.97	0.0	615.35	646.94	0.0	37792.35	9207.63	750.00	0.00	87.00	410.00	750.00
127550.000	615.00	0.0	615.49	542.56	0.0	47000.00	0.0	0.0	0.0	104.00	791.00	0.0
127550.000	615.06	0.0	615.55	542.98	0.0	46999.98	0.0	0.0	0.0	104.00	791.00	0.0
127551.000	615.01	0.0	615.50	542.72	0.0	46999.98	0.0	0.0	0.0	104.00	791.00	0.0
127551.000	615.07	0.0	615.55	543.03	0.0	46999.98	0.0	0.0	0.0	104.00	791.00	0.0
127552.000	615.04	0.0	615.53	542.90	0.0	47000.00	0.0	0.0	0.0	104.00	791.00	0.0
127552.000	615.10	0.0	615.59	543.21	0.0	46999.98	0.0	0.0	0.0	104.00	791.00	0.0
127553.000	615.05	0.0	615.53	542.94	0.0	47000.00	0.0	0.0	0.0	104.00	791.00	0.0
127553.000	615.11	0.0	615.59	543.25	0.0	47000.00	0.0	0.0	0.0	104.00	791.00	0.0

Point Reversed

TITABAWASSEE RIVER AT

SUMMARY PRINTOUT TABLE 150

SECND	XLCH	ELTRD	ELLC	ELTW	Q	CNSFL	CRIWS	ES	TCK*S	VCH	AREA	SCTK
111550.000	0.0	0.0	0.0	584.40	47800.00	610.50	0.0	610.52	0.48	0.24	18565.06	50894.76
111550.000	0.0	0.0	0.0	584.40	47800.00	610.60	0.0	610.72	0.86	0.22	18596.48	51423.74
112950.000	1400.00	0.0	0.0	584.40	47800.00	610.52	0.0	610.87	2.18	4.76	10051.39	32399.77
112950.000	1400.00	0.0	0.0	584.40	47800.00	610.62	0.0	610.97	2.15	4.73	10093.38	32626.54
112951.000	10.00	620.50	627.20	584.40	47800.00	610.52	0.0	610.87	2.18	4.75	10052.50	32403.23
112951.000	10.00	620.50	627.20	584.40	47800.00	610.62	0.0	610.97	2.15	4.73	10099.21	32630.60
112952.000	14.00	620.50	627.20	584.40	47800.00	610.53	0.0	610.88	2.17	4.75	10054.35	32411.77
112952.000	14.00	620.50	627.20	584.40	47800.00	610.62	0.0	610.97	2.14	4.73	10100.14	32638.59
112953.000	10.00	0.0	0.0	584.40	47800.00	610.53	0.0	610.88	2.17	4.75	10055.29	32416.33
112953.000	10.00	0.0	0.0	584.40	47800.00	610.62	0.0	610.97	2.14	4.73	10101.78	32643.17
113700.000	900.00	0.0	0.0	584.80	47800.00	610.76	0.0	611.06	1.73	4.56	11565.18	36346.52
113700.000	900.00	0.0	0.0	584.80	47800.00	610.86	0.0	611.15	1.70	4.53	11731.79	36641.62
116450.000	2800.00	0.0	0.0	585.20	47800.00	611.21	0.0	611.48	1.56	4.40	12051.00	37326.20
116450.000	2800.00	0.0	0.0	585.20	47800.00	611.30	0.0	611.57	1.53	4.38	12114.06	37636.14
117600.000	1140.00	0.0	0.0	584.70	47800.00	611.38	0.0	611.31	4.55	5.30	9023.82	22411.56
117600.000	1140.00	0.0	0.0	584.70	47800.00	611.46	0.0	611.39	4.49	5.27	9065.68	22559.11
117601.000	10.00	615.50	617.50	584.70	47800.00	611.38	0.0	611.32	4.55	5.30	9020.81	22430.27
117601.000	10.00	615.50	617.50	584.70	47800.00	611.47	0.0	611.90	4.49	5.27	9062.61	22557.54
117602.000	23.00	615.50	617.50	584.70	47800.00	611.39	0.0	611.33	4.54	5.30	9026.46	22421.50
117602.000	23.00	615.50	617.50	584.70	47800.00	611.48	0.0	611.91	4.48	5.27	9063.26	22578.71
117603.000	10.00	0.0	0.0	584.70	47800.00	611.40	0.0	611.33	4.54	5.29	9023.98	22430.93
117603.000	10.00	0.0	0.0	584.70	47800.00	611.48	0.0	611.91	4.48	5.27	9070.66	22537.82
118100.000	550.00	0.0	0.0	584.90	47800.00	611.59	0.0	612.02	2.57	5.48	9431.19	29275.61
118100.000	550.00	0.0	0.0	584.90	47800.00	611.68	0.0	612.10	2.63	5.45	9474.00	29455.89
119940.000	1900.00	0.0	0.0	586.40	47000.00	612.19	0.0	612.39	1.34	3.87	13275.22	41254.89
119940.000	1900.00	0.0	0.0	586.40	47000.00	612.26	0.0	612.47	1.33	3.85	13326.67	41507.57
121440.000	1500.00	0.0	0.0	586.40	47000.00	612.23	0.0	612.83	4.12	6.72	7989.03	23154.70
121440.000	1500.00	0.0	0.0	586.40	47000.00	612.31	0.0	612.90	4.06	6.69	8026.33	23317.97
122300.000	900.00	0.0	0.0	586.90	47000.00	612.63	0.0	613.14	2.62	5.34	9307.79	29046.45
122300.000	900.00	0.0	0.0	586.90	47000.00	612.70	0.0	613.20	2.58	5.31	9351.35	29241.16
123300.000	1000.00	0.0	0.0	586.90	47000.00	612.90	0.0	613.37	1.93	5.76	9287.17	33851.36
123300.000	1000.00	0.0	0.0	586.90	47000.00	612.97	0.0	613.43	1.91	5.74	9324.04	34038.46
123400.000	100.00	0.0	0.0	595.10	47000.00	612.71	0.0	613.50	5.40	7.57	7063.00	20218.00
123400.000	100.00	0.0	0.0	595.10	47000.00	612.77	0.0	613.56	5.32	7.53	7101.31	20370.69
123401.000	8.00	0.0	0.0	595.10	47000.00	612.71	0.0	613.50	5.40	7.56	7064.48	20223.97
123401.000	8.00	0.0	0.0	595.10	47000.00	612.78	0.0	613.56	5.32	7.53	7102.94	20377.20

SECND	XLCH	ELTR.	ELLC	ELTIR	Q	CASEL	CPTDS	ES	ICK#S	VCH	AREA	.OTK
123500.000	100.00	0.0	0.0	591.10	47000.00	612.85	0.0	613.56	4.29	7.16	7482.53	22699.09
123500.000	100.00	0.0	0.0	591.10	47000.00	612.92	0.0	613.62	4.23	7.13	7519.83	22855.42
124100.000	450.00	0.0	0.0	590.70	47000.00	612.91	0.0	613.92	5.77	6.44	5567.73	18057.39
124100.000	450.00	0.0	0.0	590.70	47000.00	612.98	0.0	613.97	5.69	6.41	5586.71	18170.14
124101.000	29.00	618.60	612.00	590.70	47000.00	613.02	0.0	614.64	5.88	6.09	5808.05	19345.79
124101.000	29.00	618.60	612.00	590.70	47000.00	613.09	0.0	614.70	5.81	6.06	5828.98	19502.33
124300.000	150.00	0.0	0.0	585.90	47000.00	614.03	0.0	614.74	3.88	5.77	6944.74	23855.50
124300.000	150.00	0.0	0.0	585.90	47000.00	614.09	0.0	614.80	3.84	5.75	6966.11	23911.68
124301.000	10.00	520.40	621.00	585.90	47000.00	614.03	0.0	614.74	3.88	5.77	6946.39	23873.90
124301.000	10.00	520.40	621.00	585.90	47000.00	614.10	0.0	614.80	3.84	5.75	6967.39	23938.73
124302.000	33.00	520.40	621.00	585.90	47000.00	614.04	0.0	614.75	3.87	5.76	6950.22	23874.84
124302.000	33.00	520.40	621.00	585.90	47000.00	614.11	0.0	614.82	3.83	5.74	6971.07	24038.05
124303.000	10.00	0.0	0.0	585.90	47000.00	614.05	0.0	614.76	3.87	5.76	6951.60	23902.35
124303.000	10.00	0.0	0.0	585.90	47000.00	614.12	0.0	614.82	3.83	5.74	6972.53	24016.84
124700.000	400.00	0.0	0.0	586.30	47000.00	614.86	0.0	614.90	2.56	5.07	8570.45	29374.61
124700.000	400.00	0.0	0.0	586.30	47000.00	614.93	0.0	614.96	2.53	5.05	8714.52	29551.42
126000.000	1200.00	0.0	0.0	586.30	47000.00	614.92	0.0	615.13	1.14	4.20	14106.41	44071.21
126000.000	1200.00	0.0	0.0	586.30	47000.00	614.98	0.0	615.18	1.13	4.19	14157.90	44309.79
126800.000	800.00	0.0	0.0	586.30	47000.00	614.91	0.0	615.29	1.56	5.38	10490.80	34504.11
126800.000	800.00	0.0	0.0	586.30	47000.00	614.97	0.0	615.35	1.04	5.36	10519.92	34634.13
127550.000	600.00	0.0	0.0	584.30	47000.00	615.00	0.0	615.69	4.94	5.61	8378.11	21138.86
127550.000	600.00	0.0	0.0	584.30	47000.00	615.06	0.0	615.55	4.89	5.59	8410.18	21253.57
127551.000	10.00	631.60	641.00	584.30	47000.00	615.01	0.0	615.50	4.93	5.61	8383.10	21159.20
127551.000	10.00	631.60	641.00	584.30	47000.00	615.07	0.0	615.55	4.88	5.58	8415.74	21273.43
127552.000	64.00	631.60	641.00	584.30	47000.00	615.04	0.0	615.53	4.90	5.59	8402.23	21225.11
127552.000	64.00	631.60	641.00	584.30	47000.00	615.10	0.0	615.58	4.85	5.57	8434.05	21339.00
127553.000	10.00	0.0	0.0	584.30	47000.00	615.05	0.0	615.53	4.90	5.59	8405.94	21238.39
127553.000	10.00	0.0	0.0	584.30	47000.00	615.11	0.0	615.59	4.85	5.57	8437.62	21351.81
128100.000	550.00	0.0	0.0	585.50	47000.00	614.96	0.0	615.94	4.48	7.95	5903.51	22206.51
128100.000	550.00	0.0	0.0	585.50	47000.00	615.01	0.0	615.99	4.45	7.94	5923.01	22290.62
129100.000	900.00	0.0	0.0	584.10	47000.00	615.78	0.0	616.23	1.59	5.45	8705.52	35312.73
129100.000	900.00	0.0	0.0	584.10	47000.00	615.83	0.0	616.28	1.56	5.43	8734.11	36495.31
129350.000	250.00	0.0	0.0	584.10	30300.00	616.14	0.0	616.28	0.81	3.36	10893.14	33737.25
129350.000	250.00	0.0	0.0	584.10	30300.00	616.20	0.0	616.33	0.80	3.35	10928.88	33898.18
130175.000	750.00	0.0	0.0	585.20	30300.00	616.19	0.0	616.36	1.03	3.53	9524.38	29879.35
130175.000	750.00	0.0	0.0	585.20	30300.00	616.24	0.0	616.41	1.02	3.52	9551.14	30009.97
130225.000	50.00	0.0	0.0	588.20	30300.00	616.19	0.0	616.37	1.92	3.74	9349.07	21875.53
130225.000	50.00	0.0	0.0	588.20	30300.00	616.24	0.0	616.42	1.90	3.73	9379.45	21971.22

A-3 Summary printout

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

TITTABAWASSEE RIVER AT M

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
	111550.000	0.0	0.0	0.0	584.40	28000.00	607.20	0.0	607.28	0.64	2.50	14254.88	34985.65
A	111550.000	0.0	0.0	0.0	584.40	41700.00	609.60	0.0	609.71	0.81	3.03	17389.06	46258.95
	111550.000	0.0	0.0	0.0	584.40	47800.00	610.50	0.0	610.62	0.88	3.24	18565.56	50894.76
	111550.000	0.0	0.0	0.0	584.40	62700.00	612.40	0.0	612.56	1.04	3.71	21051.94	61377.08
	112950.000	1400.00	0.0	0.0	584.40	28000.00	607.26	0.0	607.42	1.23	3.28	8526.15	25233.23
	112950.000	1400.00	0.0	0.0	584.40	41700.00	609.63	0.0	609.93	1.88	4.33	9632.61	30376.42
B	112950.000	1400.00	0.0	0.0	584.40	47800.00	610.52	0.0	610.87	2.18	4.76	10051.89	32399.77
	112950.000	1400.00	0.0	0.0	584.40	62700.00	612.38	0.0	612.89	2.89	5.73	10943.91	36905.80
	112951.000	10.00	620.50	627.20	584.40	28000.00	607.26	0.0	607.42	1.23	3.28	8526.49	25234.77
	112951.000	10.00	620.50	627.20	584.40	41700.00	609.64	0.0	609.93	1.88	4.33	9633.09	30378.68
	112951.000	10.00	620.50	627.20	584.40	47800.00	610.52	0.0	610.87	2.18	4.75	10052.60	32403.23
	112951.000	10.00	620.50	627.20	584.40	62700.00	612.38	0.0	612.89	2.89	5.73	10945.02	36912.06
	112952.000	14.00	620.50	627.20	584.40	28000.00	607.26	0.0	607.43	1.23	3.28	8527.50	25239.32
	112952.000	14.00	620.50	627.20	584.40	41700.00	609.64	0.0	609.93	1.88	4.33	9634.47	30385.26
	112952.000	14.00	620.50	627.20	584.40	47800.00	610.53	0.0	610.88	2.17	4.75	10054.35	32411.77
	112952.000	14.00	620.50	627.20	584.40	62700.00	612.38	0.0	612.89	2.88	5.73	10947.27	36924.67
	112953.000	10.00	0.0	0.0	584.40	28000.00	607.26	0.0	607.43	1.23	3.28	8528.06	25241.88
	112953.000	10.00	0.0	0.0	584.40	41700.00	609.64	0.0	609.93	1.88	4.33	9635.27	30389.11
	112953.000	10.00	0.0	0.0	584.40	47800.00	610.53	0.0	610.88	2.17	4.75	10055.29	32416.33
	112953.000	10.00	0.0	0.0	584.40	62700.00	612.39	0.0	612.90	2.88	5.73	10948.68	36932.63
	113700.000	900.00	0.0	0.0	584.80	28000.00	607.37	0.0	607.53	1.10	3.28	9317.68	26698.38
C	113700.000	900.00	0.0	0.0	584.80	41700.00	609.83	0.0	610.09	1.54	4.20	11022.03	33555.83
	113700.000	900.00	0.0	0.0	584.80	47800.00	610.76	0.0	611.06	1.73	4.56	11665.18	36346.52
	113700.000	900.00	0.0	0.0	584.80	62700.00	612.72	0.0	613.13	2.16	5.38	13035.02	42632.68
	116450.000	2600.00	0.0	0.0	585.20	28000.00	607.66	0.0	607.80	1.00	3.17	9648.45	28053.46
D	116450.000	2600.00	0.0	0.0	585.20	41700.00	610.23	0.0	610.47	1.39	4.05	11370.43	35323.89
	116450.000	2600.00	0.0	0.0	585.20	47800.00	611.21	0.0	611.48	1.56	4.40	12051.00	38326.20
	116450.000	2600.00	0.0	0.0	585.20	62700.00	613.28	0.0	613.66	1.93	5.18	13577.16	45186.32
	117600.000	1140.00	0.0	0.0	584.70	28000.00	607.78	0.0	608.01	3.05	3.86	7248.24	16042.93
E	117600.000	1140.00	0.0	0.0	584.70	41700.00	610.39	0.0	610.76	4.09	4.88	8539.13	20611.53
	117600.000	1140.00	0.0	0.0	584.70	47800.00	611.38	0.0	611.81	4.55	5.30	9023.82	22411.56
	117600.000	1140.00	0.0	0.0	584.70	62700.00	613.47	0.0	614.08	5.66	6.24	10050.20	26361.52

	SECNO	XLCH	ELTRO	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
	117601.000	10.00	616.50	617.50	584.70	28000.00	607.79	0.0	608.02	3.04	3.86	7251.12	16052.74
E	117601.000	10.00	616.50	617.50	584.70	41700.00	610.40	0.0	610.77	4.10	4.89	8535.78	20599.23
	117601.000	10.00	616.50	617.50	584.70	47800.00	611.38	0.0	611.82	4.55	5.30	9020.81	22400.27
	117601.000	10.00	616.50	617.50	584.70	62700.00	613.48	0.0	614.08	5.65	6.24	10052.02	26368.62
	117602.000	23.00	616.50	617.50	584.70	28000.00	607.79	0.0	608.02	3.04	3.86	7255.09	16066.26
	117602.000	23.00	616.50	617.50	584.70	41700.00	610.41	0.0	610.78	4.09	4.88	8540.94	20618.15
	117602.000	23.00	616.50	617.50	584.70	47800.00	611.39	0.0	611.83	4.54	5.30	9026.46	22421.50
	117602.000	23.00	616.50	617.50	584.70	62700.00	613.49	0.0	614.10	5.64	6.23	10059.46	26397.95
	117603.000	10.00	0.0	0.0	584.70	28000.00	607.80	0.0	608.03	3.04	3.86	7256.64	16071.54
	117603.000	10.00	0.0	0.0	584.70	41700.00	610.41	0.0	610.78	4.09	4.88	8542.98	20625.62
	117603.000	10.00	0.0	0.0	584.70	47800.00	611.40	0.0	611.83	4.54	5.29	9028.98	22430.98
	117603.000	10.00	0.0	0.0	584.70	62700.00	613.50	0.0	614.10	5.64	6.23	10062.70	26410.68
	118100.000	550.00	0.0	0.0	584.90	28000.00	607.92	0.0	608.15	1.72	3.98	7570.10	21369.83
F	118100.000	550.00	0.0	0.0	584.90	41700.00	610.58	0.0	610.95	2.39	5.05	8906.96	26975.00
	118100.000	550.00	0.0	0.0	584.90	47800.00	611.59	0.0	612.02	2.67	5.48	9431.19	29275.61
	118100.000	550.00	0.0	0.0	584.90	62700.00	613.75	0.0	614.34	3.30	6.42	10582.69	34513.66
	119940.000	1900.00	0.0	0.0	586.40	28000.00	608.28	0.0	608.39	0.93	2.87	10641.42	29094.94
	119940.000	1900.00	0.0	0.0	586.40	41700.00	611.11	0.0	611.28	1.22	3.59	12541.42	37711.86
G	119940.000	1900.00	0.0	0.0	586.40	47800.00	612.19	0.0	612.39	1.34	3.87	13275.22	41254.89
	119940.000	1900.00	0.0	0.0	586.40	62700.00	614.51	0.0	614.79	1.62	4.49	14869.03	49337.60
	121440.000	1500.00	0.0	0.0	586.40	27500.00	608.34	0.0	608.70	3.00	5.14	6095.89	15874.68
H	121440.000	1500.00	0.0	0.0	586.40	41000.00	611.16	0.0	611.69	3.81	6.28	7454.92	21008.51
	121440.000	1500.00	0.0	0.0	586.40	47000.00	612.23	0.0	612.83	4.12	6.72	7989.03	23164.70
	121440.000	1500.00	0.0	0.0	586.40	61600.00	614.55	0.0	615.32	4.78	7.66	9168.10	28171.66
	122300.000	900.00	0.0	0.0	586.90	27500.00	608.59	0.0	608.93	2.14	5.03	6803.44	18810.24
I	122300.000	900.00	0.0	0.0	586.90	41000.00	611.52	0.0	611.97	2.49	5.98	8607.59	25991.35
	122300.000	900.00	0.0	0.0	586.90	47000.00	612.63	0.0	613.14	2.62	6.34	9307.79	29046.45
	122300.000	900.00	0.0	0.0	586.90	61600.00	615.05	0.0	615.67	2.90	7.13	10833.89	36198.74
	123300.000	1000.00	0.0	0.0	586.90	27500.00	608.84	0.0	609.10	1.33	4.24	7117.06	23845.74
J	123300.000	1000.00	0.0	0.0	586.90	41000.00	611.78	0.0	612.19	1.76	5.34	8660.77	30885.93
	123300.000	1000.00	0.0	0.0	586.90	47000.00	612.90	0.0	613.37	1.93	5.76	9287.17	33861.36
	123300.000	1000.00	0.0	0.0	586.90	61600.00	615.32	0.0	615.93	2.27	6.67	10684.18	40860.37
	123400.000	100.00	0.0	0.0	595.10	27500.00	608.66	0.0	609.21	5.08	6.24	4911.02	12205.48
K	123400.000	100.00	0.0	0.0	595.10	41000.00	611.59	0.0	612.31	5.31	7.28	6442.51	17790.04
	123400.000	100.00	0.0	0.0	595.10	47000.00	612.71	0.0	613.50	5.40	7.67	7063.00	20218.00
	123400.000	100.00	0.0	0.0	595.10	61600.00	615.12	0.0	616.07	5.59	8.49	8453.43	26059.79
	123401.000	8.00	0.0	0.0	595.10	27500.00	608.67	0.0	609.22	5.07	6.24	4912.11	12209.23
	123401.000	8.00	0.0	0.0	595.10	41000.00	611.59	0.0	612.31	5.31	7.27	6443.72	17794.74
	123401.000	8.00	0.0	0.0	595.10	47000.00	612.71	0.0	613.50	5.40	7.66	7064.48	20223.87
	123401.000	8.00	0.0	0.0	595.10	61600.00	615.12	0.0	616.07	5.58	8.49	8454.99	26066.75

Profile revised w/s of 123500

	123500.000	100.00	0.0	0.0	591.10	27500.00	608.80	0.0	609.27	3.77	5.69	5317.50	14166.88
L	123500.000	100.00	0.0	0.0	591.10	41000.00	611.73	0.0	612.37	4.15	6.76	6858.66	20128.14
	123500.000	100.00	0.0	0.0	591.10	47000.00	612.85	0.0	613.56	4.29	7.16	7482.53	22699.09
	123500.000	100.00	0.0	0.0	591.10	61600.00	615.27	0.0	616.13	4.56	8.02	8876.51	28852.99

00BREAK00

1) COUNTY: Midland

2) STUDY NAME: City of Midland

3) WATERCOURSE: Snake Creek

4) DOCUMENT TYPE: Hydrology

00BREAK00

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

INTEROFFICE COMMUNICATION

May 21, 1986

TO: Files

FROM: David A. Hamilton, Hydrologic Studies DAH
Engineering-Water Management Division

SUBJECT: Revision of Midland FIS for Snake Creek (Siebert Drain)

We were requested to review a Stormwater Management Study for Snake Creek in Midland. The community wishes to revise the FIS on the basis of this study. The consultant used Brater's method for generating runoff. The effective drainage area was determined by a very detailed hydraulic analysis. It determined the flow paths and approximate flow splits, and proportioned the effective drainage area according to the flow split. The approach is complicated and generates a large volume of computations. It is not practical to review the work in detail.

Conceptually the approach is acceptable. It was checked by comparison with other methods and the original FIS at several points. For one comparison I used SCS procedures, with a Type II rainfall distribution, and assuming that the heavily stormsewered and paved area would develop a t_c as if the entire area functioned as "small trib" for the velocity calculation. Bruce Menerey also reviewed some of the hydraulic routing through bridges, and thought it was appropriate. From this comparison, and review of the methods used in the original FIS, I believe that the flow values proposed for Siebert Drain upstream of the confluence of Meadowbrook Drain are reasonable.

Therefore, the following values are acceptable for use in the FIS:

Siebert Drain

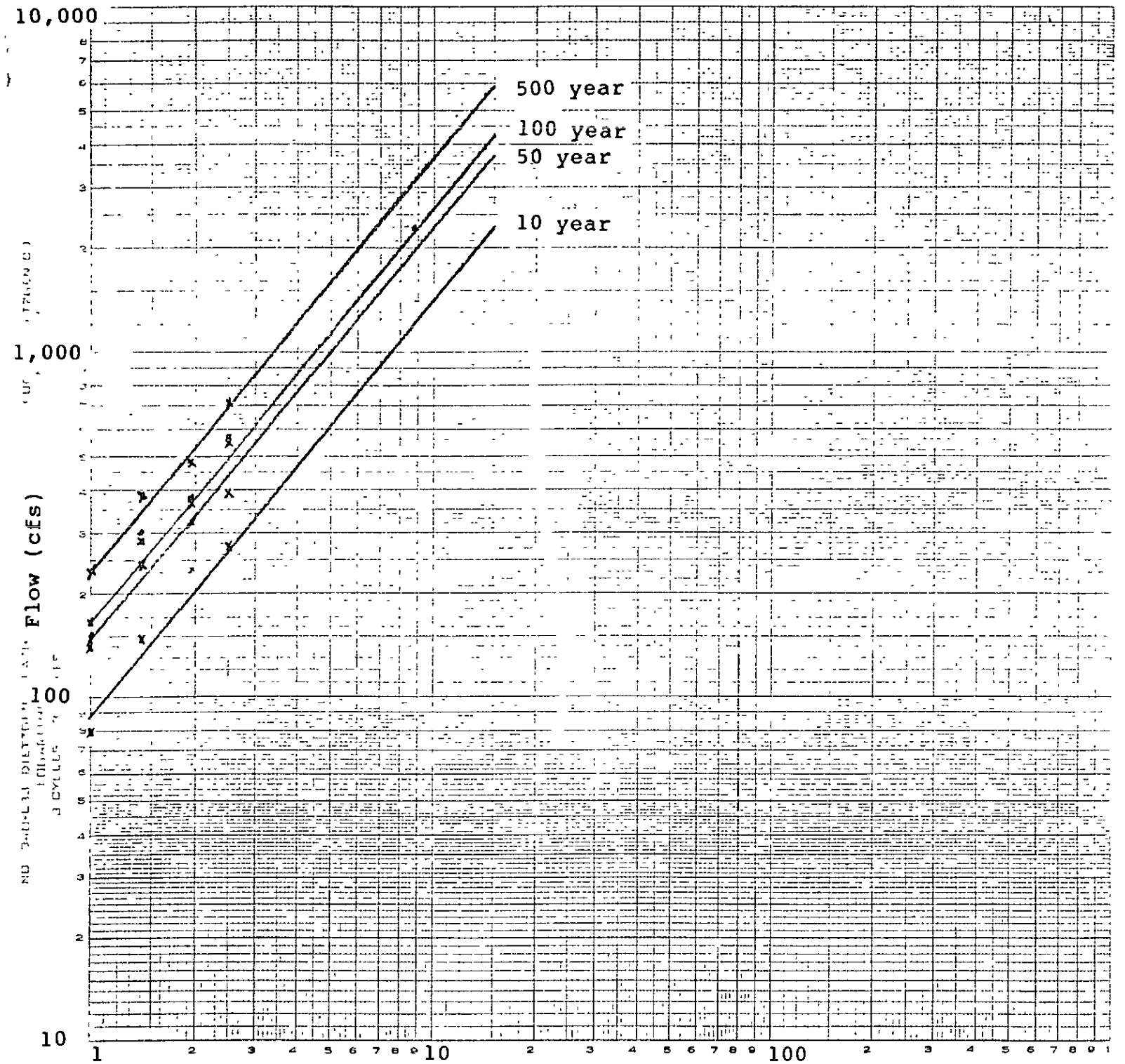
Location	1% chance flood peak
At US-10	150 cfs
At Dilloway Rd.	
upstream	330 cfs
downstream	300 cfs
At Wheeler Rd.	
upstream	490 cfs
downstream	380 cfs
Upstream confluence with Meadowbrook Dr.	570 cfs

These values are from Table 7, page C-13 of the Midland Stormwater Management Report.

DAH:cg

cc: Bruce Menerey

Flow Estimation



• used for HEC-2
x revised HEC-1 output

00BREAK00

1) COUNTY: Midland

2) STUDY NAME: City of Midland

3) WATERCOURSE: Snake Creek

4) DOCUMENT TYPE: 100 yr. floodway

00BREAK00

McNamee, Porter & Seeley | Engineers / Architects | Ann Arbor, Michigan

100-YEAR FLOODWAY

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RRRRRRRR    UU      UU  DDDDDDDD    YY      YY
RRRRRRRR    UU      UU  DDDDDDDD    YY      YY
RR      RR  UU      UU  DD      DD  YY      YY
RR      RR  UU      UU  DD      DD  YY      YY
RR      RR  UU      UU  DD      DD    YY  YY
RR      RR  UU      UU  DD      DD    YY  YY
RRRRRRRR    UU      UU  DD      DD      YY
RRRRRRRR    UU      UU  DD      DD      YY
RR  RR      UU      UU  DD      DD      YY
RR  RR      UU      UU  DD      DD      YY
RR    RR    UU      UU  DD      DD      YY
RR    RR    UU      UU  DD      DD      YY
RR      RR  UUUUUUUUUU  DDDDDDDD        YY
RR      RR  UUUUUUUUUU  DDDDDDDD        YY

 SSSS  N   N        TTTTT  EEEEE   SSSS  TTTTT        BBBB   RRRR
S      N   N          T    E      S        T          B   B  R   R
S      NN  N          T    E      S        T          B   B  R   R
 SSS   N N N          T    EEEE    SSS     T          BBBB   RRRR
    S  N  NN          T    E          S    T          B   B  R R
    S  N   N          T    E          S    T          B   B  R  R
SSSS   N   N          T    EEEEE  SSSS     T          BBBB   R   R

      J   000   BBBB          888    999    333
      J  0   0  B   B        8   8  9   9  3   3
      J  0   0  B   B        8   8  9   9      3
      J  0   0  BBBB          888    9999     3
    J  J  0   0  B   B        8   8      9      3
    J  J  0   0  B   B        8   8      9  3   3
     JJJ   000   BBBB          888    999    333
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JJJ SN_TEST_BR (893) queued to SYS$PRINT on 28-APR-1987 16:17 by user RUDY, UIC [COMPUTER,RUDY], under account COMPUTER at priority 100, started on printer _LCA0: on 28-APR-1987 16:29 from queue SYS$PRINT.

Digital Equipment Corporation - VAX/VMS Version V4.5

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WATER SURFACE PROFILES
VERSION OF NOVEMBER 1976
UPDATED AUGUST   1983

RUN DATE  27-APR-1987 13:15:19.12
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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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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 28-APR-1987 13:15:21.24

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HEC2 RELEASE DATED NOV 76 UPDATED MAR. 1982
ERROR CORR -  01,02,03,04,05
MODIFICATION -  50,51,52,53,54,55
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T1 SNAKE CREEK, MIDLAND - USGS DATUM
T2 SNAKE CREEK - MIDLAND FIS
T3 100 - YEAR FREQUENCY

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	-1.	7.	0.	0.	0.000000	0.00	0.0	0.	614.200	0.000

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

NC	0.030	0.030	0.030	0.100	0.300	0.000	0.000	0.000	0.000	0.000
QT	8.000	900.000	1170.000	1300.000	1600.000	1300.000	2300.000	500.000	2300.000	0.000
ET	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.410	0.000
X1	6500.000	12.000	210.000	225.000	570.000	570.000	720.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	150.000	0.000	330.000	0.000	0.000	0.000	0.000
GR	626.400	0.000	623.400	13.000	614.200	53.000	609.200	210.000	605.900	216.000
GR	605.200	219.000	605.900	222.000	606.600	225.000	609.100	230.000	611.900	308.000
GR	621.900	350.000	627.100	435.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.050	0.060	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	7700.000	11.000	421.000	451.000	1200.000	1200.000	1200.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	350.000	0.000	620.000	0.000	0.000	0.000	0.000
GR	623.600	0.000	623.600	200.000	621.800	319.000	614.900	342.000	611.900	421.000
GR	607.300	427.000	607.200	434.000	607.300	442.000	612.500	451.000	614.400	600.000
GR	613.700	800.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.600	0.800	0.000	0.000	0.000	0.000	0.000
X1	7750.000	11.000	401.000	417.000	100.000	100.000	100.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	384.000	0.000	620.000	0.000	0.000	0.000	0.000
GR	623.200	0.000	618.500	200.000	616.200	320.000	614.900	386.000	612.600	397.000
GR	607.200	401.000	607.300	409.000	606.900	417.000	612.500	426.000	615.100	500.000
GR	618.100	800.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SB	0.000	1.600	2.500	0.000	16.000	0.000	106.000	0.000	607.200	607.200
X1	7751.000	0.000	0.000	0.000	26.000	26.000	26.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	613.800	616.100	0.000	0.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	384.000	0.000	620.000	0.000	0.000	0.000	0.000
BT	7.000	0.000	623.200	623.200	200.000	618.500	618.500	320.000	616.200	616.200
BT	401.000	616.200	616.200	417.000	616.100	616.100	500.000	615.100	615.100	800.000
BT	618.100	618.100	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	7800.000	10.000	364.000	396.000	180.000	200.000	200.000	0.000	0.000	0.000
GR	624.200	0.000	620.000	215.000	612.600	364.000	607.300	371.000	607.100	380.000
GR	607.300	389.000	613.700	396.000	615.000	495.000	620.000	585.000	624.700	800.000
NC	0.000	0.000	0.000	0.200	0.400	0.000	0.000	0.000	0.000	0.000
X1	8250.000	11.000	470.000	515.000	590.000	590.000	470.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	400.000	0.000	600.000	0.000	0.000	0.000	0.000
GR	623.000	0.000	620.000	230.000	615.000	330.000	610.000	470.000	608.900	485.000
GR	608.700	492.000	608.900	503.000	610.000	515.000	615.000	640.000	620.000	700.000
GR	621.000	1000.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
QT	8.000	480.000	640.000	710.000	860.000	710.000	570.000	200.000	570.000	0.000
NC	0.000	0.000	0.000	0.100	0.300	0.000	0.000	0.000	0.000	0.000
X1	8680.000	12.000	610.000	630.000	430.000	430.000	430.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	565.000	0.000	700.000	0.000	0.000	0.000	0.000
GR	623.500	0.000	621.000	360.000	620.000	490.000	615.000	580.000	613.000	610.000
GR	610.500	615.000	610.300	620.000	610.500	625.000	613.000	630.000	615.000	720.000
GR	620.000	810.000	621.000	1000.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.050	0.050	0.045	0.300	0.500	0.000	0.000	0.000	0.000	0.000
X1	9450.000	9.000	308.000	337.000	545.000	545.000	545.000	0.000	0.000	0.000
GR	625.700	0.000	623.900	200.000	618.800	308.000	613.100	317.000	612.100	321.000
GR	613.100	325.000	621.100	337.000	624.300	400.000	623.200	600.000	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	9500.000	13.000	292.000	308.000	100.000	100.000	100.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	240.000	0.000	320.000	0.000	0.000	0.000	0.000
GR	622.900	0.000	622.000	100.000	621.300	183.000	618.800	287.000	613.000	292.000
GR	613.000	299.500	619.000	299.500	619.000	300.500	613.000	300.500	613.000	308.000
GR	620.700	316.000	620.700	400.000	621.400	600.000	0.000	0.000	0.000	0.000
OB	1.050	1.620	2.980	0.000	16.000	1.000	90.000	0.000	613.000	613.000
X1	9001.000	0.000	0.000	0.000	80.000	80.000	80.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	619.000	620.700	0.000	0.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	240.000	0.000	320.000	0.000	0.000	0.000	0.000
BT	4.000	240.000	621.000	621.000	292.000	620.700	619.000	308.000	620.700	619.000
BT	320.000	620.700	620.700	0.000	0.000	0.000	0.000	0.000	0.000	0.000
QT	8.000	480.000	640.000	710.000	860.000	710.000	390.000	200.000	390.000	0.000
X1	9625.000	9.000	260.000	283.000	150.000	150.000	150.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	70.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	623.300	0.000	619.700	200.000	619.800	260.000	613.900	264.000	612.300	267.000
GR	613.900	271.000	620.000	283.000	622.800	400.000	626.600	600.000	0.000	0.000
NC	0.000	0.000	0.050	0.600	0.800	0.000	0.000	0.000	0.000	0.000
X1	9750.000	11.000	297.800	302.300	150.000	150.000	150.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	110.000	0.000	390.000	0.000	0.000	0.000	0.000
GR	623.400	0.000	624.600	200.000	619.800	293.000	616.600	297.800	614.900	298.500
GR	614.300	300.000	614.900	301.500	616.600	302.300	620.000	316.000	625.700	400.000
GR	626.500	600.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

SB	0.000	1.620	2.500	0.000	3.000	0.000	15.900	0.000	613.500	613.500
X1	9751.000	0.000	0.000	0.000	116.000	116.000	116.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	618.800	625.100	0.000	0.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	110.000	0.000	390.000	0.000	0.000	0.000	0.000
BT	7.000	110.000	624.000	624.000	297.800	625.100	616.600	298.500	625.100	618.200
BT	300.000	625.100	618.800	301.500	625.100	618.200	302.300	625.600	616.600	390.000
BT	625.700	625.700	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	9800.000	9.000	289.000	324.000	100.000	100.000	100.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	50.000	0.000	400.000	0.000	0.000	0.000	0.000
GR	624.400	0.000	624.400	200.000	621.500	289.000	614.600	306.000	614.100	308.000
GR	614.000	310.000	618.700	324.000	623.600	400.000	625.500	600.000	0.000	0.000
NC	0.060	0.060	0.045	0.100	0.300	0.000	0.000	0.000	0.000	0.000
X1	10700.000	11.000	487.000	517.000	868.000	868.000	735.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	60.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	627.000	0.000	626.300	200.000	626.400	400.000	623.500	487.000	618.000	492.000
GR	617.000	498.000	618.000	504.000	628.100	517.000	627.600	600.000	626.000	800.000
GR	631.000	1000.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	10750.000	15.000	496.200	503.800	150.000	150.000	150.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	400.000	0.000	600.000	0.000	0.000	0.000	0.000
GR	626.600	0.000	627.800	200.000	627.500	400.000	623.500	497.000	620.700	496.200
GR	618.400	497.000	617.200	498.500	616.900	500.000	617.200	501.500	618.400	503.000
GR	620.700	503.800	626.500	519.000	627.100	600.000	630.200	800.000	631.800	1000.000
SB	0.000	2.280	2.500	0.000	6.000	0.000	44.000	0.000	617.100	617.100
X1	10751.000	0.000	0.000	0.000	85.000	85.000	85.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	624.400	629.800	0.000	0.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	400.000	0.000	600.000	0.000	0.000	0.000	0.000
BT	9.000	0.000	629.700	627.500	496.200	629.800	620.700	497.000	629.800	622.900
BT	498.500	629.800	624.000	500.000	629.800	624.400	501.500	629.800	624.000	503.000
BT	629.800	622.900	503.800	629.800	620.700	1000.000	630.300	627.110	0.000	0.000
QT	8.000	480.000	640.000	710.000	860.000	440.000	490.000	100.000	490.000	0.000
X1	10800.000	11.000	487.000	517.000	310.000	310.000	225.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	330.000	0.000	680.000	0.000	0.000	0.000	0.000
GR	626.600	0.000	627.800	200.000	627.500	400.000	626.100	482.000	618.000	498.000
GR	616.500	503.000	618.000	507.000	626.500	517.000	627.100	600.000	630.200	800.000
GR	631.800	1000.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.100	0.300	0.000	0.000	0.000	0.000	0.000
X1	11480.000	0.000	0.000	0.000	630.000	630.000	485.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	230.000	0.000	800.000	0.000	0.000	0.000	0.000
NC	0.040	0.040	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	12450.000	10.000	340.000	365.000	910.000	910.000	850.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	150.000	0.000	650.000	0.000	0.000	0.000	0.000
GR	628.800	0.000	628.000	250.000	627.900	340.000	621.000	354.000	620.400	356.000
GR	621.000	358.000	627.000	365.000	628.200	450.000	628.800	650.000	631.800	750.000

NC	0.000	0.000	0.000	0.100	0.300	0.000	0.000	0.000	0.000	0.000
X1	12500.000	17.000	348.000	360.000	50.000	50.000	50.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	150.000	0.000	650.000	0.000	0.000	0.000	0.000
GR	627.500	0.000	626.800	230.000	626.500	349.000	621.500	348.000	619.800	349.000
GR	619.500	350.000	619.800	351.000	621.500	352.000	621.500	356.000	619.800	357.000
GR	619.500	358.000	619.800	359.000	621.500	360.000	626.500	360.000	626.800	450.000
GR	627.900	650.000	630.800	750.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	12501.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	150.000	0.000	650.000	0.000	0.000	0.000	0.000
BT	13.000	0.000	627.500	627.500	348.000	626.500	621.500	349.000	626.500	623.250
BT	350.000	635.500	623.500	351.000	626.500	623.250	352.000	626.500	621.500	356.000
BT	626.500	621.500	357.000	626.500	623.250	358.000	626.500	623.500	359.000	626.500
BT	623.250	360.000	626.500	621.500	450.000	626.800	626.800	750.000	630.800	630.800
X1	12502.000	0.000	0.000	0.000	98.000	98.000	98.000	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	0.000	0.000	0.000	150.000	0.000	650.000	0.000	0.000	0.000	0.000
X1	12503.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	150.000	0.000	650.000	0.000	0.000	0.000	0.000
QT	8.000	450.000	600.000	660.000	800.000	660.000	400.000	85.000	400.000	0.000
X1	12550.000	10.000	340.000	369.000	50.000	50.000	50.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	180.000	0.000	650.000	0.000	0.000	0.000	0.000
GR	628.300	0.000	628.600	250.000	628.100	340.000	621.000	355.000	619.500	360.000
GR	621.000	365.000	628.700	369.000	627.700	450.000	629.000	650.000	631.200	750.000
NC	0.000	0.000	0.000	0.100	0.300	0.000	0.000	0.000	0.000	0.000
X1	13300.000	7.000	263.000	303.000	700.000	700.000	700.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	120.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	627.200	0.000	625.000	263.000	622.000	275.000	621.200	280.000	622.000	285.000
GR	625.000	303.000	630.000	310.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.050	0.050	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000
QT	8.000	450.000	600.000	660.000	800.000	660.000	300.000	85.000	300.000	0.000
X1	14075.000	8.000	211.000	257.000	620.000	620.000	620.000	0.000	0.000	0.000
GR	633.000	0.000	629.900	211.000	623.100	226.000	622.800	232.000	623.100	236.000
GR	631.600	237.000	634.600	290.000	633.300	530.000	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
X1	14125.000	11.000	227.000	233.000	50.000	50.000	50.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	130.000	0.000	330.000	0.000	0.000	0.000	0.000
GR	633.700	0.000	630.900	130.000	629.900	209.000	625.300	227.000	623.000	228.000
GR	622.300	230.000	623.000	232.000	625.300	233.000	631.600	259.000	632.900	330.000
GR	634.800	530.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SB	0.000	2.270	2.500	0.000	6.000	0.000	28.300	0.000	622.300	622.300
X1	14126.000	0.000	0.000	0.000	346.000	346.000	346.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	628.300	632.500	0.000	0.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	175.000	0.000	255.000	0.000	0.000	0.000	0.000
BT	8.000	0.000	633.700	633.700	227.000	632.500	625.300	228.000	632.500	627.500
BT	230.000	632.500	628.300	232.000	632.500	627.500	233.000	632.500	625.300	330.000

BT	632.900	632.700	530.000	634.500	634.800	0.000	0.000	0.000	0.000	0.000
X1	14200.000	9.000	200.000	241.000	100.000	100.000	100.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	70.000	0.000	280.000	0.000	0.000	0.000	0.000
GR	632.400	0.000	631.100	200.000	623.200	215.000	622.400	217.000	623.200	270.000
GR	633.400	241.000	637.900	260.000	638.000	330.000	637.900	530.000	0.000	0.000
BT	8.000	450.000	600.000	660.000	800.000	150.000	150.000	85.000	150.000	0.000
NC	0.000	0.000	0.045	0.100	0.300	0.000	0.000	0.000	0.000	0.000
X1	15500.000	10.000	400.000	422.000	1180.000	1180.000	950.000	0.000	0.000	0.000
GR	631.900	0.000	632.600	130.000	631.100	330.000	628.400	400.000	626.300	405.000
GR	625.400	410.000	626.300	416.000	629.400	422.000	635.200	660.000	647.600	750.000
X1	16450.000	10.000	363.000	404.000	945.000	945.000	945.000	0.000	0.000	0.000
GR	636.000	0.000	634.400	363.000	629.000	371.000	628.700	377.000	629.000	383.000
GR	634.700	404.000	638.700	500.000	647.000	600.000	642.000	700.000	643.300	800.000
NC	0.000	0.000	0.055	0.300	0.500	0.000	0.000	0.000	0.000	0.000
X1	16500.000	14.000	397.500	402.500	100.000	100.000	100.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	355.000	0.000	430.000	0.000	0.000	0.000	0.000
GR	637.400	0.000	635.500	300.000	634.400	385.000	631.100	397.500	629.600	398.000
GR	628.800	399.000	628.600	400.000	628.800	401.000	629.600	402.000	631.100	402.500
GR	634.700	427.000	638.500	500.000	642.400	700.000	642.200	800.000	0.000	0.000
SB	0.000	1.370	2.500	0.000	5.000	0.000	19.600	0.000	628.600	628.600
X1	16501.000	0.000	0.000	0.000	60.000	60.000	60.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	633.600	636.300	0.000	0.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	350.000	0.000	435.000	0.000	0.000	0.000	0.000
BT	10.000	0.000	637.400	637.400	397.500	636.300	631.100	398.000	636.300	632.600
BT	399.000	636.300	633.300	400.000	636.300	633.600	401.000	636.300	633.300	402.000
BT	636.300	637.600	402.500	636.300	631.100	500.000	638.500	638.500	800.000	642.200
BT	642.200	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	16550.000	11.000	390.000	419.000	100.000	100.000	100.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	350.000	0.000	450.000	0.000	0.000	0.000	0.000
GR	636.900	0.000	635.800	300.000	636.000	390.000	629.000	397.000	628.600	399.000
GR	629.000	402.000	637.100	419.000	640.100	500.000	641.100	600.000	641.600	700.000
GR	643.300	800.000	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

```
   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    IOC       ICONT     CORAR     TOPWID      ENDST

XPROF 1

CCHV=   0.100 CEHV=   0.300
XSECNO 6500.000

3470 ENCROACHMENT STATIONS=     150.0     330.0  TYPE=     1  TARGET=     180.000
  6500.00     9.00    614.20     0.00   614.20   614.39     0.19     0.00     0.00   609.20
    2300.     749.     542.    1010.     243.     116.     331.       0.       0.   606.60
     0.00     3.09     4.68     3.05    0.030    0.030    0.030    0.000   605.20   150.00
 0.000644      570      720.     570.        0        0        0     0.00   167.66   317.66

NSECNO 7700.000
3280 CROSS SECTION   7700.00 EXTENDED      1.73 FEET

3470 ENCROACHMENT STATIONS=     350.0     620.0  TYPE=     1  TARGET=     270.000
  7700.00     8.23    615.43     0.00     0.00   615.84     0.41     1.39     0.07   611.90
    2300.     399.    1351.     620.     150.     207.     316.      19.       6.   612.50
     0.07     2.12     6.51     1.96    0.060    0.040    0.060    0.000   607.20   350.00
 0.002643    1200.    1200.    1200.        3        0        0     0.00   270.00   620.00

CCHV=   0.000 CEHV=   0.800
XSECNO 7750.000

3301 HV CHANGED MORE THAN HVINS
Sugnet Rd
3470 ENCROACHMENT STATIONS=     384.0     620.0  TYPE=     1  TARGET=     236.000
  7750.00     8.71    615.61   615.47     0.00   616.94     1.33     0.36     0.73   607.20
    2300.     149.    1507.     644.      43.     135.     199.      20.       7.   606.90
     0.07     3.34    11.17     3.24    0.060    0.040    0.060    0.000   606.90   384.00
 0.005279      100.     100.     100.        2        8        0     0.00   166.27   550.27

SPECIAL BRIDGE

CB  XK        XKOR      CORB      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     0.00      1.60      2.50      0.00     16.00      0.00    106.00      0.00    607.20    607.20

XSECNO 7751.000
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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	IUC	ICONT	CORAR	TOPWID	ENDST

3301 HV CHANGED MORE THAN HVINS

PRESSURE AND WETR FLOW

EGPRS	EGLOC	H3	QWFIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
627.31	616.97	0.00	1430.	873.	106.	106.	613.80	616.10

3470 ENCROACHMENT STATIONS= 384.0 620.0 TYPE= 1 TARGET= 236.000

7751.00	9.84	616.74	0.00	0.00	617.30	0.55	0.36	0.00	607.20
2300.	165.	1214.	921.	64.	153.	407.	20.	7.	606.90
0.08	2.58	7.93	2.26	0.060	0.040	0.060	0.000	606.90	384.00
0.002244	26.	26.	26.	3	0	6	0.00	236.00	620.00

XSECNO 7800.000

7800.00	10.47	617.57	0.00	0.00	617.78	0.21	0.28	0.21	612.60
2300.	355.	1350.	596.	249.	290.	378.	24.	8.	613.70
0.09	1.43	4.66	1.57	0.060	0.040	0.060	0.000	607.10	263.91
0.000987	180.	200.	200.	2	0	0	0.00	277.37	541.28

CCHV= 0.200 CEHV= 0.400
XSECNO 8250.000

3470 ENCROACHMENT STATIONS= 400.0 600.0 TYPE= 1 TARGET= 200.000

8250.00	9.29	617.99	0.00	0.00	618.05	0.06	0.23	0.03	610.00
2300.	625.	988.	687.	472.	396.	535.	39.	11.	610.00
0.17	1.33	2.49	1.28	0.060	0.040	0.060	0.000	608.70	400.00
0.000249	590.	470.	590.	2	0	0	0.00	200.00	600.00

CCHV= 0.100 CEHV= 0.300
XSECNO 8680.000

3470 ENCROACHMENT STATIONS= 565.0 700.0 TYPE= 1 TARGET= 135.000

8680.00	7.83	618.13	0.00	0.00	618.15	0.02	0.09	0.00	613.00
570.	116.	222.	233.	164.	141.	304.	49.	13.	613.00
0.29	0.70	1.57	0.76	0.060	0.040	0.060	0.000	610.30	565.00
0.000143	430.	430.	430.	2	0	0	0.00	135.00	700.00

```
  SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS   BANK ELEV
  Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
  TIME     VLOB     VLH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
  SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IOC      ICONT    CORAR    TOPWID     ENDST

CCHV=   0.300 CFHV=   0.500
XSECNO 9450.000

3301 HV CHANGED MORE THAN HVINS

  9450.00     5.89   617.99     0.00     0.00   618.78     0.79     0.25     0.38   618.80
     570.       0.      570       0.       0.      80.       0.      53.      14.    621.10
     0.31     0.00     7.12     0.00    0.060    0.045    0.060    0.000   612.10   309.27
 0.010494      545     545.     545.        2        0        0     0.00    23.07   332.34

CCHV=   0.100 CFHV=   0.300
XSECNO 9500.000

3470 ENCROACHMENT STATIONS=     240.0     320.0  TYPE=     1  TARGET=      80.000
  9500.00     6.16   619.16     0.00     0.00   619.50     0.34     0.68     0.04   613.00
     570.      47.     466.      57.      19.      93.      20.      53.      14.    613.00
     0.31     2.50     5.03     2.89    0.060    0.045    0.060    0.000   613.00   272.33
 0.004715      100.     100.     100.        3        0        0     0.00    42.07   314.40

SPECIAL BRIDGE

SB  XK       XKOB     COFQ     RDLEN    BWC      BWP      BAREA    SS       ELCHU    ELCHD
     1.05     1.62     2.98      0.00    16.00     1.00     90.00     0.00   613.00   613.00

XSECNO 9501.000
PRESSURE FLOW

 EGPRS     EGLWC     K3       QWFIR     GPR      BAREA   TRAPEZOID     ELLC     ELTRD
                                                          AREA
  620.17   619.54    0.05        0.      570.      90.      90.      619.00   620.70

3470 ENCROACHMENT STATIONS=     240.0     320.0  TYPE=     1  TARGET=      80.000
  9501.00     6.95   619.95     0.00     0.00   620.17     0.22     0.67     0.00   613.00
     570.      74.     437.      60.      47.     105.      25.      53.      14.    613.00
     0.32     1.56     4.15     2.37    0.060    0.045    0.060    0.000   613.00   240.09
 0.002704      80.      80.      80.        2        0        0     0.00    75.13   315.22
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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

XSECNO 9625.000

3470 ENCROACHMENT STATIONS=      70.0     600.0  TYPE=     1  TARGET=     -70.000
  9625.00     8.05   620.35     0.00     0.00   620.51     0.16     0.34     0.01   619.80
     390.      33.     356.       1.      48.     106.       3.      54.      14.   620.00
     0.33     0.69     3.37     0.33    0.060    0.045    0.060    0.000   612.30   163.75
 0.001802     150.     150.     150.        2        0        0     0.00   133.98   297.73

CCHV=   0.600 CEHV=   0.800
XSECNO 9750.000

3470 ENCROACHMENT STATIONS=     110.0     390.0  TYPE=     1  TARGET=     280.000
  9750.00     6.51   620.81     0.00     0.00   621.24     0.43     0.51     0.21   616.60
     390.      63.     177.     150.      22.      26.      39.      54.      14.   616.60
     0.34     2.82     6.73     3.83    0.060    0.050    0.060    0.000   614.30   273.42
 0.008736     150.     150.     150.        2        0        0     0.00    54.52   327.94

SPECIAL BRIDGE

SB  XK       XKOR     COFQ     RDLEN    BWC      BWP      BAREA    SS       ELCHU    ELCHD
     0.00     1.62     2.50     0.00     3.00     0.00    15.90     0.00   613.50   613.50

XSECNO 9751.000
PRESSURE AND WEIR FLOW

 EGPRS     EGLWC      H3      QWEIR     QPR      BAREA   TRAPEZOID     ELLC     ELTRD
                                                          AREA
  635.94   621.05     0.00     185.     207.      16.      16.      618.80   625.10

3470 ENCROACHMENT STATIONS=     110.0     390.0  TYPE=     1  TARGET=     280.000
  9751.00    10.78   625.08     0.00     0.00   625.08     0.01     3.85     0.00   616.60
     390.     174.      47.     169.     369.      45.     283.      55.      15.   616.60
     0.39     0.47     1.04     0.60    0.060    0.050    0.060    0.000   614.30   110.00
 0.000100     116      116.     116.        0        0        7     0.00   280.00   390.00

XSECNO 9800.000

3470 ENCROACHMENT STATIONS=      50.0     400.0  TYPE=     1  TARGET=     350.000
```

SECNO Q TIME SLOPE	DEPTH QLOB VLOB XLOBL	CWSEL QCH VCH XLCH	CRIWS QROB VROB XLOBR	WSELK ALOB XNL ITRIAL	EG ACH XNCH IOC	HV AROB XNR ICONT	HL VOL WTN CORAR	OLOSS TWA ELMIN TOPWID	BANK ELEV LEFT/RIGHT SSTA ENDST
9800.00	10.98	625.08	0.00	0.00	625.09	0.01	0.01	0.00	621.50
390.	63.	209.	118.	293.	281.	299.	57.	16.	618.70
0.45	0.22	0.74	0.39	0.060	0.050	0.060	0.000	614.10	50.00
0.000042	100.	100.	100.	2	0	0	0.00	350.00	400.00

CCHV= 0.100 CEHV= 0.300
XSECNO 10700.000

3470 ENCROACHMENT STATIONS= 60.0 1000.0 TYPE= 1 TARGET= -60.000

10700.00	8.11	625.11	0.00	0.00	625.20	0.09	0.08	0.03	623.50
390.	23.	367.	0.	39.	146.	0.	67.	20.	628.10
0.53	0.59	2.52	0.00	0.060	0.045	0.060	0.000	617.00	438.76
0.000748	868.	735.	868.	2	0	0	0.00	74.39	513.15

XSECNO 10750.000

3470 ENCROACHMENT STATIONS= 400.0 600.0 TYPE= 1 TARGET= 200.000

10750.00	8.31	625.21	0.00	0.00	625.41	0.19	0.18	0.03	620.70
390.	101.	239.	50.	61.	56.	27.	68.	20.	620.70
0.55	1.66	4.29	1.88	0.060	0.045	0.060	0.000	616.90	449.71
0.002190	150.	150.	150.	2	0	0	0.00	65.92	515.63

Wheeler

SPECIAL BRIDGE

SB	XK	XWOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	2.28	2.50	0.00	6.00	0.00	44.00	0.00	617.10	617.10

XSECNO 10751.000
PRESSURE FLOW

EGPRS	ECLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
628.00	625.58	0.00	0.	390.	44.	44.	624.40	629.80

3470 ENCROACHMENT STATIONS= 400.0 600.0 TYPE= 1 TARGET= 200.000

10751.00	11.08	627.98	0.00	0.00	628.00	0.02	2.59	0.00	620.70
390.	184.	116.	90.	271.	77.	163.	68.	20.	620.70
0.57	0.68	1.51	0.55	0.060	0.045	0.060	0.000	616.90	400.00
0.000171	85.	85.	85.	1	0	0	0.00	200.00	600.00

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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       XNLH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IOC       ICONT     CORAR     TOPWID      ENDST

XSECNO 10800.000

3470 ENCROACHMENT STATIONS=     330.0     680.0  TYPE=     1  TARGET=     350.000
 10800.00    11.52   628.02     0.00      0.00   628.06     0.04      0.06      0.01    626.10
     490.      55.     383.      52.      139.     220.     129.      72.       22.     626.50
     0.62     0.40     1.74     0.40     0.060    0.045    0.060     0.000   616.50    330.00
 0.000230     310.     220.     310.         2        0        0      0.00   329.43    659.43

CCHV=   0.100 CEHV=   0.300
XSECNO 11480.000

3470 ENCROACHMENT STATIONS=     230.0     800.0  TYPE=     1  TARGET=     570.000
 11480.00    11.65   628.15     0.00      0.00   628.18     0.03      0.12      0.00    626.10
     490.      71.     362.      57.      205.     224.     147.      78.       28.     626.50
     0.74     0.35     1.61     0.37     0.060    0.045    0.060     0.000   616.50    230.00
 0.000211     630.     485.     630.         0        0        0      0.00   437.30    667.30

XSECNO 12450.000

3470 ENCROACHMENT STATIONS=     150.0     650.0  TYPE=     1  TARGET=     500.000
 12450.00     8.04   628.44     0.00      0.00   628.55     0.11      0.35      0.02    627.90
     490.      48.     363.      80.       72.     118.      81.      87.       36.     627.00
     0.83     0.66     3.08     0.98     0.040    0.040    0.040     0.000   620.40    150.00
 0.001057     910.     850.     910.         2        0        0      0.00   380.06    530.06

CCHV=   0.100 CEHV=   0.300
XSECNO 12500.000

3470 ENCROACHMENT STATIONS=     150.0     650.0  TYPE=     1  TARGET=     500.000
 12500.00     9.07   628.57     0.00      0.00   628.57     0.01      0.01      0.01    626.50
     490.     196.      87.     207.      351.      96.     416.      88.       37.     626.50
     0.86     0.56     0.91     0.50     0.040    0.040    0.040     0.000   619.50    150.00
 0.000105      50.      50.      50.         2        0        0      0.00   500.00    650.00

XSECNO 12501.000

3370 NORMAL BRIDGE,NRD= 13 MIN ELTRD=  626.50 MAX ELLC=  630.80
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Sylvan Lane

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   SECNO     DEPTH     CWSEL     CRIWS     WSELR     EG        HV        PL        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


3470 ENCROACHMENT STATIONS=     150.0     650.0  TYPE=     1  TARGET=     500.000
 12501.00     9.07    628.57     0.00      0.00    628.57     0.01      0.00      0.00    626.50
     490.      256       23.     211.      351.       43      416       88.       37.    626.50
     0.86     0.73      0.54     0.51     0.040     0.040    0.040     0.000    619.50    150.00
 0.000179       1.        1.       1.         0         0        0    -52.71    500.00    650.00

XSECNO 12502.000

3370 NORMAL BRIDGE,NRD= 13 MIN ELTRD=  626.50 MAX ELLC=  630.80

3470 ENCROACHMENT STATIONS=     150.0     650.0  TYPE=     1  TARGET=     500.000
 12502.00     9.09    628.59     0.00      0.00    628.59     0.01      0.02      0.00    626.50
     490.      256.       23.     212       354.       43.     420.       90.       38.    626.50
     0.90     0.72      0.53     0.50     0.040     0.040    0.040     0.000    619.50    150.00
 0.000175      98.       98.      98.         0         0        0    -52.73    500.00    650.00

XSECNO 12503.000

3470 ENCROACHMENT STATIONS=     150.0     650.0  TYPE=     1  TARGET=     500.000
 12503.00     9.09    628.59     0.00      0.00    628.59     0.01      0.00      0.00    626.50
     490.      196.       86.     208.      354.       96.     421.       90.       38.    626.50
     0.90     0.55      0.89     0.49     0.040     0.040    0.040     0.000    619.50    150.00
 0.000102        1        1.       1.         0         0        0      0.00    500.00    650.00

XSECNO 12550.000

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS=     180.0     650.0  TYPE=     1  TARGET=     470.000
 12550.00     9.05    628.55     0.00      0.00    628.62     0.07      0.01      0.02    628.10
     400.       6.       354.     40.       19.      158.      85.       90.       38.    628.70
     0.91     0.30      2.25     0.47     0.040     0.040    0.040     0.000    619.50    180.00
 0.000301      50.       50.      50.         2         0        0      0.00    338.13    580.80

CCHV=   0.100 CHHV=   0.300
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SECNO	DEPTH	CUSEL	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

XSECNO 13300.000

3470 ENCROACHMENT STATIONS=			120.0	310.0	TYPE=	1	TARGET=	-120.000	
13300.00	7.49	628.69	0.00	0.00	628.70	0.01	0.07	0.01	625.00
400.	225.	172.	3.	442.	227.	10.	98.	42.	625.00
1.22	0.51	0.76	0.32	0.040	0.040	0.040	0.000	621.20	170.00
0.000042	700.	700.	700.	2	0	0	0.00	188.17	308.17

XSECNO 14075.000

14075.00	5.90	628.70	0.00	0.00	628.78	0.08	0.06	0.02	629.90
300.	0.	300.	0.	0.	131.	0.	104.	44.	631.60
1.30	0.00	2.30	0.00	0.050	0.040	0.050	0.000	622.80	213.65
0.000748	620.	620.	620.	2	0	0	0.00	36.17	249.83

CONV= 0.300 CFHV= 0.500
XSECNO 14125.000

3470 ENCROACHMENT STATIONS=			130.0	330.0	TYPE=	1	TARGET=	200.000	
14125.00	6.35	628.65	0.00	0.00	628.98	0.33	0.07	0.12	625.30
300.	57.	182.	61.	22.	33.	23.	104.	44.	625.30
1.30	2.61	3.53	2.62	0.050	0.040	0.050	0.000	622.30	213.91
0.004064	50.	50.	50.	2	0	0	0.00	32.90	246.81

SPECIAL BRIDGE

SB	XK	XKCH	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	2.27	2.50	0.00	6.00	0.00	28.30	0.00	622.30	622.30

XSECNO 14126.000
PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
632.61	628.98	0.00	0.	298.	28.	36.	628.30	632.50

3470 ENCROACHMENT STATIONS=			175.0	255.0	TYPE=	1	TARGET=	80.000	
14126.00	10.24	632.54	0.00	0.00	632.55	0.02	3.58	0.00	625.30
300.	134.	79.	87.	172.	56.	101.	105.	44.	625.30
1.40	0.78	1.41	0.86	0.050	0.040	0.050	0.000	622.30	175.00
0.000129	346.	346.	346.	1	0	0	0.00	80.00	255.00

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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    IOC       ICONT     CORAR     TOPWID      ENDST

XSECNO 14250.000

3470 ENCROACHMENT STATIONS=      70.0      280.0  TYPE=     1  TARGET=      210.000
 14250.00    10.15   632.55     0.00      0.00   632.57     0.02      0.01      0.00   631.10
     300.      42.     258.       0.      133.     224.       0.      106.       45.   633.40
     1.43     0.31     1.15     0.00     0.050    0.040    0.050     0.000   622.40    70.00
 0.000109     100.     100.     100.         2        0        0      0.00   169.25   239.25

CCHV=   0.100 CEHV=   0.300
XSECNO 15300.000
3280 CROSS SECTION  15300.00 EXTENDED      0.71 FEET

 15300.00     7.21   632.61     0.00      0.00   632.61     0.00      0.05      0.00   628.40
      150      64.       32.      34.      400.     129.     212.      120.       54.   629.40
     2.61     0.16     0.40     0.16     0.050    0.045    0.050     0.000   625.40     0.00
 0.000015    1180.     950.    1180.         2        0        0      0.00   553.86   553.86

XSECNO 16450.000
 16450.00     3.92   632.62     0.00      0.00   632.68     0.06      0.05      0.02   634.40
     150.       0.     150.       0.        0.      79.       0.      129.       61.   634.70
     2.75     0.00     1.90     0.00     0.050    0.045    0.050     0.000   628.70   365.64
 0.000999     945.     945.     945.         2        0        0      0.00    30.70   396.34

CCHV=   0.300 CEHV=   0.500
XSECNO 16500.000

3470 ENCROACHMENT STATIONS=     335.0      430.0  TYPE=     1  TARGET=       75.000
 16500.00     4.07   632.67     0.00      0.00   633.15     0.48      0.26      0.21   631.10
     150.      14.     107.      29.        4.      17.       8.      129.       61.   631.10
     2.75     3.34     6.22     3.40     0.050    0.055    0.050     0.000   628.60   392.02
 0.018344     100.     100.     100.         0        0        0      0.00    21.17   413.19

SPECIAL BRIDGE

CD  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     0.00      1.39      2.50      0.00      5.00      0.00     19.60      0.00    628.60    628.60

XSECNO 16501.000
```

```
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   IDC      ICONT    CORAR    TOPWID     ENDST
```

6070 LOW FLOW BY NORMAL BRIDGE

EGPRS= 0.000 EGLWC= 633.151 ELLC= 633.600 PCWSE= 632.671 ELTRD= 636.300

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE,NRD= 10 MIN ELTRD= 636.30 MAX ELLC= 633.60

```
3470 ENCROACHMENT STATIONS=     350.0     435.0  TYPE=     1  TARGET=     85.000
 16501.00     5.73   634.33   632.19      0.00   635.36     1.02     1.93     0.27   631.10
     150.       0.     150.       0.        0.      19.       0.     129.       61.   631.10
     2.76     0.00     8.11     0.00     0.050    0.055    0.050    0.000   628.60   386.23
 0.070853      60.      60.      60.         6       15        0    60.86    38.29   424.51
```

XSFCND 16530.000

3301 HV CHANGED MORE THAN HVINS

```
3470 ENCROACHMENT STATIONS=     350.0     430.0  TYPE=     1  TARGET=    100.000
 16530.00     7.20   635.80     0.00      0.00   635.83     0.03     0.17     0.30   636.00
     150.       0     150.       0.        0.     107.       0.     129.       61.   637.10
     2.78     0.00     1.41     0.00     0.050    0.055    0.050    0.000   628.60   390.20
 0.000511     100.     100.     100.         3        0        0     0.00    26.06   416.27
```

THIS RUN EXECUTED 28-APR-1987 13:16:43.89

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XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
  HEC2 RELEASE DATED NOV 76 UPDATED MAR. 1982
  ERROR CORR -  01,02,03,04,05
  MODIFICATION -  50,51,52,53,54,55
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
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T1 SNAKE CREEK, MIDLAND - USGS DATUM
T2 SNAKE CREEK - MIDLAND FIS
T3 100 - YEAR FLOODWAY DETERMINATION

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	-1.	9.	0.	0.	0.000000	0.00	0.0	0.	614.200	0.000
J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLOC	IBW	CHNIM	ITRACE
	15.000	0.000	-1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

```
  SECNO     DEPTH     CWSEL     CRIWS     WSELR     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     XLFBL     XLCH      XLOBR     ITRIAL    IOC       ICONT     CORAR     TOPWID     ENDST

XPROF 2

CCHV=   0.100 CFHV=   0.300
XSECNO 6500.000

3470 ENCROACHMENT STATIONS=     150.0     330.0  TYPE=     1  TARGET=     180.000
  6500.00     9.10   614.20      0.00   614.20   614.48     0.18     0.00     0.00   609.20
     2300.     751.     533.     1016.     249.     117.     341.       0.       0.   606.60
      0.00     3.02     4.50     2.98    0.030    0.030    0.030    0.000   605.20   150.00
 0.000098     570.     720.     570.        0        0        0     0.00   168.08   318.08

XSECNO 7700.000
3280 CROSS SECTION   7700.00 EXTENDED      1.75 FEET

3470 ENCROACHMENT STATIONS=     350.0     620.0  TYPE=     1  TARGET=     270.000
  7700.00     8.25   615.45      0.00   615.43   615.86     0.40     1.31     0.07   611.90
     2300.     331.    1344.      625.     157.     208.     320.      19.       6.   612.50
      0.07     2.12     6.46     1.95    0.060    0.040    0.060    0.000   607.20   350.00
 0.002586    1200.    1200.    1200.        3        0        0     0.00   270.00   620.00

CCHV=   0.600 CFHV=   0.800
XSECNO 7750.000

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS=     384.0     620.0  TYPE=     1  TARGET=     236.000
  7750.00     8.73   615.63   615.47   615.61   616.94     1.31     0.35     0.73   607.20
     2300.     149.    1502.      648.      45.     135.     202.      20.       7.   606.90
      0.08     3.33    11.12     3.22    0.060    0.040    0.060    0.000   606.90   384.00
 0.005212      100.     100.      100.        2        8        0     0.00   168.03   552.03

SPECIAL BRIDGE

CB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     0.00      1.60      2.50      0.00     16.00      0.00    106.00      0.00    607.20    607.20

XSECNO 7751.000
     3700.   BRIDGE STEND =    384.00    STENCR=    620.00
```

```
SECNO    DEPTH    CWSEL    CRIWS    WSFLK    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 KVINS

PRESSURE AND WEIR FLOW

 EGPRS      EGLUC      H3       QWEIR      QPR       BAREA   TRAPEZOID      ELLC     ELTRD
                                                                AREA
  627.33    616.98     0.00     1383.      918.      106.      106.      613.80    616.10


3470 ENCROACHMENT STATIONS=     384.0     620.0  TYPE=     1  TARGET=     236.000
  7751.00    10 15   617.05     0.00   616.74   617.49     0.44     0.55     0.00   607.20
    2300.     166.    1140.     994.      69.     158.     470.      21.       7.    606.90
     0 08     2.40     7.21     2.12    0.060    0.040    0.060    0.000   606.90   384.00
 0.001779      26.      26.      26.        3        0        5     0.00   236.00   620.00

XSECNO 7800.000
 2800 NAT Q1=    732.23  WSEL=    617.57  ENC Q1=    732.23  WSEL=    617.67  RATIO=  0.0000
 NAT Q1=    757.  RATIOS LOB,CH,ROB=  0.1573  0.5779  0.2648  WSEL=    617.67

3470 ENCROACHMENT STATIONS=     318.2     501.7  TYPE=     4  TARGET=       0.033
  7800.00    10.55   617.65     0.00   617.57   617.88     0.23     0.26     0.13   612.60
    2300.     335.    1378.     587.     179.     292.     343.      24.       8.    613.70
     0 09     1.87     4.72     1.71    0.060    0.040    0.060    0.000   607.10   318.18
 0.000998     180.     200.     200.        2        0        0     0.00   183.51   501.69


CCHV=   0.200 CEHV=   0.400
XSECNO 8250.000

3470 ENCROACHMENT STATIONS=     400.0     600.0  TYPE=     1  TARGET=     200.000
  8250.00     9.38   618.08     0.00   617.99   618.14     0.06     0.23     0.03   610.00
    2300.     626.     985.     689.     478.     400.     542.      38.      10.    610.00
     0.17     1.31     2.46     1.27    0.060    0.040    0.060    0.000   608.70   400.00
 0 000239     590.     470.     590.        2        0        0     0.00   200.00   600.00


CCHV=   0.100 CEHV=   0.300
XSECNO 8680.000
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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


3470 ENCROACHMENT STATIONS=     565.0     700.0  TYPE=     1  TARGET=     135.000
  8880.00      7.91    618.21      0.00   618.13    618.23      0.02      0.09      0.00    613.00
     570.      117.      220.      233.     168.      143.      310.       48.       12.    613.00
     0.29      0.69      1.54      0.75    0.060     0.040     0.060     0.000    610.30    565.00
 0.000135       430       430.      430.        2         0         0      0.00    135.00    700.00


CONV=   0.300 DHV=   0.500
XSECNO 9430.000
 2800 NAT Q1=     55.64  WSEL=    617.99  ENC Q1=     57.76  WSEL=    618.09  RATIO= -0.0382
 NAT Q1=     58.  RATIOS LOB,CH,ROB=  0.0000  1.0000  0.0000  WSEL=    618.09

3301 HV CHANGED MORE THAN HVINS


3470 ENCROACHMENT STATIONS=     308.0     337.0  TYPE=     4  TARGET=       0.000
  9450.00      5.99    618.09      0.00   617.99    618.83      0.74      0.24      0.36    618.80
     570.        0.      570.        0.       0.       82.        0.       53.       13.    621.10
     0.31      0.00      6.92      0.00    0.060     0.045     0.060     0.000    612.10    309.11
 0.009725       545       545.      545.        3         0         0      0.00     23.38    332.49


CONV=   0.100 DHV=   0.300
XSECNO 9500.000

3470 ENCROACHMENT STATIONS=     240.0     320.0  TYPE=     1  TARGET=      80.000
  9500.00      6.18    619.18      0.00   619.16    619.52      0.34      0.65      0.04    613.00
     570.       48.      465.       57.      19.       93.       20.       53.       13.    613.00
     0.32      2.46      5.01      2.88    0.060     0.045     0.060     0.000    613.00    271.40
 0.004643      100.      100.      100.        3         0         0      0.00     43.02    314.42


SPECIAL BRIDGE

SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
    1.05      1.62      2.98      0.00      16.00     1.00      90.00     0.00      613.00    613.00

XSECNO 9501.000
    3700.   BRIDGE STENCL=    240.00    STENCR=    320.00
PRESSURE FLOW
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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


 EGPRS      EGLUC      H3       CWFIR      OPR       BAREA   TRAPEZOID      ELLC     ELTRD
                                                                AREA
  620.19    619.56     0.04        0.      570.       90.       90.      619.00    620.70


3470 ENCROACHMENT STATIONS=     240.0     320.0  TYPE=     1  TARGET=      80.000
  9501.00     6.98   619.98     0.00   619.95   620.19     0.21     0.67     0.00   613.00
     570.      75.     435.      60.      49.     106.      25.      53.      13.    613.00
     0.32     1.55     4.12     2.36    0.060    0.045    0.060    0.000   613.00   240.00
 0.002648      80.      80.      80.        2        0        0     0.00    75.25   315.25

XSECNO 9625.000

3470 ENCROACHMENT STATIONS=      70.0     600.0  TYPE=     1  TARGET=     -70.000
  9625.00     8.07   620.37     0.00   620.35   620.53     0.16     0.33     0.01   619.80
     390.      35.     355.       1.      50.     106.       3.      54.      13.    620.00
     0.34     0.69     3.34     0.34    0.060    0.045    0.060    0.000   612.30   162.70
 0.001761     150.     150.     150.        2        0        0     0.00   135.82   298.52

CCHV=   0.600 CPHV=   0.800
XSECNO 9750.000

3470 ENCROACHMENT STATIONS=     110.0     390.0  TYPE=     1  TARGET=     280.000
  9750.00     6.52   620.82     0.00   620.81   621.24     0.42     0.50     0.21   616.60
     390       63.     176.     151.      23.      26.      39.      54.      14.    616.60
     0.35     2.80     6.70     3.81    0.060    0.050    0.060    0.000   614.30   273.24
 0.008637     150.     150.     150.        2        0        0     0.00    54.84   328.08


SPECIAL BRIDGE

SB  XK       XXOR     COPQ     RDLEN    BWC      BWP      BAREA    SS       ELCHU    ELCHD
     0.00     1.62     2.50      0.00     3.00     0.00    15.90     0.00   613.50   613.50

XSECNO 9751.000
     3700.   BRIDGE STENCL=    110.00    STENCR=    390.00
PRESSURE AND WEIR FLOW
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SECNO	DEPTH	CLOSEL	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	IOC	ICONT	CORAR	TOPWID	ENDST

ECPRS	ECLLOC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
635.95	621.05	0 00	185.	207.	16.	16.	618.80	625.10

3470 ENCROACHMENT STATIONS= 110.0 390.0 TYPE= 1 TARGET= 280.000

9751.00	10.70	625.08	0.00	625.08	625.08	0.01	3.84	0.00	616.60
390.	174.	47.	169.	369.	45.	283.	55	14.	616.60
0.40	0.47	1.04	0.60	0.060	0 050	0.060	0.000	614.30	110.00
0.000099	116	116.	116.	0	0	7	0.00	280.00	390.00

XSECNO 9800.000

3470 ENCROACHMENT STATIONS= 50.0 400.0 TYPE= 1 TARGET= 350.000

9800 00	10.99	625.09	0.00	625.08	625.09	0.01	0.01	0.00	621.50
390.	63.	209.	118.	293.	281.	299.	57.	15.	618.70
0.45	0.22	0.74	0.39	0.060	0.050	0.060	0.000	614.10	50.00
0.000042	100.	100.	100.	2	0	0	0.00	350.00	400.00

CCHV= 0.100 CEXV= 0.300
XSECNO 10700.000

3470 ENCROACHMENT STATIONS= 60.0 1000.0 TYPE= 1 TARGET= -60.000

10700.00	8.11	625.11	0.00	625.11	625.20	0.09	0.08	0.03	623.50
390	23	367.	0.	39.	146.	0.	67.	19.	628.10
0 54	0.59	2.52	0.00	0.060	0.045	0.060	0.000	617.00	438.75
0.000748	868.	735.	868.	2	0	0	0.00	74.40	513.15

XSECNO 10750 000

3470 ENCROACHMENT STATIONS= 400.0 600.0 TYPE= 1 TARGET= 200.000

10750 00	8 31	625.21	0 00	625.21	625.41	0.19	0.18	0.03	620.70
390.	101.	239.	50.	61.	56.	27.	68.	19.	620.70
0.55	1 66	4.29	1.87	0.060	0.045	0.060	0.000	616.90	449.70
0.002119	150.	150.	150.	2	0	0	0.00	65.93	515.63

SECND	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	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IUC	ICONT	CORAR	TOPWID	ENDST

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	2.28	2.50	0.00	6.00	0.00	44.00	0.00	617.10	617.10

XSECND 10751.000
3700. BRIDGE STENCL= 400.00 STENCR= 600.00
PRESSURE FLOW

EGPRS	ELLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
628.00	625.58	0.00	0.	390.	44.	44.	624.40	629.80

3470 ENCROACHMENT STATIONS=			400.0	600.0	TYPE=	1	TARGET=	200.000	
10751.00	11.08	627.98	0.00	627.98	628.00	0.01	2.59	0.00	620.70
390.	184.	116.	90.	271.	77.	163.	68.	19.	620.70
0.58	0.68	1.51	0.55	0.060	0.045	0.060	0.000	616.90	400.00
0.000171	85	85.	85.	1	0	0	0.00	200.00	600.00

XSECND 10800.000

3470 ENCROACHMENT STATIONS=			330.0	680.0	TYPE=	1	TARGET=	350.000	
10800.00	11.52	628.02	0.00	628.02	628.06	0.04	0.06	0.01	626.10
490.	55.	383.	52.	139.	220.	129	72.	21.	626.50
0.63	0.40	1.74	0.40	0.060	0.045	0.060	0.000	616.50	330.00
0.000250	310.	225.	310.	2	0	0	0.00	329.45	659.45

CONV= 0.100 CPHV= 0.300
XSECND 11480.000

3470 ENCROACHMENT STATIONS=			230.0	800.0	TYPE=	1	TARGET=	570.000	
11480.00	11.65	628.15	0.00	628.15	628.18	0.03	0.12	0.00	626.10
490.	71.	362.	57.	205.	224.	147.	78.	27.	626.50
0.74	0.35	1.61	0.39	0.060	0.045	0.060	0.000	616.50	230.00
0.000211	630.	485.	630.	0	0	0	0.00	437.32	667.32

XSECND 12450.000

```
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS   BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA   LEFT/RIGHT
   TIME      VLOB      VLH       VROB      XNL       XNCH      XNR       WTN       ELMIN      SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID     ENDST


3470 ENCROACHMENT STATIONS=     150.0     650.0  TYPE=     1  TARGET=     500.000
 12450.00     8.04   628.44     0.00   628.44   628.55     0.11     0.30     0.02   627.90
     490.      48.     363.      80.      72.     118.      81.      87.      35.   627.00
     0.84     0.66     3.08     0.98    0.040    0.040    0.040    0.000   620.40   150.00
 0.001037     910.     850.     910.        2        0        0     0.00   380.15   530.15

CCHV=   0.100 CEHV=   0.300
XSECNO 12500.000

3470 ENCROACHMENT STATIONS=     150.0     650.0  TYPE=     1  TARGET=     500.000
 12500.00     9.07   628.57     0.00   628.57   628.57     0.01     0.01     0.01   624.50
     490.     196.      87.     207.     351.      96.     416.      88.      36.   626.50
     0.86     0.56     0.91     0.50    0.040    0.040    0.040    0.000   619.50   150.00
 0.000105      50.      50.      50.        2        0        0     0.00   500.00   650.00

XSECNO 12501.000
     3700.   BRIDGE STENCL=    150.00    STENCR=    650.00

3370 NORMAL BRIDGE,NRD= 13 MIN ELTRD=  626.50 MAX ELLC=  630.80

3470 ENCROACHMENT STATIONS=     150.0     650.0  TYPE=     1  TARGET=     500.000
 12501.00     9.07   628.57     0.00   628.57   628.57     0.01     0.00     0.00   626.50
     490.     216.      23.     211.     352.      43.     417.      88.      36.   626.50
     0.86     0.73     0.53     0.51    0.040    0.040    0.040    0.000   619.50   150.00
 0.000178       1.       1.       1.        7        0        0   -52.71   500.00   650.00

XSECNO 12502.000

3370 NORMAL BRIDGE,NRD= 13 MIN ELTRD=  626.50 MAX ELLC=  630.80

3470 ENCROACHMENT STATIONS=     150.0     650.0  TYPE=     1  TARGET=     500.000
 12502.00     9.09   628.59     0.00   628.59   628.59     0.01     0.02     0.00   626.50
     490.     216.      23.     212.     354.      43.     420.      90.      37.   626.50
     0.90     0.72     0.53     0.50    0.040    0.040    0.040    0.000   619.50   150.00
 0.000175      98.      98.      98.        0        0        0   -52.73   500.00   650.00
```

```
   SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       FL       OLOSS   BANK ELEV
   Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
   TIME     VLOB     VLH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
   SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST

XSECNO 12503.000

3470 ENCROACHMENT STATIONS=     150.0     650.0  TYPE=     1  TARGET=     500.000
 12503.00     9.09   628.59     0.00   628.59   628.59     0.01     0.00     0.00   626.50
     470.     196.      86.     208.     354       96.     421.      90.      37.   626.50
     0.90     0.55     0.89     0.49    0.040    0.040    0.040    0.000   619.50   150.00
 0.000102       1.       1.       1        0        0        0     0.00   500.00   650.00

XSECNO 12550.000

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS=     180.0     650.0  TYPE=     1  TARGET=     470.000
 12550.00     9.05   628.55     0.00   628.55   628.62     0.07     0.01     0.02   628.10
     400.       6.     354.      40.      19.     158.      85.      90.      37.   628.70
     0.91     0.30     2.25     0.47    0.040    0.040    0.040    0.000   619.50   180.00
 0.000501      50.      50.      50.        2        0        0     0.00   338.29   580.82

CCHV=   0.100 CEHV=   0.300
XSECNO 13300.000

3470 ENCROACHMENT STATIONS=     120.0     310.0  TYPE=     1  TARGET=    -120.000
 13300.00     7.49   628.69     0.00   628.69   628.70     0.01     0.07     0.01   625.00
     400.     225.     172.       3.     442.     227.      10.      98.      42.   625.00
     1.23     0.51     0.76     0.32    0.040    0.040    0.040    0.000   621.20   120.00
 0.000042     700.     700      700.        2        0        0     0.00   188.17   308.17

XSECNO 14075.000
 2800 NAT Q1=    109.71  WSEL=    628.70  ENC Q1=    113.84  WSEL=    628.80  RATIO= -0.0377
 NAT Q1=    114.  RATIOS LOB,CH,ROB=  0.0000  1.0000  0.0000  WSEL=    628.80

3470 ENCROACHMENT STATIONS=     211.0     257.0  TYPE=     4  TARGET=       0.000
 14075.00     5.90   628.70     0.00   628.70   628.78     0.08     0.06     0.02   629.90
     300.       0.     300.       0.       0.     131.       0.     104.      43.   631.60
     1.30     0.00     2.30     0.00    0.050    0.040    0.050    0.000   622.80   213.65
 0.000748     620.     620.     620.        2        0        0     0.00    36.17   249.83
```

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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

CCHV=   0.300 CEHV=   0.500
XSECNO 14125.000

3470 ENCROACHMENT STATIONS=      130.0      330.0  TYPE=      1  TARGET=      200.000
 14125.00      6.35    628.65      0.00    628.65    628.98      0.33      0.07      0.12    625.30
     300.       57.      182.       61.       22.       33.       23.      104.       43.    625.30
     1.31      2.61      5.53      2.62     0.050     0.040     0.050     0.000    622.30    213.91
 0.004063       50.       50.       50.         2         0         0      0.00     32.90    246.81

SPECIAL BRIDGE

SB  XK        XKOR      COEQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     0.00      2.27      2.50      0.00      6.00      0.00      28.30     0.00     622.30    622.30

XSECNO 14126.000
     3700.   BRIDGE STENCL=     130.00    STENCR=     330.00
PRESSURE AND WEIR FLOW

 EGPRS      ECHWC      H3       QWEIR      QPR       BAREA    TRAPEZOID      ELLC      ELTRD
                                                                AREA
   632.61    628.98     0.00        0.      298.       28.       36.      628.30    632.50

3470 ENCROACHMENT STATIONS=      175.0      255.0  TYPE=      1  TARGET=       80.000
 14126.00     10.24    632.54      0.00    632.54    632.55      0.02      3.58      0.00    625.30
     300       134.       79.       87.      172.       56.      101.      105.       44.    625.30
     1.40      0.78      1.41      0.86     0.050     0.040     0.050     0.000    622.30    175.00
 0.000129      346.      346.      346.         1         0         0      0.00     80.00    255.00

XSECNO 14250.000

3470 ENCROACHMENT STATIONS=       70.0      280.0  TYPE=      1  TARGET=      210.000
 14250.00     10.15    632.55      0.00    632.55    632.57      0.02      0.01      0.00    631.10
     300.       42.      258.        0.      133.      224.        0.      106.       44.    633.40
     1.43      0.31      1.15      0.00     0.050     0.040     0.050     0.000    622.40     70.00
 0.000109      100       100.      100.         2         0         0      0.00    169.25    239.25

CCHV=   0.100 CEHV=   0.300
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   SECNO     DEPTH     CWSEL     CRIWS     WSELR     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

XSECNO 15500.000
 2800 NAT Q1=    385.22  WSFL=    632.61  ENC Q1=    383.22  WSFL=    632.71  RATIO=  0.0000
 NAT Q1=    416   RATIOS LOB,CH,ROB=  0.4436  0.3310  0.2255  WSEL=    632.71
3280 CROSS SECTION  15500.00 EXTENDED      0.72 FEET

3470 ENCROACHMENT STATIONS=     230.8     475.3  TYPE=     4  TARGET=       0.073
 15500.00     7.22   632.62     0.00   632.61   632.62     0.00     0.05     0.00   628.40
     150.      64.      55.      31.      314.     129.     137.     118.      49.   629.40
     2.43     0.21     0.43     0.22    0.050    0.045    0.050    0.000   625.40   230.85
 0.000017    1180.     950.    1180.        0        0        0     0.00   244.48   475.33

XSECNO 16450.000
 2830 NAT Q1=     47.46  WSFL=    632.62  ENC Q1=     50.02  WSFL=    632.72  RATIO= -0.0539
 NAT Q1=     50.  RATIOS LOB,CH,ROB=  0.0000  1.0000  0.0000  WSEL=    632.72

3470 ENCROACHMENT STATIONS=     363.0     404.0  TYPE=     4  TARGET=       0.000
 16450.00     3.93   632.63     0.00   632.62   632.68     0.06     0.05     0.02   634.40
     150.       0.     150.       0.       0.       79.       0.     125.      52.   634.70
     2.57     0.00     1.89     0.00    0.050    0.045    0.050    0.000   628.70   365.62
 0.000990      945      945.     945.        2        0        0     0.00    30.75   396.37

CCHV=   0.300 CEHV=   0.500
XSECNO 16500.000

3470 ENCROACHMENT STATIONS=     355.0     430.0  TYPE=     1  TARGET=      75.000
 16500.00     4.08   632.68     0.00   632.67   633.15     0.47     0.26     0.21   631.10
     150.      14.     107.      29.       4.       17.       8.     125.      52.   631.10
     2.57     3.33     6.19     3.39    0.050    0.035    0.050    0.000   628.60   392.00
 0.018129     100.     100.     100.        0        0        0     0.00    21.24   413.24

SPECIAL BRIDGE

CB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     0.00      1.39      2.50      0.00      5.00      0.00     19.60      0.00    628.60    628.60

XSECNO 16501.000
     3700.   BRIDGE STENCL=    355.00    STENCR=    430.00
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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    IUC       ICONT     CORAR     TOPWID      ENDST

6070,LOW FLOW BY NORMAL BRIDGE

EGPRS=     0.000  EGLWC=   633.153  ELLC=   633.600  PCWSE=   632.679  ELTRD=   636.300

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE,NRD= 10 MIN ELTRD=  636.30 MAX ELLC=  633.60

3470 ENCROACHMENT STATIONS=     350.0     435.0  TYPE=     1  TARGET=     85.000
 16501.00     5.73   634.33   632.19   634.33   635.33     1.00     1.91     0.26   631.10
     150.       0.     149.       1.       0.      19.      11.     125.      52.   631.10
     2.57     0.00     0.06     0.08    0.050    0.033    0.050    0.000   628.60   386.26
 0.070051      60.      60.      60.        6       15        0   -49.69    38.19   424.45

WSPCND 16530.000

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS=     350.0     450.0  TYPE=     1  TARGET=    100.000
 16530.00     7.17   635.77     0.00   635.80   635.80     0.03     0.18     0.29   636.00
     150.       0.     150.       0.       0.     106.       0.     125.      53.   637.10
     2.59     0.00     1.42     0.00    0.050    0.055    0.050    0.000   628.50   390.23
 0.000521     100.     100.     100.        3        0        0     0.00    25.97   416.20
```

THIS RUN EXECUTED 28-APR-1987 13:17:53.35

HEC2 RELEASE DATED NOV 76 UPDATED MAR. 1982
ERROR CORR - 01,02,03,04,05
MODIFICATION - 50,51,52,53,54,55

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

100 - YEAR FREQUENCY

SUMMARY PRINTOUT TABLE 150

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10KKS	VCH	AREA	.01K
6500.000	0.00	0.00	0.00	605.20	2300.00	614.20	0.00	614.39	6.44	4.68	689.78	906.23
6500.000	0.00	0.00	0.00	605.20	2300.00	614.30	0.00	614.48	5.98	4.55	706.57	940.37
7700.000	1200.00	0.00	0.00	607.20	2300.00	615.43	0.00	615.84	26.43	6.51	678.78	447.36
7700.000	1200.00	0.00	0.00	607.20	2300.00	615.45	0.00	615.86	25.86	6.46	684.92	452.30
7750.000	100.00	0.00	0.00	606.90	2300.00	615.61	615.47	616.94	52.79	11.17	378.56	316.56
7750.000	100.00	0.00	0.00	606.90	2300.00	615.63	615.47	616.94	52.12	11.12	381.49	318.58
7751.000	26.00	616.10	613.80	606.90	2300.00	616.74	0.00	617.30	22.44	7.93	623.62	485.55
7751.000	26.00	616.10	613.80	606.90	2300.00	617.05	0.00	617.49	17.79	7.21	696.88	545.29
7800.000	200.00	0.00	0.00	607.10	2300.00	617.57	0.00	617.78	9.87	4.66	916.66	732.23
7800.000	200.00	0.00	0.00	607.10	2300.00	617.65	0.00	617.88	9.98	4.72	815.00	727.89
8250.000	470.00	0.00	0.00	608.70	2300.00	617.99	0.00	618.05	2.49	2.49	1402.56	1458.21
8250.000	470.00	0.00	0.00	608.70	2300.00	618.08	0.00	618.14	2.39	2.46	1420.79	1487.96
8680.000	430.00	0.00	0.00	610.30	570.00	618.13	0.00	618.15	1.43	1.57	609.81	476.15
8680.000	430.00	0.00	0.00	610.30	570.00	618.21	0.00	618.23	1.35	1.54	621.41	489.85
9450.000	545.00	0.00	0.00	612.10	570.00	617.99	0.00	618.78	104.94	7.12	80.06	55.64
9450.000	545.00	0.00	0.00	612.10	570.00	618.09	0.00	618.83	97.25	6.92	82.36	57.80
9500.000	100.00	0.00	0.00	613.00	570.00	619.16	0.00	619.50	47.15	5.03	131.20	83.01
9500.000	100.00	0.00	0.00	613.00	570.00	619.18	0.00	619.52	46.43	5.01	132.16	83.65
9501.000	80.00	620.70	619.00	613.00	570.00	619.95	0.00	620.17	27.04	4.15	177.50	109.62
9501.000	80.00	620.70	619.00	613.00	570.00	619.98	0.00	620.19	26.48	4.12	179.52	110.78
9625.000	150.00	0.00	0.00	612.30	390.00	620.35	0.00	620.51	18.02	3.37	156.18	91.89
9625.000	150.00	0.00	0.00	612.30	390.00	620.37	0.00	620.53	17.61	3.34	158.73	92.94

SFCND	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10KXS	VCH	AREA	.01K
9750.000	150.00	0.00	0.00	614.30	390.00	620.81	0.00	621.24	87.36	6.73	87.87	41.73
9750.000	150.00	0.00	0.00	614.30	390.00	620.82	0.00	621.24	86.37	6.70	88.39	41.96
9751.000	116.00	625.10	618.80	614.30	390.00	625.08	0.00	625.08	1.00	1.04	697.87	390.95
9751.000	116.00	625.10	618.80	614.30	390.00	625.08	0.00	625.08	0.99	1.04	698.01	391.05
9800.000	100.00	0.00	0.00	614.10	390.00	625.08	0.00	625.09	0.42	0.74	872.45	601.36
9800.000	100.00	0.00	0.00	614.10	390.00	625.09	0.00	625.09	0.42	0.74	872.62	601.49
10700.000	735.00	0.00	0.00	617.00	390.00	625.11	0.00	625.20	7.48	2.52	184.38	142.62
10700.000	735.00	0.00	0.00	617.00	390.00	625.11	0.00	625.20	7.48	2.52	184.41	142.64
10750.000	150.00	0.00	0.00	616.90	390.00	625.21	0.00	625.41	21.20	4.29	143.12	84.71
10750.000	150.00	0.00	0.00	616.90	390.00	625.21	0.00	625.41	21.19	4.29	143.15	84.73
10751.000	85.00	629.80	624.40	616.90	390.00	627.98	0.00	628.00	1.71	1.51	510.51	298.10
10751.000	85.00	629.80	624.40	616.90	390.00	627.98	0.00	628.00	1.71	1.51	510.61	298.16
10800.000	225.00	0.00	0.00	616.50	490.00	628.02	0.00	628.06	2.50	1.74	488.09	309.88
10800.000	225.00	0.00	0.00	616.50	490.00	628.02	0.00	628.06	2.50	1.74	488.24	309.95
11480.000	485.00	0.00	0.00	616.50	490.00	628.15	0.00	628.18	2.11	1.61	575.09	337.38
11480.000	485.00	0.00	0.00	616.50	490.00	628.15	0.00	628.18	2.11	1.61	575.26	337.45
12450.000	850.00	0.00	0.00	620.40	490.00	628.44	0.00	628.55	10.57	3.08	271.07	150.71
12450.000	850.00	0.00	0.00	620.40	490.00	628.44	0.00	628.55	10.57	3.08	271.17	150.75
12500.000	50.00	0.00	0.00	619.50	490.00	628.57	0.00	628.57	1.05	0.91	862.65	477.19
12500.000	50.00	0.00	0.00	619.50	490.00	628.57	0.00	628.57	1.05	0.91	862.74	477.27
12501.000	1.00	626.50	630.80	619.50	490.00	628.57	0.00	628.57	1.79	0.54	810.24	365.81
12501.000	1.00	626.50	630.80	619.50	490.00	628.57	0.00	628.57	1.78	0.53	811.78	366.85
12502.000	98.00	626.50	630.80	619.50	490.00	628.59	0.00	628.59	1.75	0.53	816.83	370.29
12502.000	98.00	626.50	630.80	619.50	490.00	628.59	0.00	628.59	1.75	0.53	816.91	370.34
12503.000	1.00	0.00	0.00	619.50	490.00	628.59	0.00	628.59	1.02	0.89	871.41	484.62
12503.000	1.00	0.00	0.00	619.50	490.00	628.59	0.00	628.59	1.02	0.89	871.47	484.67
12550.000	50.00	0.00	0.00	619.50	400.00	628.55	0.00	628.62	5.01	2.25	261.42	178.73
12550.000	50.00	0.00	0.00	619.50	400.00	628.55	0.00	628.62	5.01	2.25	261.46	178.74
13300.000	700.00	0.00	0.00	621.20	400.00	628.69	0.00	628.70	0.42	0.76	678.55	613.92
13300.000	700.00	0.00	0.00	621.20	400.00	628.69	0.00	628.70	0.42	0.76	678.57	613.95
14075.000	620.00	0.00	0.00	622.80	300.00	628.70	0.00	628.78	7.48	2.30	130.71	109.71
14075.000	620.00	0.00	0.00	622.80	300.00	628.70	0.00	628.78	7.48	2.30	130.72	109.72
14125.000	50.00	0.00	0.00	622.30	300.00	628.65	0.00	628.98	40.64	5.53	77.99	47.06
14125.000	50.00	0.00	0.00	622.30	300.00	628.65	0.00	628.98	40.63	5.53	77.99	47.06

SFCNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10KWS	VCH	AREA	.01K
14126.000	346.00	632.50	628.30	622.30	300.00	632.54	0.00	632.55	1.29	1.41	328.79	264.40
14126.000	346.00	632.50	628.30	622.30	300.00	632.54	0.00	632.55	1.29	1.41	328.80	264.40
14200.000	100.00	0.00	0.00	622.40	300.00	632.55	0.00	632.57	1.09	1.15	357.33	287.67
14250.000	100.00	0.00	0.00	622.40	300.00	632.55	0.00	632.57	1.09	1.15	357.34	287.68
15300.000	950.00	0.00	0.00	625.40	150.00	632.61	0.00	632.61	0.15	0.40	741.57	385.22
15300.000	950.00	0.00	0.00	625.40	150.00	632.62	0.00	632.62	0.17	0.43	580.20	365.17
16450.000	945.00	0.00	0.00	628.70	150.00	632.62	0.00	632.68	9.99	1.90	79.11	47.46
16450.000	945.00	0.00	0.00	628.70	150.00	632.63	0.00	632.68	9.90	1.89	79.37	47.67
16500.000	100.00	0.00	0.00	628.60	150.00	632.67	0.00	633.15	183.44	6.22	29.91	11.07
16500.000	100.00	0.00	0.00	628.60	150.00	632.68	0.00	633.15	181.29	6.19	30.06	11.14
16501.000	60.00	636.30	633.60	628.60	150.00	634.33	632.19	635.36	708.53	8.11	18.50	5.64
16501.000	60.00	636.30	633.60	628.60	150.00	634.33	632.19	635.33	700.51	8.06	29.33	5.67
16550.000	100.00	0.00	0.00	628.60	150.00	635.80	0.00	635.83	5.11	1.41	106.56	66.33
16550.000	100.00	0.00	0.00	628.60	150.00	635.77	0.00	635.80	5.21	1.42	105.81	65.70

100 - YEAR FREQUENCY

SUMMARY PRINTOUT TABLE 150

SFCNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
6500.000	2300.00	614.20	0.00	0.00	0.00	167.66	0.00
6500.000	2300.00	614.30	0.10	0.00	0.10	168.08	0.00
7700.000	2300.00	615.43	0.00	1.23	0.00	270.00	1200.00
7700.000	2300.00	615.45	0.02	1.15	0.02	270.00	1200.00
7750.000	2300.00	615.61	0.00	0.18	0.00	166.27	100.00
7750.000	2300.00	615.63	0.02	0.17	0.02	168.03	100.00
7751.000	2300.00	616.74	0.00	1.13	0.00	236.00	26.00
7751.000	2300.00	617.05	0.31	1.43	0.31	236.00	26.00
7800.000	2300.00	617.57	0.00	0.83	0.00	277.37	200.00
7800.000	2300.00	617.65	0.08	0.59	0.08	183.51	200.00
8250.000	2300.00	617.99	0.00	0.42	0.00	200.00	470.00
8250.000	2300.00	618.08	0.09	0.43	0.09	200.00	470.00
8680.000	570.00	618.13	0.00	0.13	0.00	135.00	430.00
8680.000	570.00	618.21	0.09	0.13	0.09	135.00	430.00
9450.000	570.00	617.99	0.00	-0.13	0.00	23.07	545.00
9450.000	570.00	618.09	0.09	-0.13	0.09	23.38	545.00
9500.000	570.00	619.16	0.00	1.17	0.00	42.07	100.00
9500.000	570.00	619.18	0.02	1.10	0.02	43.02	100.00
9501.000	570.00	619.95	0.00	0.79	0.00	75.13	80.00
9501.000	570.00	619.98	0.03	0.79	0.03	75.25	80.00
9620.000	390.00	620.35	0.00	0.40	0.00	133.98	150.00
9620.000	390.00	620.37	0.02	0.40	0.02	135.82	150.00
9750.000	390.00	620.81	0.00	0.46	0.00	54.52	150.00
9750.000	390.00	620.82	0.01	0.45	0.01	54.84	150.00
9751.000	390.00	625.08	0.00	4.27	0.00	280.00	116.00
9751.000	390.00	625.08	0.00	4.26	0.00	280.00	116.00
9800.000	390.00	625.08	0.00	0.01	0.00	350.00	100.00
9800.000	390.00	625.09	0.00	0.01	0.00	350.00	100.00
10700.000	390.00	625.11	0.00	0.02	0.00	74.39	735.00
10700.000	390.00	625.11	0.00	0.02	0.00	74.40	735.00
10750.000	390.00	625.21	0.00	0.11	0.00	65.92	150.00
10750.000	390.00	625.21	0.00	0.11	0.00	65.93	150.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
10751.000	390.00	627.98	0.00	2.77	0.00	200.00	85.00
10751.000	390.00	627.98	0.00	2.77	0.00	200.00	85.00
10800.000	490.00	628.02	0.00	0.04	0.00	329.43	225.00
10800.000	490.00	628.02	0.00	0.04	0.00	329.45	225.00
11480.000	490.00	628.15	0.00	0.13	0.00	437.30	485.00
11480.000	490.00	628.15	0.00	0.13	0.00	437.32	485.00
12450.000	490.00	628.44	0.00	0.29	0.00	380.06	850.00
12450.000	490.00	628.44	0.00	0.29	0.00	380.15	850.00
12500.000	490.00	628.57	0.00	0.13	0.00	500.00	50.00
12500.000	490.00	628.57	0.00	0.13	0.00	500.00	50.00
12501.000	490.00	628.57	0.00	0.00	0.00	500.00	1.00
12501.000	490.00	628.57	0.00	0.00	0.00	500.00	1.00
12502.000	490.00	628.59	0.00	0.02	0.00	500.00	98.00
12502.000	490.00	628.59	0.00	0.02	0.00	500.00	98.00
12503.000	490.00	628.59	0.00	0.00	0.00	500.00	1.00
12503.000	490.00	628.59	0.00	0.00	0.00	500.00	1.00
12550.000	400.00	628.55	0.00	-0.04	0.00	338.13	50.00
12550.000	400.00	628.55	0.00	-0.04	0.00	338.29	50.00
13300.000	400.00	628.69	0.00	0.14	0.00	188.17	700.00
13300.000	400.00	628.69	0.00	0.14	0.00	188.17	700.00
14075.000	300.00	628.70	0.00	0.01	0.00	36.17	620.00
14075.000	300.00	628.70	0.00	0.01	0.00	36.17	620.00
14125.000	300.00	628.65	0.00	-0.05	0.00	32.90	50.00
14125.000	300.00	628.65	0.00	-0.05	0.00	32.90	50.00
14126.000	300.00	632.54	0.00	3.89	0.00	80.00	346.00
14126.000	300.00	632.54	0.00	3.89	0.00	80.00	346.00
14250.000	300.00	632.55	0.00	0.01	0.00	169.25	100.00
14250.000	300.00	632.55	0.00	0.01	0.00	169.25	100.00
15500.000	150.00	632.61	0.00	0.07	0.00	553.86	950.00
15500.000	150.00	632.62	0.00	0.07	0.00	244.49	950.00
16450.000	150.00	632.62	0.00	0.01	0.00	30.70	945.00
16450.000	150.00	632.63	0.01	0.01	0.01	30.75	945.00
16500.000	150.00	632.67	0.00	0.05	0.00	21.17	100.00
16500.000	150.00	632.68	0.01	0.05	0.01	21.24	100.00

SECNO	Q	CUSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
16501.000	150 00	634.33	0.00	1.66	0.00	38.29	60.00
16501.000	150 00	634.33	-0.01	1.65	-0.01	38.19	60.00
16550.000	150.00	635.50	0.00	1.46	0.00	26.06	100.00
16550.000	150.00	635.77	-0.03	1.44	-0.03	25.97	100.00

SUMMARY OF ERRORS AND SPECIAL NOTES

THIS RUN EXECUTED 28-APR-1987 13:18:21.10

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HEC2 RELEASE DATED NOV 76 UPDATED MAR. 1982
ERROR COVR -  01,02,03,04,05
MODIFICATION -  50,51,52,53,54,55
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THE SNAKE CREEK BASIN

(Part of the Stormwater Management Study for the City of Midland, by McNamee, Porter & Seeley, Engineers and Architects, Ann Arbor, Michigan)

Federal Emergency Management Agency

Washington, D.C. 20472

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Community No.
260140

APR 29 1985

Honorable Joseph R. Mann
Mayor, City of Midland
City Hall
202 Ashman
Midland, Michigan 48640

Dear Mayor Mann:

This is in response to a letter dated October 31, 1984 from Mr. James H. Schroeder, City of Midland Planning Director, requesting that the Federal Emergency Management Agency (FEMA) revise the currently effective Flood Insurance Study (FIS) for the City of Midland, Midland and Bay Counties, Michigan. To support his request, Mr. Schroeder submitted a report entitled, "The Snake Creek Basin," which is a portion of the "Stormwater Management Study" prepared for the City of Midland by McNamee, Porter & Seeley.

Based on our review of the data submitted and subsequent discussion with Mr. Bruce Menerey of the Michigan Department of Natural Resources (DNR), it appears that the Base Flood Elevations on Snake Creek may need to be revised. However, additional information will be needed before we can proceed further with this revision request. Specifically, we will require the DNR's review and approval of the revised hydrologic analysis for Snake Creek and a revised floodway analysis for Snake Creek. A copy of FEMA's "Conditions and Criteria for Map Revisions" and "Conditions and Criteria for Floodway Revisions" has been enclosed for your use.

Further processing of this revision request has been suspended pending receipt of the above-mentioned data. If you have any further questions, please contact the Chief, Natural and Technological Hazards Division of FEMA in Chicago, Illinois at (312) 353-0757 or Mr. Daniel Cotter of our Central Office staff in Washington, D.C., at (202) 646-2757.

Sincerely,

John L. Matticks
Acting Chief, Risk Studies Division
Federal Insurance Administration

Enclosures

CONTENTS

From Midland Stormwater Management Study
by McNamee, Porter and Seeley, Ann Arbor, MI

Snake Creek Profile

Methodology C-10 - C-16

Hydrology Model
Flood Hydrograph Package D-92 - D-148
HEC-1

Water Surface Profiles HEC-2 E- 3 - E-25

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     2.75      0 00      1.90      0.00      .050      .045      .050      041   628.70   365.64
  .000999      945       945       945.        2         0         0     0.00    30 70   396 34


CCHV=      300 CEHV=      500
*SECNO 16500 000

3470 ENCROACHMENT STATIONS=      355 0      430.0  TYPE=      1  TARGET=       75.000
 16500 00      4 07    632 67     0.00      0 00    633 15      .48       .26       .21   631.10
     150.       14.      107.      29         4.        17        8.      129.       61.    631 10
     2.75      3.34      6.22     3 40      .050       055      .050      .041   628 60   392.02
  .018344      100.      100.      100.        0         0         0     0.00    21.17   413.19


SPECIAL BRIDGE

SB  XK         XKOR       COFQ       RDLEN      BWC        BWP        BAREA      SS         ELCHU      ELCHD
     0 00       1 39       2 50       0.00       5.00       0.00       19 60      0 00       628.60     628.60

*SECNO 16501 000

6070,LOW FLOW BY NORMAL BRIDGE

EGPRS=      0.000  EGLWC=    633.151  ELLC=    633.600  PCWSE=    632.671  ELTRD=    636.300

3301 HV CHANGED MORE THAN HVINS


3370 NORMAL BRIDGE,NRO= 10 MIN ELTRD=  636 30 MAX ELLC=  633.60


3470 ENCROACHMENT STATIONS=      350 0      435.0  TYPE=      1  TARGET=       85.000
 16501.00      5.73    634.33    632 19      0 00    635.36     1.02      1.93       .27   631.10
     150.        0.      150.        0         0       19.        0.      129.       61.    631.10
     2.76      0 00      8.11     0 00      .050      .055      .050      .042   628 60   386.23
   070853       60.       60        60         6        15         0    -60.86    38 29   424.51


*SECNO .16550 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      VLDB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST


3470 ENCROACHMENT STATIONS=      350.0      450.0  TYPE=      1  TARGET=      100.000
 16550 00      7.20    635.80     0 00      0 00    635 83      .03       .17       .30   636.00
     150.        0.      150        0.        0.      107.        0       129.       61     637.10
     2 78      0 00      1.41     0 00      .050      .055      .050      .042   628.60   390.20
  .000511      100.      100.      100.        3         0         0     0 00    26.06   416.27
```

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*************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
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*****************************************************
*  WATER SURFACE PROFILES                           *
*  VERSION OF NOVEMBER 1976                         *
*  UPDATED JULY 1979                                *
*                                                   *
*  RUN DATE  01/12/84  TIME .10.42 07.              *
*****************************************************
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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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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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E/A

*- 4 *- 4 &- 4f 1********** **********

E19

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*************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
*************************************************


C
T1      MIDLAND - CONSULTATION ON STORM SEWER DESIGN
T2      SNAKE CREEK AND SIEBERT DRAIN - CITY DATUM
T3      SUGNET RD. (W) TO SAGINAW RD. - EXISTING CONDITIONS

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

     -1        4.        0.        0.  0 000000     0.00      -1.0       0     619.300    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

NC        070       070       050       100       300       0.000     0.000     0.000     0.000     0.000
QT      3 000   450 000   780.000   570.000     0.000     0.000     0.000     0.000     0.000     0.000

        ***CONFLUENCE OF SNAKE CREEK AND SIEBERT DRAIN

X1    800 000     7 000   178.000   212.000    50 000    50.000    50.000     0.000     0.000     0.000
X3      0 000     0 000     0.000   100.000     0.000     0.000     0 000     0 000     0.000     0 000
GR    619 500     0 000   616 400    25.000   615 380   178.000   608.980   190.500   608.980   199.500
GR    614 480   212 000   615 000   320.000     0.000     0.000     0.000     0.000     0 000     0.000

X1    950.000     0 000     0.000     0 000   150 000   150.000   150.000     0 000     1.500     0.000

X1    951.000     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   614.440   615.690     0.000     0.000     0 000     0.000     0.000

X1    955 000     0 000     0 000     0.000     4 000     4.000     4.000     0.000     0.000     0 000
X2      0.000     0.000     0 000   614.440   615.690     0.000     0.000     0.000     0.000     0.000

X1    956 000     0.000     0.000     0.000     1 000     1.000     1.000     0.000     0 000     0.000

X1   1050 000     8.000   114 000   136.000    94.000    94 000    94.000     0.000     0 000     0.000
X3      0 000     0 000     0.000     0.000     0.000   150 000     0.000     0.000     0 000     0.000
GR    620 000     0 000   618.600    25 000   615.700    75.000   615.480   114.000   611.280   121.000
GR    611.280   129.000   615.980   136.000   616.500   268 000     0.000     0.000     0.000     0 000

X1   1100.000     7 000   125.000   155.000    50.000    50 000    50.000     0.000     0.000     0.000
GR    620 000     0 000   616.400    39 000   616.360   125 000   610.260   136.500   610.260   141 500
GR    618 360   155.000   620.000   172.000     0.000     0 000     0.000     0 000     0.000     0.000
```

X1	1247 000	7 000	60.000	85 000	147.000	147 000	147 000	0.000	0.000	0.000
GR	620 060	0.000	616 660	60 000	612.360	64.500	612.360	71.500	617.060	85 000
GR	618 660	145 000	620 000	161.000	0 000	0.000	0 000	0.000	0.000	0 000
X1	1248.000	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	615.770	616.600	0.000	0.000	0.000	0.000	0 000
X1	1252.000	0 000	0 000	0.000	4.000	4 000	4 000	0 000	0.000	0.000
X2	0 000	0.000	0 000	615 770	616.600	0.000	0.000	0.000	0.000	0.000
X1	1253.000	0.000	0 000	0.000	1.000	1.000	1.000	0 000	0 000	0.000
X1	1330.000	9 000	37.000	54.000	77.000	77.000	77.000	0.000	0.000	0.000
GR	620 000	0.000	619.260	7.000	616.460	37.000	612 560	41.000	612.560	47.000
GR	616.760	54.000	617 800	144.000	618 800	194.000	620 000	223.000	0.000	0.000
X1	1331 000	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	615.730	616.230	0.000	0.000	0.000	0.000	0 000
X1	1335 000	0 000	0 000	0 000	4 000	4.000	4 000	0.000	0 000	0.000
X2	0.000	0.000	0 000	615.730	616 230	0.000	0 000	0.000	0.000	0.000
X1	1336.000	0 000	0.000	0.000	1.000	1.000	1 000	0.000	0.000	0.000
X1	1600 000	8.000	15.000	55.000	264.000	264.000	264 000	0.000	0.000	0.000
GR	621.000	0.000	620.390	5.000	619 290	15.000	612.990	21.500	612.990	28.500
GR	618.090	35 000	619.790	55.000	621.000	71.000	0 000	.0.000	0.000	0.000
NC	0.000	0 000	0.000	.250	.500	0.000	0.000	0.000	0.000	0 000

***CRESCENT DR

X1	1807 000	4 000	0.000	17.000	207 000	207 000	207.000	0.000	0.000	0 000
GR	622 000	0 000	614 500	.100	614 500	16.900	622 000	17.000	0 000	0 000
SB	1.250	1.700	3 100	50.000	17.000	1.000	93.000	0 000	614.500	614.500
X1	1887 000	0.000	0.000	0.000	80.000	80 000	80.000	0.000	0.000	0 000
X2	0 000	0.000	1.000	620.330	622 000	0.000	0.000	0.000	0.000	0.000
NC	0 000	0 000	0 000	.100	.300	0.000	0.000	0 000	0.000	0.000
X1	2000.000	7 000	30 000	55 000	113 000	113.000	113.000	0.000	0.000	0.000
GR	622 000	0 000	621.440	30.000	614.640	34.500	614.640	49.500	618.140	52.000
GR	619 040	55 000	622 000	74.000	0 000	0.000	0.000	0.000	0 000	0 000
X1	2100 000	6 000	5 000	29 000	100 000	100 000	100 000	0.000	0.000	0 000
GR	622.000	0 000	619 540	5 000	613 740	13.000	613 740	21.000	621 340	29 000
GR	622 000	84 000	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

```
*PROF 1

CCHV=      100 CEHV=     .300
*SECNO 800 000
3280 CROSS SECTION     800 00 EXTENDED       4 30 FEET

   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       VRDB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICDNT     CORAR     TOPWID      ENDST


3470 ENCROACHMENT STATIONS=      100.0      320 0  TYPE=      1  TARGET=     -100.000

        ***CONFLUENCE OF SNAKE CREEK AND SIEBERT DRAIN

   800 00     10.32    619.30     0 00    619.30    619 31      .01      0.00      0.00    615.38
     570      108.      245.      217.      285       277.     492.       0.        0.      614.48
     0 00      .38       .88       .44      .070      .050     .070    0 000    608.98    100 00
  .000060     50.       50        50.        0         0        0      0.00    220.00    320.00


*SECNO 950 000
3280 CROSS SECTION     950 00 EXTENDED       2.81 FEET

   950.00     8 83     619.31     0 00      0.00    619.32      .01       .01       .00    616.88
     570.     119.      274       178       302.      226      331        3.        1.      615.98
      .05      .39      1.21       .54      .070      .050     .070      .050    610.48     13.64
   000148     150.      150.      150.        0         0        0      0 00    306.36    320.00


*SECND 951 000
3280 CROSS SECTION     951 00 EXTENDED       2.81 FEET


3370 NORMAL BRIDGE,NRD=   0 MIN ELTRD=  615.69 MAX ELLC=  614.44

   951.00     8 83     619.31     0.00      0 00    619 32      .01       .00       .00    616.88
     570      166.      156.      248       302.      190.     331.       3         1.      615.98
       05      .55       82        75       .070      .050     .070      .049    610.48     13.63
  .000289       1        1.        1          0         0        0    -35.47    306 37    320.00


*SECNO 955 000
3280 CROSS SECTION     955.00 EXTENDED       2.82 FEET  .


3370 NORMAL BRIDGE,NRD=   0 MIN ELTRD=  615.69 MAX ELLC=  614.44

   955 00     8.84     619.32     0 00      0.00    619.32      .01       00        .00    616.88
     570      166       156       248       303.      191      332.       3.        1       615.98
      .05       55       .82       .75      .070       050     .070       049    610.48     13.58
  .000287       4.        4.        4.        0         0        0    -35 47    306.42    320.00
```

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*SECNO 956 000
3280 CROSS SECTION    956.00 EXTENDED      2.82 FEET

   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

   956 00      8 83    619.31      0 00      0.00    619.33       .01       .00        00    616.88
     570       119.      273.      178.      303.      226       332        3.        1.     615.98
      05        .39      1 21       .53       070       050      .070      .049    610 48     13.58
   000147        1.        1.        1.         0         0         0      0.00    306.42    320.00

*SECNO 1050.000
3280 CROSS SECTION   1050.00 EXTENDED      2.82 FEET


3470 ENCROACHMENT STATIONS=          0      150 0  TYPE=      1  TARGET=      149.999
  1050 00      8.04    619 32      0 00      0.00    619.36       .04       .02       .01    615.48
     570       236.      295.       40       259.      146.       46.        5.        1.     615.98
      07         91      2.02       .85       070      .050       070      .049    611.28     12.06
  .000431        94.       94.       94.         1         0         0      0.00    137.94    150.00

*SECNO 1100 000
  1100 00      9 08    619 34      0 00      0.00    619.38       .03        02       .00    616.36
     570.      242       327         1       301.      183.        5.         5        2.     618.36
      08         80      1.79       .26       070      .050       070       049    610.26      7.18
  .000382        50.       50.       50.         1         0         0      0 00    157.95    165.13

*SECNO 1247.000
  1247 00      7.02    619.38      0 00      0 00    619 49       .11        09       .02    616.66
     570.       62.      414.       94.       65.      134.       94.        7.         2     617.06
      .10        .94      3.09       .99      .070      .050      .070      .049    612.36     11.95
   001307       147.      147.      147         2         0         0      0.00    141 68    153.63

*SECNO 1248 000

3370 NORMAL BRIDGE,NRO=  0 MIN ELTRD=  616 60 MAX ELLC=  615.77

  1248 00      7.07    619.43      0.00      0.00    619.50       .07       .00       .00    616.66
     570.      109.      294.      167.       68.      117.       98.        7.        2.     617 06
      10       1 61      2.51      1.71      .070      .050      .070      .049    612.36     11.13
   003739         1        1.        1.         2         0         0    -18 25    143.05    154.18

*SECNO 1252.000
   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
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3370 NORMAL BRIDGE,NRD=  0 MIN ELTRD=  616.60 MAX ELLC=  615 77

  1252 00     7 08   619 44     0.00     0.00   619.52       07      .01       00   616.66
     570      109      293.      168       68      117.      98.       7.       2.    617.06
      10     1 60     2.49     1.71     .070     .050      070     .049   612 36    10.95
  003688       4.        4        4        0        0        0   -18.25   143 35   154.30


*SECNO 1253.000
  1253 00     7.06   619.42     0 00     0.00   619 53      .11       00      .01   616.66
     570.      63.      411      96.      67.     135.      97.       7.       2.    617 06
     .10      .93     3.04      .99     .070     .050      070     .049   612 36    11.28
  001256        1        1        1.        2        0        0     0.00   142.81   154 09


*SECNO 1330.000
  1330 00     7 00   619 56     0.00     0.00   619.62      .05       08      .01   616.46
     570      46.      248      276.      52.      97      276        7.       2     616 76
      11      .90     2 57     1 00     .070     .050     .070      049   612.56     4 14
  000899       77      77.      77.        2        0        0     0.00   208.28   212.42


*SECNO 1331 000

3370 NORMAL BRIDGE,NRD=  0 MIN ELTRO=  616 23 MAX ELLC=  615.73

  1331 00     7 03   619.59     0.00     0.00   619.62      .03       00      .00   616.46
     570      61.      144.      365       52      89.     280.       7.       2.    616.76
     .11     1 17     1.61     1 30     .070     .050      070     .049   612.56     3.88
  001499        1        1        1.        2        0        0    -7.60   209 20   213 08


*SECNO 1335 000

3370 NORMAL BRIDGE,NRD=  0 MIN ELTRD=  616.23 MAX ELLC=  615.73

  1335 00     7 04   619 60     0.00     0.00   619 62      .03      .01      .00   616.46
     570      61.      144      365.      53.      89.     281.       7        2.    616 76
      11     1 17     1 61     1 30     .070     .050     .070      049   612 56     3 84
  001489        4        4.        4        0        0        0    -7 60   209 36   213 20


*SECNO 1336 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


  1336 00     7.02   619 58     0.00     0 00   619 63      .05      .00      .01   616.46
     570      47       246.      278.      52.      97.     280.       7.       2     616.76
      11      .89     2 53      .99     .070     .050     .070     .049   612 56     3 88
  000869        1        1.        1        1        0        0     0.00   209 19   213 08


*SECNO 1600.000
  1600 00     6 88   619.87     0 00     0 00   620.22      .35       50      .09   619.29
     570.        1      569.        0        2.     119.       0.       9.       3.    619.79
      13       77     4.77      .02     .070     .050     .070     .049   612.99     9.72
  006913      264      264.      264.        2        0        0     0.00    46.34    56.06
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CCHV=     .250 CEHV=      500
*SECND 1807 000

        ***CRESCENT DR.

  1807 00      6 58   621.08      0 00      0.00   621.49       .41      1.23       .03   622.00
     570         0.     570.         0         0.      111        0.       10         3.    622 00
      14      0.00     5 13      0.00      .070      050      .070      .049   614.50       01
   005199      207.     207.      207.         2        0         0      0.00    16.98    16.99


SPECIAL BRIDGE

SB  XK         XKOR       COFQ       RDLEN      BWC        BWP        BAREA      SS         ELCHU      ELCHD
     1 25       1.70       3.10      50.00      17.00       1.00      93.00      0.00      614.50     614.50

*SECNO 1887 000
PRESSURE AND WEIR FLOW

 EGPRS      EGLWC      H3       QWEIR      QPR       BAREA    TRAPEZOID      ELLC      ELTRD
                                                                 AREA
   622 07     621 55      .08         2.       567.       93        93.       620.33     622.00

  1887 00      7 22   621.72      0 00      0.00   622.06       .34       .57      0.00   622.00
     570         0.     570.         0         0      122.        0.       10.        3.    622.00
      14      0 00     4.67      0 00       070      050       070      .049   614.50       .00
  .004022       80.      80.       80         2        0         2      0.00    16.99    17 00

CCHV=     .100 CEHV=      300
*SECNO 2000 000
3280 CROSS SECTION   2000.00 EXTENDED        17 FEET

  2000 00      7 53   622 17      0.00      0.00   622.33       .17       .26       .02   621.44
     570         6      529.       35.        13      157        31        10         4.    619 04
      .15        47     3.38      1.12       070     .050      .070      .049   614.64      0.00
   001462       113      113       113         2        0         0      0.00    74.00    74.00

*SECNO 2100 000
3280 CROSS SECTION   2100.00 EXTENDED       .30 FEET

   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

  2100.00      8 56   622 30      0.00      0 00   622.49       .19       .15       .01   619.54
     570         8      541.       21         8.      152.       35.       11.        4    621.34
      .16      1 00     3 56       .62      .070      050      .070      .049   613 74      0.00
  .001572       100      100.      100         2        0         0      0.00    84.00    84 00
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*****************************************************
*  WATER SURFACE PROFILES                           *
*  VERSION OF NOVEMBER 1976                         *
*  UPDATED JULY 1979                                *
*                                                   *
*  RUN DATE  01/12/84  TIME  10 42.38               *
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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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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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E26

- 4 - 4 - 4F 1**********

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*************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
*************************************************

T1      MIDLAND CONSULTATION ON STORM SEWER DESIGN
T2      MEADOWBROOK DRAIN
T3      CONFLUENCE WITH ST  ANDREWS TO SAGINAW RD  - EXISTING CONDITIONS

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

     -1        4.        0.        0   0.000000      0 00      -1.0       0.   619 300     0.000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     1.000     0.000     0 000     0 000     0.000     0.000     0 000     0 000     0.000     0.000

NC       070       .070       .045        100        300      0.000      0.000      0.000      0.000      0 000
QT     3.000   180.000   430.000    610 000      0.000      0.000      0.000      0 000      0.000      0 000

X1    20 000     7 000   288 000    315 000      0.000      0 000      0 000      0.000      0 000      0 000
GR   616 100     0 000   615.150    288 000    610 450    297.000    610.450    303.000    613.650    312 000
GR   614 600   315.000   614 800    415 000      0 000      0 000      0.000      0.000      0.000      0 000

X1   200 000     9 000   118.000    142 000    180.000    180.000    180.000      0 000      0.000      0.000
GR   620 900     0 000   620 100     30 000    619.100     50 000    616 850    118.000    611.850    127.500
GR   611.850   132 500   616 050    142.000    617 300    210.000    619.000    230.000      0.000      0.000

X1   201.000     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    615 550    616 130      0.000      0.000      0.000      0.000      0.000

X1   208 000     0 000     0 000      0.000      8.000      8.000      8.000      0.000      0.000      0.000
X2     0.000     0.000     0.000    615.550    616.130      0.000      0.000      0.000      0.000      0.000

X1   209 000     0 000     0 000      0.000      1.000      1.000      1.000      0.000      0.000      0.000

X1   500.000    11 000    62.000    109.000    290.000    290.000    290.000      0.000      0.000      0 000
GR   622 000     0 000   621.000      9.000    620.000     15.000    619.000     25.000    618.000     37.000
GR   617 150    64 000   616 650     82 000    612 150     92 000    612.150     96.000    618.250    109.000
GR   619 550   114.000     0 000      0.000      0 000      0.000      0.000      0.000      0.000      0.000

X1   600 000     0 000     0.000      0.000    100.000    100.000    100.000      0.000       .500      0 000
SB     0 000     2 000     2.600    150.000      5 500      0.000     24.000      0 000    613.500    613.500

X1   730 000     0.000     0 000      0.000    130.000    130 000    130.000      0 000       .500      0 000
X2     0 000     0 000     1 000    619.000    623.800      0.000      0 000      0.000      0.000      0 000
NC     0 000     0.000     0 000       .100        300      0.000      0 000      0.000      0.000      0 000
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X1	1030 000	12 000	95.000	135 000	300.000	300.000	300.000	0 000	0.000	0 000
GR	625 000	15 000	624 000	55 000	623.000	80 000	622.000	95.000	614.800	102.000
GR	614 800	108.000	618 000	115 000	621 000	135.000	622.000	172.000	623.000	182.000
GR	624 000	200.000	625.000	208.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	2130 000	17 000	88 000	121 000	1100 000	1100.000	1100 000	0.000	0.000	0.000
GR	628.000	15.000	627 000	28.000	626.000	50.000	625.000	60 000	624.000	75 000
GR	623 000	88 000	622 000	95.000	620 000	96.000	618.800	98.000	618.800	102.000
GR	619 500	103 000	620 000	107.000	621.000	110.000	622.000	112.000	623.000	121.000
GR	624.000	158.000	629 000	195 000	0.000	0 000	0.000	0.000	0.000	0 000
NC	0 000	0.000	0 000	300	.500	0 000	0.000	0.000	0.000	0 000
X1	2510 000	0 000	0 000	0.000	380 000	380.000	380.000	0.000	1.000	0.000
SB	0.000	2.200	3.000	100.000	17.000	0 000	71.300	0.000	619 800	619.800
X1	2702 000	0 000	0.000	0.000	192 000	192.000	192.000	0.000	0.000	0 000
X2	0 000	0 000	1 000	625.300	626.300	0.000	0.000	0 000	0.000	0.000
NC	0 000	0.000	0 000	100	300	0.000	0.000	0.000	0.000	0.000
X1	2982 000	7 000	280.000	320.000	280.000	280.000	280 000	0.000	0.000	0.000
GR	629 400	0.000	628 900	200.000	627.000	280.000	621.200	288.000	621 200	302.000
GR	628.500	320.000	630.000	380 000	0.000	0.000	0.000	0.000	0 000	0.000
X1	3482 000	0 000	0 000	0 000	500.000	500.000	500.000	0.000	.500	0 000
EJ	0 000	0 000	0 000	0 000	0.000	0 000	0.000	0 000	0.000	0 000

F 7.9

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*PROF 1

CCHV=     .100 CEHV=      300
*SECNO 20 000
3280 CROSS SECTION      20 00 EXTENDED       4.50 FEET

   SECNO     OEPTH     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     8.85    619 30      0 00    619.30    619.30       .00      0.00      0 00    615.15
     610      318       135       157.     1058       192       460.        0         0.     614.60
     0 00      .30       .70       .34      .070      .045      .070     0 000    610.45      0 00
   000036       0.        0.        0.         0         0         0      0.00    415.00    415.00

*SECNO 200 000
3280 CROSS SECTION     200.00 EXTENDED         27 FEET

   200.00     7 42    619.27      0.00      0.00    619.34        07       .02       .02    616.85
     610.      59.      350.      201.       89.      134.      199         4.        1.     616 05
       03       67      2.60      1 01      .070       045       070       045    611.85     46.54
  .000700     180.      180.      180          2         0         0      0.00    183.46    230 00

*SECNO 201 000
3280 CROSS SECTION     201 00 EXTENDED        .31 FEET


3370 NORMAL BRIDGE,NRD=  0 MIN ELTRD=  616.13 MAX ELLC=  615 55

   201 00     7 45    619.30      0.00      0 00    619 34        04       .00       .00    616.85
     610       88      227.      295.       91       123      202.        4         1.     616.05
       03      .97      1.85      1 46      .070       045      .070      .045    611.85     45.90
   001446       1.        1         1.         2         0         0    -12 70    184.10    230.00

*SECNO 208 000
3280 CROSS SECTION     208.00 EXTENDED         31 FEET


3370 NORMAL BRIDGE,NRD=  0 MIN ELTRD=  616.13 MAX ELLC=  615.55

   208.00     7.47    619.32      0.00      0.00    619.35        04       .01        00    616.85
     610.      89      226.      295.       91       123      203.        4.        1.     616.05
       03       97      1.84      1.46      .070       045      .070      .044    611.85     45.73
   001430       8.        8.        8.         0         0         0    -12 70    184.27    230.00

*SECNO 209 000
3280 CROSS SECTION     209.00 EXTENDED        .31 FEET
```

E30

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QRDB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CDRAR	TOPWID	ENDST
209 00	7.45	619.30	0.00	0 00	619.36	.06	.00	.01	616.85
610	61	347.	202	91.	135	202	5	1.	616.05
03	.66	2.57	1 00	.070	.045	.070	044	611.85	45.82
000674	1	1	1	1	0	0	0 00	184 18	230.00

*SECNO 500 000
3280 CROSS SECTION 500 00 EXTENDED .00 FEET

500.00	7.40	619.55	0.00	0 00	619.64	09	.27	01	672 00
610	0	608.	2	0.	253.	3.	7.	2.	618.25
06	0 00	2 40	58	.070	.045	.070	.045	612.15	19 48
001375	290	290	290	2	0	0	0.00	94.52	114.00

*SECNO 600 000

600.00	7.05	619.70	0.00	0.00	619.81	.12	.17	.01	622.50
610.	0.	609.	1	0	222	2	7.	2.	618.75
07	0 00	2.74	57	.070	045	.070	.045	612 65	23 02
002024	100	100.	100.	2	0	0	0.00	89 63	112.65

SPECIAL BRIDGE

SB XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
0 00	2.00	2.60	150.00	5 50	0.00	24 00	0.00	613 50	613 50

*SECNO 730 000
3280 CROSS SECTION 730.00 EXTENDED 4.10 FEET

PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRO
639.76	620 64	0 00	308	303.	24.	30.	619.00	623.80
730 00	11.49	624.64	0.00	0 00	624 65	01	4 84	0.00	623.00
610.	0.	602.	8	0	675.	24	9.	3.	619.25
11	0 00	.89	.33	.070	.045	.070	.045	613.15	0.00
000067	130	130.	130	1	0	6	0.00	114 00	114 00

CCHV= 100 CEHV= .300
*SECNO 1030.000

1030 00	9 86	624.66	0 00	0 00	624.70	04	.04	.01	622.00
610	31.	471	108	70	264.	161.	13	4.	621.00
17	.45	1.78	.67	070	045	.070	.045	614.80	28.64
.000267	300.	300.	300	2	0	0	0.00	176.63	205.27

*SECNO 2130.000

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
2130 00	6 40	625.20	0 00	0.00	625 37	16	63	04	623.00
610	38	483.	89	33.	134	69.	22	7.	623.00
27	1 15	3.60	1 30	.070	045	.070	.045	618.80	57.94
.002004	1100	1100.	1100.	2	0	0	0.00	108 99	166.93

CCHV= 300 CEHV= 500

*SECNO 2510.000

2510.00	6 23	626.03	0 00	0.00	626.22	.19	.84	01	624 00
610.	33	496.	81.	28.	128.	60.	24.	8.	624.00
.30	1.19	3 86	1 35	.070	045	070	.045	619 80	59.73
.002456	380	380	380	2	0	0	0 00	105.87	165.60

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0 00	2 20	3.00	100 00	17.00	0.00	71.30	0.00	619.80	619.80

*SECNO 2702 000

PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
628 53	626.22	0 00	215	399	71.	94.	625 30	626.30
2702 00	7 21	627.01	0 00	0.00	627 10	.08	.88	0 00	624.00
610	59	433.	118	61.	161	108.	25.	9.	624.00
.32	97	2.69	1 09	.070	045	.070	.045	619.80	49.67
000882	192	192	192.	2	0	3	0.00	123.24	172.91

CCHV= .100 CEHV= .300

*SECNO 2982 000

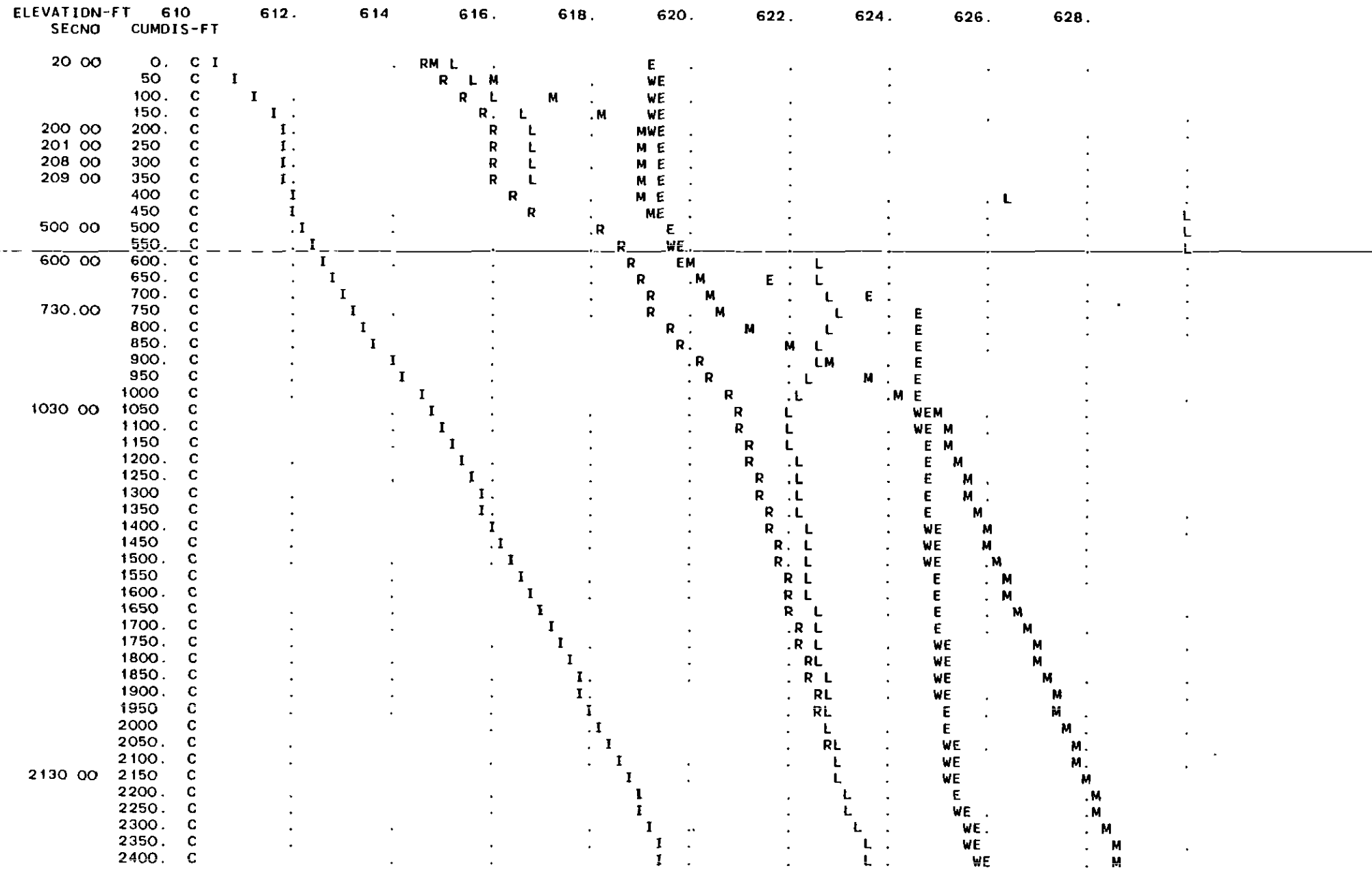
2982 00	6.08	627 28	0.00	0.00	627.52	.24	.37	05	627.00
610	0.	610	0.	2.	156.	0.	27.	9	628.50
34	28	3 90	0 00	.070	045	.070	.045	621.20	268.04
002272	280.	280	280	2	0	0	0 00	48.96	317.00

*SECNO 3482 000

3482 00	6.59	628.29	0.00	0.00	628.47	.18	.94	01	627.50
610	6.	604.	0	13.	175	0.	29.	10.	629.00
38	.45	3.45	0.00	.070	.045	070	.045	621.70	246.91
001594	500.	500	500	2	0	0	0.00	71.33	318.24

PROFILE FOR STREAM CONFLUENCE WITH ST. ANDR

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



```
          2450.  C          .         .         .         .         I         .         L.        WE        .   M     .
2510 00   2500.  C          .                                       I         .         L         WE            M     .
          2550.  C          .         .         .         .         I         .         L         .WE       .   M
          2600   C                    .                             I         .         L         .  E      .   M     .
          2650   C          .                   .                   I                   L         .   WE    .   M
2702 00   2700   C                                                  I         .         L         .    E    .   M
          2750.  C          .                                        I        .         .  LR     .    WE   .   M     .
          2800   C          .                                        .I       .         .    L  R .     E         M
          2850.  C          .                                        .  I     .         .       L . R   WE  .     M
          2900.  C          .         .         .         .         .   I                .         .L    WE        M   .
          2950.  C          .                                        .     I              .         .  L  WE  R      M  .
2982.00   3000.  C                                  .                        I   .         .              LW E    R   M
          3050   C                                                           I           .         .    L WE .  R   M  .
          3100   C          .         .                                .     I   .         .         .    L W E   R    M
          3150.  C                                                   .      I  .         .               L WE.  R    M .
          3200.  C                    .                              .      I  .         .               L WE.  R    M .
          3250   C          .         .                              .      I            .         .     L  WE   R   M
          3300   C                                        .          .       I                          L  WE   R    M
          3350.  C                                                   .       I .                         L  WE  R    M.
          3400   C                                                   .       I            .         .      L  WE  R    M.
          3450   C                                                           I .          .         .      L  .WE  R   M
3482.00   3500   C                                                   .        I                   .       L .WE  R    M
```

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*************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
*************************************************
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F.35

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*****************************************************
*  WATER SURFACE PROFILES                           *
*  VERSION OF NOVEMBER 1976                         *
*  UPDATED JULY 1979                                *
*                                                   *
*  RUN DATE  01/12/84  TIME .10.45.15.              *
*****************************************************
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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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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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F.36

- 4 - 4 - 4F 1**********

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*************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
*************************************************

T1      MIDLAND CONSULTATION ON STORM SEWER DESIGN
T2      ST. ANDREWS DRAIN
T3      CONFLUENCE WITH SIEBERT TO ST. ANDREWS RD. - EXISTING CONDITIONS

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

     -1.       5.        0.        0   0.000000      0.00     -1.0       0.   619 300    0 000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     1 000     0 000     0.000     0 000     0.000     0.000     0.000     0.000     0.000     0.000

NC       070       .070       050       100       .300      0.000     0.000     0.000     0.000     0 000
QT     4 000   500 000  1100 000   650.000  1500 000     0.000     0.000     0.000     0.000     0.000

X1    20 000    12 000   312.000   347 000     0.000     0.000     0.000     0.000     0 000     0.000
GR   619 000     0.000   616.000    35.000   615.400   135 000   614.900   235.000   615.050   312.000
GR   614 150   322 000   608.250   331 500   608.250   338.500   615.150   347.000   614 900   435.000
GR   614 800   535.000   619.200   560 000     0.000     0 000     0.000     0.000     0 000     0.000

X1   175 000    13 000   234 000   310.000   155.000   155.000   155.000     0.000     0.000     0 000
GR   619 000     0 000   618 200    30.000   616 700    50.000   615.000   150 000   615.050   234.000
GR   609 750   246 500   609.750   253.500   614 050   266.000   615 350   290.000   616 200   306 000
GR   617 050   310 000   618.300   337.000   619.100   340.000     0.000     0.000     0 000     0.000

X1   176 000     0 000     0 000     0 000     1.000     1 000     1 000     0.000     0.000     0 000
BT     2.000   234 000   615.770   614 850   290.000   615.770   614.850     0.000     0.000     0.000

X1   180 000     0 000     0 000     0 000     4.000     4 000     4 000     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
QT     4 000   320 000   740 000   360.000   980.000     0.000     0 000     0 000     0.000     0.000

X1   250 000     0 000     0.000     0 000    70 000    70.000    70.000     0.000     0.000     0 000

X1   390 000     0 000     0.000     0 000   140 000   140.000   140.000     0.000       500     0.000

X1   391 000     0 000     0.000     0.000     1.000     1 000     1 000     0.000     0.000     0 000
BT     2 000   234.000   616.590   616.010   290 000   616.590   616.010     0 000     0.000     0 000

X1   395 000     0 000     0.000     0.000     4 000     4.000     4.000     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
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X1	396 000	0.000	0 000	0.000	1.000	1 000	1.000	0.000	0.000	0 000
X1	463 000	6 000	60 000	96.000	67 000	67.000	67 000	0.000	0.000	0 000
GR	617 610	0.000	615 510	60.000	610.610	77 000	610 610	83.000	615.610	96.000
GR	617.610	230 000	0.000	0.000	0.000	0 000	0.000	0 000	0.000	0.000
X1	468.000	7 000	60 000	96.000	5.000	5.000	5.000	0.000	0.000	0 000
GR	617.610	0.000	615 510	60.000	615.000	63.000	610.610	80.000	610 610	83.000
GR	615.610	96 000	617.610	230.000	0 000	0.000	0.000	0 000	0.000	0 000
X1	473.000	6.000	60.000	96.000	5.000	5.000	5.000	0.000	0.000	0.000
GR	617.610	0 000	615.510	60.000	610 610	77.000	610.610	83 000	615.610	96 000
GR	617 610	230.000	0.000	0.000	0.000	0 000	0.000	0.000	0.000	0.000
X1	556 000	0.000	0.000	0.000	83.000	83.000	83.000	0.000	-.600	0.000
X1	557 000	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	615 310	616 020	0.000	0.000	0.000	0.000	0 000
X1	561 000	0 000	0 000	0 000	4.000	4.000	4.000	0 000	0 000	0.000
X2	0 000	0 000	0.000	615.310	616 020	0 000	0.000	0 000	0 000	0 000
X1	562 000	0.000	0 000	0.000	1.000	1 000	1.000	0 000	0.000	0 000
X1	600 000	6.000	85 000	115.000	38.000	38.000	38.000	0.000	0.000	0.000
GR	617 610	0 000	616.310	85.000	609.810	96.500	609.810	103 500	616.010	115.000
GR	618 110	250.000	0 000	0.000	0.000	0 000	0 000	0.000	0.000	0.000
X1	676 000	0 000	0 000	0.000	76.000	76 000	76.000	0 000	400	0 000
X1	677.000	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	615.510	616 510	0 000	0.000	0.000	0.000	0.000
X1	681.000	0 000	0.000	0.000	4.000	4.000	4.000	0.000	0.000	0.000
X2	0 000	0 000	0 000	615.510	616 510	0.000	0.000	0.000	0.000	0.000
X1	682 000	0 000	0.000	0 000	1.000	1.000	1 000	0.000	0.000	0.000
QT	4.000	300.000	680.000	300.000	980.000	0.000	0.000	0 000	0.000	0.000
X1	800 000	7.000	45 000	76.000	118.000	118.000	118 000	0.000	0.000	0.000
GR	618 410	0.000	615 710	45.000	611.210	57.000	611.210	63.000	615.510	68.000
GR	618 810	76 000	621.110	100.000	0.000	0.000	0 000	0.000	0.000	0.000
NC	0 000	0.000	0.000	.200	.400	0.000	0.000	0.000	0.000	0.000
X1	900 000	7 000	45 000	67.000	100.000	100 000	100.000	0.000	0.000	0 000
GR	618 800	0 000	615.500	45 000	611 000	57.000	611.000	63 000	615.300	67.000

GR	615.300	76.000	618.300	110.000	0.000	0.000	0.000	0.000	0.000	0.000
SB	0 000	1.400	2 600	0.000	10.000	0 000	60 000	0.000	611 100	611 100
X1	939 000	0 000	0.000	0 000	39 000	39 000	39.000	0.000	0.000	0.000
X2	0 000	0 000	1.000	617.000	619 200	0 000	0.000	0.000	0.000	0.000
BT	4.000	0.000	619.600	618.800	57 000	619.200	617.000	63.000	619.200	617 000
BT	110 000	619 600	618.300	0.000	0.000	0.000	0.000	0.000	0 000	0 000
NC	0 000	0 000	0.000	100	300	0 000	0.000	0.000	0.000	0 000
X1	1100.000	6 000	138 000	167.000	160.000	160.000	160.000	0.000	0.000	0.000
GR	618 030	0 000	615.830	138.000	611 830	146.000	611.830	154 000	616.530	167 000
GR	618 030	200 000	0 000	0.000	0.000	0 000	0.000	0.000	0 000	0 000
X1	1400 000	5 000	24 000	55.000	300 000	300.000	300 000	0.000	0.000	0 000
GR	618 030	0.000	617.430	24 000	611.530	35 500	611.530	44.500	618.030	55.000
X1	1700 000	4.000	0.000	30.000	300 000	300.000	300.000	0.000	0.000	0.000
GR	618 930	0 000	612.230	10.000	612 230	18.000	619.130	30 000	0 000	0.000
X1	1822 000	0 000	0.000	0 000	122.000	122 000	122 000	0.000	0.000	0.000
X1	1823 000	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	617 230	617.630	0.000	0 000	0.000	0.000	0 000
X1	1827.000	0 000	0 000	0.000	4.000	4 000	4.000	0.000	0.000	0.000
X2	0.000	0.000	0.000	617.230	617 630	0 000	0 000	0.000	0.000	0.000
X1	1828 000	0 000	0.000	0 000	1 000	1.000	1.000	0.000	0 000	0.000
X1	1934 000	5 000	24.000	56.000	228.000	228 000	228.000	0.000	0.000	0.000
GR	619.230	0 000	618.230	24 000	612.130	37 500	612.130	42 500	619.030	56.000
X1	1935 000	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	616 630	617 630	0.000	0.000	0 000	0 000	0 000
X1	1939 000	0 000	0.000	0.000	4.000	4.000	4.000	0.000	0.000	0.000
X2	0.000	0 000	0 000	616 630	617.630	0 000	0.000	0.000	0.000	0.000
X1	1940.000	0 000	0.000	0.000	1.000	1.000	1 000	0 000	0.000	0 000
X1	2267 000	6.000	20.000	48 000	327.000	327 000	327.000	0.000	0.000	0.000
GR	620 130	0.000	619 030	20 000	612.830	29 000	612.830	35.000	619.130	48.000
GR	620 030	72 000	0.000	0 000	0.000	0.000	0 000	0.000	0.000	0 000
X1	2268 000	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	617 530	618.160	0.000	0 000	0.000	0.000	0 000

X1	2272 000	0 000	0 000	0 000	4 000	4.000	4 000	0.000	0 000	0 000
X2	0 000	0.000	0 000	617 530	618 160	0.000	0.000	0.000	0.000	0.000
X1	2273 000	0.000	0 000	0 000	1.000	1 000	1.000	0.000	0 000	0 000
X1	2427 000	5.000	0 000	28.000	154.000	154.000	154 000	0.000	0 000	0 000
GR	620.030	0 000	613 430	8.000	613.430	16.000	619.030	28.000	620.030	42.000
X1	2428.000	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	616.830	618 330	0.000	0.000	0.000	0.000	0.000
X1	2430.000	0.000	0 000	0.000	2.000	2 000	2 000	0.000	0.000	0 000
X2	0 000	0.000	0.000	616.830	618.330	0 000	0.000	0.000	0.000	0.000
X1	2431 000	0 000	0.000	0.000	0 000	0.000	0.000	0.000	0 000	0 000
X1	2654.000	5.000	0.000	32 000	223.000	223 000	223.000	0.000	0.000	0.000
GR	620 990	0.000	612 690	13.000	612.690	19 000	619.790	32.000	620.590	46 000
EU	0.000	0.000	0.000	0 000	0.000	0.000	0 000	0.000	0 000	0 000

```
*PROF 1

CCHV=      100 CEHV=      300
*SECNO 20 000
3280 CROSS SECTION      20 00 EXTENDED        30 FEET

   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    11 05     619 30     0 00     619.30    619 31     .01      0.00      0 00     615 05
    1500      666       307       528      1171.      266      879.       0.        0.      615.15
     0 00      57       1 15       60       070       050      .070     0 000     608 25     0.00
   000117      0.         0        0.         0         0         0     0 00     560 00    560.00

*SECNO 175 000
3280 CROSS SECTION     175 00 EXTENDED        .32 FEET

   175 00     9 56     619.31     0 00      0.00     619 34     .03       03       .01     615 05
    1500      734       741.      25.       766       424       46        6        2.      617.05
     .03      .96       1.75      .55       070       050       070     .050     609.75     0.00
   000360     155.      155       155         0         0         0     0.00     340.00    340.00

*SECNO 176 000
3280 CRDSS SECTION     176 00 EXTENDED        .31 FEET

3370 NORMAL BRIDGE,NRD=  2 MIN ELTRD=  615.77 MAX ELLC=  614.85

   176 00     9 57     619.32     0 00      0.00     619.35     .03       .00       .00     615.05
    1500.     985.      481.      34        765       375.      46        6        2.      617.05
     .03      1 29      1.28      74        070       050      .070      049     609.75     0.00
  .000651      1         1.        1          0         0         0    -49.17     340.00    340.00

*SECNO 180 000
3280 CROSS SECTION     180.00 EXTENDED        32 FEET

3370 NORMAL BRIDGE,NRD=  2 MIN ELTRD=  615.77 MAX ELLC=  614.85

   180 00     9 57     619.32     0.00      0.00     619 35     .03       .00       .00     615 05
    1500      985       481.      34.       767.      376       46.       6        2.      617.05
      03      1.28      1 28      .74       .070      050       070      .049     609 75     0 00
   000647      4.         4.       4.         0         0         0    -49.17     340.00    340.00

*SECNO 250 000
3280 CROSS SECTION     250.00 EXTENDED        .37 FEET
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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    IOC       ICONT     CORAR     TOPWID      ENDST

   250 00      9.61    619.36      0.00      0.00    619.37       .01       02        00    615.05
     980      481        482.       17.      778       428.      48.        8.        2.    617.05
      .06      .62       1.13       36      .070       .050     .070      049    609.75      0.00
  .000148     70.        70.       70         0          0        0     0 00    340.00    340.00

*SECNO 390 000
   390 00      9 13    619.38      0.00      0.00    619.40       .02       .02       .00    615 55
     980.     463        505.       12      664.       391.      33.       12.        3.    617 55
       09      .70       1.29       35      .070       050     .070      049    610.25      4.47
  .000220     140        140       140.        2          0        0     0.00    334.71    339.18

*SECNO 391.000

3370 NORMAL BRIDGE,NRD=  2 MIN ELTRD=  616.59 MAX ELLC=  616.01

   391.00      9 13    619.38      0.00      0.00    619.40       .01       .00       .00    615.55
     980.     634        330        16      664       359.      33        12.        3     617.55
       09      .95        .92       .48      .070       .050     070      049    610.25      4.46
   000411        1         1.        1         0          0        0    -32 48    334.72    339 18

*SECNO 395.000

3370 NORMAL BRIDGE,NRD=  2 MIN ELTRD=  616.59 MAX ELLC=  616 01

   395 00      9 14    619 39      0.00      0 00    619 40       01        00       .00    615.55
     980.     634.       330.       16.      665       359.      33.       12.        3.    617.55
      10        95         92       .48       070       .050     070      049    610 25      4.28
  .000409        4         4.        4         0          0        0    -32 48    334 92    339.20

*SECNO 396 000
   396 00      9.13    619.38      0.00      0.00    619.40       .02       .00       00    615 55
     980      463.       505.       12.      666.       392.      33        12.        3.    617.55
      10       .70       1 29       .35      .070       .050     070      .049    610 25      4.24
   000219        1         1.        1         0          0        0     0 00    334 96    339.20

*SECNO 463.000
3280 CROSS SECTION    463.00 EXTENDED      1.79 FEET

   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    IOC       ICONT     CORAR     TOPWID      ENDST

   463 00      8.78    619.39      0 00      0 00    619.43       04        .02       .01    615.51
     980.     146.       513.      321.      170.       242.     373        14.        4.    615.61
       11      .86       2 12       .86       070       .050     .070      .049    610.61      0.00
   000425       67        67.       67         1          0        0     0.00    230.00    230.00
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*SECNO 468 000
3280 CROSS SECTION    468 00 EXTENDED      1.78 FEET

   468 00     8.78   619 39     0.00     0 00   619 43      .04       00      .00   615.51
     980      151.     498.     331.     170.     232      372.       14       4.    615.61
      11       .89     2.14       89     .070      050      070     .049   610.61     0.00
   000458       5.       5.       5.        0        0        0     0 00   230.00   230 00

*SECNO 473.000
3280 CROSS SECTION    473 00 EXTENDED      1 78 FEET

   473 00     8.78   619 39     0 00     0.00   619.43      .04       00      .00   615.51
     980.     146      514      320      170      242.     373.      14.       4.    615.61
      .11      86     2 12       86      070      050     .070     .049   610.61     0.00
   000427       5        5        5        0        0        0     0 00   230.00   230.00

*SECNO 556 000
3280 CROSS SECTION    556 00 EXTENDED      2.42 FEET

   556 00     9.42   619.43     0 00     0.00   619.46      .03      .03      .00   614.91
     980      159      468.     353.     208      265      458.      16.       4.    615.01
      13       77     1.77      .77      070     .050     .070      049   610.01     0.00
  .000262       83       83       83        0        0        0     0 00   230.00   230.00

*SECNO 557.000
3280 CROSS SECTION    557.00 EXTENDED      2 42 FEET


3370 NORMAL BRIDGE,NRD=  0 MIN ELTRD=  616.02 MAX ELLC=  615.31

   557 00     9 43   619.44     0.00     0.00   619.46      .02      .00       00   614.91
     980      195      332.     453.     193      240      428.      16.       4.    615 01
      13     1.01     1 38     1 06      070      050      070     .049   610.01     0.00
   000766       1.       1.        1        0        0        0   -72 03   230.00   230.00

*SECNO 561.000
3280 CROSS SECTION    561 00 EXTENDED      2.43 FEET

   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=  0 MIN ELTRD=  616 02 MAX ELLC=  615.31

   561 00     9 43   619 44     0 00     0 00   619.47       02      .00       00   614.91
     980.     195      331.     453      194.     240.     429.      16.       4.    615 01
      13     1 01     1.38     1 06      070      050      070      049   610.01     0.00
   000759       4        4.        4        0        0        0   -72 03   230.00   230.00
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*SECNO 562 000
3280 CROSS SECTION    562.00 EXTENDED      2 44 FEET

   562 00      9.43   619 44      0 00      0.00   619.47      .03       00       00   614.91
     980      160.     467.      353       209.     266.     460.       16.       4     615 01
      13        76     1 76       .77      .070     .050      070      .049   610.01     0 00
  000258        1.       1         1         0        0        0      0 00   230.00   230.00

*SECNO 600 000
3280 CROSS SECTION    600 00 EXTENDED      1.83 FEET

   600.00      9 63   619 44      0.00      0.00   619.49      .05      .01      .01   616.31
     980      186.     515.      278.      211.     216      321       16.       4.     616 01
      14        89     2.39        87      .070      050      070      .049   609.81     0.00
 .000533        38      38.       38.         2        0        0     0.00   250.00   250.00

*SECNO 676.000
3280 CROSS SECTION    676 00 EXTENDED      1 46 FEET

   676 00      9.26   619.47      0.00      0.00   619 54       07      .05      .01   616 71
     980      170      560.      250       179      205.     271.       18        5.     616.41
      15        95     2.74        92       070      .050     .070      .049   610.21     0.00
  000753       76.       76        76         0        0        0     0.00   250.00   250 00

*SECNO 677 000
3280 CROSS SECTION    677 00 EXTENDED      1.50 FEET


3370 NORMAL BRIDGE,NRD=  0 MIN ELTRD=  616.51 MAX ELLC=  615 51

   677.00      9.30   619.51      0.00      0.00   619 55       04      .00      .00   616.71
     980      258.     342.      380       183.     178.     276       18.       5.     616.41
      15      1 41     1 92      1.38      .070     .050     .070      .049   610.21     0.00
  001634        1        1        1.         2        0        0   -28 33   250.00   250.00

*SECNO 681 000
3280 CROSS SECTION    681 00 EXTENDED      1 50 FEET

   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QRDB      ALDB      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=  0 MIN ELTRD=  616.51 MAX ELLC=  615 51

   681 00      9.30   619 51      0.00      0.00   619.55       04       01       00   616.71
     980.     258.     342       380.      183.     178      277       18.       5.     616.41
      15      1 41     1.92      1.37      .070      050      070      .049   610.21     0.00
  001625        4        4.        4.         0        0        0   -28.33   250.00   250.00
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*SECNO 682 000
3280 CROSS SECTION    682 00 EXTENDED      1 48 FEET

   682 00     9 28   619 49     0 00     0.00   619 56      07      .00      .01   616.71
     980      171      557      252.     181      205.     275.      18        5    616.41
       15       94     2.71      .92     .070     .050     070      049   610.21     0 00
   000734        1       1.        1        2        0        0     0.00   250.00   250.00

*SECNO 800 000
3280 CROSS SECTION    800.00 EXTENOED      1.10 FEET

   800 00     8 30   619 51     0 00     0.00   619 77      .25      .15      .05   615 71
     980      213.     765        1     110.     172.       3.      19.        5    618.81
       16     1.93     4 45       54     .070     .050     .070     .049   611 21     0.00
  .002584     118.     118.     118.        2        0        0     0.00    83.35    83.35

CCHV=     200 CEHV=     400
*SECNO 900 000
3280 CROSS SECTION    900 00 EXTENDED      1 53 FEET

   900.00     8 83   619.83     0 00     0 00   619.96      13      .17      .02   615.50
     980.     170      571.     239      121.     159.     144.      20        6    615.30
       17     1 41     3.60     1.66     .070     .050     .070     .049   611.00     0.00
   001228     100      100.     100.        2        0        0     0.00   110.00   110 00


SPECIAL BRIDGE

SB  XK        XKOR      COFQ      ROLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     0 00      1 40      2 60      0.00     10.00      0.00     60.00      0.00    611 10    611.10

*SECNO 939 000
3280 CROSS SECTION    939.00 EXTENDED      2.57 FEET

PRESSURE AND WEIR FLOW

 EGPRS      EGLWC       H3       QWEIR      QPR       BAREA   TRAPEZOID      ELLC     ELTRD
                                                                AREA
   625 63    620.06      0.00      550       430.       60        59       617.00    619.20

   939 00     9 87   620 87     0 00     0.00   620 95      .08      .98     0.00   615 50
     980      207      511.     262.     167      182.     188       20        6    615.30
       17     1 24     2 82     1 39      070      050     .070     .049   611.00     0.00
  .000628       39      39.       39        2        0        4     0 00   110.00   110.00

CCHV=     .100 CEHV=     300
*SECNO 1100 000
3280 CROSS SECTION   1100.00 EXTENDED      2.96 FEET
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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

  1100 00     9.16    620.99     0 00      0 00    621.01      .03       .06       .01    615 83
     980      489.      395.      96       560.      219.     122.       23.       6.     616.53
      21       87      1 80       79       .070      050     .070       049    611.83     0 00
  000269     160.      160.     160          2        0        0      0.00    200.00    200.00


*SECNO 1400 000
3280 CROSS SECTION    1400.00 EXTENDED       3.00 FEET


  1400 00     9.50    621 03     0.00      0 00    621.22       20       .16       .05    617 43
     980      130.      850.       0.       79.      226.       0.       27.        7     618.03
      23      1 65      3 75     0 00       070      .050     .070      .049    611.53      0.00
 .001439      300.      300.     300.         2        0        0      0 00     55.00     55.00


*SECNO 1700 000
3280 CROSS SECTION    1700.00 EXTENDED       2.57 FEET


  1700 00     9 27    621.50     0.00      0.00    621 86      .36       .59        05    618.93
     980        0.      980.        0         0      203       0.       29.        7     619.13
      .25     0 00      4.82     0.00       070      .050      070      .049    612.23      0.00
 .002892      300       300.     300          2        0        0      0.00     30 00     30.00


*SECNO 1822 000
3280 CROSS SECTIDN    1822.00 EXTENDED       2.94 FEET


  1822 00     9 64    621.87     0.00      0.00    622.20      .32       .33       .00    618.93
     980.        0.      980.       0.        0.      214.       0        29.        8.     619.13
      26      0.00      4.57     0 00      .070      .050     .070       049    612.23      0.00
  002488      122       122.     122          2        0        0      0.00     30 00     30.00


*SECNO 1823 000
3280 CROSS SECTION    1823.00 EXTENDED       2.92 FEET


3370 NORMAL BRIDGE,NRD=  0 MIN ELTRD=  617.63 MAX ELLC=  617 23

  1823.00     9.62    621.85     0 00      0.00    622.21       36       .00        01    618.93
     980        0       980.       0.        0.      204        0       29.        8     619.13
      26      0.00      4 81     0 00      .070      .050     .070       049    612.23      0.00
  009048        1         1.        1         2        0        0     -9.92     30.00     30.00


*SECNO 1827 000
3280 CROSS SECTION    1827 00 EXTENDED       2.95 FEET


   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
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   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


3370 NORMAL BRIDGE,NRD=  0 MIN ELTRD=  617 63 MAX ELLC=  617 23

  1827 00     9 66    621.89     0 00      0 00    622.25      36       .04       .00    618.93
     980.       0.      980        0         0.      205.       0.       29         8.    619.13
      26      0 00     4 79      0 00      .070      .050     .070      049     612 23      0.00
  .008927       4        4.        4.         1         0        0    -9 92     30.00     30.00


*SECNO 1828.000
3280 CROSS SECTION   1828.00 EXTENDED      3.01 FEET


  1828 00     9 71    621.94     0 00      0.00    622.25      .32      .00       .00    618.93
     980        0.      980        0.        0.      216.       0.      29.        8.    619.13
      26      0 00     4 53      0 00      070       .050      070      049     612 23      0.00
  .002425       1        1         1         2         0        0     0.00     30.00     30.00


*SECNO 1934 000
3280 CROSS SECTION   1934 00 EXTENDED      3 44 FEET


  1934.00    10 34    622.47     0 00      0 00    622.64      .16      .37       .02    618.23
     980      143.      837.        0       90.      243        0       31.        8.    619.03
     .28      1.59      3.44     0.00      .070      050      070      .049    612.13      0.00
  001145      228       228      228         2         0        0     0.00     56.00     56.00


*SECNO 1935 000
3280 CROSS SECTION   1935 00 EXTENDED      3.45 FEET


3370 NDRMAL BRIDGE,NRD=  0 MIN ELTRD=  617.63 MAX ELLC=  616 63

  1935 00    10 35    622.48     0 00      0.00    622 64       16      .00       .00    618.23
     980      263.      717.        0       90      217        0.      31.        8.    619.03
      28      2 93      3.30     0 00      .070      .050     .070      .049    612.13      0.00
  003880        1.        1.        1         0         0        0   -25.85     56.00     56.00


*SECNO 1939.000
3280 CRDSS SECTION   1939.00 EXTENDED      3 46 FEET


3370 NORMAL BRIDGE,NRD=  0 MIN ELTRD=  617.63 MAX ELLC=  616 63

  1939.00    10.37    622.50     0 00      0.00    622.65      .16      .02       .00    618.23
     980      264       716        0       90.      218.       0.      31.        8.    619 03
     .28      2 92      3 29     0 00      .070      .050     .070      049     612.13      0.00
  003850        4         4        4         0         0        0   -25 85     56.00     56.00


*SECNO 1940.000
3280 CROSS SECTION   1940 00 EXTENDED      3.47 FEET
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	ARDB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
1940 00	10 37	622 50	0.00	0 00	622 66	.16	.00	.00	618.23
980	144	836.	0.	90.	244.	0.	31	8	619.03
28	1.59	3.43	0.00	.070	050	.070	.049	612.13	0.00
.001131	1.	1.	1.	0	0	0	0.00	56.00	56.00

*SECNO 2267.000
3280 CROSS SECTION 2267.00 EXTENDED 2.83 FEET

2267.00	10.04	622.87	0.00	0.00	623.03	17	.37	.00	619.03
980	96.	767	117.	66.	212.	79.	34	8.	619.13
31	1.46	3 62	1.48	070	.050	.070	.049	612 83	0.00
001158	327	327	327.	2	0	0	0 00	72.00	72.00

*SECNO 2268.000
3280 CROSS SECTION 2268.00 EXTENDED 2.88 FEET

3370 NORMAL BRIDGE,NRD= 0 MIN ELTRD= 618 16 MAX ELLC= 617.53

2268 00	10.08	622 91	0 00	0 00	623.04	.13	.00	00	619 03
980	167.	611.	202	67.	198.	80.	34.	8.	619.13
31	2 50	3 08	2 53	.070	.050	.070	049	612 83	0 00
003325	1.	1.	1	2	0	0	-14.89	72.00	72.00

*SECNO 2272.000
3280 CROSS SECTION 2272.00 EXTENDED 2.89 FEET

3370 NORMAL BRIDGE,NRD= 0 MIN ELTRD= 618.16 MAX ELLC= 617 53

2272.00	10 09	622.92	0.00	0.00	623 05	.13	.01	.00	619.03
980	167	611	202	67.	199.	80.	34.	8.	619.13
31	2 50	3 07	2 53	.070	.050	070	.049	612 83	0.00
.003307	4	4	4	0	0	0	-14.89	72.00	72.00

*SECNO 2273.000
3280 CROSS SECTION 2273 00 EXTENDED 2 87 FEET

2273 00	10.07	622.90	0.00	0.00	623.06	.16	.00	.01	619.03
980	97.	766.	118	66.	213.	80.	34.	8.	619.13
31	1.46	3.59	1 48	.070	.050	.070	.049	612.83	0 00
001135	1	1.	1.	2	0	0	0 00	72.00	72.00

*SECNO 2427 000

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3280 CROSS SECTION    2427 00 EXTENDED       3.02 FEET

   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     XLDBL     XLCH      XLDBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

  2427.00     9 62    623.05     0.00      0.00    623.31      .26        22       .03    620 03
     980.       0       889       91         0.      209       49.        35        8.    619.03
       32     0 00      4.24     1.85      .070     .050      .070      .049    613.43      0.00
   001849     154       154      154         2         0         0      0 00     42 00     42.00

*SECNO 2428 000
3280 CROSS SECTION    2428 00 EXTENDED       3 00 FEET


3370 NORMAL BRIDGE,NRD=  0 MIN ELTRD=  618 33 MAX ELLC=  616 83

  2428 00     9.60    623 03     0 00      0 00    623.33      .30        00       .01    620.03
     980        0       794.     186         0.      176       49        35.        8.    619.03
       32     0.00      4 51     3.80      .070      050      .070       049    613.43      0 00
  .007838       1.        1.       1.         2         0         0    -32.89     42.00     42.00

*SECNO 2430 000
3280 CROSS SECTION    2430 00 EXTENDED       3 01 FEET


3370 NORMAL BRIDGE,NRD=  0 MIN ELTRD=  618.33 MAX ELLC=  616.83

  2430 00     9 62    623.05     0 00      0 00    623.34       30       .02       .00    620.03
     980        0       794.     186.        0.      176.      49.        35.        8.    619 03
       32     0 00      4 50     3 80      .070     .050      070       049    613.43      0 00
   007796       2.        2.       2         0         0         0    -32 89     42 00     42.00

*SECNO 2431.000
3280 CROSS SECTION    2431.00 EXTENDED       3.06 FEET

  2431 00     9 66    623 09     0.00      0 00    623.35      .26      0.00       .00    620.03
     980        0       888      92.        0       211       50        35.        8.    619.03
       32     0.00      4 22     1 85      .070     .050      .070      .049    613.43      0.00
  .001817       0.        0.       0         2         0         0      0 00     42.00     42.00

*SECNO 2654 000
3280 CROSS SECTION    2654 00 EXTENDED       2.91 FEET

  2654 00    10.81    623 50     0.00      0.00    623 70      .20        34       .01    620.99
     980        0.      910.      70.        0       246       46.        36.        9.    619.79
       34     0 00      3.70     1.51      .070     .050      .070      .049    612.69      0 00
   001323     223       223.     223         2         0         0      0.00     46.00     46.00
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F.50

PROFILE FOR STREAM CONFLUENCE WITH SIEBERT

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   608.      610.      612.      614.      616.      618.      620.      622.      624.      626.
    SECNO   CUMDIS-FT

    20 00      0.  CI        .         .         .    LR   .         .    MWE  .         .         .         .         .
              10.  C I       .         .         .    LR             .    M E           .
              20.  C I                 .         .    L R  .             M E  .         .         .         .
              30   C  I                              L  R .         .    M E  .         .
              40   C  I                .         .    L  R .         .    M E  .         .                   .         .
              50.  C   I     .         .         .    L   R.         .    M E  .         .         .         .
              60   C   I                         .    L   R.         .    M E  .                             .         .
              70   C    I              .         .    L    R         .    M E  .         .         .         .         .
              80.  C    I    .         .              L    .R        .    M E  .         .         .                   .
              90   C     I   .         .              L    .R        .    M E  .         .                   .
             100   C     I   .         .         .    L    . R       .    M E  .         .         .
             110.  C      I  .         .              L    . R            M E  .         .         .         .         .
             120   C      I                   .    L    .  R           M E  .         .         .         .         .
             130   C       I           .              L    .   R          M E                             .         .
             140   C       I                          L    .   R     .    M E           .         .         .  .
             150   C        I          .              L    .    R        M E  .                             .         .
   175.00    160   C        I          .              L         R    .    M E                   .         .
   176.00    170   C        I.                        L         R    .    M E  .         .         .
   180 00    180   C        I.         .         .    L    .    R    .    M E  .         .                   .         .
             190   C        I.                        L    .    R         M E  .         .                   .
             200.  C        I.                        L    .    R    .    M E  .         .         .
             210   C        I.         .         .    L    .    R         M E  .         .                   .
             220.  C        I.         .         .    L    .    R         M E  .         .         .         .
   250.00    230.  C        I.         .         .    L    .    R    .    M E  .         .                   .         .
             240   C        I          .         .    L    .    R    .    M E  .         .         .         .         .
             250.  C        I.                        L         R    .    M E  .         .         .         .         .
             260.  C        I          .         .     L    .    R         ME  .         .         .         .
             270.  C        I          .         .     L         R    .     ME  .         .         .         .         .
             280   C         I         .              L    .    R    .     ME  .         .         .         .
             290.  C         I         .         .     L    .    R         ME  .         .         .                   .
             300.  C         I         .              L    .    R    .     ME  .         .         .         .         .
             310   C         I                         L    .     R        ME           .         .                   .
             320.  C         I         .         .      L    .     R   .      E  .         .         .         .         .
             330   C         .I                        L    .     R   .      E  .                             .
             340.  C          I        .         .      L    .     R         E  .         .         .         .
             350.  C         .I        .               L    .     R   .      E  .         .                   .         .
             360   C         .I                         L         R         E           .         .         .         .
   390.00    370.  C          I                         L         R .       EM .         .         .         .         .
   391 00    380   C          I        .         .       L .       R .       EM .                   .         .         .
   395.00    390.  C          I                  .       L .       R .       EM .         .         .         .
   396 00    400.  C         .I        .                L .       R .       EM .                             .         .
             410   C         . I                 .       L .     R    .     ME           .         .         .
             420.  C           I                 .       L      R     .    M E  .         .         .         .         .
             430.  C         . I       .         .       L .  R         M   E  .         .         .         .
             440   C         . I                 .       L   R       . M    E           .         .         .
   463.00    450.  C            I                        L .       M .       E  .                   .         .
   468 00    460.  C         .  I      .                L .       M .       E  .         .         .         .         .
   473 00    470   C         .  I                 .       L         M        E  .         .         .         .         .
             480.  C            I      .         .      LR .       M .       E  .         .         .         .         .
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ES1

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          490   C        . I       .         .     L  .      M        E  .         .         .         .
          500   C        . I       .         .    LR  .      M  .     E  .         .         .         .
          510   C          I                 .    LR         M  .     E  .                   .
          520.  C         I                  .    L  .     M   .     E  .         .         .
          530.  C        .I        .         .   LR  .     M   .     E  .         .         .         .
556 00    540.  C        I                   .    L  .    M          E            .         .
557.00    550.  C        I                   .    L  .    M          E            .         .
561 00    560   C        I                   .    L       M    .     E  .         .         .         .
562 00    570   C        I         .         .    L  .    M          E  .         .         .         .
600 00    580   C       I.         .         .         R L     M     E            .         .         .
          590   C       I.         .         .         R L     M .   E            .         .         .
          600.  C        I                   .         .RL      M.   WE           .         .
          610.  C        I         .         .         .RL      M.   WE .         .         .         .
          620   C        I         .         .          R L     M.   WF .         .         .         .
          630   C        I         .         .         .R L     M    WE .         .         .         .
          640   C        .I        .         .           RL      M  WE .         .         .         .
          650   C        .I                  .           RL      M  WE .         .         .         .
676 00    660.  C        .I        .         .           R L     M  WE .         .         .         .
677.00    670.  C         I        .         .         . R L     M   E            .         .         .
681 00    680   C        .I        .         .         . R L     M   E .         .         .         .
682.00    690   C        .I                  .           R L     M  WE .                   .         .
          700.  C         I                  .            L      M  WE .                   .
          710.  C          I        .                    LR     M  WE            .         .
          720.  C          I        .         .          L  R     M  WE .         .         .         .
          730   C        .  I       .         .          L   R    M  WE            .
          740   C        .  I                 .         L     R  .M  WE .         .
          750   C        .   I                .         .L      R  M   E            .         .         .
          760   C           I       .         .         .L       R.M   E            .         .         .
          770.  C        .  I       .                   L         RM   WE.                   .         .
800 00    780.  C        .     I    .                  L.           M R  WE                  .
          790   C        .     I                     L            . R   WE.                   .
          800.  C              I                     L            RM    WE.         .         .
          810.  C              I    .         .      L .        R  M    WE.         .         .         .
          820   C              I    .                L .      R    M    WE                   .         .
          830.  C              I                 .   L     R     . M    WE                   .         .         .
          840   C        .    I                 .    L    R       M     E.                   .         .
          850   C             I                      L . R       . M     WE          .         .
          860.  C        .    I    .                 L R           M     WE          .         .         .
          870   C        .    I    .         .       L .           M     WE          .         .         .
900.00    880   C        .    I    .         .     R L            M      WE                   .         .
          890   C        .    I                   R L            M       WE          .         .
          900   C        .    I                   R L            M         E         .         .
          910.  C             I    .            R L .           M        . WE        .
939 00    920.  C        .    I    .            R L .          .M          WE        .         .
          930   C             I                 .  RL           M        . WE        .         .
          940   C        .     I              .   RL           .M         WE        .         .
          950   C        .     I              .    L .         M          WE        .         .         .
          960   C        .     I                   L .        .M          WE        .         .         .
          970   C              I              .    L .        .M           E        .         .
          980.  C               I   .         .    LR.         M        .  E        .         .
          990   C        .      I              .   LR.        .M           E                  .         .
         1000   C        .      I              .   L R         M        .  E        .         .         .
         1010.  C        .      I                  L R        .M         E        .         .         .
         1020.  C        .       I .                LR        .M       .  E        .         .         .
         1030   C                I .         .       L.R        M        .  E                  .         .
         1040.  C                I .         .       L R       M           E                  .         .
         1050   C        .       I           .       L R       M        .  E        .         .         .
         1060.  C        .        I.         .       L. R      M           E        .         .         .
         1070   C        .        I.         .       L. R      M        .  E        .         .
1100 00  1080   C                I           .       L.  R     M           E                  .
         1090.  C        .       I.          .       L   R     M           E                  .         .
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          1100  C        .      I          .      L  R      M        .    E    .              .        .
          1110  C               I                 L  R      M             E    .
          1120. C        .      I          .      L   R     M        .    E    .        .
          1130  C        .      I          .      L   R     M             E    .        .
          1140  C        .      I                  L  R     M             E              .
          1150. C               I          .      .L  R     M        .    E    .        .        .
          1160. C        .      I          .       L   R    M        .    E    .        .
          1170. C        .      I.         .      . L  R    M        .    E    .        .        .
          1180  C               I.         .      . L  R    M        .    E    .        .
          1190. C        .      I.                  L  R    M        .    E    .        .        .
          1200  C        .      I.         .      . L   R   M        .    E    .        .        .
          1210  C        .     I           .       .  L  R  M             WE   .        .        .        .
          1220  C        .     I .                   L  R  M             WE             .
          1230. C        .     I           .       .  L  R  M        .    WE   .
          1240. C        .     I .         .       .  L   R M        .    WE   .        .        .
          1250. C        .     I .         .       .   L  R M        .    WE   .        .
          1260  C               I           .       .   L  R M        .    WE             .
          1270. C        .     I .         .       .   L  R M        .    WE   .        .        .
          1280  C        .     I .         .       .   L   R M       .    WE   .        .        .
          1290. C        .     I           .       .    L  R M       .    WE   .        .
          1300. C              I                     L  R M        .    WE             .        .
          1310  C        .     I .         .       .   L  R M        .    WE   .        .        .
          1320  C              I .                    L  RM             WE             .        .
          1330. C        .     I                      L  RM        .    WE
          1340  C        .     I .                 .  L  RM             WE   .        .        .
          1350. C        .     I .         .       .  L  RM        .    WE             .        .
          1360. C        .     I                      L  R         .    WE   .        .        .
          1370  C              I           .         L  R              WE             .
1400.00   1380. C        .     I .         .         L  R         .    WE   .        .        .
          1390. C        .     I                      L  R         .    WE   .        .        .
          1400  C              I .                 .   L MR            WE             .        .
          1410  C              I .                     L .R         .    WE   .        .
          1420  C              I           .         L .R         .    W E  .        .
          1430  C              I .         .         L  R         .     WE  .        .        .
          1440  C        .     I                       L R         .     WE  .        .        .
          1450  C        .     I                 .     L R         .     WE             .        .
          1460  C               I.         .           L MR        .     WE  .        .        .
          1470  C        .      I                      L.MR             WE             .        .
          1480. C        .      I                 .     L R             WE  .        .        .
          1490. C        .      I.         .      .     L R         .    WE  .        .        .
          1500  C               I                       L R         .    WE             .        .
          1510. C        .      I          .      .     L MR        .    WE  .        .
          1520  C               I                       .LMR        .    W E .        .        .
          1530  C        .      I.         .      .      LMR        .    W E            .        .
          1540  C        .       I         .      .     .L R        .    W E .        .
          1550  C        .       I          .     .     .L R        .    W E            .
          1560  C        .       I                 .       LR             WE .        .        .
          1570. C        .       I                         LMR        .    WE .        .        .
          1580  C               I          .              . LMR        .    WE .        .        .
          1590. C        .      I                 .       LMR        .    WE .        .
          1600  C               I                 .        LR        .    WE             .        .
          1610  C               I          .              LR        .    W E.        .
          1620  C        .      I                 .       LMR        .    W E.        .        .        .
          1630  C        .        I        .      .      . LMR        .    W E.        .
          1640  C        .       .I        .      .        LR        .    W E.        .
          1650  C        .        I        .      .      .  LR        .    W E.        .
          1660  C        .       .I        .              LR        .    W E.        .        .
          1670. C               I                 .      .  LR        .    W E.             .
1700.00   1680. C               I                 .         LR        .     WE.        .
          1690  C        .       .I                      .  LR        .     WE.        .
          1700  C        .        I                 .       LR             W E        .        .
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          1710  C        .        I                 .          LR    .     W E        .
          1720. C        .       .I        .        .          LR    .     W E                  .
          1730  C        .       .I        .        .          LR    .     W E                  .
          1740. C                .I        .        .     .    LR    .     W E                  .
          1750  C        .        I        .        .     .    LR          WE         .         .
          1760  C        .       .I        .                .    LR          WE         .         .
          1770. C        .       .I        .                     LR          W E                  .
          1780  C                .I        .                .    LR    .     W.E        .
          1790  C                .I        .        .            LR    .     W E        .         .
          1800. C        .        I        .        .            LR    .     W.E        .         .
1822 00   1810. C        .        I        .                .    LR    .     W.E        .         .
1823 00   1820. C        .       .I        .        .       .    LR    .     W.E                  .
1827 00   1830  C        .        I        .                     LR          W.E                  .
1828 00   1840  C        .        I        .                .    LR          WE         .         .
          1850  C                .I                 .       .   LMR    .     WE                   .
          1860. C        .       .I        .        .           LMR    .     WE         .
          1870  C                .I                 .           LMR          W E
          1880  C                .I        .        .           LMR    .     W E        .         .
          1890  C        .       .I                 .           LMR    .     W E                  .
          1900. C        .       .I        .                    LMR    .     W E                  .
          1910  C        .        I        .                .   LR     .     .WE                  .
          1920. C        .       .I        .                .  L R    .     .WE                  .
          1930. C        .        I        .                .  L R    .     .WE                  .
          1940  C        .        I        .        .          L R          .WE        .         .
          1950. C        .       .I        .        .          L R          .WE        .         .
          1960. C        .       .I        .        .     .    L R    .     .WE        .         .
          1970  C                .I        .        .     .    L R    .      WE        .         .
          1980  C        .       .I        .        .     .    L R    .     .WE        .         .
          1990. C        .       .I        .        .     . L  R    .      W E        .         .
          2000  C        .        I        .                 L  R    .        WE       .         .
          2010  C                 I        .        .     . L  R           . WE        .         .
          2020. C                .I                 .     . L  R           . WE                  .
          2030. C                .I        .        .     . L  R             WE        .         .
1934 00   2040  C                .I        .        .     .L   R           . WE                  .
1935 00   2050  C        .       .I        .        .     .L   R    .        WE        .         .
1939 00   2060  C        .       .I                 .     .L   R           . WE                  .
1940 00   2070  C                .I        .                 L   R    .     .  E                  .
          2080. C                 I        .        .     .L   R    .        E         .         .
          2090. C                 I        .              .L   R    .     .  E         .         .
          2100. C                .I        .              . L  RM          .  E                  .
          2110. C                 I        .        .     . L  RM   .      .  WE       .         .
          2120  C        .       .I        .        .     . L  RM   .      .  WE       .         .
          2130. C        .       .I                 .     . L  RM           WE                   .
          2140  C        .       .I                 .     . L  RM   .      .  WE       .         .
          2150  C        .         I                .     . L  RM   .      .  WE       .         .
          2160  C                . I        .              . L  R M  .        WE       .         .
          2170  C                 I        .                L  R M          .  WE       .         .
          2180. C        .        I        .        .     . L  R M          .  WE                  .
          2190  C        .        I        .        .     .  L R M          .  WE                  .
          2200  C                 I        .        .     .  L R M  .       .  WE       .         .
          2210  C        .      . I        .        .     .  L R M  .       .  WE       .         .
          2220  C                 I        .              .  L R M           WE       .         .
          2230  C                . I        .                 L R  M          .  WE                  .
          2240  C                 I                 .     .  L R  M .       .  WE       .         .
          2250  C                   I        .              .  L R  M          .  WE                  .
          2260  C        .      .  I        .              .  L R  M          .   E                  .
          2270  C        .        I        .                  LR  M          .   E       .         .
          2280. C                 I        .        .     .    LR  M          .   E                  .
          2290. C                 I        .        .          LR   M.        .   WE      .         .
          2300  C        .      .  I        .        .     .    L R  M.          WE      .         .
          2310  C        .      .  I        .        .     .    L R  M         .   WE                 .
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          2320.  C          .          .  I                          .  L R  M.          .  WE
          2330   C          .          .  I      .          .          .  L R  M           .  WE     .
          2340.  C          .          .   I                         .  L R  M.             WE                    .
          2350   C          .          .   I     .                    .   LR  M.,         .  WE                .
          2360   C          .             I     .                    .   LR   M          .  WE                .
2267.00   2370   C          .          .   I     .          .             LR   M             WE
2268 00   2380.  C          .             I     .          .          .   LR   M              E     .          .
2272 00   2390   C          .          .   I     .          .          .   LR   M          .   E                    .
2273 00   2400   C          .             I                .          .   LR   M          .   E     .
          2410   C          .          .   I                .          .   LR   M              E     .          .
          2420   C                        I     .          .              L   M          .   E     .          .
          2430.  C          .          .    I    .          .              L   M          .   WE    .          .
          2440   C          .          .    I    .          .              L   M          .   WE               .
          2450.  C          .          .    I    .                    .   R L  M          .   WE    .          .
          2460   C          .          .    I    .                        R L  M          .   WE    .          .
          2470   C          .          .     I              .              R L  M          .   WE    .          .
          2480   C          .          .     I              .              R  L M          .   WE    .          .
          2490.  C                        I    .          .          .   R  L M          .   WE               .
          2500   C          .          .     I    .          .          .   R  L M          .   WE
          2510   C                        I              .              R   LM              WE    .          .
          2520   C          .          .     I              .              R   LM          .   WE               .
2427 00   2530   C          .                 I                    .   R    L          .   W E                  .
2428 00   2540   C          .                 I    .                .   R    L          .   W E   .              .
2430.00   2550.  C          .                 I    .          .          .   R    L          .   W E               .
2431 00   2560.  C          .          .      I    .                .   R    L          .   W E               .
          2570.  C          .          .      I    .                .   R    L          .    WE   .          .
          2580   C          .                 I              .              R    ML         .    WE               .
          2590   C          .          .      I    .          .          .    R   .L         .    WE   .              .
          2600   C          .          .     I    .          .          .    R    L         .    WE   .          .
          2610.  C          .                I    .          .          .    R    L         .    WE               .
          2620   C          .          .     I    .          .              R   .L         .    WE   .          .
          2630   C          .          .     I              .          .    R    ML             WE   .
          2640   C          .          .     I    .          .          .     R  .ML            WE   .          .
          2650   C          .                I    .          .               R  .ML        .    WE   .          .
          2660.  C          .                I    .          .               R  .ML        .    W E  .
          2670.  C          .          .    I                         .      R  . ML       .    W E  .          .
          2680.  C          .                I    .                    .      R  . ML       .     WE             .
          2690   C          .          .    I              .               R  . ML       .     WE   .          .
          2700.  C          .                I              .                R . ML       .     WE   .              .
          2710   C          .          .    I              .          .      R . ML       .     WE   .          .
          2720.  C          .             I                .          .      R   M L      .     WE   .              .
          2730.  C          .             I     .                    .      R   M L      .     WE   .              .
          2740   C          .          .   I     .          .          .      R . M L      .     WE               .
          2750   C          .          .   I                .          .      R .  ML      .     WE               .
2654 00   2760   C          .             I      .          .                R   M L          WE.
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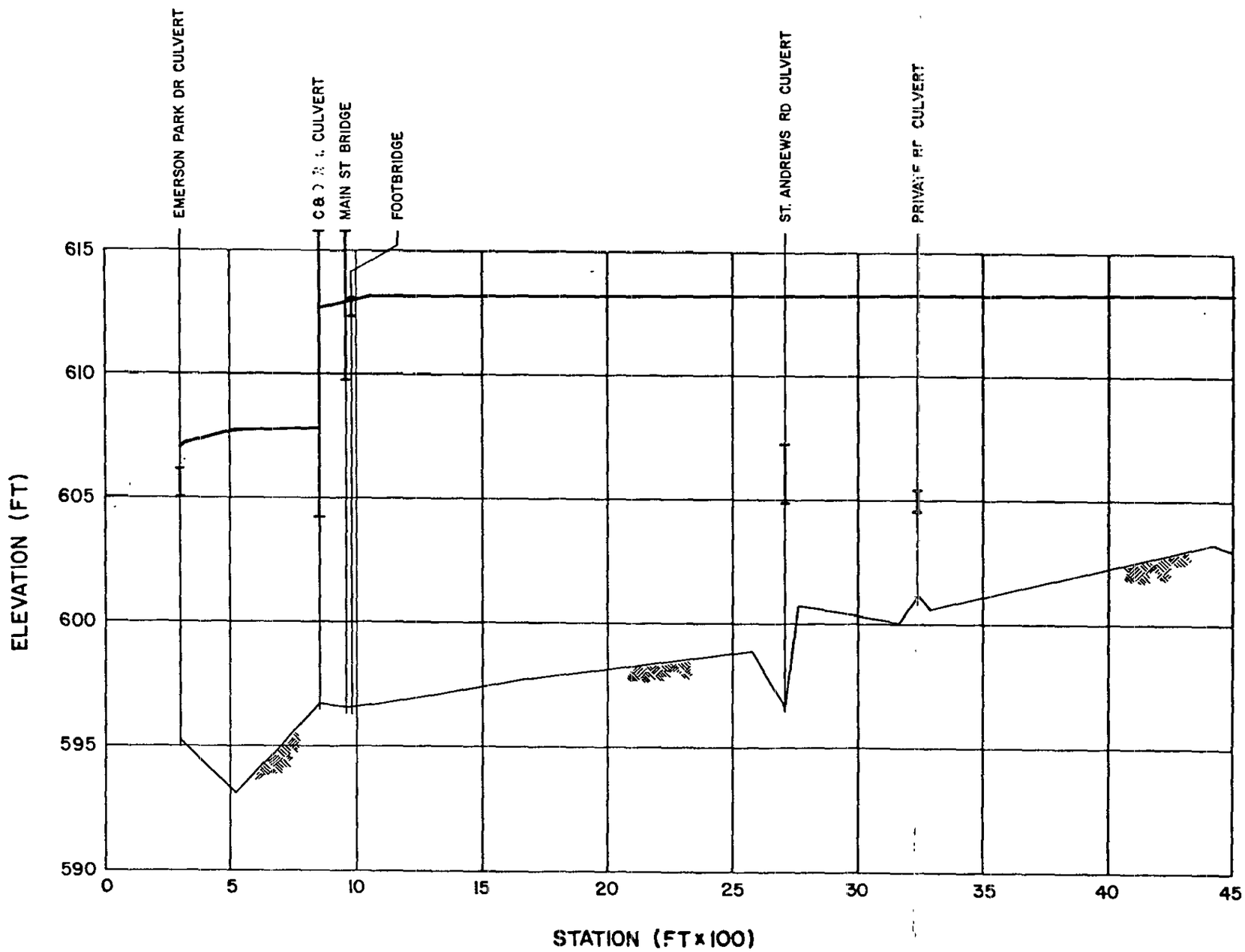


NOTE: Elevations based on city datum [to obtain U.S.G.S. subtract 1.32 ft.]

FIGURE NO. 14
SNAKE CREEK BASIN - SNAKE CREEK PROFILE

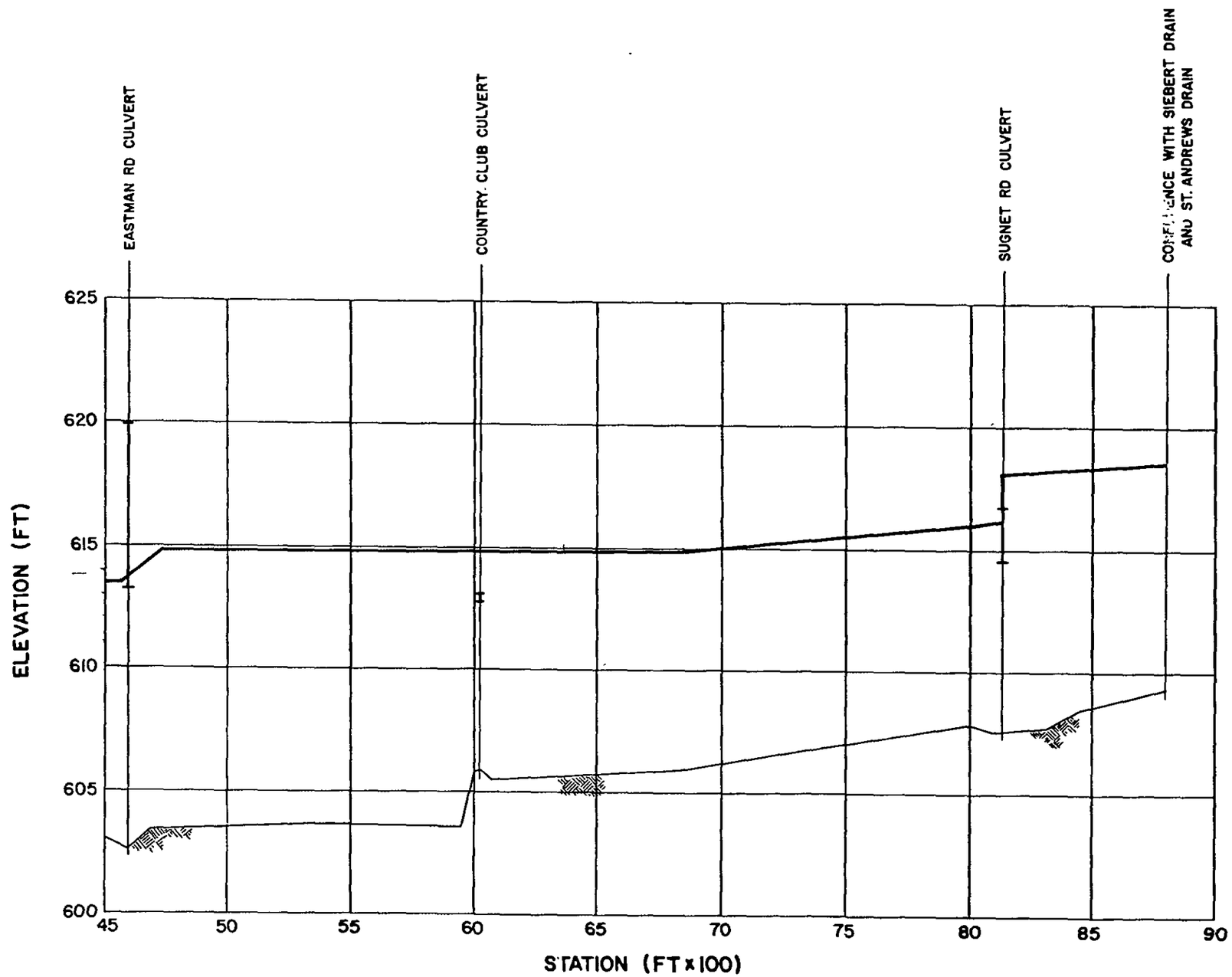
LEGEND:

- (2) Cross Section
- Centerline Ground Profile
- 100 Year Water Surface Profile

MIDLAND, MICHIGAN

STORMWATER MANAGEMENT STUDY

McNAMEE PORTER & SEELEY
ENGINEERS ARCHITECTS
ANN ARBOR, MICHIGAN



NOTE: Elevations based on city datum (to obtain U.S.G.S. subtract 1.32 ft.)

FIGURE NO. 15
SNAKE CREEK BASIN - SNAKE CREEK PROFILE

LEGEND:

- (2) Cross Section
- Centerline Ground Profile
- 100 Year Water Surface Profile

MIDLAND, MICHIGAN

STORMWATER MANAGEMENT STUDY

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ENGINEERS ARCHITECTS
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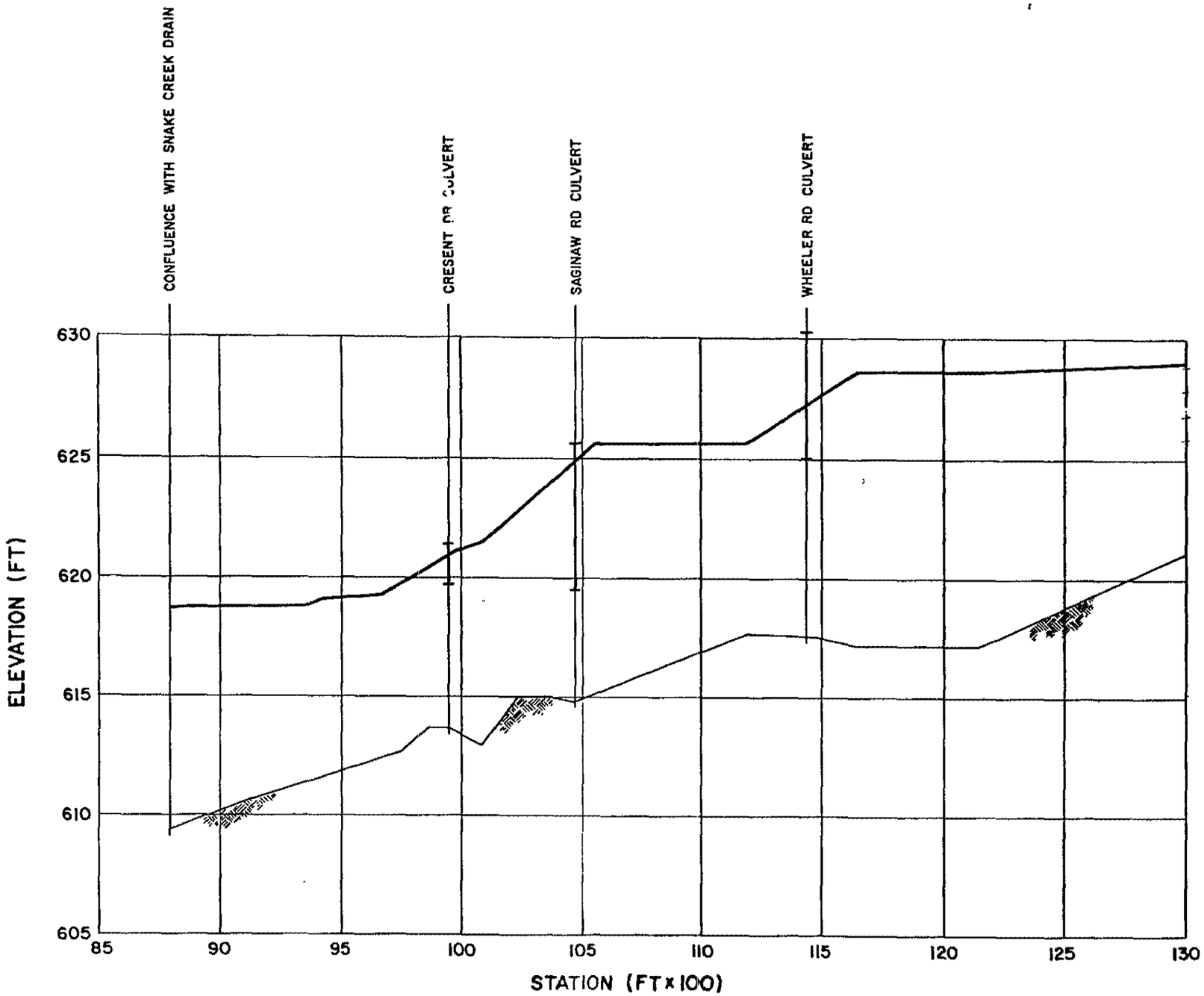

NOTE: Elevations based on city datum [to obtain U.S.G.S. subtract 1.32 ft.]

FIGURE NO. 16
SNAKE CREEK BASIN-
SIEBERT DRAIN PROFILE

LEGEND:

- (2) Cross Section
- Centerline Ground Profile
- 100 Year Water Surface Profile

MIDLAND, MICHIGAN

STORMWATER MANAGEMENT STUDY

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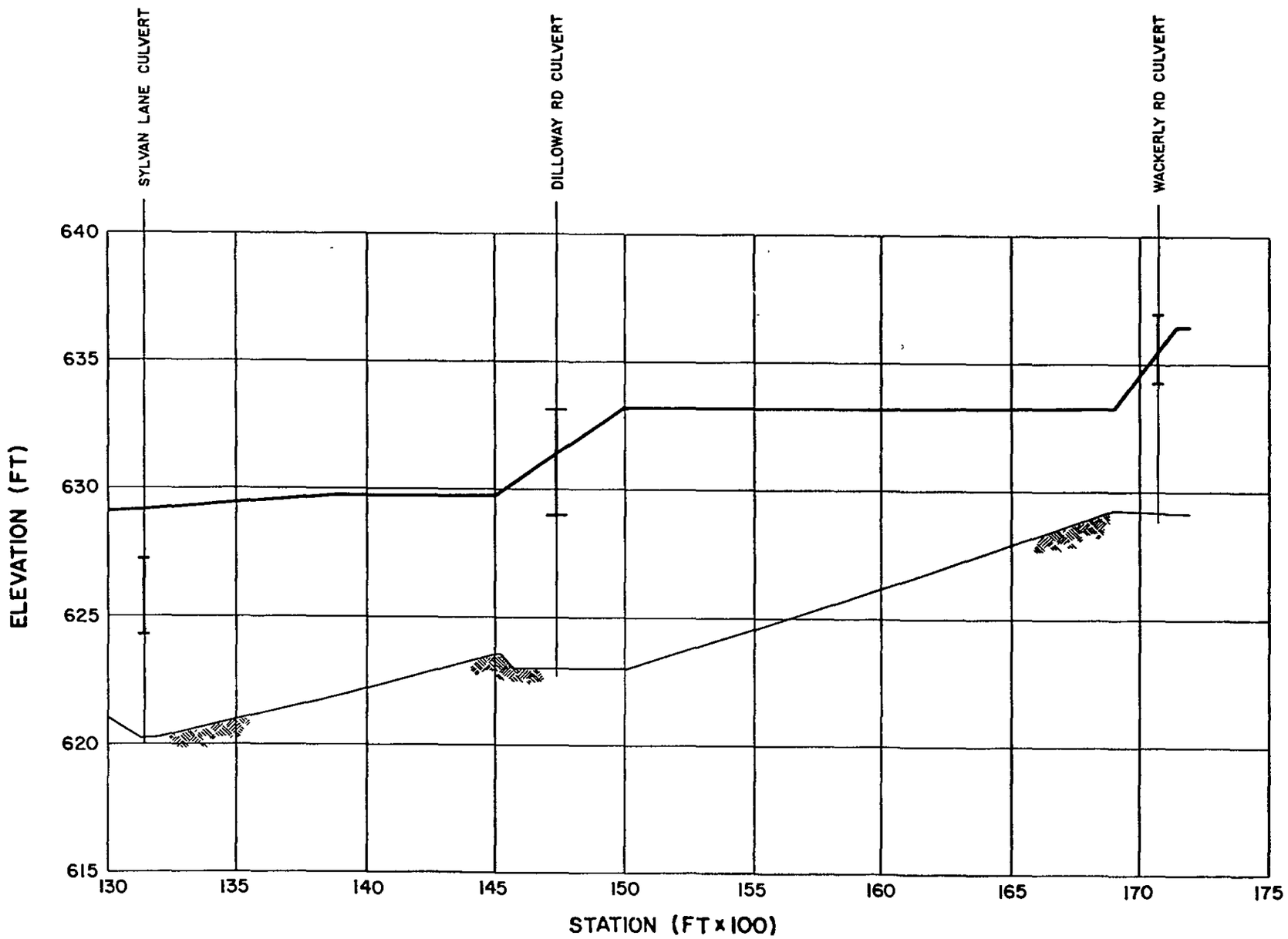

NOTE: Elevations based on city datum (to obtain U.S.G.S. subtract 1.32 ft.)

FIGURE NO. 17
SNAKE CREEK BASIN - SIEBERT DRAIN PROFILE

LEGEND:

- (2) Cross Section
- Centerline Ground Profile
- 100 Year Water Surface Profile

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increase. The major storage areas, listed in Table 4, are coincident with the floodplain/floodway boundaries and are so delineated.

SNAKE CREEK BASIN

Drainage Area

The Snake Creek watershed is located in the central portion of the City of Midland. The storm sewer system is generally bounded on the north by US10, on the east by City limits, on the south by Ashman Street and on the west by Eastman Road-Saginaw Road-Orchard Drive. The overland flow drainage boundary is basically the same as the storm sewer boundary except for an area north of Ashman in which overland flow contributes to the George Street Basin. The drainage boundaries are shown on Figure 3.

Table 5 presents overland flow drainage areas. The Snake Creek storm sewer system encompasses approximately 6.0 square miles, while the overland flow watershed encompasses approximately 5.5 square miles. As a comparison, the storm sewer drainage area for Snake Creek at Sugnet Road is approximately 4.9 square miles, while the overland drainage area at the same location is approximately 4.4 square miles.

Table 5

Snake Creek - Overland Flow Drainage Area

Location	Drainage Area (sq.miles)
Snake Creek at Tittabawassee River	5.5
Sugnet	4.4
Siebert Drain	1.9
Meadowbrook Drain	1.3
St. Andrews Drain (plus George St. overflow)	1.0

The storm system drainage area boundaries were determined utilizing storm sewer plans and information from the 1977 City of Midland Master Storm Sewer Plan. The area is served by an enclosed system of storm sewers which flow to Snake Creek and its tributaries, the Siebert Drain, the Meadowbrook Drain, and the St. Andrews Drain. Snake Creek and tributaries are open channels which flow southwesterly to the Tittabawassee River. The storm system is generally designed to handle 10-year frequency flows. Some improvements were shown to be necessary in the 1977 report.

During the 100-year frequency event, the storm sewer systems will be unable to carry the storm flow. Therefore, storm water will begin to pond and flow overland along natural or man-made flow paths. Flow travels westerly and easterly into Snake Creek and its tributaries via overland flow paths, generally in the streets. Overland flow from an area north of Ashman flows into the George Street Basin. Overland flow at the outlet of the George Street Basin overflows into St. Andrews Drain and continues into Snake Creek.

Topography and Development

The Snake Creek watershed slopes from the eastern and western boundaries toward Snake Creek and then slopes to the south to the Tittabawassee River. Natural flow paths occur along streets, resulting in narrow flow paths. The topography slopes along the overland flow paths from the upstream tributary areas (east/west direction) are generally mild while the topography slopes along the open channels are generally moderate.

Development within the Snake Creek watershed is primarily residential. Significant commercial development is located along Saginaw Road, while significant undeveloped land is located in the northeastern areas of the basin. The population of the Snake Creek overland flow watershed is approximately 10,900. Figure 3, the aerial contour map, shows existing structures, roadways, parking lots, schools, etc. and undeveloped land.

Storm Sewer Capacities

The Snake Creek Basin is served by a storm sewer system flowing to Snake Creek and its tributaries; Siebert Drain, Meadowbrook Drain and St. Andrews Drain. The major outlet from this system is Snake Creek, which discharges to the Tittabawassee River. The sewer system is generally designed to handle peak flow rates with a 10% chance of occurrence in any given year, commonly known as the 10-year event. The 1977 Master Storm Sewer Plan did indicate that some portions of the system have less than 10-year capacity and require relief.

Existing nominal storm sewer capacities were evaluated by utilizing storm sewer slopes and sizes from City plans. Manning's formula was utilized to calculate the flow capacities, assuming an average roughness value of 0.013 for the entire storm system. Surcharged storm sewer capacities for the major trunk storm sewers were obtained from information prepared in conjunction with the 1977 City of Midland Master Storm Sewer Plan. Table 6 presents the trunk storm sewer capacities.

The storm sewer system capacity appears to be able to accommodate peak flows ranging from 2-year to 10-year frequency flows. Some improvements to alleviate existing deficiencies for a 10-year design capacity were shown to be necessary in the 1977 City of Midland Master Storm Sewer Report. Some improvements have been constructed since 1977.

Snake Creek and Siebert Drain open channel information was available from the 1982 City of Midland Flood Insurance Study. Additional flow characteristics for Snake Creek and Siebert Drain, as well as for Meadowbrook Drain and St. Andrews Drain, were determined from field inspection, aerial contour maps and previous studies conducted by McNamee, Porter and Seeley.

Table 6

Snake Creek - Storm Sewer Capacities

Location	Diameter (inches)	Capacity (cfs) Pipe Full
Wackerly at Siebert Drain	27	11
Knollwood at Siebert Drain	24	13
Chapel Lane at Siebert Drain	42	32
Sylvan at Siebert Drain	30	15
	18	6
	18	5
Wheeler at Siebert Drain	42	66
	36	18
Wheeler at Meadowbrook Drain	66	90
	66	90
St. Andrews Road at Saginaw St.	54	90
Swede Rd. south of Plymouth St.	24	12
Washington St. north of Sugnet St.	60	55
Saginaw Road at Sugnet St.	72	240
Meadowbrook Drain south of Wheeler	36	35
Meadowbrook Drain at Crescent St.	24	20
Meadowbrook Drain east of Saginaw	30	20
Crescent St. at Meadowbrook Drain	24	13
Sugnet Rd. east of Eastman Rd.	30	20
Snake Creek at Eastman Rd.	60	100
	18	6
	18	10
	18	10

Hydrology

The peak flow rates throughout the Snake Creek Basin were estimated using Brater's unit hydrograph method. Existing storm sewer capacities, major storage areas, hydrograph timings, and channel storage were taken into account by use of the HEC-1 computer model. Discharge hydrographs were computed at selected locations along the major flow paths and

used as inputs to the HEC-1 model. The overflow from the George Street Basin to the St. Andrews Drain was also taken into account in the computer model. Table 7 shows the peak discharges computed at selected key points. Appendix B contains details of the methodologies and techniques utilized to conduct this portion of the study.

Along Siebert Drain, Meadowbrook Drain, and St. Andrews Drain, the culverts cause significant backup during the 100-year event. This creates some storage, thereby reducing peak flow rates experienced downstream. The culvert at Wheeler Road on Siebert Drain can cause flow to backup and bypass to Meadowbrook Drain. This tends to limit the peak flow rates on Siebert Drain, but increase peak rates in the Meadowbrook Drain. For the 100-year event under existing conditions, this bypass is very small.

Table 7

Snake Creek - Peak Discharges

Location	100-year Peak Overland Flow (cfs)
Siebert Drain	
At US-10	150
At Dilloway Road	
Upstream	330
Downstream	300
At Wheeler Road	
Upstream	490
Downstream	380
At Confluence	570
Meadowbrook Drain	
At Saginaw Road	670
At Confluence	600
St. Andrews Drain	
At St. Andrews Road	970
At Confluence	960
Snake Creek	
At Confluence	2100
At Eastman Road	1400
At Railroad Culvert	1100

Along Snake Creek, large amounts of channel storage are available due to the backup at the railroad culverts near the outlet. The amount of storage available is dependent upon the elevation in the Tittabawassee River. For this analysis, it was assumed that at the time Snake Creek was experiencing a 100-year event, the Tittabawassee River at the Snake Creek outlet was at an elevation of 607 (USGS datum). This approximates the maximum elevation in the Tittabawassee which will not significantly affect the upstream hydraulics on Snake Creek.

Table 8 lists the major channel storage volumes along Snake Creek and its tributaries.

Table 8

Snake Creek - Major Open Channel Storage Volumes

Location	Approximate 100-year Major Channel Storage Volume (ac-ft.)
Siebert Drain	
Dilloway Road	12
Wheeler Road	31
Meadowbrook Drain	
Saginaw Road	19
St. Andrews Road	
Sugnet Road	16
Snake Creek	
Sugnet Road	54
Eastman Road	143
C & O Railroad	164

Brater's unit hydrograph method uses the drainage area and population density as inputs for developing unit hydrographs. Summer and winter rainfall data, infiltration capacity, and surface retention are used as inputs for developing the surface runoff volumes. Continuous gauging of flows in the George Street outlet sewer during 1983 aided in development and verification of hydrologic parameters for the George Street, Snake Creek and Sturgeon Creek Basins. Continuous monitoring was also conducted on Snake Creek. Data was not sufficient to adequately verify hydrologic parameters. However, results of available data indicated that the Snake Creek watershed has similar hydrologic characteristics to the George Street watershed.

Further development of the basin or modifications to storage volumes could significantly affect the peak flow rates experienced in the Snake Creek Basin.

Hydraulics

The 100-year frequency flood on the Snake Creek Basin would create overland flows as existing storm sewer capacities are not designed to handle such a large flow. Overland flows occur in low-lying areas, such as old drains, roads, and occasionally between and around man-made structures. Overland flow paths in the Snake Creek Basin act as stream channels during rare flooding events but are essentially dry the majority of the time. The overland flow paths in the Snake Creek Basin discharge to open channels which convey the flow to the Tittabawassee River.

Depths of flooding and the extent of the 100-year flood plain were estimated based on the 100-year overland flows and the physical characteristics of the overland flow channel. Cross sections along the flow paths were developed from the 1-foot topographic maps. Flow path roughness factors (Manning's "n") used in the hydraulic computations were based on field observations. Roughness values for the overland flow channels ranged from 0.030 to 0.045. Hydraulic grade line slopes were estimated based on the ground profiles along the flow paths.

Flood profiles along the major overland flow paths are shown in Figures 20 through 28. Floodplain delineations noting the extent of flooding are shown in Figure 3. For the Snake Creek Basin, depth of flooding adjacent to structures in the floodplain is generally less than one foot. Floodway delineations, showing the area of the floodplain where the majority of the flow is occurring, are also shown on the contour maps.

Hydraulic computer models for the open channels were available from previous studies. However, due to significant changes in flows and the additional data available from the topographic maps, refinements to the HEC-2 models were required. Flood profiles along the open channels are shown in Figures 14 through 19.

Relatively few structures along the open channels are affected by the 100-year flood under existing conditions. The structures affected are generally subject to flooding at a significantly lower elevation than surrounding structures.

The hydraulic analyses for this study were based on unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures (such as culverts,

storm sewers, overland flow paths through bridges, etc.) or physical structures in the floodplain (i.e. flow paths between buildings, roadways, etc.) remain unobstructed, operate properly, and do not fail.

The hydraulic losses that will occur due to the addition of bridges and other structures on the overland flow paths because of population growth or shifts have not been considered.

Locations of cross sections used in the hydraulic analyses are shown on the flood profiles and the floodplain map.

The floodplain maps also indicate the location of floodways, sheet flow, and major storage areas. The floodways are those portions of the cross-section which carry the bulk of the flow. For example, if there is a very localized widening of the floodplain, the water in this area will be ponded and will not contribute to conveyance of the flow. Where floodways are not specifically shown on the floodplain map, they are essentially coincident with the floodplain boundary. In some areas, the floodplain becomes very wide and shallow. These areas have been designated as "sheet flow." Depths will usually be less than 0.5 foot in areas of sheet flow.

If the storage areas, particularly the larger channel volumes available in the areas noted in Table 8, are removed by further development or filling in of the floodplain, the flood elevations would increase.

STURGEON CREEK BASIN

Drainage Area

The Sturgeon Creek watershed is located in the northwest portion of the City of Midland. The storm sewer system is generally bounded on the west by Dublin Road, on the north by US-10, on the east by Eastman Road-Saginaw Road-Orchard Drive, and on the south by the Chesapeake and Ohio Railroad. The drainage boundaries are shown on Figure 4.

The storm system drainage area boundaries were determined utilizing storm sewer plans and information from the 1977 City of Midland Master Storm Sewer Plan. The area is mostly served by an enclosed system of storm sewers which flow to Sturgeon Creek and its tributaries, the State (Inman) Drain and the Hahn Drain. Sturgeon Creek and tributaries are open channels which flow south to the Tittabawassee River. The storm system is generally

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*            FEBRUARY 1981              *
*          REVISED 04 NOV 81            *
*                                       *
*  RUN DATE JAN 10, 1984  TIME 14:46:36 *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*  THE HYDROLOGIC ENGINEERING CENTER    *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*  (916) 440-3285 OR (FTS) 448-3285     *
*                                       *
*****************************************
```

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X               X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X               X
X     X  X        X     X         X
X     X  XXXXXXX   XXXXX         XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE. THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. SEE SEPTEMBER 1981 INPUT DESCRIPTION FOR NEW DEFINITIONS.

092

hydrology model

```
LINE        ID  ...  1  .....2. .....3... .. 4   .. .5 .....6.......7.......8.......9......10

  1         ID    MIDLAND STORM WATER MGT STUDY
  2         ID    SNAKE CREEK BASIN
  3         ID    100 -YEAR FREQUENCY EVENT
            *DIAGRAM
  4         IT      15 16DEC83       0      80
  5         IN      15 16DEC83       0
  6         IO       3       0       0

  7         KK    EXPS
  8         KM   INPUT HYDRO-DRAINAGE AREA TO EXPRESSWAY
  9         BA     .41
 10         PB       0
 11         PI       0       0       0    .014    .174    .397    .255    .123     .09    .067
 12         PI    .053     038
 13         LU       0       0       0
 14         UI       0       3       8      16      29      45      64     103     126     129
 15         UI     128     124     120     115     109     102      94      86      82      75
 16         UI      67      61      55      51      47      42      39      36      33      30
 17         UI      28      27      25      24      23      22      21      19      18      17
 18         UI      16      15      14      13      12      11      10       9       8       8
 19         UI       7     6 5       5     5.5       4       3       2       1      .5       0

 20         KK    WACK
 21         KM    STORAGE ROUTE UPSTREAM OF WACKERLY
 22         KO       3       2
16501 23    RS       1    ELEV     630                                  Q=150cfs  Stage = 634.33
 24         SV       0     .17     .68    1 04    1.61    2.56
 25         SE     630  632 633     635     636  673 637     638        Q=660     Stage 637 31
 26         SQ       0      50      80     130  660 200     360
 27         SE     630     633     635     636     637     638

 28         KK    WACK
 29         KM    INPUT HYDRO-DRAINAGE AREA TO DILLOWAY
 30         BA      39
 31         PB       0
 32         PI       0       0       0       0     056    .384    .246     .12    .087    .065
 33         PI     052     037
 34         LU       0       0       0
 35         UI       5       1       3       5       7      12      20     105     167     195
 36         UI     200     199     178     156     136     122     102      92      84      77
 37         UI      68      61      54      49      43      41      37      32      29      25
 38         UI      21      17      12       9       5       0

 39         KK    WACK
 40         KM    COMBINE HYORO-DRAINAGE AREAS AT OILLOWAY
 41         HC       2

 42         KK    OILL
 43         KM    STORAGE ROUTE UPSTREAM OF OILLOWAY
 44         KO       1       2
 45         RS       1    ELEV     624
 46         SV       0     0 2     5.2     8.6    16.1     24.        Stage 632 5   Q=300
 47         SE     624     628     632     633     634     635
 48         SQ       0      60     170     220     400    1100            633.5   Q=660 (FCS)
 49         SE     624     628     632     633     634     635
```

```
LINE      ID   .. .1 ..  . 2 . .. .3.   ...4...  ..5... ...6.......7.......8.......9......10

  50      KK   DILL
  51      KM   INPUT HYDRO-DRAINAGE  AREA TO SYLVAN
  52      BA     21
  53      PB      0
  54      PI      0       0       0       0    .022    .204    .131    .063    .046    .035
  55      PI    027     .02
  56      LU      0       0       0
  57      UI      0       8      24      75     153     290     293     274     244     204
  58      UI    165     134     110      89      73      58      50      44      38      33
  59      UI     28      24      20      14      11       7       2       0

  60      KK   DILL
  61      KM   INPUT HYDRO-DRAINAGE AREA TO WHEELER
  62      BA    .34
  63      PB      0
  64      PI      0       0       0       0    .050     .33    .212    .103    .075    .056
  65      PI    045    .032
  66      LU      0       0       0
  67      UI      0      17      53     158     350     395     356     298     225     159
  68      UI    114      93      79      67      59      50      45      37      30      22
  69      UI     15       9       3       0

  70      KK   DILL
  71      KM   COMBINE HYDRO-DRAINAGE AREAS AT WHEELER
  72      HC      3

  73      KK   WHEEL
  74      KM   STORAGE ROUTE UPSTREAM OF WHEELER
  75      KO      1       2
  76      RS      1    ELEV     617
  77      SV      0       2     6.3    12.8    25.1      45      57      70
  78      SE    617     625     627     628     629     630   630.5     631
  79      SQ      0      80     240     300     360     430     600     730
  80      SE    617     625     627     628     629     630   630.5     631

  81      KK   WHEEL
  82      KM   DIVERT FLOW TO MEADDWBRDOK
  83      DT   OFLO
  84      DI      0     410     460     520     600     680     730
  85      DQ      0       0      40      60     120     190     230

  86      KK   WHEEL
  87      KM   INPUT HYDRO-DRAINAGE AREA SOUTH OF WHEELER
  88      BA     57
  89      PB      0
  90      PI      0       0       0       0       0      11    .355    .172    .125    .094
  91      PI    075     054
  92      LU      0       0       0
  93      UI      0       5      15      39      70     118     185     234     240     234
  94      UI    223     202     169     141     117      98      77      63      55      50
  95      UI     45      41      36      33      29      25      21      18      15      12
  96      UI      8       5       2       0
```

10751

Q=710 Stage 630.0 (FIS)
Q 390 62798

D94

```
LINE        ID   .    1 .  . .2.......3.  .. .4 .....5. .....6.......7.......8.......9......10

  97        KK   WHEEL
  98        KM    COMBINE HYDRO SOUTH OF WHEELER
  99        HC       2

 100        KK   CONFL
 101        KM    CHANNEL ROUTE SIEBERT TO CONFLUENCE SECTION 1330
 102        KO       3       2
 103        RS       1    STOR      -1
 104        RC      06    .045     .06    2200    .001
 105        RX       6      13      43      47      53      60     150     229
 106        RY     620   619.2   616.5   612.6   612 6   616.8   617.9     620

 107        KK     SAG
 108        KM    INPUT HYDRO-MEADOWBROOK DRAIN
 109        BA    1.27
 110        PB       0
 111        PI       0       0       0       0    .165   1.232    .791    .385    .281    .211
 112        PI     168    .121
 113        LU       0       0       0
 114        UI       0       4      11      22      47      85     131     188     211     220
 115        UI     216     204     186     168     146     127     110      88      71      58
 116        UI      49      44      39      34      31      28      24      22      20      17
 117        UI      15      13      11       9       7       5       3       2       0

 118        KK     SAG
 119        KM    RETRIEVE DIVERTED FLOW AT WHEELER
 120        DR    OFLO

 121        KK     SAG
 122        KM    ADD MEADOWBROOK AND DIVERSION HYDROS
 123        HC       2

 124        KK   CONFL
 125        KM    ROUTE TO CONFLUENCE  - SECTION 200
 126        KO       1       2
 127        RS       1    STOR      -1
 128        RC      07    .045     .07    3500    .001
 129        RX       0      50     118     127     132     142     230     240
 130        RY   620 9   619 1   616.8   611.9   611.9   616.3     619   620.9

 131        KK    ANOY
 132        KM    INPUT HYDRO-DRAINAGE AREA FROM ST ANOREWS
 133        BA       1
 134        PB       0
 135        PI       0       0       0       0    .003    .969    .622    .302    .220    .165
 136        PI     131    .094
 137        LU       0       0       0
 138        UI       0       4      10      18      31      57      98     146     174     186
 139        UI     190     188     179     160     138     120     105      88      76      63
 140        UI      54      48      43      38      35      32      30      27      24      21
 141        UI      18      16      14      11       8       7       5       4       3       1
 142        UI       0
```

```
LINE          ID.  .    1 . . . 2. .....3 ......4. .... 5. . . .6.......7.......8.......9......10

 143          KK    ANDY
 144          KM    RETRIEVE GEORGE ST OUTFLOW HYOROGRAPH
 145          BI      25      22

 146          KK    ANDY
 147          KM    ADD ST ANDREWS AND GEORGE ST HYDROGRAPHS
 148          HC       2

 149          KK   CONFL
 150          KM    CHANNEL ROUTE TO CONFLUENCE - SECTION 2267
 151          KO       1       2
 152          RS       1    STOR      -1
 153          RC      07     .05     .07    2600    .001
 154          RX       3       8      28      37      43      56      80      85
 155          RY   625.0   620 1   619.0   612.8   612.8   619.1   620.0   625.0

 156          KK   CONFL
 157          KM    COMBINE ALL HYDROS AT CONFLUENCE
 158          HC       3

 159          KK   CONFL
 160          KM    INPUT HYDRO-DRAINAGE AREA TO EASTMAN
 161          BA     .55
 162          PB       0
 163          PI       0       0       0       0    .091    .536    .344    .167    .122    .091
 164          PI     072     052
 165          LU       0       0       0
 166          UI       0       4      10      19      45     108     143     167     177     180
 167          UI     177     169     152     135     121     107      95      82      73      63
 168          UI      54      46      40      34      31      28      24      22      20      17
 169          UI      15      13      12      10       9       8       7       5       4       3
 170          UI       2       1       0

 171          KK   CONFL
 172          KM    COMBINE HYDROS
 173          HC       2

 174          KK    EAST
 175          KM    STORAGE ROUTE UPSTREAM OF EASTMAN
 176          KO       3       2
 177          RS       1    STOR       8      -1
 178          SV       8      49     130     167
 179          SQ       0     900    1300    1600
                            694     637     617.6
 180          KK    EAST
 181          KM    INPUT HYDRO-DRAINAGE AREA TO TITTABAWASSEE
 182          BA     .51
 183          PB       0
 184          PI       0       0       0       0    .083    .493    .317    .154    .112    .084
 185          PI     066    .048
 186          LU       0       0       0
 187          UI       0       4       8      18      32      60     104     134     151     155
 188          UI     153     150     142     129     116     103      93      82      71      62
 189          UI      56      51      45      42      39      36      34      31      28      26
```

096

```
LINE        ID. . . . .1   . . .2. . . . .3. . . . . . 4. . . . . 5. . . . .6. . . . . .7. . . . . . .8. . . . . . .9. . . . . .10

 190        UI      24      22      21      19      17      15      14      12      11      10
 191        UI       9       7       6       5       4       3       2       1       0

 192        KK    EAST
 193        KM    COMBINE HYDROS
 194        HC       2

 195        KK   RIVER
 196        KM    STORAGE ROUTE TO TITTABAWASSEE
 197        KO       1       2
 198        RS       1    STOR      29      -1
 199        SV      29     113     219     251
 200        SQ       0     900    1300    1600
 201        ZZ             606.3   612.1   615.1
```

Railroad

10 100 500

51 AF 70 AF 113 A

SCHEMATIC DIAGRAM OF STREAM NETWORK

```
INPUT .
 LINE      (V) ROUTING          (--->) DIVERSION
  NO       ( ) CONNECTOR        (<---) RETURN OF DIVERTED FLOW

   7        EXPS
               V
               V
  20        WACK
               .

  28                    WACK

                           .
  39        WACK.    .... .
               V
               V
  42        DILL
               .

  50           .        DILL
               .
                           .
  60           .           .        DILL
                           .           .
               .                       .
  70        DILL. .....   ...  . .    ..
               V
               V
  73       WHEEL
               .

  83           .------->    OFLO
  81       WHEEL
               .
               .
  86           .       WHEEL
               .
                           .
  97       WHEEL    ..  .. .
               V
               V
 100       CONFL
               .
               .
 107           .         SAG
               .
               .
 120                       .            <-------    OFLO
 118                                  SAG
               .                       .
                           .           .
 121           .         SAG  . . ..
                           V
               .           V
 124           .       CONFL
               .           .

 131           .           .        ANDY
```

```
                .           .           .
                .           .           .
143             .           .                     ANDY
                .           .
                .           .           .           .
146             .           .        ANDY ...........
                .           .           V
                .           .           V
149                                  CONFL
                .           .           .
                            .           .
156        CONFL .. .  . .. .. . .. .
                .
159             .       CONFL
                .           .
                .
171        CONFL.      .     .
               V
               V
174         EAST
                .
                .
180                      EAST
                .           .
                            .
192         EAST... ... ....
               V
               V
195        RIVER
```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
*************************************
*                                   *
*  FLOOD HYDROGRAPH PACKAGE  (HEC-1)*
*          FEBRUARY 1981            *
*        REVISED 04 NOV 81          *
*                                   *
* RUN DATE JAN 10, 1984  TIME 14 46.36 *
*                                   *
*************************************
```

```
*************************************
*                                   *
*    U.S. ARMY CORPS OF ENGINEERS   *
*  THE HYDROLOGIC ENGINEERING CENTER *
*          609 SECOND STREET        *
*       DAVIS, CALIFORNIA 95616     *
*  (916) 440-3285 OR (FTS) 448-3285 *
*                                   *
*************************************
```

```
                    MIDLAND STORM WATER MGT STUDY
                    SNAKE CREEK BASIN
                    100 -YEAR FREQUENCY EVENT

  6 10        OUTPUT CONTROL VARIABLES
                 IPRNT          3  PRINT CONTROL
                 IPLOT          0  PLOT CONTROL
                 QSCAL          0  HYDROGRAPH PLOT SCALE

    IT        HYDROGRAPH TIME DATA
                 NMIN         15  MINUTES IN COMPUTATION INTERVAL
                 IDATE    16DEC83  STARTING DATE
                 ITIME       0000  STARTING TIME
                   NQ         80  NUMBER OF HYDROGRAPH ORDINATES
                NDDATE    16DEC83  ENDING DATE
                NDTIME       1945  ENDING TIME

              COMPUTATION INTERVAL    0.25 HOURS
                   TOTAL TIME BASE   19 75 HOURS

        ENGLISH UNITS
             DRAINAGE AREA          SQUARE MILES
             PRECIPITATION DEPTH    INCHES
             LENGTH, ELEVATION      FEET
             FLOW                   CUBIC FEET PER SECOND
             STORAGE VOLUME         ACRE-FEET
             SURFACE AREA           ACRES
             TEMPERATURE            DEGREES FAHRENHEIT


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
  7 KK    *     EXPS   *
          *            *
          **************
                   INPUT HYDRO-DRAINAGE AREA TO EXPRESSWAY.

  5 IN        TIME DATA FOR INPUT TIME SERIES
                 JXMIN         15  TIME INTERVAL IN MINUTES
                JXDATE    16DEC83  STARTING DATE
                JXTIME          0  STARTING TIME
```

```
              SUBBASIN RUNOFF DATA

  9 BA          SUBBASIN CHARACTERISTICS
                     TAREA          0.41  SUBBASIN AREA

                PRECIPITATION DATA

 10 PB               STORM          1.21  BASIN TOTAL PRECIPITATION

 11 PI            INCREMENTAL PRECIPITATION PATTERN
                    0.0       0 0       0.0       0.01      0.17      0.40      0.25      0.12      0.09      0.07
                    0.05      0.04

 13 LU          UNIFORM LOSS RATE
                     STRTL          0.0   INITIAL LOSS
                     CNSTL          0 0   UNIFORM LOSS RATE
                     RTIMP          0 0   PERCENT IMPERVIOUS AREA

 13 UI          INPUT UNITGRAPH,  59 ORDINATES,  VOLUME = 2 26
                     0 0       3.0       8.0      16.0      29.0      45.0      64.0     103.0     126.0     129.0
                   128.0     124 0     120.0     115.0     109.0     102.0      94.0      86.0      82.0      75.0
                    67.0      61 0      55.0      51 0      47.0      42.0      39.0      36.0      33.0      30.0
                    28.0      27.0      25 0      24 0      23.0      22.0      21.0      19.0      18.0      17.0
                    16.0      15 0      14.0      13.0      12 0      11.0      10.0       9.0       8.0       8.0
                     7.0       6 5       5.0       5 5       4.0       3.0       2.0       1.0       0.5

                                                                   ***

    ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION     EXPS

     TOTAL RAINFALL =  1.21, TOTAL LOSS =  0.0 , TOTAL EXCESS =  1.21

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                   6-HR       24-HR       72-HR     19.75-HR
   144.       4.50        (CFS)       96          37.         37.          37.
                        (INCHES)    2.180       2.739       2.739        2.739
                         (AC-FT)      48          60.         60.          60.

                       CUMULATIVE AREA =    0.41 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
 20 KK      *      WACK  *
            *            *
            **************
                         STORAGE ROUTE UPSTREAM OF WACKERLY

 22 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           3  PRINT CONTROL
                     IPLOT           2  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
```

HYDROGRAPH ROUTING DATA

23 RS	STORAGE ROUTING			
	NSTPS	1	NUMBER OF SUBREACHES	
	ITYP	ELEV	TYPE OF INITIAL CONDITION	
	RSVRIC	630 00	INITIAL CONDITION	
	X	0.0	WORKING R AND D COEFFICIENT	

24 SV	STORAGE	0 0	0.2	0.7	1.0	1.6	2.6
25 SE	ELEVATION	630 00	633.00	635.00	636.00	637.00	638.00
26 SQ	DISCHARGE	0.	50.	80.	130.	200.	360.
27 SE	ELEVATION	630.00	633.00	635.00	636.00	637.00	638.00

***

COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	0.0	0.17	0.68	1.04	1.61	2 56
OUTFLOW	0.0	50 00	80.00	130.00	200.00	360.00
ELEVATION	630.00	633 00	635.00	636.00	637.00	638.00

*** WARNING *** MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS BETWEEN 0. TO 360.
THE ROUTED HYDROGRAPH SHOULD BE EXAMINED FOR OSCILLATIONS OR OUTFLOWS GREATER THAN PEAK INFLOWS.
THIS CAN BE CORRECTED BY DECREASING THE TIME INTERVAL OR INCREASING STORAGE (USE A LONGER REACH.)

*** *** *** *** ***

HYDROGRAPH AT STATION WACK

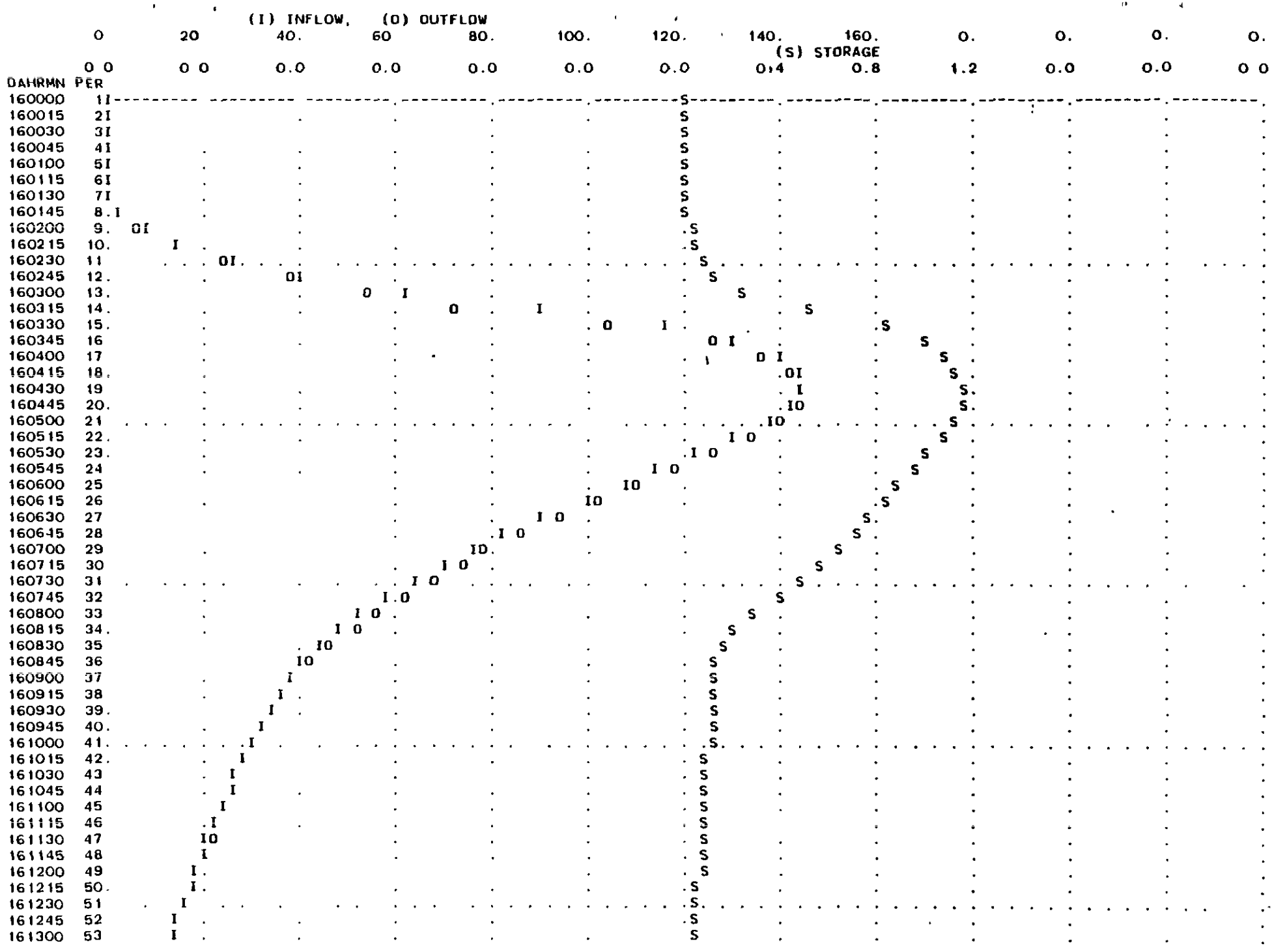
PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	19 75-HR
144	4.50	(CFS)	96.	37	37.	37.
		(INCHES)	2.180	2.739	2.739	2.739
		(AC-FT)	48.	60.	60.	60.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	19.75-HR
1.	4 50	1.	0.	0.	0.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	19.75-HR
636.20	4.50	634.93	631.94	631.94	631.94

CUMULATIVE AREA = 0.41 SQ MI

STATION WACK



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161315  54      I   .         .                   .         .         .S        .         .         .         .         .         .
161330  55      I   .         .                   .         .         .S        .         .         .         .         .         .
161345  56.    I                                  .         .         S         .         .         .         .         .         .
161400  57     I                       .         .         .         .S        .         .         .         .         .         .
161415  58    I     .         .         .         .         .         .S        .         .         .         .         .         .
161430  59.   I                       .         .         .         .S        .         .         .         .         .         .
161445  60   I0                       .         .         .         .S        .         .         .         .         .         .
161500  61  .I. . . . . . . . . . . . . . . . . . . . . . . . . . . .S. . . . . . . . . . . . . . . . . . . . . . . . . . . . .
161515  62  I         .         .                   .         .         S         .         .         .         .         .         .
161530  63  I         .                   .         .         .         S         .         .         .         .         .         .
161545  64 I          .                   .         .         .         S         .         .         .         .         .         .
161600  65.I          .                   .         .         .         S         .         .         .         .         .         .
161615  66 I          .         .         .         .         .         S         .         .         .         .         .         .
161630  67I           .         .         .         .         .         S         .         .         .         .         .         .
161645  68I           .         .                   .         .         S         .         .         .         .         .         .
161700  69I           .         .                   .         .         S         .         .         .         .         .         .
161715  70I           .         .         .         .         .         S         .         .         .         .         .         .
161730  71I           . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
161745  72I           .                   .         .         .         S         .         .         .         .         .         .
161800  73I           .         .         .         .         .         S         .         .         .         .         .         .
161815  74I           .                   .         .         .         S         .         .         .         .         .         .
161830  75I           .         .         .         .         .         S         .         .         .         .         .         .
161845  76I           .                   .         .         .         S         .         .         .         .         .         .
161900  77I                               .         .         .         S         .         .         .         .         .         .
161915  78I           .                   .         .         .         S         .         .         .         .         .         .
161930  79I           .         .         .         .         .         S         .         .         .         .         .         .
161945  80I---------.---------.---------.---------.---------.---------S---------.---------.---------.---------.---------.---------.
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0104

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*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

          **************
          *            *
 28 KK    *     WACK   *
          *            *
          **************
                         INPUT HYDRO-DRAINAGE AREA TO DILLOWAY

  5 IN          TIME DATA FOR INPUT TIME SERIES
                     JXMIN          15  TIME INTERVAL IN MINUTES
                    JXDATE     16DEC83  STARTING DATE
                    JXTIME           0  STARTING TIME

                SUBBASIN RUNOFF DATA

 30 BA          SUBBASIN CHARACTERISTICS
                     TAREA        0.39  SUBBASIN AREA

                PRECIPITATION DATA

 31 PB               STORM        1.05  BASIN TOTAL PRECIPITATION

 32 PI            INCREMENTAL PRECIPITATION PATTERN
                    0.0       0 0       0.0       0.0       0.06      0.38      0.25      0.12      0.09      0.06
                    0.05      0 04

 34 LU          UNIFORM LOSS RATE
                     STRTL        0 0   INITIAL LOSS
                     CNSTL        0.0   UNIFORM LOSS RATE
                     RTIMP        0.0   PERCENT IMPERVIOUS AREA

 34 UI          INPUT UNITGRAPH,  35 ORDINATES,  VOLUME = 2.35
                     0 5       1.0       3.0       5.0       7.0      12.0      20.0     105.0     167.0     195.0
                   200.0     199 0     178 0     156.0     136 0     122.0     102.0      92.0      84.0      77.0
                    68 0      61 0      54.0      49.0      43.0      41.0      37.0      32.0      29.0      25.0
                    21.0      17 0      12.0       9.0       5.0
                                                                  ***

    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION     WACK

     TOTAL RAINFALL =  1.05, TOTAL LOSS =  0.0 , TOTAL EXCESS =  1 05

PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
  (CFS)        (HR)                 6-HR        24-HR       72-HR     19.75-HR
   184         4 50        (CFS)     98          31.         31.          31
                         (INCHES)  2 335        2.459       2.459        2.459
                          (AC-FT)    49.         51.         51.          51.

                       CUMULATIVE AREA =    0.39 SQ MI
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*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
 39 KK      *     WACK   *
            *            *
            **************
                        COMBINE HYDRO-DRAINAGE AREAS AT DILLOWAY

 41 HC          HYDROGRAPH COMBINATION
                     ICOMP            2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                  ***

     ***            ***            ***            ***            ***

                      HYDROGRAPH AT STATION     WACK

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR     19.75-HR
    328.      4.50       (CFS)      194.         68.         68.          68.
                       (INCHES)     2.252       2.602       2.602        2.602
                        (AC-FT)      96.        111.        111.         111.

                      CUMULATIVE AREA =    0.80 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
 42 KK      *     OILL   *
            *            *
            **************
                        STORAGE ROUTE UPSTREAM OF DILLOWAY

 44 KO          OUTPUT CONTROL VARIABLES
                     IPRNT            1  PRINT CONTROL
                     IPLOT            2  PLOT CONTROL
                     QSCAL           0   HYDROGRAPH PLOT SCALE

              HYDROGRAPH ROUTING DATA

 45 RS          STORAGE ROUTING
                     NSTPS            1  NUMBER OF SUBREACHES
                      ITYP         ELEV  TYPE OF INITIAL CONDITION
                    RSVRIC       624.00  INITIAL CONDITION
                         X         0.0  WORKING R AND D COEFFICIENT

 46 SV            STORAGE          0.0       0.2       5 2       8.6      16.1      24.0

 47 SE          ELEVATION       624.00    628.00    632 00    633.00    634.00    635.00

 48 SQ          DISCHARGE          0.        60.      170.      220.      400.     1100.
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49 SE · ELEVATION	624 00	628.00	632.00	633.00	634.00	635.00

***

COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	0.0	0.20	5.20	8 60	16.10	24.00
OUTFLOW	0.0	60 00	170.00	220.00	400.00	1100 00
ELEVATION	624.00	628 00	632 00	633.00	634 00	635.00

*** WARNING *** MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS BETWEEN 0. TO 60.
THE ROUTED HYDROGRAPH SHOULD BE EXAMINED FOR OSCILLATIONS OR OUTFLOWS GREATER THAN PEAK INFLOWS.
THIS CAN BE CORRECTED BY DECREASING THE TIME INTERVAL OR INCREASING STORAGE (USE A LONGER REACH.)

****

HYDROGRAPH AT STATION DILL

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DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
16	DEC	0000	1	0	-0 0	624.0	16	DEC	0645	28	205.	7.6	632.7	16	DEC	1330	55	12.	0.0	624.8
16	DEC	0015	2	0.	-0 0	624.0	16	DEC	0700	29	191	6.6	632.4	16	DEC	1345	56	11.	0.0	624.7
16	DEC	0030	3	0.	-0 0	624.0	16	DEC	0715	30	178.	5.7	632.2	16	DEC	1400	57	10.	0.0	624.7
16	DEC	0045	4	0.	-0 0	624 0	16	DEC	0730	31	163.	4.9	631.7	16	DEC	1415	58	9.	0.0	624.6
16	DEC	0100	5	0	-0 0	624.0	16	DEC	0745	32	146	4.1	631.1	16	DEC	1430	59	8.	0.0	624.5
16	DEC	0115	6	0	0 0	624.0	16	DEC	0800	33	131.	3.4	630.6	16	DEC	1445	60	7.	0.0	624.5
16	DEC	0130	7	1.	0 0	624.0	16	DEC	0815	34	119.	2.9	630.1	16	DEC	1500	61	6.	0.0	624 4
16	DEC	0145	8	3.	0 0	624.2	16	DEC	0830	35	107.	2.3	629.7	16	DEC	1515	62	5.	0.0	624.3
16	DEC	0200	9	7	0 0	624 5	16	DEC	0845	36	96	1.8	629.3	16	DEC	1530	63	4.	0.0	624.3
16	DEC	0215	10	15.	0 0	625 0	16	DEC	0900	37	86.	1.4	628.9	16	DEC	1545	64	3.	0.0	624.2
16	DEC	0230	11	26.	0 1	625 8	16	DEC	0915	38	77.	1.0	628.6	16	DEC	1600	65	2.	0.0	624.1
16	DEC	0245	12	43	0 1	626.9	16	DEC	0930	39	69.	0.6	628.3	16	DEC	1615	66	1.	0.0	624.1
16	DEC	0300	13	62	0 3	628.1	16	DEC	0945	40	62.	0.3	628.1	16	DEC	1630	67	1.	0.0	624.0
16	DEC	0315	14	76	0 9	628.6	16	DEC	1000	41	40.	0.1	626.7	16	DEC	1645	68	0.	0.0	624.0
16	DEC	0330	15	110.	2.5	629 8	16	DEC	1015	42	37	0.1	626.4	16	DEC	1700	69	0.	0.0	624.0
16	DEC	0345	16	158	4 7	631.6	16	DEC	1030	43	31.	0.1	626.1	16	DEC	1715	70	0.	0.0	624.0
16	DEC	0400	17	195.	6.9	632.5	16	DEC	1045	44	28	0.1	625.9	16	DEC	1730	71	0.	0.0	624 0
16	DEC	0415	18	230	9 0	633.1	16	DEC	1100	45	25.	0.1	625.7	16	DEC	1745	72	0.	0.0	624.0
16	DEC	0430	19	268	10 6	633 3	16	DEC	1115	46	23.	0.1	625.6	16	DEC	1800	73	0.	-0.0	624.0
16	DEC	0445	20	291.	11 5	633.4	16	DEC	1130	47	21.	0.1	625.4	16	DEC	1815	74	0.	-0.0	624.0
16	DEC	0500	21	300	11 9	633.4	16	DEC	1145	48	20.	0.1	625.3	16	DEC	1830	75	0.	-0.0	624.0
16	DEC	0515	22	298	11.8	633.4	16	DEC	1200	49	19	0.1	625.2	16	DEC	1845	76	0.	-0.0	624 0
16	DEC	0530	23	287.	11 4	633.4	16	DEC	1215	50	17	0.1	625.2	16	DEC	1900	77	0.	-0.0	624 0
16	DEC	0545	24	272	10.7	633.3	16	DEC	1230	51	16.	0.1	625.1	16	DEC	1915	78	0.	-0.0	624.0
16	DEC	0600	25	253	10 0	633.2	16	DEC	1245	52	15	0.1	625.0	16	DEC	1930	79	0.	-0.0	624.0
16	DEC	0615	26	234	9 2	633.1	16	DEC	1300	53	14	0.0	624.9	16	DEC	1945	80	0.	-0.0	624.0
16	DEC	0630	27	217	8 4	632 9	16	DEC	1315	54	13	0.0	624.8							

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PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	19.75-HR
300.	5.00	(CFS)	192.	68.	68.	68.
		(INCHES)	2 233	2.602	2.602	2.602
		(AC-FT)	95.	111.	111.	111.

PEAK STORAGE TIME MAXIMUM AVERAGE STORAGE

(AC-FT)	(HR)	6-HR	24-HR	72-HR	19.75-HR
12.	5.00	7.	2.	2.	2.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	19.75-HR
633.44	5.00	631.82	627.01	627.01	627.01

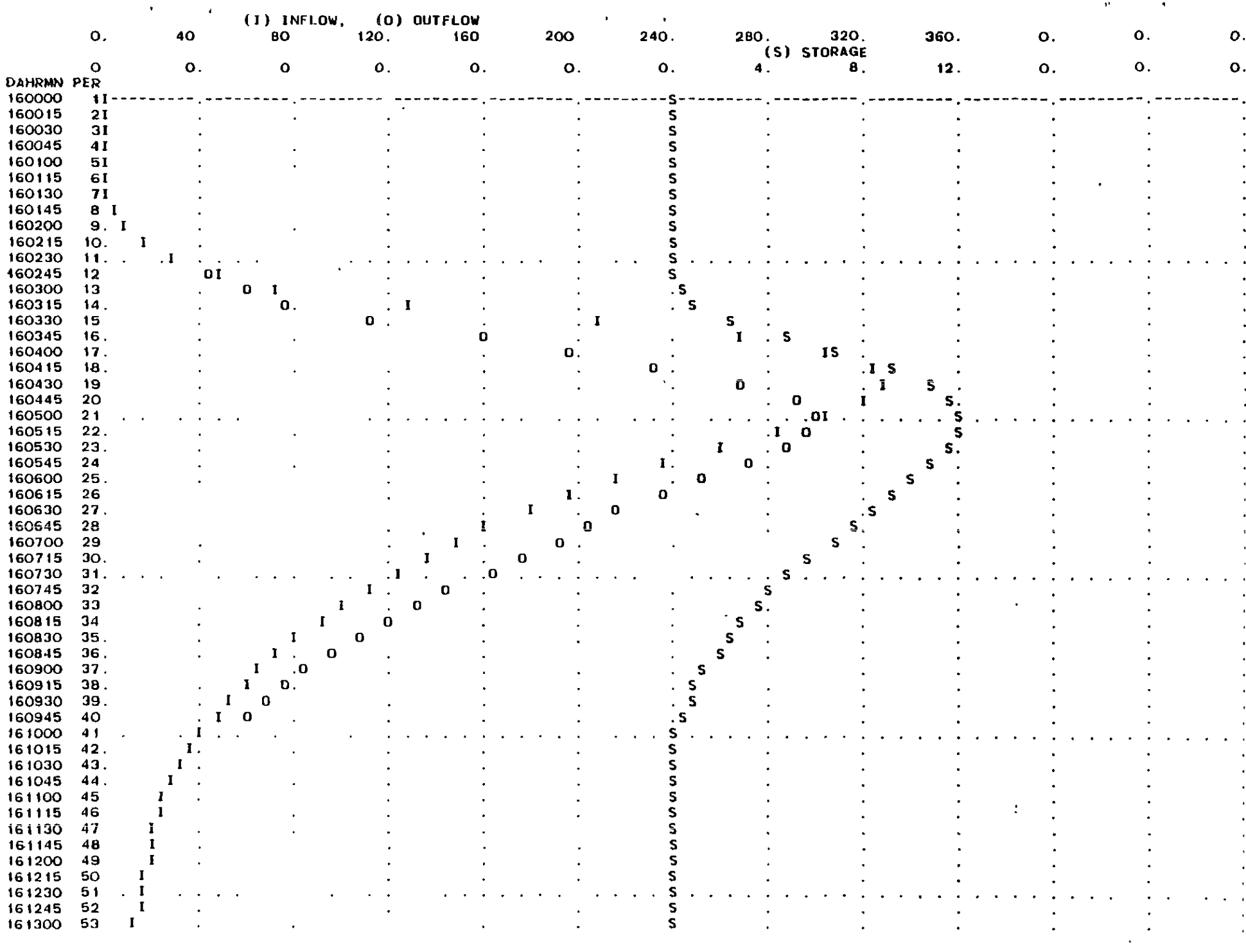
CUMULATIVE AREA = 0 80 SQ MI

0108

STATION DILL

(I) INFLOW, (O) OUTFLOW

(S) STORAGE



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161315  64    I                                                S
161330  55    I                                                S
161345  56    I                                                S
161400  57   I                                                 S
161415  58.  I                                                 S
161430  59   I                                                 S
161445  60.  I                                                 S
161500  61.  I                                                 S
161515  62  I                                                  S
161530  63.I                                                   S
161545  64.I                                                   S
161600  65I                                                    S
161615  66I                                                    S
161630  67I                                                    S
161645  68I                                                    S
161700  69I                                                    S
161715  70I                                                    S
161730  71I                                                    S
161745  72I                                                    S
161800  73I                                                    S
161815  74I                                                    S
161830  75I                                                    S
161845  76I                                                    S
161900  77I                                                    S
161915  78I                                                    S
161930  79I                                                    S
161945  80I                                                    S
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*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
 50 KK      *     DILL   *
            *            *
            **************
                          INPUT HYDRO-DRAINAGE  AREA TO SYLVAN

  5 IN          TIME DATA FOR INPUT TIME SERIES
                     JXMIN          15  TIME INTERVAL IN MINUTES
                    JXDATE     16DEC83  STARTING DATE
                    JXTIME           0  STARTING TIME

               SUBBASIN RUNOFF DATA

 52 BA          SUBBASIN CHARACTERISTICS
                     TAREA        0 21  SUBBASIN AREA

                PRECIPITATION DATA

 53 PB                STORM        0.55  BASIN TOTAL PRECIPITATION

 54 PI            INCREMENTAL PRECIPITATION PATTERN
                    0.0       0 0       0.0       0.0       0.02      0.20      0.13      0.06      0.05      0.03
                    0 03      0 02

 56 LU          UNIFORM LOSS RATE
                     STRTL        0.0   INITIAL LOSS
                     CNSTL        0 0   UNIFORM LOSS RATE
                     RTIMP        0 0   PERCENT IMPERVIOUS AREA

 56 UI          INPUT UNITGRAPH,  27 ORDINATES,  VOLUME = 4 55
                     0 0       8 0       24.0      75 0      153.0     290.0     293.0     274.0     244.0     204.0
                   165 0     134 0      110 0      89.0      73.0      58.0      50.0      44.0      38.0      33.0
                    28 0      24 0      20.0      14 0      11 0       7.0       2.0
                                                                   ***

    ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION     DILL

     TOTAL RAINFALL =  0.55, TOTAL LOSS =  0.0 , TOTAL EXCESS = 0.55

PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
  (CFS)        (HR)                   6-HR       24-HR       72-HR      19 75-HR
   130         3 50        (CFS)      56          17.         17.          17.
                         (INCHES)    2.465       2.492       2 492        2.492
                          (AC-FT)     28.         28          28.          28.

                       CUMULATIVE AREA =    0.21 SQ MI
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*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

          **************
          *            *
 60 KK    *      DILL  *
          *            *
          **************
                         INPUT HYDRO-DRAINAGE AREA TO WHEELER

  5 IN          TIME DATA FOR INPUT TIME SERIES
                     JXMIN          15  TIME INTERVAL IN MINUTES
                    JXDATE     16DEC83  STARTING DATE
                    JXTIME           0  STARTING TIME

              SUBBASIN RUNOFF DATA

 62 BA          SUBBASIN CHARACTERISTICS
                     TAREA        0 34  SUBBASIN AREA

                PRECIPITATION DATA

 63 PB               STORM        0.90  BASIN TOTAL PRECIPITATION

 64 PI            INCREMENTAL PRECIPITATION PATTERN
                    0.0       0.0       0.0       0.0       0.05      0.33      0.21      0.10      0.07      0.06
                    0.04      0.03

 66 LU          UNIFORM LOSS RATE
                     STRTL        0.0   INITIAL LOSS
                     CNSTL        0 0   UNIFORM LOSS RATE
                     RTIMP        0.0   PERCENT IMPERVIOUS AREA

 66 UI          INPUT UNITGRAPH,  23 ORDINATES,  VOLUME = 3.00
                     0 0      17 0      53.0     158 0     350.0     395.0     356.0     298.0     225.0     159.0
                   114 0      93.0      79.0      67.0      59.0      50.0      45.0      37.0      30.0      22.0
                    15.0       9 0       3 0

                                                                  ***

    ***            ***            ***            ***            ***

                       HYDROGRAPH AT STATION     DILL

     TOTAL RAINFALL =  0 90, TOTAL LOSS =  0.0 , TOTAL EXCESS =  0 90

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                   6-HR       24-HR       72-HR     19.75-HR
   268        3.00        (CFS)      99          30.         30.          30.
                        (INCHES)   2 703       2.710       2 710        2.710
                         (AC-FT)     49.         49.         49.          49.

                       CUMULATIVE AREA =    0 34 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***
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D 112

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          **************
          *            *
70 KK     *     DILL   *
          *            *
          **************
                    COMBINE HYDRO-DRAINAGE AREAS AT WHEELER

72 HC          HYDROGRAPH COMBINATION
                    ICOMP          3  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                  ***

    ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION     DILL

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR      19.75-HR
    488       3.75       (CFS)      334.        115         115.         115.
                       (INCHES)    2 303       2.612       2.612        2.612
                        (AC-FT)     166.        188.        188.         188.

                     CUMULATIVE AREA =     1.35 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

          **************
          *            *
73 KK     *     WHEEL  *
          *            *
          **************
                    STORAGE ROUTE UPSTREAM OF WHEELER

75 KO          OUTPUT CONTROL VARIABLES
                    IPRNT          1  PRINT CONTROL
                    IPLDT          2  PLOT CONTROL
                    QSCAL         0.  HYDROGRAPH PLOT SCALE

             HYDROGRAPH ROUTING DATA

76 RS          STORAGE ROUTING
                    NSTPS          1  NUMBER OF SUBREACHES
                     ITYP       ELEV  TYPE OF INITIAL CONDITION
                   RSVRIC     617 00  INITIAL CONDITION
                        X       0 0  WORKING R AND D COEFFICIENT

77 SV            STORAGE        0.0       2.0       6.3      12.8      25.1      45.0      57.0      70.0

78 SE          ELEVATION     617 00    625 00    627 00    628 00    629.00    630.00    630.50    631.00

79 SQ          DISCHARGE        0.        80       240.      300.      360.      430.      600.      730.

80 SE          ELEVATION     617.00    625.00    627.00    628.00    629.00    630.00    630.50    631.00

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D113

COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	0.0	2.00	6.30	12.80	25.10	45.00	57.00	70.00
OUTFLOW	0.0	80 00	240 00	300.00	360 00	430 00	600.00	730.00
ELEVATION	617.00	625 00	627.00	628.00	629.00	630.00	630.50	631.00

HYDROGRAPH AT STATION WHEEL

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
16	DEC	0000	1	0	-0 0	617.0	16	DEC	0645	28	355.	24.1	628.9	16	DEC	1330	55	13.	0.3	618.3
16	DEC	0015	2	0	-0 0	617.0	16	DEC	0700	29	343.	21.6	628.7	16	DEC	1345	56	12.	0.3	618.2
16	DEC	0030	3	.0.	-0 0	617.0	16	DEC	0715	30	330.	18.9	628.5	16	DEC	1400	57	11.	0.3	618.1
16	DEC	0045	4	0.	-0.0	617 0	16	DEC	0730	31	316.	16.0	628.3	16	DEC	1415	58	10.	0.2	618.0
16	DEC	0100	5	0.	-0 0	617.0	16	DEC	0745	32	301.	13.1	628.0	16	DEC	1430	59	9.	0.2	617 9
16	DEC	0115	6	0	0 0	617.0	16	DEC	0800	33	275.	10.1	627.6	16	DEC	1445	60	8.	0.2	617.8
16	DEC	0130	7	0.	0 0	617 0	16	DEC	0815	34	250.	7.4	627.2	16	DEC	1500	61	7.	0 2	617.7
16	DEC	0145	8	4.	0.1	617 4	16	DEC	0830	35	197	5.1	626.5	16	DEC	1515	62	6.	0.2	617.6
16	DEC	0200	9	18	0 5	618 8	16	DEC	0845	36	144	3.7	625.8	16	DEC	1530	63	5.	0.1	617.5
16	DEC	0215	10	55.	1 4	622 5	16	DEC	0900	37	115.	2.9	625.4	16	DEC	1545	64	4.	0 1	617.4
16	DEC	0230	11	129.	3.3	625.6	16	DEC	0915	38	97.	2 4	625.2	16	DEC	1600	65	3.	0.1	617.3
16	DEC	0245	12	232	6.1	626.9	16	DEC	0930	39	84	2.1	625.0	16	DEC	1615	66	2.	0.1	617 2
16	DEC	0300	13	269.	9 4	627.5	16	DEC	0945	40	73.	1.8	624.3	16	DEC	1630	67	2.	0.0	617.2
16	DEC	0315	14	301	13 0	628.0	16	DEC	1000	41	60	1.5	623.0	16	DEC	1645	68	1.	0.0	617.1
16	DEC	0330	15	318.	16 4	628 3	16	DEC	1015	42	47	1.2	621.7	16	DEC	1700	69	1.	0.0	617.1
16	DEC	0345	16	334	19 7	628.6	16	DEC	1030	43	39	1.0	620.9	16	DEC	1715	70	0.	0.0	617.0
16	DEC	0400	17	348	22 6	628.8	16	DEC	1045	44	34.	0.8	620.4	16	DEC	1730	71	0.	0.0	617 0
16	DEC	0415	18	360.	25.1	629.0	16	DEC	1100	45	30	0.7	620.0	16	DEC	1745	72	0.	0.0	617.0
16	DEC	0430	19	367.	27 2	629.1	16	DEC	1115	46	26.	0.7	619.6	16	DEC	1800	73	0.	0.0	617.0
16	DEC	0445	20	373.	28 9	629.2	16	DEC	1130	47	24.	0.6	619.4	16	DEC	1815	74	0.	0.0	617.0
16	DEC	0500	21	378.	30 2	629.3	16	DEC	1145	48	22.	0.6	619.2	16	DEC	1830	75	0.	0 0	617.0
16	DEC	0515	22	381	31.0	629.3	16	DEC	1200	49	21.	0.5	619.1	16	DEC	1845	76	0.	0.0	617.0
16	DEC	0530	23	381.	31.2	629.3	16	DEC	1215	50	19.	0.5	618.9	16	DEC	1900	77	0.	0.0	617.0
16	DEC	0545	24	380.	30.8	629.3	16	DEC	1230	51	18.	0.4	618.8	16	DEC	1915	78	0.	0.0	617.0
16	DEC	0600	25	377.	29 8	629.2	16	DEC	1245	52	17.	0.4	618.7	16	DEC	1930	79	0.	0.0	617.0
16	DEC	0615	26	371.	28 3	629.2	16	DEC	1300	53	15	0.4	618.5	16	DEC	1945	80	0.	0.0	617.0
16	DEC	0630	27	364.	26 4	629.1	16	DEC	1315	54	14.	0.4	618.4							

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	19.75-HR
381	5.50	(CFS)	328.	115.	115.	115.
		(INCHES)	2 257	2 612	2.612	2.612
		(AC-FT)	163	188.	188.	188.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	19.75-HR
31	5.50	20	7.	7.	7.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	19.75-HR
629 30	5 50	628 46	621 82	621.82	621.82

CUMULATIVE AREA = 1.35 SQ MI

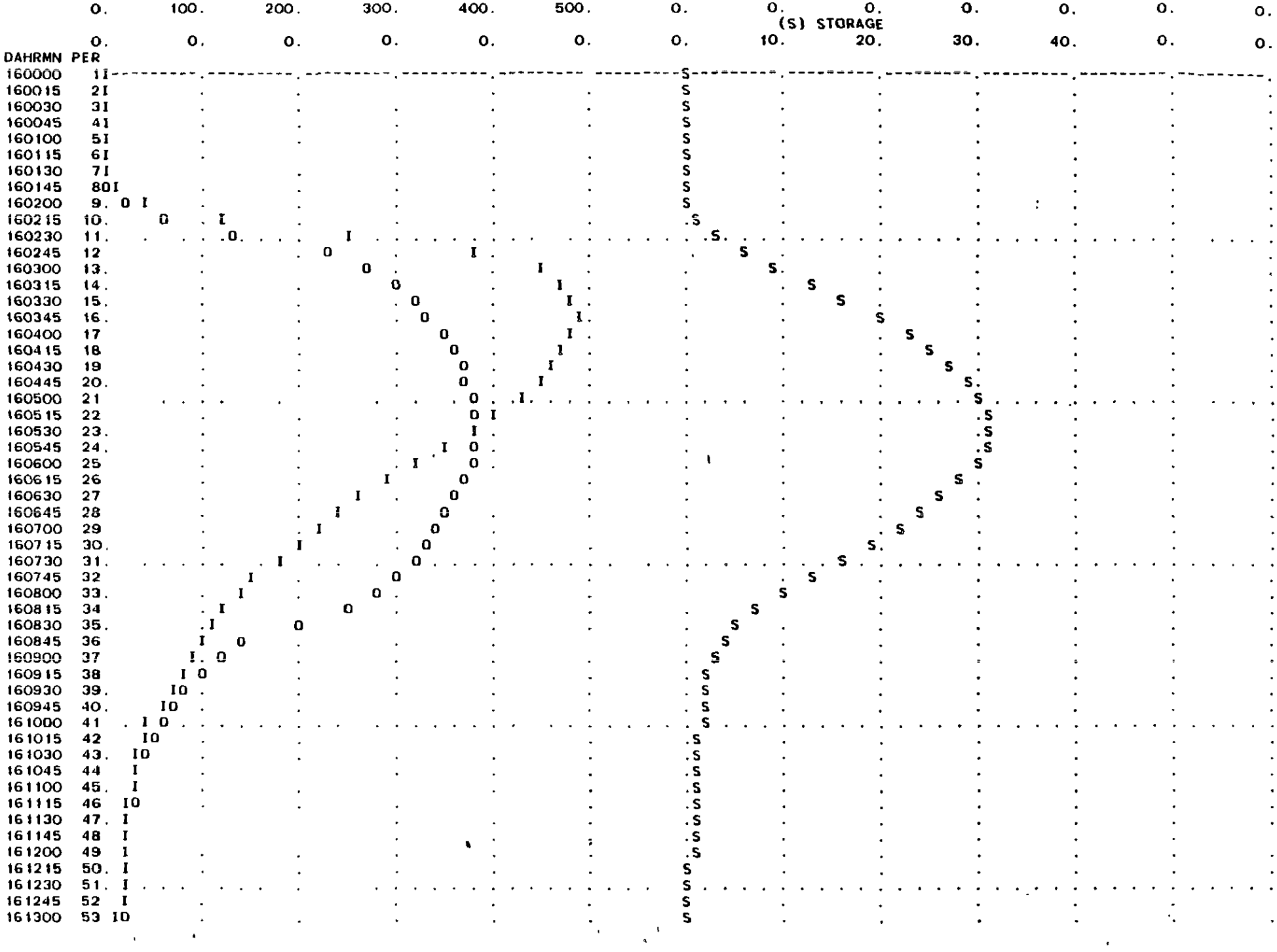
STATION WHEEL

(I) INFLOW, (D) OUTFLOW

0. 100. 200. 300. 400. 500. 0. 0. 0. 0. 0. 0. 0.

(S) STORAGE

0. 0. 0. 0. 0. 0. 0. 10. 20. 30. 40. 0. 0.



```
161315  54 I                                                  S
161330  55 I                                                  S
161345  56.I                                                  S
161400  57.I                                                  S
161415  58 I                                                  S
161430  59.I                                                  S
161445  60 I                                                  S
161500  61 I                                                  S
161515  62 I                                                  S
161530  63I0                                                  S
161545  64I                                                   S
161600  65I                                                   S
161615  66I                                                   S
161630  67I                                                   S
161645  68I                                                   S
161700  69I                                                   S
161715  70I                                                   S
161730  71I                                                   S
161745  72I                                                   S
161800  73I                                                   S
161815  74I                                                   S
161830  75I                                                   S
161845  76I                                                   S
161900  77I                                                   S
161915  78I                                                   S
161930  79I                                                   S
161945  80I                                                   S
```

D 117

```
*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

          **************
          *            *
 81 KK    *    WHEEL   *
          *            *
          **************
                         DIVERT FLOW TO MEADOWBROOK

   DT          DIVERSION
                    ISTAD        DFLO  DIVERSION HYDROGRAPH IDENTIFICATION

   DI             INFLOW        0.0     410 00    460.00    520.00    600.00    680.00    730.00

   DQ      DIVERTED FLOW        0 0       0.0      40 00     60.00    120.00    190.00    230.00

                                                                    ***

    ***            ***            ***            ***            ***

                     DIVERSION HYDROGRAPH     DFLO

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                   6-HR       24-HR       72-HR     19.75-HR
     0.       0.25        (CFS)       0.          0           0.          0.
                        (INCHES)    0.0         0.0         0.0         0.0
                         (AC-FT)      0           0.          0.          0.

                         CUMULATIVE AREA =    1.35 SQ MI

    ***            ***            ***            ***            ***

                     HYDROGRAPH AT STATION    WHEEL

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                   6-HR       24-HR       72-HR     19.75-HR
   381        5 50        (CFS)      328.        115.        115.        115.
                        (INCHES)    2.257       2.612       2.612       2.612
                         (AC-FT)     163.        188.        188.        188.

                         CUMULATIVE AREA =    1.35 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

          **************
          *            *
 86 KK    *    WHEEL   *
          *            *
          **************
                         INPUT HYDRO-DRAINAGE AREA SOUTH OF WHEELER
```

D 118

```
 5 IN          TIME DATA FOR INPUT TIME SERIES
                    JXMIN          15  TIME INTERVAL IN MINUTES
                   JXDATE     16DEC83  STARTING DATE
                   JXTIME           0  STARTING TIME

              SUBBASIN RUNOFF DATA

88 BA           SUBBASIN CHARACTERISTICS
                    TAREA        0 57  SUBBASIN AREA

                PRECIPITATION DATA

89 PB                STORM        0 98  BASIN TOTAL PRECIPITATION

90 PI             INCREMENTAL PRECIPITATION PATTERN
                   0 0       0 0       0.0       0.0       0 0       0.11      0 36      0.17      0.13      0.09
                   0.07      0 05

92 LU           UNIFORM LOSS RATE
                    STRTL        0.0   INITIAL LOSS
                    CNSTL        0.0   UNIFORM LOSS RATE
                    RTIMP        0 0   PERCENT IMPERVIOUS AREA

92 UI           INPUT UNITGRAPH,  33 ORDINATES,  VOLUME = 1.78
                    0 0       5 0      15 0      39.0      70.0     118.0     185.0     234.0     240.0     234.0
                  223.0     202.0     169.0     141.0     117.0      98.0      77.0      63.0      55.0      50.0
                   45.0      41 0      36.0      33.0      29.0      25.0      21.0      18.0      15.0      12.0
                    8.0       5 0       2.0

                                                                    ***

    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION    WHEEL

     TOTAL RAINFALL =  0 98, TOTAL LOSS =  0.0 , TOTAL EXCESS =  0 98

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                   6-HR       24-HR       72-HR     19.75-HR
    214       4.25        (CFS)     103.         33.         33.          33.
                        (INCHES)    1.686       1.757       1.757        1.757
                         (AC-FT)      51.         53.         53.          53.

                      CUMULATIVE AREA =    0.57 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            *************
            *           *
 97 KK      *    WHEEL  *
            *           *
            *************
                        COMBINE HYDRO SOUTH OF WHEELER

 99 HC          HYDROGRAPH COMBINATION
```

0 119

```
                    ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                  ***

     ***            ***            ***            ***            ***

                      HYDROGRAPH AT STATION    WHEEL

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR      19.75-HR
    575.      4.50       (CFS)      431.        148.        148.         148.
                       (INCHES)    2 088       2.358       2.358        2.358
                        (AC-FT)     214.        242.        242.         242.

                       CUMULATIVE AREA =    1.92 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
100 KK      *     CONFL  *
            *            *
            **************
                          CHANNEL ROUTE SIEBERT TO CONFLUENCE SECTION 1330

102 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           3  PRINT CONTROL
                      IPLOT           2  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE

              HYDROGRAPH ROUTING DATA

103 RS          STORAGE ROUTING
                      NSTPS           1  NUMBER OF SUBREACHES
                       ITYP        STOR  TYPE OF INITIAL CONDITION
                     RSVRIC       -1.00  INITIAL CONDITION
                          X        0.0  WORKING R AND D COEFFICIENT

104 RC          NORMAL DEPTH CHANNEL ROUTING
                        ANL       0.060  LEFT OVERBANK N-VALUE
                       ANCH       0.045  MAIN CHANNEL N-VALUE
                        ANR       0.060  RIGHT OVERBANK N-VALUE
                      RLNTH       2200   REACH LENGTH
                        SEL      0.0010  ENERGY SLOPE
                      ELMAX         0 0  MAX. ELEV. FOR STORAGE/OUTFLOW CALCULATION

                                        CROSS-SECTION DATA
                          --- LEFT OVERBANK --- + ------ MAIN CHANNEL ------- + --- RIGHT OVERBANK ---
106 RY        ELEVATION    620 00    619.20    616.50    612.60    612 60    616.80    617.90    620.00
105 RX        DISTANCE       6 00     13.00     43.00     47.00     53 00     60.00    150.00    229.00

                                                                  ***

                                        COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

            STORAGE       0.0       0.13      0.28      0.45      0.64      0.85      1.08      1.33      1.60      1.90
```

D 120

OUTFLOW	0.0	1 31	4.25	8 57	14 24	21.31	29.82	39.83	51.41	64.83
ELEVATION	612.60	612.99	613.38	613 77	614.16	614.55	614.94	615.33	615.72	616.10
STORAGE	2.21	2.60	3.51	5 13	7 43	10.17	13.29	16.78	20.63	24.84
OUTFLOW	79 55	98 52	124.89	162 79	217.98	293.06	386.72	500.07	634.86	791.38
ELEVATION	616.49	616 88	617.27	617.66	618 05	618.44	618.83	619.22	619.61	620.00

*** *** *** *** ***

HYDROGRAPH AT STATION CONFL

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	19.75-HR
562	4.75	(CFS)	424	148.	148.	148.
		(INCHES)	2 052	2.358	2.358	2.358
		(AC-FT)	210	241.	241.	241.

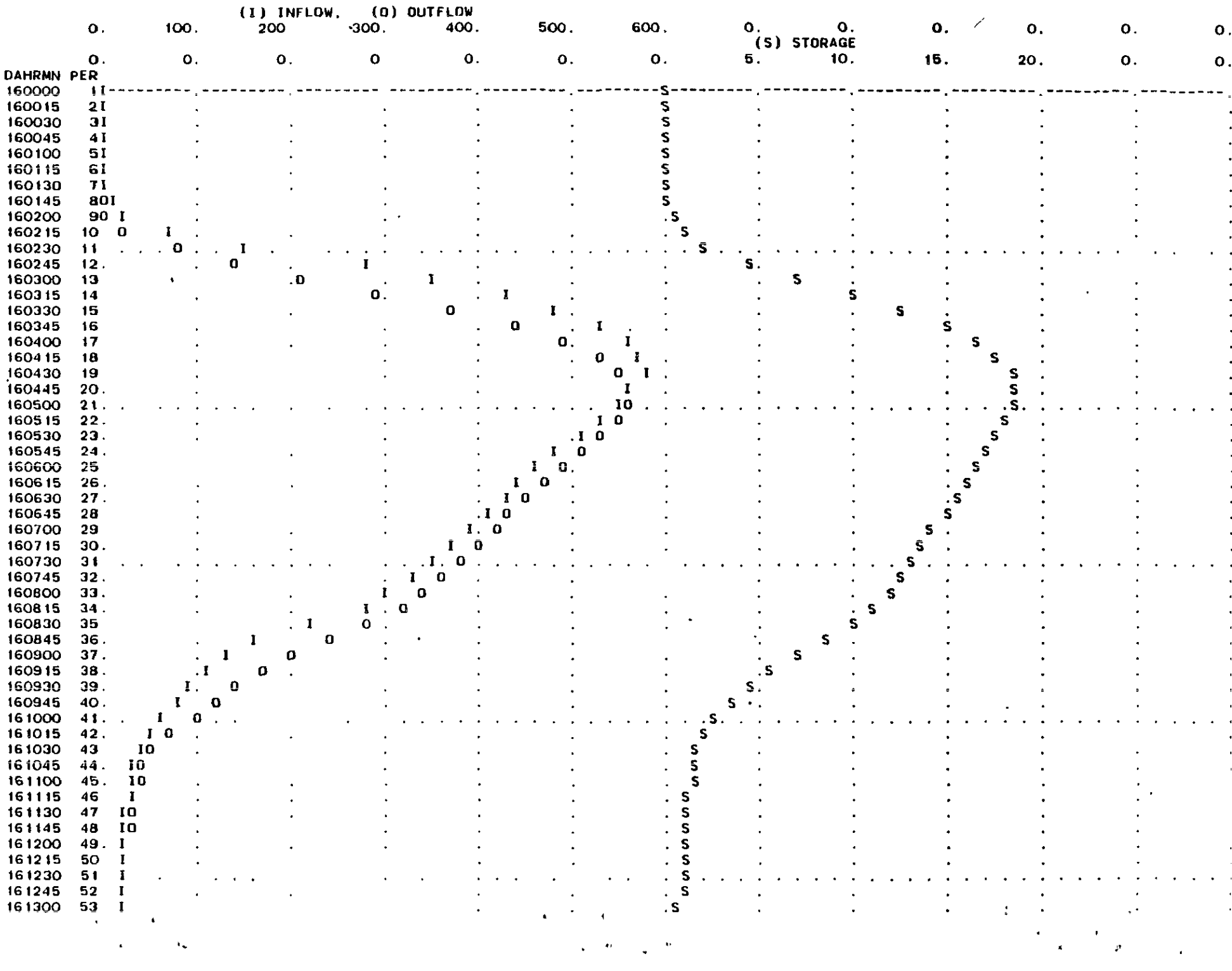
PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	19.75-HR
19.	4 75	14	5.	5.	5.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	19 75-HR
619 40	4.75	618 92	615.58	615.58	615.58

CUMULATIVE AREA = 1.92 SQ MI

D 121

STATION CONFL



0122

```
161315  54 IO                                                  .S
161330  55.I                                                    .S
161345  56.I                                                    .S
161400  57 I                                                    .S
161415  58 I                                                    .S
161430  59 I                                                     S
161445  60.I                                                    .S
161500  61.I                                                     S
161515  62 I                                                    .S
161530  63 I                                                    .S
161545  64IO                                                    .S
161600  65IO                                                    .S
161615  66I                                                     .S
161630  67I                                                      S
161645  68I                                                      S
161700  69I                                                      S
161715  70I                                                      S
161730  71I                                                      S
161745  72I                                                      S
161800  73I                                                      S
161815  74I                                                      S
161830  75I                                                      S
161845  76I                                                      S
161900  77I                                                      S
161915  78I                                                      S
161930  79I                                                      S
161945  80I                                                      S
```

D/23

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*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
107 KK      *     SAG    *
            *            *
            **************
                          INPUT HYDRO-MEADOWBROOK DRAIN

  5 IN          TIME DATA FOR INPUT TIME SERIES
                     JXMIN          15  TIME INTERVAL IN MINUTES
                    JXDATE     16DEC83  STARTING DATE
                    JXTIME           0  STARTING TIME

               SUBBASIN RUNOFF DATA

109 BA          SUBBASIN CHARACTERISTICS
                     TAREA        1 27  SUBBASIN AREA

                PRECIPITATION DATA

110 PB               STORM        3 35  BASIN TOTAL PRECIPITATION

111 PI            INCREMENTAL PRECIPITATION PATTERN
                    0 0       0 0       0.0       0.0       0.17      1.23      0 79      0.38      0.28      0.21
                    0.17      0.12

113 LU          UNIFORM LOSS RATE
                     STRTL        0.0   INITIAL LOSS
                     CNSTL        0.0   UNIFORM LOSS RATE
                     RTIMP        0 0   PERCENT IMPERVIOUS AREA

113 UI          INPUT UNITGRAPH,  38 ORDINATES,  VOLUME = 0.81
                    0 0       4 0       11.0      22.0      47.0      85.0      131.0     188.0     211.0     220.0
                  216.0     204 0     186 0     168.0     146.0     127.0     110.0     88.0      71.0      58.0
                   49.0      44 0      39.0      34.0      31.0      28.0      24.0      22.0      20.0      17.0
                   15.0      13 0      11 0       9 0       7.0       5.0       3.0       2.0
                                                                   ***

    ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION      SAG

     TOTAL RAINFALL =  3 35, TOTAL LOSS =  0.0 , TOTAL EXCESS =  3.35

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR        24-HR       72-HR     19.75-HR
   669.       4 25        (CFS)    350.         113.        113.        113.
                        (INCHES)  2.562        2 728       2 728       2.728
                         (AC-FT)   174         185.        185.        185.

                       CUMULATIVE AREA =    1.27 SQ MI
```

0/24

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*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
118 KK      *     SAG    *
            *            *
            **************
                        RETRIEVE DIVERTED FLOW AT WHEELER

120 DR          RETRIEVE DIVERSION HYDROGRAPH
                     ISTAD        OFLO  DIVERSION HYDROGRAPH IDENTIFICATION

                                                                  ***

    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION      SAG

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR     19.75-HR
     0.       0.25        (CFS)      0.          0.          0          0.
                        (INCHES)    0.0         0.0         0.0        0.0
                         (AC-FT)      0.          0.          0.         0.

                      CUMULATIVE AREA =    0 0  SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
121 KK      *     SAG    *
            *            *
            **************
                        ADD MEADOWBROOK AND DIVERSION HYDROS

123 HC          HYDROGRAPH COMBINATION
                     ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                  ***

    ***             ***             ***             ***             ***

                      HYDROGRAPH AT STATION      SAG

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR     19.75-HR
   669        4.25        (CFS)     350.        113.        113.       113.
                        (INCHES)   2.562       2.728       2.728      2.728
                         (AC-FT)    174         185.        185.       185.

                      CUMULATIVE AREA =    1.27 SQ MI
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D 125

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*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
124 KK      *     CONFL  *
            *            *
            **************
                          ROUTE TO CONFLUENCE  - SECTION 200

126 KO          OUTPUT CONTROL VARIABLES
                      IPRNT            1  PRINT CONTRDL
                      IPLOT            2  PLOT CONTROL
                      QSCAL            0  HYDROGRAPH PLOT SCALE

               HYDRDGRAPH ROUTING DATA

127 RS          STORAGE ROUTING
                      NSTPS            1  NUMBER OF SUBREACHES
                       ITYP         STOR  TYPE OF INITIAL CONDITION
                      RSVRIC       -1.00  INITIAL CONDITION
                           X        0.0  WORKING R AND D COEFFICIENT

128 RC          NORMAL DEPTH CHANNEL ROUTING
                        ANL       0 070  LEFT OVERBANK N-VALUE
                       ANCH       0.045  MAIN CHANNEL N-VALUE
                        ANR       0.070  RIGHT OVERBANK N-VALUE
                      RLNTH       3500   REACH LENGTH
                        SEL      0.0010  ENERGY SLOPE
                      ELMAX         0.0  MAX. ELEV. FOR STORAGE/OUTFLOW CALCULATION

                                   CROSS-SECTION DATA
                          --- LEFT OVERBANK --- + ------ MAIN CHANNEL ------- + --- RIGHT OVERBANK ---
130 RY        ELEVATION   620.90    619.10    616.80    611 90    611.90    616.30    619.00    620.90
129 RX        DISTANCE      0.0      50.00    118 00    127.00    132 00    142.00    230.00    240.00

                                                  ***

                                   COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

          STORAGE       0 0       0.23      0 53      0 90      1.35      1.88      2.47      3.15      3.89      4.71
          OUTFLOW       0.0       1 59      5.46     11.61     20.28     31.71     46.14     63.83     85.00    109.89
        ELEVATION     611 90    612.37    612.85    613.32    613.79    614.27    614.74    615.22    615.69    616.16

          STORAGE       5.74      7 48     10.31     14 25     19 32     25.51     32.56     40.20     48.44     57.27
          OUTFLOW     141.64    184 28    240 84    314 56    409.19    528.15    683.53    866.08   1076.29   1314.88
        ELEVATION     616.64    617.11    617.58    618.06    618.53    619.00    619.48    619.95    620.43    620.90

*****************************************************************************************************************************

                                   HYDROGRAPH AT STATION    CONFL

*****************************************************************************************************************************
                                  *                                          *
DA MON HRMN ORD  OUTFLOW  STORAGE  STAGE * DA MON HRMN ORD  OUTFLOW  STORAGE  STAGE * DA MON HRMN ORD  OUTFLOW  STORAGE  STAGE
                                  *                                          *
16 DEC 0000  1      0.     -0 0   611.9 * 16 DEC 0645  28    307.     13.9   618.0 * 16 DEC 1330  55      1.       0.2   612.3
```

16 DEC 0015	2	0	-0 0	611 9	*	16 DEC 0700	29	266.	11.7	617.7	*	16 DEC 1345	56	1.	0 2	612.3
16 DEC 0030	3	0.	-0.0	611.9	*	16 DEC 0715	30	230	9.7	617.5	*	16 DEC 1400	57	1.	0.2	612.2
16 DEC 0045	4	0.	-0 0	611.9	*	16 DEC 0730	31	197.	8.1	617.2	*	16 DEC 1415	58	1.	0.1	612.2
16 DEC 0100	5	0.	-0 0	611.9	*	16 DEC 0745	32	168.	6.8	616.9	*	16 DEC 1430	59	1.	0 1	612.1
16 DEC 0115	6	0.	-0 0	611 9	*	16 DEC 0800	33	142.	5.8	616.6	*	16 DEC 1445	60	1.	0.1	612.1
16 DEC 0130	7	0.	0 0	611.9	*	16 DEC 0815	34	119.	5.0	616.3	*	16 DEC 1500	61	1.	0.1	612.1
16 DEC 0145	8	1.	0 1	612.1	*	16 DEC 0830	35	102.	4.4	616.0	*	16 DEC 1515	62	1.	0.1	612.1
16 DEC 0200	9	3.	0 3	612 5	*	16 DEC 0845	36	89.	4.0	615.8	*	16 DEC 1530	63	0.	0.1	612.0
16 DEC 0215	10	11.	0 9	613.3	*	16 DEC 0900	37	78.	3.6	615.5	*	16 DEC 1545	64	0.	0.1	612 0
16 DEC D230	11	31.	1.9	614 3	*	16 DEC 0915	38	69.	3.3	615.3	*	16 DEC 1600	65	0.	0.0	612.0
16 DEC 0245	12	75	3 6	615.5	*	16 DEC 0930	39	61	3.0	615.1	*	16 DEC 1615	66	0.	0.0	612.0
16 DEC 0300	13	149	6 0	616.7	*	16 DEC 0945	40	53.	2.7	614.9	*	16 DEC 1630	67	0.	0.0	612.0
16 DEC 0315	14	225.	9 5	617 4	*	16 DEC 1000	41	46.	2.5	614.7	*	16 DEC 1645	68	0.	0 0	612.0
16 DEC 0330	15	308	13.9	618.0	*	16 DEC 1015	42	39.	2.2	614.5	*	16 DEC 1700	69	0.	0.0	612.0
16 DEC 0345	16	393.	18 5	618 5	*	16 DEC 1030	43	33.	1.9	614.3	*	16 DEC 1715	70	0.	0.0	611.9
16 DEC 0400	17	473.	22 6	618 8	*	16 DEC 1045	44	27.	1.7	614.1	*	16 DEC 1730	71	0.	0.0	611.9
16 DEC 0415	18	536.	25.9	619.0	*	16 DEC 1100	45	21.	1.4	613.8	*	16 DEC 1745	72	0.	0 0	611 9
16 DEC 0430	19	583	28 0	619.2	*	16 DEC 1115	46	16	1.1	613.6	*	16 DEC 1800	73	0.	0 0	611.9
16 DEC 0445	20	604	28 9	619.2	*	16 DEC 1130	47	12.	0.9	613.3	*	16 DEC 1815	74	0.	0.0	611.9
16 DEC 0500	21	601.	28.8	619 2	*	16 DEC 1145	48	9	0.8	613.1	*	16 DEC 1830	75	0.	0.0	611.9
16 DEC 0515	22	579	27.8	619.2	*	16 DEC 1200	49	7.	0 6	613.0	*	16 DEC 1845	76	0.	0.0	611.9
16 DEC 0530	23	543.	26 2	619.1	*	16 DEC 1215	50	5	0.5	612.8	*	16 DEC 1900	77	0.	0.0	611 9
16 DEC 0545	24	501.	24.1	618.9	*	16 DEC 1230	51	4.	0.4	612.7	*	16 DEC 1915	78	0.	0.0	611.9
16 DEC 0600	25	454.	21 6	618 7	*	16 DEC 1245	52	3	0.3	612.5	*	16 DEC 1930	79	0.	0 0	611.9
16 DEC 0615	26	403.	19.0	618.5	*	16 DEC 1300	53	2.	0.3	612.5	*	16 DEC 1945	80	0.	0.0	611.9
16 DEC 0630	27	353.	16.3	618.3	*	16 DEC 1315	54	2.	0.2	612.4	*					
					*						*					

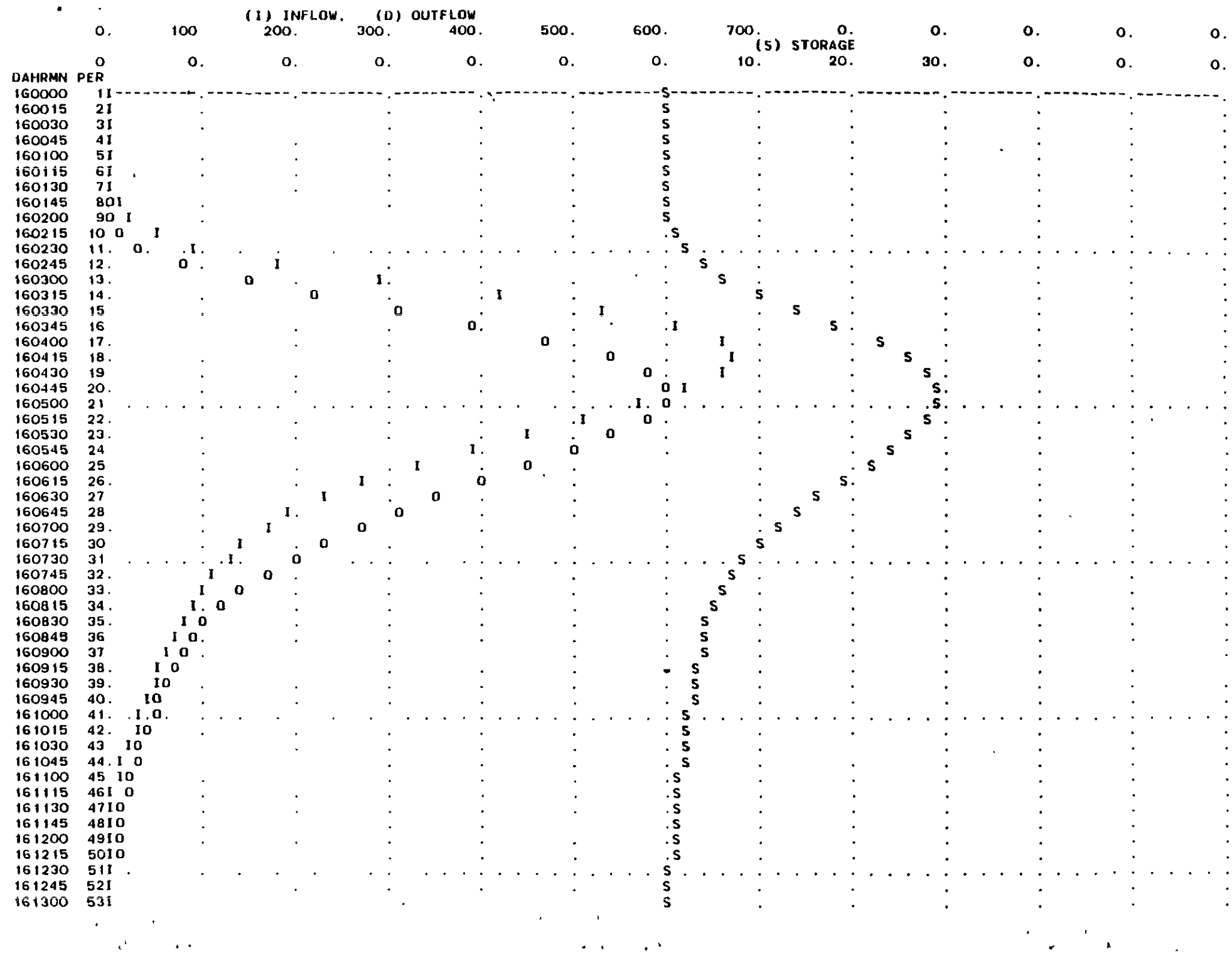
PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	19.75-HR
604	4 75	(CFS)	347.	113.	113.	113.
		(INCHES)	2 537	2.727	2.727	2.727
		(AC-FT)	172.	185.	185.	185.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	19.75-HR
29	4.75	16.	5.	5.	5.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	19.75-HR
619.23	4.75	617.94	614.31	614.31	614.31

CUMULATIVE AREA = 1.27 SQ MI

STATION CONFL



D/28

```
161315  54I                                                  S
161330  55I                                                  S
161345  56I                                                  S
161400  57I                                                  S
161415  58I                                                  S
161430  59I                                                  S
161445  60I                                                  S
161500  61I                                                  S
161515  62I                                                  S
161530  63I                                                  S
161545  64I                                                  S
161600  65I                                                  S
161615  66I                                                  S
161630  67I                                                  S
161645  68I                                                  S
161700  69I                                                  S
161715  70I                                                  S
161730  71I                                                  S
161745  72I                                                  S
161800  73I                                                  S
161815  74I                                                  S
161830  75I                                                  S
161845  76I                                                  S
161900  77I                                                  S
161915  78I                                                  S
161930  79I                                                  S
161945  80I----------.---------.---------.---------.---------.---------S---------.---------.---------.---------.---------.---------.
```

D/29

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*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
131 KK      *     ANDY   *
            *            *
            **************
                          INPUT HYDRO-DRAINAGE AREA FROM ST ANDREWS

  5 IN          TIME DATA FOR INPUT TIME SERIES
                     JXMIN          15  TIME INTERVAL IN MINUTES
                    JXDATE     16DEC83  STARTING DATE
                    JXTIME           0  STARTING TIME

              SUBBASIN RUNOFF DATA

133 BA          SUBBASIN CHARACTERISTICS
                     TAREA        1 00  SUBBASIN AREA

                PRECIPITATION DATA

134 PB               STORM        2 51  BASIN TOTAL PRECIPITATION

135 PI            INCREMENTAL PRECIPITATION PATTERN
                    0.0       0 0       0.0       0.0       0.00      0.97      0.62      0.30      0.22      0.16
                    0.13      0 09

137 LU          UNIFORM LOSS RATE
                     STRTL        0.0   INITIAL LOSS
                     CNSTL        0.0   UNIFORM LOSS RATE
                     RTIMP        0.0   PERCENT IMPERVIOUS AREA

137 UI          INPUT UNITGRAPH,  40 ORDINATES,  VOLUME = 0.96
                     0.0       4.0       10.0      18.0      31.0      57.0      98.0     146.0     174.0     186.0
                   190.0     188 0      179.0     160.0     138.0     120.0     105.0      88.0      76.0      63.0
                    54 0      48.0       43.0      38.0      35.0      32.0      30.0      27.0      24.0      21.0
                    18.0      16.0       14.0      11.0       8.0       7.0       5.0       4.0       3.0       1.0

                                                                   ***

    ***             ***             ***             ***             ***

                       HYDROGRAPH AT STATION     ANDY

     TOTAL RAINFALL =  2 51, TOTAL LOSS =  0.0 , TOTAL EXCESS =  2.51

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR        24-HR       72-HR     19.75-HR
   446.       4 50        (CFS)     238.         78.         78.          78.
                        (INCHES)   2.216        2.398       2.398        2.398
                         (AC-FT)    118.        128.        128.         128.

                       CUMULATIVE AREA =    1.00 SQ MI
```

0130

*** ***

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              **************
              *            *
143 KK        *    ANDY    *
              *            *
              **************
                    RETRIEVE GEORGE ST OUTFLOW HYDROGRAPH

145 BI          READ STATION       25 HYDROGRAPH FROM UNIT 22
```

*** *** *** *** ***

HYDROGRAPH AT STATION ANDY

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	19.75-HR
537.	4.00	(CFS)	366.	132	132.	132.
		(INCHES)	0.860	1.022	1.022	1.022
		(AC-FT)	181.	215	215	215.

CUMULATIVE AREA = 3.95 SQ MI

***

*** ***

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              **************
              *            *
146 KK        *    ANDY    *
              *            *
              **************
                    ADD ST ANDREWS AND GEORGE ST HYDROGRAPHS

148 HC          HYDROGRAPH COMBINATION
                    ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE
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***

*** *** *** *** ***

HYDROGRAPH AT STATION ANDY

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	19.75-HR
970	4 25	(CFS)	604	210.	210.	210.
		(INCHES)	1.134	1.300	1.300	1.300
		(AC-FT)	299.	343.	343.	343

CUMULATIVE AREA = 4 95 SQ MI

D/31

```
149 KK      **************
            *            *
            *    CONFL   *
            *            *
            **************
                          CHANNEL ROUTE TO CONFLUENCE - SECTION 2267

151 KO          OUTPUT CONTROL VARIABLES
                      IPRNT            1  PRINT CONTROL
                      IPLOT            2  PLOT CONTROL
                      QSCAL           0.  HYDROGRAPH PLOT SCALE

              HYDROGRAPH ROUTING DATA

152 RS          STORAGE ROUTING
                      NSTPS            1  NUMBER OF SUBREACHES
                       ITYP         STOR  TYPE OF INITIAL CONDITION
                     RSVRIC        -1 00  INITIAL CONDITION
                          X         0.0  WORKING R AND D COEFFICIENT

153 RC          NORMAL DEPTH CHANNEL ROUTING
                        ANL.       0 070  LEFT OVERBANK N-VALUE
                       ANCH       0.050  MAIN CHANNEL N-VALUE
                        ANR       0.070  RIGHT OVERBANK N-VALUE
                      RLNTH       2600.  REACH LENGTH
                        SEL      0.0010  ENERGY SLOPE
                      ELMAX         0.0  MAX. ELEV  FOR STORAGE/OUTFLOW CALCULATION

                                        CROSS-SECTION DATA
                          --- LEFT OVERBANK --- + ------ MAIN CHANNEL ------- + --- RIGHT OVERBANK ---
155 RY        ELEVATION    625 00    620.10    619 00    612.80    612.80    619.10    620.00    625.00
154 RX        DISTANCE       3 00      8.00     28.00     37.00     43.00     56.00     80.00     85.00

                                                   ***

                                        COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

          STORAGE       0.0       0.27      0.63      1.08      1 61      2 23      2.94      3.73      4.61      5.57
          OUTFLOW       0 0       2 83      9.63     20.39     35.46     55.26     80.20    110.70    147.15    189.93
        ELEVATION     612.80    613 44    614.08    614.73    615.37    616.01    616.65    617.29    617.94    618.58

          STORAGE       6 66      8.56     11.29     14.11     16.98     19.90     22.86     25.88     28.95     32.07
          OUTFLOW     242.72    316.99    414.51    533.11    669.21    821.41    988.77   1170.60   1366.39   1575.72
        ELEVATION     619.22    619 86    620.51    621.15    621.79    622.43    623.07    623.72    624.36    625.00

*****************************************************************************************************************************

                                        HYDROGRAPH AT STATION    CONFL
*****************************************************************************************************************************
                                   *                                   *                                   *
DA MON HRMN ORD  OUTFLOW  STORAGE   STAGE * DA MON HRMN ORD  OUTFLOW  STORAGE   STAGE * DA MON HRMN ORD  OUTFLOW  STORAGE   STAGE
                                   *                                   *
16 DEC 0000   1      0      -0 0   612.8 * 16 DEC 0645  28     521      13.8   621.1 * 16 DEC 1330  55      26.      1.3   615.0
16 DEC 0015   2      0.     -0.0   612 8 * 16 DEC 0700  29     466.     12.5   620.8 * 16 DEC 1345  56      24.      1.2   614.9
```

0/32

16 DEC 0030	3	0.	-0 0	612.8	*	16 DEC 0715	30	416.	11.3	620.5	*	16 DEC 1400	57	22.	1 1	614.8
16 DEC 0045	4	0.	-0 0	612.8	*	16 DEC 0730	31	377.	10.2	620.3	*	16 DEC 1415	58	20.	1.1	614.7
16 DEC 0100	5	0	-0 0	612.8	*	16 DEC 0745	32	342.	9.2	620.0	*	16 DEC 1430	59	19.	1.0	614.7
16 DEC 0115	6	0	-0 0	612.8	*	16 DEC 0800	33	310.	8.4	619.8	*	16 DEC 1445	60	18.	1.0	614.6
16 DEC 0130	7	0	0 0	612 8	*	16 DEC 0815	34	282.	7.7	619.6	*	16 DEC 1500	61	18.	1.0	614.6
16 DEC 0145	8	0	0 0	612.9	*	16 DEC 0830	35	257.	7.0	619.3	*	16 DEC 1515	62	17.	0.9	614.5
16 DEC 0200	9	2.	0 2	613 2	*	16 DEC 0845	36	232.	6.4	619.1	*	16 DEC 1530	63	16.	0.9	614.5
16 DEC 0215	10	7.	0 5	613 8	*	16 DEC 0900	37	208.	6.0	618.8	*	16 DEC 1545	64	16.	0.9	614.5
16 DEC 0230	11	19	1 0	614 7	*	16 DEC 0915	38	189	5.5	618.6	*	16 DEC 1600	65	15.	0 9	614 4
16 DEC 0245	12	77	2 8	616 6	*	16 DEC 0930	39	173.	5.2	618.3	*	16 DEC 1615	66	15.	0.8	614 4
16 DEC 0300	13	240.	6 6	619 2	*	16 DEC 0945	40	157.	4.8	618.1	*	16 DEC 1630	67	14.	0 8	614.4
16 DEC 0315	14	415.	11.3	620.5	*	16 DEC 1000	41	142.	4.5	617.9	*	16 DEC 1645	68	14.	0 8	614.3
16 DEC 0330	15	603.	15 6	621.5	*	16 DEC 1015	42	128.	4.1	617.6	*	16 DEC 1700	69	13.	0.8	614.3
16 DEC 0345	16	766	18 8	622.2	*	16 DEC 1030	43	112.	3.8	617.3	*	16 DEC 1715	70	13.	0.8	614.3
16 DEC 0400	17	877.	20 9	622 6	*	16 DEC 1045	44	98.	3.4	617.0	*	16 DEC 1730	71	12.	0.7	614.2
16 DEC 0415	18	938.	22 0	622.9	*	16 DEC 1100	45	85	3.1	616.8	*	16 DEC 1745	72	12.	0.7	614.2
16 DEC 0430	19	961.	22 4	623.0	*	16 DEC 1115	46	73	2.7	616.5	*	16 DEC 1800	73	12.	0.7	614.2
16 DEC 0445	20	959.	22 3	623.0	*	16 DEC 1130	47	63.	2.4	616.2	*	16 DEC 1815	74	11.	0.7	614.2
16 DEC 0500	21	936.	21.9	622.9	*	16 DEC 1145	48	54.	2.2	616.0	*	16 DEC 1830	75	11.	0.7	614.2
16 DEC 0515	22	897.	21 2	622.7	*	16 DEC 1200	49	47.	2.0	615.7	*	16 DEC 1845	76	10.	0.7	614.1
16 DEC 0530	23	847.	20 4	622.5	*	16 DEC 1215	50	42.	1.8	615.6	*	16 DEC 1900	77	10.	0.6	614.1
16 DEC 0545	24	790.	19 3	622.3	*	16 DEC 1230	51	37.	1.7	615.4	*	16 DEC 1915	78	10.	0.6	614.1
16 DEC 0600	25	725	18.0	622.0	*	16 DEC 1245	52	34.	1.5	615.3	*	16 DEC 1930	79	9.	0.6	614.1
16 DEC 0615	26	654.	16 7	621.7	*	16 DEC 1300	53	31.	1.4	615.2	*	16 DEC 1945	80	9.	0.6	614.0
16 DEC 0630	27	586.	15 2	621.4	*	16 DEC 1315	54	28.	1.3	615.1	*					

****

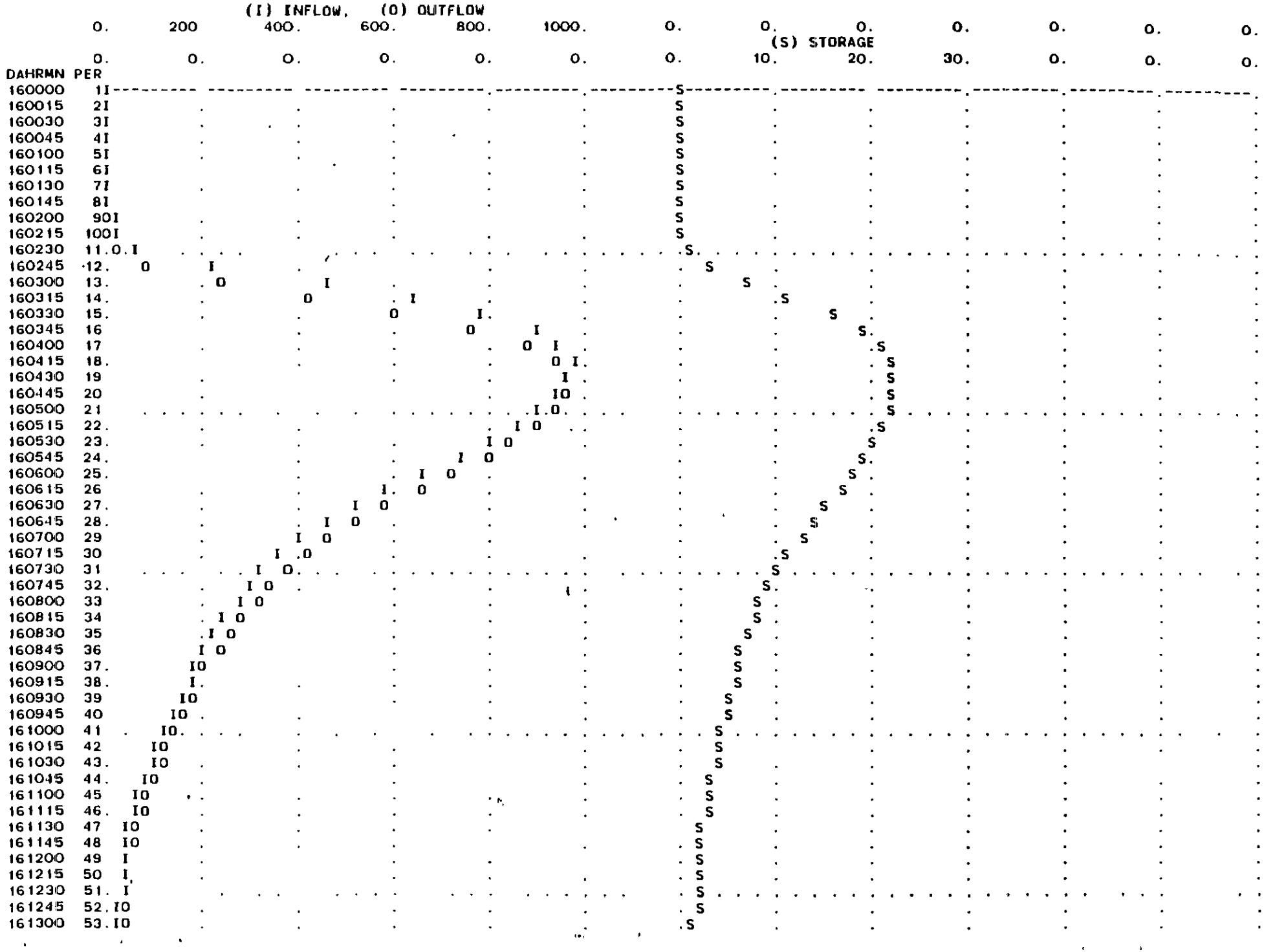
PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	19 75-HR
961	4 50	(CFS)	599	210.	210.	210.
		(INCHES)	1 125	1.298	1.298	1.298
		(AC-FT)	297	343.	343.	343.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	19.75-HR
22.	4.50	15.	6.	6.	6.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	19.75-HR
622 97	4 50	621 27	616.88	616.88	616.88

CUMULATIVE AREA = 4.95 SQ MI

STATION CONFL



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161315  54.I                                                  .S
161330  55.I                                                  .S
161345  56.I                                                  .S
161400  57 I                                                   S
161415  58.I                                                  .S
161430  59.I                                                  .S
161445  60.I                                                  .S
161500  61 I                                                  .S
161515  62.I                                                  .S
161530  63 I                                                  .S
161545  64 I                                                  .S
161600  65 I                                                  .S
161615  66 I                                                  .S
161630  67 I                                                  .S
161645  68 I                                                  .S
161700  69 I                                                  .S
161715  70 I                                                  .S
161730  71.I                                                  .S
161745  72.I                                                  .S
161800  73 I                                                  .S
161815  74 I                                                   S
161830  75IO                                                   S
161845  76IO                                                  .S
161900  77IO                                                  .S
161915  78I                                                   .S
161930  79I                                                   .S
161945  80I                                                   .S
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D 135

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*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
156 KK      *     CONFL  *
            *            *
            **************
                          COMBINE ALL HYDRDS AT CONFLUENCE

158 HC          HYDROGRAPH COMBINATION
                      ICOMP            3  NUMBER OF HYDROGRAPHS TO CDMBINE

                                                                  ***

     ***              ***              ***              ***              ***

                        HYDROGRAPH AT STATION    CONFL

PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                    6-HR        24-HR        72-HR      19.75-HR
   2125.      4.75        (CFS)      1368.         471.         471.         471.
                        (INCHES)     1.563        1.771        1.771        1.771
                         (AC-FT)      679          769.         769.         769.

                        CUMULATIVE AREA =    8.14 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
159 KK      *     CONFL  *
            *            *
            **************
                          INPUT HYDRO-DRAINAGE AREA TO EASTMAN

  5 IN          TIME DATA FOR INPUT TIME SERIES
                       JXMIN           15  TIME INTERVAL IN MINUTES
                      JXDATE      16DEC83  STARTING DATE
                      JXTIME            0  STARTING TIME

              SUBBASIN RUNOFF DATA

161 BA          SUBBASIN CHARACTERISTICS
                      TAREA         0 55  SUBBASIN AREA

                PRECIPITATION DATA

162 PB                STORM         1.47  BASIN TOTAL PRECIPITATION

163 PI            INCREMENTAL PRECIPITATION PATTERN
                    0.0       0.0       0.0       0.0       0.09      0.54      0.34      0.17      0.12      0.09
```

```
                0 07      0.05

165 LU          UNIFORM LOSS RATE
                     STRTL        0.0   INITIAL LOSS
                     CNSTL        0 0   UNIFORM LOSS RATE
                     RTIMP        0 0   PERCENT IMPERVIDUS AREA

165 UI          INPUT UNITGRAPH,  42 ORDINATES,  VOLUME = 1.71
                     0.0       4.0       10.0      19.0      45 0     108.0     143.0     167.0     177.0     180.0
                   177.0     169 0      152 0     135.0     121.0     107.0      95.0      82.0      73.0      63.0
                    54 0      46 0       40.0      34.0      31.0      28.0      24.0      22.0      20.0      17.0
                    15 0      13 0       12 0      10.0       9.0       8.0       7.0       5.0       4.0       3.0
                     2.0       1 0

                                                                    ***

     ***            ***            ***            ***            ***

                       HYDROGRAPH AT STATION    CONFL

      TOTAL RAINFALL =  1.47, TOTAL LOSS =  0.0 , TOTAL EXCESS =  1.47

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR     19.75-HR
   248.       4.25       (CFS)      138.         45.         45.          45.
                       (INCHES)     2.335       2.527       2.527        2.527
                        (AC-FT)      69.         74.         74           74.

                        CUMULATIVE AREA =    0.55 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
171 KK      *     CONFL  *
            *            *
            **************
                          COMBINE HYDROS

173 HC          HYDRDGRAPH CDMBINATION
                     ICOMP            2  NUMBER OF HYDRDGRAPHS TO COMBINE

                                                                    ***

     ***            ***            ***            ***            ***

                       HYDROGRAPH AT STATION    CONFL

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR     19.75-HR
   2348       4 75       (CFS)     1502.        516.        516.         516
                       (INCHES)     1 607       1.819       1.819        1.819
                        (AC-FT)      745.        843.        843.         843.

                        CUMULATIVE AREA =    8.69 SQ MI
```

```
174 KK      **************
            *            *
            *     EAST   *
            *            *
            **************
                          STORAGE ROUTE UPSTREAM OF EASTMAN

176 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           3  PRINT CONTROL
                      IPLOT           2  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE

              HYDROGRAPH ROUTING DATA

177 RS          STORAGE ROUTING
                      NSTPS           1  NUMBER OF SUBREACHES
                       ITYP        STOR  TYPE OF INITIAL CONDITION
                     RSVRIC        8.00  INITIAL CONDITION
                          X       -1.00 WORKING R AND D COEFFICIENT

178 SV            STORAGE         8.0      49.0     130.0     167.0

179 SQ          DISCHARGE          0.      900.     1300.     1600.
                                                              ***

    ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION     EAST

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR     19.75-HR
   1408.      6 75        (CFS)     1239.       516.        516.        516.
                        (INCHES)    1.325      1.816       1.816       1.816
                         (AC-FT)     614.       842.        842.        842.

PEAK STORAGE  TIME                          MAXIMUM AVERAGE STORAGE
  (AC-FT)     (HR)                  6-HR       24-HR       72-HR     19 75-HR
    143.      6 75                   115.        47.         47.         47.

                       CUMULATIVE AREA =    8.69 SQ MI
```

STATION EAST

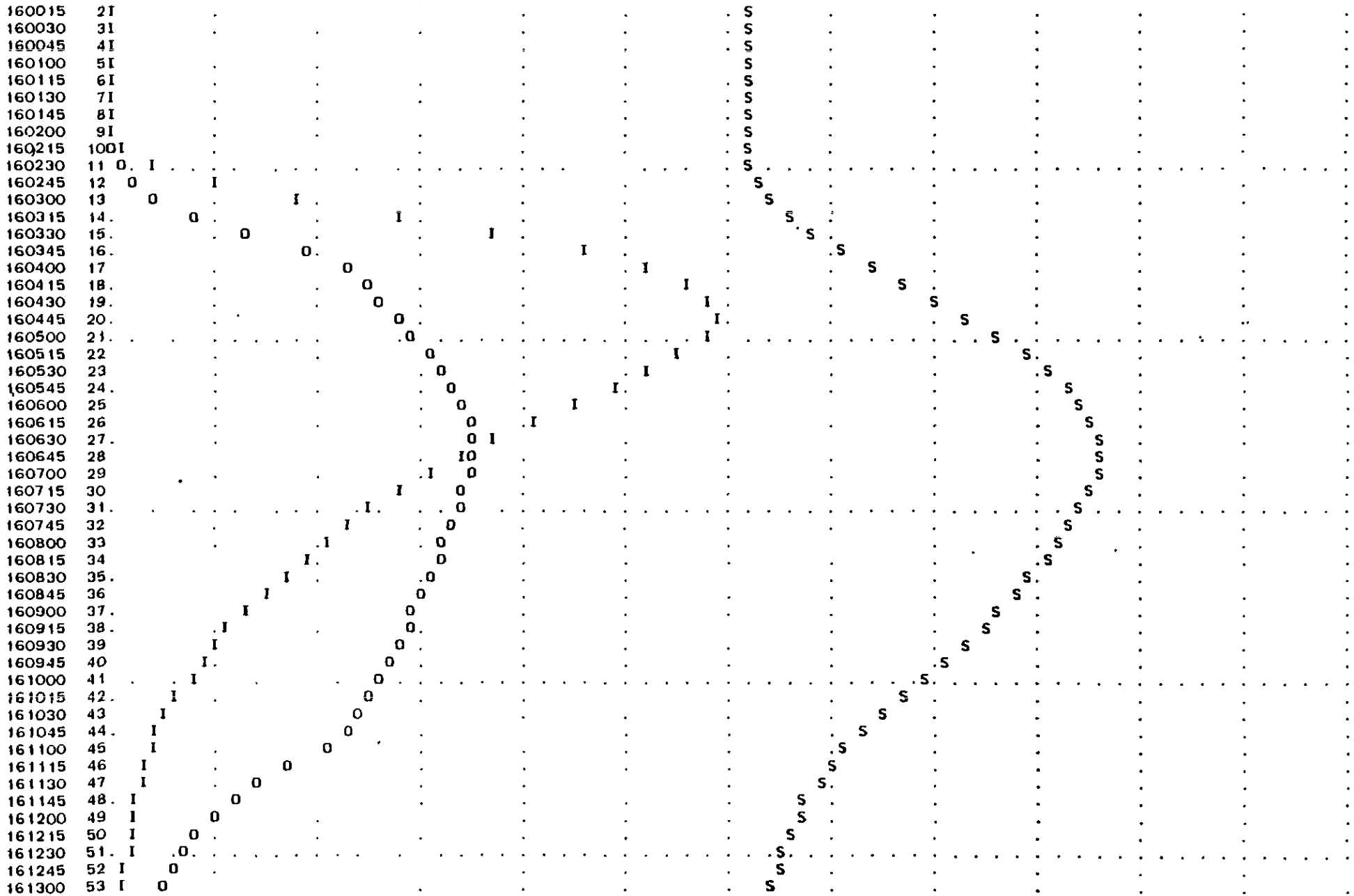
(I) INFLOW, (O) OUTFLOW

0 400 800 1200. 1600 2000 2400

0. 0. 0. 0. 0. 0.

(S) STORAGE

0. 0. 0 0 0. 0. 0. 40. 80. 120. 160. 0 0.



```
161315  54 I  0                                                  S
161330  55 I  0                                                  S
161345  56 I 0                                                  S
161400  57 I 0                                                  S
161415  58.I0                                                   S
161430  59.I0                                                   S
161445  60 I0                                                   S
161500  61 I                                                    S
161515  62 I                                                    S
161530  63 I                                                    S
161545  64 I                                                   S
161600  65.I                                                   S
161615  66I0                                                   S
161630  67I0                                                   S
161645  68I0                                                   S
161700  69I0                                                   S
161715  70I0                                                   S
161730  71I0                                                   S
161745  72I                                                    S
161800  73I                                                    S
161815  74I                                                    S
161830  75I                                                    S
161845  76I                                                    S
161900  77I                                                    S
161915  78I                                                    S
161930  79I                                                    S
161945  80I                                                    S
```

D140

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*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
180 KK      *     EAST   *
            *            *
            **************
                          INPUT HYDRO-DRAINAGE AREA TO TITTABAWASSEE

  5 IN          TIME DATA FOR INPUT TIME SERIES
                     JXMIN          15  TIME INTERVAL IN MINUTES
                    JXDATE     16DEC83  STARTING DATE
                    JXTIME           0  STARTING TIME

              SUBBASIN RUNOFF DATA

182 BA          SUBBASIN CHARACTERISTICS
                     TAREA        0.51  SUBBASIN AREA

                PRECIPITATION DATA

183 PB               STORM        1.36  BASIN TOTAL PRECIPITATION

184 PI            INCREMENTAL PRECIPITATION PATTERN
                   0 0       0.0       0.0       0.0       0.08      0.49      0.32      0.15      0.11      0.08
                   0.07      0.05

186 LU          UNIFORM LOSS RATE
                     STRTL        0 0   INITIAL LOSS
                     CNSTL        0.0   UNIFORM LOSS RATE
                     RTIMP        0 0   PERCENT IMPERVIOUS AREA

186 UI          INPUT UNITGRAPH,  48 ORDINATES,  VOLUME = 1.79
                   0 0       4 0       8.0      18.0      32.0      60.0     104.0     134.0     151.0     155.0
                 153 0     150 0     142.0     129 0     116.0     103.0      93.0      82.0      71.0      62.0
                  56 0      51 0      45.0      42 0      39.0      36.0      34.0      31.0      28.0      26.0
                  24 0      22 0      21 0      19.0      17.0      15.0      14.0      12.0      11.0      10.0
                   9 0       7 0       6.0       5.0       4.0       3.0       2.0       1.0

                                                                  ***

     ***            ***            ***            ***            ***

                       HYDROGRAPH AT STATION     EAST

      TOTAL RAINFALL =  1 36, TOTAL LOSS =  0.0 , TOTAL EXCESS =  1.36

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR     19 75-HR
   196.       4.25        (CFS)     116.         40.         40.         40.
                        (INCHES)   2.106       2.430       2.430       2.430
                         (AC-FT)     57.         66.         66.         66.

                       CUMULATIVE AREA =    0.51 SQ MI
```

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*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
192 KK      *     EAST   *
            *            *
            **************
                          COMBINE HYDROS

194 HC          HYDROGRAPH COMBINATION
                      ICOMP            2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                  ***

     ***            ***            ***            ***            ***

                        HYDROGRAPH AT STATION     EAST

PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                    6-HR       24-HR       72-HR      19.75-HR
   1499       6 50        (CFS)      1331        556.        556          556.
                        (INCHES)     1 345       1.850       1.850        1.850
                         (AC-FT)      660.        908.        908.         908.

                        CUMULATIVE AREA =    9 20 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
195 KK      *     RIVER  *
            *            *
            **************
                          STORAGE ROUTE TO TITTABAWASSEE

197 KO          OUTPUT CONTROL VARIABLES
                      IPRNT            1  PRINT CONTROL
                      IPLOT            2  PLOT CONTROL
                      QSCAL           0.  HYDROGRAPH PLOT SCALE

              HYDROGRAPH ROUTING DATA

198 RS          STORAGE ROUTING
                      NSTPS            1  NUMBER OF SUBREACHES
                       ITYP         STOR  TYPE OF INITIAL CONDITION
                     RSVRIC        29 00  INITIAL CONDITION
                          X        -1.00 WORKING R AND D COEFFICIENT

199 SV            STORAGE        29 0     113.0     219.0     251.0

200 SQ          DISCHARGE          0.      900.     1300.     1600.
```

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HYDROGRAPH AT STATION RIVER

DA MON HRMN	ORD	OUTFLOW	STORAGE	DA MON HRMN	ORD	OUTFLOW	STORAGE	DA MON HRMN	ORD	OUTFLOW	STORAGE
16 DEC 0000	1	0.	29.00	16 DEC 0645	28	970.	131.55	16 DEC 1330	55	758.	99.72
16 DEC 0015	2	0.	29.00	16 DEC 0700	29	990.	136.73	16 DEC 1345	56	692.	93.60
16 DEC 0030	3	0.	29 00	16 DEC 0715	30	1007.	141.49	16 DEC 1400	57	631.	87.92
16 DEC 0045	4	0.	29.00	16 DEC 0730	31	1024.	145.77	16 DEC 1415	58	575.	82.69
16 DEC 0100	5	0.	29 00	16 DEC 0745	32	1038.	149.55	16 DEC 1430	59	524.	77.88
16 DEC 0115	6	0.	29.00	16 DEC 0800	33	1050.	152.82	16 DEC 1445	60	476.	73.46
16 DEC 0130	7	0.	29 00	16 DEC 0815	34	1061.	155.64	16 DEC 1500	61	433.	69.42
16 DEC 0145	8	0	29.02	16 DEC 0830	35	1070.	158.06	16 DEC 1515	62	394.	65.74
16 DEC 0200	9	1.	29.08	16 DEC 0845	36	1078.	160.05	16 DEC 1530	63	358.	62.37
16 DEC 0215	10	3.	29.24	16 DEC 0900	37	1083.	161.62	16 DEC 1545	64	325.	59.31
16 DEC 0230	11	7.	29 62	16 DEC 0915	38	1088.	162.75	16 DEC 1600	65	295.	56.52
16 DEC 0245	12	16	30 50	16 DEC 0930	39	1090.	163.46	16 DEC 1615	66	268.	53.99
16 DEC 0300	13	36.	32 32	16 DEC 0945	40	1092.	163.75	16 DEC 1630	67	243.	51.69
16 DEC 0315	14	70	35 53	16 DEC 1000	41	1091.	163 64	16 DEC 1645	68	221.	49.60
16 DEC 0330	15	123	40 44	16 DEC 1015	42	1089.	163.12	16 DEC 1700	69	200.	47.71
16 DEC 0345	16	195.	47.18	16 DEC 1030	43	1086.	162.21	16 DEC 1715	70	182	45.99
16 DEC 0400	17	282.	55.31	16 DEC 1045	44	1081.	160.93	16 DEC 1730	71	165.	44 43
16 DEC 0415	18	373.	63.79	16 DEC 1100	45	1074.	159 03	16 DEC 1745	72	150.	43.01
16 DEC 0430	19	461	72 04	16 DEC 1115	46	1062.	155 99	16 DEC 1800	73	136	41.73
16 DEC 0445	20	547	80.01	16 DEC 1130	47	1046.	151.76	16 DEC 1815	74	124.	40.57
16 DEC 0500	21	629.	87 66	16 DEC 1145	48	1027.	146.60	16 DEC 1830	75	113.	39.52
16 DEC 0515	22	706.	94.93	16 DEC 1200	49	1005.	140 73	16 DEC 1845	76	103.	38.57
16 DEC 0530	23	780	101 79	16 DEC 1215	50	980.	134.32	16 DEC 1900	77	93.	37.71
16 DEC 0545	24	849	108 22	16 DEC 1230	51	955.	127.55	16 DEC 1915	78	85.	36.93
16 DEC 0600	25	905.	114 32	16 DEC 1245	52	928.	120.52	16 DEC 1930	79	77.	36.23
16 DEC 0615	26	927.	120 24	16 DEC 1300	53	901.	113.33	16 DEC 1945	80	71.	35.59
16 DEC 0630	27	949	126 02	16 DEC 1315	54	828.	106.30				

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	19.75-HR
1092.	9.75	(CFS)	1047.	548.	548	548.
		(INCHES)	1.058	1.824	1.824	1.824
		(AC-FT)	519	895	895.	895.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	19.75-HR
164	9 75	152.	88.	88.	88.

CUMULATIVE AREA = 9.20 SQ MI

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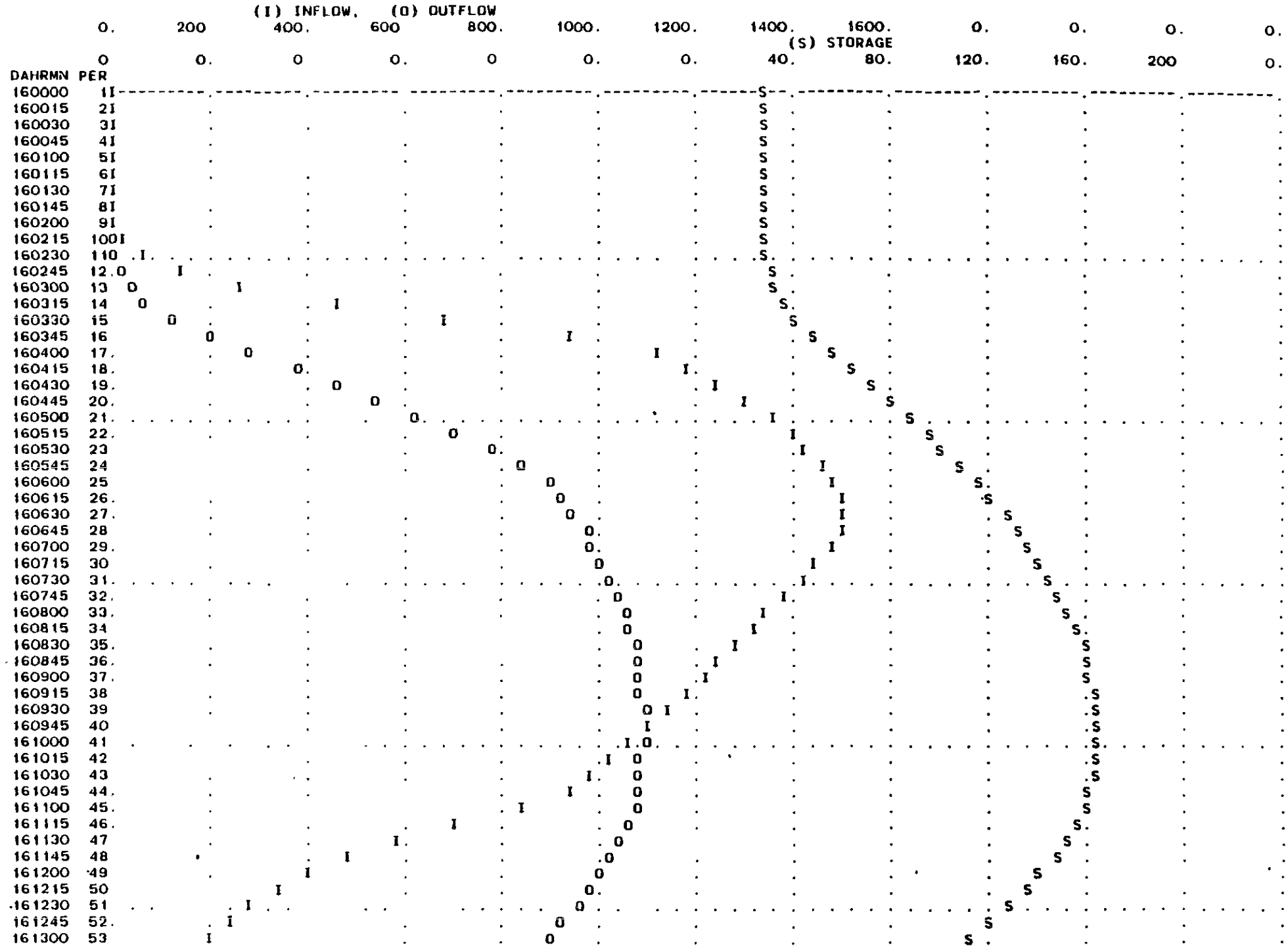
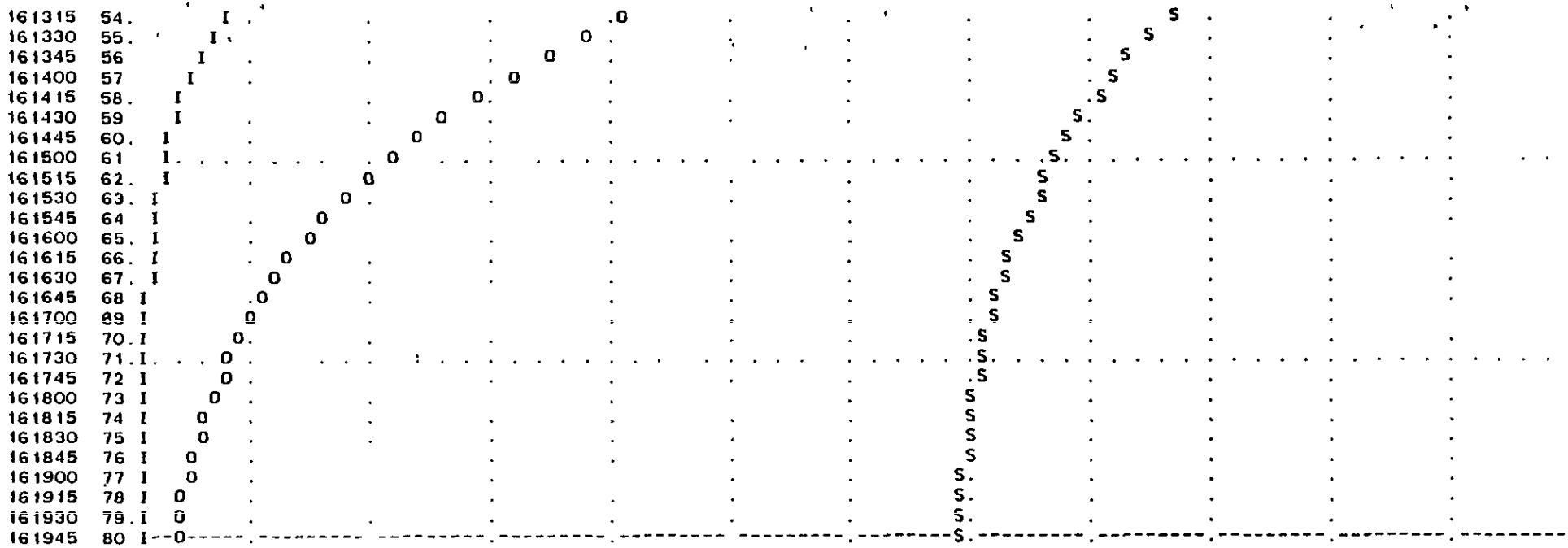
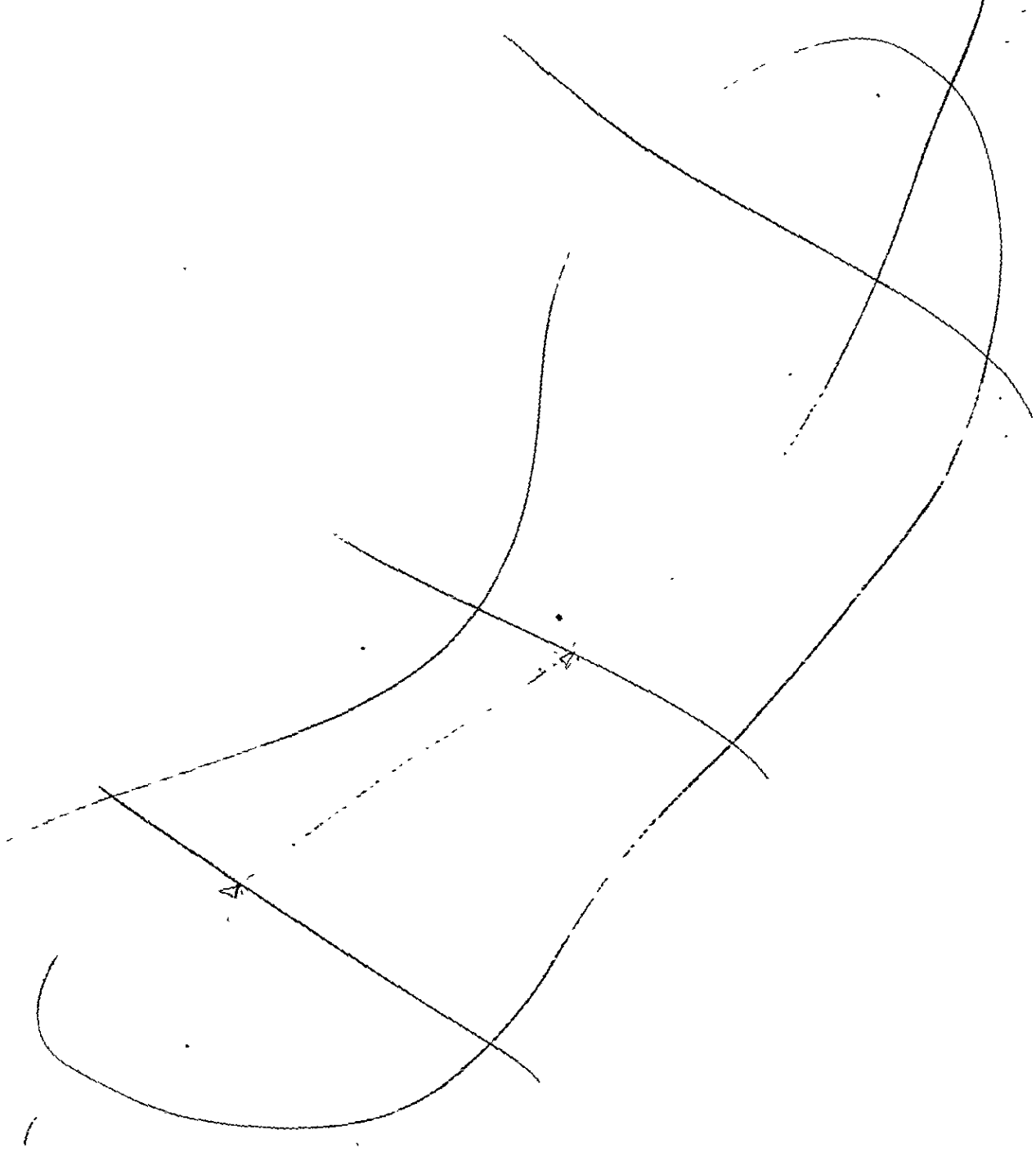
STATION RIVER




161315 54.
161330 55.
161345 56
161400 57
161415 58.
161430 59
161445 60.
161500 61
161515 62.
161530 63.
161545 64
161600 65.
161615 66.
161630 67.
161645 68
161700 69
161715 70.
161730 71.
161745 72
161800 73
161815 74
161830 75
161845 76
161900 77
161915 78
161930 79.
161945 80

0/45



RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	EXPS	144.	4 50	96.	37.	37.	0.41		
ROUTED TO	WACK	144	4.50	96.	37.	37.	0.41	636.20	4.50
HYDROGRAPH AT	WACK	184.	4.50	98.	31.	31.	0.39		
2 COMBINED AT	WACK	328.	4.50	194.	68.	68.	0.80		
ROUTED TO	DILL	300	5.00	192.	68.	68.	0.80	633.44	5.00
HYDROGRAPH AT	DILL	130	3.50	56.	17.	17.	0.21		
HYDROGRAPH AT	DILL	268.	3.00	99.	30.	30.	0.34		
3 COMBINED AT	DILL	488.	3.75	334	115.	115.	1.35		
ROUTED TO	WHEEL	381.	5.50	328	115.	115.	1.35	629.30	5.50
DIVERSION TO	DFLO	0.	5.50	0.	0.	0.	1.35		
HYDROGRAPH AT	WHEEL	381	5.50	328	115.	115.	1.35		
HYDROGRAPH AT	WHEEL	214.	4.25	103.	33.	33.	0.57		
2 COMBINED AT	WHEEL	575	4.50	431.	148.	148.	1.92		
ROUTED TO	CONFL	562.	4.75	424.	148.	148.	1.92	619.40	4.75
HYDROGRAPH AT	SAG	669.	4.25	350.	113.	113.	1.27		
HYDROGRAPH AT	SAG	0	0 25	0	0.	0.	0.0		
2 COMBINED AT	SAG	669	4 25	350.	113.	113.	1.27		
ROUTED TO	CONFL	604	4 75	347.	113.	113.	1.27	619.23	4.75
HYDROGRAPH AT	ANDY	446	4.50	238.	78.	78.	1.00		
HYDROGRAPH AT	ANDY	537.	4 00	366.	132.	132.	3.95		
2 COMBINED AT	ANDY	970.	4 25	604.	210.	210.	4.95		
ROUTED TO	CONFL	961.	4.50	599	210.	210.	4.95	622.97	4.50
3 COMBINED AT	CONFL	2125.	4 75	1368.	471.	471.	8.14		
HYDROGRAPH AT	CONFL	248.	4.25	138.	45.	45.	0.55		
2 COMBINED AT	CONFL	2348.	4.75	1502.	516.	516.	8.69		
ROUTED TO	EAST	1408.	6.75	1239.	516.	516.	8.69		

D147

HYDROGRAPH AT	EAST	196.	4.25	116.	40.	40.	0.51
2 COMBINED AT	EAST	1499.	6.50	1331.	556.	556.	9.20
ROUTED TO	RIVER	1092.	9.75	1047.	548.	548.	9.20

*** NORMAL END OF HEC-1 ***

D148

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*****************************************************
*  WATER SURFACE PROFILES                           *
*  VERSION OF NOVEMBER 1976                         *
*  UPDATED JULY 1979                                *
*                                                   *
*  RUN DATE  01/12/84  TIME .10.33.54               *
*****************************************************
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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        *
*****************************************
```

```
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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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
**************************************************


T1      SNAKE CREEK,MIDLAND - USGS DATUM
T2      SNAKE CREEK-MIDLAND STORM WATER STUDY
T3       100 YEAR-SWMS

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      -1.       7.        0.        0.  0.000000      0.00      0.0       0.    614.200    0.000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

      0.000     0.000    -1.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

NC      .030      .030      .030      .100      .300     0.000     0.000     0.000     0.000     0.000
QT     7.000   900.000  1170.000  1300.000  1600.000  1300.000  2300.000   500.000     0.000     0.000


X1  6500.000    12.000   210.000   225.000   570.000   570.000   720.000     0.000     0.000     0.000
X3     0.000     0.000     0 000   150.000     0.000   330.000     0.000     0.000     0.000     0.000
GR   626.400     0.000   625.400    13.000   614.200    53.000   609.200   210.000   605.900   216.000
GR   605.200   219.000   605.900   222.000   606.600   225.000   609.100   230.000   611.900   308.000
GR   621.900   350.000   627.100   435.000     0.000     0.000     0.000     0.000     0.000     0.000
NC      .060      .060      .040     0.000     0.000     0.000     0.000     0.000     0.000     0.000


X1  7700.000    11.000   421.000   451.000  1200.000  1200.000  1200.000     0.000     0.000     0.000
X3     0.000     0.000     0.000   350.000     0.000   620.000     0.000     0.000     0.000     0.000
GR   623 600     0.000   623.600   200.000   621.800   319.000   614.900   342.000   611.900   421.000
GR   607.300   427.000   607.200   434 000   607.300   442.000   612.500   451.000   614.400   600 000
GR   613.700   800.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
NC     0.000     0.000     0.000      .600      .800     0.000     0.000     0.000     0.000     0.000


X1  7750.000    11.000   401.000   417.000   100 000   100.000   100.000     0.000     0.000     0.000
X3    10.000     0.000     0 000   384 000     0.000   620.000     0.000     0.000     0.000     0.000
GR   623.200     0.000   618.500   200.000   616.200   320.000   614.900   386.000   612.600   397.000
GR   607.200   401.000   607.300   409.000   606.900   417.000   612.500   426.000   615.100   500.000
GR   618.100   800.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0 000
SB     0.000     1.600     2.500     0.000    16.000     0.000   106.000     0.000   607.200   607.200


X1  7751 000     0.000     0 000     0.000    26.000    26.000    26.000     0.000     0.000     0.000
X2     0 000     0.000     1 000   613.800   616.100     0.000     0.000     0.000     0.000     0.000
X3     0.000     0.000     0 000   384.000     0.000   620.000     0 000     0.000     0.000     0.000
BT     7.000     0.000   623.200   623.200   200.000   618.500   618.500   320.000   616.200   616.200
BT   401.000   616.200   616.200   417.000   616 100   616.100   500.000   615.100   615.100   800.000
BT   618.100   618.100     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0 000


X1  7800.000    10.000   364.000   396.000   180.000   200.000   200.000     0.000     0.000     0.000
GR   624.200     0.000   620.000   215.000   612.600   364.000   607.300   371.000   607.100   380.000
```

GR	607.300	389.000	613.700	396.000	615.000	495.000	620.000	585.000	624.700	800.000
NC	0.000	0.000	0.000	.200	.400	0.000	0.000	0.000	0.000	0.000
X1	8250.000	11.000	470.000	515.000	590.000	590.000	470.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	400.000	0.000	600.000	0.000	0.000	0.000	0.000
GR	623.000	0.000	620.000	230.000	615.000	330.000	610.000	470.000	608.900	485.000
GR	608.700	492.000	608.900	503.000	610.000	515.000	615.000	640.000	620.000	700.000
GR	621.000	1000.000	0 000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
QT	7.000	480.000	640 000	710.000	860.000	710.000	570.000	200.000	0.000	0.000
NC	0.000	0.000	0.000	.100	.300	0.000	0.000	0.000	0.000	0.000
X1	8680.000	12.000	610.000	630.000	430.000	430.000	430 000	0.000	0.000	0 000
X3	0.000	0.000	- 0.000	565.000	0.000	700.000	0.000	0.000	0.000	0.000
GR	623.500	0.000	621.000	360.000	620.000	490.000	615.000	580.000	613.000	610 000
GR	610.500	615.000	610.300	620.000	610.500	625.000	613.000	630.000	615.000	720 000
GR	620.000	810.000	621.000	1000.000	0.000	0.000	0.000	0.000	0.000	0 000
NC	.060	.060	.045	.300	.500	0.000	0.000	0.000	0.000	0.000
X1	9450.000	9.000	308.000	337.000	545.000	545.000	545.000	0.000	0.000	0 000
GR	625.700	0.000	623.900	200.000	618.800	308.000	613.100	317.000	612.100	321.000
GR	613.100	325.000	621.100	337.000	624.300	400.000	623.200	600.000	0.000	0 000
NC	0.000	0.000	0.000	.100	.300	0.000	0.000	0.000	0.000	0.000
X1	9500.000	13.000	292.000	308.000	100.000	100.000	100.000	0.000	0.000	0 000
X3	0.000	0.000	0.000	240.000	0.000	320.000	0.000	0.000	0.000	0 000
GR	622.900	0.000	622.000	100.000	621.300	185 000	618.800	287.000	613.000	292.000
GR	613.000	299.500	619.000	299.500	619.000	300.500	613.000	300.500	613.000	308.000
GR	620.700	316.000	620.700	400.000	621.400	600.000	0.000	0.000	0.000	0.000
SB	1.050	1.620	2.980	0 000	16.000	1.000	90.000	0.000	613.000	613.000
X1	9501.000	0.000	0.000	0.000	80.000	80.000	80.000	0.000	0.000	0.000
X2	0.000	0 000	1.000	619.000	620.700	0.000	0.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	240.000	0.000	320.000	0.000	0.000	0.000	0 000
BT	4.000	240.000	621.000	621.000	292.000	620.700	619.000	308.000	620.700	619.000
BT	320 000	620.700	620.700	0.000	0.000	0.000	0.000	0.000	0.000	0.000
QT	7.000	480.000	640.000	710.000	860.000	710.000	390.000	200.000	0.000	0.000
X1	9625.000	9.000	260.000	283.000	150 000	150.000	150.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	70.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	623.300	0.000	619 700	200.000	619.800	260.000	613.900	264.000	612.300	267.000
GR	613.900	271.000	620.000	283 000	622.800	400.000	626.600	600.000	0.000	0.000
NC	0.000	0.000	050	.600	.800	0.000	0.000	0.000	0 000	0 000
X1	9750.000	11.000	297.800	302.300	150.000	150.000	150.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	110 000	0.000	390 000	0 000	0.000	0.000	0.000
GR	623.400	0.000	624.600	200.000	619.800	293.000	616.600	297.800	614.900	298 500
GR	614.300	300.000	614.900	301.500	616.600	302.300	620.000	316.000	625.700	400.000
GR	626.500	600.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SB	0.000	1.620	2.500	0.000	3.000	0.000	15.900	0.000	613.500	613.500
X1	9751.000	0.000	0.000	0.000	116.000	116.000	116.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	618.800	625.100	0.000	0.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	110.000	0.000	390.000	0.000	0.000	0.000	0 000

BT	7.000	110.000	624.000	624.000	297.800	625.100	616.600	298.500	625.100	618.200
BT	300.000	625.100	618.800	301.500	625.100	618.200	302.300	625.600	616.600	390.000
BT	625.700	625.700	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	9800.000	9.000	289.000	324.000	100.000	100.000	100.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	50.000	0.000	400.000	0.000	0.000	0.000	0.000
GR	624.400	0.000	624.400	200.000	621.500	289.000	614.600	306.000	614.100	308.000
GR	614.600	310.000	618.700	324.000	623.600	400.000	625.500	600.000	0.000	0 000
NC	.060	.060	.045	.100	.300	0.000	0.000	0.000	0.000	0.000
X1	10700.000	11.000	487.000	517.000	868.000	868.000	735.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	60.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	627.000	0.000	626.300	200.000	626.400	400.000	623.500	487.000	618.000	492.000
GR	617.000	498.000	618.000	504.000	628.100	517.000	627.600	600.000	626.000	800 000
GR	631.000	1000.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0 000
X1	10750.000	15 000	496.200	503.800	150.000	150 000	150.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	400.000	0.000	600.000	0.000	0.000	0.000	0.000
GR	626.600	0.000	627.800	200.000	627.500	400.000	623.500	487.000	620.700	496.200
GR	618.400	497.000	617.200	498.500	616.900	500.000	617.200	501.500	618.400	503.000
GR	620.700	503.800	626.500	519.000	627.100	600.000	630.200	800.000	631.800	1000.000
SB	0.000	2.280	2.500	0.000	6.000	0.000	44.000	0.000	617.100	617.100
ET	0.000	0.000	0.000	0.000	0.000	9.100	0.000	0.000	509.000	600.000
X1	10751.000	0.000	0.000	0.000	85.000	85.000	85.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	624.400	629.800	0.000	0.000	0.000	0.000	0.000
X3	0 000	0.000	0.000	400.000	0.000	600.000	0.000	0.000	0.000	0 000
BT	9.000	0.000	629.700	627.500	496.200	629.800	620.700	497.000	629.800	622.900
BT	498.500	629.800	624.000	500.000	629.800	624.400	501.500	629.800	624.000	503.000
BT	629.800	622 900	503.800	629.800	620.700	1000.000	630.300	627.110	0.000	0.000
QT	7.000	480.000	640.000	710.000	860.000	440.000	490.000	100.000	0.000	0.000
X1	10800.000	11.000	487.000	517.000	310.000	310.000	225.000	0.000	0 000	0.000
X3	0.000	0.000	0.000	330.000	0.000	680.000	0.000	0.000	0.000	0.000
GR	626.600	0.000	627.800	200.000	627.500	400.000	626.100	487.000	618.000	498.000
GR	616.500	503.000	618.000	507.000	626.500	517.000	627.100	600.000	630.200	800.000
GR	631.800	1000.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0 000
NC	0 000	0.000	0.000	.100	.300	0.000	0.000	0.000	0.000	0.000
X1	11480.000	0.000	0.000	0.000	630.000	630.000	485.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	230.000	0.000	800.000	0.000	0.000	0.000	0.000
NC	.040	.040	.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	12450.000	10.000	340.000	365.000	910.000	910.000	850.000	0.000	0.000	0.000
X3	0 000	0.000	0.000	150.000	0.000	650.000	0.000	0.000	0.000	0.000
GR	628 800	0.000	628.000	250.000	627.900	340.000	621.000	354.000	620.400	356 000
GR	621.000	358.000	627.000	365.000	628.200	450.000	628.800	650.000	631.800	750.000
NC	0 000	0.000	0 000	.100	.300	0.000	0.000	0.000	0.000	0.000
X1	12500.000	17.000	348.000	360 000	50.000	50.000	50.000	0.000	0.000	0.000
X3	0.000	0 000	0.000	150.000	0.000	650.000	0.000	0.000	0.000	0.000
GR	627.500	0 000	626.800	250.000	626.500	348.000	621.500	348.000	619.800	349.000
GR	619.500	350.000	619.800	351.000	621.500	352.000	621.500	356.000	619.800	357 000

GR	619.500	358.000	619.800	359.000	621.500	360.000	626.500	360.000	626.800	450.000
GR	627.900	650.000	630.800	750.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	12501.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	0.000	0 000	0.000	150.000	0.000	650.000	0.000	0.000	0.000	0.000
BT	13.000	0.000	627 500	627.500	348.000	626.500	621.500	349.000	626.500	623.250
BT	350.000	636.500	623.500	351.000	626.500	623.250	352.000	626.500	621.500	356.000
BT	626.500	621 500	357.000	626.500	623.250	358.000	626.500	623.500	359.000	626.500
BT	623.250	360.000	626.500	621.500	450.000	626.800	626.800	750.000	630.800	630.800
X1	12502.000	0.000	0.000	0.000	98.000	98.000	98.000	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	0.000	0.000	0.000	150.000	0.000	650.000	0.000	0.000	0.000	0.000
X1	12503 000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	150.000	0.000	650.000	0.000	0.000	0.000	0 000
QT	7.000	450.000	600.000	660.000	800.000	660.000	400.000	85.000	0.000	0.000
X1	12550.000	10.000	340.000	369.000	50.000	50.000	50.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	180.000	0.000	650.000	0.000	0.000	0.000	0.000
GR	628.300	0.000	628.600	250.000	628.100	340.000	621.000	355.000	619.500	360.000
GR	621.000	365 000	628.700	369.000	627.700	450.000	629 000	650.000	631.200	750.000
NC	0.000	0.000	0.000	.100	.300	0.000	0.000	0.000	0.000	0.000
X1	13300 000	7.000	263.000	303.000	700.000	700.000	700.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	120.000	0.000	0.000	0:000	0.000	0.000	0.000
GR	627.200	0.000	625.000	263.000	622.000	275.000	621.200	280.000	622.000	285.000
GR	625.000	303.000	630.000	310.000	0 000	0.000	0.000	0.000	0.000	0.000
NC	.050	.050	.040	0.000	0.000	0.000	0.000	0.000	0.000	0 000
QT	7.000	450.000	600.000	660.000	800.000	660.000	300.000	85.000	0.000	0.000
X1	14075.000	8.000	211 000	257.000	620.000	620.000	620.000	0.000	0.000	0.000
GR	633.000	0.000	629.900	211.000	623.100	226.000	622.800	232.000	623.100	236.000
GR	631.600	257.000	634.600	290 000	633.300	530.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	.300	.500	0.000	0.000	0.000	0.000	0.000
X1	14125.000	11.000	227.000	233.000	50.000	50.000	50.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	130.000	0.000	330.000	0.000	0.000	0.000	0.000
GR	633.700	0.000	630.900	130.000	629.900	209.000	625.300	227.000	623.000	228.000
GR	622.300	230.000	623.000	232.000	625.300	233.000	631.600	259.000	632.900	330.000
GR	634.800	530.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SB	0 000	2.270	2.500	0.000	6.000	0.000	28.300	0.000	622.300	622.300
X1	14126.000	0.000	0.000	0.000	346.000	346.000	346.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	628.300	632.500	0.000	0.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	175.000	0.000	255.000	0.000	0.000	0.000	0.000
BT	8.000	0.000	633.700	633.700	227.000	632.500	625.300	228.000	632.500	627.500
BT	230.000	632.500	628.300	232.000	632.500	627.500	233.000	632.500	625.300	330.000
BT	632 900	632.900	530.000	634.800	634 800	0.000	0.000	0.000	0.000	0.000
X1	14250.000	9.000	200 000	241.000	100.000	100.000	100.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	70.000	0.000	280.000	0.000	0.000	0.000	0.000

GR	632.400	0.000	631.100	200.000	623.200	214.000	622.400	217.000	623.200	220.000
GR	633.400	241.000	637.900	260.000	638.000	330 000	637.900	530 000	0.000	0.000
OT	7.000	450.000	600.000	660.000	800.000	150.000	150.000	85.000	0.000	0 000
NC	050	050	.045	.100	.300	0 000	0.000	0.000	0.000	0.000
X1	15500.000	10.000	400 000	422.000	1180.000	1180.000	950.000	0.000	0.000	0.000
GR	631.900	0.000	632 600	130.000	631.100	330.000	628.400	400.000	626.300	405.000
GR	625.400	410.000	626.300	416 000	629.400	422.000	635.200	660.000	647.600	750.000
X1	16450.000	10.000	363.000	404.000	945.000	945.000	945.000	0.000	0.000	0.000
GR	636.000	0.000	634.400	363.000	629.000	371.000	628.700	377.000	629.000	383.000
GR	634.700	404.000	638.700	500.000	647.000	600.000	642.000	700.000	643.300	800.000
NC	0.000	0.000	.055	.300	.500	0.000	0.000	0:000	0.000	0.000
X1	16500 000	14.000	397.500	402.500	100.000	100.000	100.000	0.000	0.000	0.000
X3	0 000	0.000	0.000	355.000	0.000	430 000	0.000	0.000	0.000	0.000
GR	637.400	0.000	635.500	300.000	634.400	386.000	631.100	397.500	629.600	398.000
GR	628.800	399.000	628.600	400.000	628.800	401.000	629.600	402.000	631.100	402.500
GR	634.700	427.000	638 500	500.000	642 400	700.000	642.200	800.000	0.000	0 000
SB	0.000	1.390	2.500	0.000	5.000	0.000	19.600	0.000	628.600	628 600
X1	16501 000	0.000	0.000	0.000	60.000	60.000	60.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	633.600	636 300	0.000	0.000	0.000	0.000	0.000
X3	0 000	0.000	0.000	350.000	0.000	435.000	0.000	0.000	0.000	0.000
BT	10.000	0.000	637.400	637.400	397.500	636.300	631.100	398.000	636.300	632.600
BT	399.000	636.300	633.300	400.000	636.300	633.600	401.000	636.300	633.300	402.000
BT	636.300	632.600	402.500	636.300	631.100	500.000	638.500	638.500	800.000	642.200
BT	642.200	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	16550.000	11 000	390.000	419.000	100.000	100.000	100.000	0 000	0.000	0 000
X3	0.000	0.000	0.000	350.000	0.000	450.000	0 000	0.000	0.000	0.000
GR	636 900	0.000	635.800	300.000	636.000	390.000	629.000	397.000	628.600	399.000
GR	629.000	402.000	637.100	419.000	640.100	500.000	641.100	600.000	644.600	700.000
GR	643.300	800.000	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

*PROF 1

CCHV= .100 CEHV= .300
*SECNO 6500.000

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

150yr Tittab = 616.

FES Q

3470 ENCROACHMENT STATIONS= 150.0 330.0 TYPE= 1 TARGET= 180.000

6500.00	9.00	614.20	0.00	614.20	614.39	.19	0.00	0.00	609.20
2300.	749.	542.	1010.	243.	116.	331.	0.	0.	606.60
0 00	3.09	4.68	3.05	.030	.030	.030	0.000	605.20	150.00
.000644	570.	720.	570.	0	0	0	0.00	167.66	317.66

616.40 1300

*SECNO 7700.000
3280 CROSS SECTION 7700.00 EXTENDED 1.73 FEET

616 S 1300

3470 ENCROACHMENT STATIONS= 350 0 620.0 TYPE= 1 TARGET= 270.000

7700.00	8.23	615.43	0.00	0.00	615.84	.41	1.39	.07	611.90
2300.	329.	1351.	620.	155.	207.	316.	19.	6.	612.50
.07	2.12	6.51	1.96	.060	.040	.060	.040	607.20	350.00
.002643	1200.	1200.	1200.	3	0	0	0.00	270.00	620.00

CCHV= .600 CEHV= .800
*SECNO 7750.000

3301 HV CHANGED MORE THAN HVINS
Sugnet Road

3470 ENCROACHMENT STATIONS= 384.0 620.0 TYPE= 1 TARGET= 236.000

7750.00	8.71	615.61	615.47	0.00	616.94	1.33	.36	.73	607.20
2300.	149.	1507.	644.	45.	135.	199.	20	7.	606.90
.07	3.34	11.17	3.24	.060	.040	.060	.040	606.90	384.00
.005279	100.	100	100.	2	8	0	0.00	166.27	550.27

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0 00	1.60	2.50	0.00	16.00	0.00	106.00	0.00	607.20	607.20

*SECNO 7751.000

3301 HV CHANGED MORE THAN HVINS

PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
627.31	616.97	0.00	1430.	873.	106.	106.	613.80	616.10

```
3470 ENCROACHMENT STATIONS=      384.0      620.0  TYPE=      1  TARGET=      236.000
  7751.00      9 84    616.74      0.00      0 00   617.30       .55       .36      0.00    607.20
    2300.      165.     1214.      921.       64.     153.      407.       20.        7.    606.90
      .08      2.58      7.93      2.26      .060     .040      .060      .040    606.90    384.00
  .002244       26.       26.       26.         3        0         6      0.00    236.00    620.00
```

616.8 1300

```
*SECNO 7800.000
   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

  7800.00     10.47    617.57      0.00      0.00   617.78       .21       .28       .21    612.60
    2300.      355.     1350.      596       249      290.      378.       24.        8.    613.70
      .09      1.43      4.66      1.57      .060     .040      .060      .040    607.10    263.91
  .000987      180.      200.      200.         2        0         0      0.00    277.37    541.28
```

617.0 1300

```
CCHV=     .200 CEHV=     .400
*SECNO 8250.000

3470 ENCROACHMENT STATIONS=      400.0      600.0  TYPE=      1  TARGET=      200.000
  8250.00      9.29    617.99      0.00      0.00   618.05       .06        23       .03    610.00
    2300.      625.      988.      687.      472.     396.      535.       39.       11.    610.00
      .17      1.33      2.49      1.28      .060     .040      .060      .039    608.70    400.00
  .000249      590.      470.      590.         2        0         0      0.00    200.00    600.00
```

617.2 1300

```
CCHV=     .100 CEHV=     .300
*SECNO 8680.000

3470 ENCROACHMENT STATIONS=      565.0      700.0  TYPE=      1  TARGET=      135.000
  8680.00      7.83    618.13      0.00      0.00   618.15       .02       .09       .00    613.00
     570.      116.      222.      233.      164.     141.      304.       49.       13.    613.00
      .29       .70      1.57       .76      .060     .040      .060      .039    610.30    565.00
  .000143      430.      430.      430.         2        0         0      0.00    135.00    700.00
```

617.3 710

```
CCHV=     .300 CEHV=     .500
*SECNO 9450.000

3301 HV CHANGED MORE THAN HVINS

  9450.00      5.89    617.99      0.00      0.00   618.78       .79       .25       .38    618.80
     570.         0      570.        0.        0.      80.        0.       53.       14.    621.10
      .31      0.00      7.12      0.00      .060     .045      .060      .040    612 10    309.27
  .010494      545.      545.      545         2        0         0      0.00     23.07    332.34
```

617.5 710

```
CCHV=     .100 CEHV=     .300
*SECNO 9500.000

3470 ENCROACHMENT STATIONS=      240.0      320.0  TYPE=      1  TARGET=       80.000
  9500.00      6.16    619.16      0.00      0.00   619.50       .34       .68       .04    613.00
     570.       47.      466.       57.       19.      93.       20.       53.       14.    613.00
      .31      2.50      5.03      2.89      .060     .045      .060      .040    613.00    272.33
```

613.8 710

.004715	100.	100.	100.	3	0	0	0.00	42.07	314.40

Crescent Drive

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.05	1.62	2.98	0.00	16.00	1.00	90.00	0.00	613.00	613.00

*SECNO 9501.000

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

PRESSURE FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
620.17	619.54	.05	0.	570.	90.	90.	619.00	620.70

3470 ENCROACHMENT STATIONS= 240.0 320.0 TYPE= 1 TARGET= 80.000

9501.00	6.95	619.95	0.00	0.00	620.17	.22	.67	0.00	613.00
570.	74.	437.	60.	47.	105.	25.	53.	14.	613.00
.32	1.56	4.15	2.37	.060	.045	.060	.040	613.00	240.09
.002704	80.	80.	80.	2	0	0	0.00	75.13	315.22

621.0 710

*SECNO 9625 000

3470 ENCROACHMENT STATIONS= 70.0 600.0 TYPE= 1 TARGET= -70.000

9625.00	8.05	620.35	0.00	0.00	620.51	.16	.34	.01	619.80
390.	33.	356.	[illegible]	48.	106.	3.	54.	14.	620.00
.33	.69	3.37	.33	.060	.045	.060	.041	612.30	163.75
.001802	150.	150.	150.	2	0	0	0.00	133.98	297.73

CCHV= .600 CEHV= .800
*SECNO 9750.000

3470 ENCRDACHMENT STATIONS= 110.0 390.0 TYPE= 1 TARGET= 280.000

9750.00	6.51	620.81	0.00	0.00	621.24	.43	.51	.21	616.60
390.	63.	177.	150.	22.	26.	39.	54.	14.	616.60
.34	2.82	6.73	3.83	.060	.050	.060	.041	614.30	273.42
.008736	150.	150.	150.	2	0	0	0.00	54.52	327.94

Saginaw

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.62	2.50	0.00	3.00	0.00	15.90	0.00	613.50	613.50

*SECNO 9751 000
PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
635.94	621 05	0 00	185.	207.	16.	16.	618.80	625.10

3470 ENCROACHMENT STATIONS= 110.0 390.0 TYPE= 1 TARGET= 280.000

9751.00	10.78	625 08	0 00	0.00	625.08	.01	3.85	0.00	616.60
390.	174.	47.	169.	369.	45.	283.	55.	15.	616.60
.39	.47	1.04	60	.060	.050	.060	.041	614.30	110.00
.000100	116.	116.	116.	0	0	7	0.00	280.00	390.00

*SECNO 9800.000

3470 ENCROACHMENT STATIONS= 50.0 400 0 TYPE= 1 TARGET= 350.000

9800.00	10 98	625 08	0.00	0.00	625 09	.01	01	.00	621.50
390.	63.	209	118.	293.	281.	299.	57.	16.	618.70
.45	.22	.74	.39	.060	.050	.060	.041	614.10	50.00
.000042	100.	100.	100	2	0	0	0.00	350 00	400.00

CCHV= .100 CEHV= .300
*SECNO 10700.000

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

3470 ENCROACHMENT STATIONS= 60.0 1000.0 TYPE= 1 TARGET= -60.000

10700.00	8.11	625.11	0.00	0.00	625.20	.09	.08	.03	623.50
390.	23.	367.	0.	39.	146.	0.	67.	20.	628.10
.53	.59	2.52	0.00	.060	.045	.060	.042	617.00	438.76
.000748	868.	735.	868.	2	0	0	0.00	74.39	513.15

Wheeler

*SECNO 10750.000

3470 ENCROACHMENT STATIONS= 400.0 600.0 TYPE= 1 TARGET= 200.000

10750.00	8.31	625.21	0.00	0.00	625.41	.19	.18	.03	620.70
390.	101.	239.	50.	61.	56.	27.	68.	20.	620.70
.55	1.66	4 29	1.88	.060	.045	.060	042	616.90	449.71
.002120	150.	150.	150.	2	0	0	0.00	65.92	515.63

625.9 710 530

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	2.28	2.50	0.00	6.00	0 00	44.00	0.00	617.10	617.10

*SECNO 10751.000
PRESSURE FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
628.00	625 58	0.00	0.	390.	44.	44.	624.40	629.80

```
3470 ENCROACHMENT STATIONS=      400.0      600.0  TYPE=      1  TARGET=      200.000
 10751.00     11.08    627.98     0.00      0.00    628.00      .02      2.59      0.00    620.70
     390.      184.      116.      90.      271.       77.      163.       68.       20.    620.70
      .57       .68      1.51      .55      .060      .045      .060      .042    616.90    400.00
  .000171       85.       85.      85.         1         0         0      0.00    200.00    600.00

*SECNO 10800.000

3470 ENCROACHMENT STATIONS=      330.0      680.0  TYPE=      1  TARGET=      350.000
 10800.00     11.52    628.02     0.00      0.00    628.06      .04       .06       .01    626.10
     490        65.      383.      52.      139.      220.      129.       72.       22.    626.50
      .62       .40      1.74      .40      .060      .045      .060      .042    616.50    330.00
  .000250      310.      225.     310.         2         0         0      0.00    329.43    659.43

CCHV=      100 CEHV=     .300
*SECNO 11480.000

3470 ENCROACHMENT STATIONS=      230.0      800.0  TYPE=      1  TARGET=      570.000
 11480.00     11.65    628.15     0.00      0.00    628.18      .03       .12       .00    626.10
     490.       71.      362.      57.      205.      224.      147.       78.       28.    626.50
      .74       .35      1.61      .39      .060      .045      .060      .042    616.50    230.00
  .000211      630.      485.     630.         0         0         0      0.00    437.30    667.30

*SECNO 12450.000
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       ARDB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

3470 ENCROACHMENT STATIONS=      150.0      650.0  TYPE=      1  TARGET=      500.000
 12450.00      8.04    628.44     0.00      0.00    628.55      .11       .35       .02    627.90
     490.       48.      363.      80.       72.      118.       81.       87.       36.    627.00
      .83       .66      3.08      .98      .040      .040      .040      .041    620.40    150.00
  .001057      910.      850.     910.         2         0         0      0.00    380.06    530.06

CCHV=      100 CEHV=     .300
*SECNO 12500.000

3470 ENCROACHMENT STATIONS=      150.0      650.0  TYPE=      1  TARGET=      500.000
 12500.00      9.07    628.57     0.00      0.00    628.57      .01       .01       .01    626.50
     490.      196.       87.     207.      351.       96.      416.       88.       37.    626.50
      .86       .56       .91      .50      .040      .040      .040      .041    619.50    150.00
  .000105       50.       50.      50.         2         0         0      0.00    500.00    650.00

*SECNO 12501.000

3370 NORMAL BRIDGE,NRD= 13 MIN ELTRD=  626 50 MAX ELLC=  630.80

3470 ENCROACHMENT STATIONS=      150.0      650.0  TYPE=      1  TARGET=      500.000
 12501.00      9.07    628.57     0.00      0 00    628.57      .01       .00       .00    626.50
     490.      256.       23.     211.      351.       43.      416.       88.       37.    626.50
```

Rt BR Station 517

630.1 710

AI Rt BR Rt Over bank
83' 142' 283
-1.5 = .9' depth 0 +2.1

AJ
12% flow

AK Rt BR 85' 165' 285
16% -.44 -.24 0 +.35

Sylvan Lane

630 2 660

E13

```
     86      .73      .54       51      .040      .040      .040      .041   619.50   150.00
  .000179      1.       1.        1.        0         0         0    -52.71   500.00   650.00

*SECNO 12502.000

3370 NORMAL BRIDGE,NRD= 13 MIN ELTRD=  626.50 MAX ELLC=  630.80

3470 ENCROACHMENT STATIONS=      150 0      650.0  TYPE=      1  TARGET=      500.000
 12502.00      9.09   628.59     0 00      0.00   628.59       .01       .02       .00   626.50
     490.      256.      23.      212.      354.      43.      420.       90.       38.    626.50
      .90       .72      .53       .50      .040     .040      .040      .041   619.50   150.00
  .000175       98.      98.       98.        0         0         0    -52.73   500.00   650.00

*SECNO 12503 000

3470 ENCROACHMENT STATIONS=      150.0      650.0  TYPE=      1  TARGET=      500.000
 12503.00      9.09   628.59     0.00      0.00   628.59       .01       .00        00   626.50
     490.      196.      86.      208.      354.      96.      421.       90.       38.    626.50
      .90        55      .89       .49      .040     .040      .040       041   619.50   150.00
  .000102         1       1.        1.        0         0         0      0.00   500.00   650.00

*SECNO 12550.000

3265 DIVIDED FLOW

   SECNO     OEPTH     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


3470 ENCROACHMENT STATIONS=      180.0      650.0  TYPE=      1  TARGET=      470.000
 12550.00      9.05   628.55     0 00      0.00   628.62       .07       .01        02   628.10
     400.        6.     354.       40.       19.     158.       85.       90.       38.    628.70
      .91       .30     2.25       .47       040     .040      .040      .041   619 50   180.00
  .000501       50.      50.       50.         2         0         0      0.00   338.13   580.80

CCHV=     .100 CEHV=     .300
*SECNO 13300.000

3470 ENCROACHMENT STATIONS=      120.0      310.0  TYPE=      1  TARGET=     -120.000
 13300.00      7.49   628.69     0.00      0.00   628.70       .01       .07       .01   625.00
     400.      225.     172.        3.      442.     227.       10.       98.       42.    625.00
     1.22       .51      .76       .32      .040     .040      .040      .041   621.20   120.00
  .000042      700.     700.      700.         2         0         0      0.00   188.17   308.17

*SECNO 14075 000
 14075.00      5.90   628.70     0.00      0 00   628.78       .08       .06       .02   629.90
     300         0.     300.        0.        0.     131.        0.      104.       44.    631.60
     1 30      0.00     2.30     0.00      .050     .040      .050      .041   622.80   213.65
   000748      620.     620.      620.         2         0         0      0.00    36.17   249.83

CCHV=     .300 CEHV=     .500
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630.2 660

Dilloway

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*SECNO 14125 000

3470 ENCROACHMENT STATIONS=      130.0      330.0  TYPE=      1  TARGET=      200.000
 14125.00      6 35    628.65      0 00      0.00    628.98       .33       .07       .12    625.30
     300.       57.      182.       61.       22.       33.       23.      104.       44.    625.30
     1.30      2.61      5.53      2.62      .050      .040      .050      .041    622.30    213.91
  .004064       50.       50.       50.         2         0         0      0.00     32.90    246.81
```

6301 660 490

```
SPECIAL BRIDGE

SB  XK        XKOR       COFQ       RDLEN      BWC        BWP        BAREA      SS         ELCHU      ELCHD
     0.00      2 27       2.50       0.00       6.00       0.00       28.30      0.00       622.30     622.30

*SECNO 14126.000
PRESSURE AND WEIR FLOW

 EGPRS       EGLWC        H3        QWEIR       QPR        BAREA    TRAPEZOID       ELLC      ELTRD
                                                                        AREA
   632.61     628.98       0.00         0.       298.        28.        36.       628.30     632.50

3470 ENCROACHMENT STATIONS=      175.0      255.0  TYPE=      1  TARGET=       80.000
 14126.00     10 24    632.54      0.00      0.00    632.55       .02      3.58      0.00    625.30
     300.      134.       79.       87.      172.       56.      101.      105.       44.    625.30
     1.40        78      1.41       .86      .050      .040      .050      .041    622.30    175.00
  .000129      346.      346.      346.         1         0         0      0.00     80.00    255.00
```

633.5 660 490

```
*SECNO 14250 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

3470 ENCROACHMENT STATIONS=       70.0      280.0  TYPE=      1  TARGET=      210.000
 14250.00     10.15    632.55      0.00      0.00    632.57       .02       .01       .00    631.10
     300.       42.      258.        0.      133.      224.        0.      106.       45.    633.40
     1.43       .31      1.15      0 00      .050      .040      .050      .041    622.40     70.00
  .000109      100.      100.      100.         2         0         0      0.00    169.25    239.25

CCHV=     .100 CEHV=     .300
*SECNO 15500.000
3280 CROSS SECTION  15500.00 EXTENDED        .71 FEET

 15500.00      7.21    632.61      0.00      0.00    632.61       .00       .05       .00    628.40
    150.       64.       52.       34.      400       129.      212.      120.       54.    629.40
     2.61       .16       .40       .16      .050      .045      .050      .041    625.40      0.00
  .000015     1180.      950      1180.         2         0         0      0 00    553.86    553.86
```

633.7 660 490

```
*SECNO 16450.000
 16450.00      3 92    632.62      0.00      0.00    632.68       .06       .05       .02    634.40
     150.        0       150         0.        0.       79.        0.      129.       61.    634.70
```

E15

```
    2.75      0.00     1.90      0.00      .050      .045      .050      .041   628.70    365.64
 .000999      945.     945.      945.         2         0         0      0.00    30.70    396.34


CCHV=     .300 CEHV=     .500
*SECND 16500.000

3470 ENCRDACHMENT STATIONS=     355.0     430.0  TYPE=     1  TARGET=     75.000
 16500.00     4.07   632.67      0.00      0.00   633.15       .48       .26       .21   631.10
     150.      14.     107.       29.        4.      17.        8.      129.       61.   631.10
     2.75     3.34     6.22     3 40      .050      .055      .050      .041   628.60    392.02
  .018344     100.     100.      100.         0         0         0      0.00    21.17    413.19
```

634.7 660 330

Wackerly

```
SPECIAL BRIDGE

SB  XK        XKOR      COFQ      ROLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
    0 00      1.39      2.50      0.00      5.00      0.00      19.60     0.00      628.60    628.60

*SECNO 16501.000

6070,LOW FLOW BY NORMAL BRIDGE

EGPRS=     0.000  EGLWC=   633.151  ELLC=   633.600  PCWSE=   632.671  ELTRD=   636.300

3301 HV CHANGED MORE THAN HVINS


3370 NORMAL BRIDGE,NRD= 10 MIN ELTRD=  636.30 MAX ELLC=  633.60

3470 ENCRDACHMENT STATIONS=     350.0     435.0  TYPE=     1  TARGET=     85.000
 16501.00     5.73   634.33   632.19      0.00   635.36      1.02      1.93       .27   631.10
     150.       0.     150.       0.         0       19.        0.      129.       61.   631.10
     2.76     0.00     8 11     0.00      .050      .055      050       .042   628.60    386.23
  .070853      60.      60.      60.         6        15         0    -60.86    38.29    424.51
```

637.3 1-60 330

```
*SECNO 16550.000

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    IDC       ICONT     CORAR     TOPWID      ENDST


3470 ENCROACHMENT STATIONS=     350 0     450.0  TYPE=     1  TARGET=    100.000
 16550.00     7.20   635.80      0.00      0.00   635.83       .03       .17       .30   636.00
     150.       0.     150.       0.         0.     107.        0.      129.       61.   637.10
     2.78     0.00     1.41     0.00      .050      .055      .050      .042   628.60    390.20
  .000511     100.     100.      100.         3         0         0      0.00    26.06    416.27
```

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*************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
*************************************************
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*****************************************************
*  WATER SURFACE PROFILES                           *
*  VERSION OF NOVEMBER 1976                         *
*  UPDATED JULY 1979                                *
*                                                   *
*  RUN DATE  01/12/84  TIME .10.42.07.              *
*****************************************************
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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        *
*****************************************
```

```
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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Revised model near confluence based on more cross-section data obtained by the City

*- 4 *- 4 B- 4F 1**********

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*************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
*************************************************

C
T1      MIDLAND - CONSULTATION ON STORM SEWER DESIGN
T2      SNAKE CREEK AND SIEBERT DRAIN - CITY DATUM
T3      SUGNET RD. (W) TO SAGINAW RD. - EXISTING CONDITIONS

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

     -1.       4.        0.        0.  0.000000      0.00      -1.0       0.    619.300    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

NC      .070      .070      .050      .100      .300     0.000     0.000     0.000     0.000     0.000
QT     3 000   450.000   780.000   570.000     0.000     0.000     0.000     0.000     0.000     0.000

        ***CONFLUENCE OF SNAKE CREEK AND SIEBERT DRAIN

X1   800.000     7.000   178.000   212.000    50.000    50.000    50.000     0.000     0.000     0.000
X3     0 000     0.000     0 000   100.000     0 000     0.000     0.000     0.000     0.000     0.000
GR   619.500     0.000   616.400    25.000   615.380   178.000   608.980   190.500   608.980   199.500
GR   614.480   212.000   615.000   320.000     0.000     0.000     0.000     0.000     0.000     0 000

X1   950.000     0.000     0.000     0.000   150.000   150.000   150.000     0.000     1.500     0 000

X1   951.000     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   614.440   615.690     0.000     0.000     0.000     0.000     0.000

X1   955.000     0 000     0.000     0.000     4.000     4.000     4.000     0.000     0.000     0.000
X2     0.000     0.000     0.000   614.440   615.690     0.000     0.000     0.000     0.000     0.000

X1   956.000     0.000     0.000     0.000     1.000     1.000     1.000     0.000     0.000     0.000

X1  1050.000     8.000   114 000   136.000    94.000    94.000    94.000     0.000     0.000     0.000
X3     0.000     0.000     0.000     0.000     0.000   150.000     0.000     0.000     0.000     0.000
GR   620.000     0.000   618.600    25.000   615.700    75 000   615.480   114.000   611.280   121.000
GR   611 280   129.000   615.980   136.000   616.500   268 000     0.000     0.000     0.000     0.000

X1  1100.000     7.000   125.000   155.000    50.000    50 000    50.000     0.000     0.000     0.000
GR   620.000     0.000   616.400    39.000   616.360   125 000   610.260   136.500   610.260   141 500
GR   618.360   155.000   620.000   172.000     0.000     0 000     0.000     0.000     0.000     0.000
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E20

X1	1247.000	7.000	60.000	85.000	147.000	147.000	147.000	0.000	0.000	0.000
GR	620.060	0.000	616.660	60.000	612.360	64.500	612.360	71.500	617.060	85.000
GR	618.660	145.000	620.000	161.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	1248 000	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	615.770	616.600	0.000	0.000	0.000	0.000	0.000
X1	1252.000	0.000	0.000	0.000	4.000	4.000	4.000	0.000	0 000	0.000
X2	0.000	0.000	0.000	615.770	616.600	0.000	0.000	0.000	0.000	0 000
X1	1253.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X1	1330.000	9.000	37.000	54.000	77.000	77.000	77.000	0.000	0.000	0.000
GR	620.000	0.000	619.260	7.000	616.460	37.000	612.560	41.000	612.560	47.000
GR	616.760	54.000	617.800	144.000	618.800	194.000	620.000	223.000	0.000	0.000
X1	1331 000	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	615.730	616.230	0.000	0.000	0.000	0.000	0.000
X1	1335 000	0.000	0.000	0.000	4.000	4.000	4.000	0.000	0.000	0.000
X2	0.000	0.000	0 000	615.730	616.230	0.000	0.000	0.000	0.000	0.000
X1	1336.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X1	1600.000	8.000	15.000	55.000	264.000	264.000	264.000	0.000	0.000	0.000
GR	621.000	0.000	620.390	5.000	619.290	15.000	612.990	21.500	612.990	28.500
GR	618.090	35.000	619.790	55.000	621.000	71.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	.250	.500	0.000	0.000	0.000	0.000	0.000

***CRESCENT DR.

X1	1807.000	4.000	0.000	17 000	207.000	207.000	207.000	0.000	0.000	0.000
GR	622.000	0.000	614.500	.100	614.500	16.900	622.000	17.000	0.000	0.000
SB	1.250	1.700	3.100	50.000	17.000	1.000	93.000	0.000	614.500	614.500
X1	1887.000	0.000	0.000	0.000	80.000	80.000	80.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	620.330	622.000	0.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	.100	.300	0.000	0.000	0.000	0.000	0.000
X1	2000.000	7.000	30.000	55.000	113.000	113.000	113.000	0.000	0.000	0 000
GR	622.000	0.000	621.440	30.000	614.640	34.500	614.640	49.500	618.140	52.000
GR	619.040	55.000	622.000	74.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	2100 000	6.000	5 000	29.000	100.000	100.000	100.000	0.000	0.000	0.000
GR	622.000	0.000	619.540	5.000	613 740	13.000	613.740	21.000	621.340	29.000
GR	622.000	84.000	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

```
*PROF 1

CCHV=     .100 CEHV=     .300
*SECNO 800.000
3280 CROSS SECTION     800 00 EXTENDED       4.30 FEET

   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLDB      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


3470 ENCROACHMENT STATIONS=      100.0      320.0  TYPE=      1  TARGET=     -100.000

        ***CONFLUENCE OF SNAKE CREEK AND SIEBERT DRAIN

   800.00     10.32    619.30      0.00    619.30    619.31       .01      0.00      0.00    615.38
     570.      108.      245.      217.      285.      277.      492.        0.        0.    614.48
     0.00       .38       .88       .44      .070      .050      .070     0.000    608.98    100.00
  .000060       50.       50.       50.         0         0         0      0.00    220.00    320.00


*SECNO 950.000
3280 CROSS SECTION     950.00 EXTENDED       2.81 FEET


   950.00      8.83    619.31      0.00      0.00    619.32       .01       .01       .00    616.88
     570.      119.      274.      178.      302.      226.      331.        3.        1.    615.98
      .05       .39      1.21       .54      .070      .050      .070      .050    610.48     13.64
  .000148      150.      150.      150.         0         0         0      0.00    306.36    320.00


*SECNO 951 000
3280 CROSS SECTION     951.00 EXTENDED       2.81 FEET


3370 NORMAL BRIDGE,NRD=  O MIN ELTRD=  615.69 MAX ELLC=  614.44

   951.00      8.83    619.31      0.00      0.00    619.32       .01       .00       .00    616.88
     570.      166.      156.      248.      302.      190.      331.        3.        1.    615.98
       05       .55       .82       .75      .070      .050      .070      .049    610.48     13.63
  .000289        1.        1.         1         0         0         0    -35.47    306.37    320.00


*SECNO 955.000
3280 CROSS SECTION     955.00 EXTENDED       2.82 FEET


3370 NORMAL BRIDGE,NRD=  O MIN ELTRD=  615.69 MAX ELLC=  614.44

   955.00      8.84    619.32      0.00      0.00    619.32       .01       .00       .00    616.88
     570.      166.      156.      248.      303.      191.      332.        3.        1.    615.98
      .05       .55        82       .75      .070      .050      .070      .049    610.48     13.58
  .000287        4.        4.        4.         0         0         0    -35.47    306.42    320.00
```

```
*SECNO 956.000
3280 CROSS SECTION    956.00 EXTENDED      2.82 FEET

   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

   956.00     8.83    619.31      0.00      0.00    619.33      .01       .00       .00     616.88
     570.     119.      273.      178.      303.      226.     332.        3.        1.      615.98
      .05      .39      1.21      .53      .070      .050     .070      .049    610.48      13.58
  .000147      1.        1.        1.        0         0        0      0.00    306.42     320.00

*SECNO 1050.000
3280 CROSS SECTION   1050.00 EXTENDED      2.82 FEET


3470 ENCROACHMENT STATIONS=        .0      150.0  TYPE=      1  TARGET=      149.999
  1050.00     8.04    619.32      0.00      0.00    619.36      .04       .02       .01     615.48
     570.     236.      295.       40.      259.      146.      46.        5.        1.      615.98
      .07      .91      2.02      .85      .070      .050     .070      .049    611.28      12.06
  .000431     94.       94.       94.        1         0        0      0.00    137.94     150.00

*SECNO 1100.000
  1100.00     9.08    619.34      0.00      0.00    619.38      .03       .02       .00     616.36
     570.     242.      327.        1.      301.      183.       5.        5.        2.      618.36
      .08      .80      1.79      .26      .070      .050     .070      .049    610.26       7.18
  .000382     50.       50.       50.        1         0        0      0.00    157.95     165.13

*SECNO 1247.000
  1247.00     7.02    619.38      0.00      0.00    619.49      .11       .09       .02     616.66
     570.      62.      414.       94.       65.      134.      94.        7.        2.      617.06
      .10      .94      3.09      99       .070      .050     .070      .049    612.36      11.95
   001307    147.      147.      147.        2         0        0      0.00    141.68     153.63

*SECNO 1248.000

3370 NORMAL BRIDGE,NRD=  0 MIN ELTRD=  616.60 MAX ELLC=  615.77

  1248.00     7.07    619.43      0.00      0.00    619.50      .07       .00       .00     616.66
     570.     109.      294.      167.       68.      117.      98.        7.        2.      617.06
      .10     1 61      2.51      1.71      .070      .050     .070      .049    612.36      11.13
  .003739      1.        1.        1.        2         0        0    -18.25    143.05     154.18

*SECNO 1252.000
   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= 0 MIN ELTRD= 616.60 MAX ELLC= 615.77

1252.00	7.08	619.44	0.00	0.00	619.52	.07	01	.00	616.66
570.	109	293.	168	68.	117.	98.	7.	2.	617.06
.10	1.60	2.49	1.71	.070	.050	.070	.049	612.36	10.95
.003688	4.	4.	4.	0	0	0	-18.25	143.35	154.30

*SECNO 1253.000

1253.00	7.06	619.42	0 00	0.00	619.53	.11	.00	.01	616.66
570.	63.	411	96.	67.	135.	97.	7.	2.	617.06
.10	.93	3.04	.99	.070	.050	.070	.049	612.36	11.28
.001256	1.	1.	1.	2	0	0	0.00	142.81	154.09

*SECNO 1330.000

1330.00	7.00	619.56	0.00	0.00	619.62	.05	.08	.01	616.46
570.	46.	248.	276.	52.	97.	276.	7.	2.	616 76
.11	.90	2.57	1.00	.070	050	.070	.049	612.56	4.14
.000899	77.	77.	77.	2	0	0	0.00	208.28	212.42

*SECNO 1331.000

3370 NORMAL BRIDGE,NRD= 0 MIN ELTRD= 616.23 MAX ELLC= 615.73

1331 00	7 03	619.59	0.00	0.00	619.62	.03	.00	.00	616.46
570.	61.	144.	365.	52.	89.	280.	7.	2.	616.76
.11	1.17	1.61	1.30	.070	.050	.070	.049	612.56	3.88
.001499	1.	1.	1.	2	0	0	-7.60	209.20	213.08

*SECNO 1335 000

3370 NORMAL BRIDGE,NRD= 0 MIN ELTRD= 616.23 MAX ELLC= 615.73

1335.00	7.04	619.60	0.00	0.00	619.62	.03	.01	.00	616.46
570.	61.	144	365.	53.	89.	281.	7.	2.	616.76
.11	1.17	1.61	1.30	.070	.050	.070	.049	612.56	3.84
.001489	4.	4	4.	0	0	0	-7.60	209 36	213.20

*SECNO 1336.000

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
SLDPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TDPWID	ENDST
1336 00	7 02	619.58	0 00	0.00	619.63	.05	.00	.01	616.46
570	47.	246.	278.	52.	97.	280.	7.	2.	616.76
.11	89	2.53	.99	.070	050	.070	.049	612.56	3.88
.000869	1.	1	1	1	0	0	0.00	209.19	213.08

*SECNO 1600.000

1600.00	6.88	619.87	0 00	0.00	620.22	.35	.50	.09	619.29
570.	1.	569.	0.	2.	119.	0.	9.	3.	619.79
.13	.77	4.77	.02	.070	.050	.070	.049	612.99	9.72
.006913	264.	264.	264.	2	0	0	0.00	46.34	56.06

```
CCHV=     .250 CEHV=     .500
*SECNO 1807.000

        ***CRESCENT DR.

  1807.00     6.58   621.08     0 00     0.00   621.49      .41     1.23      .03   622.00
     570.       0.     570.       0.       0.     111.       0.      10.       3.   622.00
      .14     0.00     5.13     0.00     .070     .050     .070     .049   614.50      .01
  .005199     207.     207.     207.        2        0        0     0.00    16.98    16.99


SPECIAL BRIDGE

SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     1.25      1.70      3.10     50.00     17.00      1.00     93.00     0.00     614.50    614.50

*SECNO 1887.000
PRESSURE AND WEIR FLOW

 EGPRS      EGLWC       H3       QWEIR      QPR       BAREA   TRAPEZOID      ELLC     ELTRD
                                                                AREA
   622.07    621.55       .08        2       567.       93.       93.      620.33    622.00


  1887.00     7 22   621.72     0.00     0.00   622.06      .34      .57     0.00   622.00
     570.       0.     570.       0.       0.     122.       0.      10.       3.   622.00
      .14     0.00     4.67     0 00     .070     .050     .070     .049   614.50      .00
  .004022      80.      80.      80.        2        0        2     0.00    16.99    17.00

CCHV=     .100 CEHV=     .300
*SECNO 2000 000
3280 CROSS SECTION   2000.00 EXTENDED        17 FEET


  2000.00     7.53   622.17     0.00     0.00   622.33      .17      .26      .02   621.44
     570.       6.     529.      35.      13.     157.      31.      10.       4.   619.04
      .15      .47     3.38     1.12     .070     .050     .070     .049   614.64     0.00
  .001462     113.     113.     113.        2        0        0     0.00    74.00    74.00

*SECNO 2100.000
3280 CROSS SECTION   2100.00 EXTENDED       .30 FEET


   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


  2100.00     8.56   622.30     0.00     0.00   622.49      .19      .15      .01   619.54
     570.       8.     541.      21.       8.     152.      35.      11.       4.   621.34
      .16     1.00     3.56      .62      070     .050     .070     .049   613.74     0.00
  .001572     100.     100.     100.        2        0        0     0.00    84.00    84.00
```

E25

CITY OF MIDLAND, MICHIGAN

STORMWATER MANAGEMENT STUDY

100-YEAR FLOODPLAIN ANALYSIS

FINAL REPORT

Remainder of Report
Filed with Hydrologic Studies

McNAMEE
PORTER & SEELEY
ENGINEERS ARCHITECTS

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APPENDIX E

HEC-2 Computer Output

```
*****************************************************
*  WATER SURFACE PROFILES                           *
*  VERSION OF NOVEMBER 1976                         *
*  UPDATED JULY 1979                                *
*                                                   *
*  RUN DATE  01/12/84  TIME .10.33 54               *
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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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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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*************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
*************************************************


T1      SNAKE CREEK,MIDLAND - USGS DATUM
T2      SNAKE CREEK-MIDLAND STORM WATER STUDY
T3       100 YEAR-SWMS

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

     -1        7         0         0   0.000000      0.00      0.0       0    614.200     0.000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    0.000     0.000    -1.000     0 000     0.000     0.000     0.000     0.000     0 000     0.000

NC      .030       030      .030      .100       300     0 000     0.000     0.000     0.000     0 000
QT     7.000   900.000  1170 000  1300.000  1600.000  1300.000  2300.000   500.000     0.000     0.000

X1  6500.000    12.000   210.000   225.000   570.000   570.000   720.000     0.000     0.000     0.000
X3     0.000     0.000     0.000   150.000     0.000   330.000     0.000     0.000     0.000     0.000
GR   626 400     0 000   625.400    13.000   614.200    53.000   609 200   210.000   605.900   216.000
GR   605 200   219 000   605.900   222.000   606.600   225.000   609.100   230 000   611.900   308.000
GR   621.900   350.000   627 100   435.000     0.000     0.000     0.000     0.000     0.000     0.000
NC      .060      .060       040     0.000     0.000     0.000     0.000     0.000     0.000     0 000

X1  7700 000    11.000   421 000   451.000  1200.000  1200.000  1200.000     0.000     0.000     0 000
X3     0.000     0.000     0 000   350.000     0.000   620.000     0.000     0.000     0.000     0.000
GR   623.600     0 000   623.600   200.000   621 800   319.000   614.900   342.000   611 900   421.000
GR   607 300   427 000   607 200   434.000   607.300   442.000   612.500   451.000   614.400   600 000
GR   613.700   800.000     0.000     0 000     0.000     0 000     0 000     0.000     0 000     0 000
NC     0 000     0 000     0 000      .600       800     0.000     0.000     0.000     0.000     0.000

X1  7750 000    11.000   401 000   417.000   100.000   100.000   100.000     0.000     0.000     0 000
X3    10 000     0 000     0 000   384.000     0 000   620.000     0.000     0.000     0 000     0.000
GR   623 200     0 000   618.500   200.000   616.200   320.000   614 900   386.000   612.600   397.000
GR   607 200   401 000   607.300   409.000   606.900   417 000   612.500   426.000   615.100   500.000
GR   618.100   800.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
SB     0 000     1 600     2 500     0.000    16.000     0.000   106.000     0.000   607.200   607 200

X1  7751.000     0 000     0 000     0.000    26 000    26 000    26 000     0.000     0.000     0 000
X2     0 000     0 000     1 000   613.800   616.100     0 000     0 000     0.000     0.000     0 000
X3     0.000     0 000     0.000   384 000     0.000   620.000     0.000     0.000     0.000     0.000
BT     7 000     0 000   623 200   623.200   200.000   618.500   618.500   320.000   616.200   616.200
BT   401.000   616 200   616 200   417.000   616 100   616 100   500 000   615.100   615.100   800 000
BT   618.100   618.100     0 000     0 000     0 000     0 000     0.000     0.000     0.000     0.000

X1  7800 000    10 000   364 000   396 000   180.000   200.000   200 000     0.000     0.000     0 000
GR   624 200     0 000   620.000   215.000   612 600   364.000   607.300   371.000   607.100   380 000
```

GR	607.300	389.000	613.700	396.000	615.000	495.000	620.000	585.000	624.700	800 000
NC	0.000	0.000	0.000	.200	400	0.000	0.000	0.000	0.000	0.000
X1	8250 000	11.000	470 000	515 000	590.000	590 000	470.000	0 000	0.000	0 000
X3	0 000	0.000	0 000	400.000	0.000	600.000	0.000	0 000	0.000	0 000
GR	623.000	0.000	620.000	230.000	615.000	330.000	610.000	470 000	608.900	485.000
GR	608 700	492.000	608.900	503.000	610.000	515.000	615.000	640.000	620 000	700.000
GR	621 000	1000.000	0 000	0 000	0.000	0 000	0 000	0.000	0.000	0 000
QT	7 000	480 000	640 000	710.000	860 000	710.000	570.000	200 000	0.000	0.000
NC	0 000	0.000	0.000	.100	.300	0 000	0.000	0.000	0.000	0 000
X1	8680.000	12 000	610 000	630.000	430.000	430 000	430 000	0.000	0.000	0 000
X3	0 000	0.000	0.000	565.000	0.000	700 000	0.000	0.000	0.000	0.000
GR	623.500	0.000	621 000	360.000	620 000	490 000	615.000	580.000	613.000	610 000
GR	610 500	615 000	610.300	620.000	610.500	625.000	613.000	630.000	615.000	720.000
GR	620.000	810.000	621.000	1000.000	0.000	0 000	0.000	0.000	0.000	0 000
NC	060	.060	.045	.300	500	0.000	0.000	0.000	0.000	0.000
X1	9450 000	9 000	308.000	337.000	545.000	545 000	545.000	0.000	0.000	0 000
GR	625.700	0 000	623.900	200.000	618.800	308.000	613.100	317.000	612.100	321.000
GR	613 100	325.000	621.100	337.000	624.300	400.000	623.200	600.000	0.000	0 000
NC	0.000	0.000	0.000	.100	.300	0.000	0.000	0.000	0.000	0.000
X1	9500 000	13 000	292.000	308.000	100.000	100.000	100.000	0.000	0.000	0 000
X3	0 000	0.000	0.000	240.000	0.000	320.000	0.000	0.000	0.000	0.000
GR	622.900	0.000	622 000	100 000	621 300	185.000	618 800	287.000	613 000	292 000
GR	613 000	299.500	619.000	299.500	619.000	300.500	613.000	300.500	613.000	308.000
GR	620 700	316.000	620 700	400.000	621.400	600.000	0.000	0.000	0.000	0.000
SB	1 050	1.620	2.980	0.000	16 000	1.000	90.000	0.000	613.000	613.000
X1	9501 000	0.000	0 000	0 000	80.000	80.000	80.000	0.000	0.000	0 000
X2	0 000	0 000	1 000	619 000	620 700	0 000	0.000	0 000	0.000	0.000
X3	0 000	0.000	0.000	240.000	0.000	320 000	0.000	0 000	0.000	0 000
BT	4 000	240.000	621.000	621.000	292 000	620.700	619.000	308.000	620.700	619 000
BT	320 000	620.700	620.700	0.000	0.000	0.000	0.000	0.000	0.000	0 000
QT	7 000	480 000	640 000	710.000	860.000	710.000	390.000	200.000	0.000	0 000
X1	9625 000	9 000	260.000	283.000	150 000	150 000	150.000	0 000	0.000	0.000
X3	0.000	0 000	0.000	70.000	0 000	0 000	0 000	0.000	0.000	0 000
GR	623 300	0 000	619 700	200 000	619.800	260.000	613.900	264.000	612 300	267.000
GR	613 900	271.000	620.000	283.000	622 800	400 000	626.600	600.000	0.000	0 000
NC	0 000	0.000	050	600	800	0 000	0.000	0 000	0.000	0.000
X1	9750 000	11 000	297.800	302.300	150.000	150.000	150 000	0.000	0.000	0 000
X3	0 000	0.000	0 000	110 000	0.000	390.000	0 000	0.000	0.000	0.000
GR	623 400	0.000	624.600	200.000	619 800	293.000	616.600	297.800	614.900	298.500
GR	614 300	300 000	614.900	301 500	616 600	302.300	620.000	316.000	625.700	400.000
GR	626 500	600 000	0 000	0 000	0.000	0 000	0.000	0.000	0.000	0 000
SB	0 000	1 620	2.500	0 000	3 000	0.000	15 900	0.000	613.500	613 500
X1	9751 000	0.000	0 000	0 000	116.000	116.000	116.000	0.000	0 000	0.000
X2	0 000	0.000	1 000	618.800	625.100	0.000	0 000	0.000	0.000	0 000
X3	0 000	0 000	0.000	110.000	0.000	390.000	0.000	0.000	0.000	0.000

BT	7 000	110.000	624.000	624.000	297 800	625.100	616.600	298.500	625.100	618.200
BT	300 000	625 100	618.800	301 500	625.100	618.200	302.300	625.600	616.600	390.000
BT	625.700	625 700	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	9800 000	9.000	289 000	324.000	100.000	100.000	100.000	0 000	0.000	0.000
X3	0 000	0.000	0 000	50.000	0 000	400.000	0.000	0.000	0.000	0.000
GR	624.400	0.000	624.400	200.000	621.500	289.000	614.600	306.000	614.100	308 000
GR	614.600	310.000	618.700	324.000	623.600	400 000	625.500	600.000	0.000	0 000
NC	060	.060	.045	.100	.300	0.000	0.000	0 000	0.000	0.000
X1	10700 000	11 000	487.000	517.000	868.000	868.000	735.000	0.000	0.000	0 000
X3	0 000	0 000	0 000	60.000	0 000	0.000	0 000	0.000	0.000	0 000
GR	627 000	0.000	626.300	200.000	626.400	400.000	623.500	487.000	618.000	492 000
GR	617 000	498 000	618 000	504.000	628.100	517 000	627.600	600.000	626.000	800.000
GR	631 000	1000.000	0.000	0.000	0.000	0 000	0.000	0 000	0.000	0.000
X1	10750 000	15.000	496.200	503.800	150.000	150.000	150.000	0.000	0.000	0 000
X3	0 000	0.000	0 000	400.000	0 000	600.000	0 000	0.000	0.000	0.000
GR	626.600	0.000	627 800	200.000	627 500	400.000	623 500	487.000	620.700	496.200
GR	618 400	497 000	617 200	498.500	616.900	500 000	617 200	501.500	618 400	503.000
GR	620.700	503.800	626 500	519.000	627 100	600 000	630.200	800 000	631.800	1000.000
SB	0 000	2 280	2 500	0.000	6.000	0 000	44 000	0 000	617.100	617.100
ET	0.000	0 000	0.000	0 000	0.000	9.100	0.000	0.000	509.000	600 000
X1	10751 000	0 000	0 000	0.000	85.000	85.000	85 000	0.000	0 000	0.000
X2	0 000	0.000	1 000	624.400	629 800	0 000	0 000	0 000	0.000	0.000
X3	0 000	0.000	0 000	400.000	0 000	600 000	0.000	0.000	0.000	0 000
BT	9 000	0 000	629 700	627.500	496 200	629.800	620.700	497.000	629.800	622.900
BT	498 500	629.800	624.000	500.000	629.800	624.400	501.500	629.800	624.000	503.000
BT	629.800	622 900	503 800	629.800	620.700	1000 000	630.300	627.110	0.000	0 000
QT	7.000	480 000	640.000	710 000	860.000	440.000	490.000	100.000	0.000	0 000
X1	10800 000	11 000	487.000	517.000	310 000	310 000	225.000	0 000	0.000	0 000
X3	0 000	0 000	0.000	330.000	0.000	680 000	0.000	0.000	0.000	0.000
GR	626.600	0.000	627.800	200.000	627 500	400.000	626.100	487.000	618.000	498.000
GR	616.500	503.000	618 000	507 000	626.500	517.000	627.100	600.000	630 200	800.000
GR	631.800	1000.000	0.000	0 000	0.000	0.000	0 000	0.000	0.000	0.000
NC	0 000	0 000	0 000	.100	.300	0.000	0 000	0.000	0.000	0.000
X1	11480 000	0 000	0 000	0.000	630 000	630.000	485.000	0.000	0.000	0.000
X3	0 000	0.000	0.000	230.000	0.000	800.000	0.000	0.000	0 000	0 000
NC	040	.040	040	0.000	0.000	0.000	0.000	0.000	0.000	0 000
X1	12450 000	10 000	340.000	365.000	910.000	910 000	850.000	0.000	0.000	0.000
X3	0 000	0 000	0 000	150.000	0 000	650.000	0.000	0.000	0.000	0 000
GR	628 800	0 000	628.000	250.000	627 900	340.000	621.000	354.000	620.400	356 000
GR	621 000	358 000	627.000	365.000	628 200	450.000	628.800	650.000	631.800	750.000
NC	0 000	0.000	0 000	.100	300	0.000	0 000	0.000	0.000	0.000
X1	12500 000	17.000	348 000	360.000	50.000	50 000	50.000	0.000	0 000	0.000
X3	0.000	0 000	0 000	150.000	0.000	650.000	0.000	0.000	0.000	0 000
GR	627 500	0 000	626 800	250.000	626.500	348.000	621.500	348.000	619.800	349.000
GR	619 500	350 000	619.800	351 000	621 500	352.000	621 500	356.000	619.800	357 000

GR	619.500	358.000	619 800	359.000	621.500	360.000	626.500	360 000	626.800	450.000
GR	627.900	650.000	630.800	750.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	12501 000	0 000	0 000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	0.000	0 000	0.000	150.000	0.000	650 000	0 000	0 000	0.000	0.000
BT	13 000	0.000	627.500	627.500	348.000	626.500	621.500	349 000	626.500	623.250
BT	350.000	636 500	623.500	351.000	626.500	623.250	352.000	626.500	621.500	356 000
BT	626 500	621.500	357 000	626.500	623 250	358 000	626.500	623 500	359.000	626.500
BT	623.250	360.000	626.500	621.500	450.000	626.800	626.800	750.000	630.800	630.800
X1	12502.000	0.000	0.000	0.000	98 000	98.000	98 000	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	0 000	0 000	0 000	150.000	0.000	650.000	0.000	0 000	0.000	0.000
X1	12503.000	0.000	0 000	0.000	1.000	1 000	1.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	150.000	0 000	650.000	0.000	0 000	0.000	0 000
QT	7.000	450.000	600.000	660.000	800.000	660.000	400.000	85.000	0.000	0.000
X1	12550 000	10 000	340.000	369.000	50 000	50.000	50.000	0.000	0.000	0.000
X3	0.000	0.000	0 000	180 000	0.000	650 000	0 000	0 000	0.000	0 000
GR	628 300	0 000	628 600	250.000	628.100	340.000	621.000	355.000	619.500	360 000
GR	621.000	365 000	628.700	369.000	627 700	450.000	629 000	650.000	631 200	750.000
NC	0.000	0.000	0.000	100	300	0.000	0.000	0 000	0 000	0 000
X1	13300.000	7.000	263.000	303 000	700 000	700 000	700 000	0.000	0 000	0.000
X3	0.000	0.000	0.000	120.000	0.000	0 000	0 000	0 000	0.000	0.000
GR	627 200	0 000	625 000	263.000	622.000	275.000	621.200	280.000	622.000	285.000
GR	625.000	303 000	630.000	310.000	0 000	0 000	0.000	0.000	0 000	0.000
NC	.050	.050	.040	0.000	0.000	0.000	0 000	0.000	0.000	0.000
QT	7.000	450 000	600 000	660.000	800 000	660.000	300.000	85 000	0.000	0.000
X1	14075 000	8 000	211 000	257.000	620.000	620 000	620.000	0.000	0.000	0.000
GR	633.000	0 000	629 900	211.000	623 100	226.000	622.800	232.000	623.100	236.000
GR	631 600	257.000	634.600	290.000	633.300	530.000	0 000	0.000	0 000	0 000
NC	0 000	0 000	0 000	.300	.500	0.000	0.000	0.000	0.000	0.000
X1	14125.000	11.000	227.000	233 000	50.000	50.000	50.000	0 000	0.000	0.000
X3	0.000	0.000	0.000	130.000	0 000	330.000	0 000	0.000	0.000	0 000
GR	633.700	0 000	630.900	130.000	629.900	209.000	625.300	227.000	623.000	228.000
GR	622 300	230.000	623 000	232 000	625.300	233.000	631.600	259.000	632.900	330 000
GR	634 800	530.000	0.000	0.000	0 000	0.000	0.000	0.000	0.000	0.000
SB	0 000	2.270	2.500	0.000	6 000	0.000	28.300	0.000	622.300	622 300
X1	14126 000	0.000	0.000	0.000	346.000	346.000	346.000	0.000	0.000	0 000
X2	0 000	0 000	1 000	628 300	632.500	0 000	0.000	0.000	0.000	0.000
X3	0 000	0 000	0.000	175.000	0.000	255.000	0.000	0.000	0.000	0 000
BT	8.000	0 000	633.700	633.700	227.000	632 500	625.300	228.000	632.500	627 500
BT	230 000	632 500	628.300	232.000	632.500	627 500	233.000	632.500	625 300	330.000
BT	632 900	632.900	530 000	634.800	634 800	0.000	0.000	0.000	0.000	0 000
X1	14250 000	9 000	200 000	241.000	100 000	100 000	100.000	0.000	0.000	0.000
X3	0 000	0.000	0 000	70 000	0 000	280 000	0.000	0.000	0.000	0.000

GR	632.400	0.000	631.100	200.000	623.200	214 000	622.400	217.000	623.200	220 000
GR	633.400	241.000	637.900	260.000	638.000	330.000	637.900	530.000	0.000	0 000
QT	7 000	450.000	600.000	660.000	800.000	150 000	150.000	85.000	0.000	0 000
NC	.050	050	.045	.100	.300	0 000	0.000	0.000	0.000	0.000
X1	15500.000	10 000	400.000	422.000	1180 000	1180.000	950.000	0.000	0.000	0.000
GR	631 900	0.000	632.600	130.000	631.100	330.000	628.400	400 000	626.300	405.000
GR	625.400	410.000	626.300	416.000	629.400	422.000	635.200	660.000	647.600	750.000
X1	16450 000	10 000	363.000	404.000	945 000	945.000	945.000	0.000	0.000	0.000
GR	636.000	0 000	634.400	363.000	629.000	371 000	628.700	377.000	629.000	383.000
GR	634.700	404.000	638.700	500.000	647.000	600.000	642.000	700.000	643.300	800.000
NC	0.000	0.000	.055	.300	.500	0.000	0.000	0.000	0.000	0 000
X1	16500 000	14 000	397 500	402 500	100 000	100.000	100.000	0.000	0.000	0.000
X3	0.000	0 000	0 000	355.000	0.000	430 000	0.000	0 000	0.000	0 000
GR	637.400	0.000	635.500	300.000	634.400	386 000	631.100	397 500	629.600	398.000
GR	628 800	399 000	628.600	400.000	628.800	401.000	629.600	402.000	631.100	402.500
GR	634 700	427 000	638 500	500 000	642.400	700.000	642 200	800.000	0.000	0 000
SB	0.000	1 390	2 500	0.000	5 000	0 000	19 600	0 000	628.600	628.600
X1	16501.000	0 000	0.000	0.000	60.000	60.000	60.000	0.000	0.000	0 000
X2	0 000	0.000	1.000	633 600	636 300	0.000	0.000	0 000	0.000	0 000
X3	0 000	0.000	0 000	350 000	0.000	435.000	0.000	0 000	0.000	0.000
BT	10 000	0.000	637 400	637 400	397.500	636.300	631.100	398.000	636 300	632.600
BT	399 000	636 300	633 300	400.000	636.300	633 600	401.000	636.300	633.300	402.000
BT	636 300	632.600	402.500	636.300	631.100	500.000	638.500	638.500	800.000	642 200
BT	642.200	0.000	0.000	0.000	0.000	0.000	0 000	0.000	0.000	0 000
X1	16550 000	11 000	390.000	419.000	100.000	100 000	100.000	0.000	0 000	0 000
X3	0 000	0.000	0 000	350.000	0.000	450.000	0 000	0.000	0.000	0.000
GR	636 900	0.000	635.800	300.000	636.000	390.000	629 000	397.000	628.600	399.000
GR	629.000	402 000	637.100	419.000	640.100	500.000	641.100	600.000	644.600	700.000
GR	643.300	800 000	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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*PROF 1

CCHV=      100 CEHV=     .300
*SECNO 6500 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


3470 ENCROACHMENT STATIONS=      150 0      330.0  TYPE=      1  TARGET=      180 000
  6500 00      9 00    614 20      0 00    614 20    614 39       .19      0.00      0 00    609.20
    2300       749.      542      1010       243       116.      331.        0.        0.     606.60
     0 00      3 09      4 68      3 05      .030      .030      .030     0 000    605.20    150.00
   000644      570       720       570          0         0         0      0.00    167.66    317 66


*SECNO 7700 000
3280 CROSS SECTION    7700.00 EXTENDED       1.73 FEET


3470 ENCROACHMENT STATIONS=      350 0      620.0  TYPE=      1  TARGET=      270 000
  7700 00      8.23    615.43      0.00      0.00    615.84        41      1.39       .07    611.90
    2300       329.     1351.      620.       155       207.      316        19.        6     612.50
      .07      2.12      6.51      1 96      .060      .040      .060      .040    607.20    350.00
   002643     1200.     1200.     1200.         3         0         0      0 00    270.00    620.00


CCHV=      600 CEHV=      800
*SECNO 7750 000

3301 HV CHANGED MORE THAN HVINS


3470 ENCROACHMENT STATIONS=      384 0      620.0  TYPE=      1  TARGET=      236.000
  7750 00      8.71    615 61    615.47      0.00    616.94      1.33       .36        73    607.20
    2300       149      1507.      644        45.       135.      199.       20.        7.     606.90
       07      3.34     11.17      3.24       060       040      .060       040    606.90    384.00
  .005279      100.      100       100.         2         8         0      0.00    166.27    550.27


SPECIAL BRIDGE

SB  XK         XKOR       COFQ       RDLEN      BWC        BWP        BAREA      SS         ELCHU      ELCHD
     0.00       1 60       2.50       0.00      16.00       0 00     106.00      0.00      607.20     607.20

*SECNO 7751 000

3301 HV CHANGED MORE THAN HVINS

PRESSURE AND WEIR FLOW


 EGPRS       EGLWC       H3        QWEIR       QPR        BAREA    TRAPEZOID       ELLC      ELTRD
                                                                      AREA
   627.31     616.97      0.00      1430.       873.       106        106.       613.80     616.10
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3470 ENCROACHMENT STATIONS=      384.0      620 0  TYPE=      1  TARGET=      236.000
  7751 00      9.84    616 74      0 00      0 00    617.30       55       .36      0 00    607 20
    2300.      165.     1214.      921        64.      153.      407.       20.        7.    606.90
       08      2.58      7 93      2 26      .060      .040      060       040    606.90    384.00
   002244       26.       26.       26.         3         0        6      0.00    236.00    620.00

*SECNO 7800 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

  7800.00     10.47    617 57      0 00      0 00    617.78       .21       .28        21    612.60
    2300.      355.     1350.      596       249       290.      378.       24.        8.    613.70
      .09      1 43      4 66      1 57      .060      .040      .060      .040    607 10    263.91
  .000987      180       200.      200.         2         0         0      0 00    277 37    541 28

CCHV=      200 CEHV=      .400
*SECNO 8250 000

3470 ENCROACHMENT STATIONS=      400.0      600 0  TYPE=      1  TARGET=      200.000
  8250.00      9 29    617 99      0 00      0.00    618 05       .06       .23       .03    610.00
    2300       625.      988.      687.      472.      396.      535.       39.       11.    610.00
       17      1 33      2.49      1.28      .060      .040      .060      .039    608 70    400.00
   000249      590.      470       590         2         0         0      0 00    200.00    600.00

CCHV=     .100 CEHV=       300
*SECNO 8680.000

3470 ENCROACHMENT STATIONS=      565 0      700.0  TYPE=      1  TARGET=      135.000
  8680 00      7.83    618 13      0.00      0.00    618 15       02       .09       .00    613.00
     570       116.      222.      233.      164.      141.      304.       49.       13.    613.00
       29       .70      1 57       .76      .060       040      .060      .039    610 30    565.00
  .000143      430.      430       430         2         0         0      0 00    135.00    700.00

CCHV=     .300 CEHV=       500
*SECNO 9450 000

3301 HV CHANGED MORE THAN HVINS

  9450.00      5 89    617 99      0 00      0.00    618 78       79        25       .38    618.80
     570         0      570.        0.        0.        80        0        53       14.    621.10
       31      0.00      7 12      0 00       060      .045      060      .040    612 10    309.27
  .010494      545       545       545         2         0         0      0.00     23.07    332.34

CCHV=      100 CEHV=      .300
*SECNO 9500 000

3470 ENCROACHMENT STATIONS=      240 0      320.0  TYPE=      1  TARGET=       80 000
  9500 00      6.16    619.16      0 00      0.00    619.50       .34       .68       .04    613 00
     570        47      466.       57        19.        93       20        53.       14     613.00
       31      2 50      5.03      2.89       060       045      .060      .040    613.00    272.33
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   004715      100.      100.      100          3         0         0      0.00     42.07    314.40


SPECIAL BRIDGE

SB  XK          XKOR       COFQ       RDLEN      BWC        BWP        BAREA      SS         ELCHU      ELCHD
     1.05        1.62       2 98       0 00      16.00       1.00      90.00       0.00     613.00     613 00

*SECNO 9501 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


PRESSURE FLOW


 EGPRS       EGLWC        H3        QWEIR       QPR        BAREA    TRAPEZOID       ELLC      ELTRD
                                                                       AREA
   620 17     619.54        05          0        570.        90         90.       619.00     620.70


3470 ENCROACHMENT STATIONS=      240 0      320 0  TYPE=      1  TARGET=       80.000
  9501.00      6 95    619.95      0 00      0.00    620.17        22        67      0.00    613.00
     570.        74       437        60.       47.      105.        25        53.       14.     613 00
       32      1 56      4.15      2.37      .060      .045       060       040    613.00    240 09
  .002704       80.       80        80          2         0         0      0.00     75.13    315 22


*SECND 9625 000

3470 ENCROACHMENT STATIONS=       70.0      600.0  TYPE=      1  TARGET=      -70.000
  9625 00      8 05    620 35      0 00      0 00    620 51       .16        34        01    619 80
     390.       33.      356.        1.       48.      106.        3.        54.       14.     620.00
      .33        69      3.37        33      .060      .045      .060      .041    612.30    163.75
   001802      150.      150.       150          2         0         0      0.00    133.98    297.73


CCHV=     .600 CEHV=     .800
*SECND 9750 000

3470 ENCROACHMENT STATIONS=      110.0      390.0  TYPE=      1  TARGET=      280 000
  9750.00      6.51    620.81      0 00      0.00    621.24       .43       .51        21    616.60
     390        63.      177.       150        22.       26.       39.        54       14.     616.60
       34      2 82      6.73      3.83       060       050      .060      .041    614.30    273.42
   008736      150.      150.       150.         2         0         0      0.00     54.52    327.94


SPECIAL BRIDGE

SB  XK          XKOR       COFQ       RDLEN      BWC        BWP        BAREA      SS         ELCHU      ELCHD
     0 00        1 62       2.50       0 00       3.00       0.00      15.90       0 00     613 50     613.50

*SECND 9751 000
PRESSURE AND WEIR FLOW
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```
 EGPRS      EGLWC       H3       QWEIR      QPR       BAREA   TRAPEZOID      ELLC     ELTRD
                                                                 AREA
   635.94    621.05     0.00      185.      207.        16       16.      618.80    625 10


3470 ENCROACHMENT STATIONS=      110 0     390.0  TYPE=      1  TARGET=      280.000
  9751 00    10.78   625.08     0 00     0 00   625.08       01      3.85     0 00   616 60
     390.     174       47      169      369.      45      283.       55       15.    616.60
      .39       47     1.04       60     .060     .050     .060     .041   614.30   110 00
   000100     116.     116      116         0        0        7     0.00   280 00   390 00


*SECNO 9800 000

3470 ENCROACHMENT STATIONS=       50.0     400 0  TYPE=      1  TARGET=      350 000
  9800 00    10.98   625 08     0.00     0.00   625 09      .01      .01      .00   621.50
     390       63      209      118.      293      281      299.       57       16    618.70
      45      .22      .74      .39     .060     .050      060     .041   614 10    50.00
   000042     100     100.      100         2        0        0     0 00   350.00   400.00


CCHV=     .100 CEHV=      300
*SECNO 10700 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    IOC       ICONT     CORAR     TOPWID     ENDST


3470 ENCROACHMENT STATIONS=       60.0    1000.0  TYPE=      1  TARGET=      -60.000
 10700.00     8.11   625 11     0.00     0.00   625.20      .09       08       03   623.50
     390       23      367.       0.       39      146.       0.      67.      20.    628 10
      53      .59     2.52     0 00     .060      045     .060     .042   617.00   438.76
  .000748     868.     735      868         2        0        0     0.00    74.39   513.15


*SECNO 10750.000

3470 ENCROACHMENT STATIONS=      400 0     600.0  TYPE=      1  TARGET=      200.000
 10750 00     8 31   625.21     0 00     0.00   625.41      .19       18      .03   620.70
     390      101      239       50.       61.      56.       27      68.      20.    620.70
      55     1 66     4 29     1 88      060     .045     .060     .042   616.90   449.71
   002120     150     150.      150.         2        0        0     0 00    65 92   515.63


SPECIAL BRIDGE

SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     0 00      2.28      2 50      0.00      6 00      0 00     44.00      0.00    617.10    617.10

*SECNO 10751 000
PRESSURE FLOW


 EGPRS      EGLWC       H3       QWEIR      QPR       BAREA   TRAPEZOID      ELLC     ELTRD
                                                                 AREA
   628 00    625 58     0.00        0.      390        44.       44       624.40    629.80
```

```
3470 ENCROACHMENT STATIONS=      400 0      600.0  TYPE=      1  TARGET=      200.000
 10751 00     11.08    627.98     0.00      0 00    628.00       02      2.59      0.00    620.70
     390.      184.      116.      90.       271       77.      163.       68.       20.     620 70
      .57       .68      1 51       55      .060      045       060      .042    616.90    400.00
   000171       85.       85.      85.         1         0         0      0.00    200 00    600.00

*SECNO 10800.000

3470 ENCROACHMENT STATIONS=      330.0      680 0  TYPE=      1  TARGET=      350.000
 10800 00     11.52    628.02     0.00      0.00    628.06       04       .06       .01    626.10
     490        55.      383.      52.       139      220.      129.       72.       22.     626 50
      .62        40      1.74       40       060      .045      .060      .042    616 50    330.00
   000250       310      225.     310.         2         0         0      0 00    329.43    659 43

CCHV=      100 CEHV=      300
*SECNO 11480.000

3470 ENCROACHMENT STATIONS=      230.0      800.0  TYPE=      1  TARGET=      570.000
 11480 00     11 65    628 15     0 00      0.00    628 18       .03       .12       .00    626.10
     490        71      362.      57.       205.      224.      147.       78.       28.     626.50
      .74        35      1.61       39       060      .045      .060      .042    616.50    230 00
   000211      630.      485      630         0         0         0      0 00    437.30    667 30

*SECNO 12450 000
   SECNO     OEPTH     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

3470 ENCROACHMENT STATIONS=      150.0      650.0  TYPE=      1  TARGET=      500.000
 12450 00      8.04    628.44     0.00      0 00    628.55       11        35        02    627.90
     490        48      363.      80        72       118.       81.       87.       36.     627.00
       83       .66      3 08      .98      .040      .040       040      .041    620.40    150.00
  .001057      910.      850.     910.         2         0         0      0 00    380.06    530.06

CCHV=      100 CEHV=     .300
*SECNO 12500 000

3470 ENCROACHMENT STATIONS=      150 0      650.0  TYPE=      1  TARGET=      500.000
 12500 00      9 07    628.57     0.00      0 00    628.57       01       .01       .01    626.50
     490.      196.       87.     207.       351       96.      416        88.       37.     626.50
      .86        56       .91      .50      .040      .040      .040       041    619.50    150.00
   000105        50       50.      50         2         0         0      0.00    500.00    650.00

*SECNO 12501.000

3370 NORMAL BRIDGE,NRD= 13 MIN ELTRD=  626.50 MAX ELLC=  630.80

3470 ENCROACHMENT STATIONS=      150 0      650 0  TYPE=      1  TARGET=      500.000
 12501 00      9.07    628 57     0 00      0 00    628.57       .01       .00       .00    626.50
     490       256.       23.     211       351        43      416.       88        37      626.50
```

```
     .86        73        54        51      .040       040      .040       041    619.50    150.00
  .000179        1.         1         1.         0         0         0    -52 71    500.00    650.00

*SECNO 12502 000

3370 NORMAL BRIDGE,NRD= 13 MIN ELTRD=  626.50 MAX ELLC=  630.80

3470 ENCROACHMENT STATIONS=      150.0      650.0  TYPE=      1  TARGET=      500.000
 12502 00      9 09    628 59     0.00      0.00    628 59      .01        02       .00    626.50
     490.       256        23.      212       354        43.     420.        90       38.    626.50
      .90        .72       .53       .50      .040       040      .040      .041    619.50    150.00
  .000175        98.       98.       98.         0         0         0    -52 73    500.00    650.00

*SECNO 12503.000

3470 ENCROACHMENT STATIONS=      150.0      650 0  TYPE=      1  TARGET=      500.000
 12503 00      9 09    628 59     0.00      0.00    628 59      .01        00       .00    626.50
     490.       196        86.      208.      354.       96.     421.        90       38     626.50
       90        55        89        49       040       040      040       041    619.50    150.00
   000102         1         1.         1         0         0         0      0 00    500.00    650 00

*SECNO 12550 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      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST


3470 ENCROACHMENT STATIONS=      180.0      650 0  TYPE=      1  TARGET=      470.000
 12550 00      9 05    628 55     0.00      0 00    628 62      .07        01        02    628 10
     400         6.      354.       40.       19.       158       85.       90.       38.    628.70
       91        .30      2.25       47       040      .040      .040      .041    619.50    180.00
   000501        50.       50.       50         2         0         0      0.00    338 13    580 80

CCHV=     .100 CEHV=     .300
*SECNO 13300.000

3470 ENCROACHMENT STATIONS=      120.0      310.0  TYPE=      1  TARGET=     -120 000
 13300 00      7 49    628.69     0.00      0.00    628 70      .01       .07       .01    625.00
     400.       225       172.        3.      442       227.      10.       98.       42.    625.00
     1 22        51        .76       .32       040      .040      .040      .041    621.20    120.00
  .000042       700       700.      700         2         0         0      0.00    188.17    308.17

*SECNO 14075 000
 14075.00      5 90    628.70     0 00      0.00    628.78      .08       .06        02    629.90
     300         0.      300.        0         0.      131.       0.      104.       44.    631.60
     1 30      0.00      2 30     0.00      .050       040      .050      .041    622.80    213.65
   000748       620       620.      620         2         0         0      0 00     36 17    249.83

CCHV=     .300 CEHV=     .500
```

```
*SECNO 14125 000

3470 ENCROACHMENT STATIONS=      130.0      330.0  TYPE=      1  TARGET=      200.000
 14125.00      6 35    628.65     0 00      0.00    628 98       33       .07       .12    625.30
     300        57.      182.       61       22.       33.      23.      104.       44.     625 30
     1 30      2 61      5 53     2 62      .050      .040     .050       041    622 30    213.91
   004064       50.       50       50         2         0        0      0.00     32.90    246 81


SPECIAL BRIDGE

SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     0 00      2 27      2.50      0 00      6.00      0.00      28.30     0.00     622.30    622.30

*SECNO 14126.000
PRESSURE AND WEIR FLOW


 EGPRS      EGLWC      H3        QWEIR      QPR       BAREA    TRAPEZOID      ELLC      ELTRD
                                                                  AREA
   632.61    628.98     0.00        0.       298        28.       36.      628.30    632.50


3470 ENCROACHMENT STATIONS=      175.0      255.0  TYPE=      1  TARGET=       80 000
 14126 00     10 24    632.54     0.00      0.00    632.55      .02      3 58      0.00    625.30
     300       134.       79       87.      172       56.     101.      105        44.     625.30
     1.40        78      1.41      .86      .050       040     .050       041    622.30    175.00
   000129      346.      346      346         1         0        0      0.00     80.00    255.00


*SECNO 14250 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


3470 ENCROACHMENT STATIONS=       70.0      280.0  TYPE=      1  TARGET=      210.000
 14250.00     10 15    632.55     0 00      0 00    632.57      .02        01       .00    631.10
     300        42       258.       0       133       224.       0      106.       45.     633.40
     1.43       .31      1.15     0 00      .050       040     050      .041    622.40     70 00
   000109      100       100      100         2         0        0      0 00    169 25    239.25


CCHV=     .100 CEHV=      300
*SECNO 15500 000
3280 CROSS SECTION  15500.00 EXTENDED       .71 FEET


 15500 00      7.21    632.61     0.00      0.00    632.61      .00       .05       .00    628.40
     150        64.       52.       34.      400.      129.     212.      120.       54.     629.40
     2.61        16        40      .16      .050       045     .050      .041    625.40      0.00
  .000015      1180      950.     1180.         2         0        0      0 00    553.86    553 86


*SECNO 16450.000
 16450.00      3 92    632.62     0 00      0 00    632.68      .06        05       .02    634.40
     150         0       150.       0        0.       79       0.      129.       61     634.70
```

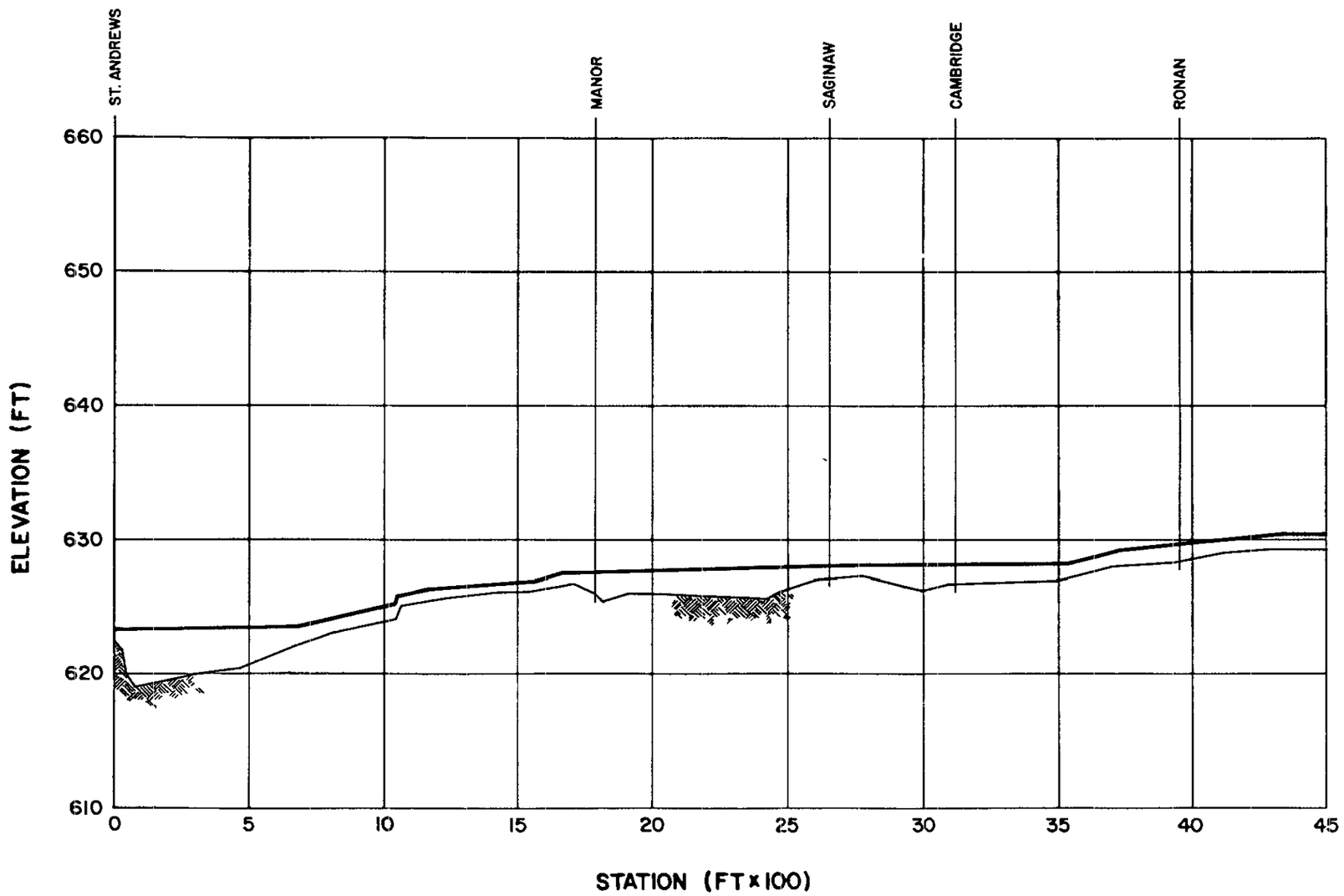

FIGURE NO. 5
GEORGE STREET BASIN-ASHMAN PROFILE

LEGEND:

- (2) Cross Section
- Centerline Ground Profile
- 100 Year Water Surface Profile

MIDLAND, MICHIGAN

STORMWATER MANAGEMENT STUDY

McNAMEE PORTER & SEELEY
ENGINEERS ARCHITECTS
ANN ARBOR, MICHIGAN

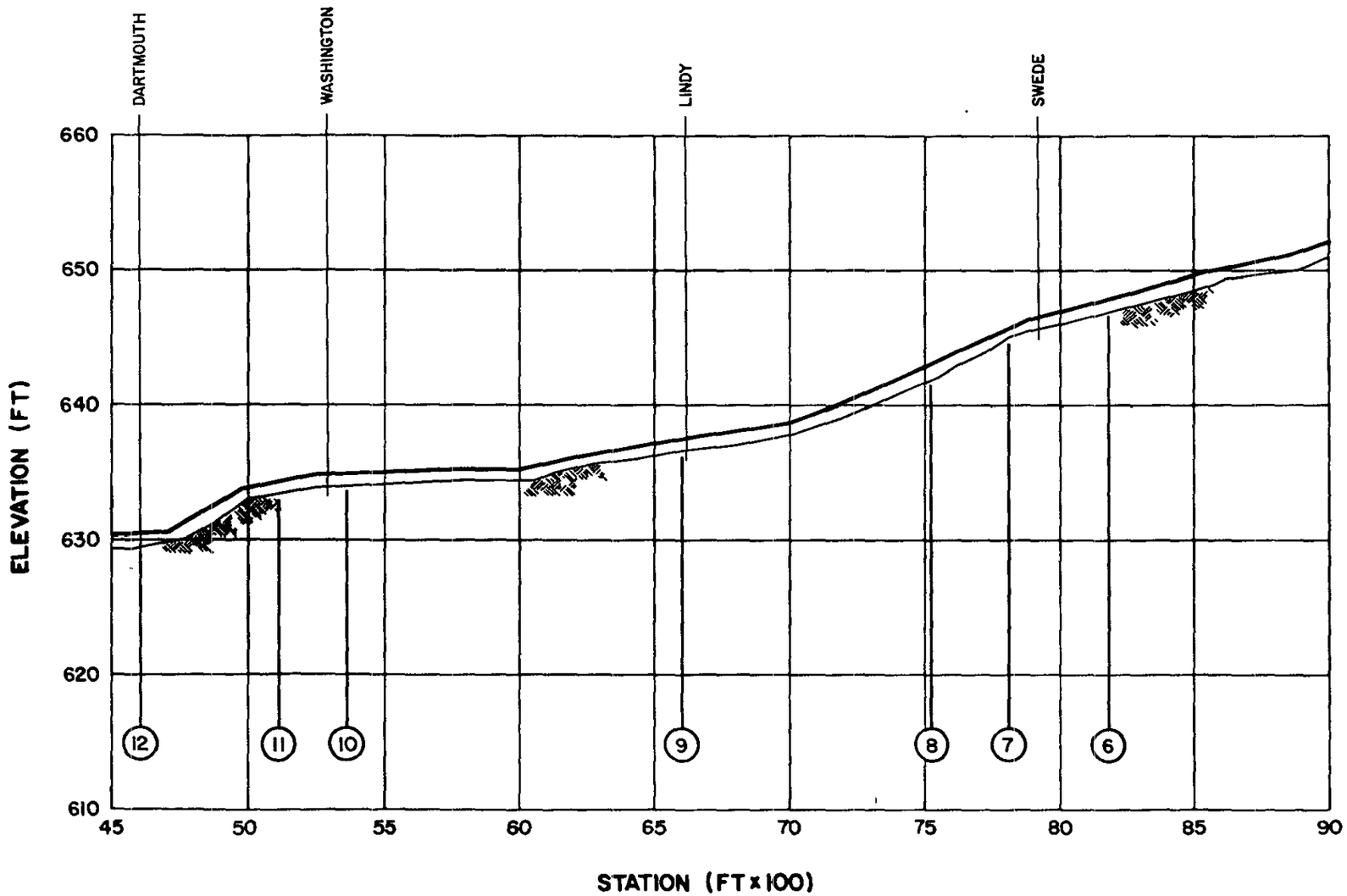

FIGURE NO. 6
GEORGE STREET BASIN-ASHMAN PROFILE

LEGEND:

- (2) Cross Section
- Centerline Ground Profile
- 100 Year Water Surface Profile

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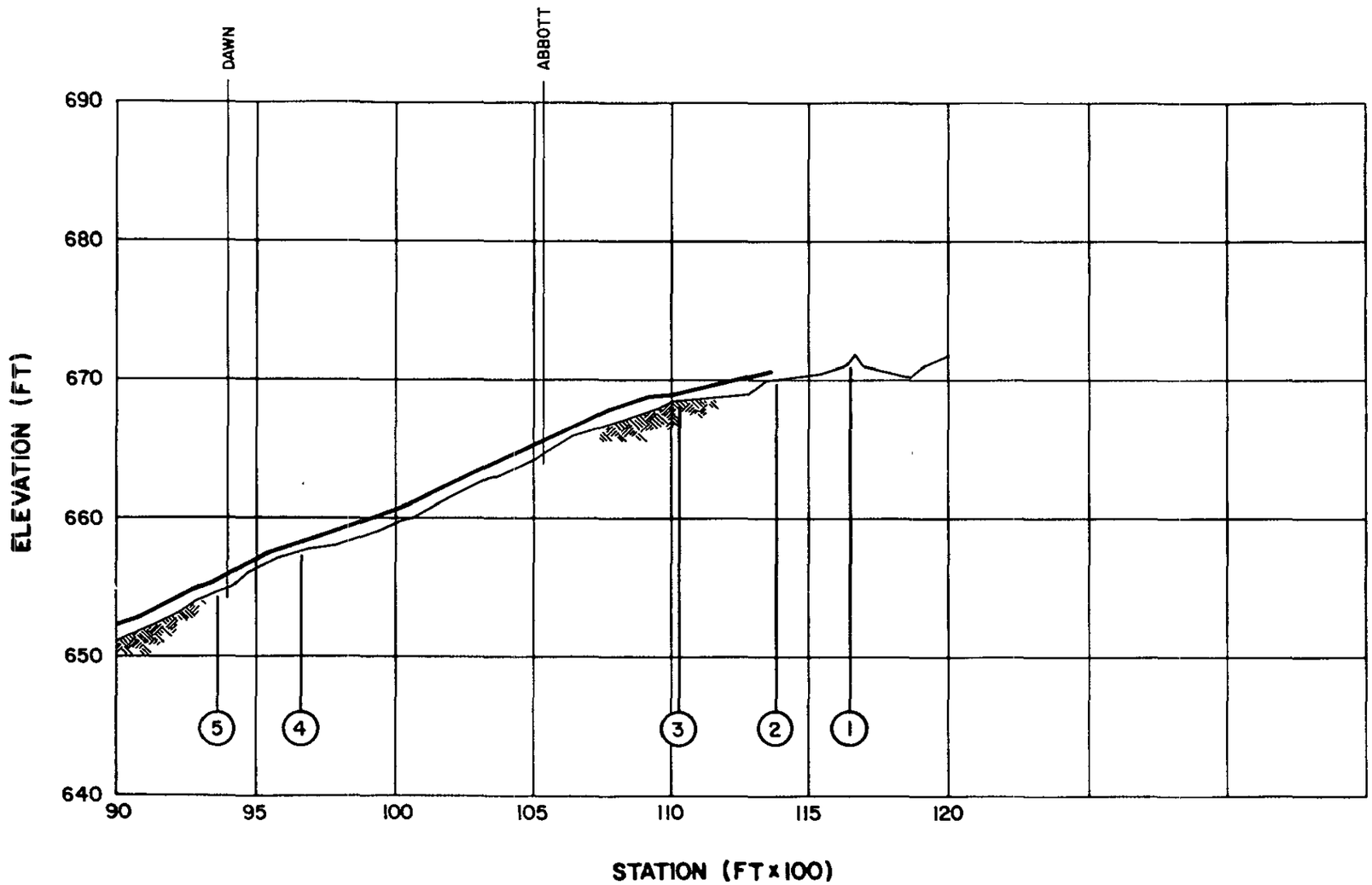

FIGURE NO. 7
GEORGE STREET BASIN-ASHMAN PROFILE

LEGEND:

- (2) Cross Section
- Centerline Ground Profile
- 100 Year Water Surface Profile

MIDLAND, MICHIGAN

STORMWATER MANAGEMENT STUDY

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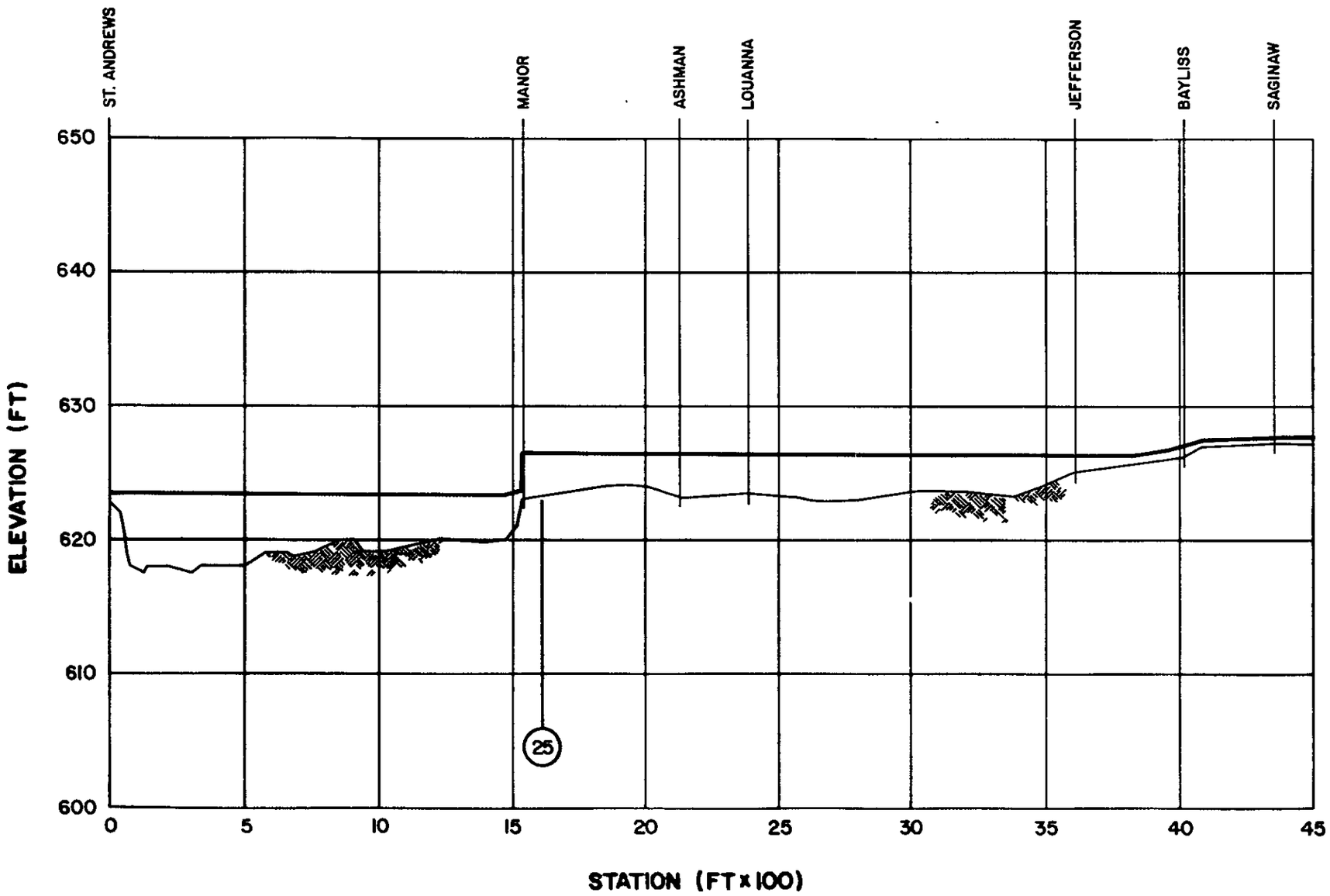

FIGURE NO. 8
GEORGE STREET BASIN-EASTLAWN PROFILE

LEGEND:

- (2) Cross Section
- Centerline Ground Profile
- 100 Year Water Surface Profile

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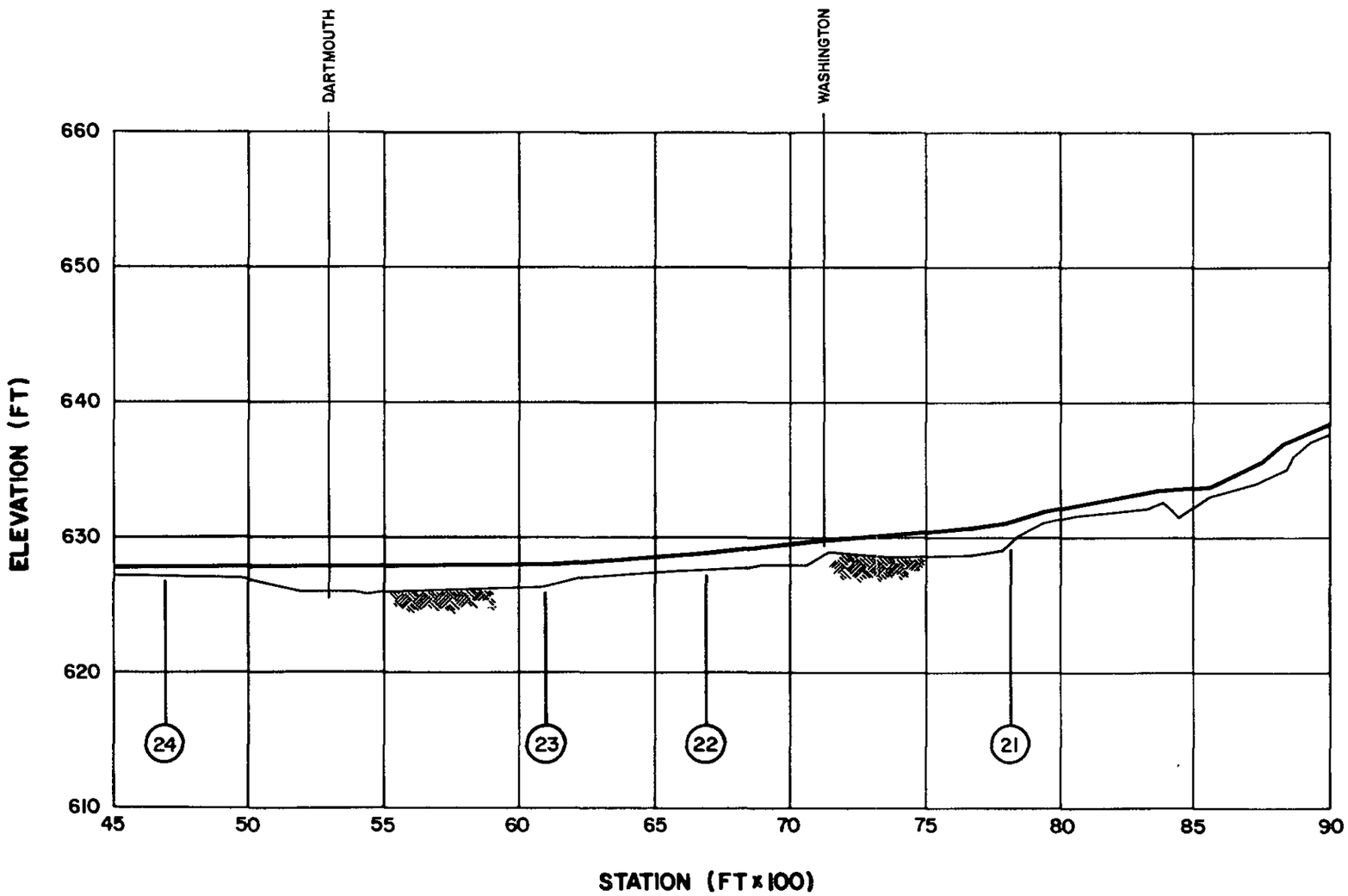

FIGURE NO. 9
GEORGE STREET BASIN-EASTLAWN PROFILE

LEGEND:

- (2) Cross Section
- Centerline Ground Profile
- 100 Year Water Surface Profile

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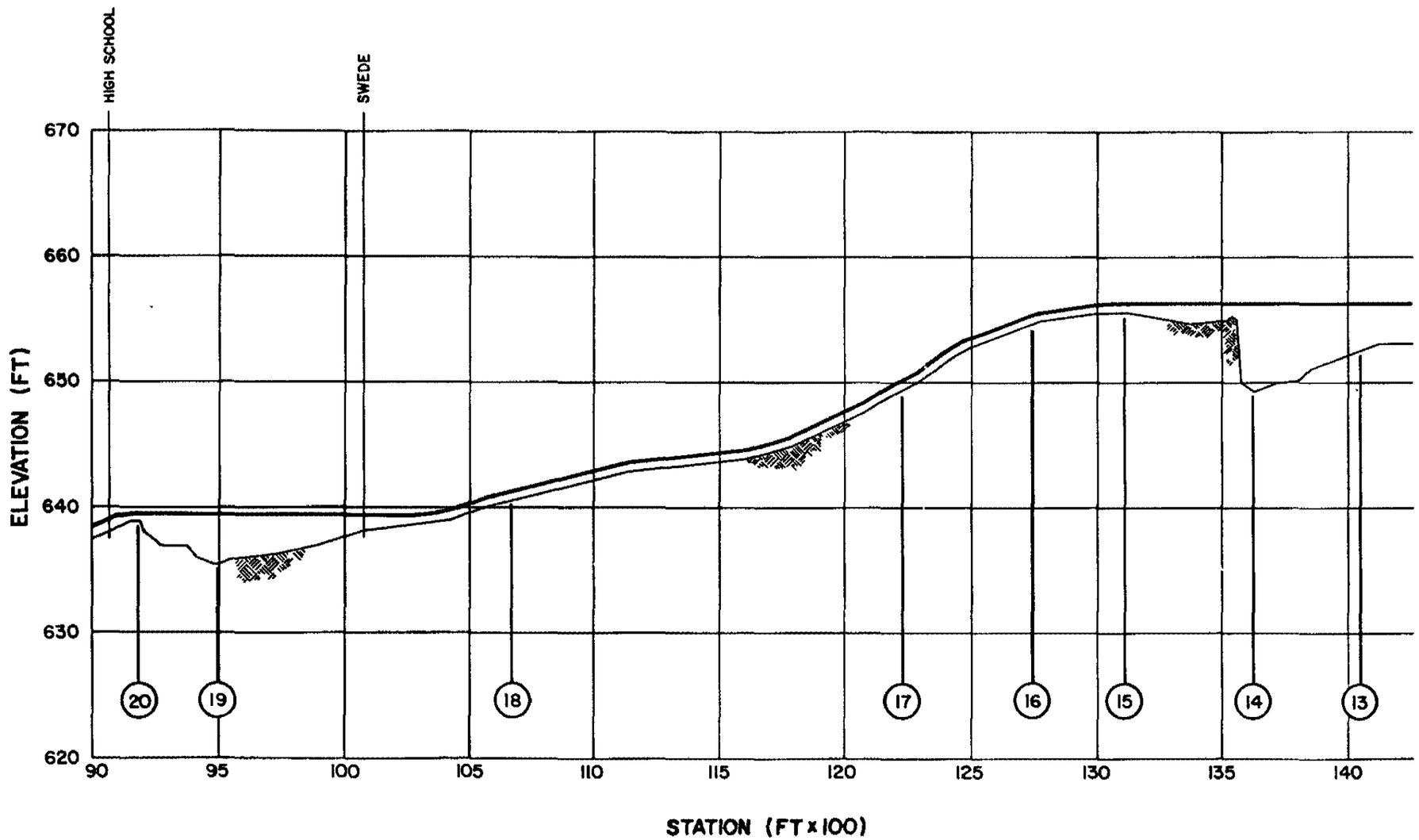
FIGURE NO. 10
GEORGE STREET BASIN-EASTLAWN PROFILE



LEGEND:

- (2) Cross Section
- Centerline Ground Profile
- 100 Year Water Surface Profile

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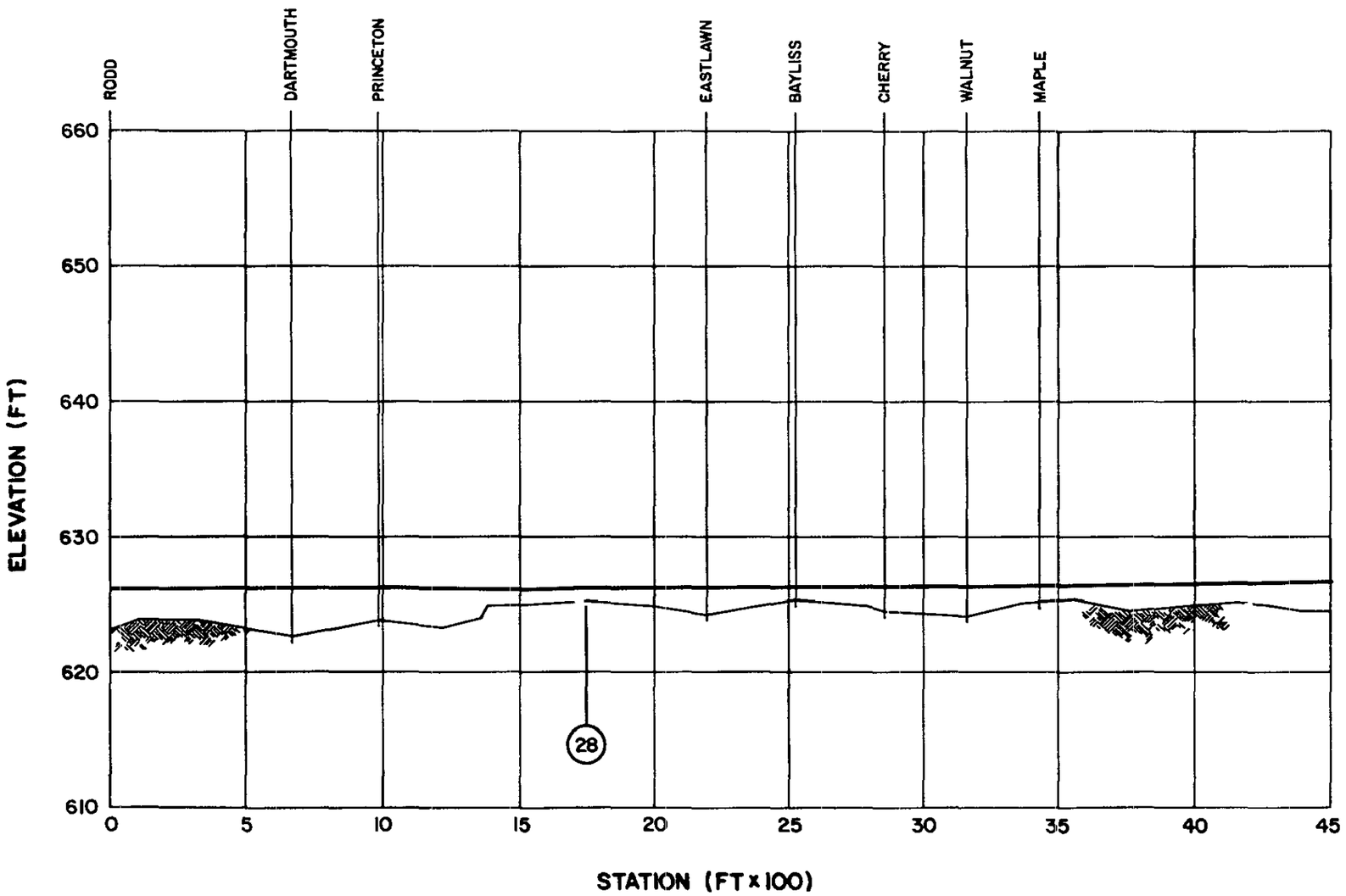

FIGURE NO.11
GEORGE STREET BASIN-PATRICK PROFILE

LEGEND:

- (2) Cross Section
- Centerline Ground Profile
- 100 Year Water Surface Profile

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STORMWATER MANAGEMENT STUDY

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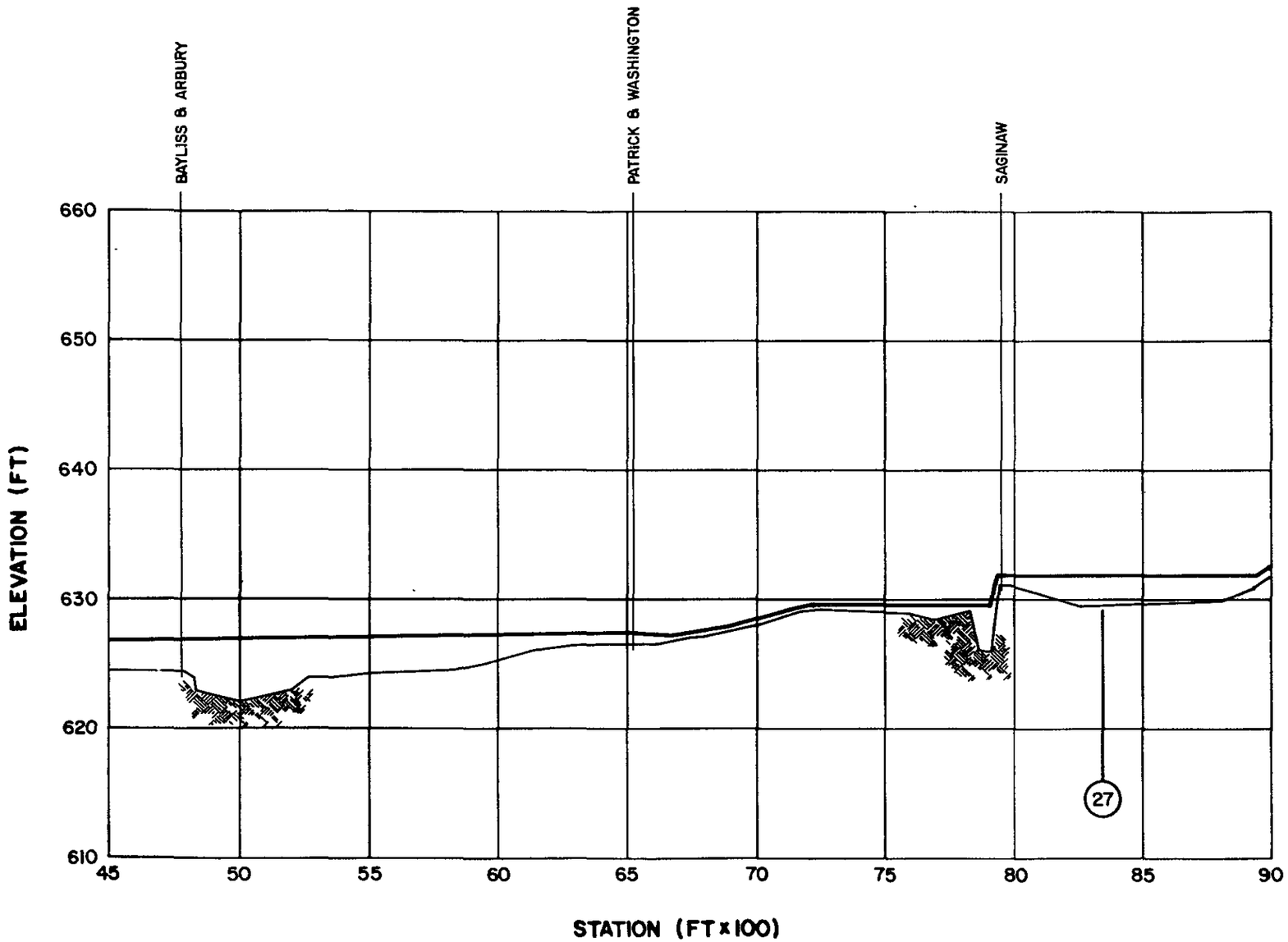

FIGURE NO. 12
GEORGE STREET BASIN-PATRICK PROFILE

LEGEND:

- (2) Cross Section
- Centerline Ground Profile
- 100 Year Water Surface Profile

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STORMWATER MANAGEMENT STUDY

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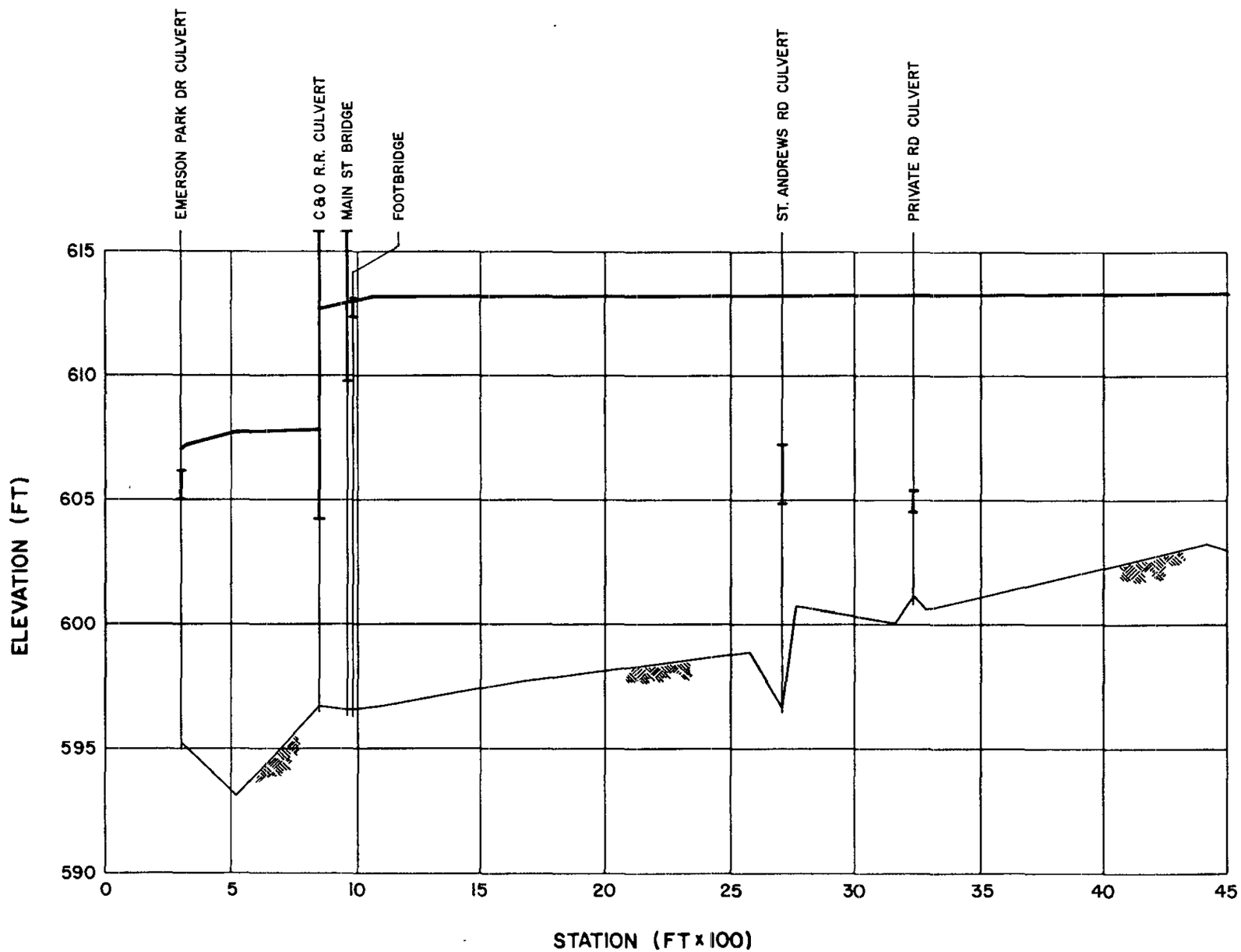

NOTE: Elevations based on city datum (to obtain U.S.G.S. subtract 1.32 ft.)

FIGURE NO. 14
SNAKE CREEK BASIN - SNAKE CREEK PROFILE

LEGEND:

- (2) Cross Section
- Centerline Ground Profile
- 100 Year Water Surface Profile

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STORMWATER MANAGEMENT STUDY

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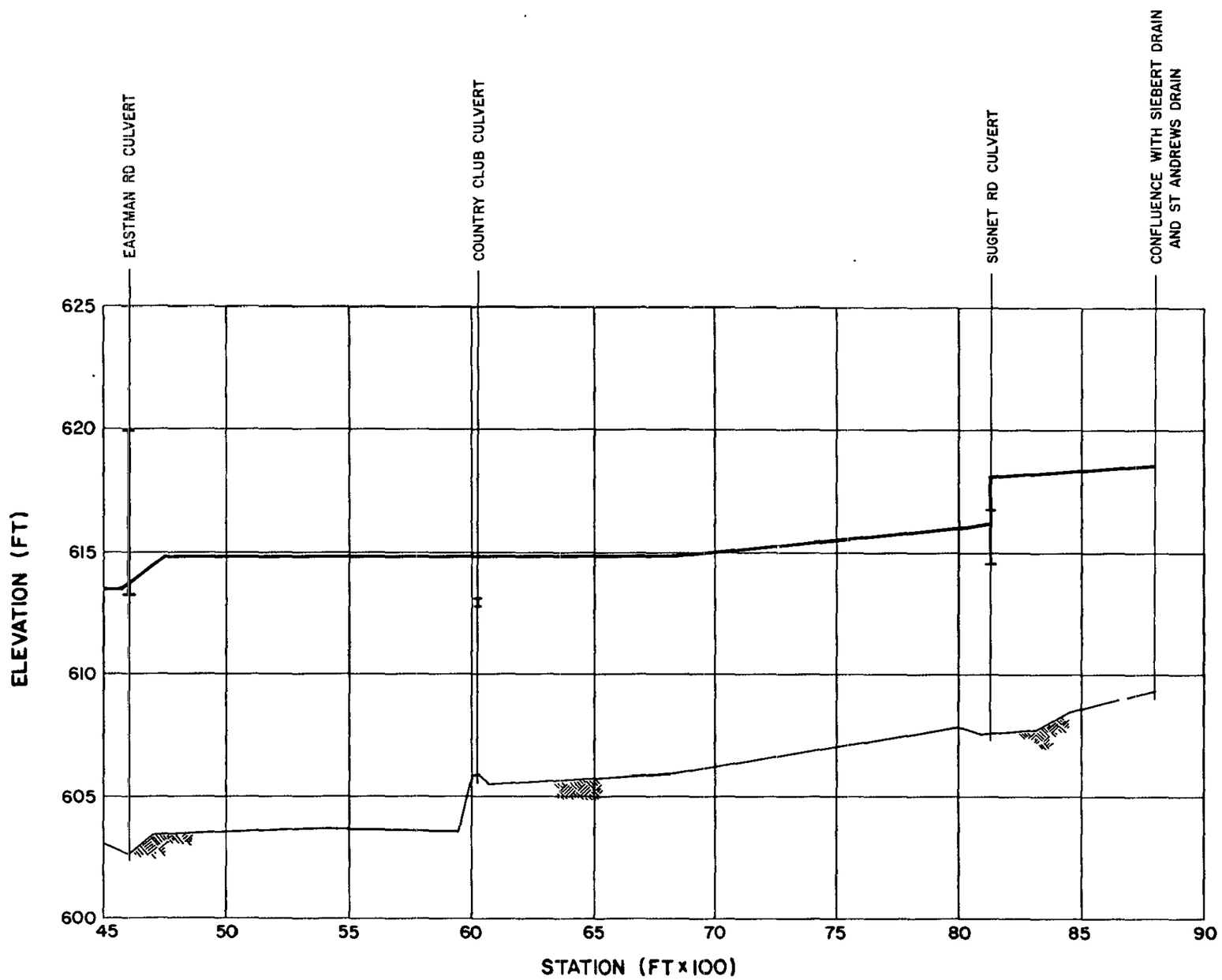


NOTE: Elevations based on city datum (to obtain U.S.G.S. subtract 1.32 ft.)

FIGURE NO. 15
SNAKE CREEK BASIN-
SNAKE CREEK PROFILE

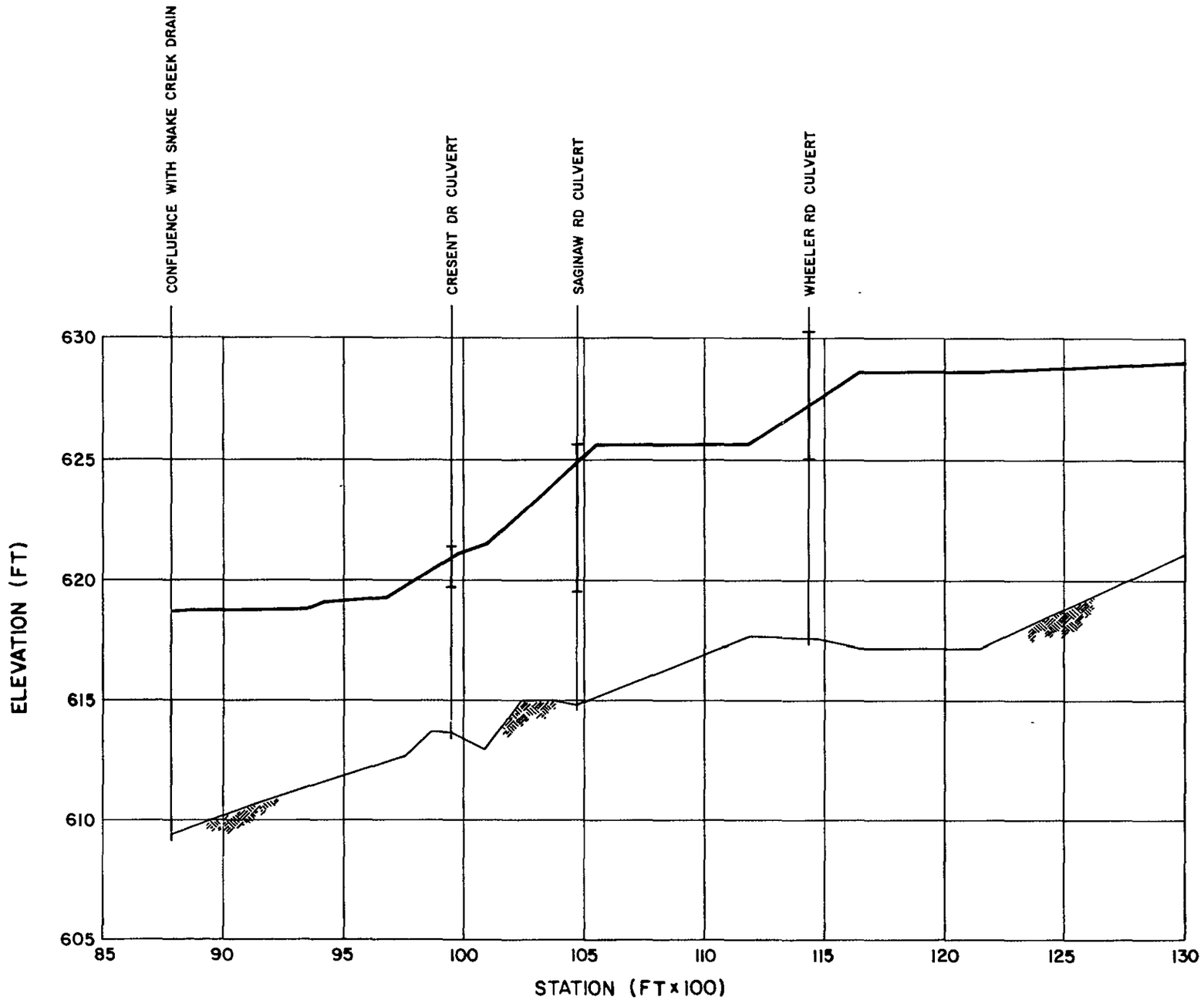
LEGEND:

- (2) Cross Section
- Centerline Ground Profile
- 100 Year Water Surface Profile

MIDLAND, MICHIGAN

STORMWATER MANAGEMENT STUDY

McNAMEE PORTER & SEELEY
ENGINEERS ARCHITECTS
ANN ARBOR, MICHIGAN



NOTE: Elevations based on city datum (to obtain U.S.G.S. subtract 1.32 ft.)

FIGURE NO. 16
SNAKE CREEK BASIN-SIEBERT DRAIN PROFILE

LEGEND:

- (2) Cross Section
- Centerline Ground Profile
- 100 Year Water Surface Profile

MIDLAND, MICHIGAN

STORMWATER MANAGEMENT STUDY

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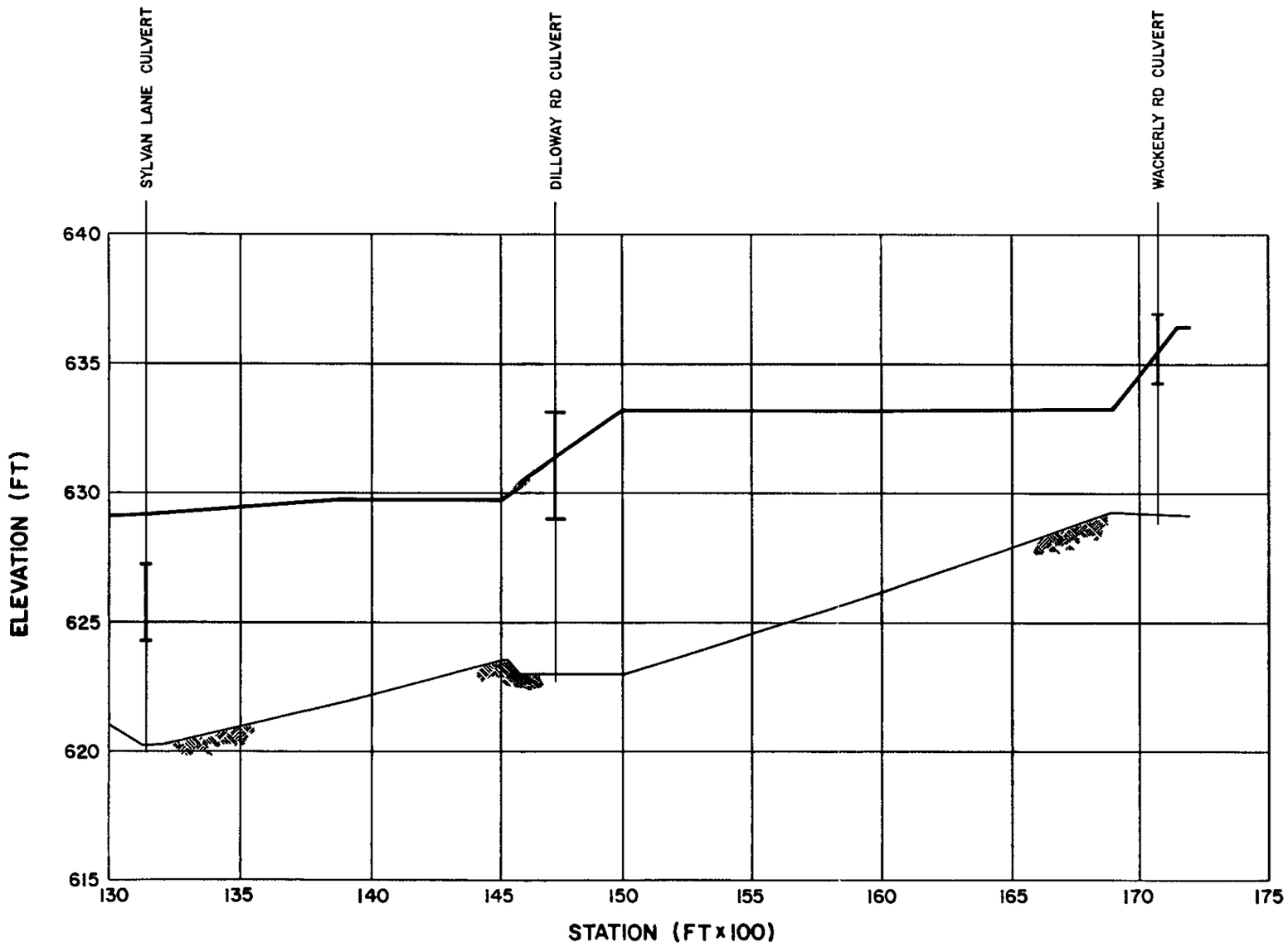

NOTE: Elevations based on city datum (to obtain U.S.G.S. subtract 1.32 ft.)

FIGURE NO. 17
SNAKE CREEK BASIN - SIEBERT DRAIN PROFILE

LEGEND:

- (2) Cross Section
- Centerline Ground Profile
- 100 Year Water Surface Profile

MIDLAND, MICHIGAN

STORMWATER MANAGEMENT STUDY

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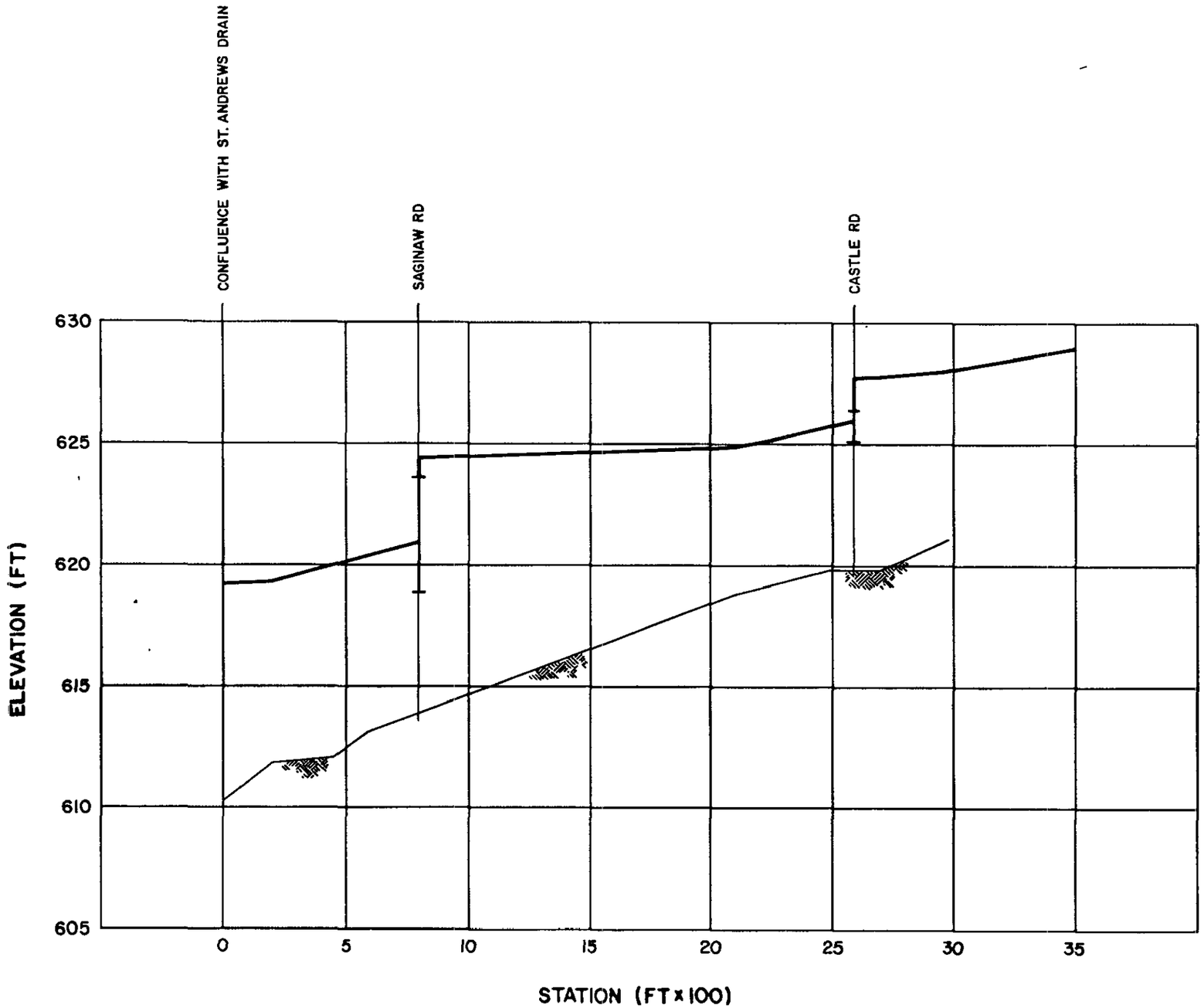
ENGINEERS ARCHITECTS
ANN ARBOR, MICHIGAN



NOTE: Elevations based on city datum (to obtain U.S.G.S. subtract 1.32 ft.)

FIGURE NO. 18
SNAKE CREEK BASIN - MEADOWBROOK DRAIN PROFILE

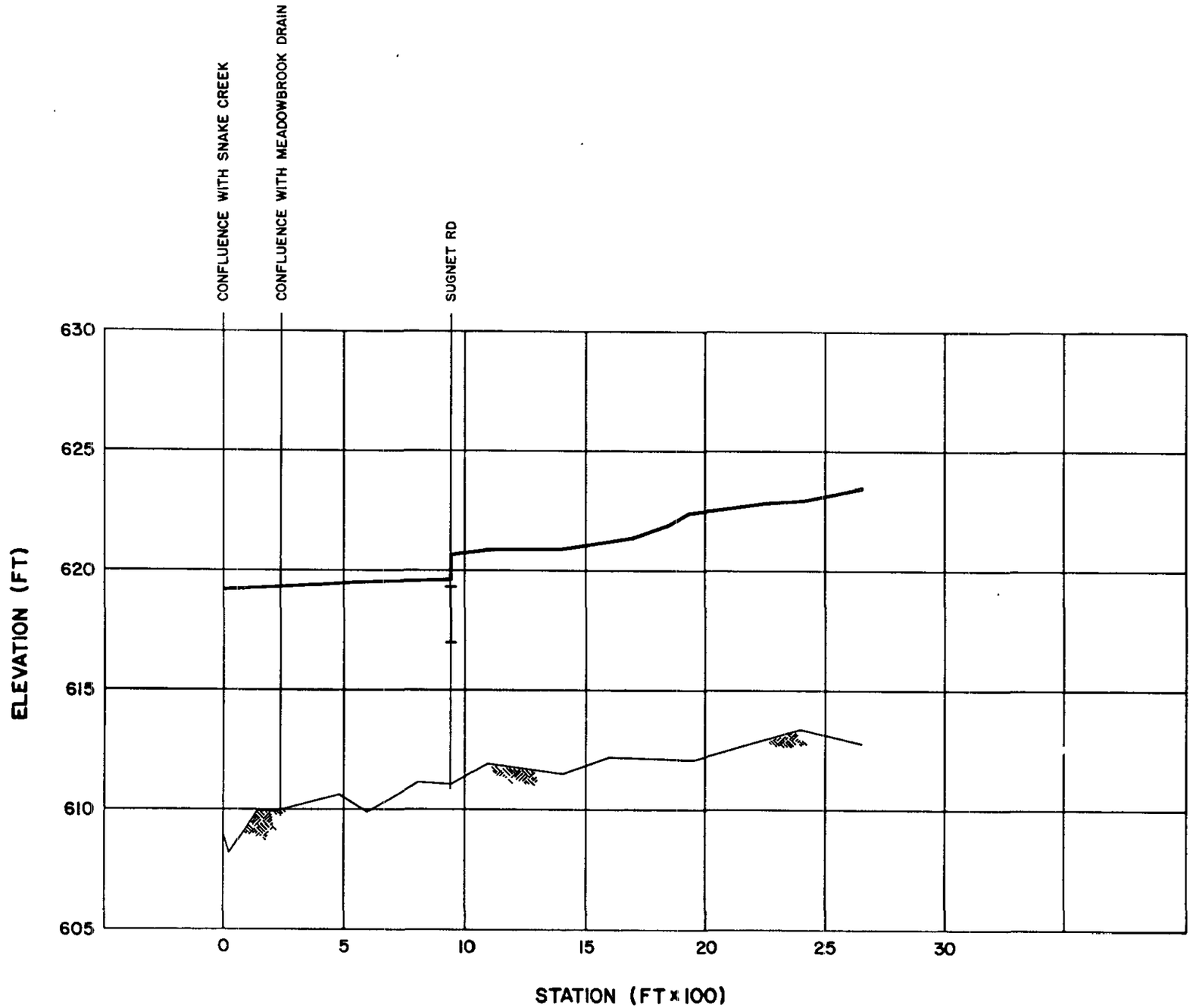
LEGEND:

- (2) Cross Section
- Centerline Ground Profile
- 100 Year Water Surface Profile

MIDLAND, MICHIGAN

STORMWATER MANAGEMENT STUDY

McNAMEE PORTER & SEELEY
ENGINEERS ARCHITECTS
ANN ARBOR, MICHIGAN



NOTE: Elevations based on city datum [to obtain U.S.G.S. subtract 1.32 ft.]

FIGURE NO. 19
SNAKE CREEK BASIN - ST. ANDREWS DRAIN PROFILE

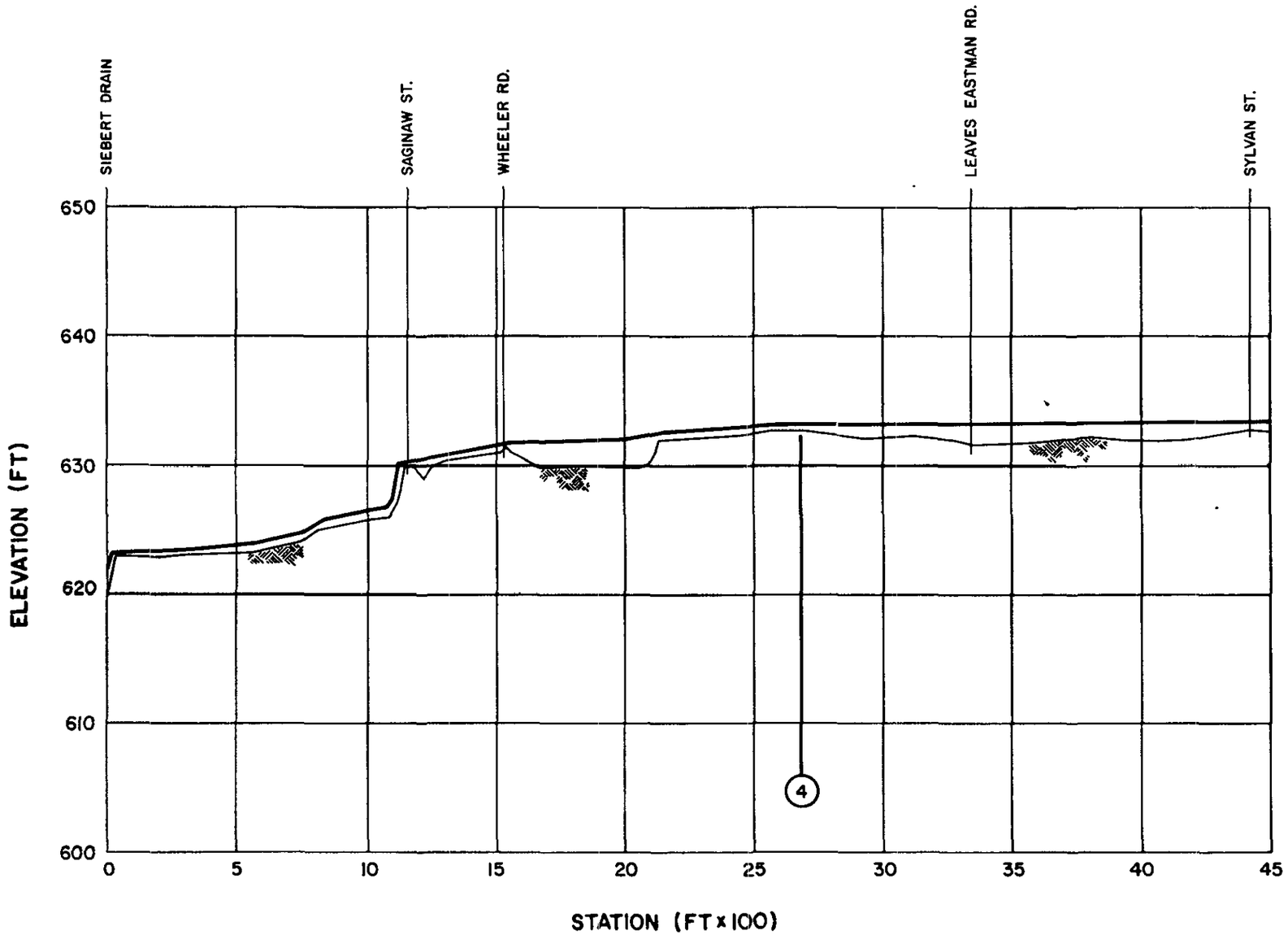
LEGEND:

- (2) Cross Section
- Centerline Ground Profile
- 100 Year Water Surface Profile

MIDLAND, MICHIGAN

STORMWATER MANAGEMENT STUDY

McNAMEE PORTER & SEELEY
ENGINEERS ARCHITECTS
ANN ARBOR, MICHIGAN



NOTE: Elevations based on city datum [to obtain U.S.G.S. subtract 1.32 ft.]

FIGURE NO. 20
SNAKE CREEK BASIN - EASTMAN PROFILE

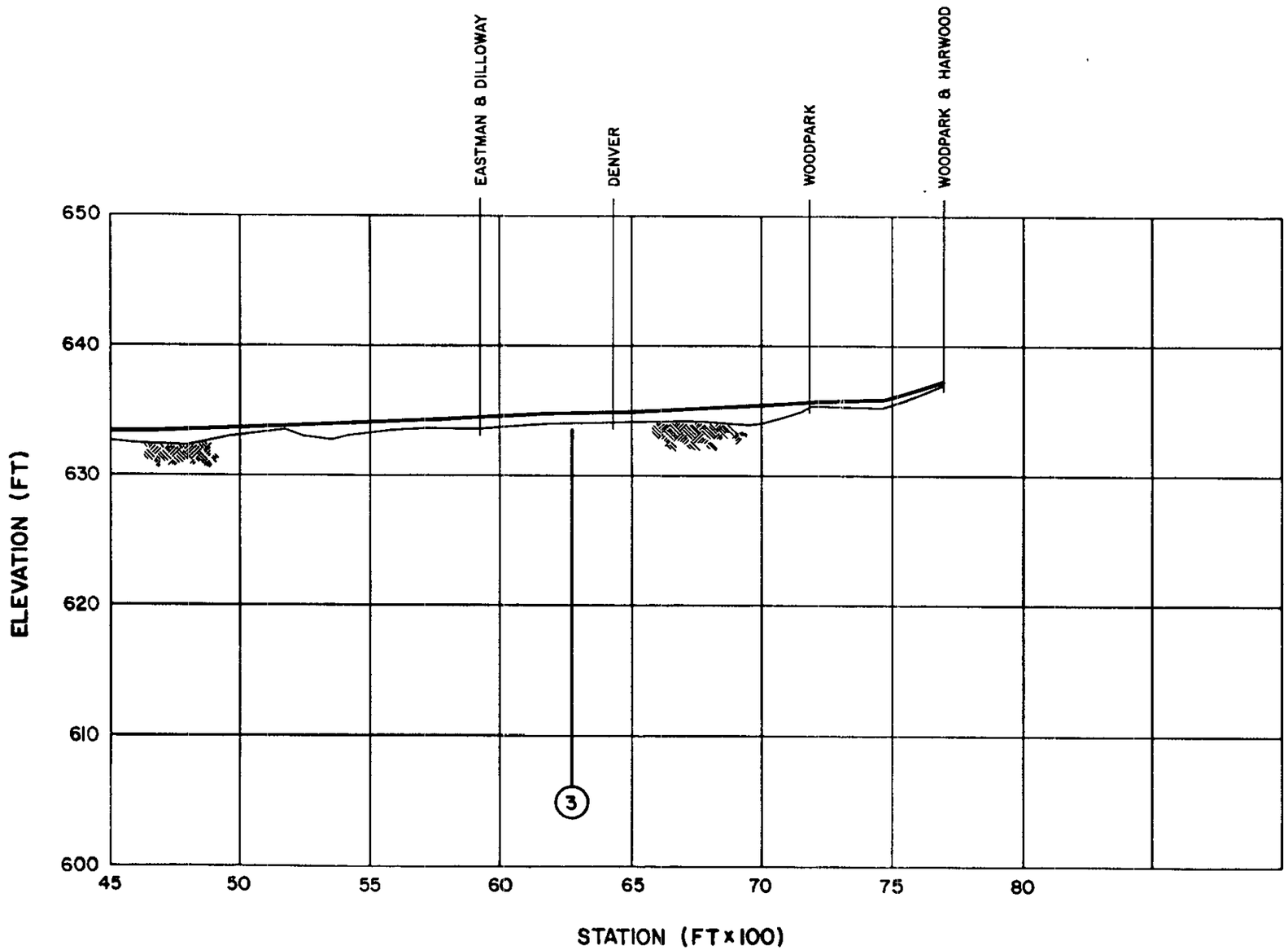
LEGEND:

- (2) Cross Section
- Centerline Ground Profile
- 100 Year Water Surface Profile

MIDLAND, MICHIGAN

STORMWATER MANAGEMENT STUDY

McNAMEE PORTER & SEELEY
ENGINEERS ARCHITECTS
ANN ARBOR, MICHIGAN



NOTE: Elevations based on city datum (to obtain U.S.G.S. subtract 1.32 ft.)

FIGURE NO. 21
SNAKE CREEK BASIN - EASTMAN PROFILE

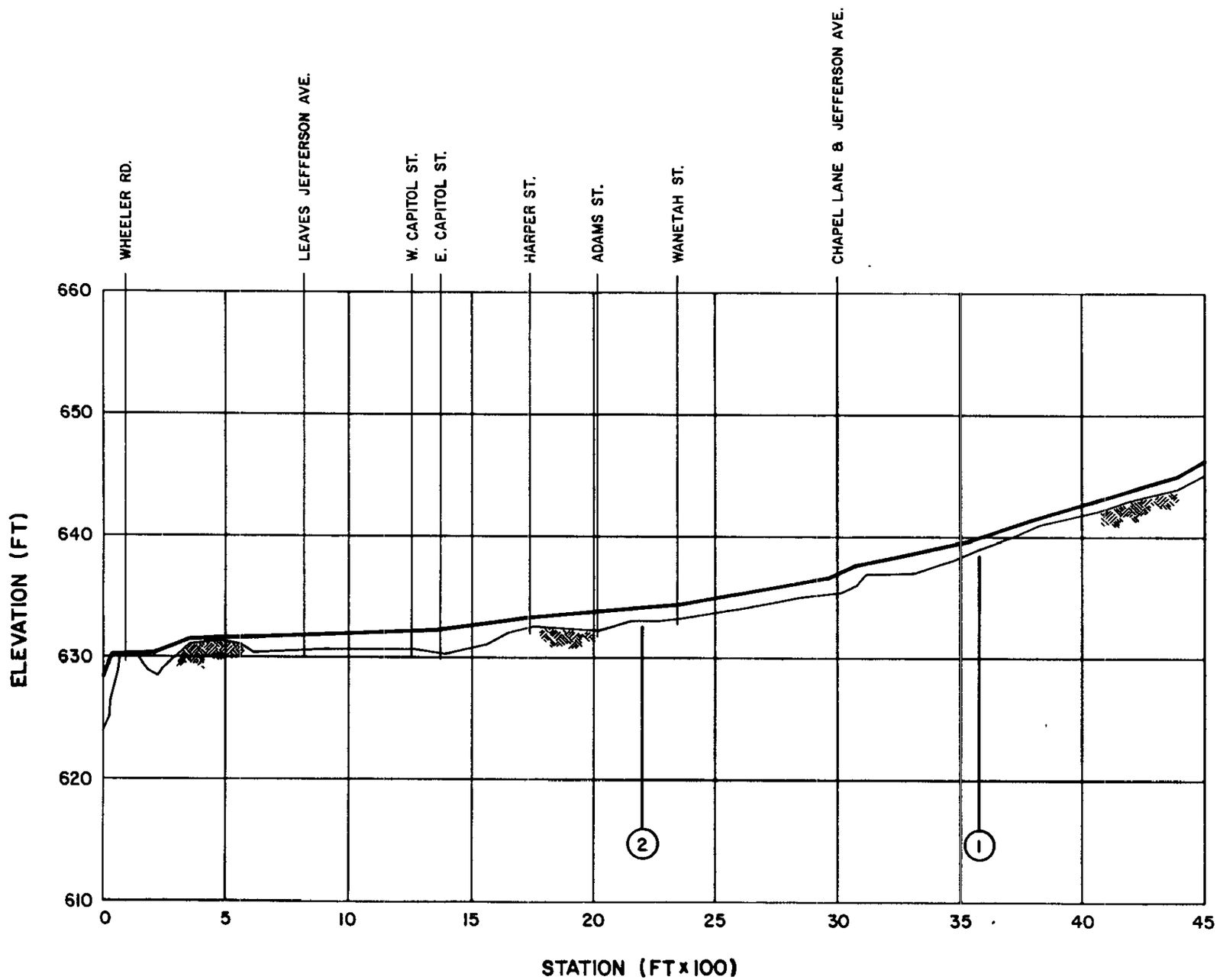
LEGEND:

- (2) Cross Section
- Centerline Ground Profile
- 100 Year Water Surface Profile

MIDLAND, MICHIGAN

STORMWATER MANAGEMENT STUDY

McNAMEE PORTER & SEELEY
ENGINEERS ARCHITECTS
ANN ARBOR, MICHIGAN



NOTE: Elevations based on city datum (to obtain U.S.G.S. subtract 1.32 ft.)

FIGURE NO. 22
SNAKE CREEK BASIN-JEFFERSON PROFILE

LEGEND:

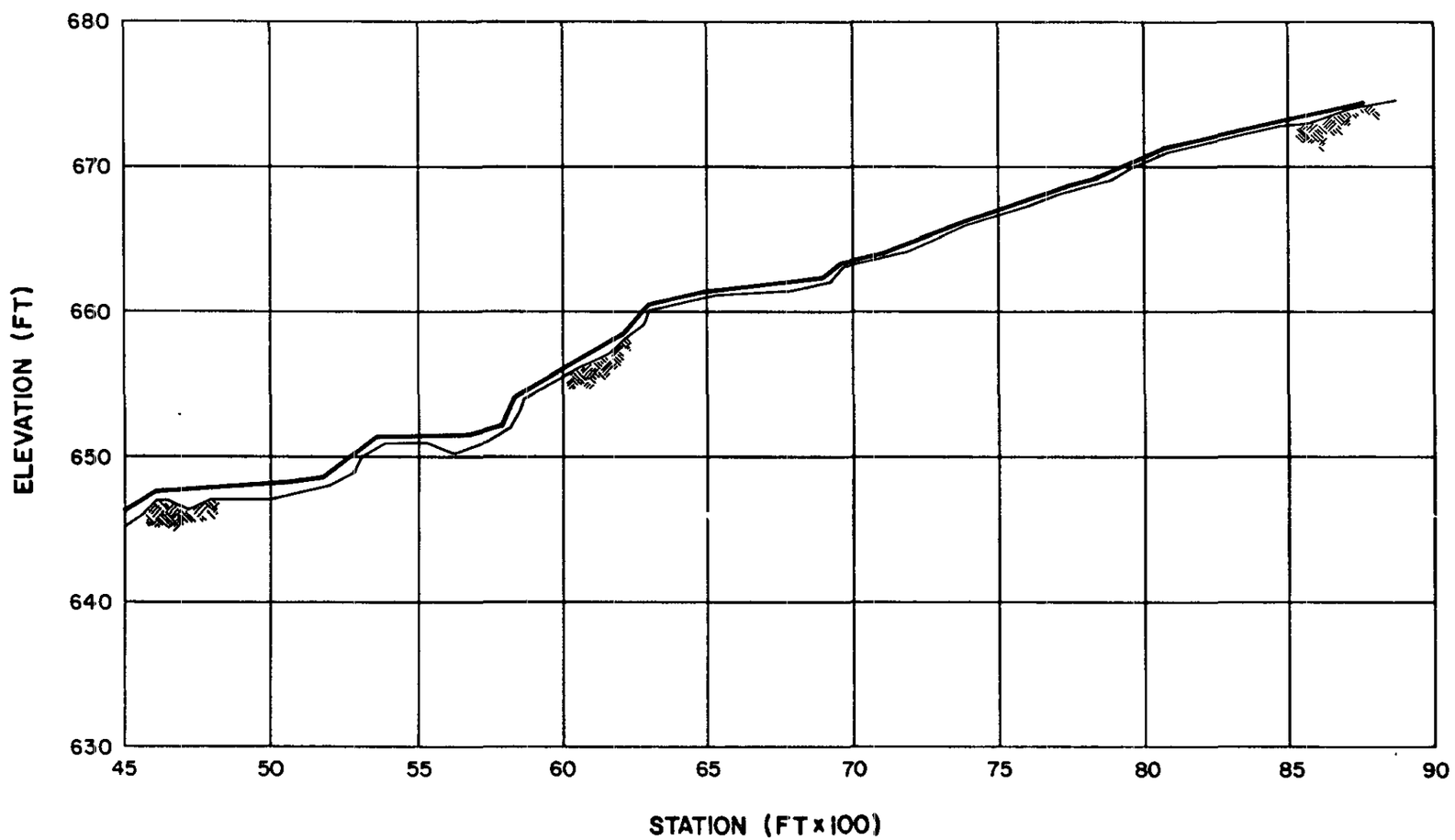
- (2) Cross Section
- Centerline Ground Profile
- 100 Year Water Surface Profile

MIDLAND, MICHIGAN

STORMWATER MANAGEMENT STUDY

McNAMEE PORTER & SEELEY
ENGINEERS ARCHITECTS
ANN ARBOR, MICHIGAN

FIGURE NO. 23
SNAKE CREEK BASIN - JEFFERSON PROFILE



NOTE: Elevations based on city datum (to obtain U.S.G.S. subtract 1.32 ft.)

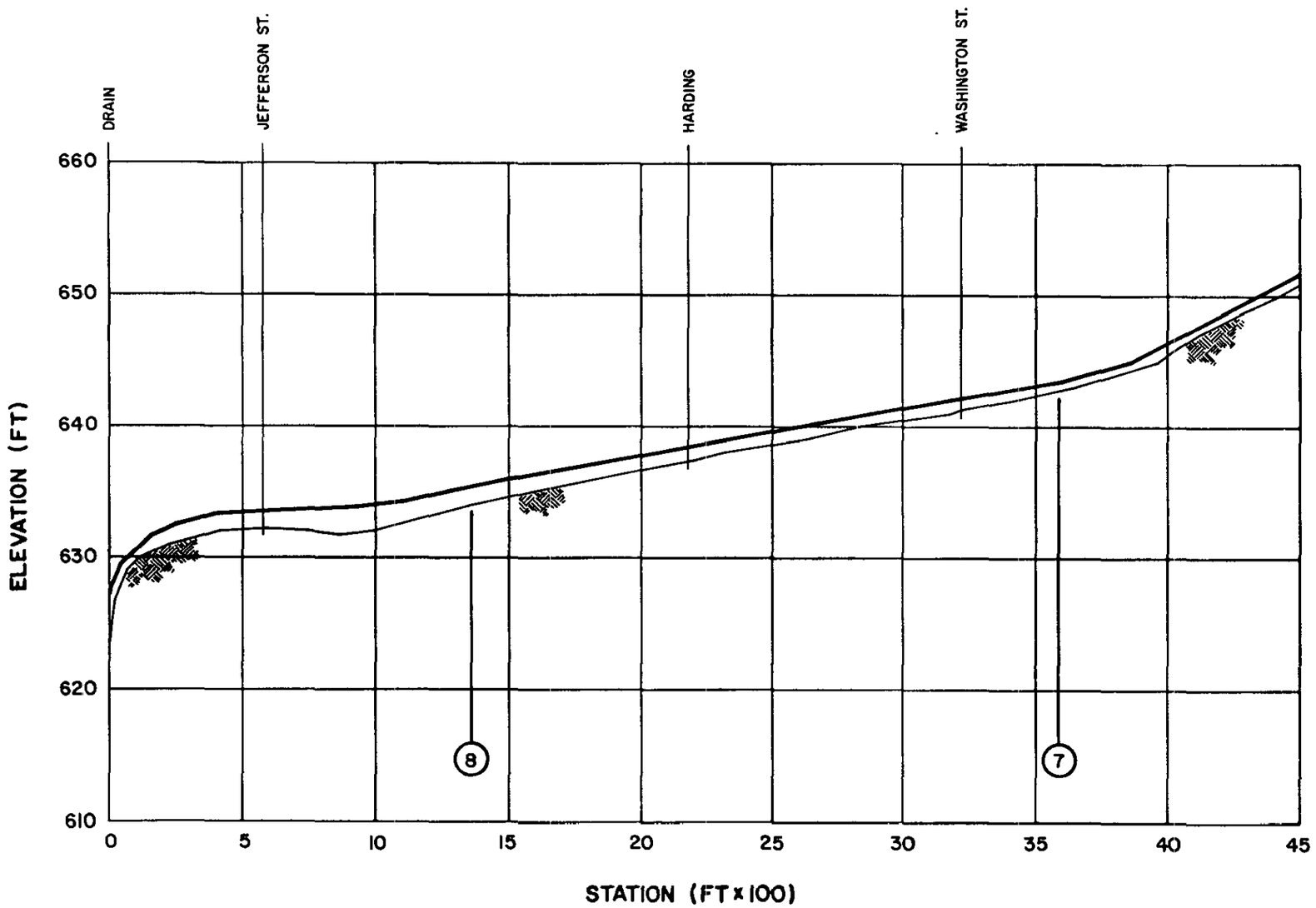
LEGEND:

- (2) Cross Section
- Centerline Ground Profile
- 100 Year Water Surface Profile

MIDLAND, MICHIGAN

STORMWATER MANAGEMENT STUDY

McNAMEE PORTER & SEELEY
ENGINEERS ARCHITECTS
ANN ARBOR, MICHIGAN



NOTE: Elevations based on city datum (to obtain U.S.G.S. subtract 1.32 ft.)

FIGURE NO. 24
SNAKE CREEK BASIN-WHEELER PROFILE

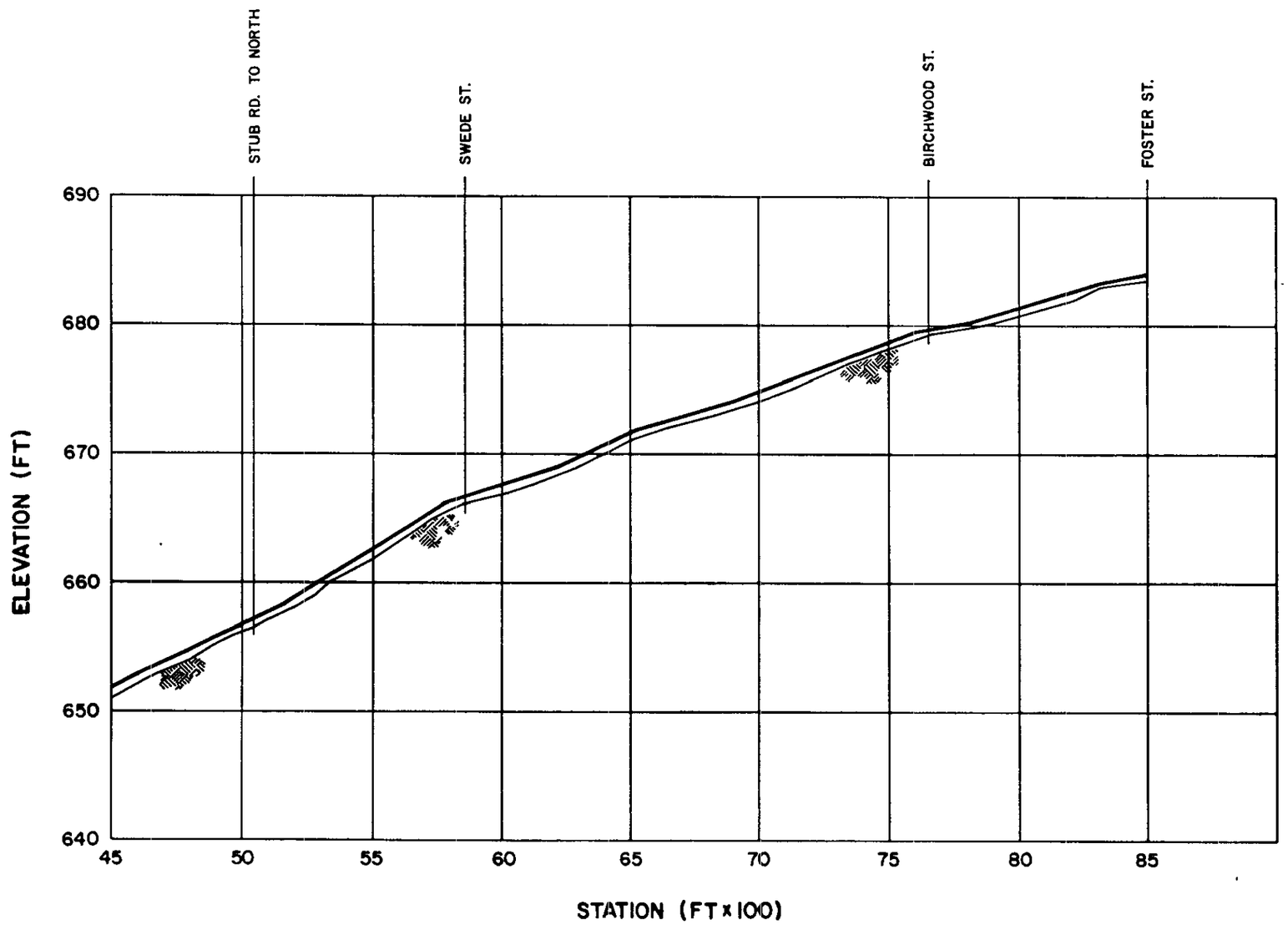
LEGEND:

- (2) Cross Section
- Centerline Ground Profile
- 100 Year Water Surface Profile

MIDLAND, MICHIGAN

STORMWATER MANAGEMENT STUDY

McNAMEE PORTER & SEELEY
ENGINEERS ARCHITECTS
ANN ARBOR, MICHIGAN



NOTE: Elevations based on city datum (to obtain U.S.G.S. subtract 1.32 ft.)

FIGURE NO. 25
SNAKE CREEK BASIN - WHEELER PROFILE

LEGEND:

- (2) Cross Section
- Centerline Ground Profile
- 100 Year Water Surface Profile

MIDLAND, MICHIGAN

STORMWATER MANAGEMENT STUDY

McNAMEE PORTER & SEELEY
ENGINEERS ARCHITECTS
ANN ARBOR, MICHIGAN

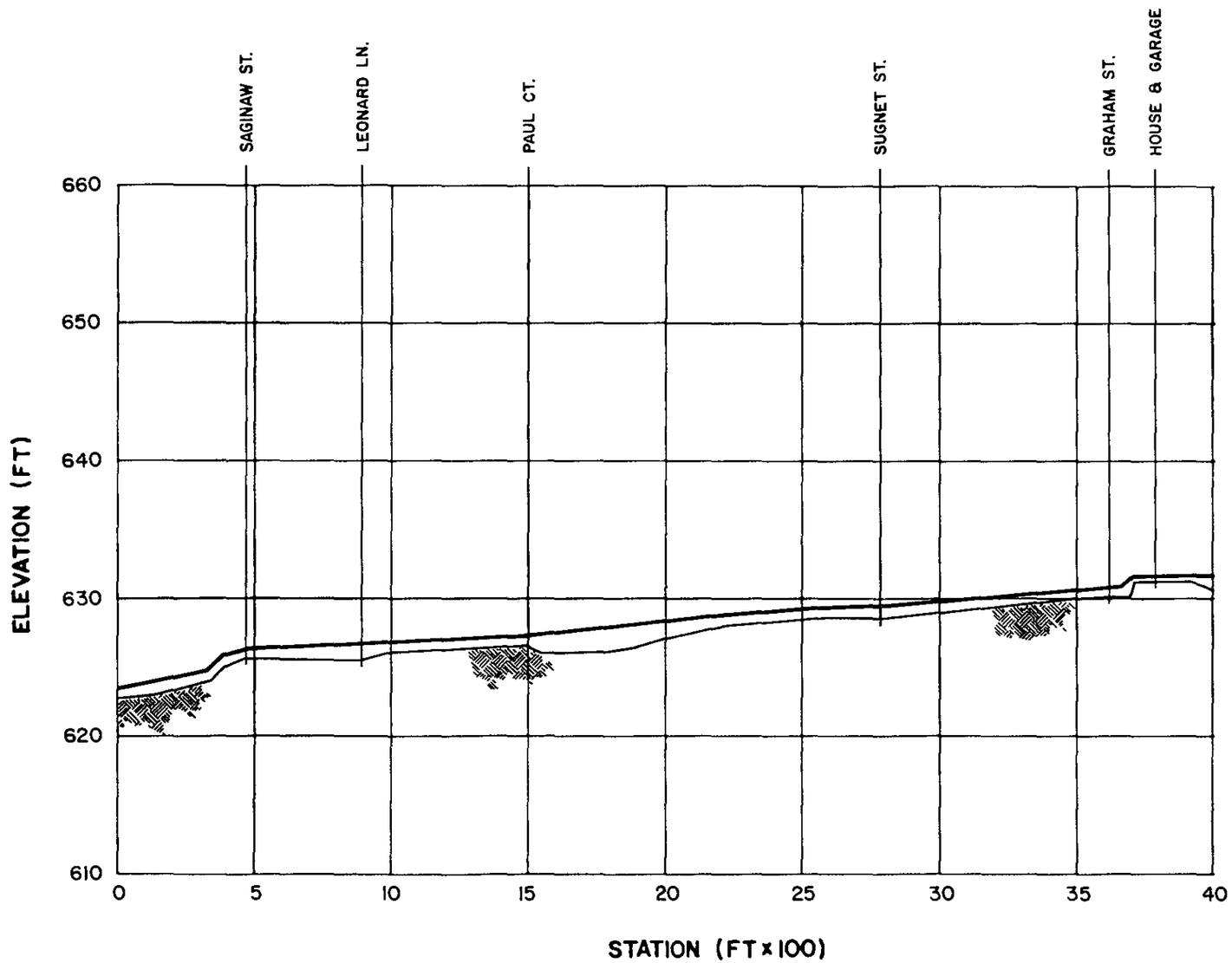


FIGURE NO. 26
SNAKE CREEK BASIN-SAINT ANDREWS TRIBUTARY PROFILE

LEGEND:

- (2) Cross Section
- Centerline Ground Profile
- 100 Year Water Surface Profile

MIDLAND, MICHIGAN

STORMWATER MANAGEMENT STUDY

McNAMEE PORTER & SEELEY
ENGINEERS ARCHITECTS
ANN ARBOR, MICHIGAN

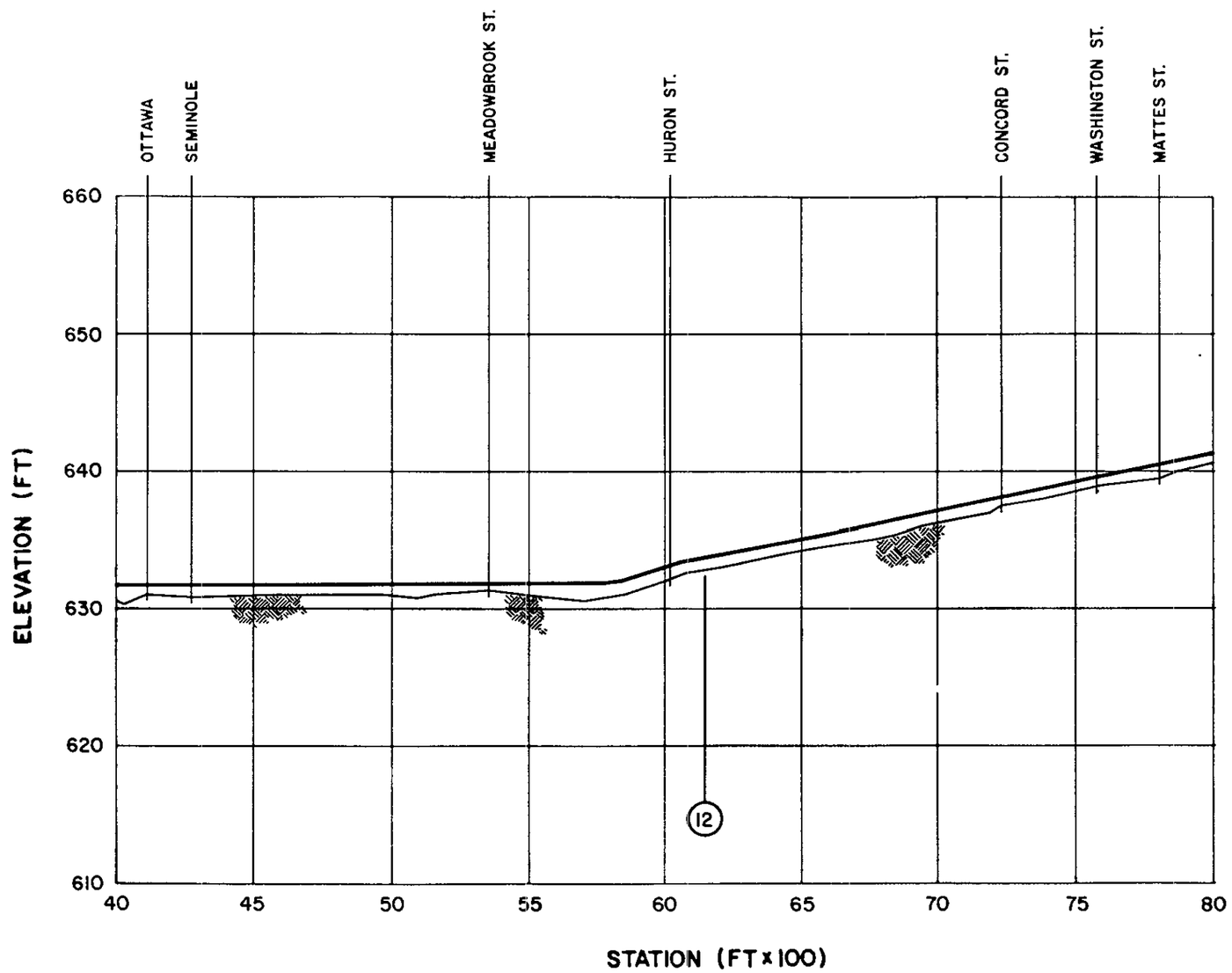


FIGURE NO. 27
SNAKE CREEK BASIN - SAINT ANDREWS TRIBUTARY PROFILE

LEGEND:

- (2) Cross Section
- Centerline Ground Profile
- 100 Year Water Surface Profile

MIDLAND, MICHIGAN

STORMWATER MANAGEMENT STUDY

McNAMEE PORTER & SEELEY
ENGINEERS ARCHITECTS
ANN ARBOR, MICHIGAN

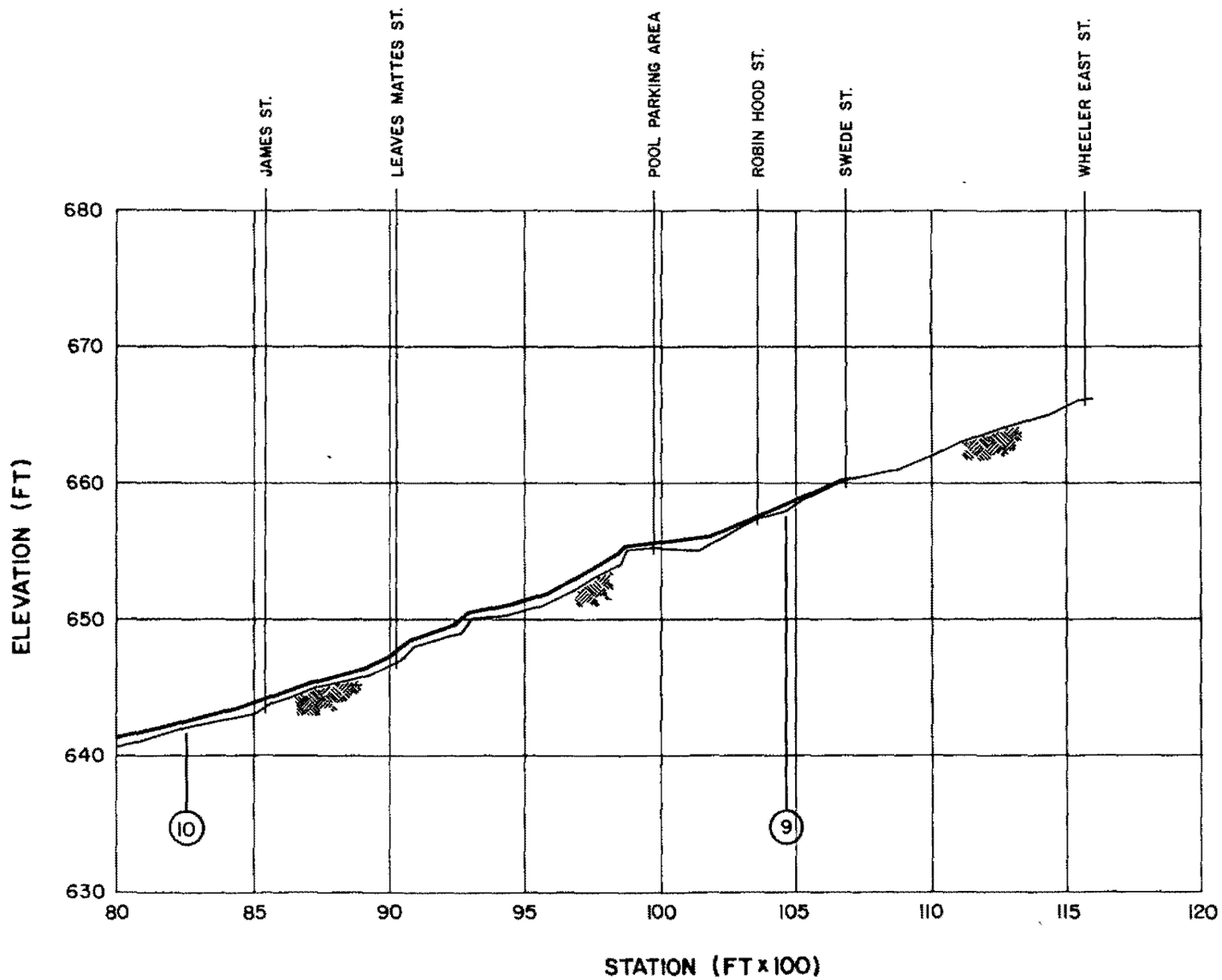


FIGURE NO. 28
SNAKE CREEK BASIN - SAINT ANDREWS TRIBUTARY PROFILE

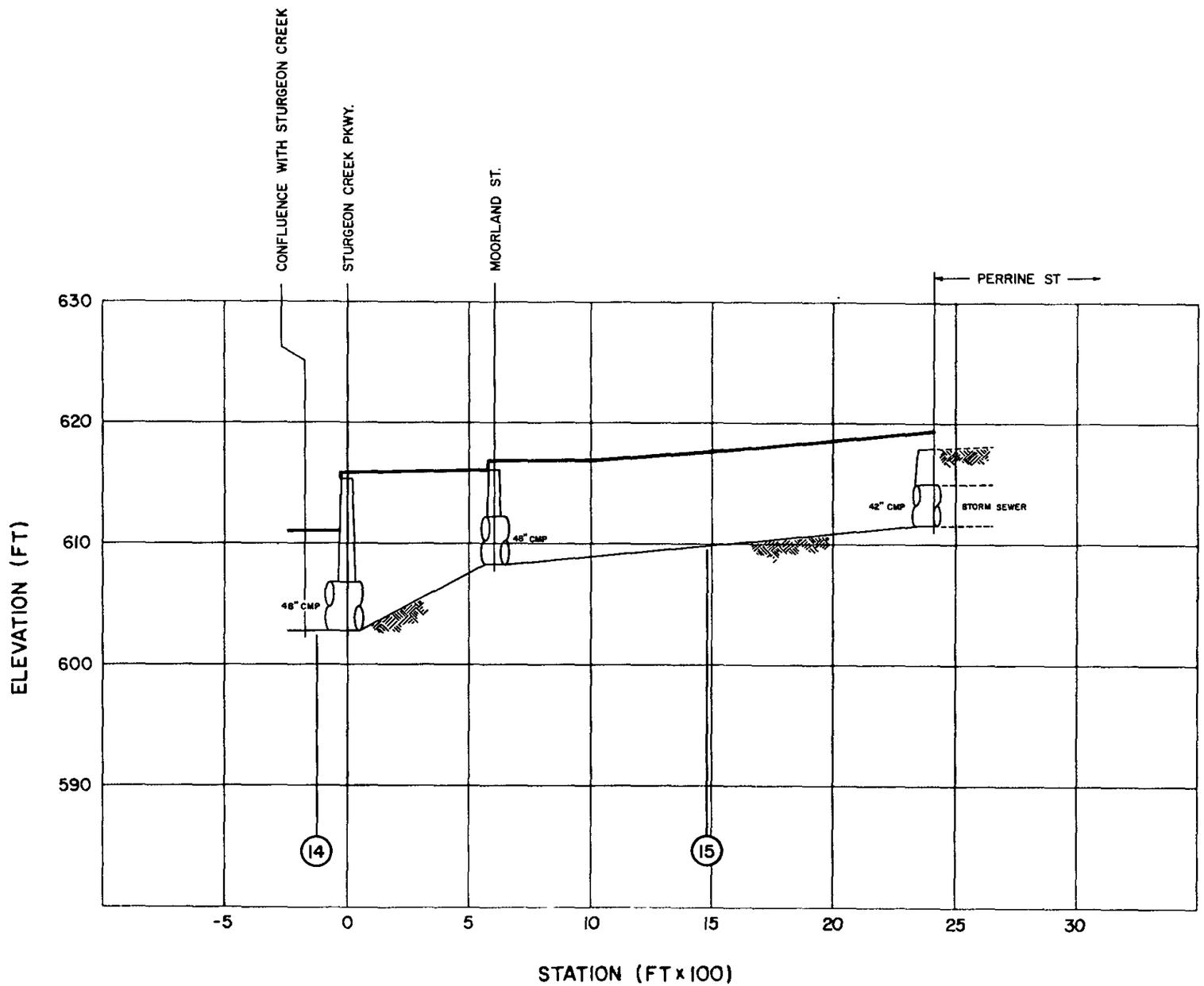
LEGEND:

- (2) Cross Section
- Centerline Ground Profile
- 100 Year Water Surface Profile

MIDLAND, MICHIGAN

STORMWATER MANAGEMENT STUDY

McNAMEE PORTER & SEELEY
ENGINEERS ARCHITECTS
ANN ARBOR, MICHIGAN



NOTE: Elevations based on city datum [to obtain U.S.G.S. subtract 1.32 ft.]

FIGURE NO. 29
STURGEON CREEK BASIN - HAHN DRAIN PROFILE

LEGEND:

- (2) Cross Section
- Centerline Ground Profile
- 100 Year Water Surface Profile

MIDLAND, MICHIGAN

STORMWATER MANAGEMENT STUDY

McNAMEE PORTER & SEELEY
ENGINEERS ARCHITECTS
ANN ARBOR, MICHIGAN

00BREAK00

1) COUNTY: Midland

2) STUDY NAME: City of Midland

3) WATERCOURSE: Tittabawassee, Chippewa, Sturgeon Cr. Inman Drain, Snake Creek

4) DOCUMENT TYPE: 10 yr

00BREAK00

McNamee, Porter & Seeley | Engineers / Architects | Ann Arbor, Michigan

```
RRRRRRRR    UU      UU  DDDDDDDD    YY      YY
RRRRRRRR    UU      UU  DDDDDDDD    YY      YY
RR      RR  UU      UU  DD      DD  YY      YY
RR      RR  UU      UU  DD      DD  YY      YY
RR      RR  UU      UU  DD      DD    YY  YY
RR      RR  UU      UU  DD      DD    YY  YY
RRRRRRRR    UU      UU  DD      DD      YY
RRRRRRRR    UU      UU  DD      DD      YY
RR  RR      UU      UU  DD      DD      YY
RR  RR      UU      UU  DD      DD      YY
RR    RR    UU      UU  DD      DD      YY
RR    RR    UU      UU  DD      DD      YY
RR      RR  UUUUUUUUUU  DDDDDDDD        YY
RR      RR  UUUUUUUUUU  DDDDDDDD        YY

 SSSS  N   N        1     000
S      N   N       11    0   0
S      NN  N        1    0  00
 SSS   N N N        1    0 0 0
    S  N  NN        1    00  0
    S  N   N        1    0   0
SSSS   N   N      111    000

J   000   8888      999    000    666
J  0   0  8   8    9   9  0   0  6
J  0   0  8   8    9   9  0  00  6
J  0   0  8888      9999  0 0 0  6666
J  J  0   0  8   8     9  00  0  6   6
J  J  0   0  8   8     9  0   0  6   6
 JJJ   000   8888    999    000    666
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Job SH_10 (906) queued to SYS$PRINT on 28-APR-1987 16:28 by user RUDY, UIC [COMPUTER,RUDY], under account COMPUTER at priority 100, started on printer _LCA0: on 28-APR-1987 16:34 from queue SYS$PRINT.

Digital Equipment Corporation - VAX/VMS Version V4.5

```
FLOOD HYDROGRAPH PACKAGE  (HEC-1)
          FEBRUARY 1981
        REVISED 04 NOV 81

RUN DATE 20-APR-1987   TIME 16:26:53
```


U.S. ARMY CORPS OF ENGINEERS
THE HYDROLOGIC ENGINEERING CENTER
609 SECOND STREET
DAVIS, CALIFORNIA 95616
(916) 440-3285 OR (FTS) 448-3285


```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X       XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE. THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. SEE SEPTEMBER 1981 INPUT DESCRIPTION FOR NEW DEFINITIONS.

```
LINE          ID.......1.......2.......3.... ..4.......5.......6.......7.......8.......9......10

  1           ID   MIDLAND FIS
  2           ID   SNAKE CREEK BASIN
  3           ID   10 - YEAR FREQUENCY EVENT
              XDIAGRAM
  4           IT      15 16DEC83       0      60
  5           IN      15 16DEC83       0
  6           IO       3       0       0

  7           KK    EXPS
  8           KM   INPUT HYDRO-DRAINAGE AREA TO EXPRESSWAY
  9           BA     1.0
 10           PB       0
 11           PI       0.      0.      0.      0.      0.    .075    .386    .178    .125    .089
 12           PI    .067    .043
 13           LU       0       0       0
 14           UI       0.      2.      3.      6       8.     12.     18.     27.     36.     45.
 15           UI      56.     76.     86.     88      90.     86.     76.     68.     62.     58.
 16           UI      56.     54.     52.     49.     47.     45.     44.     42.     41.     40.
 17           UI      38.     37.     36.     35.     34.     34.     33.     32.     31.     31.
 18           UI      30.     30.     29.     29.     28.     28.     28.     27.     27.     26.
 19           UI      26.     25.     24.     24.     23.     23.     22.     21.     20.     20.
 20           UI      19.     19.     18.     17.     17.     16.     15.     15.     14.     13.
 21           UI      13.     12.     11.     10.     10.      9.      8.      8.      7.      6.
 22           UI       6.      5.      4.      4.      3.      2.      2.      1.      0.      0.

 23           KK    EXPS
 24           KM   STORAGE ROUTE UPSTREAM OF US-10
 25           KO       3       2
 26           RS       1    ELEV   630.0
 27           SV       0.     .10    .250     .50     1.0     1.5     2.5     4.0     6.1
 28           SE   630.0  634.70  635.00  635.25  635.60  635.85  636.10  636.30  636.68
 29           SQ       0.     70.     80.     90.    105.    130.    150.    165.    210.    275.
 30           SE    630.  634.61  634.83  635.07  635.52  635.92  636.22  636.39  637.01  637.89

 31           KK    WACK
 32           KM    STORAGE ROUTE UPSTREAM OF WACKERLY
 33           KO       3.      2.
 34           RS       1.    ELEV    630.
 35           SV       0.     .17     .68    1.04    1.61    2.56
 36           SE    630.    633.    635.    636.    637.    638.
 37           SQ       0.     50.     80.    130.    200.    360.
 38           SE    630.    633.     635    636.    637.    638.

 39           KK    WACK
 40           KM    INPUT HYDRO-DRAINAGE AREA TO DILLOWAY
 41           BA     .39
 42           PB       0.
 43           PI       0.      0.      0.      0.      0.    .181    .153    .071    .050    .036
 44           PI    .027    .017
 45           LU       0.      0.      0.
 46           UI       .5      1.      3.      5       7.     12.     20.    105.    167.    195.
 47           UI     200.    199.    178.    156.    136    122.    102.     92.     84.     77.
 48           UI      68.     61.     54.     49.     43.     41.     37.     32.     29.     25.
 49           UI      21.     17.     12.      9.      5.      0.
```

```
LINE          ID.......1.......2.......3.......4.......5 .......6.......7.......8.......9......10

  50          KK    WACK
  51          KM    COMBINE HYDRO-DRAINAGE AREAS AT DILLOWAY
  52          HC      2.

  53          KK    DILL
  54          KM    STORAGE ROUTE UPSTREAM OF DILLOWAY
  55          KO      1.      2.
  56          RS      1.    ELEV    624.
  57          SV      0.      0.2     5.2     8.6    16.1     24.
  58          SE    624.    628.    632.    633.    634.    635.
  59          SQ      0.     60.    170.    220     400.   1100.
  60          SE    624.    628.    632.    633.    634.    635.

  61          KK    DILL
  62          KM    INPUT HYDRO-DRAINAGE  AREA TO SYLVAN
  63          BA     .21
  64          PB      0.
  65          PI      0.      0.      0.      0.      0.    .086    .080    .037    .026    .019
  66          PI    .014    .009
  67          LU      0.      0.      0.
  68          UI      0.      8.     24.     75.    153.    290.    293.    274.    244.    204.
  69          UI    165     134.    110.     89.     73.     38.     50.     44.     38.     33.
  70          UI     28.     24.     20.     14.     11.      7.      2.      0.

  71          KK    DILL
  72          KM    INPUT HYDRO-DRAINAGE AREA TO WHEELER
  73          BA     .34
  74          PB      0.
  75          PI      0.      0.      0.      0.      0.    .153    .130    .060    .043    .031
  76          PI    .023    .015
  77          LU      0.      0.      0.
  78          UI      0.     17.     53.    158     350.    395.    356.    298.    225.    159.
  79          UI    114.     93.     79.     67.     59.     50.     45.     37.     30.     22.
  80          UI     15.      9.      3.      0.

  81          KK    DILL
  82          KM    COMBINE HYDRO-DRAINAGE AREAS AT WHEELER
  83          HC      3.

  84          KK    WHEEL
  85          KM    STORAGE ROUTE UPSTREAM OF WHEELER
  86          KO      1.      2.
  87          RS      1.    ELEV    617.
  88          SV      0.      2.      6.3    12.8    25.1     45.     57.     70.
  89          SE    617.    625.    627.    628.    629.    630.   630.5    631.
  90          SQ      0.     80.    240.    300.    360.    430.    600.    730.
  91          SE    617.    625.    627.    628.    629.    630.   630.5    631.

  92          KK    WHEEL
  93          KM    DIVERT FLOW TO MEADOWBROOK
  94          DT    DFLO
  95          DI      0.    410.    460.    520.    600.    680.    730.
  96          DQ      0.      0.     40.     60.    120.    190.    230.
```

```
LINE          ID.......1.......2.......3 ......4.......5.......6 .....7.......8.......9......10

  97          KK   WHEEL
  98          KM    INPUT HYDRO-DRAINAGE AREA SOUTH OF WHEELER
  99          BA     .57
 100          PB      0.
 101          PI      0.       0.       0.       0.       0.       0.       0.     .059     .072     .052
 102          PI    .039     .025
 103          LU      0.       0.       0.
 104          UI      0.       5.      15.      39.      70.     118.     185.     234.     240      234.
 105          UI    223.     202.     169.     141.     117.      98.      77.      63.      55.      50.
 106          UI     45.      41.      36.      33       29.      25.      21.      18.      15.      12.
 107          UI      8.       5.       2.       0.

 108          KK   WHEEL
 109          KM    COMBINE HYDRO SOUTH OF WHEELER
 110          HC      2.

 111          KK   CONFL
 112          KM    CHANNEL ROUTE SIEBERT TO CONFLUENCE SECTION 1330
 113          KO      3.       2.
 114          RS      1.     STOR      -1.
 115          RC     .06     .045      .06    2200.     .001
 116          RX      6.      13.      43.      47.      53.      60.     150.     229.
 117          RY    620.    619.2    616.5    612.6    612.6    616.8    617.9    620.

 118          KK     SAG
 119          KM    INPUT HYDRO-MEADOWBROOK DRAIN
 120          BA    1.27
 121          PB      0.
 122          PI      0.       0.       0.       0.       0.     .559     .493     .229     .161     .116
 123          PI    .081     .057
 124          LU      0.       0.       0.
 125          UI      0.       4.      11.      22.      47.      85.     131.     188.     211.     220.
 126          UI    216.     204.     186.     168.     146.     127.     110.      88.      71.      58.
 127          UI     49.      44.      39.      34.      31.      28.      24.      22.      20.      17.
 128          UI     15.      13.      11.       9.       7.       5.       3.       2.       0

 129          KK     SAG
 130          KM    RETRIEVE DIVERTED FLOW AT WHEELER
 131          DR    OFLO

 132          KK     SAG
 133          KM    ADD MEADOWBROOK AND DIVERSION HYDROS
 134          HC      2.

 135          KK   CONFL
 136          KM    ROUTE TO CONFLUENCE  - SECTION 200
 137          KO      1.       2.
 138          RS      1.     STOR      -1.
 139          RC     .07     .045      .07    3500.     .001
 140          RX      0.      50.     118.     127      132.     142.     230.     240.
 141          RY    620.9   619.1    616.8    611.9    611.9    616.3    619.0    620.9
 142          ZZ
```

```
FLOOD HYDROGRAPH PACKAGE  (HEC-1)
          FEBRUARY 1981
        REVISED 04 NOV 81

RUN DATE 28-APR-1987   TIME 16:26:53
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```
U.S. ARMY CORPS OF ENGINEERS
THE HYDROLOGIC ENGINEERING CENTER
        609 SECOND STREET
      DAVIS, CALIFORNIA 95616
(916) 440-3285 OR (FTS) 448-3285
```

```
                    MIDLAND FIS
                    SNAKE CREEK BASIN
                    10 - YEAR FREQUENCY EVENT

6 IO          OUTPUT CONTROL VARIABLES
                  IPRNT          3  PRINT CONTROL
                  IPLOT          0  PLOT CONTROL
                  QSCAL         0.  HYDROGRAPH PLOT SCALE

  IT          HYDROGRAPH TIME DATA
                   NMIN         15  MINUTES IN COMPUTATION INTERVAL
                  IDATE    16DEC83  STARTING DATE
                  ITIME       0000  STARTING TIME
                     NQ         80  NUMBER OF HYDROGRAPH ORDINATES
                 NDDATE    16DEC83  ENDING DATE
                 NDTIME       1945  ENDING TIME

              COMPUTATION INTERVAL    0.25 HOURS
                   TOTAL TIME BASE   19.75 HOURS

        ENGLISH UNITS
            DRAINAGE AREA          SQUARE MILES
            PRECIPITATION DEPTH    INCHES
            LENGTH, ELEVATION      FEET
            FLOW                   CUBIC FEET PER SECOND
            STORAGE VOLUME         ACRE-FEET
            SURFACE AREA           ACRES
            TEMPERATURE            DEGREES FAHRENHEIT
```

```
7 KK        EXPS
                    INPUT HYDRO-DRAINAGE AREA TO EXPRESSWAY

5 IN          TIME DATA FOR INPUT TIME SERIES
                  JXMIN         15  TIME INTERVAL IN MINUTES
                 JXDATE    16DEC83  STARTING DATE
                 JXTIME          0  STARTING TIME
```

```
                SUBBASIN RUNOFF DATA

 9 BA           SUBBASIN CHARACTERISTICS
                     TAREA          1.00  SUBBASIN AREA

                PRECIPITATION DATA

10 PB                STORM          0.96  BASIN TOTAL PRECIPITATION

11 PI             INCREMENTAL PRECIPITATION PATTERN
                    0.00      0.00      0.00      0.00      0.00      0.08      0.39      0.18      0.13      0.09
                    0.07      0.04

13 LU           UNIFORM LOSS RATE
                     STRTL          0.00  INITIAL LOSS
                     CNSTL          0.00  UNIFORM LOSS RATE
                     RTIMP          0.00  PERCENT IMPERVIOUS AREA

13 UI           INPUT UNITGRAPH,  88 ORDINATES,  VOLUME = 0.97
                     0.0       2.0       3.0       6.0       8.0      12.0      18.0      27.0      36.0      45.0
                    56.0      76.0      86.0      88.0      90.0      86.0      76.0      68.0      62.0      58.0
                    56.0      54.0      52.0      49.0      47.0      45.0      44.0      42.0      41.0      40.0
                    38.0      37.0      36.0      35.0      34.0      34.0      33.0      32.0      31.0      31.0
                    30.0      30.0      29.0      29.0      28.0      28.0      28.0      27.0      27.0      26.0
                    26.0      25.0      24.0      24.0      23.0      23.0      22.0      21.0      20.0      20.0
                    19.0      19.0      18.0      17.0      17.0      16.0      15.0      15.0      14.0      13.0
                    13.0      12.0      11.0      10.0      10.0       9.0       8.0       8.0       7.0       6.0
                     6.0       5.0       4.0       4.0       3.0       2.0       2.0       1.0

                                                                   XXX

    XXX             XXX             XXX             XXX             XXX

                        HYDROGRAPH AT STATION     EXPS

     TOTAL RAINFALL =  0.96, TOTAL LOSS =  0.00, TOTAL EXCESS =  0.96

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR        24-HR       72-HR     19.75-HR
    81.       5.50        (CFS)      55.         29.         29.         29.
                         (INCHES)   0.507       0.897       0.897       0.897
                         (AC-FT)    27.         48.         48.         48.

                        CUMULATIVE AREA =    1.00 SQ MI

[illegible]

            XXXXXXXXXXXXXX
            X            X
 23 KK      X     EXPS   X
            X            X
            XXXXXXXXXXXXXX
                     STORAGE ROUTE UPSTREAM OF US-10

 25 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          3  PRINT CONTROL
```

```
                IPLOT          2  PLOT CONTROL
                QSCAL         0.  HYDROGRAPH PLOT SCALE

          HYDROGRAPH ROUTING DATA

26 RS        STORAGE ROUTING
                NSTPS          1  NUMBER OF SUBREACHES
                 ITYP       ELEV  TYPE OF INITIAL CONDITION
                RSVRIC     630.00  INITIAL CONDITION
                     X       0.00 WORKING R AND D COEFFICIENT

27 SV        STORAGE        0.0      0.1      0.3      0.5      1.0      1.5      2.5      4.0      6.1

28 SE        ELEVATION    630.00   634.70   635.00   635.25   635.60   635.85   636.10   636.30   636.68

29 SQ        DISCHARGE        0.       70.      80.      90.     105.     130.     150.     165.     210.     275.

30 SE        ELEVATION    630.00   634.61   634.83   635.07   635.52   635.92   636.22   636.39   637.01   637.89

                                                    XXX

                          COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

          STORAGE      0.00     0.10     0.10     0.17     0.25     0.32     0.50     0.89     1.00     1.50
          OUTFLOW      0.00    70.00    74.09    80.00    87.08    90.00    96.00   105.00   110.00   125.62
        ELEVATION    630.00   634.61   634.70   634.83   635.00   635.07   635.25   635.52   635.60   635.85

          STORAGE      1.78     2.50     3.40     4.00     4.50     6.10     7.92    12.79
          OUTFLOW    130.00   142.00   150.00   157.06   165.00   186.05   210.00   275.00
        ELEVATION    635.92   636.10   636.22   636.30   636.39   636.68   637.01   637.89

XXX WARNING XXX MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS BETWEEN        0. TO       74.
             THE ROUTED HYDROGRAPH SHOULD BE EXAMINED FOR OSCILLATIONS OR OUTFLOWS GREATER THAN PEAK INFLOWS.
             THIS CAN BE CORRECTED BY DECREASING THE TIME INTERVAL OR INCREASING STORAGE (USE A LONGER REACH.)

    XXX          XXX          XXX          XXX          XXX

                    HYDROGRAPH AT STATION     EXPS

PEAK FLOW     TIME                      MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR      24-HR      72-HR     19.75-HR
   80.        5.50       (CFS)      55.        29.        29.         29.
                       (INCHES)    0.507      0.896      0.896       0.896
                        (AC-FT)     27.        48.        48.         48.

PEAK STORAGE   TIME                      MAXIMUM AVERAGE STORAGE
  (AC-FT)      (HR)                 6-HR      24-HR      72-HR     19.75-HR
    0.         5.50                  0.         0.         0.          0.

PEAK STAGE     TIME                      MAXIMUM AVERAGE STAGE
  (FEET)       (HR)                 6-HR      24-HR      72-HR     19.75-HR
 634.84        5.50               633.52     631.91     631.91      631.91

                    CUMULATIVE AREA =     1.00 SQ MI
```

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XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX

          XXXXXXXXXXXXXX
          X            X
31 KK     X     WACK   X
          X            X
          XXXXXXXXXXXXXX
                    STORAGE ROUTE UPSTREAM OF WACKERLY

33 KO          OUTPUT CONTROL VARIABLES
                    IPRNT          3  PRINT CONTROL
                    IPLOT          2  PLOT CONTROL
                    QSCAL         0.  HYDROGRAPH PLOT SCALE

             HYDROGRAPH ROUTING DATA

34 RS          STORAGE ROUTING
                    NSTPS          1  NUMBER OF SUBREACHES
                     ITYP       ELEV  TYPE OF INITIAL CONDITION
                    RSVRIC     630.00  INITIAL CONDITION
                         X       0.00 WORKING R AND D COEFFICIENT

35 SV          STORAGE        0.0       0.2       0.7       1.0       1.6       2.6

36 SE          ELEVATION    630.00    633.00    635.00    636.00    637.00    638.00

37 SQ          DISCHARGE        0.        50.       80.      130.      200.      360.

38 SF          ELEVATION    630.00    633.00    635.00    636.00    637.00    638.00

                                                          XXX

                                  COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

          STORAGE       0.00      0.17      0.68      1.04      1.61      2.56
          OUTFLOW       0.00     50.00     80.00    130.00    200.00    360.00
        ELEVATION     630.00    633.00    635.00    636.00    637.00    638.00

XXX WARNING XXX MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS BETWEEN        0. TO      360.
              THE ROUTED HYDROGRAPH SHOULD BE EXAMINED FOR OSCILLATIONS OR OUTFLOWS GREATER THAN PEAK INFLOWS.
              THIS CAN BE CORRECTED BY DECREASING THE TIME INTERVAL OR INCREASING STORAGE (USE A LONGER REACH.)

     XXX            XXX            XXX            XXX            XXX

                     HYDROGRAPH AT STATION     WACK

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR     19.75-HR
    79.       5.75        (CFS)      55.         29.         29.         29.
                        (INCHES)   0.507       0.896       0.896       0.896
                         (AC-FT)     27.         48.         48.         48.

PEAK STORAGE  TIME                          MAXIMUM AVERAGE STORAGE
  (AC-FT)     (HR)                  6-HR       24-HR       72-HR     19.75-HR
     1.       5.75                   0.          0.          0.          0.
```

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	19.75-HR
634.96	5.75	633.33	631.77	631.77	631.77

CUMULATIVE AREA = 1.00 SQ MI

```
*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

              **************
 39 KK        *            *
              *    WACK    *
              *            *
              **************
                          INPUT HYDRO-DRAINAGE AREA TO DILLOWAY

  5 IN             TIME DATA FOR INPUT TIME SERIES
                         JXMIN           15  TIME INTERVAL IN MINUTES
                        JXDATE      16DEC83  STARTING DATE
                        JXTIME            0  STARTING TIME

                 SUBBASIN RUNOFF DATA

 41 BA             SUBBASIN CHARACTERISTICS
                         TAREA         0.39  SUBBASIN AREA

                   PRECIPITATION DATA

 42 PB                   STORM         0.54  BASIN TOTAL PRECIPITATION

 43 PI               INCREMENTAL PRECIPITATION PATTERN
                        0.00      0.00      0.00      0.00      0.00      0.18      0.15      0.07      0.05      0.04
                        0.03      0.02

 45 LU             UNIFORM LOSS RATE
                         STRTL         0.00  INITIAL LOSS
                         CNSTL         0.00  UNIFORM LOSS RATE
                         RTIMP         0.00  PERCENT IMPERVIOUS AREA

 45 UI             INPUT UNITGRAPH,  35 ORDINATES,  VOLUME = 2.35
                         0.5       1.0       3.0       5.0       7.0      12.0      20.0     105.0     167.0     195.0
                       200.0     199.0     178.0     156.0     136.0     122.0     102.0      92.0      84.0      77.0
                        68.0      61.0      54.0      49.0      43.0      41.0      37.0      32.0      29.0      25.0
                        21.0      17.0      12.0       9.0       5.0

                                                      ***

          ***          ***          ***          ***          ***

                      HYDROGRAPH AT STATION      WACK

           TOTAL RAINFALL =  0.54, TOTAL LOSS =  0.00, TOTAL EXCESS =  0.54

       PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
         (CFS)       (HR)                       6-HR         24-HR         72-HR      19.75-HR
           96.       4.50           (CFS)        50.           16.           16.           16.
                                  (INCHES)     1.194         1.257         1.257         1.257
                                   (AC-FT)       25.           26.           26.           26.

                        CUMULATIVE AREA =     0.39 SQ MI
```

```
50 KK      WACK

                    COMBINE HYDRO-DRAINAGE AREAS AT DILLOWAY

52 HC        HYDROGRAPH COMBINATION
                 ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                    XXX
   XXX          XXX          XXX          XXX          XXX

                  HYDROGRAPH AT STATION     WACK

PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR      24-HR      72-HR     19.75-HR
   155.       5.00        (CFS)    103.       45.        45.        45.
                        (INCHES)  0.886     0.997      0.997      0.997
                         (AC-FT)   51.       74.        74.        74.

                  CUMULATIVE AREA =    1.39 SQ MI
```

```
53 KK      DILL

                    STORAGE ROUTE UPSTREAM OF DILLOWAY

55 KO        OUTPUT CONTROL VARIABLES
                 IPRNT          1  PRINT CONTROL
                 IPLOT          2  PLOT CONTROL
                 QSCAL         0.  HYDROGRAPH PLOT SCALE

           HYDROGRAPH ROUTING DATA

56 RS        STORAGE ROUTING
                 NSTPS          1  NUMBER OF SUBREACHES
                  ITYP       ELEV  TYPE OF INITIAL CONDITION
                RSVRIC     624.00  INITIAL CONDITION
                     X       0.00 WORKING R AND D COEFFICIENT

57 SV          STORAGE        0.0       0.2       5.2       8.6      16.1      24.0

58 SE        ELEVATION     624.00    628.00    632.00    633.00    634.00    635.00

59 SQ        DISCHARGE        0.        60.       170.      220.      400.      1100.
```

60 SP ELEVATION 624.00 628.00 632.00 633.00 634.00 635.00

COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	0.00	0.20	5.20	8.60	16.10	24.00
OUTFLOW	0.00	60.00	170.00	220.00	400.00	1100.00
ELEVATION	624.00	628.00	632.00	633.00	634.00	635.00

*** WARNING *** MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS BETWEEN 0. TO 60.
THE ROUTED HYDROGRAPH SHOULD BE EXAMINED FOR OSCILLATIONS OR OUTFLOWS GREATER THAN PEAK INFLOWS.
THIS CAN BE CORRECTED BY DECREASING THE TIME INTERVAL OR INCREASING STORAGE (USE A LONGER REACH.)

HYDROGRAPH AT STATION DILL

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
16	DEC	0000	1	0.	0.0	624.0	16	DEC	0645	28	121.	3.0	630.2	16	DEC	1330	55	27.	0.1	625.8
16	DEC	0015	2	0.	0.0	624.0	16	DEC	0700	29	112.	2.6	629.9	16	DEC	1345	56	26.	0.1	625.8
16	DEC	0030	3	0.	0.0	624.0	16	DEC	0715	30	104.	2.2	629.6	16	DEC	1400	57	26.	0.1	625.7
16	DEC	0045	4	0.	0.0	624.0	16	DEC	0730	31	96.	1.9	629.3	16	DEC	1415	58	26.	0.1	625.7
16	DEC	0100	5	0.	0.0	624.0	16	DEC	0745	32	90.	1.5	629.1	16	DEC	1430	59	25.	0.1	625.7
16	DEC	0115	6	0.	0.0	624.0	16	DEC	0800	33	83.	1.2	628.8	16	DEC	1445	60	24.	0.1	625.6
16	DEC	0130	7	0.	0.0	624.0	16	DEC	0815	34	77.	1.0	628.6	16	DEC	1500	61	24.	0.1	625.6
16	DEC	0145	8	0.	0.0	624.0	16	DEC	0830	35	72.	0.8	628.4	16	DEC	1515	62	23.	0.1	625.5
16	DEC	0200	9	1.	0.0	624.1	16	DEC	0845	36	67.	0.5	628.3	16	DEC	1530	63	23.	0.1	625.5
16	DEC	0215	10	3.	0.0	624.2	16	DEC	0900	37	63.	0.4	628.1	16	DEC	1545	64	22.	0.1	625.5
16	DEC	0230	11	5.	0.0	624.3	16	DEC	0915	38	58.	0.2	627.8	16	DEC	1600	65	21.	0.1	625.4
16	DEC	0245	12	8.	0.0	624.6	16	DEC	0930	39	50.	0.1	627.0	16	DEC	1615	66	21.	0.1	625.4
16	DEC	0300	13	13.	0.0	624.9	16	DEC	0945	40	46.	0.2	627.1	16	DEC	1630	67	20.	0.1	625.3
16	DEC	0315	14	31.	0.1	626.0	16	DEC	1000	41	41.	0.1	626.7	16	DEC	1645	68	19.	0.1	625.3
16	DEC	0330	15	60.	0.2	628.0	16	DEC	1015	42	39.	0.1	626.6	16	DEC	1700	69	19.	0.1	625.3
16	DEC	0345	16	68.	0.6	628.3	16	DEC	1030	43	36.	0.1	626.4	16	DEC	1715	70	18.	0.1	625.2
16	DEC	0400	17	82.	1.2	628.8	16	DEC	1045	44	34.	0.1	626.3	16	DEC	1730	71	18.	0.1	625.2
16	DEC	0415	18	98.	1.9	629.4	16	DEC	1100	45	33.	0.1	626.2	16	DEC	1745	72	17.	0.1	625.1
16	DEC	0430	19	114.	2.7	630.0	16	DEC	1115	46	32.	0.1	626.1	16	DEC	1800	73	16.	0.1	625.1
16	DEC	0445	20	127.	3.3	630.4	16	DEC	1130	47	31.	0.1	626.0	16	DEC	1815	74	16.	0.1	625.0
16	DEC	0500	21	137.	3.7	630.8	16	DEC	1145	48	30.	0.1	626.0	16	DEC	1830	75	15.	0.1	625.0
16	DEC	0515	22	143.	4.0	631.0	16	DEC	1200	49	29.	0.1	626.0	16	DEC	1845	76	15	0.0	625.0
16	DEC	0530	23	146.	4.1	631.1	16	DEC	1215	50	29.	0.1	625.9	16	DEC	1900	77	14.	0.0	624.9
16	DEC	0545	24	145.	4.1	631.1	16	DEC	1230	51	28.	0.1	625.9	16	DEC	1915	78	13.	0.0	624.9
16	DEC	0600	25	142.	3.9	631.0	16	DEC	1245	52	28.	0.1	625.9	16	DEC	1930	79	13	0.0	624.8
16	DEC	0615	26	137.	3.7	630.8	16	DEC	1300	53	28.	0.1	625.8	16	DEC	1945	80	12.	0.0	624.8
16	DEC	0630	27	129.	3.3	630.5	16	DEC	1315	54	27.	0.1	625.8							

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	19.75-HR
146.	5.50	(CFS)	103.	45.	45	45.
		(INCHES)	0.687	0.996	0.996	0.996
		(AC-FT)	51.	74.	74.	74.

PEAK STORAGE TIME MAXIMUM AVERAGE STORAGE

(AC-FT)	(HR)	6-HR	24-HR	72-HR	19.75-HR
4.	5.50	2.	1.	1.	1.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	19.75-HR
631.12	5.50	629.54	626.62	626.62	626.62

CUMULATIVE AREA = 1.39 SQ MI

```
XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX

          XXXXXXXXXXXXXX
          X            X
61 KK     X     DILL   X
          X            X
          XXXXXXXXXXXXXX
                    INPUT HYDRO-DRAINAGE  AREA TO SYLVAN

 5 IN          TIME DATA FOR INPUT TIME SERIES
                    JXMIN          15  TIME INTERVAL IN MINUTES
                   JXDATE     16DEC83  STARTING DATE
                   JXTIME           0  STARTING TIME

             SUBBASIN RUNOFF DATA

63 BA          SUBBASIN CHARACTERISTICS
                    TAREA        0.21  SUBBASIN AREA

               PRECIPITATION DATA

64 PB               STORM        0.27  BASIN TOTAL PRECIPITATION

65 PI            INCREMENTAL PRECIPITATION PATTERN
                   0.00      0.00      0.00      0.00      0.00      0.09      0.08      0.04      0.03      0.02
                   0.01      0.01

67 LU          UNIFORM LOSS RATE
                    STRTL        0.00  INITIAL LOSS
                    CNSTL        0.00  UNIFORM LOSS RATE
                    RTIMP        0.00  PERCENT IMPERVIOUS AREA

67 UI          INPUT UNITGRAPH,  27 ORDINATES,  VOLUME = 4.55
                    0.0       8.0      24.0      75.0     153.0     290.0     293.0     274.0     244.0     204.0
                  165.0     134.0     110.0      89.0      73.0      58.0      50.0      44.0      38.0      33.0
                   28.0      24.0      20.0      14.0      11.0       7.0       2.0

                                                                XXX

    XXX            XXX            XXX            XXX            XXX

                     HYDROGRAPH AT STATION     DILL

     TOTAL RAINFALL =  0.27, TOTAL LOSS =  0.00, TOTAL EXCESS =  0.27

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR     19.75-HR
    65.       3.50        (CFS)      28.          8.          8.          8.
                        (INCHES)   1.221       1.232       1.232       1.232
                         (AC-FT)     14          14.         14.         14.

                     CUMULATIVE AREA =    0.21 SQ MI
```

```
                 XXXXXXXXXXXXXX
                 X            X
 71 KK           X     DILL   X
                 X            X
                 XXXXXXXXXXXXXX
                          INPUT HYDRO-DRAINAGE AREA TO WHEELER

  5 IN          TIME DATA FOR INPUT TIME SERIES
                     JXMIN          15  TIME INTERVAL IN MINUTES
                    JXDATE     16DEC83  STARTING DATE
                    JXTIME           0  STARTING TIME

               SUBBASIN RUNOFF DATA

 73 BA          SUBBASIN CHARACTERISTICS
                     TAREA        0.34  SUBBASIN AREA

                PRECIPITATION DATA

 74 PB               STORM        0.45  BASIN TOTAL PRECIPITATION

 75 PI            INCREMENTAL PRECIPITATION PATTERN
                    0.00      0.00      0.00      0.00      0.00      0.15      0.13      0.06      0.04      0.03
                    0.02      0.01

 77 LU          UNIFORM LOSS RATE
                     STRTL        0.00  INITIAL LOSS
                     CNSTL        0.00  UNIFORM LOSS RATE
                     RTIMP        0.00  PERCENT IMPERVIOUS AREA

 77 UI          INPUT UNITGRAPH,  23 ORDINATES,  VOLUME = 3.00
                     0.0      17.0      53.0     158.0     350.0     395.0     356.0     298.0     225.0     159.0
                   114.0      93.0      79.0      67.0      59.0      50.0      45.0      37.0      30.0      22.0
                    15.0       9.0       3.0

                                                                XXX

     XXX            XXX            XXX            XXX            XXX

                       HYDROGRAPH AT STATION     DILL

      TOTAL RAINFALL =  0.45, TOTAL LOSS =  0.00, TOTAL EXCESS =  0.45

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR     19.75-HR
    137.       3.25       (CFS)       50.         15.         15.         15.
                        (INCHES)    1.363       1.366       1.366       1.366
                         (AC-FT)      25.         25.         25.         25.

                       CUMULATIVE AREA =    0.34 SQ MI
```

```
81 KK    DILL

         COMBINE HYDRO-DRAINAGE AREAS AT WHEELER

83 HC    HYDROGRAPH COMBINATION
              ICOMP          3  NUMBER OF HYDROGRAPHS TO COMBINE

                                                        XXX

   XXX            XXX            XXX            XXX            XXX

              HYDROGRAPH AT STATION     DILL

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR        24-HR        72-HR      19.75-HR
   213.       3.50       (CFS)     169.         69.          69.          69.
                       (INCHES)   0.811        1.087        1.087        1.087
                        (AC-FT)    84.         112.         112.         112.

              CUMULATIVE AREA =    1.94 SQ MI
```

```
84 KK    WHEEL

         STORAGE ROUTE UPSTREAM OF WHEELER

86 KO    OUTPUT CONTROL VARIABLES
              IPRNT          1  PRINT CONTROL
              IPLOT          2  PLOT CONTROL
              QSCAL         0.  HYDROGRAPH PLOT SCALE

         HYDROGRAPH ROUTING DATA

87 RS    STORAGE ROUTING
              NSTPS          1  NUMBER OF SUBREACHES
               ITYP       ELEV  TYPE OF INITIAL CONDITION
             RSVRIC     617.00  INITIAL CONDITION
                  X       0.00  WORKING R AND D COEFFICIENT

88 SV      STORAGE        0.0       2.0       6.3      12.8      20.1      45.0      57.0      70.0

89 SE    ELEVATION     617.00    625.00    627.00    628.00    629.00    630.00    630.50    631.00

90 SQ    DISCHARGE        0.        80.       240.      300.      360.      430.      600.      730.

91 OR    ELEVATION     617.00    625.00    627.00    628.00    629.00    630.00    630.50    631.00

                                                        XXX
```

COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	0.00	2.00	6.30	12.80	25.10	45.00	57.00	70.00
OUTFLOW	0.00	80.00	240.00	300.00	360.00	430.00	600.00	730.00
ELEVATION	617.00	625.00	627.00	628.00	629.00	630.00	630.50	631.00

HYDROGRAPH AT STATION WREFL

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
16	DEC	0000	1	0.	0.0	617.0	16	DEC	0645	28	154.	4.0	625.9	16	DEC	1330	55	27.	0.7	619.7
16	DEC	0015	2	0.	0.0	617.0	16	DEC	0700	29	142.	3.7	625.8	16	DEC	1345	56	27.	0.7	619.7
16	DEC	0030	3	0.	0.0	617.0	16	DEC	0715	30	129.	3.3	625.6	16	DEC	1400	57	26.	0.7	619.6
16	DEC	0045	4	0.	0.0	617.0	16	DEC	0730	31	118.	3.0	625.5	16	DEC	1415	58	26.	0.7	619.6
16	DEC	0100	5	0	0.0	617.0	16	DEC	0745	32	107.	2.7	625.3	16	DEC	1430	59	26.	0.6	619.6
16	DEC	0115	6	0.	0.0	617.0	16	DEC	0800	33	98.	2.5	625.2	16	DEC	1445	60	25.	0.6	619.5
16	DEC	0130	7	0.	0.0	617.0	16	DEC	0815	34	89.	2.2	625.1	16	DEC	1500	61	24.	0.6	619.4
16	DEC	0145	8	1.	0.0	617.1	16	DEC	0830	35	82.	2.0	625.0	16	DEC	1515	62	24.	0.6	619.4
16	DEC	0200	9	6.	0.1	617.6	16	DEC	0845	36	75.	1.9	624.5	16	DEC	1530	63	23.	0.6	619.3
16	DEC	0215	10	19.	0.5	618.9	16	DEC	0900	37	70.	1.7	624.0	16	DEC	1545	64	23.	0.6	619.3
16	DEC	0230	11	51.	1.3	622.1	16	DEC	0915	38	64.	1.6	623.4	16	DEC	1600	65	22.	0.6	619.2
16	DEC	0245	12	99.	2.5	625.2	16	DEC	0930	39	57.	1.4	622.7	16	DEC	1615	66	22.	0.5	619.2
16	DEC	0300	13	148.	3.8	625.8	16	DEC	0945	40	50.	1.3	622.0	16	DEC	1630	67	21.	0.5	619.1
16	DEC	0315	14	187	4.9	626.3	16	DEC	1000	41	45.	1.2	621.6	16	DEC	1645	68	20.	0.5	619.0
16	DEC	0330	15	217.	5.7	626.7	16	DEC	1015	42	42.	1.1	621.2	16	DEC	1700	69	20.	0.5	619.0
16	DEC	0345	16	234.	6.1	626.9	16	DEC	1030	43	39.	1.0	620.9	16	DEC	1715	70	19.	0.5	618.9
16	DEC	0400	17	234.	6.1	626.9	16	DEC	1045	44	37.	0.9	620.7	16	DEC	1730	71	18.	0.5	618.8
16	DEC	0415	18	229.	6.0	626.9	16	DEC	1100	45	35.	0.9	620.5	16	DEC	1745	72	18.	0.4	618.8
16	DEC	0430	19	222.	5.8	626.8	16	DEC	1115	46	33.	0.8	620.3	16	DEC	1800	73	17.	0.4	618.7
16	DEC	0445	20	216.	5.7	626.7	16	DEC	1130	47	32.	0.8	620.2	16	DEC	1815	74	17.	0.4	618.7
16	DEC	0500	21	210.	5.5	626.6	16	DEC	1145	48	31.	0.8	620.1	16	DEC	1830	75	16.	0.4	618.6
16	DEC	0315	22	203	5.4	626.6	16	DEC	1200	49	30.	0.8	620.0	16	DEC	1845	76	15.	0.4	618.5
16	DEC	0530	23	199	5.2	626.5	16	DEC	1215	50	30.	0.7	620.0	16	DEC	1900	77	15.	0.4	618.5
16	DEC	0545	24	193.	5.0	626.4	16	DEC	1230	51	29.	0.7	619.9	16	DEC	1915	78	14.	0.3	618.4
16	DEC	0600	25	185.	4.8	626.3	16	DEC	1245	52	29.	0.7	619.9	16	DEC	1930	79	13.	0.3	618.3
16	DEC	0615	26	176.	4.6	626.2	16	DEC	1300	53	28.	0.7	619.8	16	DEC	1945	80	13.	0.3	618.3
16	DEC	0630	27	166.	4.3	626.1	16	DEC	1315	54	28.	0.7	619.8							

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	19.75-HR
234.	4.00	(CFS)	168.	69.	69.	69.
		(INCHES)	0.804	1.083	1.083	1.083
		(AC-FT)	83.	112.	112.	112.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	19.75-HR
6.	4.00	4.	2.	2.	2.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	19.75-HR
626.93	4.00	626.09	621.52	621.52	621.52

CUMULATIVE AREA = 1.94 SQ MI

```
92 KK    WHEEL

                    DIVERT FLOW TO MEADOWBROOK

DT        DIVERSION
                ISTAQ       QFLO  DIVERSION HYDROGRAPH IDENTIFICATION

DI            INFLOW       0.00    410.00    460.00    520.00    600.00    680.00    730.00

DQ      DIVERTED FLOW      0.00      0.00     40.00     60.00    120.00    190.00    230.00

                                                          XXX

 XXX          XXX          XXX          XXX          XXX

                  DIVERSION HYDROGRAPH     QFLO

PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR      24-HR     72-HR    19.75-HR
    0.        0.25       (CFS)      0.        0.        0.        0.
                       (INCHES)   0.000     0.000     0.000     0.000
                        (AC-FT)      0.        0.        0.        0.

                  CUMULATIVE AREA =    1.94 SQ MI

 XXX          XXX          XXX          XXX          XXX

                  HYDROGRAPH AT STATION    WHEEL

PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR      24-HR     72-HR    19.75-HR
  234.        4.00       (CFS)    168.       69.       69.       69.
                       (INCHES)   0.804     1.083     1.083     1.083
                        (AC-FT)     83.      112.      112.      112.

                  CUMULATIVE AREA =    1.94 SQ MI

97 KK    WHEEL

                    INPUT HYDRO-DRAINAGE AREA SOUTH OF WHEELER
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  5 IN        TIME DATA FOR INPUT TIME SERIES
                  JXMIN          15  TIME INTERVAL IN MINUTES
                  JXDATE    16DEC83  STARTING DATE
                  JXTIME          0  STARTING TIME

            SUBBASIN RUNOFF DATA

 99 BA        SUBBASIN CHARACTERISTICS
                  TAREA        0.57  SUBBASIN AREA

              PRECIPITATION DATA

100 PB            STORM        0.25  BASIN TOTAL PRECIPITATION

101 PI          INCREMENTAL PRECIPITATION PATTERN
                  0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.06      0.07      0.05
                  0.04      0.03

103 LU        UNIFORM LOSS RATE
                  STRTL        0.00  INITIAL LOSS
                  CNSTL        0.00  UNIFORM LOSS RATE
                  RTIMP        0.00  PERCENT IMPERVIOUS AREA

103 UI        INPUT UNITGRAPH,  33 ORDINATES,  VOLUME = 1.78
                   0.0       5.0      15.0      39.0      70.0     118.0     185.0     234.0     240.0     234.0
                 223.0     202.0     169.0     141.0     117.0      98.0      77.0      63.0      55.0      50.0
                  45.0      41.0      36.0      33.0      29.0      25.0      21.0      18.0      15.0      12.0
                   8.0       5.0       2.0

                                                ***

       ***         ***         ***         ***         ***

                  HYDROGRAPH AT STATION     WHEEL

     TOTAL RAINFALL =  0.25, TOTAL LOSS =  0.00, TOTAL EXCESS =  0.25

PEAK FLOW     TIME                            MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                    6-HR        24-HR       72-HR     19.75-HR
      56.     4.50       (CFS)         26.           8.          8.          8.
               (INCHES)    0.424       0.441       0.441       0.441
                (AC-FT)      13.         13.         13.         13.

                    CUMULATIVE AREA =     0.57 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

           ***************
           *             *
103 KK     *    WHEEL    *
           *             *
           ***************
                    COMBINE HYDRO SOUTH OF WHEELER

110 HC        HYDROGRAPH COMBINATION
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ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                      ***

    ***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION    WHEEL

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR      72-HR     19.75-HR
    282.       4.25        (CFS)     194.        77.        77.         77.
                        (INCHES)    0.718      0.938      0.938       0.938
                         (AC-FT)      96.       126.       126.        126.

                    CUMULATIVE AREA =    2.51 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            ***************
            *             *
 111 KK     *    CONFL    *
            *             *
            ***************
                    CHANNEL ROUTE SIEBERT TO CONFLUENCE SECTION 1330

 113 KO          OUTPUT CONTROL VARIABLES
                      IPRNT         3  PRINT CONTROL
                      IPLOT         2  PLOT CONTROL
                      QSCAL        0.  HYDROGRAPH PLOT SCALE

             HYDROGRAPH ROUTING DATA

 114 RS          STORAGE ROUTING
                      NSTPS         1  NUMBER OF SUBREACHES
                      ITYP       STOR  TYPE OF INITIAL CONDITION
                     RSVRIC     -1.00  INITIAL CONDITION
                          X      0.00 WORKING R AND D COEFFICIENT

 115 RC          NORMAL DEPTH CHANNEL ROUTING
                        ANL     0.060  LEFT OVERBANK N-VALUE
                       ANCH     0.045  MAIN CHANNEL N-VALUE
                        ANR     0.060  RIGHT OVERBANK N-VALUE
                      RLNTH     2200.  REACH LENGTH
                        SEL    0.0010  ENERGY SLOPE
                      ELMAX       0.0  MAX. ELEV. FOR STORAGE/OUTFLOW CALCULATION

                                 CROSS-SECTION DATA
                      --- LEFT OVERBANK --- + ------ MAIN CHANNEL ------- + --- RIGHT OVERBANK ---
 117 RY     ELEVATION   620.00    619.20    616.50    612.60    612.60    616.80    617.90    620.00
 116 RX     DISTANCE      6.00     13.00     43.00     47.00     53.00     60.00    150.00    229.00

                                                      ***

                              COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

         STORAGE      0.00      0.13      0.28      0.45      0.64      0.85      1.08      1.33      1.60      1.90
```

OUTFLOW	0.00	1.31	4.23	8.57	14.23	21.31	29.83	39.84	51.42	64.65
ELEVATION	612.60	612.99	613.38	613.77	614.16	614.55	614.94	615.33	615.72	616.11
STORAGE	2.21	2.60	3.51	5.13	7.44	10.18	13.30	16.79	20.64	24.85
OUTFLOW	79.58	98.56	124.95	162.88	218.11	293.23	386.95	500.36	635.22	791.82
ELEVATION	616.49	616.88	617.27	617.66	618.05	618.44	618.83	619.22	619.61	620.00

XXX XXX XXX XXX XXX

HYDROGRAPH AT STATION CONFL

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	19.75-HR
270.	4.75	(CFS)	192.	77.	77.	77.
		(INCHES)	0.713	0.933	0.933	0.933
		(AC-FT)	95.	125.	125.	125.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	19.75-HR
9.	4.75	6.	3.	3.	3.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	19.75-HR
618.32	4.75	617.78	615.52	615.52	615.52

CUMULATIVE AREA = 2.51 SQ MI

```
XXXXXXXXXXXXXXX
X             X
118 KK     X      SAG   X
X             X
XXXXXXXXXXXXXXX
                    INPUT HYDRO-MEADOWBROOK DRAIN

  5 IN          TIME DATA FOR INPUT TIME SERIES
                     JXMIN          15  TIME INTERVAL IN MINUTES
                    JXDATE     16DEC83  STARTING DATE
                    JXTIME           0  STARTING TIME

              SUBBASIN RUNOFF DATA

120 BA          SUBBASIN CHARACTERISTICS
                     TAREA        1.27  SUBBASIN AREA

                PRECIPITATION DATA

121 PB               STORM        1.70  BASIN TOTAL PRECIPITATION

122 PI            INCREMENTAL PRECIPITATION PATTERN
                    0.00      0.00      0.00      0.00      0.00      0.56      0.49      0.23      0.16      0.12
                    0.08      0.06

124 LU          UNIFORM LOSS RATE
                     STRTL        0.00  INITIAL LOSS
                     CNSTL        0.00  UNIFORM LOSS RATE
                     RTIMP        0.00  PERCENT IMPERVIOUS AREA

124 UI          INPUT UNITGRAPH,  38 ORDINATES,  VOLUME = 0.81
                     0.0       4.0      11.0      22.0      47.0      85.0     131.0     188.0     211.0     220.0
                   216.0     204.0     186.0     168.0     146.0     127.0     110.0      88.0      71.0      58.0
                    49.0      44.0      39.0      34.0      31.0      28.0      24.0      22.0      20.0      17.0
                    15.0      13.0      11.0       9.0       7.0       5.0       3.0       2.0

                                                                XXX

    XXX            XXX            XXX            XXX            XXX

                       HYDROGRAPH AT STATION      SAG

     TOTAL RAINFALL =  1.70, TOTAL LOSS =  0.00, TOTAL EXCESS =  1.70

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR     19.75-HR
   342.       4.25        (CFS)     177.         57.         57.         57.
                        (INCHES)   1.297       1.379       1.379       1.379
                         (AC-FT)     88.         93.         93.         93.

                       CUMULATIVE AREA =    1.27 SQ MI
```

```
129 KK      SAG

                    RETRIEVE DIVERTED FLOW AT WHEELER

131 DR          RETRIEVE DIVERSION HYDROGRAPH
                    ISTAD        OFLO  DIVERSION HYDROGRAPH IDENTIFICATION

                                                                  XXX

     XXX            XXX            XXX            XXX            XXX

                    HYDROGRAPH AT STATION      SAG

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR     19.75-HR
     0.       0.25       (CFS)       0.          0.          0.          0.
                       (INCHES)    0.000       0.000       0.000       0.000
                        (AC-FT)      0.          0.          0.          0.

                    CUMULATIVE AREA =    0.00 SQ MI


132 KK      SAG

                    ADD MEADOWBROOK AND DIVERSION HYDROS

134 HC          HYDROGRAPH COMBINATION
                    ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                  XXX

     XXX            XXX            XXX            XXX            XXX

                    HYDROGRAPH AT STATION      SAG

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR     19.75-HR
    342       4.25       (CFS)     177.         57.         57.         57.
                       (INCHES)    1.297       1.379       1.379       1 379
                        (AC-FT)      88.         93.         93.         93.

                    CUMULATIVE AREA =    1.27 SQ MI
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                 XXXXXXXXXXXXXX
                 X            X
135 KK           X    CONFL   X
                 X            X
                 XXXXXXXXXXXXXX
                          ROUTE TO CONFLUENCE  - SECTION 200

137 KO           OUTPUT CONTROL VARIABLES
                      IPRNT          1  PRINT CONTROL
                      IPLOT          2  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE

              HYDROGRAPH ROUTING DATA

133 RS           STORAGE ROUTING
                      NSTPS          1  NUMBER OF SUBREACHES
                       ITYP       STOR  TYPE OF INITIAL CONDITION
                     RSVRIC      -1.00  INITIAL CONDITION
                          X       0.00 WORKING R AND D COEFFICIENT

139 RC           NORMAL DEPTH CHANNEL ROUTING
                        ANL      0.070  LEFT OVERBANK N-VALUE
                       ANCH      0.045  MAIN CHANNEL N-VALUE
                        ANR      0.070  RIGHT OVERBANK N-VALUE
                      RLNTH      3500.  REACH LENGTH
                        SEL     0.0010  ENERGY SLOPE
                      ELMAX        0.0  MAX. ELEV. FOR STORAGE/OUTFLOW CALCULATION

                                  CROSS-SECTION DATA
                        --- LEFT OVERBANK --- + ------ MAIN CHANNEL ------- + --- RIGHT OVERBANK ---
141 RY        ELEVATION   620.90    619.10    616.80    611.90    611.90    616.30    619.00    620.90
140 RX        DISTANCE      0.00     50.00    118.00    127.00    132.00    142.00    230.00    240.00

                                                          XXX

                                  COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

          STORAGE       0.00      0.23      0.53      0.90      1.35      1.88      2.48      3.15      3.89      4.71
          OUTFLOW       0.00      1.59      5.46     11.62     20.29     31.72     46.16     63.85     85.03    109.93
        ELEVATION     611.90    612.37    612.85    613.32    613.79    614.27    614.74    615.22    615.69    616.16

          STORAGE       5.75      7.48     10.31     14.26     19.33     25.52     32.57     40.22     48.46     57.30
          OUTFLOW     141.70    184.36    240.96    314.72    409.41    528.46    683.93    866.58   1076.88   1315.59
        ELEVATION     616.64    617.11    617.58    618.06    618.53    619.01    619.48    619.95    620.43    620.90

                                  HYDROGRAPH AT STATION    CONFL

DA MON HRMN ORD  OUTFLOW  STORAGE   STAGE  DA MON HRMN ORD  OUTFLOW  STORAGE   STAGE  DA MON HRMN ORD  OUTFLOW  STORAGE   STAGE
16 DEC 0000  1       0.       0.0   611.9  16 DEC 0645  28     152.       6.2   616.8  16 DEC 1330  55       1.       0.2   612.2
```

16 DEC	0015	2	0.	0.0	611.9	*	16 DEC	0700	29	125.	5.2	616.4	*	16 DEC	1345	56	1.	0.1	612.2
16 DEC	0030	3	0.	0.0	611.9	*	16 DEC	0715	30	103.	4.5	616.0	*	16 DEC	1400	57	1.	0.1	612.2
16 DEC	0045	4	0.	0.0	611.9	*	16 DEC	0730	31	87.	4.0	615.7	*	16 DEC	1415	58	1.	0.1	612.1
16 DEC	0100	5	0.	0.0	611.9	*	16 DEC	0745	32	75.	3.5	615.5	*	16 DEC	1430	59	1.	0.1	612.1
16 DEC	0115	6	0.	0.0	611.9	*	16 DEC	0800	33	66.	3.2	615.3	*	16 DEC	1445	60	1.	0.1	612.1
16 DEC	0130	7	0.	0.0	611.9	*	16 DEC	0815	34	58.	2.9	615.1	*	16 DEC	1500	61	0.	0.1	612.0
16 DEC	0145	8	0.	0.0	611.9	*	16 DEC	0830	35	51.	2.7	614.9	*	16 DEC	1515	62	0.	0.1	612.0
16 DEC	0200	9	1.	0.1	612.1	*	16 DEC	0845	36	46.	2.5	614.7	*	16 DEC	1530	63	0.	0.1	612.0
16 DEC	0215	10	3.	0.4	612.6	*	16 DEC	0900	37	41.	2.3	614.6	*	16 DEC	1545	64	0.	0.0	612.0
16 DEC	0230	11	10.	0.8	613.2	*	16 DEC	0915	38	37.	2.1	614.4	*	16 DEC	1600	65	0.	0.0	612.0
16 DEC	0245	12	27.	1.7	614.1	*	16 DEC	0930	39	32.	1.9	614.3	*	16 DEC	1615	66	0.	0.0	612.0
16 DEC	0300	13	58.	2.9	615.1	*	16 DEC	0945	40	27.	1.7	614.1	*	16 DEC	1630	67	0.	0.0	612.0
16 DEC	0315	14	108	4.6	616.1	*	16 DEC	1000	41	25.	1.6	614.0	*	16 DEC	1645	68	0.	0.0	612.0
16 DEC	0330	15	163.	6.6	616.9	*	16 DEC	1015	42	22.	1.4	613.8	*	16 DEC	1700	69	0.	0.0	611.9
16 DEC	0345	16	208.	8.7	617.3	*	16 DEC	1030	43	18.	1.3	613.7	*	16 DEC	1715	70	0.	0.0	611.9
16 DEC	0400	17	246.	10.6	617.6	*	16 DEC	1045	44	15.	1.1	613.5	*	16 DEC	1730	71	0.	0.0	611.9
16 DEC	0415	18	275.	12.2	617.8	*	16 DEC	1100	45	12.	0.9	613.4	*	16 DEC	1745	72	0.	0.0	611.9
16 DEC	0430	19	296.	13.3	617.9	*	16 DEC	1115	46	10.	0.8	613.2	*	16 DEC	1800	73	0.	0.0	611.9
16 DEC	0445	20	307.	13.8	618.0	*	16 DEC	1130	47	7.	0.6	613.0	*	16 DEC	1815	74	0.	0.0	611.9
16 DEC	0500	21	307.	13.8	618.0	*	16 DEC	1145	48	6.	0.5	612.9	*	16 DEC	1830	75	0.	0.0	611.9
16 DEC	0515	22	298.	13.4	618.0	*	16 DEC	1200	49	4.	0.4	612.7	*	16 DEC	1845	76	0.	0.0	611.9
16 DEC	0530	23	283.	12.5	617.9	*	16 DEC	1215	50	3.	0.4	612.6	*	16 DEC	1900	77	0.	0.0	611.9
16 DEC	0545	24	262.	11.4	617.7	*	16 DEC	1230	51	3.	0.3	612.5	*	16 DEC	1915	78	0.	0.0	611.9
16 DEC	0600	25	237.	10.1	617.6	*	16 DEC	1245	52	2.	0.3	612.4	*	16 DEC	1930	79	0.	0.0	611.9
16 DEC	0615	26	209.	8.7	617.3	*	16 DEC	1300	53	2.	0.2	612.4	*	16 DEC	1945	80	0.	0.0	611.9
16 DEC	0630	27	182.	7.4	617.1	*	16 DEC	1315	54	1.	0.2	612.3	*						
						*							*						

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	19.75-HR
307	5.00	(CFS)	175.	57.	57.	57.
		(INCHES)	1.279	1.379	1.379	1.379
		(AC-FT)	87.	93.	93.	93.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	19.75-HR
14.	5.00	8.	3.	3.	3.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	19.75-HR
618.01	5.00	616.68	613.77	613.77	613.77

CUMULATIVE AREA = 1.27 SQ MI

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	EXPS	81.	5.50	55.	29.	29.	1.00		
ROUTED TO	EXPS	80.	5.50	55.	29.	29.	1.00	634.84	5.50
ROUTED TO	WACK	79.	5.75	55.	29.	29.	1.00	634.96	5.75
HYDROGRAPH AT	WACK	96.	4.50	50.	16.	16.	0.39		
2 COMBINED AT	WACK	155.	5.00	103.	45.	45.	1.39		
ROUTED TO	DILL	146.	5.50	103.	45.	45.	1.39	631.12	5.50
HYDROGRAPH AT	DILL	65.	3.50	28.	8.	8.	0.21		
HYDROGRAPH AT	DILL	137.	3.25	50.	15.	15.	0.34		
3 COMBINED AT	DILL	253.	3.50	169.	69.	69.	1.94		
ROUTED TO	WHEEL	234.	4.00	168.	69.	69.	1.94	626.93	4.00
DIVERSION TO	OFLO	0.	4.00	0.	0.	0.	1.94		
HYDROGRAPH AT	WHEEL	234.	4.00	168.	69.	69.	1.94		
HYDROGRAPH AT	WHEEL	56.	4.50	26.	8.	8.	0.57		
2 COMBINED AT	WHEEL	282.	4.25	194.	77.	77.	2.51		
ROUTED TO	CONFL	270.	4.75	192.	77.	77.	2.51	618.32	4.75
HYDROGRAPH AT	SAG	342.	4.25	177.	57.	57.	1.27		
HYDROGRAPH AT	SAG	0.	0.25	0.	0.	0.	0.00		
2 COMBINED AT	SAG	342.	4.25	177.	57.	57.	1.27		
ROUTED TO	CONFL	307.	5.00	175.	57.	57.	1.27	618.01	5.00

XXX NORMAL END OF HEC-1 XXX

00BREAK00

1) COUNTY: Midland

2) STUDY NAME: City of Midland

3) WATERCOURSE: Tittabawassee, Chippewa, Sturgeon, Inman Drain, Snake Creek

4) DOCUMENT TYPE: 100yr.

00BREAK00

McNamee, Porter & Seeley ! Engineers / Architects ! Ann Arbor, Michigan

```
RRRRRRRR    UU      UU  DDDDDDDD    YY      YY
RRRRRRRR    UU      UU  DDDDDDDD    YY      YY
RR      RR  UU      UU  DD      DD  YY      YY
RR      RR  UU      UU  DD      DD  YY      YY
RR      RR  UU      UU  DD      DD    YY  YY
RR      RR  UU      UU  DD      DD    YY  YY
RRRRRRRR    UU      UU  DD      DD      YY
RRRRRRRR    UU      UU  DD      DD      YY
RR  RR      UU      UU  DD      DD      YY
RR  RR      UU      UU  DD      DD      YY
RR    RR    UU      UU  DD      DD      YY
RR    RR    UU      UU  DD      DD      YY
RR      RR  UUUUUUUUUU  DDDDDDDD        YY
RR      RR  UUUUUUUUUU  DDDDDDDD        YY

 SSSS  N   N        55555   000    000
S      N   N        5      0   0  0   0
S      NN  N        555    0  00  0  00
 SSS   N N N           5   0 0 0  0 0 0
    S  N  NN           5  00  0  00  0
    S  N   N        5   5  0   0  0   0
SSSS   N   N         555    000    000

 J   000   8888        999     1     000
 J  0   0  8   8      9   9   11    0   0
 J  0   0  8   8      9   9    1    0  00
 J  0   0  8888        9999    1    0 0 0
J   J  0   0  8   8       9    1    00  0
J   J  0   0  8   8       9    1    0   0
 JJJ    000   8888      999    111    000
```

JSB SN 500 (910) queued to SYS$PRINT on 28-APR-1987 16:31 by user RUDY, UIC [COMPUTER,RUDY], under account COMPUTER at priority 100, started on printer _LCA0: on 28-APR-1987 16:46 from queue SYS$PRINT.

Digital Equipment Corporation - VAX/VMS Version V4.5

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FLOOD HYDROGRAPH PACKAGE  (HEC-1)
        FEBRUARY 1981
      REVISED 04 NOV 81

RUN DATE 20-APR-1987   TIME 16:30:12
```


U.S. ARMY CORPS OF ENGINEERS
THE HYDROLOGIC ENGINEERING CENTER
609 SECOND STREET
DAVIS, CALIFORNIA 95616
(916) 440-3285 OR (FTS) 448-3285


```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIOR- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE. THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. SEE SEPTEMBER 1981 INPUT DESCRIPTION FOR NEW DEFINITIONS.

```
LINE          ID.......1..... .2.......3.......4.......5.......6.......7.......8.......9......10

  1           ID   MIDLAND STORM WATER MGT STUDY
  2           ID   SNAKE CREEK BASIN
  3           ID   100 -YEAR FREQUENCY EVENT
              XDIAGRAM
  4           IT      15 16DEC83       0      90
  5           IN      15 16DEC83       0
  6           ID       3       0       0

  7           KK    EXPS
  8           KM   INPUT HYDRO-DRAINAGE AREA TO EXPRESSWAY
  9           BA     1.0
 10           PB       0
 11           PI       0.      0.      0.      0.      0.   1.223    .798    .394    .290    .220
 12           PI    .177    .131
 13           LU       0       0       0
 14           UI       0.      2.      3.      6.      8.     12.     18.     27.     36.     45.
 15           UI      56.     76.     86.     88.     90.     86.     76.     68.     62.     58.
 16           UI      56.     54.     52.     49.     47.     45      44.     42.     41.     40.
 17           UI      38.     37.     36.     35.     34.     34.     33.     32.     31.     31.
 18           UI      30.     30.     29.     29.     28.     28.     28.     27.     27.     26.
 19           UI      26.     25.     24.     24.     23.     23.     22.     21      20.     20.
 20           UI      19.     19.     18.     17.     17.     16.     15.     15.     14.     13.
 21           UI      13.     12.     11.     10.     10.      9.      8.      8.      7.      6.
 22           UI       6.      5.      4.      4.      3.      2.      2.      1.      0.      0.

 23           KK    EXPS
 24           KM   STORAGE ROUTE UPSTREAM OF US-10
 25           KO       3       2
 26           RS       1    ELEV   630.0
 27           SV       0.     .10     .250     .50     1.0     1.5     2.5     4.0     6.1
 28           SF   630.0  634.70  635.00  635.25  635.60  635.85  636.10  636.30  636.68
 29           SQ       0.     70.     80.     90.    105.    130.    150.    165.    210.    275.
 30           SF    630.  634.61  634.83  635.07  635.52  635.92  636.22  636.39  637.01  637.89

 31           KK    WACK
 32           KM    STORAGE ROUTE UPSTREAM OF WACKERLY
 33           KO      3.      2.
 34           RS      1.    ELEV    630.
 35           SV      0.     .17     .68    1.04    1.61    2.56
 36           SF    630.    633.    635.    636.    637.    638.
 37           SQ      0.     50.     80.    130.    200.    360.
 38           SF    630.    633.     635    636.    637.    638.

 39           KK    WACK
 40           KM    INPUT HYDRO-DRAINAGE AREA TO DILLOWAY
 41           BA     .39
 42           PB      0.
 43           PI      0.      0.      0.      0.    .145    .491    .316    .156    .115    .088
 44           PI    .070    .052
 45           LU      0.      0.      0.
 46           UI      .5      1.      3.      5.      7.     12.     20.    105.    167.    195.
 47           UI    200.    199.    178.    156.    136    122.    102.     92.     84.     77.
 48           UI     68.     61.     54.     49.     43.     41.     37.     32.     29.     25.
 49           UI     21.     17.     12.      9.      5.      0.
```

```
LINE          ID.......1 .....2.......3.......4.......5 .....6.......7.......8.......9......10

  50          KK    WACK
  51          KM    COMBINE HYDRO-DRAINAGE AREAS AT DILLOWAY
  52          HC      2.

  53          KK    DILL
  54          KM    STORAGE ROUTE UPSTREAM OF DILLOWAY
  55          KO      1.      2.
  56          RS      1.    ELEV    624.
  57          SV      0.      0.2     5.2     8.6    16.1     24.
  58          SE    624.    628.    632     633.    634.    635.
  59          SQ      0.     60.    170.    220.    400.   1100.
  60          SQ    624.    628.    632.    633.    634.    635.

  61          KK    DILL
  62          KM    INPUT HYDRO-DRAINAGE  AREA TO SYLVAN
  63          BA     .21
  64          PB      0.
  65          PI      0.      0.      0.      0.    .068    .256    .165    .082    .060    .046
  66          PI    .037    .027
  67          LU      0.      0.      0.
  68          UI      0.      8.     24.     75.    153.    290.    293.    274.    244.    204.
  69          UI    165.    134.    110.     89.     73.     58.     50.     44.     38.     33.
  70          UI     28.     24.     20.     14.     11.      7.      2.      0.

  71          KK    DILL
  72          KM    INPUT HYDRO-DRAINAGE AREA TO WHEELER
  73          BA     .34
  74          PB      0.
  75          PI      0.      0.      0.      0.    .124    .416    .269    .133    .098    .075
  76          PI    .060    .045
  77          LU      0.      0.      0.
  78          UI      0.     17      53.    158.    350     395.    356.    298.    225.    159.
  79          UI    114.     93.     79.     67.     59.     50.     45.     37.     30.     22.
  80          UI     15.      9.      3.      0.

  81          KK    DILL
  82          KM    COMBINE HYDRO-DRAINAGE AREAS AT WHEELER
  83          HC      3.

  84          KK   WHEEL
  85          KM    STORAGE ROUTE UPSTREAM OF WHEELER
  86          KO      1.      2.
  87          RS      1     ELEV    617.
  88          SV      0.      2.      6.3    12.8    25.1     45.     57.     70.
  89          SE    617.    625.    627.    628.    629.    630.   630.5    631.
  90          SQ      0.     80.    240.    300.    360.    430.    600.    730.
  91          SE    617.    625.    627.    628.    629.    630.   630.5    631.

  92          KK   WHEEL
  93          KM    DIVERT FLOW TO MEADOWBROOK
  94          DT    OFLO
  95          DI      0.    410.    460.    520.    600.    680.    730.
  96          DQ      0.      0.     40.     60.    120.    190.    230.
```

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9.......10

  97          KK   WHEEL
  98          KM    INPUT HYDRO-DRAINAGE AREA SOUTH OF WHEELER
  99          BA     .57
 100          PB      0.
 101          PI      0.      0.      0.      0.      0.    .390    .453    .224    .165    .126
 102          PI    .101    .075
 103          LU      0       0.      0.
 104          UI      0.      5.     15.     39.     70.    118.    185.    234.    240.    234.
 105          UI    223.    202.    169.    141.    117.     98.     77.     63.     55.     50.
 106          UI     45.     41.     36.     33.     29.     25.     21.     18      15.     12.
 107          UI      8.      5.      2.      0.

 108          KK   WHEEL
 109          KM    COMBINE HYDRO SOUTH OF WHEELER
 110          HC      2.

 111          KK   CONFL
 112          KM    CHANNEL ROUTE SIEBERT TO CONFLUENCE SECTION 1330
 113          KO      3.      2.
 114          RS      1.    STOR     -1.
 115          RC     .06    .045     .06    2200.    .001
 116          RX      6.     13.     43.     47.     53.     60.    150.    229.
 117          RY    620.   619.2   616.5   612.6   612.6   616.8   617.9   620.

 118          KK     SAG
 119          KM    INPUT HYDRO-MEADOWBROOK DRAIN
 120          BA    1.27
 121          PB      0.
 122          PI      0.      0.      0.      0.    .447   1 575   1.016    .503    .371    .282
 123          PI    .227    .169
 124          LU      0.      0.      0.
 125          UI      0.      4.     11.     22.     47.     85.    131.    188.    211.    220.
 126          UI    216.    204.    186.    168.    146.    127.    110.     88.     71.     58.
 127          UI     49.     44.     39.     34.     31      28.     24.     22.     20.     17.
 128          UI     15.     13.     11.      9.      7.      5.      3.      2.      0.

 129          KK     SAG
 130          KM    RETRIEVE DIVERTED FLOW AT WHEELER
 131          DR    OFLO

 132          KK     SAG
 133          KM    ADD MEADOWBROOK AND DIVERSION HYDROS
 134          HC      2.

 135          KK   CONFL
 136          KM    ROUTE TO CONFLUENCE  - SECTION 200
 137          KO      1.      2.
 138          RS      1.    STOR     -1.
 139          RC     .07    .045     .07    3500.    .001
 140          RX      0.     50.    118.    127.    132     142.    230.    240
 141          RY    620.9  619.1   616.8   611.9   611.9   616.3   619.0   620.9
 142          ZZ
```

```
FLOOD HYDROGRAPH PACKAGE  (HEC-1)
          FEBRUARY 1981
        REVISED 04 NOV 81

RUN DATE 28-APR-1987   TIME 16:30:12
```


U.S. ARMY CORPS OF ENGINEERS
THE HYDROLOGIC ENGINEERING CENTER
609 SECOND STREET
DAVIS, CALIFORNIA 95616
(916) 440-3285 OR (FTS) 448-3285

MIDLAND STORM WATER MGT STUDY
SNAKE CREEK BASIN
100 -YEAR FREQUENCY EVENT

```
6 IO        OUTPUT CONTROL VARIABLES
                IPRNT          3  PRINT CONTROL
                IPLOT          0  PLOT CONTROL
                QSCAL         0.  HYDROGRAPH PLOT SCALE

  IT        HYDROGRAPH TIME DATA
                NMIN          15  MINUTES IN COMPUTATION INTERVAL
               IDATE    16DEC83  STARTING DATE
               ITIME       0000  STARTING TIME
                  NQ         90  NUMBER OF HYDROGRAPH ORDINATES
              NDDATE    16DEC83  ENDING DATE
              NDTIME       2215  ENDING TIME

          COMPUTATION INTERVAL    0.25 HOURS
               TOTAL TIME BASE   22.25 HOURS

     ENGLISH UNITS
         DRAINAGE AREA          SQUARE MILES
         PRECIPITATION DEPTH    INCHES
         LENGTH, ELEVATION      FEET
         FLOW                   CUBIC FEET PER SECOND
         STORAGE VOLUME         ACRE-FEET
         SURFACE AREA           ACRES
         TEMPERATURE            DEGREES FAHRENHEIT
```

```
7 KK        EXPS
```

INPUT HYDRO-DRAINAGE AREA TO EXPRESSWAY

```
5 IN        TIME DATA FOR INPUT TIME SERIES
               JXMIN          15  TIME INTERVAL IN MINUTES
              JXDATE    16DEC83  STARTING DATE
              JXTIME           0  STARTING TIME
```

```
                SUBBASIN RUNOFF DATA

  9 BA          SUBBASIN CHARACTERISTICS
                     TAREA          1.00  SUBBASIN AREA

                PRECIPITATION DATA

 10 PB                STORM          3.23  BASIN TOTAL PRECIPITATION

 11 PI            INCREMENTAL PRECIPITATION PATTERN
                    0.00      0.00      0.00      0.00      0.00      1.22      0.80      0.39      0.29      0.22
                    0.18      0.13

 13 LU          UNIFORM LOSS RATE
                     STRTL          0.00  INITIAL LOSS
                     CNSTL          0.00  UNIFORM LOSS RATE
                     RTIMP          0.00  PERCENT IMPERVIOUS AREA

 13 UI          INPUT UNITGRAPH,  88 ORDINATES,  VOLUME = 0.97
                    0.0       2.0       3.0       6.0       8.0      12.0      18.0      27.0      36.0      45.0
                   56.0      76.0      86.0      88.0      90.0      86.0      76.0      68.0      62.0      58.0
                   56.0      54.0      52.0      49.0      47.0      45.0      44.0      42.0      41.0      40.0
                   38.0      37.0      36.0      35.0      34.0      34.0      33.0      32.0      31.0      31.0
                   30.0      30.0      29.0      29.0      28.0      28.0      28.0      27.0      27.0      26.0
                   26.0      25.0      24.0      24.0      23.0      23.0      22.0      21.0      20.0      20.0
                   19.0      19.0      18.0      17.0      17.0      16.0      15.0      15.0      14.0      13.0
                   13.0      12.0      11.0      10.0      10.0       9.0       8.0       8.0       7.0       6.0
                    6.0       5.0       4.0       4.0       3.0       2.0       2.0       1.0

                                                                  XXX

    XXX           XXX           XXX           XXX           XXX

                     HYDROGRAPH AT STATION     EXPS

     TOTAL RAINFALL =  3.23, TOTAL LOSS =  0.00, TOTAL EXCESS =  3.23

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR      22.25-HR
   249.       5.25        (CFS)     183.        90.         90           90.
                         (INCHES)  1.699      3.119       3.119        3.119
                          (AC-FT)   91.        166.        166.         166.

                      CUMULATIVE AREA =    1.00 SQ MI

XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX

            XXXXXXXXXXXXXXX
            X             X
 23 KK      X      EXPS   X
            X             X
            XXXXXXXXXXXXXXX
                      STORAGE ROUTE UPSTREAM OF US-10

 25 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          3  PRINT CONTROL
```

```
                IPLOT          2  PLOT CONTROL
                QSCAL         0.  HYDROGRAPH PLOT SCALE

          HYDROGRAPH ROUTING DATA

26 RS        STORAGE ROUTING
                NSTPS          1  NUMBER OF SUBREACHES
                 ITYP       ELEV  TYPE OF INITIAL CONDITION
               RSVRIC     630.00  INITIAL CONDITION
                    X       0.00  WORKING R AND D COEFFICIENT

27 SV        STORAGE        0.0      0.1      0.3      0.5      1.0      1.5      2.5      4.0      6.1

28 SF        ELEVATION    630.00   634.70   635.00   635.25   635.60   635.85   636.10   636.30   636.68

29 SQ        DISCHARGE        0.      70.      80.      90.     105.     130.     150.     165.     210.     275.

30 SE        ELEVATION    630.00   634.61   634.83   635.07   635.52   635.92   636.22   636.39   637.01   637.89

                                                   XXX

                                  COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

          STORAGE      0.00     0.10     0.10     0.17     0.25     0.32     0.50     0.89     1.00     1.50
          OUTFLOW      0.00    70.00    74.09    80.00    87.08    90.00    96.00   105.00   110.00   125.62
        ELEVATION    630.00   634.61   634.70   634.83   635.00   635.07   635.25   635.52   635.60   635.85

          STORAGE      1.78     2.50     3.40     4.00     4.50     6.10     7.92    12.79
          OUTFLOW    130.00   142.00   150.00   157.06   165.00   186.05   210.00   275.00
        ELEVATION    635.92   636.10   636.22   636.30   636.39   636.68   637.01   637.89

XXX WARNING XXX MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS BETWEEN        0. TO       74.
                THE ROUTED HYDROGRAPH SHOULD BE EXAMINED FOR OSCILLATIONS OR OUTFLOWS GREATER THAN PEAK INFLOWS.
                THIS CAN BE CORRECTED BY DECREASING THE TIME INTERVAL OR INCREASING STORAGE (USE A LONGER REACH.)

     XXX          XXX          XXX          XXX          XXX

                    HYDROGRAPH AT STATION     EXPS

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR      22.25-HR
   231.       6.00        (CFS)     181.        90.         90.         90.
                         (INCHES)  1.683      3.119       3.119       3.119
                         (AC-FT)    90.       166.        166.        166.

PEAK STORAGE   TIME                          MAXIMUM AVERAGE STORAGE
  (AC-FT)      (HR)                  6-HR       24-HR       72-HR      22.25-HR
     9.        6.00                   6.         2.          2.          2.

PEAK STAGE     TIME                          MAXIMUM AVERAGE STAGE
  (FEET)       (HR)                  6-HR       24-HR       72-HR      22.25-HR
  637.29       6.00                636.62     634.23      634.23      634.23

                    CUMULATIVE AREA =     1.00 SQ MI
```

```
XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX

                  ***************
                  *             *
  31 KK           *    WACK     *
                  *             *
                  ***************
                                  STORAGE ROUTE UPSTREAM OF WACKERLY

  33 KO          OUTPUT CONTROL VARIABLES
                       IPRNT            3  PRINT CONTROL
                       IPLOT            2  PLOT CONTROL
                       QSCAL           0.  HYDROGRAPH PLOT SCALE

                HYDROGRAPH ROUTING DATA

  34 RS          STORAGE ROUTING
                       NSTPS            1  NUMBER OF SUBREACHES
                       ITYP          ELEV  TYPE OF INITIAL CONDITION
                       RSVRIC      630.00  INITIAL CONDITION
                            X        0.00  WORKING R AND D COEFFICIENT

  35 SV            STORAGE        0.0       0.2       0.7       1.0       1.6       2.6

  36 SE          ELEVATION     630.00    633.00    635.00    636.00    637.00    638.00

  37 SQ          DISCHARGE         0.       50.       80.      130.      200.      360.

  38 SE          ELEVATION     630.00    633.00    635.00    636.00    637.00    638.00

                                                                  ***

                                            COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

                STORAGE      0.00      0.17      0.68      1.04      1.61      2.56
                OUTFLOW      0.00     50.00     80.00    130.00    200.00    360.00
              ELEVATION    630.00    633.00    635.00    636.00    637.00    638.00

*** WARNING *** MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS BETWEEN        0. TO       360.
                THE ROUTED HYDROGRAPH SHOULD BE EXAMINED FOR OSCILLATIONS OR OUTFLOWS GREATER THAN PEAK INFLOWS.
                THIS CAN BE CORRECTED BY DECREASING THE TIME INTERVAL OR INCREASING STORAGE (USE A LONGER REACH.)

       ***          ***          ***          ***          ***

                         HYDROGRAPH AT STATION      WACK

  PEAK FLOW    TIME                              MAXIMUM AVERAGE FLOW
    (CFS)      (HR)                  6-HR        24-HR        72-HR      22.25-HR
     230.      6.00      (CFS)       181.          90.          90.          90.
                       (INCHES)     1.681        3.118        3.118        3.118
                        (AC-FT)       90.         166.         166.         166.

 PEAK STORAGE  TIME                             MAXIMUM AVERAGE STORAGE
   (AC-FT)     (HR)                  6-HR        24-HR        72-HR      22.25-HR
       2.      6.00                    1.           1.           1.           1.
```

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	22.25-HR
637.19	6.00	636.67	634.19	634.19	634.19

CUMULATIVE AREA = 1.00 SQ MI

```
                 XXXXXXXXXXXXXXX
                 X             X
39 KK            X    WACK     X
                 X             X
                 XXXXXXXXXXXXXXX
                        INPUT HYDRO-DRAINAGE AREA TO DILLOWAY

 5 IN          TIME DATA FOR INPUT TIME SERIES
                    JXMIN          15  TIME INTERVAL IN MINUTES
                    JXDATE     16DEC83  STARTING DATE
                    JXTIME           0  STARTING TIME

             SUBBASIN RUNOFF DATA

41 BA         SUBBASIN CHARACTERISTICS
                    TAREA        0.39  SUBBASIN AREA

              PRECIPITATION DATA

42 PB               STORM        1.43  BASIN TOTAL PRECIPITATION

43 PI           INCREMENTAL PRECIPITATION PATTERN
                  0.00      0.00      0.00      0.00      0.14      0.49      0.32      0.16      0.12      0.09
                  0.07      0.05

45 LU         UNIFORM LOSS RATE
                    STRTL        0.00  INITIAL LOSS
                    CNSTL        0.00  UNIFORM LOSS RATE
                    RTIMP        0.00  PERCENT IMPERVIOUS AREA

45 UI         INPUT UNITGRAPH,  35 ORDINATES,  VOLUME = 2.35
                  0.5       1.0       3.0       5.0       7.0      12.0      20.0     105.0     167.0     195.0
                200.0     199.0     178.0     156.0     136.0     122.0     102.0      92.0      84.0      77.0
                 68.0      61.0      54.0      49.0      43.0      41.0      37.0      32.0      29.0      25.0
                 21.0      17.0      12.0       9.0       5.0

                                                          XXX

   XXX            XXX            XXX            XXX            XXX

                     HYDROGRAPH AT STATION     WACK

    TOTAL RAINFALL =  1.43, TOTAL LOSS =  0.00, TOTAL EXCESS =  1.43

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR      72-HR     22.25-HR
   250.       4.50        (CFS)     134.        38.        38.         38.
                        (INCHES)   3.194      3.366      3 366       3.366
                         (AC-FT)     66.        70.        70.         70.

                     CUMULATIVE AREA =    0.39 SQ MI
```

```
50 KK      WACK

           COMBINE HYDRO-DRAINAGE AREAS AT DILLOWAY

52 HC      HYDROGRAPH COMBINATION
                ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                    XXX

   XXX          XXX          XXX          XXX          XXX

                HYDROGRAPH AT STATION     WACK

PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                6-HR       24-HR       72-HR     22.25-HR
   401.       5.25      (CFS)     304.        129.        129.        129.
                      (INCHES)   2.034       3.187       3.187       3.187
                       (AC-FT)    151.        236.        236.        236.

                CUMULATIVE AREA =    1.39 SQ MI


53 KK      DILL

           STORAGE ROUTE UPSTREAM OF DILLOWAY

55 KO      OUTPUT CONTROL VARIABLES
                IPRNT          1  PRINT CONTROL
                IPLOT          2  PLOT CONTROL
                QSCAL          0  HYDROGRAPH PLOT SCALE

           HYDROGRAPH ROUTING DATA

56 RS      STORAGE ROUTING
                NSTPS          1  NUMBER OF SUBREACHES
                 ITYP       ELEV  TYPE OF INITIAL CONDITION
                RSVRIC     624.00  INITIAL CONDITION
                     X       0.00 WORKING R AND D COEFFICIENT

57 SV        STORAGE        0.0       0.2       5.2       8.6      16.1      24.0

58 SE      ELEVATION     624.00    628.00    632.00    633.00    634.00    635.00

59 SQ      DISCHARGE        0.        60       170.       220.       400.      1100.
```

60 SE	ELEVATION	624.00	628.00	632.00	633.00	634.00	635.00

XXX

COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	0.00	0.20	5.20	8.60	16.10	24.00
OUTFLOW	0.00	60.00	170.00	220.00	400.00	1100.00
ELEVATION	624.00	628.00	632.00	633.00	634.00	635.00

XXX WARNING XXX MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS BETWEEN 0. TO 60.
THE ROUTED HYDROGRAPH SHOULD BE EXAMINED FOR OSCILLATIONS OR OUTFLOWS GREATER THAN PEAK INFLOWS.
THIS CAN BE CORRECTED BY DECREASING THE TIME INTERVAL OR INCREASING STORAGE (USE A LONGER REACH.)

HYDROGRAPH AT STATION DILL

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
16	DEC	0000	1	0.	0.0	624.0	16	DEC	0730	31	304.	12.1	633.5	16	DEC	1500	61	84.	1.3	628.9
16	DEC	0015	2	0.	0.0	624.0	16	DEC	0745	32	287.	11.4	633.4	16	DEC	1515	62	82.	1.2	628.8
16	DEC	0030	3	0.	0.0	624.0	16	DEC	0800	33	272.	10.8	633.3	16	DEC	1530	63	81.	1.1	628.7
16	DEC	0045	4	0.	0.0	624.0	16	DEC	0815	34	257.	10.2	633.2	16	DEC	1545	64	79.	1.1	628.7
16	DEC	0100	5	0.	0.0	624.0	16	DEC	0830	35	243.	9.6	633.1	16	DEC	1600	65	77.	1.0	628.6
16	DEC	0115	6	0.	0.0	624.0	16	DEC	0845	36	229.	9.0	633.1	16	DEC	1615	66	74.	0.8	628.5
16	DEC	0130	7	0.	0.0	624.0	16	DEC	0900	37	218.	8.4	633.0	16	DEC	1630	67	72.	0.7	628.4
16	DEC	0145	8	2.	0.0	624.1	16	DEC	0915	38	209.	7.9	632.8	16	DEC	1645	68	70.	0.6	628.4
16	DEC	0200	9	6.	0.0	624.4	16	DEC	0930	39	200.	7.3	632.6	16	DEC	1700	69	68.	0.6	628.3
16	DEC	0215	10	13.	0.0	624.8	16	DEC	0945	40	191.	6.6	632.4	16	DEC	1715	70	66.	0.5	628.2
16	DEC	0230	11	21.	0.1	625.4	16	DEC	1000	41	181.	6.0	632.2	16	DEC	1730	71	64.	0.4	628.1
16	DEC	0245	12	33.	0.1	626.2	16	DEC	1015	42	171.	5.3	632.0	16	DEC	1745	72	61.	0.3	628.1
16	DEC	0300	13	59.	0.2	627.9	16	DEC	1030	43	157.	4.6	631.5	16	DEC	1800	73	58.	0.2	627.8
16	DEC	0315	14	75.	0.9	628.6	16	DEC	1045	44	145.	4.1	631.1	16	DEC	1815	74	52.	0.2	627.4
16	DEC	0330	15	112.	2.5	629.9	16	DEC	1100	45	134.	3.6	630.7	16	DEC	1830	75	52.	0.2	627.4
16	DEC	0345	16	160.	4.8	631.7	16	DEC	1115	46	126.	3.2	630.4	16	DEC	1845	76	47.	0.2	627.1
16	DEC	0400	17	201.	7.3	632.6	16	DEC	1130	47	119.	2.9	630.1	16	DEC	1900	77	45.	0.1	627.0
16	DEC	0415	18	249.	9.8	633.2	16	DEC	1145	48	113.	2.6	629.9	16	DEC	1915	78	43.	0.1	626.9
16	DEC	0430	19	300.	11.9	633.4	16	DEC	1200	49	109.	2.4	629.8	16	DEC	1930	79	41.	0.1	626.7
16	DEC	0445	20	337.	13.5	633.6	16	DEC	1215	50	106.	2.3	629.7	16	DEC	1945	80	38.	0.1	626.5
16	DEC	0500	21	361.	14.5	633.8	16	DEC	1230	51	103.	2.2	629.6	16	DEC	2000	81	36.	0.1	626.4
16	DEC	0515	22	377.	15.1	633.9	16	DEC	1245	52	101.	2.1	629.5	16	DEC	2015	82	34.	0.1	626.2
16	DEC	0530	23	385.	15.5	633.9	16	DEC	1300	53	99.	2.0	629.4	16	DEC	2030	83	31.	0.1	626.1
16	DEC	0545	24	388.	15.6	633.9	16	DEC	1315	54	97.	1.9	629.3	16	DEC	2045	84	29.	0.1	625.9
16	DEC	0600	25	385.	15.5	633.9	16	DEC	1330	55	95.	1.8	629.3	16	DEC	2100	85	27.	0.1	625.8
16	DEC	0615	26	377.	15.2	633.9	16	DEC	1345	56	93.	1.7	629.2	16	DEC	2115	86	25.	0.1	625.6
16	DEC	0630	27	366.	14.7	633.8	16	DEC	1400	57	92.	1.6	629.2	16	DEC	2130	87	22.	0.1	625.5
16	DEC	0645	28	352.	14.1	633.7	16	DEC	1415	58	90.	1.6	629.1	16	DEC	2145	88	21.	0.1	625.4
16	DEC	0700	29	337.	13.5	633.6	16	DEC	1430	59	88.	1.5	629.0	16	DEC	2200	89	18.	0.1	625.2
16	DEC	0715	30	320.	12.8	633.6	16	DEC	1445	60	86.	1.4	628.9	16	DEC	2215	90	16.	0.1	625.1

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	22.25-HR
388.	5.75	(CFS)	297.	128.	128.	128.
		(INCHES)	1.989	3.187	3.187	3.187

(AC-FT)	147.	236.	236.	236	

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	22.25-HR
16.	5.75	12	4.	4.	4.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	22.25-HR
633.93	5.75	633.37	629.25	629.25	629.25

CUMULATIVE AREA = 1.39 SQ MI

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XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX

          XXXXXXXXXXXXXX
          X            X
61 KK     X     DILL   X
          X            X
          XXXXXXXXXXXXXX
                    INPUT HYDRO-DRAINAGE  AREA TO SYLVAN

 5 IN          TIME DATA FOR INPUT TIME SERIES
                    JXMIN          15  TIME INTERVAL IN MINUTES
                   JXDATE     16DEC83  STARTING DATE
                   JXTIME           0  STARTING TIME

             SUBBASIN RUNOFF DATA

63 BA          SUBBASIN CHARACTERISTICS
                    TAREA        0.21  SUBBASIN AREA

               PRECIPITATION DATA

64 PB               STORM        0.74  BASIN TOTAL PRECIPITATION

65 PI            INCREMENTAL PRECIPITATION PATTERN
                   0.00      0.00      0.00      0.00      0.07      0.26      0.17      0.08      0.06      0.05
                   0.04      0.03

67 LU          UNIFORM LOSS RATE
                    STRTL        0.00  INITIAL LOSS
                    CNSTL        0.00  UNIFORM LOSS RATE
                    RTIMP        0.00  PERCENT IMPERVIOUS AREA

67 UI          INPUT UNITGRAPH,  27 ORDINATES,  VOLUME = 4.55
                    0.0       8.0      24.0      75.0     153.0     290.0     293.0     274.0     244.0     204.0
                  165.0     134.0     110.0      89.0      73.0      58.0      50.0      44.0      38.0      33.0
                   28.0      24.0      20.0      14.0      11.0       7.0       2.0

                                                                XXX

    XXX            XXX            XXX            XXX            XXX

                      HYDROGRAPH AT STATION     DILL

     TOTAL RAINFALL =  0.74, TOTAL LOSS =  0.00, TOTAL EXCESS =  0.74

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR     22.25-HR
   173.       3.50       (CFS)       75.         21.         21.         21.
                       (INCHES)    3.331       3.370       3.370       3.370
                        (AC-FT)      37.         38.         38.         38.

                      CUMULATIVE AREA =    0.21 SQ MI
```

```
                 XXXXXXXXXXXXXXX
                 X             X
71 KK            X      DILL   X
                 X             X
                 XXXXXXXXXXXXXXX
                          INPUT HYDRO-DRAINAGE AREA TO WHEELER

 5 IN          TIME DATA FOR INPUT TIME SERIES
                    JXMIN          15  TIME INTERVAL IN MINUTES
                   JXDATE     16DEC83  STARTING DATE
                   JXTIME           0  STARTING TIME

             SUBBASIN RUNOFF DATA

73 BA          SUBBASIN CHARACTERISTICS
                    TAREA        0.34  SUBBASIN AREA

               PRECIPITATION DATA

74 PB               STORM        1.22  BASIN TOTAL PRECIPITATION

75 PI            INCREMENTAL PRECIPITATION PATTERN
                   0.00      0.00      0.00      0.00      0.12      0.42      0.27      0.13      0.10      0.08
                   0.06      0.04

77 LU          UNIFORM LOSS RATE
                    STRTL        0.00  INITIAL LOSS
                    CNSTL        0.00  UNIFORM LOSS RATE
                    RTIMP        0.00  PERCENT IMPERVIOUS AREA

77 UI          INPUT UNITGRAPH,  23 ORDINATES,  VOLUME = 3.00
                    0.0      17.0      53.0     158.0     350.0     395.0     356.0     298.0     225.0     159.0
                  114.0      93.0      79.0      67.0      59.0      50.0      45.0      37.0      30.0      22.0
                   15.0       9.0       3.0

                                                                XXX

    XXX            XXX            XXX            XXX            XXX

                      HYDROGRAPH AT STATION     DILL

     TOTAL RAINFALL =  1.22, TOTAL LOSS =  0.00, TOTAL EXCESS =  1.22

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR     22.25-HR
   358.       3.00       (CFS)      134.         36.         36.         36.
                       (INCHES)    3.652       3.661       3.661       3.661
                        (AC-FT)      66.         66.         66.         66.

                      CUMULATIVE AREA =    0.34 SQ MI
```

```
                 XXXXXXXXXXXXXXX
                 X             X
 81 KK           X    DILL     X
                 X             X
                 XXXXXXXXXXXXXXX
                          COMBINE HYDRO-DRAINAGE AREAS AT WHEELER

 83 HC          HYDROGRAPH COMBINATION
                      ICOMP           3  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                  XXX

     XXX             XXX             XXX             XXX             XXX

                        HYDROGRAPH AT STATION     DILL

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                 6-HR       24-HR       72-HR     22.25-HR
    603.       3.50        (CFS)    461.        185.        185.        185.
                         (INCHES)  2.210       3.290       3.290       3.290
                          (AC-FT)   229.        340.        340.        340.

                        CUMULATIVE AREA =    1.94 SQ MI

XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX

                 XXXXXXXXXXXXXXX
                 X             X
 84 KK           X    WHEEL    X
                 X             X
                 XXXXXXXXXXXXXXX
                          STORAGE ROUTE UPSTREAM OF WHEELER

 86 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           1  PRINT CONTROL
                      IPLOT           2  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE

              HYDROGRAPH ROUTING DATA

 87 RS          STORAGE ROUTING
                      NSTPS           1  NUMBER OF SUBREACHES
                       ITYP        ELEV  TYPE OF INITIAL CONDITION
                     RSVRIC      617.00  INITIAL CONDITION
                          X        0.00  WORKING R AND D COEFFICIENT

 88 SV            STORAGE        0.0       2.0       6.3      12.8      25.1      45.0      57.0      70.0

 89 SE            ELEVATION    617.00    625.00    627.00    628.00    629.00    630.00    630.50    631.00

 90 SQ            DISCHARGE        0.       80.       240.      300.      360.      430.      600.      730.

 91 SE            ELEVATION    617.00    625.00    627.00    628.00    629.00    630.00    630.50    631.00

                                                                  XXX
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COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	0.00	2.00	6.30	12.80	25.10	45.00	57.00	70.00
OUTFLOW	0.00	80.00	240.00	300.00	360.00	430.00	600.00	730.00
ELEVATION	617.00	625.00	627.00	628.00	629.00	630.00	630.50	631.00

HYDROGRAPH AT STATION WHEEL

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
16	DEC	0000	1	0.	0.0	617.0	16	DEC	0730	31	419.	41.9	629.8	16	DEC	1500	61	87.	2.2	625.1
16	DEC	0015	2	0.	0.0	617.0	16	DEC	0745	32	411.	39.7	629.7	16	DEC	1515	62	85.	2.1	625.1
16	DEC	0030	3	0.	0.0	617.0	16	DEC	0800	33	403.	37.3	629.6	16	DEC	1530	63	83.	2.1	625.0
16	DEC	0045	4	0.	0.0	617.0	16	DEC	0815	34	394.	34.6	629.5	16	DEC	1545	64	81.	2.0	625.0
16	DEC	0100	5	0.	0.0	617.0	16	DEC	0830	35	384.	31.8	629.3	16	DEC	1600	65	79.	2.0	624.9
16	DEC	0115	6	0.	0.0	617.0	16	DEC	0845	36	373.	28.9	629.2	16	DEC	1615	66	77.	1.9	624.7
16	DEC	0130	7	1.	0.0	617.1	16	DEC	0900	37	363.	26.0	629.0	16	DEC	1630	67	75.	1.9	624.5
16	DEC	0145	8	7.	0.2	617.7	16	DEC	0915	38	350.	23.0	628.8	16	DEC	1645	68	72.	1.8	624.2
16	DEC	0200	9	28.	0.7	619.8	16	DEC	0930	39	336.	20.2	628.6	16	DEC	1700	69	70.	1.8	624.0
16	DEC	0215	10	81.	2.0	625.0	16	DEC	0945	40	322.	17.4	628.4	16	DEC	1715	70	68.	1.7	623.8
16	DEC	0230	11	178.	4.6	626.2	16	DEC	1000	41	309.	14.7	628.2	16	DEC	1730	71	66.	1.7	623.6
16	DEC	0245	12	262.	8.7	627.4	16	DEC	1015	42	294.	12.1	627.9	16	DEC	1745	72	64.	1.6	623.4
16	DEC	0300	13	305.	13.8	628.1	16	DEC	1030	43	271.	9.7	627.5	16	DEC	1800	73	61.	1.5	623.1
16	DEC	0315	14	332.	19.4	628.5	16	DEC	1045	44	250.	7.4	627.2	16	DEC	1815	74	57.	1.4	622.7
16	DEC	0330	15	358.	24.7	629.0	16	DEC	1100	45	211.	5.5	626.6	16	DEC	1830	75	54.	1.4	622.4
16	DEC	0345	16	375.	29.5	629.2	16	DEC	1115	46	166.	4.3	626.1	16	DEC	1845	76	51.	1.3	622.1
16	DEC	0400	17	390.	33.7	629.4	16	DEC	1130	47	142.	3.7	625.8	16	DEC	1900	77	48.	1.2	621.8
16	DEC	0415	18	403.	37.3	629.6	16	DEC	1145	48	128.	3.3	625.6	16	DEC	1915	78	46.	1.1	621.6
16	DEC	0430	19	414.	40.5	629.8	16	DEC	1200	49	118.	3.0	625.5	16	DEC	1930	79	44.	1.1	621.4
16	DEC	0445	20	424.	43.3	629.9	16	DEC	1215	50	112.	2.9	625.4	16	DEC	1945	80	41.	1.0	621.1
16	DEC	0500	21	438.	45.6	630.0	16	DEC	1230	51	108.	2.8	625.4	16	DEC	2000	81	39.	1.0	620.9
16	DEC	0515	22	460.	47.1	630.1	16	DEC	1245	52	105.	2.7	625.3	16	DEC	2015	82	36.	0.9	620.6
16	DEC	0530	23	474.	48.1	630.1	16	DEC	1300	53	102.	2.6	625.3	16	DEC	2030	83	34.	0.9	620.4
16	DEC	0545	24	479.	48.5	630.1	16	DEC	1315	54	100.	2.5	625.2	16	DEC	2045	84	32.	0.8	620.2
16	DEC	0600	25	479.	48.5	630.1	16	DEC	1330	55	98.	2.5	625.2	16	DEC	2100	85	30.	0.7	620.0
16	DEC	0615	26	474.	48.1	630.1	16	DEC	1345	56	96.	2.4	625.2	16	DEC	2115	86	27.	0.7	619.7
16	DEC	0630	27	464.	47.4	630.1	16	DEC	1400	57	94.	2.4	625.2	16	DEC	2130	87	25.	0.6	619.5
16	DEC	0645	28	450.	46.4	630.1	16	DEC	1415	58	92.	2.3	625.2	16	DEC	2145	88	23.	0.6	619.3
16	DEC	0700	29	433.	45.2	630.0	16	DEC	1430	59	91.	2.3	625.1	16	DEC	2200	89	21.	0.5	619.1
16	DEC	0715	30	425.	43.7	629.9	16	DEC	1445	60	89.	2.2	625.1	16	DEC	2215	90	19.	0.5	618.9

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	22.25-HR
479.	5.75	(CFS)	418.	185.	183.	185
		(INCHES)	2.003	3.285	3.285	3.285
		(AC-FT)	207.	340.	340.	340.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	22.25-HR
49.	5.75	39.	13.	13.	13.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	22.25-HR

630.15	3.75	629.69	625.05	625.05	625.05

CUMULATIVE AREA = 1.94 SQ MI

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92 KK      WHEEL
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DIVERT FLOW TO MEADOWBROOK

DT	DIVERSION IS1AD	OFLO	DIVERSION HYDROGRAPH IDENTIFICATION					
DI	INFLOW	0.00	410.00	460.00	520.00	600.00	680.00	730.00
DQ	DIVERTED FLOW	0.00	0.00	40.00	60.00	120.00	190.00	230.00

DIVERSION HYDROGRAPH OFLO

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	22.25-HR
46.	5.75	(CFS)	15.	4.	4.	4.
		(INCHES)	0.074	0.074	0.074	0.074
		(AC-FT)	8.	8.	8.	8.

CUMULATIVE AREA = 1.94 SQ MI

HYDROGRAPH AT STATION WHEEL

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	22.25-HR
433.	5.75	(CFS)	402.	181.	181.	181.
		(INCHES)	1.929	3.211	3.211	3.211
		(AC-FT)	200.	332.	332.	332.

CUMULATIVE AREA = 1.94 SQ MI

```
97 KK      WHEEL
```

INPUT HYDRO-DRAINAGE AREA SOUTH OF WHEELER

```
  5 IN          TIME DATA FOR INPUT TIME SERIES
                     JXMIN          15  TIME INTERVAL IN MINUTES
                    JXDATE     16DEC83  STARTING DATE
                    JXTIME           0  STARTING TIME

               SUBBASIN RUNOFF DATA

 99 BA          SUBBASIN CHARACTERISTICS
                     TAREA        0.57  SUBBASIN AREA

                PRECIPITATION DATA

100 PB               STORM        1.53  BASIN TOTAL PRECIPITATION

101 PI            INCREMENTAL PRECIPITATION PATTERN
                    0.00      0.00      0.00      0.00      0.00      0.39      0.45      0.22      0.16      0.13
                    0.10      0.08

103 LU          UNIFORM LOSS RATE
                     STRTL        0.00  INITIAL LOSS
                     CNSTL        0.00  UNIFORM LOSS RATE
                     RTIMP        0.00  PERCENT IMPERVIOUS AREA

103 UI          INPUT UNITGRAPH,  33 ORDINATES,  VOLUME = 1.78
                    0.0       5.0      15.0      39.0      70.0     118.0     185.0     234.0     240.0     234.0
                  223.0     202.0     169.0     141.0     117.0      98.0      77.0      63.0      55.0      50.0
                   45.0      41.0      36.0      33.0      29.0      25.0      21.0      18.0      15.0      12.0
                    8.0       5.0       2.0

                                                                  XXX

    XXX            XXX            XXX            XXX            XXX

                       HYDROGRAPH AT STATION    WHEEL

     TOTAL RAINFALL =  1.53, TOTAL LOSS =  0.00, TOTAL EXCESS =  1.53

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR     22.25-HR
   329.       4.25        (CFS)     161.         45.         45.          45.
                        (INCHES)   2.622       2.737       2.737        2.737
                         (AC-FT)     80.         83.         83.          83.

                       CUMULATIVE AREA =    0.57 SQ MI


XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX

            XXXXXXXXXXXXXX
            X            X
108 KK      X    WHEEL   X
            X            X
            XXXXXXXXXXXXXX
                       COMBINE HYDRO SOUTH OF WHEELER

110 HC          HYDROGRAPH COMBINATION
```

```
                    ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                    XXX

   XXX            XXX            XXX            XXX            XXX

                    HYDROGRAPH AT STATION    WHEEL

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR     22.25-HR
   732.       4.25        (CFS)     556.        226.        226.        226.
                        (INCHES)   2.061       3.103       3.103       3.103
                         (AC-FT)    276.        415.        415.        415.

                    CUMULATIVE AREA =    2.51 SQ MI

117 KK
            XXXXXXXXXXXXXXXX
            X              X
            X    CONFL     X
            X              X
            XXXXXXXXXXXXXXXX
                    CHANNEL ROUTE SIEBERT TO CONFLUENCE SECTION 1330

113 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          3  PRINT CONTROL
                      IPLOT          2  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE

              HYDROGRAPH ROUTING DATA

114 RS          STORAGE ROUTING
                      NSTPS          1  NUMBER OF SUBREACHES
                       ITYP       STOR  TYPE OF INITIAL CONDITION
                     RSVRIC      -1.00  INITIAL CONDITION
                          X       0.00  WORKING R AND D COEFFICIENT

115 RC          NORMAL DEPTH CHANNEL ROUTING
                        ANL      0.060  LEFT OVERBANK N-VALUE
                       ANCH      0.045  MAIN CHANNEL N-VALUE
                        ANR      0.060  RIGHT OVERBANK N-VALUE
                      RLNTH      2200.  REACH LENGTH
                        SFL     0.0010  ENERGY SLOPE
                      ELMAX        0.0  MAX. ELEV. FOR STORAGE/OUTFLOW CALCULATION

                                   CROSS-SECTION DATA
                      --- LEFT OVERBANK --- + ------ MAIN CHANNEL ------- + --- RIGHT OVERBANK ---
117 RY      ELEVATION   620.00   619.20   616.50   612.60   612.60   616.80   617.90   620.00
116 RX      DISTANCE      6.00    13.00    43.00    47.00    53.00    60.00   150.00   229.00

                                                    XXX

                                   COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

            STORAGE      0.00     0.13     0.28     0.45     0.64     0.85     1.08     1.33     1.60     1.90
```

OUTFLOW	0.00	1.31	4.25	8.57	14.25	21.31	29.83	39.84	51.42	64.65
ELEVATION	612.60	612.99	613.38	613.77	614.16	614.55	614.94	615.33	615.72	616.11
STORAGE	2.21	2.60	3.51	5.13	7.44	10.18	13.30	16.79	20.64	24.85
OUTFLOW	79.58	98.56	124.95	162.88	218.11	293.23	386.95	500.36	635.22	791.82
ELEVATION	616.49	616.88	617.27	617.66	618.05	618.44	618.83	619.22	619.61	620.00

XXX XXX XXX XXX XXX

HYDROGRAPH AT STATION CONFL

PEAK FLOW (CFS)	TIME (HR)		6-HR	MAXIMUM AVERAGE FLOW 24-HR	72-HR	22.25-HR
711.	4.75	(CFS)	550.	225.	225	225.
		(INCHES)	2.038	3.097	3.097	3.097
		(AC-FT)	273.	415.	415.	415.

PEAK STORAGE (AC-FT)	TIME (HR)	6-HR	MAXIMUM AVERAGE STORAGE 24-HR	72-HR	22.25-HR
23.	4.75	18.	7.	7	7.

PEAK STAGE (FEET)	TIME (HR)	6-HR	MAXIMUM AVERAGE STAGE 24-HR	72-HR	22.25-HR
619.80	4.75	619.33	617.02	617.02	617.02

CUMULATIVE AREA = 2.51 SQ MI

```
118 KK        XXXXXXXXXXXXXX
              X            X
              X     SAG    X
              X            X
              XXXXXXXXXXXXXX
                          INPUT HYDRO-MEADOWBROOK DRAIN

  5 IN          TIME DATA FOR INPUT TIME SERIES
                     JXMIN          15  TIME INTERVAL IN MINUTES
                    JXDATE    16DEC83  STARTING DATE
                    JXTIME           0  STARTING TIME

              SUBBASIN RUNOFF DATA

120 BA          SUBBASIN CHARACTERISTICS
                     TAREA        1.27  SUBBASIN AREA

                PRECIPITATION DATA

121 PB               STORM        4.59  BASIN TOTAL PRECIPITATION

122 PI            INCREMENTAL PRECIPITATION PATTERN
                   0.00      0.00      0.00      0.00      0.45      1.58      1.02      0.50      0.37      0.28
                   0.23      0.17

123 LU          UNIFORM LOSS RATE
                     STRTL        0.00  INITIAL LOSS
                     CNSTL        0.00  UNIFORM LOSS RATE
                     RTIMP        0.00  PERCENT IMPERVIOUS AREA

124 UI          INPUT UNITGRAPH,  38 ORDINATES,  VOLUME = 0.81
                   0.0       4.0      11.0      22.0      47.0      85.0     131 0     188.0     211.0     220.0
                 216.0     204.0     186.0     168.0     146.0     127.0     110.0      88.0      71.0      58.0
                  49.0      44.0      39.0      34.0      31.0      28.0      24.0      22.0      20.0      17.0
                  15.0      13.0      11.0       9.0       7.0       5.0       3.0       2.0
                                                                  XXX

    XXX             XXX             XXX             XXX             XXX

                       HYDROGRAPH AT STATION      SAG

      TOTAL RAINFALL =  4.59, TOTAL LOSS =  0.00, TOTAL EXCESS =  4.59

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR      72-HR     22.25-HR
   910.       4 25        (CFS)     478.        137.       137.        137.
                        (INCHES)   3.503       3.733      3.733       3.733
                         (AC-FT)    237.        253.       253.        253.

                       CUMULATIVE AREA =    1 27 SQ MI
```

```
129 KK      SAG

                    RETRIEVE DIVERTED FLOW AT WHEELER

131 DR          RETRIEVE DIVERSION HYDROGRAPH
                    ISTAD        OFLO  DIVERSION HYDROGRAPH IDENTIFICATION

                                                                  XXX

    XXX             XXX             XXX             XXX             XXX

                    HYDROGRAPH AT STATION      SAG

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR      22.25-HR
    46.       5.75        (CFS)      15.          4.          4.           4.
                        (INCHES)   0.113       0.113       0.113        0.113
                         (AC-FT)      8.          8.          8.           8.

                    CUMULATIVE AREA =    0.00 SQ MI


132 KK      SAG

                    ADD MEADOWBROOK AND DIVERSION HYDROS

134 HC          HYDROGRAPH COMBINATION
                    ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                  XXX

    XXX             XXX             XXX             XXX             XXX

                    HYDROGRAPH AT STATION      SAG

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR      22.25-HR
   910.       4.25        (CFS)     494.        142.        142.         142.
                        (INCHES)   3.616       3.846       3.846        3.846
                         (AC-FT)     245.        260.        260.         260.

                    CUMULATIVE AREA =    1.27 SQ MI
```

```
135 KK    CONFL

                    ROUTE TO CONFLUENCE  - SECTION 200

137 KO        OUTPUT CONTROL VARIABLES
                    IPRNT          1  PRINT CONTROL
                    IPLOT          2  PLOT CONTROL
                    QSCAL         0.  HYDROGRAPH PLOT SCALE

            HYDROGRAPH ROUTING DATA

133 RS        STORAGE ROUTING
                    NSTPS          1  NUMBER OF SUBREACHES
                     ITYP       STOR  TYPE OF INITIAL CONDITION
                   RSVRIC      -1.00  INITIAL CONDITION
                        X       0.00  WORKING R AND D COEFFICIENT

137 RC        NORMAL DEPTH CHANNEL ROUTING
                      AKL      0.070  LEFT OVERBANK N-VALUE
                     ANCH      0.045  MAIN CHANNEL N-VALUE
                      AKR      0.070  RIGHT OVERBANK N-VALUE
                    RLNTH      3500.  REACH LENGTH
                      SFL     0.0010  ENERGY SLOPE
                    ELMAX        0.0  MAX. ELEV. FOR STORAGE/OUTFLOW CALCULATION

                                CROSS-SECTION DATA
                        --- LEFT OVERBANK --- + ------- MAIN CHANNEL -------- + --- RIGHT OVERBANK ---
141 RY     ELEVATION   620.90   619.10   616.80   611.90   611.90   616.30   619.00   620.90
140 RX     DISTANCE      0.00    50.00   118.00   127.00   132.00   142.00   230.00   240.00

                                          XXX

                              COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

          STORAGE      0.00     0.23     0.53     0.90     1.30     1.88     2.48     3.15     3.89     4.71
          OUTFLOW      0.00     1.59     5.46    11.62    20.29    31.72    46.16    63.85    85.03   109.93
        ELEVATION    611.90   612.37   612.85   613.32   613.79   614.27   614.74   615.22   615.69   616.16

          STORAGE      5.75     7.48    10.31    14.26    19.33    25.52    32.57    40.22    48.46    57.30
          OUTFLOW    141.70   184.36   240.96   314.72   409.41   528.46   683.93   866.58  1076.88  1315.59
        ELEVATION    616.64   617.11   617.58   618.06   618.53   619.01   619.48   619.95   620.43   620.90

                              HYDROGRAPH AT STATION    CONFL

 DA MON HRMN ORD  OUTFLOW  STORAGE   STAGE | DA MON HRMN ORD  OUTFLOW  STORAGE   STAGE | DA MON HRMN ORD  OUTFLOW  STORAGE   STAGE
16 DEC 0000  1       0.       0.0   611.9 | 16 DEC 0730 31     288.     12.8   617.9 | 16 DEC 1500 61       1.       0.1   612.1
```

16 DEC 0015	2	0.	0.0	611.9	*	16 DEC 0745	32	248.	10.7	617.6	*	16 DEC 1515	62	1.	0.1	612.1
16 DEC 0030	3	0.	0.0	611.9	*	16 DEC 0800	33	213.	8.9	617.3	*	16 DEC 1530	63	1.	0.1	612.0
16 DEC 0045	4	0.	0.0	611.9	*	16 DEC 0815	34	183.	7.4	617.1	*	16 DEC 1545	64	0.	0.1	612.0
16 DEC 0100	5	0.	0.0	611.9	*	16 DEC 0830	35	155.	6.3	616.8	*	16 DEC 1600	65	0.	0.1	612.0
16 DEC 0115	6	0.	0.0	611.9	*	16 DEC 0845	36	131.	5.4	616.5	*	16 DEC 1615	66	0.	0.0	612.0
16 DEC 0130	7	0.	0.0	611.9	*	16 DEC 0900	37	111.	4.7	616.2	*	16 DEC 1630	67	0.	0.0	612.0
16 DEC 0145	8	1	0.1	612.2	*	16 DEC 0915	38	95.	4.2	615.9	*	16 DEC 1645	68	0.	0.0	612.0
16 DEC 0200	9	5.	0.5	612.8	*	16 DEC 0930	39	82.	3.8	615.6	*	16 DEC 1700	69	0.	0.0	612.0
16 DEC 0215	10	19.	1.3	613.7	*	16 DEC 0945	40	71.	3.4	615.4	*	16 DEC 1715	70	0.	0.0	612.0
16 DEC 0230	11	53.	2.7	614.9	*	16 DEC 1000	41	61.	3.1	615.2	*	16 DEC 1730	71	0.	0.0	611.9
16 DEC 0245	12	120.	5.0	616.3	*	16 DEC 1015	42	52.	2.7	614.9	*	16 DEC 1745	72	0.	0.0	611.9
16 DEC 0300	13	206.	8.6	617.3	*	16 DEC 1030	43	43.	2.3	614.6	*	16 DEC 1800	73	0.	0.0	611.9
16 DEC 0315	14	304.	13.7	618.0	*	16 DEC 1045	44	35.	2.0	614.4	*	16 DEC 1815	74	0.	0.0	611.9
16 DEC 0330	15	422.	20.0	618.6	*	16 DEC 1100	45	27.	1.7	614.1	*	16 DEC 1830	75	0.	0.0	611.9
16 DEC 0345	16	545.	26.3	619.1	*	16 DEC 1115	46	21.	1.4	613.8	*	16 DEC 1845	76	0.	0.0	611.9
16 DEC 0400	17	665.	31.7	619.4	*	16 DEC 1130	47	15.	1.1	613.5	*	16 DEC 1900	77	0.	0.0	611.9
16 DEC 0415	18	757.	35.7	619.7	*	16 DEC 1145	48	11.	0.9	613.3	*	16 DEC 1915	78	0.	0.0	611.9
16 DEC 0430	19	815.	38.0	619.8	*	16 DEC 1200	49	8.	0.7	613.1	*	16 DEC 1930	79	0.	0.0	611.9
16 DEC 0445	20	838.	39.0	619.9	*	16 DEC 1215	50	6.	0.6	612.9	*	16 DEC 1945	80	0.	0.0	611.9
16 DEC 0500	21	833.	38.8	619.9	*	16 DEC 1230	51	5.	0.5	612.7	*	16 DEC 2000	81	0.	0.0	611.9
16 DEC 0515	22	806.	37.7	619.8	*	16 DEC 1245	52	4.	0.4	612.6	*	16 DEC 2015	82	0.	0.0	611.9
16 DEC 0530	23	762.	35.9	619.7	*	16 DEC 1300	53	3.	0.3	612.5	*	16 DEC 2030	83	0.	0.0	611.9
16 DEC 0545	24	704	33.4	619.5	*	16 DEC 1315	54	2.	0.3	612.4	*	16 DEC 2045	84	0.	0.0	611.9
16 DEC 0600	25	638.	30.5	619.3	*	16 DEC 1330	55	2.	0.2	612.4	*	16 DEC 2100	85	0.	0.0	611.9
16 DEC 0615	26	568.	27.3	619.1	*	16 DEC 1345	56	1.	0.2	612.3	*	16 DEC 2115	86	0.	0.0	611.9
16 DEC 0630	27	502.	24.1	618.9	*	16 DEC 1400	57	1.	0.2	612.3	*	16 DEC 2130	87	0.	0.0	611.9
16 DEC 0645	28	442.	21.0	618.7	*	16 DEC 1415	58	1.	0.1	612.2	*	16 DEC 2145	88	0.	0.0	611.9
16 DEC 0700	29	386.	18.1	618.4	*	16 DEC 1430	59	1.	0.1	612.2	*	16 DEC 2200	89	0.	0.0	611.9
16 DEC 0715	30	334.	15.3	618.2	*	16 DEC 1445	60	1.	0.1	612.1	*	16 DEC 2215	90	0	0.0	611.9
					*						*					

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	22.25-HR
838.	4.75	(CFS)	499.	142.	142.	142.
		(INCHES)	3.581	3.846	3.846	3.846
		(AC-FT)	243.	260.	260.	260.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	22.25-HR
39.	4.75	23.	7.	7.	7.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	22.25-HR
619.88	4.75	618.60	614.30	614.30	614.30

CUMULATIVE AREA = 1.27 SQ MI

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	EXPS	269.	5.25	183.	90.	90.	1.00		
ROUTED TO	EXPS	231.	6.00	181.	90.	90.	1.00	637.29	6.00
ROUTED TO	WACK	230.	6.00	181.	90.	90.	1.00	637.19	6.00
HYDROGRAPH AT	WACK	250.	4.50	134.	38.	38.	0.39		
2 COMBINED AT	WACK	401.	5.25	304.	129.	129.	1.39		
ROUTED TO	DILL	388.	5.75	297.	128.	128.	1.39	633.93	5.75
HYDROGRAPH AT	DILL	173.	3.50	75.	21.	21.	0.21		
HYDROGRAPH AT	DILL	358.	3.00	134.	36.	36.	0.34		
3 COMBINED AT	DILL	609.	3.50	461.	185.	185.	1.94		
ROUTED TO	WHEEL	479.	5.75	418.	185.	185.	1.94	630.15	5.75
DIVERSION TO	OFLO	46.	5.75	15.	4.	4.	1.94		
HYDROGRAPH AT	WHEEL	433.	5.75	402.	181.	181.	1.94		
HYDROGRAPH AT	WHEEL	329.	4.25	161.	45.	45.	0.57		
2 COMBINED AT	WHEEL	732.	4.25	556.	226.	226.	2.51		
ROUTED TO	CONFL	711.	4.75	550.	225.	225.	2.51	619.80	4.75
HYDROGRAPH AT	SAG	910.	4.25	478.	137.	137.	1.27		
HYDROGRAPH AT	SAG	46.	5.75	15.	4.	4.	0.00		
2 COMBINED AT	SAG	910.	4.25	494.	142.	142.	1.27		
ROUTED TO	CONFL	838.	4.75	489.	142.	142.	1.27	619.88	4.75

XXX NORMAL END OF HEC-1 XXX

00BREAK00

1) COUNTY: Midland

2) STUDY NAME: City of Midland

3) WATERCOURSE: Snake Creek

4) DOCUMENT TYPE: Revised by MPS 10; 50; 500yr.

00BREAK00

Midland FCS

Snake Creek

	10yr	50yr	100yr	500-yr	
6500	1150	2250	2300 2350	3400	at Confl.
8680	280	460	570	710	d/s Conf. Meadow Br.
9620	240	320	390	480	
10808	260	390	490	605	
12550	210	320	400 380	500	Wheaton d/s
14126	150	240	300	390	DILLOWAY
15500	80	140	150	230	US-10

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McNamee, Porter & Seeley | Engineers / Architects | Ann Arbor, Michigan

RRRRRRRR    UU      UU  DDDDDDDD    YY      YY
RRRRRRRR    UU      UU  DDDDDDDD    YY      YY
RR      RR  UU      UU  DD      DD  YY      YY
RR      RR  UU      UU  DD      DD  YY      YY
RR      RR  UU      UU  DD      DD    YY  YY
RR      RR  UU      UU  DD      DD    YY  YY
RRRRRRRR    UU      UU  DD      DD      YY
RRRRRRRR    UU      UU  DD      DD      YY
RR  RR      UU      UU  DD      DD      YY
RR  RR      UU      UU  DD      DD      YY
RR    RR    UU      UU  DD      DD      YY
RR    RR    UU      UU  DD      DD      YY
RR      RR  UUUUUUUUUU  DDDDDDDD        YY
RR      RR  UUUUUUUUUU  DDDDDDDD        YY

 SSSS  N   N        1     000        H   H  EEEEE   CCCC   222
S      N   N       11    0   0       H   H  E      C      2   2
S      NN  N        1    0  00       H   H  E      C          2
 SSS   N N N        1    0 0 0       HHHHH  EEEE   C         2
    S  N  NN        1    00  0       H   H  E      C        2
    S  N   N        1    0   0       H   H  E      C       2
SSSS   N   N      111     000        H   H  EEEEE   CCCC  22222

                J   000   8888          888    999    666
                J  0   0  8   8        8   8  9   9  6
                J  0   0  8   8        8   8  9   9  6
                J  0   0  8888          888    9999  6666
              J  J  0   0  8   8        8   8      9  6   6
              J  J  0   0  8   8        8   8      9  6   6
               JJJ    000   8888          888    999    666

Job SN_10_HEC2 (896) queued to SYS$PRINT on 28-APR-1987 16:20 by user RUDY, UIC [COMPUTER,RUDY], under account COMPUTER at priority
100, started on printer _LCA0: on 28-APR-1987 16:21 from queue SYS$PRINT.

Digital Equipment Corporation - VAX/VMS Version V4.5
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WATER SURFACE PROFILES
VERSION OF NOVEMBER 1976
UPDATED AUGUST   1983

RUN DATE  20-APR-1987 16:18:59.18
```


U.S. ARMY CORPS OF ENGINEERS
THE HYDROLOGIC ENGINEERING CENTER
609 SECOND STREET, SUITE D
DAVIS, CALIFORNIA 95616
(916) 440-2105 (FTS) 448-2105


```
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 28-APR-1987 16.19:02.62

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HECP RELEASE DATED NOV 76 UPDATED MAR. 1982
ERROR CORR -  01,02,03,04,05
MODIFICATION -  50,51,52,53,54,55
```

T1 SNAKE CREEK, MIDLAND - USGS DATUM
T2 SNAKE CREEK - MIDLAND FIS
T3 10 - YEAR FREQUENCY

J1	ICHECK	INQ	NINV	IDIR	SIRT	METRIC	HVINS	Q	WSEL	FQ
	-1.	2.	0.	0.	0.000000	0.00	0.0	0.	608.800	0.000

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

NC	0.030	0.030	0.030	0.100	0.300	0.000	0.000	0.000	0.000	0.000
QT	5.000	1150.000	2250.000	2300.000	3400.000	2300.000	0.000	0.000	0.000	0.000
X1	6500.000	12.000	210.000	225.000	570.000	570.000	720.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	150.000	0.000	330.000	0.000	0.000	0.000	0.000
GR	626.400	0.000	625.400	13.000	614.200	53.000	609.200	210.000	605.900	216.000
GR	605.200	219.000	605.900	222.000	606.600	225.000	609.100	230.000	611.900	308.000
GR	621.900	350.000	627.100	435.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.060	0.060	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	7700.000	11.000	421.000	451.000	1200.000	1200.000	1200.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	350.000	0.000	620.000	0.000	0.000	0.000	0.000
GR	623.600	0.000	623.600	200.000	621.800	319.000	614.900	342.000	611.900	421.000
GR	607.300	427.000	607.200	434.000	607.300	442.000	612.500	451.000	614.400	600.000
GR	613.700	800.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.600	0.800	0.000	0.000	0.000	0.000	0.000
X1	7750.000	11.000	401.000	417.000	100.000	100.000	100.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	384.000	0.000	620.000	0.000	0.000	0.000	0.000
GR	623.200	0.000	618.500	200.000	616.200	320.000	614.900	386.000	612.600	397.000
GR	607.200	401.000	607.300	409.000	606.900	417.000	612.500	426.000	615.100	500.000
GR	618.100	800.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SB	0.000	1.600	2.500	0.000	16.000	0.000	106.000	0.000	607.200	607.200
X1	7751.000	0.000	0.000	0.000	26.000	26.000	26.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	613.800	616.100	0.000	0.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	384.000	0.000	620.000	0.000	0.000	0.000	0.000
BT	7.000	0.000	623.200	623.200	200.000	618.500	618.500	320.000	616.200	616.200
BT	401.000	616.200	616.200	417.000	616.100	616.100	500.000	615.100	615.100	800.000
BT	618.100	618.100	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	7800.000	10.000	364.000	396.000	180.000	200.000	200.000	0.000	0.000	0.000
GR	624.200	0.000	620.000	215.000	612.600	364.000	607.300	371.000	607.100	380.000
GR	607.300	389.000	613.700	396.000	615.000	495.000	620.000	585.000	624.700	800.000
NC	0.000	0.000	0.000	0.200	0.400	0.000	0.000	0.000	0.000	0.000
X1	8750.000	11.000	470.000	515.000	590.000	590.000	470.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	400.000	0.000	600.000	0.000	0.000	0.000	0.000
GR	623.000	0.000	620.000	230.000	615.000	330.000	610.000	470.000	608.900	485.000
GR	608.700	492.000	608.900	503.000	610.000	515.000	615.000	640.000	620.000	700.000
GR	621.000	1000.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
QT	5.000	280.000	460.000	570.000	710.000	570.000	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	8680.000	12.000	610.000	630.000	430.000	430.000	430.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	565.000	0.000	700.000	0.000	0.000	0.000	0.000
GR	623.500	0.000	621.000	360.000	620.000	490.000	615.000	580.000	613.000	610.000
GR	610.500	615.000	610.300	620.000	610.500	625.000	613.000	630.000	615.000	720.000
GR	620.000	810.000	621.000	1000.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.060	0.060	0.045	0.300	0.500	0.000	0.000	0.000	0.000	0.000
X1	9430.000	9.000	308.000	337.000	545.000	545.000	545.000	0.000	0.000	0.000
GR	625.700	0.000	623.900	200.000	618.800	308.000	613.100	317.000	612.100	321.000
GR	613.100	375.000	621.100	337.000	624.300	400.000	623.200	600.000	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	9500.000	13.000	292.000	308.000	100.000	100.000	100.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	240.000	0.000	320.000	0.000	0.000	0.000	0.000
GR	622.900	0.000	622.000	100.000	621.300	185.000	618.800	287.000	613.000	292.000
GR	613.000	299.500	619.000	299.500	619.000	300.500	613.000	300.500	613.000	308.000
GR	620.700	316.000	620.700	400.000	621.400	600.000	0.000	0.000	0.000	0.000
CH	1.050	1.620	2.980	0.000	16.000	1.000	90.000	0.000	613.000	613.000
X1	9301.000	0.000	0.000	0.000	80.000	80.000	80.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	619.000	620.700	0.000	0.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	240.000	0.000	320.000	0.000	0.000	0.000	0.000
BT	4.000	240.000	621.000	621.000	292.000	620.700	619.000	308.000	620.700	619.000
BT	320.000	620.700	620.700	0.000	0.000	0.000	0.000	0.000	0.000	0.000
QT	5.000	240.000	320.000	390.000	480.000	390.000	0.000	0.000	0.000	0.000
X1	9625.000	9.000	260.000	283.000	150.000	150.000	150.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	70.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	623.300	0.000	619.700	200.000	619.800	260.000	613.900	264.000	612.300	267.000
GR	613.900	271.000	620.000	283.000	622.800	400.000	626.600	600.000	0.000	0.000
NC	0.000	0.000	0.050	0.600	0.800	0.000	0.000	0.000	0.000	0.000
X1	9750.000	11.000	297.800	302.300	150.000	150.000	150.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	110.000	0.000	390.000	0.000	0.000	0.000	0.000
GR	623.400	0.000	624.600	200.000	619.800	293.000	616.600	297.800	614.900	298.500
GR	614.300	300.000	614.900	301.500	616.600	302.300	620.000	316.000	625.700	400.000
GR	626.500	600.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

SB	0.000	1.620	2.500	0.000	3.000	0.000	15.900	0.000	613.500	613.500
X1	9751.000	0.000	0.000	0.000	116.000	116.000	116.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	618.800	625.100	0.000	0.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	110.000	0.000	390.000	0.000	0.000	0.000	0.000
BT	7.000	110.000	624.000	624.000	297.800	625.100	616.600	298.500	625.100	618.200
BT	300.000	625.100	618.800	301.500	625.100	618.200	302.300	625.600	616.600	390.000
BT	625.700	625.700	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	9800.000	9.000	289.000	324.000	100.000	100.000	100.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	50.000	0.000	400.000	0.000	0.000	0.000	0.000
GR	624.400	0.000	624.400	200.000	621.500	289.000	614.600	306.000	614.100	308.000
GR	614.600	310.000	618.700	324.000	623.600	400.000	625.500	600.000	0.000	0.000
NC	0.060	0.060	0.045	0.100	0.300	0.000	0.000	0.000	0.000	0.000
X1	10700.000	11.000	487.000	517.000	868.000	868.000	735.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	60.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	627.000	0.000	626.300	200.000	626.400	400.000	623.500	487.000	618.000	492.000
GR	617.000	498.000	618.000	504.000	628.100	517.000	627.600	600.000	626.000	800.000
GR	631.000	1000.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	10750.000	15.000	496.200	503.800	150.000	150.000	150.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	400.000	0.000	600.000	0.000	0.000	0.000	0.000
GR	626.600	0.000	627.800	200.000	627.500	400.000	623.500	487.000	620.700	496.200
GR	618.400	497.000	617.200	498.500	616.900	500.000	617.200	501.500	618.400	503.000
GR	620.700	503.800	626.500	519.000	627.100	600.000	630.200	800.000	631.800	1000.000
SB	0.000	2.280	2.500	0.000	6.000	0.000	44.000	0.000	617.100	617.100
ET	0.000	0.000	0.000	0.000	0.000	9.100	0.000	0.000	509.000	600.000
X1	10751.000	0.000	0.000	0.000	85.000	85.000	85.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	624.400	629.800	0.000	0.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	400.000	0.000	600.000	0.000	0.000	0.000	0.000
BT	9.000	0.000	629.700	627.500	496.200	629.800	620.700	497.000	629.800	622.900
BT	498.500	629.800	624.000	500.000	629.800	624.400	501.500	629.800	624.000	503.000
BT	629.800	622.900	503.800	629.800	620.700	1000.000	630.300	627.110	0.000	0.000
QT	5.000	260.000	390.000	490.000	605.000	490.000	0.000	0.000	0.000	0.000
X1	10800.000	11.000	487.000	517.000	310.000	310.000	225.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	330.000	0.000	680.000	0.000	0.000	0.000	0.000
GR	626.600	0.000	627.800	200.000	627.500	400.000	626.100	487.000	618.000	498.000
GR	616.500	503.000	618.000	507.000	626.500	517.000	627.100	600.000	630.200	800.000
GR	631.800	1000.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.100	0.300	0.000	0.000	0.000	0.000	0.000
X1	11430.000	0.000	0.000	0.000	630.000	630.000	485.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	230.000	0.000	800.000	0.000	0.000	0.000	0.000
NC	0.040	0.040	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	12450.000	10.000	340.000	365.000	910.000	910.000	850.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	150.000	0.000	650.000	0.000	0.000	0.000	0.000
GR	628.600	0.000	628.000	250.000	627.900	340.000	621.000	354.000	620.400	356.000
GR	621.000	358.000	627.000	365.000	628.200	450.000	628.800	650.000	631.800	750.000

NC	0.000	0.000	0.000	0.100	0.300	0.000	0.000	0.000	0.000	0.000
X1	12500.000	17.000	348.000	360.000	50.000	50.000	50.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	150.000	0.000	650.000	0.000	0.000	0.000	0.000
GR	627.500	0.000	626.800	250.000	626.500	348.000	621.500	348.000	619.800	349.000
GR	619.500	350.000	619.800	351.000	621.500	352.000	621.500	356.000	619.800	357.000
GR	619.500	358.000	619.800	359.000	621.500	360.000	626.500	360.000	626.800	450.000
GR	627.900	650.000	630.800	750.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	12501.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	150.000	0.000	650.000	0.000	0.000	0.000	0.000
BT	13.000	0.000	627.500	627.500	348.000	626.500	621.500	349.000	626.500	623.250
BT	350.000	636.500	623.500	351.000	626.500	623.250	352.000	626.500	621.500	356.000
BT	626.500	621.500	357.000	626.500	623.250	358.000	626.500	623.500	359.000	626.500
BT	623.250	360.000	626.500	621.500	450.000	626.800	626.800	750.000	630.800	630.800
X1	12502.000	0.000	0.000	0.000	98.000	98.000	98.000	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	0.000	0.000	0.000	150.000	0.000	650.000	0.000	0.000	0.000	0.000
X1	12503.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	150.000	0.000	650.000	0.000	0.000	0.000	0.000
QT	5.000	210.000	320.000	400.000	500.000	400.000	0.000	0.000	0.000	0.000
X1	12550.000	10.000	340.000	369.000	50.000	50.000	50.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	180.000	0.000	650.000	0.000	0.000	0.000	0.000
GR	628.300	0.000	628.600	250.000	628.100	340.000	621.000	355.000	619.500	360.000
GR	621.000	365.000	628.700	369.000	627.700	450.000	629.000	650.000	631.200	750.000
NC	0.000	0.000	0.000	0.100	0.300	0.000	0.000	0.000	0.000	0.000
X1	13300.000	7.000	263.000	303.000	700.000	700.000	700.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	120.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	627.200	0.000	625.000	263.000	622.000	275.000	621.200	280.000	622.000	285.000
GR	625.000	303.000	630.000	310.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.050	0.050	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000
QT	5.000	150.000	240.000	300.000	390.000	300.000	0.000	0.000	0.000	0.000
X1	14075.000	8.000	211.000	257.000	620.000	620.000	620.000	0.000	0.000	0.000
GR	633.000	0.000	629.900	211.000	623.100	226.000	622.800	232.000	623.100	236.000
GR	631.600	257.000	634.600	290.000	633.300	530.000	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
X1	14125.000	11.000	227.000	233.000	50.000	50.000	50.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	130.000	0.000	330.000	0.000	0.000	0.000	0.000
GR	633.700	0.000	630.900	130.000	629.900	209.000	625.300	227.000	623.000	228.000
GR	622.300	230.000	623.000	232.000	625.300	233.000	631.600	259.000	632.900	330.000
GR	634.800	530.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SB	0.000	2.270	2.500	0.000	6.000	0.000	28.300	0.000	622.300	622.300
X1	14126.000	0.000	0.000	0.000	346.000	345.000	346.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	628.300	632.500	0.000	0.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	175.000	0.000	255.000	0.000	0.000	0.000	0.000
BT	8.000	0.000	633.700	633.700	227.000	632.500	625.300	228.000	632.500	627.500
BT	230.000	632.500	628.300	232.000	632.500	627.500	233.000	632.500	625.300	330.000

BT	632.900	632.900	530.000	634.800	634.800	0.000	0.000	0.000	0.000	0.000
X1	14250.000	9.000	200.000	241.000	100.000	100.000	100.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	70.000	0.000	280.000	0.000	0.000	0.000	0.000
GR	632.400	0.000	631.100	200.000	623.200	214.000	622.400	217.000	623.200	220.000
GR	633.400	241.000	637.900	260.000	636.000	330.000	637.900	530.000	0.000	0.000
QT	5.000	80.000	140.000	150.000	230.000	150.000	0.000	0.000	0.000	0.000
NC	0.050	0.050	0.045	0.100	0.300	0.000	0.000	0.000	0.000	0.000
X1	15500.000	10.000	400.000	422.000	1180.000	1180.000	950.000	0.000	0.000	0.000
GR	631.500	0.000	632.600	130.000	631.100	330.000	628.400	400.000	626.300	405.000
GR	625.400	410.000	626.300	416.000	629.400	422.000	635.200	660.000	647.600	750.000
X1	16450.000	10.000	363.000	404.000	945.000	945.000	945.000	0.000	0.000	0.000
GR	636.000	0.000	634.400	363.000	629.000	371.000	628.700	377.000	629.000	383.000
GR	634.700	404.000	638.700	500.000	647.000	600.000	642.000	700.000	643.300	800.000
NC	0.000	0.000	0.055	0.300	0.500	0.000	0.000	0.000	0.000	0.000
X1	16500.000	14.000	397.500	402.500	100.000	100.000	100.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	355.000	0.000	430.000	0.000	0.000	0.000	0.000
GR	637.400	0.000	635.500	300.000	634.400	386.000	631.100	397.500	629.600	398.000
GR	628.800	399.000	628.600	400.000	628.800	401.000	629.600	402.000	631.100	402.500
GR	634.700	427.000	638.500	500.000	642.400	700.000	642.200	800.000	0.000	0.000
SB	0.000	1.390	2.500	0.000	5.000	0.000	19.600	0.000	628.600	628.600
X1	16501.000	0.000	0.000	0.000	60.000	60.000	60.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	633.600	636.300	0.000	0.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	350.000	0.000	435.000	0.000	0.000	0.000	0.000
BT	10.000	0.000	637.400	637.400	397.500	636.300	631.100	398.000	636.300	632.600
BT	399.000	636.300	633.300	400.000	636.300	633.600	401.000	636.300	633.300	402.000
BT	636.300	632.600	402.500	636.300	631.100	500.000	638.500	638.500	800.000	642.200
BT	642.200	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	16550.000	11.000	390.000	419.000	100.000	100.000	100.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	350.000	0.000	450.000	0.000	0.000	0.000	0.000
GR	636.500	0.000	635.800	300.000	636.000	390.000	629.000	397.000	628.600	399.000
GR	629.000	402.000	637.100	419.000	640.100	500.000	641.100	600.000	644.600	700.000
GR	643.300	800.000	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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   SECNO    DEPTH    CWSEL    CRIWS    WSELR    EG       HV       HL       OLOSS   BANK ELEV
   Q        QLOB     QCH      QROB     ALOB     ACH      ARUB     VOL      TWA   LEFT/RIGHT
   TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
   SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IUC      ICONT    CORAR    TOPWID     ENDST

XPROF 1

CCHV=   0.100 CEHV=   0.300
XSECNO 6500.000
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     150.0     330.0  TYPE=     1  TARGET=     180.000
  6500.00     5.98   611.18   611.18   608.80   611.95     0.77     0.00     0.00   609.20
    1150.     206.     625.     319.      61.      70.      77.       0.       0.   606.60
     0.00     3.37     8.88     4.16    0.030    0.030    0.030    0.000   605.20   150.00
 0.004503     570.     720.     570.        0       13        0     0.00   137.85   287.85

XSECNO 7700.000
3780 CROSS SECTION   7700.00 EXTENDED      0.95 FEET

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS=     350.0     620.0  TYPE=     1  TARGET=     270.000
  7700.00     7.45   614.65     0.00     0.00   614.89     0.24     2.89     0.05   611.90
    1150.     120.     833.     197.     100.     184.     185.       9.       6.   612.50
     0.09     1.20     4.52     1.06    0.060    0.040    0.060    0.000   607.20   350.00
 0.001495    1200.    1200.    1200.        3        0        0     0.00   270.00   620.00

CCHV=   0.600 CEHV=   0.800
XSECNO 7750.000

3470 ENCROACHMENT STATIONS=     384.0     620.0  TYPE=     1  TARGET=     236.000
  7750.00     7.87   614.77     0.00     0.00   615.34     0.57     0.19     0.27   607.20
    1150.      62.     847.     241.      31.     122.     119.      10.       6.   606.90
     0.10     2.01     6.97     2.03    0.060    0.040    0.060    0.000   606.90   386.61
 0.002305     100.     100.     100.        2        0        0     0.00   104.08   490.69


SPECIAL BRIDGE
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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	IOC	ICONT	CORAR	TOPWID	ENDST

CR	XK	XWOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.60	2.50	0.00	16.00	0.00	106.00	0.00	607.20	607.20

XSFCNO 7751.000
PRESSURE AND WEIR FLOW.

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
617.70	615.55	0.00	310.	846.	106.	106.	613.80	616.10

3470 ENCROACHMENT STATIONS= 384.0 620.0 TYPE= 1 TARGET= 236.000

7751.00	9.23	616.13	0.00	0.00	616.36	0.22	1.01	0.00	607.20
1150.	80.	687.	383.	54.	143.	284.	10.	6.	606.90
0.10	1.49	4.79	1.35	0.060	0.040	0.060	0.000	606.90	384.00
0.000895	26.	26.	26.	2	0	4	0.00	219.29	603.29

XSECNO 7800.000

7800.00	9.34	616.44	0.00	0.00	616.56	0.12	0.14	0.07	612.60
1150.	134.	809.	207.	149.	254.	226.	13.	7.	613.70
0.12	0.90	3.19	0.91	0.060	0.040	0.060	0.000	607.10	286.56
0.000552	180.	200.	200.	0	0	0	0.00	234.47	521.03

CCHV= 0.200 CHV= 0.400
XSECNO 8250.000

3470 ENCROACHMENT STATIONS= 400.0 600.0 TYPE= 1 TARGET= 200.000

8250.00	7.97	616.67	0.00	0.00	616.69	0.02	0.12	0.02	610.00
1150.	304.	521.	324.	380.	337.	423.	24.	10.	610.00
0.25	0.80	1.55	0.77	0.060	0.040	0.060	0.000	608.70	400.00
0.000119	590.	470.	590.	2	0	0	0.00	200.00	600.00

CCHV= 0.100 CHV= 0.300
XSECNO 8680.000

3470 ENCROACHMENT STATIONS= 565.0 700.0 TYPE= 1 TARGET= 135.000

8680.00	6.43	616.73	0.00	0.00	616.74	0.01	0.05	0.00	613.00
280.	46.	130.	104.	102.	113.	207.	32.	12.	613.00
0.40	0.45	1.15	0.50	0.060	0.040	0.060	0.000	610.30	565.00
0.000102	430.	430.	430.	2	0	0	0.00	135.00	700.00

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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   IOC      ICONT    CORAR    TOPWID     ENDST

CCHV=   0.300 CHHV=   0.500
XSECNO 9450.000
  9450.00     4.60   616.70     0.00     0.00   617.14     0.44     0.18     0.21   618.80
     280.       0.     280.       0.       0.      53.       0.      35.      13.    621.10
     0.43     0.00     5.31     0.00    0.060    0.045    0.060    0.000   612.10   311.32
 0.007792      545     545.     545.        2        0        0     0.00    19.08   330.40

CCHV=   0.100 CHHV=   0.300
XSECNO 9500.000

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS=     240.0     320.0  TYPE=     1  TARGET=      80.000
  9500.00     4.44   617.44     0.00     0.00   617.63     0.19     0.47     0.02   613.00
     280.      15.     245.      20.       9.      67.      10.      35.      13.    613.00
     0.44     1.78     3.68     1.91    0.060    0.045    0.060    0.000   613.00   288.17
 0.003164      100.     100.     100.        2        0        0     0.00    23.44   312.62

SPECIAL BRIDGE

CB  XK       XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     1.05     1.62      2.98      0.00     16.00      1.00     90.00     0.00    613.00    613.00

XSECNO 9501.000

3265 DIVIDED FLOW

CLASS A LOW FLOW

3420 BRIDGE W.S.=    617.41 BRIDGE VELOCITY=,      4.24     CALCULATED CHANNEL AREA=,      66.

 EGPRS      EGLWC      H3       QWEIR      QLOW      BAREA   TRAPEZOID      ELLC      ELTRD
                                                                AREA
     0.00   617.65     0.02        0.      280.       90.       90.      619.00    620.70

3470 ENCROACHMENT STATIONS=     240.0     320.0  TYPE=     1  TARGET=      80.000
  9501.00     4.46   617.46     0.00     0.00   617.65     0.19     0.02     0.00   613.00
     280       15.     245.      20.       9.      67.      10.      35.      13.    613.00
     0.44     1.78     3.66     1.90    0.060    0.045    0.060    0.000   613.00   288.15
 0.003113       80      80.      80.        0        0        0     0.00    23.49   312.64
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   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      ELMIN      SSTA
   SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST

XSECNO 9625.000

3470 ENCROACHMENT STATIONS=      70.0      600.0  TYPE=      1  TARGET=      -70.000
  9625.00     5.66   617.96     0.00      0.00   618.25     0.29     0.56     0.03   619.80
     240.       0.     240.       0.        0.      56.       0.      35.      13.   620.00
     0.45     0.00     4.30     0.00     0.060    0.045    0.060    0.000   612.30   261.25
 0.004778     150.     150.     150.         2        0        0     0.00    17.74   278.98

CCHV=   0.600 CEHV=   0.800
XSECNO 9750.000

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS=     110.0      390.0  TYPE=      1  TARGET=      280.000
  9750.00     4.88   619.18     0.00      0.00   620.05     0.87     1.34     0.47   616.60
     240.      19.     163.      58.        5.      19.      13.      35.      13.   616.60
     0.46     3.87     8.64     4.29     0.060    0.050    0.060    0.000   614.30   293.93
 0.022269     150      150.     150.         3        0        0     0.00    18.76   312.69

SPECIAL BRIDGE

SR  XK       XKOR     COFO     RDLEN    BWC      BWP      BAREA    SS       ELCHU    ELCHD
     0.00     1.62     2.50     0.00     3.00     0.00    15.90     0.00   613.50   613.50

XSECNO 9751.000

3301 HV CHANGED MORE THAN HVINS

PRESSURE FLOW

 EGPRS     EGLWC     H3       QWEIR     QPR      BAREA   TRAPEZOID     ELLC     ELTRD
                                                          AREA
  624.91   620.44    0.00       0.      240.      16.      16.      618.80   625.10

3470 ENCROACHMENT STATIONS=     110.0      390.0  TYPE=      1  TARGET=      280.000
  9751.00    10.61   624.91     0.00      0.00   624.91     0.00     4.86     0.00   616.60
     240.     104      31.     105.      337.      45.     268.      36.      13.   616.60
     0.54     0.31     0.69     0.39     0.060    0.050    0.060    0.000   614.30   110.00
 0.000045     116.     116.     116.         0        0        0     0.00   278.38   388.38
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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

NSECNO 9800.000

3470 ENCROACHMENT STATIONS=      50.0      400.0  TYPE=      1  TARGET=      350.000
  9800.00     10.81    624.91      0.00      0.00    624.91      0.00      0.00      0.00    621.50
     240.       34.      133       73.      251.      275.      286.       38.       14.    618.70
     0.62      0.14      0.48      0.25     0.060     0.050     0.060     0.000    614.10     50.00
 0.000018      100.      100.      100.         2         0         0      0.00    350.00    400.00

CCHV=   0.100 CEHV=   0.300
XSECNO 10700.000

3470 ENCROACHMENT STATIONS=      60.0     1000.0  TYPE=      1  TARGET=      -60.000
 10700.00      7.92    624.92      0.00      0.00    624.96      0.04      0.04      0.01    623.50
     240.       11.      229.        0.       31.      141.        0.       47.       18.    628.10
     0.75      0.35      1.63      0.00     0.060     0.045     0.060     0.000    617.00    444.09
 0.000320      868.      735.      868.         1         0         0      0.00     68.83    512.92

XSECNO 10750.000

3470 ENCROACHMENT STATIONS=     400.0      600.0  TYPE=      1  TARGET=      200.000
 10750.00      8.06    624.96      0.00      0.00    625.06      0.09      0.08      0.02    620.70
     240.       55.      155.       30.       49.       54.       24.       48        18.    620.70
     0.77      1.12      2.89      1.24     0.060     0.045     0.060     0.000    616.90    455.32
 0.001007      150.      150.      150.         1         0         0      0.00     59.63    514.95

SPECIAL BRIDGE

SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     0.00      2.28      2.50      0.00      6.00      0.00     44.00      0.00    617.10    617.10

XSECNO 10751.000
PRESSURE FLOW

 EGPRS      EGLWC      H3       QWEIR      QPR       BAREA   TRAPEZOID      ELLC      ELTRD
                                                                AREA
   626.02    625.24     0.00       0.       240.       44.       44.      624.40    629.80

3470 ENCROACHMENT STATIONS=     400.0      600.0  TYPE=      1  TARGET=      200.000
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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    IDC       ICONT     CURAR     TOPWID      ENDST

 10751.00     9.08    625.98      0.00      0.00    626.02      0.04      0.96      0.00    620.70
    240.       82.      125.       34.      103.      62.       37.       48.       18.     620.70
     0.79      0.80     2.02      0.92     0.060     0.045     0.060     0.000    616.90    433.06
 0.000412      85.       85.       85.         2         0         0      0.00     84.58    517.64

XSECNO 10800.000

3470 ENCROACHMENT STATIONS=     330.0     680.0  TYPE=     1  TARGET=     350.000
 10800.00     9.57    626.07      0.00      0.00    626.11      0.04      0.09      0.00    626.10
    260.       0.      260.       0.        0.       162.       0.        49.       19.     626.50
     0.83      0.00     1.61      0.00     0.060     0.045     0.060     0.000    616.50    487.05
 0.000314     310.      225.      310          2         0         0      0.00     29.44    516.49

CCHV=   0.100 CEHV=   0.300
XSECNO 11480.000

3470 ENCROACHMENT STATIONS=     230.0     800.0  TYPE=     1  TARGET=     570.000
 11480.00     9.71    626.21      0.00      0.00    626.25      0.04      0.15      0.00    626.10
    260.       0.      260.       0.        0.       166.       0.        51.       19.     626.50
     0.92      0.06     1.56      0.00     0.060     0.045     0.060     0.000    616.50    479.86
 0.000290     630.      485.      630.         2         0         0      0.00     36.80    516.66

XSECNO 12450.000

3470 ENCROACHMENT STATIONS=     150.0     650.0  TYPE=     1  TARGET=     500.000
 12450.00     6.23    626.63      0.00      0.00    626.82      0.19      0.53      0.05    627.90
    260.       0.      260.       0.        0.        74.       0.        53.       20.     627.00
     0.98      0.00     3.49      0.00     0.040     0.040     0.040     0.000    620.40    342.57
 0.002124     910.      850.      910.         2         0         0      0.00     22.01    364.57

CCHV=   0.100 CEHV=   0.300
XSECNO 12500.000

3470 ENCROACHMENT STATIONS=     150.0     650.0  TYPE=     1  TARGET=     500.000
 12500.00     7.26    626.76      0.00      0.00    626.93      0.17      0.11      0.00    626.50
    260.       5.      251.       4.       11.        74.       10.       53.       20.     626.50
     0.99      0.43     3.40      0.43     0.040     0.040     0.040     0.000    619.50    264.07
 0.002086      50.       50.       50.         2         0         0      0.00    173.01    437.08
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   SECNO     DEPTH     CWSEL     CRIWS     WSELR     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

XSECND 12501.000

3370 NORMAL BRIDGE/NRD= 13 MIN ELTRD=  626.50 MAX ELLC=  630.80

3680 20 TRIALS ATTEMPTED WSPL/CWSEL
3710 WSFL ASSUMED BASED ON MIN DIFF

3470 ENCROACHMENT STATIONS=     150.0     650.0  TYPE=     1  TARGET=     500.000
 12501.00     7.51   627.01   623.19      0.00   627.13     0.11      0.00      0.66   626.50
     260.      85.      96.      78.       44.      27.      37.       53.       20.   626.50
     0.99     1.95     3.57     2.13     0.040    0.040    0.040     0.000   619.50   173.78
 0.013233       1.       1.       1.        20       17        0    -50.00   315.03   488.80

XSECND 12502.000

3370 NORMAL BRIDGE/NRD= 13 MIN ELTRD=  626.50 MAX ELLC=  630.80

3470 ENCROACHMENT STATIONS=     150.0     650.0  TYPE=     1  TARGET=     500.000
 12502.00     7.90   627.40     0.00      0.00   627.42     0.02      0.28      0.01   626.50
     260.     116.      36.     108       120.      31.     101.       54.       21.   626.50
     1.01     0.96     1.18     1.07     0.040    0.040    0.040     0.000   619.50   150.00
 0.001231      98.      98.      98.         5        0        0    -50.72   409.63   559.63

XSECND 12503.000

3470 ENCROACHMENT STATIONS=     150.0     650.0  TYPE=     1  TARGET=     500.000
 12503.00     7.90   627.40     0.00      0.00   627.42     0.02      0.00      0.00   626.50
     260.      69.      136.     55.       120.      82.     101.       54.       21.   626.50
     1.01     0.57     1.66     0.55     0.040    0.040    0.040     0.000   619.50   150.00
 0.000436        1       1.       1.         1        0        0      0.00   409.99   559.99

XSECND 12550.000

3470 ENCROACHMENT STATIONS=     180.0     650.0  TYPE=     1  TARGET=     470.000
 12550.00     7.90   627.40     0.00      0.00   627.45     0.04      0.02      0.01   628.10
     210.       0.      210.      0.        0.      176.      0.       54.       21.   628.70
     1.02     0.00     1.67     0.00     0.040    0.040    0.040     0.000   619.50   341.47
 0.000336      50.      50.      50.         2        0        0      0.00    26.86   368.33
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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   IOC      ICONT    CORAR    TOPWID     ENDST

CCHV=   0.100 CFHV=   0.300
XSECNO 13300.000

3470 ENCROACHMENT STATIONS=      120.0      310.0  TYPE=      1  TARGET=     -120.000
 13300.00      6.31    627.51      0.00      0.00    627.51      0.00      0.06      0.00    625.00
     210.       97.      112.        1.      273.      179.        4.       59.       23.    625.00
     1.41      0.36      0.62      0.24     0.040     0.040     0.040     0.000    621.20    120.00
 0.000039      700.      700.      700.         2         0         0      0.00    186.51    306.51

XSECNO 14075.000
 14075.00      4.73    627.53      0.00      0.00    627.57      0.04      0.05      0.01    629.90
     150.        0.      150.        0.        0.       92.        0.       63.       24.    631.60
     1.52      0.00      1.63      0.00     0.050     0.040     0.050     0.000    622.80    216.22
 0.000487      620.      620.      620.         2         0         0      0.00     30.73    246.95

CCHV=   0.300 CFHV=   0.500
XSECNO 14125.000

3470 ENCROACHMENT STATIONS=      130.0      330.0  TYPE=      1  TARGET=      200.000
 14125.00      5.18    627.48      0.00      0.00    627.73      0.24      0.05      0.10    625.30
     150.       17.      115.       18.        9.       26.       10.       63.       24.    625.30
     1.52      1.84      4.41      1.84     0.050     0.040     0.050     0.000    622.30    218.46
 0.003558       50.       50.       50.         2         0         0      0.00     23.55    242.01

SPECIAL BRIDGE

SR  XK        XXOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     0.00      2.27      2.50      0.00      6.00      0.00     28.30      0.00    622.30    622.30

XSECNO 14126.000

6070,LOW FLOW BY NORMAL BRIDGE

EGPRS=     0.000  EGLWC=   627.727  ELLC=   628.300  PCWSF=   627.483  ELTRD=   632.500

3370 NORMAL BRIDGE,NRD=  8 MIN ELTRD=  632.50 MAX ELLC=  628.30

3470 ENCROACHMENT STATIONS=      175.0      255.0  TYPE=      1  TARGET=       80.000
 14126.00      7.32    629.62    625.77      0.00    630.16      0.54      2.28      0.15    625.30
     150.        0.      150.        0.        0.       26.        0.       63.       24.    625.30
     1.54      0.00      5.88      0.00     0.050     0.040     0.050     0.000    622.30    210.10
 0.016220      346.      346.      346.         6        18         0     88.34     40.73    250.83
```

less may be 1-1½" high

```
   SECNO     DEPTH     CWSEL     CRIWS     WSELR     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    IOC       ICONT     CORAR     TOPWID      ENDST

XSECNO 14250.000

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS=      70.0      280.0  TYPE=     1  TARGET=      210.000
 14250.00      7.94    630.34      0.00      0.00    630.36      0.02      0.04      0.16    631.10
     150.        0.      150.        0.        0.      143.        0.       63.       25.    633.40
     1.56      0.00      1.05      0.00     0.050     0.040     0.050     0.000    622.40    201.35
 0.000132      100.      100.      100.         2         0         0      0.00     33.35    234.70

CCHV=   0.100 CEHV=   0.300
XSECNO 15500.000
 15500.00      5.06    630.46      0.00      0.00    630.47      0.01      0.11      0.00    628.40
      80.       16.       60.        4.       55.      82.       23.       67.       26.    629.40
     2.01      0.29      0.73      0.19     0.050     0.045     0.050     0.000    625.40    346.39
 0.000090      1180.     950.      1180.         3         0         0      0.00    119.42    465.81

XSECNO 16450.000
 16450.00      1.95    630.65      0.00      0.00    630.77      0.12      0.26      0.03    634.40
      80.        0.       80.        0.        0.      29.        0.       69.       28.    634.70
     2.11      0.00      2.80      0.00     0.050     0.045     0.050     0.000    628.70    368.56
 0.004822      945.      945.      945.         2         0         0      0.00     20.52    389.08

CCHV=   0.300 CEHV=   0.500
XSECNO 16500.000

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS=     355.0      430.0  TYPE=     1  TARGET=       75.000
 16500.00      2.80    631.40    631.33      0.00    632.22      0.81      1.10      0.35    631.10
      80.        0.       79.        1.        0.      11.        0.       69.       28.    631.10
     2.11      1.78      7.27      1.82     0.050     0.055     0.050     0.000    628.60    396.43
 0.046111      100.      100.      100.         5        14         0      0.00      8.16    404.59
```

```
SECNO    DEPTH    CWSEL    CRIWS    WSELR    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   INC      ICONT    CORAR    TOPWID     ENDST
```

SPECIAL BRIDGE

```
SB  XK       AXOR     COFQ     RDLEN    BWC      BWP      BAREA    SS       ELCHU    ELCHD
     0.00     1.39     2.50     0.00     5.00     0.00    19.60     0.00   628.60   628.60
```

XSECNO 16501.000

6070,LOW FLOW BY NORMAL BRIDGE

EGPRS= 0.000 EGLWC= 632.219 ELLC= 633.600 PCWSE= 631.405 ELTRD= 636.300

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE,NRD= 10 MIN ELTRD= 636.30 MAX ELLC= 633.60

```
3470 ENCROACHMENT STATIONS=     350.0     435.0  TYPE=     1  TARGET=     85.000
 16501.00     5.24   633.84   631 21     0.00   634.13     0.29     1.75     0.16   631.10
      80.       0.      80.       0.       0.      19.       0.      69.      28.   631.10
     2.11     0.00     4.32     0.00    0.050    0.055    0.050    0.000   628.60   387.97
 0.020154      60.      60.      60.        9       12        0   -43.04    33.15   421.12
```

XSECNO 16550.000

```
3470 ENCROACHMENT STATIONS=     350.0     450.0  TYPE=     1  TARGET=    100.000
 16550.00     5 72   634.32     0.00     0.00   634.34     0.02     0.13     0.08   636.00
      80.       0.      80.       0.       0.      71.       0.      69.      28.   637.10
     2.14     0.00     1.12     0.00    0.050    0.055    0.050    0.000   628.50   391.68
 0.000423     100.     100.     100.        3        0        0     0.00    21.48   413.16
```

THIS RUN EXECUTED 28-APR-1987 16:20:15.05

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**********************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAR. 1982
  ERROR CORR -  01,02,03,04,05
  MODIFICATION -  50,51,52,53,54,55
**********************************************************
```

```
McNamee, Porter & Seeley | Engineers / Architects | Ann Arbor, Michigan

RRRRRRRR    UU      UU  DDDDDDDD    YY      YY
RRRRRRRR    UU      UU  DDDDDDDD    YY      YY
RR      RR  UU      UU  DD      DD  YY      YY
RR      RR  UU      UU  DD      DD  YY      YY
RR      RR  UU      UU  DD      DD    YY  YY
RR      RR  UU      UU  DD      DD    YY  YY
RRRRRRRR    UU      UU  DD      DD      YY
RRRRRRRR    UU      UU  DD      DD      YY
RR  RR      UU      UU  DD      DD      YY
RR  RR      UU      UU  DD      DD      YY
RR    RR    UU      UU  DD      DD      YY
RR    RR    UU      UU  DD      DD      YY
RR      RR  UUUUUUUUUU  DDDDDDDD        YY
RR      RR  UUUUUUUUUU  DDDDDDDD        YY

 SSSS  N   N        55555   000        H   H  EEEEE   CCCC   222
S      N   N        5      0   0       H   H  E      C      2   2
S      NN  N        555    0  00       H   H  E      C          2
 SSS   N N N           5   0 0 0       HHHHH  EEEE   C         2
    S  N  NN            5  00  0       H   H  E      C        2
    S  N   N        5   5  0   0       H   H  E      C       2
SSSS   N   N         555    000        H   H  EEEEE   CCCC  22222

          J   000   8888          888    999    888
          J  0   0  8   8        8   8  9   9  8   8
          J  0   0  8   8        8   8  9   9  8   8
          J  0   0  8888          888    9999   888
        J  J  0   0  8   8        8   8      9  8   8
        J  J  0   0  8   8        8   8      9  8   8
         JJJ   000   8888          888    999    888
```

Job SN_50_HEC2 (898) queued to SYS$PRINT on 28-APR-1987 16:22 by user RUDY, UIC [COMPUTER,RUDY], under account COMPUTER at priority 100, started on printer _LCA0: on 28-APR-1987 16:24 from queue SYS$PRINT.

Digital Equipment Corporation - VAX/VMS Version V4.5

```
WATER SURFACE PROFILES
VERSION OF NOVEMBER 1976
UPDATED AUGUST   1983

RUN DATE  20-APR-1987 16:20.50.65
```


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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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 28-APR-1987 16:20:52.72

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XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
  HEC2 RELEASE DATED NOV 76 UPDATED MAR. 1982
  ERROR CODE -  01,02,03,04,05
  MODIFICATION -  50,51,52,53,54,55
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
```

T1 SNAKE CREEK, MIDLAND - USGS DATUM
T2 SNAKE CREEK - MIDLAND FIS
T3 50 - YEAR FREQUENCY

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	-1.	3.	0.	0.	0.000000	0.00	0.0	0.	612.500	0.000

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

NC	0.030	0.030	0.030	0.100	0.300	0.000	0.000	0.000	0.000	0.000
QT	5.000	1150.000	2250.000	2300.000	3400.000	2300.000	0.000	0.000	0.000	0.000
X1	6500.000	12.000	210.000	225.000	570.000	570.000	720.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	150.000	0.000	330.000	0.000	0.000	0.000	0.000
GR	626.400	0.000	625.400	13.000	614.200	53.000	609.200	210.000	605.900	216.000
GR	605.200	219.000	603.900	222.000	606.600	225.000	609.100	230.000	611.900	308.000
GR	621.900	350.000	627.100	435.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.060	0.060	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	7700.000	11.000	421.000	451.000	1200.000	1200.000	1200.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	350.000	0.000	620.000	0.000	0.000	0.000	0.000
GR	623.600	0.000	623.600	200.000	621.800	319.000	614.900	342.000	611.900	421.000
GR	607.300	427.000	607.200	434.000	607.300	442.000	612.500	451.000	614.400	600.000
GR	613.700	200.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.600	0.800	0.000	0.000	0.000	0.000	0.000
X1	7750.000	11.000	401.000	417.000	100.000	100.000	100.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	384.000	0.000	620.000	0.000	0.000	0.000	0.000
GR	623.200	0.000	618.500	200.000	616.200	320.000	614.900	386.000	612.600	397.000
GR	607.200	401.000	607.300	409.000	606.900	417.000	612.500	426.000	615.100	500.000
GR	618.100	800.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SB	0.000	1.600	2.500	0.000	16.000	0.000	106.000	0.000	607.200	607.200
X1	7751.000	0.000	0.000	0.000	24.000	26.000	26.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	613.800	616.100	0.000	0.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	384.000	0.000	620.000	0.000	0.000	0.000	0.000
BT	7.000	0.000	623.200	623.200	200.000	618.500	618.500	320.000	616.200	616.200
BT	401.000	616.200	616.200	417.000	616.100	616.100	500.000	615.100	615.100	800.000
BT	618.100	618.100	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	7800.000	10.000	364.000	396.000	180.000	200.000	200.000	0.000	0.000	0.000
GR	624.200	0.000	620.000	215.000	612.600	364.000	607.300	371.000	607.100	380.000
GR	607.300	389.000	613.700	396.000	615.000	495.000	620.000	585.000	624.700	800.000
NC	0.000	0.000	0.000	0.200	0.400	0.000	0.000	0.000	0.000	0.000
X1	8250.000	11.000	470.000	515.000	590.000	590.000	470.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	400.000	0.000	600.000	0.000	0.000	0.000	0.000
GR	623.000	0.000	620.000	230.000	615.000	330.000	610.000	470.000	608.900	485.000
GR	608.700	492.000	608.900	503.000	610.000	515.000	615.000	640.000	620.000	700.000
GR	621.000	1000.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
BT	5.000	280.000	460.000	570.000	710.000	570.000	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	8680.000	12.000	610.000	630.000	430.000	430.000	430.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	565.000	0.000	700.000	0.000	0.000	0.000	0.000
GR	623.500	0.000	621.000	360.000	620.000	490.000	615.000	580.000	613.000	610.000
GR	610.500	615.000	610.300	620.000	610.500	625.000	613.000	630.000	615.000	720.000
GR	620.000	810.000	621.000	1000.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.060	0.060	0.045	0.300	0.500	0.000	0.000	0.000	0.000	0.000
X1	9450.000	9.000	308.000	337.000	545.000	545.000	545.000	0.000	0.000	0.000
GR	625.700	0.000	623.900	200.000	618.800	308.000	613.100	317.000	612.100	321.000
GR	613.100	325.000	621.100	337.000	624.300	400.000	623.200	600.000	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	9500.000	13.000	292.000	308.000	100.000	100.000	100.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	240.000	0.000	320.000	0.000	0.000	0.000	0.000
GR	622.900	0.000	622.000	100.000	621.300	185.000	618.800	287.000	613.000	292.000
GR	613.000	299.500	619.000	299.500	619.000	300.500	613.000	300.500	613.000	308.000
GR	620.700	316.000	620.700	400.000	621.400	600.000	0.000	0.000	0.000	0.000
CM	1.050	1.620	2.980	0.000	16.000	1.000	90.000	0.000	613.000	613.000
X1	9501.000	0.000	0.000	0.000	80.000	80.000	80.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	619.000	620.700	0.000	0.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	240.000	0.000	320.000	0.000	0.000	0.000	0.000
BT	4.000	240.000	621.000	621.000	292.000	620.700	619.000	308.000	620.700	619.000
BT	320.000	620.700	620.700	0.000	0.000	0.000	0.000	0.000	0.000	0.000
BT	5.000	240.000	320.000	390.000	480.000	390.000	0.000	0.000	0.000	0.000
X1	9625.000	9.000	260.000	283.000	150.000	150.000	150.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	70.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	623.300	0.000	619.700	200.000	619.800	260.000	613.900	264.000	612.300	267.000
GR	613.900	271.000	620.000	283.000	622.800	400.000	626.600	600.000	0.000	0.000
NC	0.000	0.000	0.050	0.600	0.800	0.000	0.000	0.000	0.000	0.000
X1	9750.000	11.000	297.800	302.300	150.000	150.000	150.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	110.000	0.000	390.000	0.000	0.000	0.000	0.000
GR	623.400	0.000	624.600	200.000	619.800	293.000	616.600	297.800	614.900	298.500
GR	614.300	300.000	614.900	301.500	616.600	302.300	620.000	316.000	625.700	400.000
GR	626.500	600.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

SB	0.000	1.620	2.500	0.000	3.000	0.000	15.900	0.000	613.500	613.500
X1	9751.000	0.000	0.000	0.000	116.000	116.000	116.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	618.800	625.100	0.000	0.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	110.000	0.000	390.000	0.000	0.000	0.000	0.000
BT	7.000	110.000	624.000	624.000	297.800	625.100	616.600	298.500	625.100	618.200
BT	300.000	625.100	618.800	301.500	625.100	618.200	302.300	625.600	616.600	390.000
BT	625.700	625.700	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	9800.000	9.000	289.000	324.000	100.000	100.000	100.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	50.000	0.000	400.000	0.000	0.000	0.000	0.000
GR	624.400	0.000	624.400	200.000	621.500	289.000	614.600	306.000	614.100	308.000
GR	614.200	310.000	618.700	324.000	623.600	400.000	625.500	600.000	0.000	0.000
NC	0.060	0.060	0.045	0.100	0.300	0.000	0.000	0.000	0.000	0.000
X1	10700.000	11.000	487.000	517.000	868.000	868.000	735.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	60.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	627.000	0.000	626.300	200.000	626.400	400.000	623.500	487.000	618.000	492.000
GR	617.000	498.000	618.000	504.000	628.100	517.000	627.600	600.000	626.000	800.000
GR	631.000	1000.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	10750.000	15.000	496.200	503.800	150.000	150.000	150.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	400.000	0.000	600.000	0.000	0.000	0.000	0.000
GR	626.600	0.000	627.800	200.000	627.500	400.000	623.500	487.000	620.700	496.200
GR	618.400	497.000	617.200	498.500	616.900	500.000	617.200	501.500	618.400	503.000
GR	620.700	503.800	626.500	519.000	627.100	600.000	630.200	800.000	631.800	1000.000
SB	0.000	2.200	2.500	0.000	6.000	0.000	44.000	0.000	617.100	617.100
ET	0.000	0.000	0.000	0.000	0.000	9.100	0.000	0.000	509.000	600.000
X1	10701.000	0.000	0.000	0.000	85.000	85.000	85.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	624.400	629.800	0.000	0.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	400.000	0.000	600.000	0.000	0.000	0.000	0.000
BT	9.000	0.000	629.700	627.500	496.200	629.800	620.700	497.000	629.800	622.900
BT	498.500	629.800	624.000	500.000	629.800	624.400	501.500	629.800	624.000	503.000
BT	629.800	622.900	503.800	629.800	620.700	1000.000	630.300	627.110	0.000	0.000
GT	5.000	280.000	390.000	490.000	605.000	490.000	0.000	0.000	0.000	0.000
X1	10800.000	11.000	487.000	517.000	310.000	310.000	225.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	330.000	0.000	680.000	0.000	0.000	0.000	0.000
GR	626.600	0.000	627.800	200.000	627.500	400.000	626.100	487.000	618.000	498.000
GR	616.500	503.000	618.000	507.000	626.500	517.000	627.100	600.000	630.200	800.000
GR	631.800	1000.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.100	0.300	0.000	0.000	0.000	0.000	0.000
X1	11480.000	0.000	0.000	0.000	630.000	630.000	485.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	280.000	0.000	800.000	0.000	0.000	0.000	0.000
NC	0.040	0.040	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	12430.000	10.000	340.000	365.000	910.000	910.000	850.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	150.000	0.000	650.000	0.000	0.000	0.000	0.000
GR	628.800	0.000	628.000	200.000	627.900	340.000	621.000	354.000	620.400	356.000
GR	621.000	358.000	627.000	365.000	628.200	450.000	628.800	650.000	631.800	750.000

NC	0.000	0.000	0.000	0.100	0.300	0.000	0.000	0.000	0.000	0.000
X1	12500.000	17.000	348.000	360.000	50.000	50.000	50.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	150.000	0.000	650.000	0.000	0.000	0.000	0.000
GR	627.500	0.000	626.800	250.000	626.500	348.000	621.500	348.000	619.800	349.000
GR	619.500	350.000	619.800	351.000	621.500	352.000	621.500	356.000	619.800	357.000
GR	619.500	358.000	619.800	359.000	621.500	360.000	626.500	360.000	626.800	450.000
GR	627.800	650.000	630.800	750.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	12501.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	150.000	0.000	650.000	0.000	0.000	0.000	0.000
BT	13.000	0.000	627.500	627.500	348.000	626.500	621.500	349.000	626.500	623.250
BT	350.000	636.500	623.500	351.000	626.500	623.250	352.000	626.500	621.500	356.000
BT	626.500	621.500	357.000	626.500	623.250	358.000	626.500	623.500	359.000	626.500
BT	623.250	360.000	626.500	621.500	450.000	626.800	626.800	750.000	630.800	630.800
X1	12502.000	0.000	0.000	0.000	98.000	98.000	98.000	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	0.000	0.000	0.000	150.000	0.000	650.000	0.000	0.000	0.000	0.000
X1	12503.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	150.000	0.000	650.000	0.000	0.000	0.000	0.000
GT	5.000	210.000	320.000	400.000	500.000	400.000	0.000	0.000	0.000	0.000
X1	12550.000	10.000	340.000	369.000	50.000	50.000	50.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	180.000	0.000	650.000	0.000	0.000	0.000	0.000
GR	628.300	0.000	628.600	250.000	628.100	340.000	621.000	355.000	619.500	360.000
GR	621.000	365.000	628.700	369.000	627.700	450.000	629.000	650.000	631.200	750.000
NC	0.000	0.000	0.000	0.100	0.300	0.000	0.000	0.000	0.000	0.000
X1	13300.000	7.000	263.000	303.000	700.000	700.000	700.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	170.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	627.200	0.000	625.000	263.000	622.000	275.000	621.200	280.000	622.000	285.000
GR	625.000	303.000	630.000	310.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.050	0.050	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GT	5.000	150.000	240.000	300.000	390.000	300.000	0.000	0.000	0.000	0.000
X1	14075.000	8.000	211.000	257.000	620.000	620.000	620.000	0.000	0.000	0.000
GR	633.000	0.000	629.900	211.000	623.100	226.000	622.800	232.000	623.100	236.000
GR	631.600	257.000	634.600	290.000	633.300	330.000	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
X1	14125.000	11.000	227.000	233.000	50.000	50.000	50.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	130.000	0.000	330.000	0.000	0.000	0.000	0.000
GR	633.700	0.000	630.900	130.000	629.900	209.000	625.300	227.000	623.000	228.000
GR	622.300	230.000	623.000	232.000	625.300	233.000	631.600	259.000	632.900	330.000
GR	634.800	530.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SB	0.000	2.270	2.500	0.000	6.000	0.000	28.300	0.000	622.300	622.300
X1	14126.000	0.000	0.000	0.000	346.000	346.000	346.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	628.300	632.500	0.000	0.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	175.000	0.000	250.000	0.000	0.000	0.000	0.000
BT	8.000	0.000	633.700	633.700	227.000	632.500	625.300	228.000	632.500	627.500
BT	230.000	632.500	628.300	232.000	632.500	627.500	233.000	632.500	625.300	330.000

BT	632.900	632.900	530.000	634.800	634.800	0.000	0.000	0.000	0.000	0.000
X1	14200.000	9.000	200.000	241.000	100.000	100.000	100.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	70.000	0.000	280.000	0.000	0.000	0.000	0.000
GR	632.400	0.000	631.100	200.000	623.200	214.000	622.400	217.000	623.200	220.000
GR	633.400	241.000	637.900	250.000	638.000	330.000	637.900	530.000	0.000	0.000
BT	5.000	80.000	140.000	150.000	230.000	150.000	0.000	0.000	0.000	0.000
NC	0.050	0.050	0.045	0.100	0.300	0.000	0.000	0.000	0.000	0.000
X1	15300.000	10.000	400.000	422.000	1180.000	1180.000	950.000	0.000	0.000	0.000
GR	631.700	0.000	632.600	130.000	631.100	330.000	628.400	400.000	626.300	405.000
GR	625.400	410.000	626.300	416.000	629.400	422.000	635.200	660.000	647.600	750.000
X1	16450.000	10.000	363.000	404.000	945.000	945.000	945.000	0.000	0.000	0.000
GR	636.000	0.000	634.400	363.000	629.000	371.000	628.700	377.000	629.000	383.000
GR	634.700	404.000	638.700	500.000	647.000	600.000	642.000	700.000	643.300	800.000
NC	0.000	0.000	0.055	0.300	0.500	0.000	0.000	0.000	0.000	0.000
X1	16500.000	14.000	397.500	402.500	100.000	100.000	100.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	355.000	0.000	430.000	0.000	0.000	0.000	0.000
GR	637.400	0.000	635.500	300.000	634.430	386.000	631.100	397.500	629.600	398.000
GR	628.800	399.000	628.600	400.000	628.800	401.000	629.600	402.000	631.100	402.500
GR	634.700	427.000	638.500	500.000	642.400	700.000	642.200	800.000	0.000	0.000
SB	0.000	1.390	2.500	0.000	5.000	0.000	19.600	0.000	628.600	628.600
X1	16501.000	0.000	0.000	0.000	60.000	60.000	60.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	633.600	636.300	0.000	0.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	350.000	0.000	430.000	0.000	0.000	0.000	0.000
BT	10.000	0.000	637.400	637.400	397.500	636.300	631.100	398.000	636.300	632.600
BT	399.000	636.300	633.300	400.000	636.300	633.600	401.000	636.300	633.300	402.000
BT	636.300	632.600	402.500	636.300	631.100	500.000	638.500	638.500	800.000	642.200
BT	642.200	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	16550.000	11.000	390.000	419.000	100.000	100.000	100.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	350.000	0.000	450.000	0.000	0.000	0.000	0.000
GR	636.900	0.000	635.800	300.000	636.000	390.000	629.000	397.000	628.600	399.000
GR	629.000	402.000	637.100	419.000	640.100	500.000	641.100	600.000	644.600	700.000
GR	643.300	800.000	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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   SECNO     DEPTH     CWSEL     CRIWS     WSFLK     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

%PROF 1

CCHV=   0.100 CEHV=   0.300
%SECNO 6500.000

3470 ENCROACHMENT STATIONS=     150.0     330.0  TYPE=     1  TARGET=     180.000
  6500.00     7.30    612.50      0.00    612.50    613.10      0.60      0.00      0.00    609.20
    2250.     657.      760.      828.      141.       90.      180.        0.        0.    606.60
     0.00     4.67      8.48      4.60     0.030     0.030     0.030     0.000    605.20    150.00
 0.002946     570.      720.      570.         0         0         0      0.00    160.52    310.52

%SECNO 7700.000
3280 CROSS SECTION   7700.00 EXTENDED      1.99 FEET

3470 ENCROACHMENT STATIONS=     350.0     620.0  TYPE=     1  TARGET=     270.000
  7700.00     8.49    615.69      0.00      0.00    616.00      0.31      2.87      0.03    611.90
    2250.     343.     1244.      663.      173.      215.      360.       16.        6.    612.50
     0.08     1.98      5.78      1.84     0.060     0.040     0.060     0.000    607.20    350.00
 0.001982     1200     1200.     1200.         2         0         0      0.00    270.00    620.00

CCHV=   0.600 CEHV=   0.800
%SECNO 7750.000

3301 HV CHANGED MORE THAN HVINS
                                Sugnet
3470 ENCROACHMENT STATIONS=     384.0     620.0  TYPE=     1  TARGET=     236.000
  7750.00     8.91    615.81    615.41      0.00    616.90      1.09      0.28      0.62    607.20
    2250.     151.     1422.      677.       48.      138.      230.       17.        6.    606.90
     0.09     3.13     10.29      2.95     0.060     0.040     0.060     0.000    606.90    384.00
 0.004328      100.      100.      100.         4         5         0      0.00    187.52    571.52


SPECIAL BRIDGE

SS  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     0.00      1.60      2.50      0.00     16.00      0.00    106.00      0.00    607.20    607.20

%SECNO 7751.000
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SECNO	DEPTH	CWSEL	CRIWS	WSELR	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

3301 HV CHANGED MORE THAN XVINS

PRESSURE AND WEIR FLOW

EGPRS	EGTUC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
627.01	617.20	0.00	1433.	819.	106.	106.	613.80	616.10

3470 ENCROACHMENT STATIONS= 384.0 620.0 TYPE= 1 TARGET= 236.000

7751.00	9.88	616.78	0.00	0.00	617.30	0.51	0.39	0.00	607.20
2250.	162.	1177.	911.	65.	154.	415.	18.	7.	606.90
0.09	2.50	7.66	2.19	0.060	0.040	0.060	0.000	606.90	384.00
0.002079	26.	26.	26.	3	0	6	0.00	236.00	620.00

XSECNO 7800.000

7800.00	10.44	617.54	0.00	0.00	617.75	0.21	0.27	0.18	612.60
2250.	355.	1325.	579.	246.	289.	375.	21.	8.	613.70
0.10	1.40	4.59	1.55	0.060	0.040	0.060	0.000	607.10	264.43
0.000961	180.	200.	200.	2	0	0	0.00	276.38	540.81

CCHV= 0.200 CFHV= 0.400
XSECNO 8250.000

3470 ENCROACHMENT STATIONS= 400.0 600.0 TYPE= 1 TARGET= 200.000

8250.00	9.25	617.95	0.00	0.00	618.01	0.05	0.23	0.03	610.00
2250.	611	968.	671.	469.	394.	532.	36	11.	610.00
0.19	1.30	2.43	1.26	0.060	0.040	0.060	0.000	608.70	400.00
0.000242	590.	470.	590.	2	0	0	0.00	200.00	600.00

CCHV= 0.100 CFHV= 0.300
XSECNO 8680.000

3470 ENCROACHMENT STATIONS= 565.0 700.0 TYPE= 1 TARGET= 135.000

8680.00	7.79	618.09	0.00	0.00	618.10	0.01	0.09	0.00	613.00
460.	93.	180.	187.	163.	140.	302.	46.	13.	613.00
0.32	0.57	1.28	0.62	0.060	0.040	0.060	0.000	610.30	565.00
0.000096	430.	430.	430.	2	0	0	0.00	135.00	700.00

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	XLORR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

CCHV= 0.300 CEHV= 0.500
XSFCNO 9450.000

9450.00	5.90	618.00	0.00	0.00	618.51	0.51	0.17	0.25	618.80
460.	0.	460.	0.	0.	80.	0.	50.	13.	621.10
0.35	0.00	5.73	0.00	0.060	0.045	0.060	0.000	612.10	309.25
0.006783	545.	545.	545.	2	0	0	0.00	23.10	332.36

CCHV= 0.100 CEHV= 0.300
XSFCNO 9500.000

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS= 240.0 320.0 TYPE= 1 TARGET= 80.000

9500.00	5.76	618.76	0.00	0.00	619.03	0.27	0.49	0.02	613.00
460.	33	384.	43.	14.	86.	17.	50.	14.	613.00
0.36	2.31	4.45	2.47	0.060	0.045	0.060	0.000	613.00	287.03
0.003754	100.	100.	100.	2	0	0	0.00	25.95	313.99

Crescent

SPECIAL BRIDGE

SB XK	XXOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
1.05	1.62	2.98	0.00	16.00	1.00	90.00	0.00	613.00	613.00

XSFCNO 9501.000
PRESSURE FLOW

EGPRS	EGWC	H3	QUEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
619.42	619.06	0.03	0.	460.	90.	90.	619.00	620.70

3470 ENCROACHMENT STATIONS= 240.0 320.0 TYPE= 1 TARGET= 80.000

9501.00	6.20	619.20	0.00	0.00	619.42	0.22	0.39	0.00	613.00
460.	39.	375.	46.	20.	93.	20.	50.	14.	613.00
0.36	1.96	4.02	2.31	0.060	0.045	0.060	0.000	613.00	270.70
0.002989	80.	80.	80.	2	0	0	0.00	43.74	314.44

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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    IOC       ICONT     CORAR     TOPWID     ENDST

XSFCNO 9625.000

3470 ENCROACHMENT STATIONS=      70.0      600.0  TYPE=      1  TARGET=      -70.000
  9625.00      7.33    619.63      0.00      0.00    619.83      0.20      0.41      0.00    619.80
     320.        0.      320.        0.        0.       89.        0.       51.       14.    620.00
     0.37      0.00      3.59      0.00     0.060     0.045     0.060     0.000    612.30    260.11
 0.002436      150.      150.      150.         2         0         0      0.00     22.16    282.27

CCHV=   0.600 CEHV=   0.800
XSECNO 9750.000

3470 ENCROACHMENT STATIONS=     110.0      390.0  TYPE=      1  TARGET=      280.000
  9750.00      5.95    620.25      0.00      0.00    620.79      0.54      0.69      0.27    616.60
     320.       39.      172.      109.       12.       24.       27.       51.       14.    616.60
     0.38      3.33      7.24      4.02     0.060     0.050     0.060     0.000    614.30    284.29
 0.011536      150.      150.      150.         2         0         0      0.00     35.39    319.68

SPECIAL BRIDGE

SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     0.00      1.62      2.50      0.00      3.00      0.00     15.90      0.00    613.50    613.50

XSECNO 9751.000

3301 HV CHANGED MORE THAN HVINS

PRESSURE AND WEIR FLOW

 EGPRS      EGLWC      H3        QWEIR      QPR       BAREA   TRAPEZOID      ELLC      ELTRD
                                                                 AREA
   630.44    620.64     0.00      105.      215.       16.       16.       618.80    625.10

3470 ENCROACHMENT STATIONS=     110.0      390.0  TYPE=      1  TARGET=      280.000
  9751.00     10.56    624.86      0.00      0.00    624.87      0.00      4.07      0.00    616.60
     320.      137.       42.      141.      328.       44.      264.       52.       14.    616.60
     0.44      0.42      0.93      0.53     0.060     0.050     0.060     0.000    614.30    110.00
 0.000083      116.      116.      116.         0         0         7      0.00    277.70    387.70
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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

XSECNO 9800.000

3470 ENCROACHMENT STATIONS= 50.0 400.0 TYPE= 1 TARGET= 350.000

9800.00	10.77	624.87	0.00	0.00	624.87	0.00	0.01	0.00	621.50
320.	44.	179.	97.	241.	273	282.	54.	15.	618.70
0.50	0.18	0.66	0.34	0.060	0.050	0.060	0.000	614.10	50.00
0.000034	100.	100.	100.	2	0	0	0.00	350.00	400.00

CCHV= 0.100 CHHV= 0.300

XSECNO 10700.000

3470 ENCROACHMENT STATIONS= 60.0 1000.0 TYPE= 1 TARGET= -60.000

10700.00	7.89	624.89	0.00	0.00	624.96	0.07	0.07	0.02	623.50
320.	14.	306.	0.	29.	140.	0.	63.	19.	628.10
0.60	0.47	2.19	0.00	0.060	0.045	0.060	0.000	617.00	445.39
0.000586	868	735.	868.	2	0	0	0.00	67.47	512.86

XSECNO 10750.000

3470 ENCROACHMENT STATIONS= 400.0 600.0 TYPE= 1 TARGET= 200.000

10750.00	8.07	624.97	0.00	0.00	625.13	0.16	0.14	0.03	620.70
320.	74	207.	39.	50.	54.	24.	63.	19.	620.70
0.61	1.48	3.84	1.65	0.060	0.045	0.060	0.000	616.90	455.11
0.001775	150.	150.	150.	2	0	0	0.00	59.87	514.98

Wheeler

SPECIAL BRIDGE

SB	XK	XKOR	CCMB	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	2.28	2.50	0.00	6.00	0.00	44.00	0.00	617.10	617.10

XSECNO 10751.000
PRESSURE FLOW

EGPRS	EGNOC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
626.84	625.30	0.00	0.	320.	44.	44.	624.40	629.80

3470 ENCROACHMENT STATIONS= 400.0 600.0 TYPE= 1 TARGET= 200.000

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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      VLH       VROB      XNL       XNCH      XNR       WTN       ELMIN      SSTA
  SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID     ENDST

 10751.00     9.91    626.81      0.00      0.00    626.84      0.03      1.71      0.00    620.70
     320.     134.     137.       49.      162.       68.       55.       63.       19.    620.70
     0.63     0.83     2.02      0.88     0.060     0.045     0.060     0.000    616.90    415.11
 0.000363      85.      85.       85.         2         0         0      0.00    145.10    560.21

XSECNO 10800.000

3470 ENCROACHMENT STATIONS=      330.0      680.0  TYPE=      1  TARGET=      350.000
 10800.00    10.38    626.88      0.00      0.00    626.95      0.06      0.10      0.01    626.10
     390.       5.     383.        2.       19.      186.       10.       65.       20.    626.50
     0.66     0.28     2.06      0.17     0.060     0.045     0.060     0.000    616.50    438.28
 0.000438     310.     225.      310.         2         0         0      0.00    131.83    570.12

CCHV=   0.100 CEHV=   0.300
XSECNO 11480.000

3470 ENCROACHMENT STATIONS=      230.0      800.0  TYPE=      1  TARGET=      570.000
 11480.00    10.59    627.09      0.00      0.00    627.15      0.06      0.20      0.00    626.10
     390.       9.     376.        5        31.      192.       24        68.       23.    626.50
     0.74     0.30     1.95      0.21     0.060     0.045     0.060     0.000    616.50    425.43
 0.000378     630.     485.      630.         2         0         0      0.00    173.30    598.73

XSECNO 12450.000

3470 ENCROACHMENT STATIONS=      150.0      650.0  TYPE=      1  TARGET=      500.000
 12450.00     7.21    627.61      0.00      0.00    627.84      0.23      0.64      0.05    627.90
     390.       0      380.       10.        0.       97.       13.       71.       25.    627.00
     0.80     0.00     3.91      0.78     0.040     0.040     0.040     0.000    620.40    340.59
 0.002141     910.     850.      910.         2         0         0      0.00     67.44    408.04

CCHV=   0.100 CEHV=   0.300
XSECNO 12500.000

3470 ENCROACHMENT STATIONS=      150.0      650.0  TYPE=      1  TARGET=      500.000
 12500.00     8.38    627.88      0.00      0.00    627.89      0.01      0.03      0.02    626.50
     390.     143.     123.      124.      214.       87.      216.       72.       25.    626.50
     0.81     0.67     1.41      0.57     0.040     0.040     0.040     0.000    619.50    150.00
 0.000287      50.      50.       50.         2         0         0      0.00    495.97    645.97
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Sylvan Lane

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   SECNO     DEPTH     CWSEL     CRIWS     WSELR     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

XSECNO 12501.000

3370 NORMAL BRIDGE,NRD= 13 MIN ELTRD=  626.50 MAX ELLC=  630.80

3470 ENCROACHMENT STATIONS=     150.0     650.0  TYPE=     1  TARGET=     500.000
 12501.00     8.38   627.88     0.00      0.00   627.89     0.01      0.00      0.00    626.50
     390.     172.      26.     191.      214.      36.     216.      72.       25.     626.50
     0.81     0.60     0.74     0.89     0.040    0.040    0.040     0.000   619.50    150.00
 0.000415       1.       1.       1.         0        0        0    -51.57   496.05    646.05

XSECNO 12502.000

3370 NORMAL BRIDGE,NRD= 13 MIN ELTRD=  626.50 MAX ELLC=  630.80

3470 ENCROACHMENT STATIONS=     150.0     650.0  TYPE=     1  TARGET=     500.000
 12502.00     8.43   627.93     0.00      0.00   627.94     0.01      0.04      0.00    626.50
     390.     204.      30.     157.      223.      36.     229.      73.       26.     626.50
     0.85     0.91     0.83     0.69     0.040    0.040    0.040     0.000   619.50    150.00
 0.000511      98.      98.      98.         1        0        0    -51.64   500.00    650.00

XSECNO 12503.000

3470 ENCROACHMENT STATIONS=     150.0     650.0  TYPE=     1  TARGET=     500.000
 12503.00     8.43   627.93     0.00      0.00   627.94     0.01      0.00      0.00    626.50
     390.     145      117.     128.      224.      88.     230.      73.       26.     626.50
     0.85     0.65     1.33     0.55     0.040    0.040    0.040     0.000   619.50    150.00
 0.000235       1.       1.       1.         0        0        0      0.00   500.00    650.00

XSECNO 12450.000

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS=     180.0     650.0  TYPE=     1  TARGET=     470.000
 12450.00     8.39   627.89     0.00      0.00   627.98     0.08      0.02      0.02    628.10
     320.       0.     319.       1.        0.     139.       4.      73.       27.     628.70
     0.85     0.00     2.30     0.19     0.040    0.040    0.040     0.000   619.50    340.43
 0.000592      50.      50.      50.         2        0        0      0.00    73.83    479.93
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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   IOC      ICONT    CORAR    TOPWID     ENDST

CCHV=   0.100 CEHV=   0.300
XSECNO 13300.000

3470 ENCROACHMENT STATIONS=     120.0     310.0  TYPE=     1  TARGET=    -120.000
 13300.00     6.86   628.06     0.00     0.00   628.07     0.01     0.08     0.01   625.00
     320.     166.     152.       2.     352.     201.       7.      79.      29.   625.00
     1.18     0.47     0.76     0.30    0.040    0.040    0.040    0.000   621.20   120.00
 0.000049     700.     700.     700.        2        0        0     0.00   187.28   307.28

XSECNO 14075.000
 14075.00     5.28   628.08     0.00     0.00   628.15     0.07     0.07     0.02   629.90
     240.       0.     240.       0.       0.     109.       0.      84.      30.   631.60
     1.25     0.00     2.20     0.00    0.050    0.040    0.050    0.000   622.80   215.02
 0.000777     620.     620.     620.        2        0        0     0.00    33.28   248.30

CCHV=   0.300 CEHV=   0.500
XSECNO 14125.000

3470 ENCROACHMENT STATIONS=     130.0     330.0  TYPE=     1  TARGET=     200.000
 14125.00     5.71   628.01     0.00     0.00   628.38     0.37     0.06     0.15   625.30
     240.      36.     165.      38.      14.      29.      15.      84.      30.   625.30
     1.26     2.53     5.67     2.53    0.050    0.040    0.050    0.000   622.30   216.40
 0.005042      50.      50.      50.        2        0        0     0.00    27.78   244.18

SPECIAL BRIDGE

CB  XK       XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     0.00     2.27      2.50      0.00      6.00      0.00     28.30      0.00    622.30    622.30

XSECNO 14126.000
PRESSURE FLOW

 EGPRS      EGLWC      H3       QWEIR      QPR       BAREA   TRAPEZOID      ELLC      ELTRD
                                                                AREA
   630.54    628.38     0.00        0.      240.       28.       36.      628.30    632.50

3470 ENCROACHMENT STATIONS=     175.0     255.0  TYPE=     1  TARGET=      80.000
 14126.00     8.20   630.50     0.00     0.00   630.54     0.05     2.16     0.00   625.30
     240.      72     101.      67.      65.      44.      56.      85.      31.   625.30
     1.32     1.10     2.30     1.20    0.050    0.040    0.050    0.000   622.30   175.00
 0.000476     346.     346.     346.        2        0        0     0.00    79.45   254.45
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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    IUC       ICONT     CORAR     TOPWID      ENDST

XSECNO 14250.000

3470 ENCROACHMENT STATIONS=      70.0      280.0  TYPE=     1  TARGET=      210.000
 14250.00     8.14    630.54      0.00      0.00    630.58      0.04      0.04      0.00    631.10
     240.       0.      240.        0.        0.      150.        0.       85.       31.    633.40
     1.33     0.00      1.60      0.00     0.050     0.040     0.050     0.000    622.40    200.99
 0.000299     100.      100.      100.         2         0         0      0.00     34.13    235.12

CCHV=   0.100 CEHV=   0.300
XSECNO 15500.000
 15500.00     5.41    620.81      0.00      0.00    630.82      0.01      0.24      0.00    628.40
     140.      33.      95.       12.       75.      90.       41.       89.       33.    629.40
     1.66     0.44      1.06     0.31     0.050     0.045     0.050     0.000    625.40    337.57
 0.000170    1180.     950.     1180.         2         0         0      0.00    142.21    479.78

XSECNO 16450.000
 16450.00     2.45    631.15      0.00      0.00    631.34      0.19      0.47      0.05    634.40
     140        0.      140.        0.        0.       40.        0.       92.       35.    634.70
     1.73     0.00      3.54      0.00     0.050     0.045     0.050     0.000    628.70    367.81
 0.005912     945       945.      945.         2         0         0      0.00     23.12    390.93

CCHV=   0.300 CEHV=   0.500
XSECNO 16500.000
7180 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     355.0      430.0  TYPE=     1  TARGET=       75.000
 16500.00     3.74    632.34    632.34      0.00    633.02      0.68      1.11      0.24    631.10
     140.       9.      112.       19.        3.       16.        5.       92.       35.    631.10
     1.74     3.52      7.18     3.59     0.050     0.055     0.050     0.000    628.60    393.17
 0.027912     100.      100.      100.         6        11         0      0.00     17.78    410.96

SPECIAL BRIDGE

SB  XK        XKOK      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     0.00      1.39      2.50      0.00      5.00      0.00     19.60      0.00    628.60    628.60

XSECNO 16501.000
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SECND     DEPTH     CWSEL     CRIWS     WSFLX     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


6070,LOW FLOW BY NORMAL BRIDGE

EGPRS=     0.000  ELLWC=   633.020  ELLC=   633.600  PCWSE=   632 342  ELTRD=   636.300

3370 NORMAL BRIDGE,NRD= 10 MIN ELTRD=  636.30 MAX ELLC=  633.60

3470 ENCROACHMENT STATIONS=     350.0     435.0  TYPE=     1  TARGET=     85.000
 16501.00     6.03   634.63   632.04      0.00   635.52     0.89      2.39      0.11   631.10
     140.       0.     140.       0.        0.      19.       0.       92.       35.   631.10
     1.74     0.00     7.57     0.00     0.050    0.055    0.050     0.000    628.60   367.90
 0.061721      60.       60      60.         5       18        0    -74.68     58.64   426.53

WSFCND 16550.000

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS=     350.0     450.0  TYPE=     1  TARGET=    100.000
 16550.00     7.30   635.90     0.00      0.00   635.92     0.03      0.14      0.26   636.00
     140.       0.     140.       0.        0.     109.       0.       92.       35.   637.10
     1.76     0.00     1.28     0.00     0.050    0.055    0.050     0.000    628.60   390.10
 0.000417     100.     100.     100.         3        0        0      0.00     26.38   416.48
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THIS RUN EXECUTED 28-APR-1987 16:21:54.66

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***************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAR. 1982
  ERROR CORR -  01,02,03,04,05
  MODIFICATION -  50,51,52,53,54,55
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??????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????
???????????????????????? McNamee, Porter & Seeley | Engineers / Architects | Ann Arbor, Michigan ???????????????????????????
??????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????

                    RRRRRRRR    UU      UU  DDDDDDDD    YY      YY
                    RRRRRRRR    UU      UU  DDDDDDDD    YY      YY
                    RR      RR  UU      UU  DD      DD  YY      YY
                    RR      RR  UU      UU  DD      DD  YY      YY
                    RR      RR  UU      UU  DD      DD    YY  YY
                    RR      RR  UU      UU  DD      DD    YY  YY
                    RRRRRRRR    UU      UU  DD      DD      YY
                    RRRRRRRR    UU      UU  DD      DD      YY
                    RR  RR      UU      UU  DD      DD      YY
                    RR  RR      UU      UU  DD      DD      YY
                    RR    RR    UU      UU  DD      DD      YY
                    RR    RR    UU      UU  DD      DD      YY
                    RR      RR  UUUUUUUUUU  DDDDDDDD        YY
                    RR      RR  UUUUUUUUUU  DDDDDDDD        YY

          SSSS  N   N        55555   000    000        H   H  EEEEE   CCCC   222
         S      N   N        5      0   0  0   0       H   H  E      C      2   2
         S      NN  N        555    0  00  0  00       H   H  E      C          2
          SSS   N N N          5   0 0 0  0 0 0       HHHHH  EEEE   C         2
             S  N  NN           5  00  0  00  0       H   H  E      C        2
             S  N   N        5   5  0   0  0   0       H   H  E      C       2
         SSSS   N   N         555    000    000        H   H  EEEEE   CCCC  22222

                        J   000   8888          999    000   4  4
                        J  0   0  8   8        9   9  0   0  4  4
                        J  0   0  8   8        9   9  0  00  4  4
                        J  0   0  8888          9999  0 0 0  44444
                    J   J  0   0  8   8            9  00  0     4
                    J   J  0   0  8   8            9  0   0     4
                     JJJ    000   8888          999    000      4

Job SN_500_HEF2 (904) queued to SYS$PRINT on 28-APR-1987 16:26 by user RUDY, UIC [COMPUTER,RUDY], under account COMPUTER at
priority 100, started on printer _LCA0: on 28-APR-1987 16:27 from queue SYS$PRINT.

??????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????
???????????????????????????????????????? Digital Equipment Corporation - VAX/VMS Version V4.5 ???????????????????????????????????
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XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX          XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
X  WATER SURFACE PROFILES                      X          X  U.S. ARMY CORPS OF ENGINEERS          X
X  VERSION OF NOVEMBER 1976                    X          X  THE HYDROLOGIC ENGINEERING CENTER     X
X  UPDATED AUGUST  1983                        X          X  609 SECOND STREET, SUITE D            X
X                                              X          X  DAVIS, CALIFORNIA 95616               X
X  RUN DATE  20-APR-1987 16:25:06.46           X          X  (916) 440-2105 (FTS) 448-2105         X
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX          XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
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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 28-APR-1987 16:25:08.64

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XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
  HEC2 RELEASE DATED NOV 76 UPDATED MAR. 1982
  ERROR CORR -  01,02,03,04,05
  MODIFICATION -  50,51,52,53,54,55
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
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T1      SNAKE CREEK, MIDLAND - USGS DATUM
T2      SNAKE CREEK - MIDLAND FIS
T3      500 - YEAR FREQUENCY

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ
     -1.       5.       0.       0.  0.000000   0.00     0.0      0.   621.100   0.000

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

NC      0.030    0.030    0.030    0.100    0.300    0.000    0.000    0.000    0.000    0.000
BT      5.000 1150.000 2200.000 2300.000 3400.000 2300.000    0.000    0.000    0.000    0.000
X1   6500.000   12.000  210.000  225.000  570.000  570.000  720.000    0.000    0.000    0.000
X3      0.000    0.000    0.000  150.000    0.000  330.000    0.000    0.000    0.000    0.000
GR    626.400    0.000  625.400   13.000  614.200   53.000  609.200  210.000  605.900  216.000
GR    605.200  219.000  605.900  222.000  606.600  225.000  609.100  230.000  611.900  308.000
GR    621.900  350.000  627.100  435.000    0.000    0.000    0.000    0.000    0.000    0.000

NC      0.060    0.060    0.040    0.000    0.000    0.000    0.000    0.000    0.000    0.000
X1   7700.000   11.000  421.000  451.000 1200.000 1200.000 1200.000    0.000    0.000    0.000
X3      0.000    0.000    0.000  350.000    0.000  620.000    0.000    0.000    0.000    0.000
GR    623.600    0.000  623.600  200.000  621.800  319.000  614.900  342.000  611.900  421.000
GR    607.300  427.000  607.200  434.000  607.300  442.000  612.500  451.000  614.400  600.000
GR    613.700  800.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000

NC      0.000    0.000    0.000    0.600    0.800    0.000    0.000    0.000    0.000    0.000
X1   7750.000   11.000  401.000  417.000  100.000  100.000  100.000    0.000    0.000    0.000
X3     10.000    0.000    0.000  384.000    0.000  620.000    0.000    0.000    0.000    0.000
GR    623.200    0.000  618.500  200.000  616.200  320.000  614.900  386.000  612.600  397.000
GR    607.200  401.000  607.300  409.000  606.900  417.000  612.500  426.000  615.100  500.000
GR    618.100  800.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000

SB      0.000    1.600    2.500    0.000   16.000    0.000  106.000    0.000  607.200  607.200
X1   7751.000    0.000    0.000    0.000   26.000   26.000   26.000    0.000    0.000    0.000
X2      0.000    0.000    1.000  613.800  616.100    0.000    0.000    0.000    0.000    0.000
X3      0.000    0.000    0.000  384.000    0.000  620.000    0.000    0.000    0.000    0.000
BT      7.000    0.000  623.200  623.200  200.000  618.500  618.500  320.000  616.200  616.200
BT    401.000  616.200  616.200  417.000  616.100  616.100  500.000  615.100  615.100  800.000
BT    618.100  618.100    0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000
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X1	7800.000	10.000	364.000	396.000	180.000	200.000	200.000	0.000	0.000	0.000
GR	624.200	0.000	620.000	215.000	612.600	364.000	607.300	371.000	607.100	380.000
GR	607.300	389.000	613.700	396.000	615.000	495.000	620.000	585.000	624.700	800 000
NC	0.000	0.000	0.000	0.200	0.400	0.000	0.000	0.000	0.000	0.000
X1	8250.000	11.000	470.000	515.000	590.000	590.000	470.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	400.000	0.000	600.000	0.000	0.000	0.000	0.000
GR	623.000	0.000	620.000	230.000	615.000	330.000	610.000	470.000	608.900	485.000
GR	608.700	492.000	608.900	503 000	610.000	515 000	615 000	640.000	620.000	700.000
GR	621.000	1000.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
QT	5.000	280.000	460.000	570.000	710.000	570.000	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	8680.000	12.000	610.000	630.000	430.000	430.000	430.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	565.000	0.000	700.000	0.000	0.000	0.000	0.000
GR	623.500	0.000	621.000	360.000	620.000	490.000	615.000	580.000	613.000	610 000
GR	610.500	615.000	610.300	620.000	610.500	625.000	613.000	630.000	615.000	720.000
GR	620.000	810.000	621.000	1000.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.060	0.060	0.045	0.300	0.500	0.000	0.000	0.000	0.000	0.000
X1	9430.000	9.000	308.000	337.000	545.000	545 000	545.000	0.000	0.000	0.000
GR	625.700	0.000	623.900	200.000	618.800	308.000	613.100	317.000	612.100	321.000
GR	613.100	325.000	621.100	337.000	624.300	400.000	623.200	600.000	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	9500.000	13.000	292.000	308.000	100.000	100.000	100.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	240.000	0.000	320.000	0.000	0.000	0.000	0.000
GR	622.900	0.000	622.000	100.000	621.300	185.000	618.800	287.000	613.000	292.000
GR	613.000	299.500	619.000	299.500	619.000	300.500	613.000	300.500	613.000	308.000
GR	620.700	316.000	620.700	400.000	621.400	600.000	0.000	0.000	0.000	0.000
SH	1.000	1.620	2.980	0.000	16.000	1.000	90.000	0.000	613.000	613.000
X1	9501.000	0 000	0.000	0.000	80.000	80.000	80.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	619.000	620.700	0.000	0.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	240.000	0.000	320.000	0.000	0.000	0.000	0.000
BT	4.000	240.000	621.000	621.000	292.000	620.700	619.000	308.000	620.700	619.000
BT	320.000	620.700	620.700	0.000	0.000	0.000	0.000	0.000	0.000	0.000
QT	5.000	240.000	320.000	390.000	480.000	390.000	0.000	0 000	0.000	0.000
X1	9625.000	9.000	260.000	283.000	150.000	150.000	150.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	70.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	623.300	0.000	619.700	200.000	619.800	260.000	613.900	264.000	612.300	267.000
GR	613.900	271.000	620.000	283.000	622.800	400 000	626.600	600.000	0.000	0.000
NC	0.000	0.000	0.050	0.600	0.800	0.000	0.000	0.000	0.000	0.000
X1	9750.000	11.000	297.800	302.300	150.000	150.000	150.000	0.000	0.000	0.000
X2	0.000	0.000	0.000	110.000	0.000	390.000	0.000	0.000	0.000	0.000
GR	623.400	0.000	624.600	200.000	619.800	293.000	616.600	297.800	614.900	298.500
GR	614.300	300.000	614.900	301.500	616.600	302 300	620.000	316.000	625.700	400.000
GR	626.500	600.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

SR	0.000	1.620	2.500	0.000	3.000	0.000	15.900	0.000	613.500	613.500
X1	9751.000	0.000	0.000	0.000	116.000	116.000	116.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	618.800	625.100	0.000	0.000	0.000	0.000	0.000
ET	0.000	0.000	0.000	110.000	0.000	390.000	0.000	0.000	0.000	0.000
BT	7.000	110.000	624.000	624.000	297.800	625.100	616.600	298.500	625.100	618.200
BT	300.000	625.100	618.800	301.500	625.100	618.200	302.300	625.600	616.600	390.000
BT	625.700	625.700	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	9800.000	9.000	289.000	324.000	100.000	100.000	100.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	50.000	0.000	400.000	0.000	0.000	0.000	0.000
GR	624.400	0.000	624.400	200.000	621.500	289.000	614.600	306.000	614.100	308.000
GR	614.600	310.000	618.700	324.000	623.600	400.000	625.500	600.000	0.000	0.000
NC	0.060	0.060	0.045	0.100	0.300	0.000	0.000	0.000	0.000	0.000
X1	10700.000	11.000	487.000	517.000	868.000	868.000	735.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	60.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	627.000	0.000	626.300	200.000	626.400	400.000	623.500	487.000	618.000	492.000
GR	617.000	498.000	618.000	504.000	628.100	517.000	627.600	600.000	626.000	800.000
GR	631.000	1000.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	10700.000	15.000	496.200	503.800	150.000	150.000	150.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	400.000	0.000	600.000	0.000	0.000	0.000	0.000
GR	626.600	0.000	627.800	200.000	627.500	400.000	623.500	487.000	620.700	496.200
GR	618.400	497.000	617.200	498.500	616.900	500.000	617.200	501.500	618.400	503.000
GR	620.700	503.800	626.500	519.000	627.100	600.000	630.200	800.000	631.800	1000.000
SR	0.000	2.280	2.500	0.000	6.000	0.000	44.000	0.000	617.100	617.100
ET	0.000	0.000	0.000	0.000	0.000	9.100	0.000	0.000	509.000	600.000
X1	10751.000	0.000	0.000	0.000	85.000	85.000	85.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	624.400	629.800	0.000	0.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	400.000	0.000	600.000	0.000	0.000	0.000	0.000
BT	9.000	0.000	629.700	627.500	496.200	629.800	620.700	497.000	629.800	622.900
BT	498.500	629.800	624.000	500.000	629.800	624.400	501.500	629.800	624.000	503.000
BT	629.800	622.900	503.800	629.800	620.700	1000.000	630.300	627.110	0.000	0.000
OT	5.000	260.000	390.000	490.000	605.000	490.000	0.000	0.000	0.000	0.000
X1	10800.000	11.000	487.000	517.000	310.000	310.000	225.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	330.000	0.000	680.000	0.000	0.000	0.000	0.000
GR	626.600	0.000	627.800	200.000	627.500	400.000	626.100	487.000	618.000	498.000
GR	616.500	503.000	618.000	507.000	626.500	517.000	627.100	600.000	630.200	800.000
GR	631.800	1000.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.100	0.300	0.000	0.000	0.000	0.000	0.000
X1	11480.000	0.000	0.000	0.000	630.000	630.000	485.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	230.000	0.000	800.000	0.000	0.000	0.000	0.000
NC	0.040	0.040	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	12450.000	10.000	340.000	365.000	910.000	910.000	850.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	150.000	0.000	650.000	0.000	0.000	0.000	0.000
GR	628.800	0.000	628.000	250.000	627.900	340.000	621.000	354.000	620.400	356.000
GR	621.000	358.000	627.000	365.000	628.200	450.000	628.800	650.000	631.800	750.000

NC	0.000	0.000	0.000	0.100	0.300	0.000	0.000	0.000	0.000	0.000
X1	12500.000	17.000	348.000	360.000	50.000	50.000	50.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	150.000	0.000	650.000	0.000	0.000	0.000	0.000
GR	627.300	0.000	626.800	250.000	626.500	349.000	621.500	348.000	619.800	349.000
GR	619.500	350.000	619.800	351.000	621.500	352.000	621.500	356.000	619.800	357.000
GR	619.500	358.000	619.800	359.000	621.500	360.000	626.500	360.000	626.800	450.000
GR	627.900	650.000	630.800	750.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	12501.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	150.000	0.000	650.000	0.000	0.000	0.000	0.000
BT	13.000	0.000	627.500	627.500	348.000	626.500	621.500	349.000	626.500	623.250
BT	300.000	636.500	623.500	351.000	626.500	623.250	352.000	626.500	621.500	356.000
BT	626.500	621.500	357.000	626.500	623.250	358.000	626.500	623.500	359.000	626.500
BT	623.250	360.000	626.500	621.500	450.000	626.800	626.800	750.000	630.800	630.800
X1	12502.000	0.000	0.000	0.000	98.000	98.000	98.000	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	0.000	0.000	0.000	150.000	0.000	650.000	0.000	0.000	0.000	0.000
X1	12503.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	150.000	0.000	650.000	0.000	0.000	0.000	0.000
BT	5.000	210.000	320.000	400.000	500.000	400.000	0.000	0.000	0.000	0.000
X1	12550.000	10.000	340.000	369.000	50.000	50.000	50.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	180.000	0.000	650.000	0.000	0.000	0.000	0.000
GR	628.300	0.000	628.600	250.000	628.100	340.000	621.000	355.000	619.500	360.000
GR	621.000	365.000	628.700	369.000	627.700	450.000	629.000	650.000	631.200	750.000
NC	0.000	0.000	0.000	0.100	0.300	0.000	0.000	0.000	0.000	0.000
X1	13300.000	7.000	263.000	303.000	700.000	700.000	700.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	120.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	627.200	0.000	625.000	263.000	622.000	275.000	621.200	280.000	622.000	285.000
GR	625.000	303.000	630.000	310.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.050	0.050	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000
BT	5.000	150.000	240.000	300.000	390.000	300.000	0.000	0.000	0.000	0.000
X1	14075.000	8.000	211.000	257.000	620.000	620.000	620.000	0.000	0.000	0.000
GR	633.000	0.000	629.700	211.000	623.100	226.000	622.800	232.000	623.100	236.000
GR	631.600	257.000	634.600	290.000	633.300	530.000	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
X1	14125.000	11.000	227.000	233.000	50.000	50.000	50.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	130.000	0.000	330.000	0.000	0.000	0.000	0.000
GR	633.700	0.000	630.900	130.000	629.900	209.000	625.300	227.000	623.000	228.000
GR	622.300	230.000	623.000	232.000	625.300	233.000	631.600	259.000	632.900	330.000
GR	634.800	530.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SB	0.000	2.270	2.500	0.000	6.000	0.000	28.300	0.000	622.300	622.300
X1	14126.000	0.000	0.000	0.000	346.000	346.000	346.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	628.300	632.500	0.000	0.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	175.000	0.000	255.000	0.000	0.000	0.000	0.000
BT	8.000	0.000	633.700	633.700	227.000	632.500	625.300	228.000	632.500	627.500
BT	230.000	632.500	628.300	232.000	632.500	627.500	233.000	632.500	625.300	330.000

BT	632.900	632.900	530.000	634.800	634.800	0.000	0.000	0.000	0.000	0.000
X1	14250.000	9.000	200.000	241.000	100.000	100.000	100.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	70.000	0.000	280.000	0.000	0.000	0.000	0.000
GR	632.400	0.000	631.100	200.000	623.200	214.000	622.400	217.000	623.200	220.000
GR	633.400	241.000	637.900	260.000	638.000	330.000	637.900	530.000	0.000	0.000
BT	5.000	80.000	140.000	150.000	230.000	150.000	0.000	0.000	0.000	0.000
NC	0.050	0.050	0.045	0.100	0.300	0.000	0.000	0.000	0.000	0.000
X1	15500.000	10.000	400.000	422.000	1180.000	1180.000	950.000	0.000	0.000	0.000
GR	631.900	0.000	632.600	130.000	631.100	330.000	628.400	400.000	626.300	405.000
GR	625.400	410.000	626.300	416.000	629.400	422.000	635.200	660.000	647.600	750.000
X1	16450.000	10.000	363.000	404.000	945.000	945.000	945.000	0.000	0.000	0.000
GR	636.000	0.000	634.400	363.000	629.000	371.000	628.700	377.000	629.000	383.000
GR	634.700	404.000	628.700	500.000	647.000	600.000	642.000	700.000	643.300	800.000
NC	0.000	0.000	0.055	0.300	0.500	0.000	0.000	0.000	0.000	0.000
X1	16500.000	14.000	397.500	402.500	100.000	100.000	100.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	355.000	0.000	430.000	0.000	0.000	0.000	0.000
GR	637.400	0.000	635.500	300.000	634.400	386.000	631.100	397.500	629.600	398.000
GR	628.800	399.000	628.600	400.000	628.800	401.000	629.600	402.000	631.100	402.500
GR	634.700	427.000	638.500	500.000	642.400	700.000	642.200	800.000	0.000	0.000
SB	0.000	1.390	2.500	0.000	5.000	0.000	19.600	0.000	628.600	628.600
X1	16501.000	0.000	0.000	0.000	60.000	60.000	60.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	633.600	636.300	0.000	0.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	350.000	0.000	430.000	0.000	0.000	0.000	0.000
BT	10.000	0.000	637.400	637.400	397.500	636.300	631.100	398.000	636.300	632.600
BT	399.000	626.300	633.300	400.000	636.300	633.600	401.000	636.300	633.300	402.000
BT	636.300	632.600	402.500	636.300	631.100	500.000	638.500	638.500	800.000	642.200
BT	642.200	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	16550.000	11.000	390.000	419.000	100.000	100.000	100.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	350.000	0.000	450.000	0.000	0.000	0.000	0.000
GR	636.900	0.000	635.800	300.000	636.000	390.000	629.000	397.000	628.600	399.000
GR	629.000	402.000	637.100	419.000	640.100	500.000	641.100	600.000	644.600	700.000
GR	643.300	800.000	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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   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

XPROF 1

CCHV=   0.100 CEHV=   0.300
XSECNO 6500.000

3470 ENCROACHMENT STATIONS=     150.0     330.0  TYPE=     1  TARGET=     180.000
  6500.00    15.90   621.10      0.00   621.10   621.15     0.05      0.00      0.00    609.20
    3400.     1109.     475.     1816.     657.     219.    1038.        0.        0.    606.60
     0.00      1.69     2.17      1.75    0.030    0.030    0.030     0.000    605.20    150.00
 0.000339      570.     720.      570.        0        0        0      0.00    180.00    330.00

XSECNO 7700.000
3280 CROSS SECTION   7700.00 EXTENDED      7.52 FEET

3470 ENCROACHMENT STATIONS=     350.0     620.0  TYPE=     1  TARGET=     270.000
  7700.00    14.02   621.22      0.00     0.00   621.27     0.05      0.12      0.00    611.90
    3400.      723.     994.     1682.     566.     381.    1294.       57.        6.    612.50
     0.20      1.28     2.61      1.30    0.060    0.040    0.060     0.000    607.20    350.00
 0.000189     1200.    1200.     1200.        2        0        0      0.00    270.00    620.00

CCHV=   0.600 CEHV=   0.800
XSECNO 7750.000
3280 CROSS SECTION   7750.00 EXTENDED      3.13 FEET

3470 ENCROACHMENT STATIONS=     384.0     620.0  TYPE=     1  TARGET=     236.000
  7750.00    14.33   621.23      0.00     0.00   621.34     0.11      0.03      0.05    607.20
    3400.      296.     948.     2216.     140.     225.    1317.       62.        7.    606.90
     0.21      1.68     4.22      1.68    0.060    0.040    0.060     0.000    606.90    384.00
 0.000380      100.     100.      100.        0        0        0      0.00    236.00    620.00

SPECIAL BRIDGE

SS   XK       XKOR      CDFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     0.00      1.60      2.50      0.00     16.00      0.00    106.00      0.00    607.20    607.20

XSECNO 7751.000
3280 CROSS SECTION   7751.00 EXTENDED      3.14 FEET
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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

PRESSURE AND WEIR FLOW

 EGPRS      EWLWC      H3       QWEIR      QPR       BAREA   TRAPEZOID      ELLC     ELTRD
                                                                AREA
  646.79    621.64     0.00     3170.      227.      106.      106.      613.80    616.10


3470 ENCROACHMENT STATIONS=     384.0     620.0  TYPE=     1  TARGET=     236.000
  7751.00    14.34   621.24     0.00     0.00   621.35     0.11     0.01     0.00   607.20
    3400.     236      948.    2216.     140.     225.    1319.      63.       7.    606.90
     0.21     1.68     4.21     1.68    0.060    0.040    0.060    0.000   606.90   384.00
 0.000379      26.      26.      26.        2        0        7     0.00   236.00   620.00

%SECNO 7800.000
  7800.00    14.27   621.37     0.00     0.00   621.43     0.06     0.06     0.03   612.60
    3400.     874.    1200.    1327.     804.     411.    1087.      72.       9.    613.70
     0.24     1.09     2.92     1.22    0.060    0.040    0.060    0.000   607.10   144.74
 0.000242     180.     200.     200.        2        0        0     0.00   503.05   647.79

CCHV=   0.200 CFHV=   0.400
%SECNO 8250.000
3280 CROSS SECTION   8250.00 EXTENDED      0.48 FEET

3470 ENCROACHMENT STATIONS=     400.0     600.0  TYPE=     1  TARGET=     200.000
  8250.00    12.78   621.48     0.00     0.00   621.54     0.05     0.10     0.00   610.00
    3400.     953     1351.    1096.     716.     553.     832.     100.      13.    610.00
     0.33     1.33     2.44     1.32    0.060    0.040    0.060    0.000   608.70   400.00
 0.000153     590.     470.     590.        2        0        0     0.00   200.00   600.00

CCHV=   0.100 CFHV=   0.300
%SECNO 8680.000
3280 CROSS SECTION   8680.00 EXTENDED      0.58 FEET

3470 ENCROACHMENT STATIONS=     565.0     700.0  TYPE=     1  TARGET=     135.000
  8680.00    11.28   621.58     0.00     0.00   621.59     0.01     0.05     0.00   613.00
     710.     174.     225.     311.     320.     210.     546.     116.      15.    613.00
     0.49     0.54     1.07     0.57    0.060    0.040    0.060    0.000   610.30   565.00
 0.000039     430      430      430.        1        0        0     0.00   135.00   700.00
```

```
   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

CCHV=   0.300 CEHV=   0.500
XSECNO 9450.000
  9450.00     9.46   621.56      0.00      0.00   621.73      0.17      0.06      0.08   618.80
     710.      88.     622.        1.       81.     176.        2.      124.       16.   621.10
     0.54     1.09     3.54      0.33     0.060    0.045     0.060     0.000    612.10   249.53
 0.001251     545.     545.      545.         2        0         0      0.00     96.54   346.07

CCHV=   0.100 CEHV=   0.300
XSECNO 9500.000
3280 CROSS SECTION   9500.00 EXTENDED      0.35 FEET

3470 ENCROACHMENT STATIONS=     240.0     320.0  TYPE=     1  TARGET=      80.000
  9500.00     8.75   621.75      0.00      0.00   621.86      0.10      0.12      0.01   613.00
     710.      217     415.       77.      141.     134.       43.      125.       17.   613.00
     0.55     1.54     3.10      1.78     0.060    0.045     0.060     0.000    613.00   240.00
 0.001091     100.     100.      100.         2        0         0      0.00     80.00   320.00

SPECIAL BRIDGE

SH  XK        XKOR      COPQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
    1.05      1.62      2.98      0.00      16.00     1.00      90.00     0.00      613.00    613.00

XSECNO 9501.000
3280 CROSS SECTION   9501.00 EXTENDED      0.67 FEET

PRESSURE AND WEIR FLOW

 EGPRS      ECLWC      H3        QWFIR     QPR       BAREA     TRAPEZOID     ELLC      ELTRD
                                                                 AREA
  623.32    621.86     0.01      351.      362.       90.        90.       619.00    620.70

3470 ENCROACHMENT STATIONS=     240.0     320.0  TYPE=     1  TARGET=      80.000
  9501.00     9.07   622.07      0.00      0.00   622.16      0.09      0.30      0.00   613.00
     710.      233.     398.       79.      158.     139.       47.      125.       17.   613.00
     0.56     1.48     2.86      1.66     0.060    0.045     0.060     0.000    613.00   240.00
 0.000885      80.      80.       80.         2        0         3      0.00     80.00   320.00
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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   IOC      ICONT    CORAR    TOPWID     ENDST

XSECNO 9625.000

3470 ENCROACHMENT STATIONS=      70.0     600.0  TYPE=     1  TARGET=     -70.000
  9625.00     9.92   622.22     0.00     0.00   622.24     0.02     0.07     0.01   619.80
     480.     195.     241.      44.     324.     149.     103.     127.      17.   620.00
     0.60     0.60     1.62     0.43    0.060    0.045    0.060    0.000   612.30    70.00
 0.000264     150      150.     150.        0        0        0     0.00   305.77   375.77

CCHV=   0.600 CFHV=   0.800
XSECNO 9750.000

3470 ENCROACHMENT STATIONS=     110.0     390.0  TYPE=     1  TARGET=     280.000
  9750.00     7.99   622.29     0.00     0.00   622.40     0.12     0.09     0.08   616.60
     480.     136.     133.     211.      80.      33.      94.     128.      18.   616.60
     0.62     1.70     4.03     2.26    0.060    0.050    0.060    0.000   614.30   244.66
 0.002310     150.     150.     150.        1        0        0     0.00   105.16   349.82

SPECIAL BRIDGE

SB  XK       XKOX      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     0.00      1.62      2.50      0.00      3.00      0.00     15.90      0.00    613.50    613.50

XSECNO 9751.000
PRESSURE AND WEIR FLOW

 EGPRS      EGLWC      H3       QWEIR      QPR       BAREA   TRAPEZOID      ELLC     ELTRD
                                                              AREA
   645.21    621.78     0.00      308.      174.       16.       16.      618.80    625.10

3470 ENCROACHMENT STATIONS=     110.0     390.0  TYPE=     1  TARGET=     280.000
  9751.00    11.00   625.30     0.00     0.00   625.30     0.01     2.90     0.00   616.60
     480.     221.      54.     205.     410.      46.     303.     130.      19.   616.60
     0.67     0.54     1.16     0.68    0.060    0.050    0.060    0.000   614.30   110.00
 0.000121     116.     116.     116.        0        0        7     0.00   280.00   390.00

XSECNO 9800.000

3470 ENCROACHMENT STATIONS=      50.0     400.0  TYPE=     1  TARGET=     350.000
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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   IOC      ICONT    CORAR    TOPWID     ENDST

 9800.00    11.20   625.30     0.00     0.00   625.31     0.01     0.01     0.00   621.50
    480.      90.     245.     145.     345.     288.     316.     132.      19.   618.70
     0.71     0.26     0.85     0.46    0.060    0.050    0.060    0.000   614.10    50.00
 0.000053    100.     100.     100.        2        0        0     0.00   350.00   400.00

CCHV=   0.100 CEHV=   0.300
XSECNO 10700.000

3470 ENCROACHMENT STATIONS=      60.0     1000.0  TYPE=     1  TARGET=     -60.000
 10700.00     8.33   625.33     0.00     0.00   625.45     0.12     0.11     0.04   623.50
    480.      37.     443.       0.      50.     151.       0.     142.      23.   628.10
     0.79     0.73     2.93     0.00    0.060    0.045    0.060    0.000   617.00   432.08
 0.000971    868.     735.     868.        2        0        0     0.00    81.35   513.44

XSECNO 10750.000

3470 ENCROACHMENT STATIONS=     400.0      600.0  TYPE=     1  TARGET=     200.000
 10750.00     8.58   625.48     0.00     0.00   625.71     0.23     0.22     0.03   620.70
    480.     138.     279.      64.      74.      58.      30.     143.      24.   620.70
     0.80     1.87     4.82     2.14    0.060    0.045    0.060    0.000   616.90   444.02
 0.002533    150.     150.     150.        2        0        0     0.00    72.29   516.32

SPECIAL BRIDGE

SB  XK       XKOR     COFQ     RDLEN    BWC      BWP      BAREA    SS       ELCHU    ELCHD
     0.00     2.28     2.50     0.00     6.00     0.00    44.00     0.00   617.10   617.10

XSECNO 10751.000
PRESSURE FLOW

 EGPRS     EGWC      H3       QWEIR     QPR      BAREA   TRAPEZOID     ELLC     ELTRD
                                                          AREA
  629.69   625.87     0.00       0.      480.      44.      44.     624.40   629.80

3470 ENCROACHMENT STATIONS=     400.0      600.0  TYPE=     1  TARGET=     200.000
 10751.00    12.78   629.68     0.00     0.00   629.69     0.01     3.98     0.00   620.70
    480.     237.      92.     151.     434.      90.     327.     144.      24.   620.70
     0.84     0.55     1.03     0.46    0.060    0.045    0.060    0.000   616.90   400.00
 0.000064     85.      85.      85.        0        0        0     0.00   200.00   600.00
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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

RSECNO 10900.000

3470 ENCROACHMENT STATIONS=     330.0     680.0  TYPE=     1  TARGET=     350.000
 10800.00    13.20   629.70     0.00      0.00   629.71     0.01      0.02      0.00   626.10
     605.      160.     290.     155.      403.     271.     399.      151.       26.   626.50
     0.95      0.40     1.07     0.39     0.060    0.045    0.060     0.000   616.50   330.00
 0.000072      310.     225.     310.         2        0        0      0.00   350.00   680.00

CONV=   0.100 DIV=   0.300
RSECNO 11480.000

3470 ENCROACHMENT STATIONS=     230.0     800.0  TYPE=     1  TARGET=     570.000
 11480.00    13.24   629.74     0.00      0.00   629.75     0.01      0.04      0.00   626.10
     605.      206.     257.     143.      615.     272.     469.      167.       32.   626.50
     1.21      0.33     0.94     0.30     0.060    0.045    0.060     0.000   616.50   230.00
 0.000056      630.     485.     630.         0        0        0      0.00   540.28   770.28

RSECNO 12450.000

3470 ENCROACHMENT STATIONS=     150.0     650.0  TYPE=     1  TARGET=     500.000
 12450.00     9.40   629.80     0.00      0.00   629.81     0.01      0.07      0.00   627.90
     605.      185.     178.     242.      330.     152.     446.      191.       43.   627.00
     1.55      0.56     1.17     0.54     0.040    0.040    0.040     0.000   620.40   150.00
 0.000110      910.     850.     910.         0        0        0      0.00   500.00   650.00

CONV=   0.100 DIV=   0.300
RSECNO 12500.000

3470 ENCROACHMENT STATIONS=     150.0     650.0  TYPE=     1  TARGET=     500.000
 12500.00    10.31   629.81     0.00      0.00   629.82     0.00      0.00      0.00   626.50
     605.      247.      58.     300.      596.     111.     776.      192.       44.   626.50
     1.58      0.41     0.52     0.39     0.040    0.040    0.040     0.000   619.50   150.00
 0.000029       50.      50.      50.         0        0        0      0.00   500.00   650.00

RSECNO 12501.000

3370 NORMAL BRIDGE,NRD= 13 MIN ELTRD=  626.50 MAX ELLC=  630.80
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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


3470 ENCROACHMENT STATIONS=     150.0     650.0  TYPE=     1  TARGET=     500.000
 12501.00    10.31   629.81     0.00     0.00   629.82     0.00     0.00     0.00   626.50
     605.     319.      18.     269.     598.      56.     778.     192.      44.    626.50
     1.58     0.53     0.32     0.35    0.040    0.040    0.040    0.000   619.50   150.00
 0.000048       1.       1.       1.        0        0        0   -54.53   500.00   650.00

XSECNO 12502.000

3370 NORMAL BRIDGE,NRD= 13 MIN ELTRD=  626.50 MAX ELLC=  630.80

3470 ENCROACHMENT STATIONS=     150.0     650.0  TYPE=     1  TARGET=     500.000
 12502.00    10.32   629.82     0.00     0.00   629.82     0.00     0.00     0.00   626.50
     605.     319.      18.     269.     598.      56.     779.     195.      45.    626.50
     1.65     0.53     0.32     0.35    0.040    0.040    0.040    0.000   619.50   150.00
 0.000048      98.      98.      98.        0        0        0   -54.53   500.00   650.00

XSECNO 12503.000

3470 ENCROACHMENT STATIONS=     150.0     650.0  TYPE=     1  TARGET=     500.000
 12503.00    10.32   629.82     0.00     0.00   629.82     0.00     0.00     0.00   626.50
     605.     247.      58.     300.     598.     111.     779.     195.      45.    626.50
     1.65     0.41     0.52     0.37    0.040    0.040    0.040    0.000   619.50   150.00
 0.000029       1.       1.       1.        0        0        0     0.00   500.00   650.00

XSECNO 12550.000

3470 ENCROACHMENT STATIONS=     180.0     650.0  TYPE=     1  TARGET=     470.000
 12550.00    10.32   629.82     0.00     0.00   629.83     0.01     0.00     0.00   628.10
     500.      95.     210.     195.     221.     195.     426.     197.      45.    628.70
     1.67     0.43     1.08     0.46    0.040    0.040    0.040    0.000   619.50   180.00
 0.000088      50.      50.      50.        0        0        0     0.00   470.00   650.00

CCHV=   0.100 CEHV=   0.300
XSECNO 13300.000

3470 ENCROACHMENT STATIONS=     120.0     310.0  TYPE=     1  TARGET=    -120.000
 13300.00     8.65   629.85     0.00     0.00   629.86     0.01     0.03     0.00   625.00
     500.     306     189.       5.     609.     273.      17.     211.      51.    625.00
     2.01     0.50     0.69     0.31    0.040    0.040    0.040    0.000   621.20   120.00
 0.000027     700.     700.     700.        0        0        0     0.00   189.80   309.80
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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

XSECNO 14075.000
 14075.00      7.04    629.84      0.00      0.00    629.92      0.08      0.04      0.02    629.90
     390        0.      390.        0.        0.      175.        0.      218.       52.     631.60
     2.08      0.00      2.23      0.00     0.050     0.040     0.050     0.000    622.80    211.13
 0.000574      620.      620.      620.         2         0         0      0.00     41.53    252.66

CCHV=   0.300 CFHV=   0.500
XSECNO 14125.000

3470 ENCROACHMENT STATIONS=      130.0      330.0  TYPE=      1  TARGET=      200.000
 14125.00      7.52    629.82      0.00      0.00    630.04      0.22      0.05      0.07    625.30
     390.       97.      191.      102.       40.       40.       42.      219.       52.     625.30
     2.09      2.42      4.76      2.43     0.050     0.040     0.050     0.000    622.30    209.30
 0.002332       50.       50.       50.         2         0         0      0.00     42.36    251.66


SPECIAL BRIDGE

CB  XK        XXOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     0.00      2.27      2.50      0.00      6.00      0.00     28.30      0.00    622.30    622.30

XSECNO 14126.000
PRESSURE AND WEIR FLOW

 EGPRS      EGLWC      H3        QWEIR     QPR       BAREA   TRAPEZOID      ELLC      ELTRD
                                                                AREA
   636.52    630.04      0.00      119.      273.       26.       36.      628.30    632.50


3470 ENCROACHMENT STATIONS=      175.0      255.0  TYPE=      1  TARGET=       80.000
 14126.00     10.79    633.09      0.00      0.00    633.11      0.02      3.06      0.00    625.30
     390.      183.       95.      112.      200.       60.      113.      221.       53.     625.30
     2.17      0.92      1.59      1.00     0.050     0.040     0.050     0.000    622.30    175.00
 0.000152      346.      346.      346.         2         0         6      0.00     80.00    255.00

XSECNO 14250.000

3470 ENCROACHMENT STATIONS=       70.0      280.0  TYPE=      1  TARGET=      210.000
 14250.00     10.70    633.10      0.00      0.00    633.12      0.02      0.01      0.00    631.10
     390.       88.      302.        0.      205.      246.        0.      221.       53.     633.40
     2.20      0.43      1.23      0.00     0.050     0.040     0.050     0.000    622.40     70.00
 0.000114      100.      100.      100         2         0         0      0.00    170.38    240.38
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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   IOC      ICONT    CORAR    TOPWID     ENDST

CCHV=   0.100 CFHV=   0.300
XSECNO 15500.000
3280 CROSS SECTION  15500.00 EXTENDED      1.27 FEET

 15500.00     7.77   633.17     0.00     0.00   633.17     0.00     0.05     0.00   628.40
     230.     115.      62.      53.     621.     141.     291.     241.      63.   629.40
     3.37     0.19     0.44     0.18    0.050    0.045    0.050    0.000   625.40     0.00
 0.000016    1180.     950.    1180.        2        0        0     0.00   576.54   576.54

XSECNO 16450.000
 16450.00     4.45   633.15     0.00     0.00   633.24     0.09     0.05     0.03   634.40
     230.       0.     230.       0.       0.      96.       0.     253.      70.   634.70
     3.47     0.00     2.39     0.00    0.050    0.045    0.050    0.000   628.70   364.85
 0.001376     945      945.     945.        2        0        0     0.00    33.46   398.30

CCHV=   0.300 CFHV=   0.500
XSECNO 16500.000

3470 ENCROACHMENT STATIONS=     355.0     430.0  TYPE=     1  TARGET=      75.000
 16500.00     4.69   633.29     0.00     0.00   633.77     0.48     0.33     0.20   631.10
     230.      33.     132.      65.       8.      20.      16.     253.      70.   631.10
     3.48     3.91     6.53     3.99    0.050    0.055    0.050    0.000   628.60   389.88
 0.016234     100.     100.     100.        2        0        0     0.00    27.50   417.38

SPECIAL BRIDGE

CR  XK       XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     0.00      1.39      2.50      0.00      5.00      0.00     19.60      0.00    628.60    628.60

XSECNO 16501.000
PRESSURE FLOW

 EGPRS      ECLWC       H3       QWEIR      QPR       BAREA   TRAPEZOID      ELLC      ELTRD
                                                                 AREA
   636.26    633.77      0.00        0.      230.       20.       25.      633.60    636.30

3470 ENCROACHMENT STATIONS=     350.0     435.0  TYPE=     1  TARGET=      85.000
 16501.00     7.64   636.24     0.00     0.00   636.26     0.02     2.49     0.00   631.10
     230       86.      45.      99.      99.      35.      93.     254.      70.   631.10
     3.50     0.87     1.27     1.07    0.050    0.055    0.050    0.000   628.60   350.00
 0.000295      60.      60.      60.        1        0        0     0.00    85.00   435.00
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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    IOC       ICONT     CORAR     TOPWID      ENDST

RSPCNO 16550.000

3470 ENCROACHMENT STATIONS=     350.0     450.0  TYPE=     1  TARGET=     100.000
 16550.00     7.67   636.27     0.00      0.00   636.32     0.05      0.05      0.02   636.00
     230.       5.     225.       0.       13.     119.       0.      254.       70.   637.10
     3 51     0 40     1.89     0.00     0.050    0 055    0.050     0.000    628.60   350.00
 0.000840     100.     100.     100.         2        0        0      0.00     67.26   417.26
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THIS RUN EXECUTED 28-APR-1987 16:26:21.21

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XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
  H:C> RELEASE DATED NOV 76 UPDATED MAR. 1982
  ERROR CORR -  01,02,03,04,05
  MODIFICATION -  50,51,52,53,54,55
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
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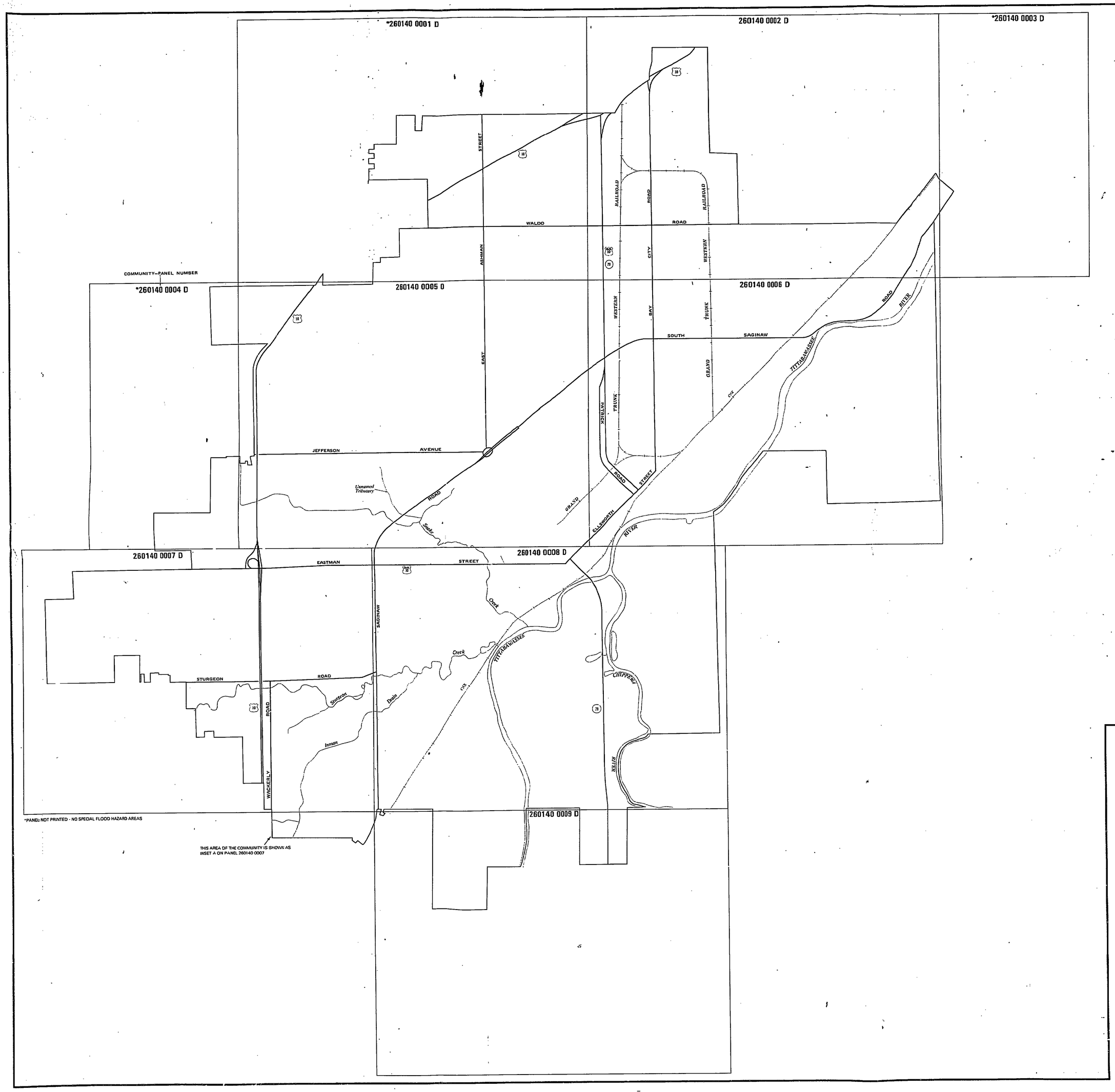

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
MIDLAND,
MICHIGAN
MIDLAND AND
BAY COUNTIES

MAP INDEX
PANELS PRINTED: 2, 5, 6, 7, 8, 9

PRELIMINARY

MAY 18 1994

COMMUNITY-PANEL NUMBERS
260140 0001-0009

MAP REVISED:

Federal Emergency Management Agency

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DEWBERRY & DAVIS
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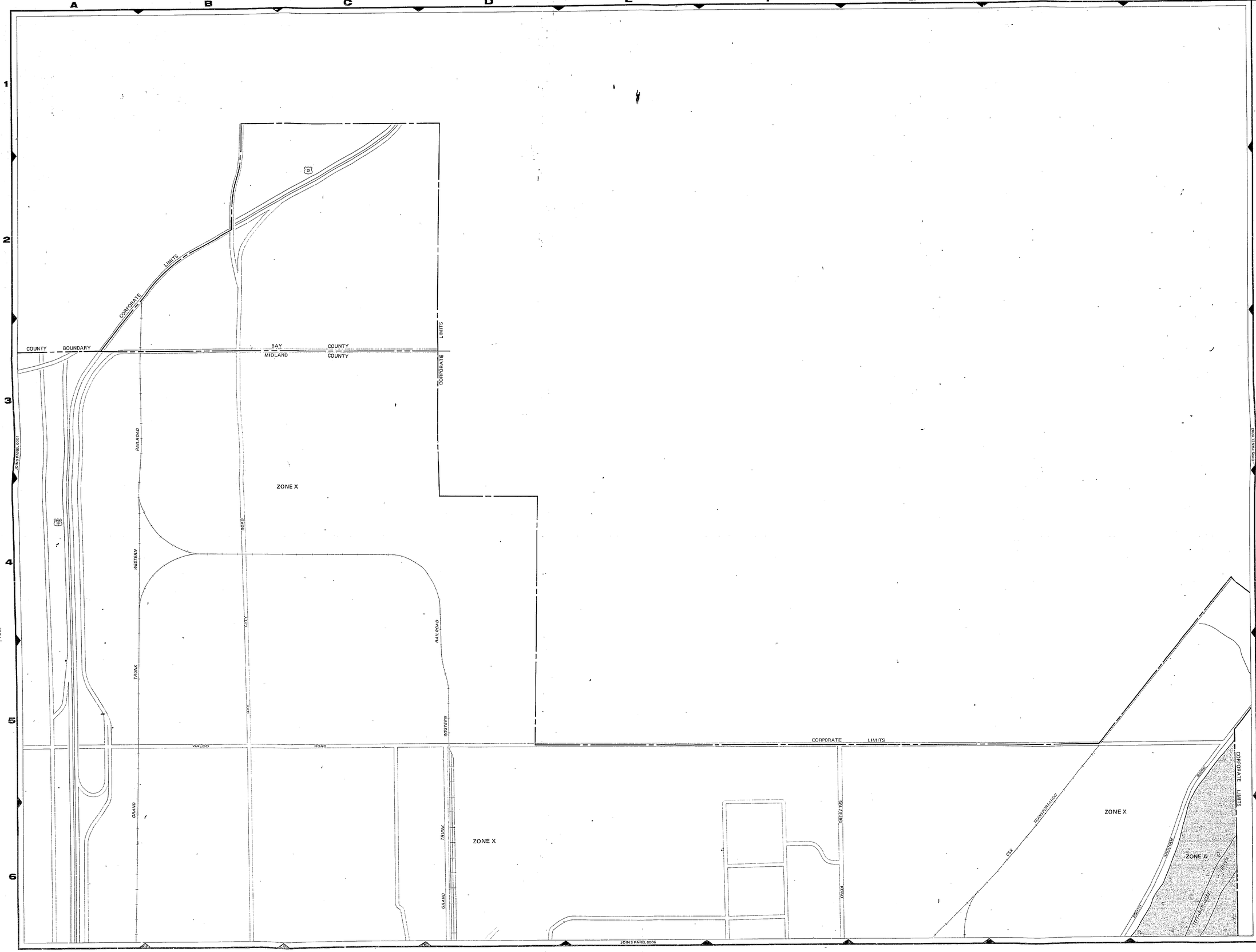

LEGEND

SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD

- **ZONE A** No base flood elevations determined.
- **ZONE AE** Base flood elevations determined.
- **ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.
- **ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE A99** To be protected from 100-year flood by Federal flood protection system under construction; no base flood elevations determined.
- **ZONE V** Coastal flood with velocity hazard (wave action); no base flood elevations determined.
- **ZONE VE** Coastal flood with velocity hazard (wave action); base flood elevations determined.

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

- **ZONE X** Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.

OTHER AREAS

- **ZONE X** Areas determined to be outside 500-year floodplain.
- **ZONE D** Areas in which flood hazards are undetermined.

UNDEVELOPED COASTAL BARRIERS†

Identified 1983 | Identified 1990 or later | Otherwise Protected Areas

†Coastal barrier areas are normally located within or adjacent to special flood hazard areas.

Floodplain Boundary

Floodway Boundary

Zone D Boundary

Boundary Dividing Special Flood Hazard Zones, and Boundary Dividing Areas of Different Coastal Base Flood Elevations Within Special Flood Hazard Zones.

513 — Base Flood Elevation Line; Elevation in Feet*

D — D Cross Section Line

(EL 987) Base Flood Elevation in Feet Where Uniform Within Zone*

RM 7x Elevation Reference Mark

•M1.5 River Mile

*Referenced to the National Geodetic Vertical Datum of 1929

NOTES

This map is for use in administering the National Flood Insurance Program; it does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size, or all planimetric features outside Special Flood Hazard Areas. The community map repository should be consulted for possible updated flood hazard information prior to use of this map for property purchase or construction purposes.

Coastal base flood elevations apply only land ward of 0.0 NGVD, and include the effects of wave action; these elevations may also differ significantly from those developed by the National Weather Service for hurricane evacuation planning.

Areas of special flood hazard (100-year flood) include Zones A, AE, AH, AO, A99, V, and VE.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the Federal Emergency Management Agency.

Floodway widths in some areas may be too narrow to show to scale. Floodway widths are provided in the Flood Insurance Study Report.

For adjoining map panels see separately - printed Map Index.

MAP REPOSITORY

INITIAL IDENTIFICATION:
MAY 3, 1974

FLOOD HAZARD BOUNDARY MAP REVISIONS:
AUGUST 1, 1975

FLOOD INSURANCE RATE MAP EFFECTIVE:
JUNE 15, 1984

FLOOD INSURANCE RATE MAP REVISIONS:

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at (800) 638-6620.

APPROXIMATE SCALE
500 0 500 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
MIDLAND,
MICHIGAN
MIDLAND AND
BAY COUNTIES

PANEL 2 OF 9
(SEE MAP INDEX FOR PANELS NOT PRINTED)

PRELIMINARY

MAY 18 1994

COMMUNITY-PANEL NUMBER
260140 0002 D

MAP REVISED:

Federal Emergency Management Agency

DEWBERRY & DAVIS
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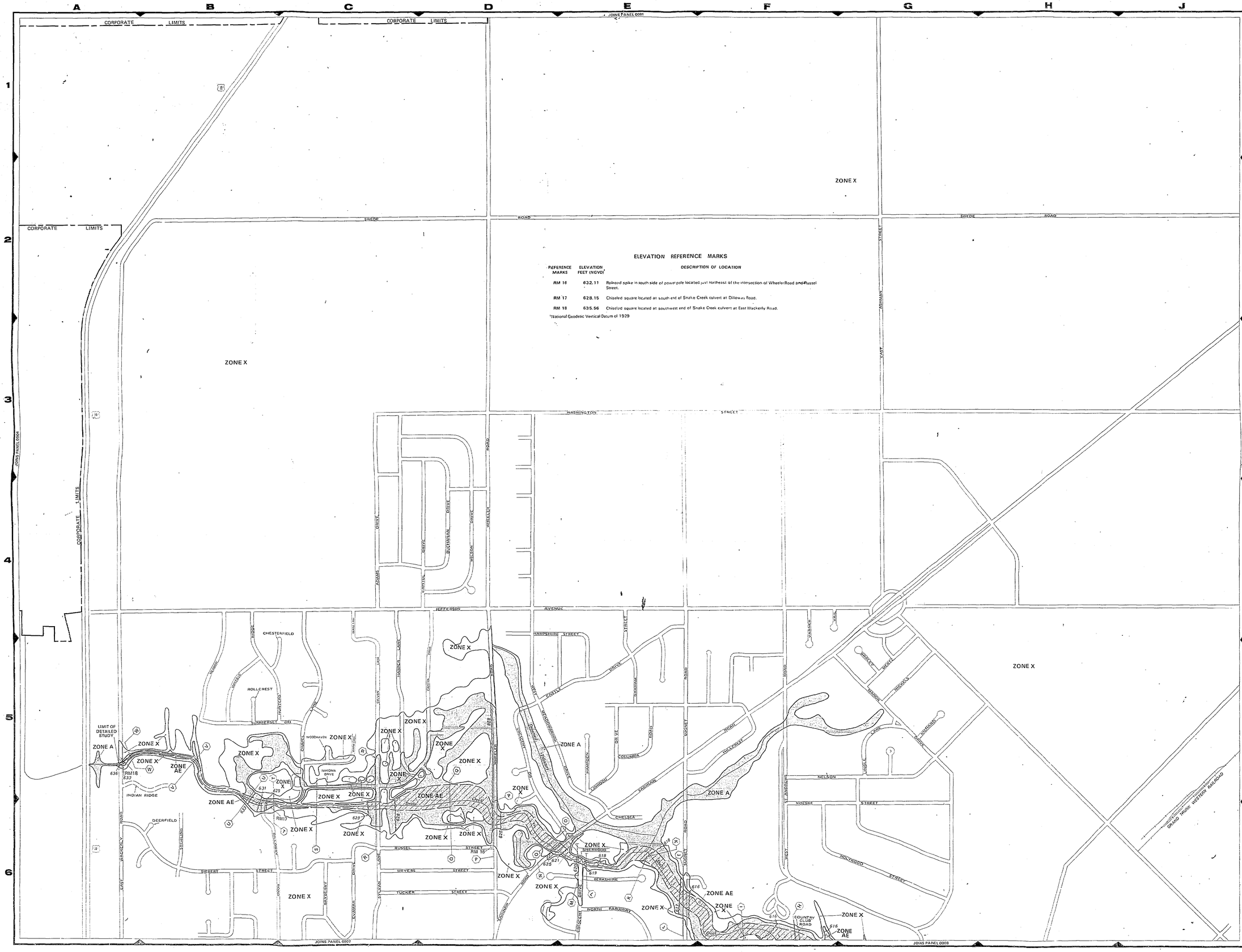

ELEVATION REFERENCE MARKS

REFERENCE MARKS	ELEVATION FEET (NGVD)[1]	DESCRIPTION OF LOCATION
RM 16	632.11	Railroad spike in south side of power pole located just northeast of the intersection of Wheeler Road and Russel Street.
RM 17	628.15	Chiseled square located at south end of Snake Creek culvert at Dillaway Road.
RM 18	635.56	Chiseled square located at southwest end of Snake Creek culvert at East Wackerly Road.

[1]National Geodetic Vertical Datum of 1929

LEGEND

SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD

- ZONE A — No base flood elevations determined.
- ZONE AE — Base flood elevations determined.
- ZONE AH — Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.
- ZONE AO — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- ZONE A99 — To be protected from 100-year flood by Federal flood protection system under construction; no base flood elevations determined.
- ZONE V — Coastal flood with velocity hazard (wave action); no base flood elevations determined.
- ZONE VE — Coastal flood with velocity hazard (wave action); base flood elevations determined.

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

- ZONE X — Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.

OTHER AREAS

- ZONE X — Areas determined to be outside 500-year floodplain.
- ZONE D — Areas in which flood hazards are undetermined.

UNDEVELOPED COASTAL BARRIERS[1]

Identified 1983 | Identified 1990 or Later | Otherwise Protected Areas

[1]Coastal barrier areas are normally located within or adjacent to special flood hazard areas.

- Floodplain Boundary
- Floodway Boundary
- Zone D Boundary
- Boundary Dividing Special Flood Hazard Zones, and Boundary Dividing Areas of Different Coastal Base Flood Elevations Within Special Flood Hazard Zones.
- 513 — Base Flood Elevation Line; Elevation in Feet[1]
- (D)—(D) — Cross Section Line
- (EL 987) — Base Flood Elevation in Feet Where Uniform Within Zone[1]
- RM 7x — Elevation Reference Mark
- •M1.5 — River Mile

[1]Referenced to the National Geodetic Vertical Datum of 1929

NOTES

This map is for use in administering the National Flood Insurance Program; it does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size, or all planimetric features outside Special Flood Hazard Areas. The community map repository should be consulted for possible updated flood hazard information prior to use of this map for property purchase or construction purposes.

Coastal base flood elevations apply only landward of 0.0 NGVD, and include the effects of wave action; these elevations may also differ significantly from those developed by the National Weather Service for hurricane evacuation planning.

Areas of special flood hazard (100-year floods) include Zones A, AE, AH, AO, A99, V, and VE.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the Federal Emergency Management Agency.

Floodway widths in some areas may be too narrow to show to scale. Floodway widths are provided in the Flood Insurance Study Report.

For adjoining map panels see separately printed Map Index.

MAP REPOSITORY

INITIAL IDENTIFICATION:
MAY 3, 1974

FLOOD HAZARD BOUNDARY/MAP REVISIONS:
AUGUST 11, 1975

FLOOD INSURANCE RATE MAP EFFECTIVE:
JUNE 15, 1984

FLOOD INSURANCE RATE MAP REVISIONS:

Map revised January 5, 1989 to change special flood hazard areas, zone B boundary, base flood elevations, and zone designations; add streets and street names; and revise corporate limits.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at (800) 638-6620.

APPROXIMATE SCALE
500 0 500 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
MIDLAND, MICHIGAN
MIDLAND AND
BAY COUNTIES

PANEL 5 OF 9
(SEE MAP INDEX FOR PANELS NOT PRINTED)

PRELIMINARY

MAY 18 1994

COMMUNITY-PANEL NUMBER
260140 0005 D

MAP REVISED:

Federal Emergency Management Agency

DEWBERRY & DAVIS
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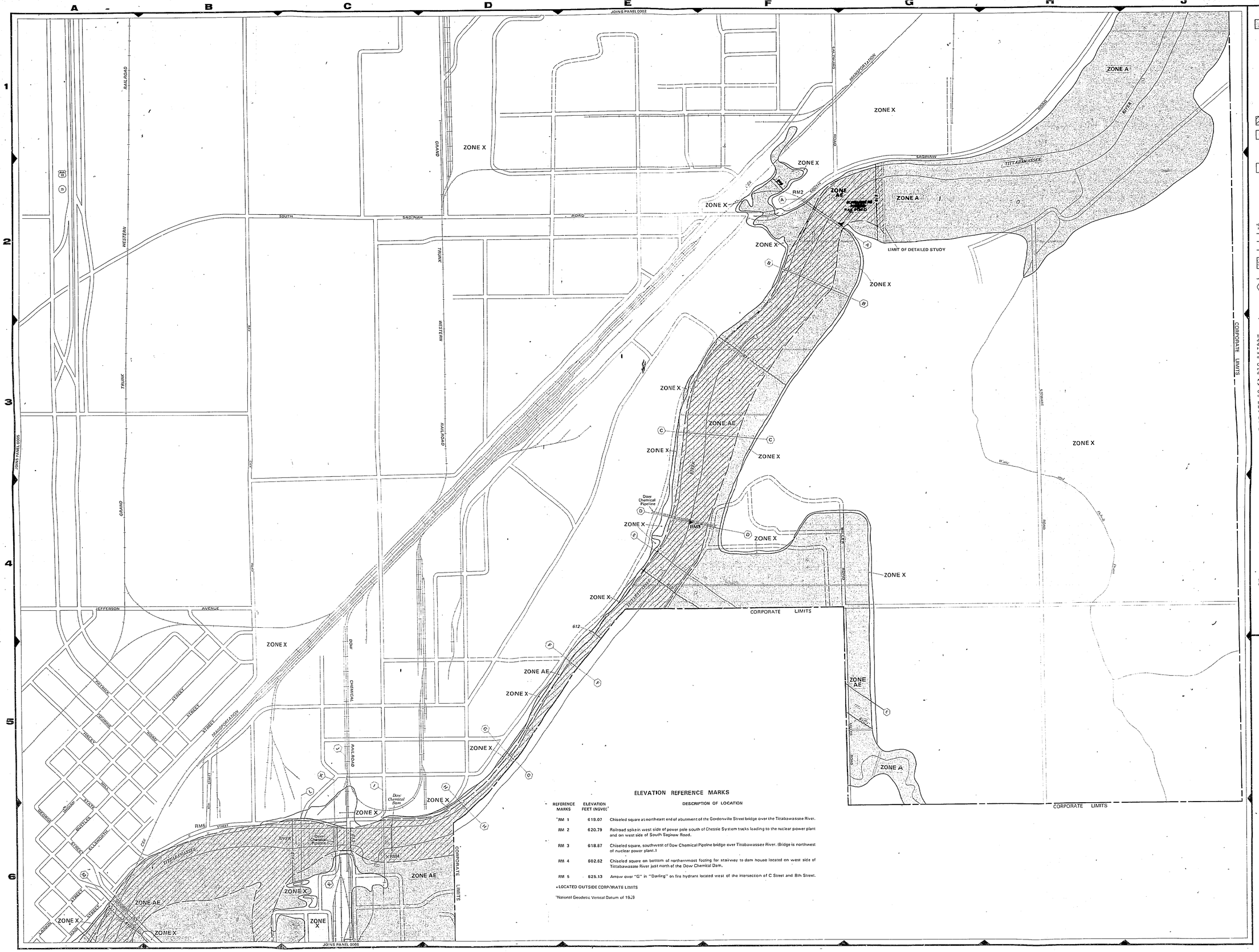

LEGEND

SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD

- **ZONE A** No base flood elevations determined.
- **ZONE AE** Base flood elevations determined.
- **ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.
- **ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE A99** To be protected from 100-year flood by Federal flood protection system under construction; no base flood elevations determined.
- **ZONE V** Coastal flood with velocity hazard (wave action); no base flood elevations determined.
- **ZONE VE** Coastal flood with velocity hazard (wave action); base flood elevations determined.

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

- **ZONE X** Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.

OTHER AREAS

- **ZONE X** Areas determined to be outside 500-year floodplain.
- **ZONE D** Areas in which flood hazards are undetermined.

UNDEVELOPED COASTAL BARRIERS†

Identified 1983 | Identified 1990 or Later | Otherwise Protected Areas

†Coastal barrier areas are normally located within or adjacent to special flood hazard areas.

- Floodplain Boundary
- Floodway Boundary
- Zone D Boundary
- Boundary Dividing Special Flood Hazard Zones, and Boundary Dividing Areas of Different Coastal Base Flood Elevations Within Special Flood Hazard Zones.
- 513 — Base Flood Elevation Line; Elevation in Feet*
- D — D — Cross Section Line
- EL 987† — Base Flood Elevation in Feet Where Uniform Within Zone*
- RM 7x — Elevation Reference Mark
- •M1.5 — River Mile

*Referenced to the National Geodetic Vertical Datum of 1929

NOTES

This map is for use in administering the National Flood Insurance Program; it does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size, or all planimetric features outside Special Flood Hazard Areas. The community map repository should be consulted for possible updated flood hazard information prior to use of this map for property purchase or construction purposes.

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Areas of special flood hazard (100-year flood) include Zones A, AE, AH, AO, A99, V, and VE.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the Federal Emergency Management Agency.

Floodway widths in some areas may be too narrow to show to scale. Floodway widths are provided in the Flood Insurance Study Report.

For adjoining map panels see separately printed Map Index.

MAP REPOSITORY

INITIAL IDENTIFICATION:
MAY 31, 1974

FLOOD HAZARD BOUNDARY MAP REVISIONS:
AUGUST 1, 1975

FLOOD INSURANCE RATE MAP EFFECTIVE:

FLOOD INSURANCE RATE MAP REVISIONS:

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at (800) 638-6620.

APPROXIMATE SCALE
500 0 500 FEET

ELEVATION REFERENCE MARKS

REFERENCE MARKS	ELEVATION FEET (NGVD)[1]	DESCRIPTION OF LOCATION
*RM 1	619.07	Chiseled square at northeast end of abutment of the Gordonville Street bridge over the Tittabawassee River.
RM 2	620.79	Railroad spike in west side of power pole south of Chessie System tracks leading to the nuclear power plant and on west side of South Saginaw Road.
RM 3	618.87	Chiseled square, southwest of Dow Chemical Pipeline bridge over Tittabawassee River. (Bridge is northwest of nuclear power plant.)
RM 4	602.62	Chiseled square on bottom of northernmost footing for stairway to dam house located on west side of Tittabawasse River just north of the Dow Chemical Dam.
RM 5	625.13	Arrow over "G" in "Darling" on fire hydrant located west of the intersection of C Street and 8th Street.

*LOCATED OUTSIDE CORPORATE LIMITS

[1]National Geodetic Vertical Datum of 1929

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
MIDLAND,
MICHIGAN
MIDLAND AND
BAY COUNTIES

PANEL 6 OF 9
(SEE MAP INDEX FOR PANELS NOT PRINTED)

PRELIMINARY

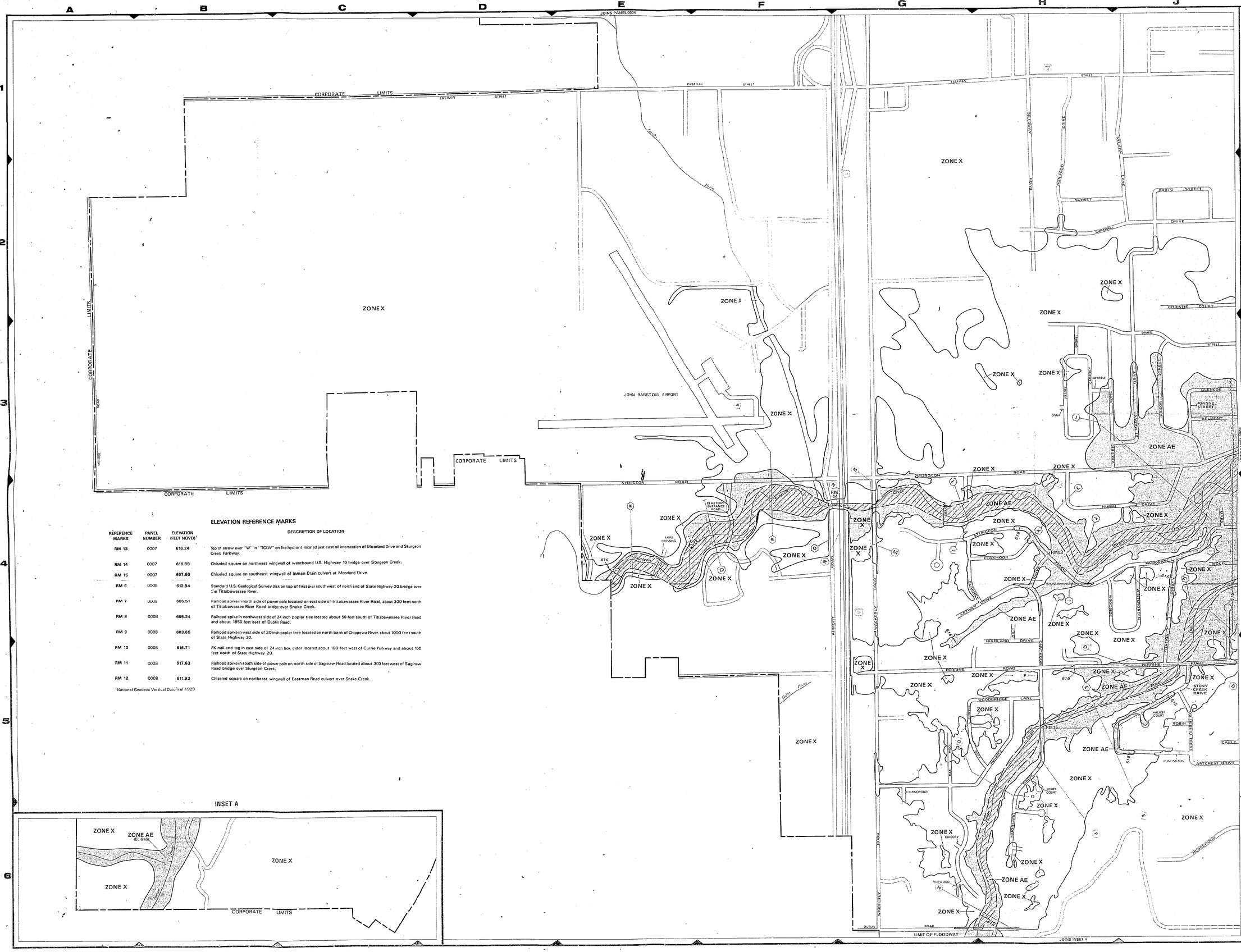
MAY 18 1994

COMMUNITY-PANEL NUMBER
260140 0006 D

MAP REVISED:

Federal Emergency Management Agency

DEWBERRY & DAVIS



ELEVATION REFERENCE MARKS

REFERENCE MARKS	PANEL NUMBER	ELEVATION (FEET NGVD)[1]	DESCRIPTION OF LOCATION
RM 13	0007	616.24	Top of arrow over "W" in "TCIW" on fire hydrant located just east of intersection of Moorland Drive and Sturgeon Creek Parkway.
RM 14	0007	616.83	Chiseled square on northeast wingwall of westbound U.S. Highway 10 bridge over Sturgeon Creek.
RM 15	0007	607.60	Chiseled square on southeast wingwall of Inman Drain culvert at Moorland Drive.
RM 6	0008	612.94	Standard U.S. Geological Survey disk on top of first pier southwest of north end of State Highway 20 bridge over the Tittabawassee River.
RM 7	0008	606.51	Railroad spike in north side of power pole located on east side of Tittabawassee River Road, about 300 feet north of Tittabawassee River Road bridge over Snake Creek.
RM 8	0008	605.24	Railroad spike in northwest side of 24 inch poplar tree located about 50 feet south of Tittabawassee River Road and about 1850 feet east of Dublin Road.
RM 9	0008	603.65	Railroad spike in west side of 30 inch poplar tree located on north bank of Chippewa River, about 1000 feet south of State Highway 20.
RM 10	0008	616.71	PK nail and tag in east side of 24 inch box elder located about 100 feet west of Currie Parkway and about 100 feet north of State Highway 20.
RM 11	0008	617.63	Railroad spike in south side of power pole on north side of Saginaw Road located about 300 feet west of Saginaw Road bridge over Sturgeon Creek.
RM 12	0008	611.93	Chiseled square on northeast wingwall of Eastman Road culvert over Snake Creek.

[1]National Geodetic Vertical Datum of 1929

INSET A

LEGEND

SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD

ZONE A No base flood elevations determined.

ZONE AE Base flood elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE A99 To be protected from 100-year flood by Federal flood protection system under construction; no base flood elevations determined.

ZONE V Coastal flood with velocity hazard (wave action); no base flood elevations determined.

ZONE VE Coastal flood with velocity hazard (wave action); base flood elevations determined.

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

ZONE X Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.

OTHER AREAS

ZONE X Areas determined to be outside 500-year floodplain.

ZONE D Areas in which flood hazards are undetermined.

UNDEVELOPED COASTAL BARRIERS†

Identified 1983 — Identified 1983or Later — Otherwise Protected Areas

†Coastal barrier areas are normally located within or adjacent to special flood hazard areas.

Floodplain Boundary

Floodway Boundary

Zone D Boundary

Boundary Dividing Special Flood Hazard Zones, and Boundary Dividing Areas of Different Coastal Base Flood Elevations Within Special Flood Hazard Zones

513 — Base Flood Elevation Line; Elevation in Feet*

D — D — Cross Section Line

(EL 987) — Base Flood Elevation in Feet Where Uniform Within Zone*

RM 7x — Elevation Reference Mark

•M1.5 — River Mile

*Referenced to the National Geodetic Vertical Datum of 1929

NOTES

This map is for use in administering the National Flood Insurance Program; it does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size, or all planimetric features outside Special Flood Hazard Areas. The community map repository should be consulted for possible updated flood hazard information prior to use of this map for property purchase or construction purposes.

Coastal base flood elevations apply only land ward of 0.0 NGVD, and include the effects of wave action; these elevations may also differ significantly from those developed by the National Weather Service for hurricane evacuation planning.

Areas of special flood hazard (100-year flood) include Zones A, AE, AH, AO, A99, V, and VE.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the Federal Emergency Management Agency.

Floodway widths in some areas may be too narrow to show to scale. Floodway widths are provided in the Flood Insurance Study Report.

For adjoining map panels see separately printed Map Index.

MAP REPOSITORY

INITIAL IDENTIFICATION:
MAY 31, 1974

FLOOD HAZARD BOUNDARY MAP REVISIONS:
AUGUST 1, 1975

FLOOD INSURANCE RATE MAP EFFECTIVE:
JUNE 15, 1984

FLOOD INSURANCE RATE MAP REVISIONS:

Map revised January 5, 1989 to change special flood hazard areas, zone B boundary, base flood elevations, and zone designations; add streets and street names; and revise corporate limits.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at (800) 638-6620.

APPROXIMATE SCALE
500 0 500 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
MIDLAND,
MICHIGAN
MIDLAND AND
BAY COUNTIES

PANEL 7 OF 9
(SEE MAP INDEX FOR PANELS NOT PRINTED)

PRELIMINARY

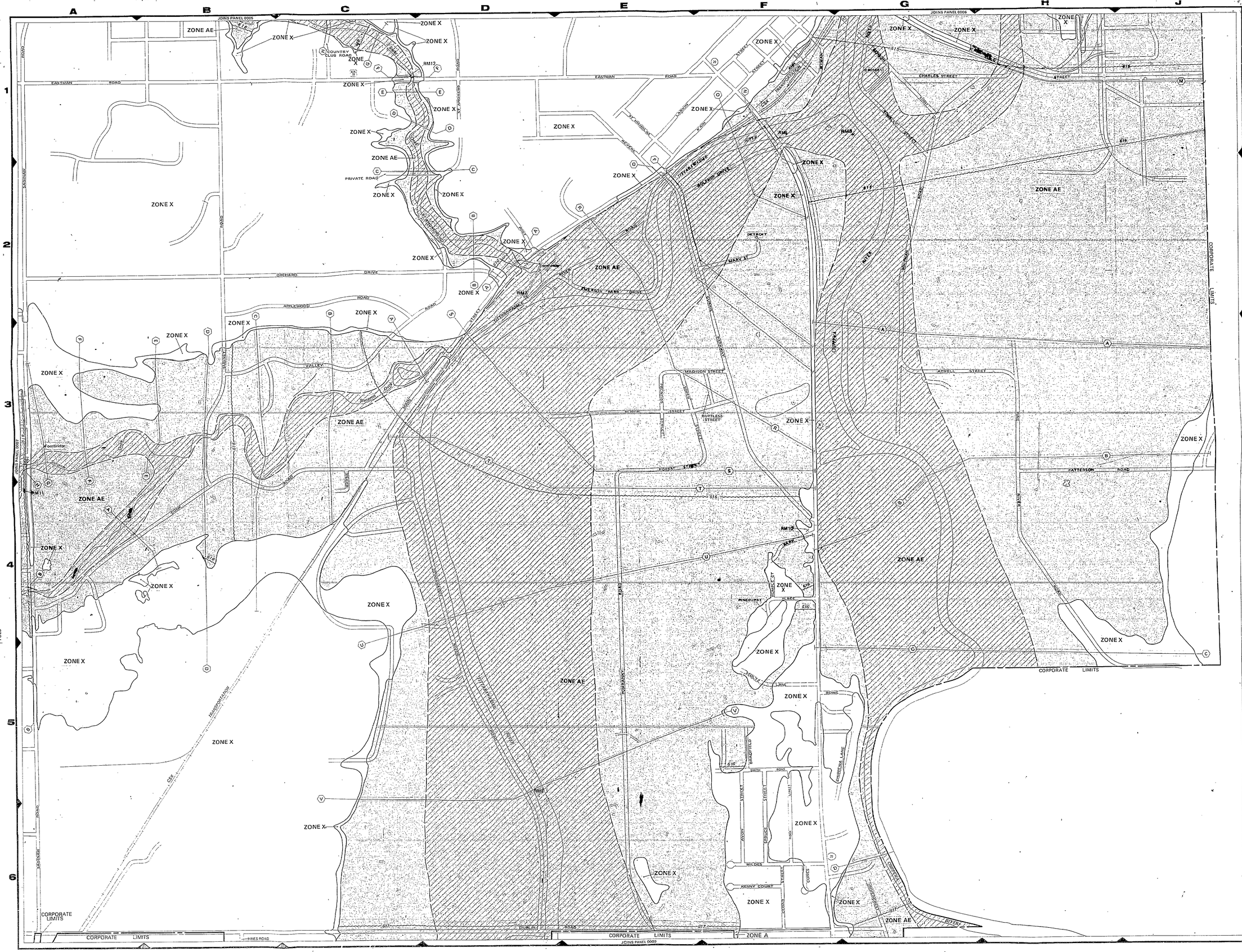
MAY 18 1994

COMMUNITY-PANEL NUMBER
260140 0007 D

MAP REVISED:

Federal Emergency Management Agency

DEWBERRY & DAVIS



LEGEND

SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD

- **ZONE A** No base flood elevations determined.
- **ZONE AE** Base flood elevations determined.
- **ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.
- **ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE A99** To be protected from 100-year flood by Federal flood protection system under construction; no base flood elevations determined.
- **ZONE V** Coastal flood with velocity hazard (wave action); no base flood elevations determined.
- **ZONE VE** Coastal flood with velocity hazard (wave action); base flood elevations determined.

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

- **ZONE X** Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.

OTHER AREAS

- **ZONE X** Areas determined to be outside 500-year floodplain
- **ZONE D** Areas in which flood hazards are undetermined.

UNDEVELOPED COASTAL BARRIERS†

Identified 1983 | Identified 1990 or Later | Otherwise Protected Areas

†Coastal barrier areas are normally located within or adjacent to special flood hazard areas

Floodplain Boundary

Floodway Boundary

Zone D Boundary

Boundary Dividing Special Flood Hazard Zones, and Boundary Dividing Areas of Different Coastal Base Flood Elevations Within Special Flood Hazard Zones.

513 — Base Flood Elevation Line; Elevation in Feet*

(D) — (D) Cross Section Line

(EL 987) Base Flood Elevation in Feet Where Uniform Within Zone*

RM7x Elevation Reference Mark

•M1.5 River Mile

*Referenced to the National Geodetic Vertical Datum of 1929

NOTES

This map is for use in administering the National Flood Insurance Program; it does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size, or all planimetric features outside Special Flood Hazard Areas. The community map repository should be consulted for possible updated flood hazard information prior to use of this map for property purchase or construction purposes.

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Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the Federal Emergency Management Agency.

Floodway widths in some areas may be too narrow to show to scale. Floodway widths are provided in the Flood Insurance Study Report.

For adjoining map panels see separately printed Map Index.

For description of elevation reference marks, see panel 260140 0007

MAP REPOSITORY

INITIAL IDENTIFICATION:
MAY 3, 11974

FLOOD HAZARD BOUNDARY MAP REVISIONS:
AUGUST 1, 1975

FLOOD INSURANCE RATE MAP EFFECTIVE:
JUNE 15, 11984

FLOOD INSURANCE RATE MAP REVISIONS:
Map revised January 5, 1989
to change special flood hazard areas, zone B boundary, base flood elevations, and zone designations; add streets and street names; and revise corporate limits.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at (800) 638-6620.

APPROXIMATE SCALE
500 0 500 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
MIDLAND,
MICHIGAN
MIDLAND AND
BAY COUNTIES

PANEL 8 OF 9
(SEE MAP INDEX FOR PANELS NOT PRINTED)

PRELIMINARY
MAY 18 1994

COMMUNITY-PANEL NUMBER
260140 0008 D

MAP REVISED:

Federal Emergency Management Agency

DEWBERRY & DAVIS
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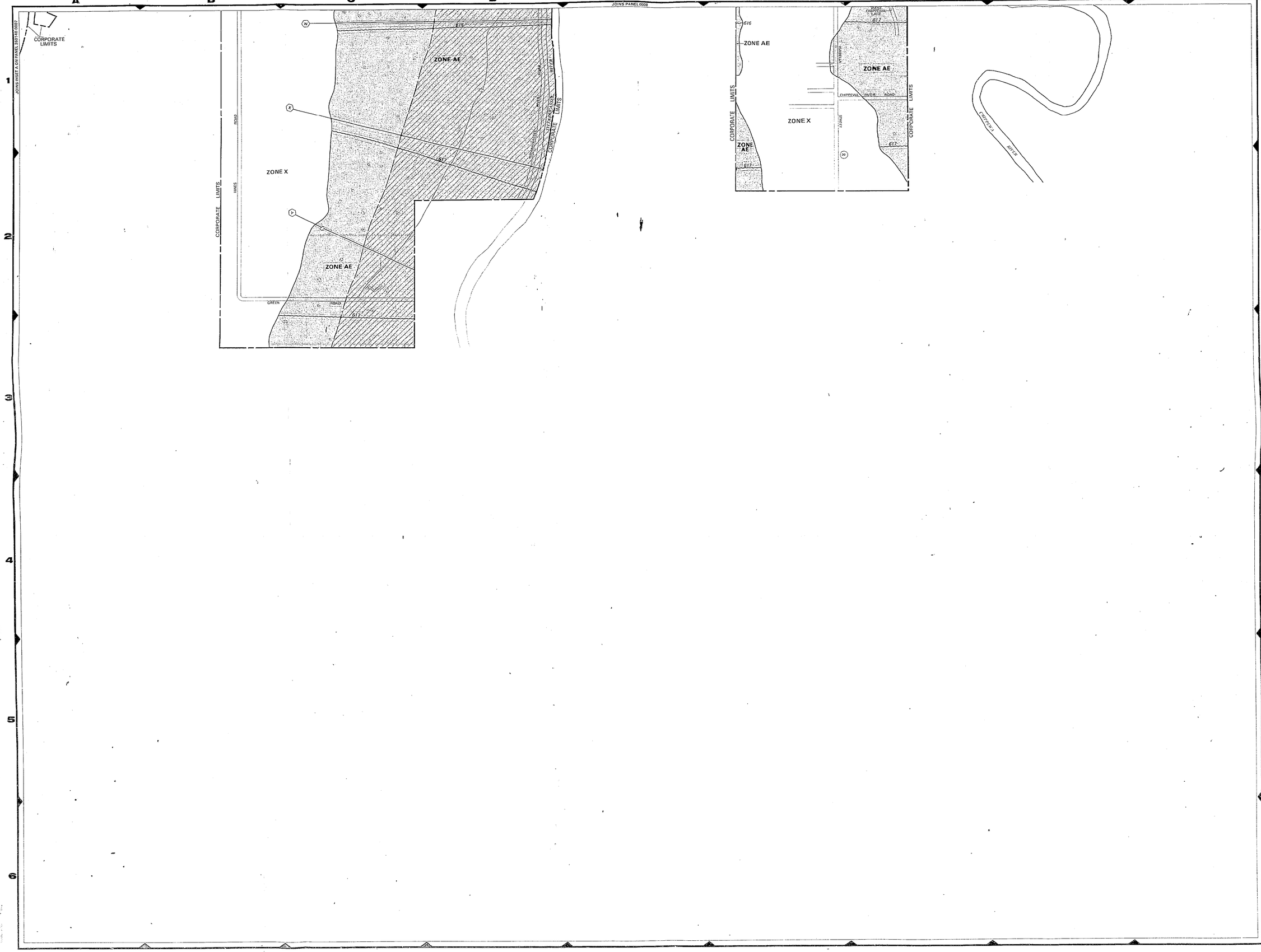

LEGEND

SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD

ZONE A No base flood elevations determined.

ZONE AE Base flood elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE A99 To be protected from 100-year flood by Federal flood protection system under construction; no base flood elevations determined.

ZONE V Coastal flood with velocity hazard (wave action); no base flood elevations determined.

ZONE VE Coastal flood with velocity hazard (wave action); base flood elevations determined.

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

ZONE X Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.

OTHER AREAS

ZONE X Areas determined to be outside 500-year floodplain.

ZONE D Areas in which flood hazards are undetermined.

UNDEVELOPED COASTAL BARRIERS†

Identified 1983 | Identified 1990 or later | Otherwise Protected Areas

†Coastal barrier areas are normally located within or adjacent to special flood hazard areas.

Floodplain Boundary

Floodway Boundary

Zone D Boundary

Boundary Dividing Special Flood Hazard Zones, and Boundary Dividing Areas of Different Coastal Base Flood Elevations Within Special Flood Hazard Zones.

513 — Base Flood Elevation Line; Elevation in Feet*

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(EL 987) Base Flood Elevation in Feet Where Uniform Within Zone*

RM 7 × Elevation Reference Mark

•M1.5 River Mile

*Referenced to the National Geodetic Vertical Datum of 1929

NOTES

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Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the Federal Emergency Management Agency.

Floodway widths in some areas may be too narrow to show to scale. Floodway widths are provided in the Flood Insurance Study Report.

For adjoining map panels see separately printed Map Index.

MAP REPOSITORY

INITIAL IDENTIFICATION:

FLOOD HAZARD BOUNDARY MAP REVISIONS:

FLOOD INSURANCE RATE MAP EFFECTIVE:

FLOOD INSURANCE RATE MAP REVISIONS:

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at (800) 638-6620.

APPROXIMATE SCALE

500 0 500 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
MIDLAND,
MICHIGAN
MIDLAND AND
BAY COUNTIES

PANEL 9 OF 9
(SEE MAP INDEX FOR PANELS NOT PRINTED)

PRELIMINARY

MAY 18 1994

COMMUNITY-PANEL NUMBER
260140 0009 D

MAP REVISED:

Federal Emergency Management Agency

DIEWBERRY & DAVIS

00BREAK00

1) COUNTY: Midland

2) STUDY NAME: City of Midland

3) WATERCOURSE: Tittabawasee, Chippewa, Sturgeon Cr. Inman Dr. Snake Creek.

4) DOCUMENT TYPE: Reports

00BREAK00

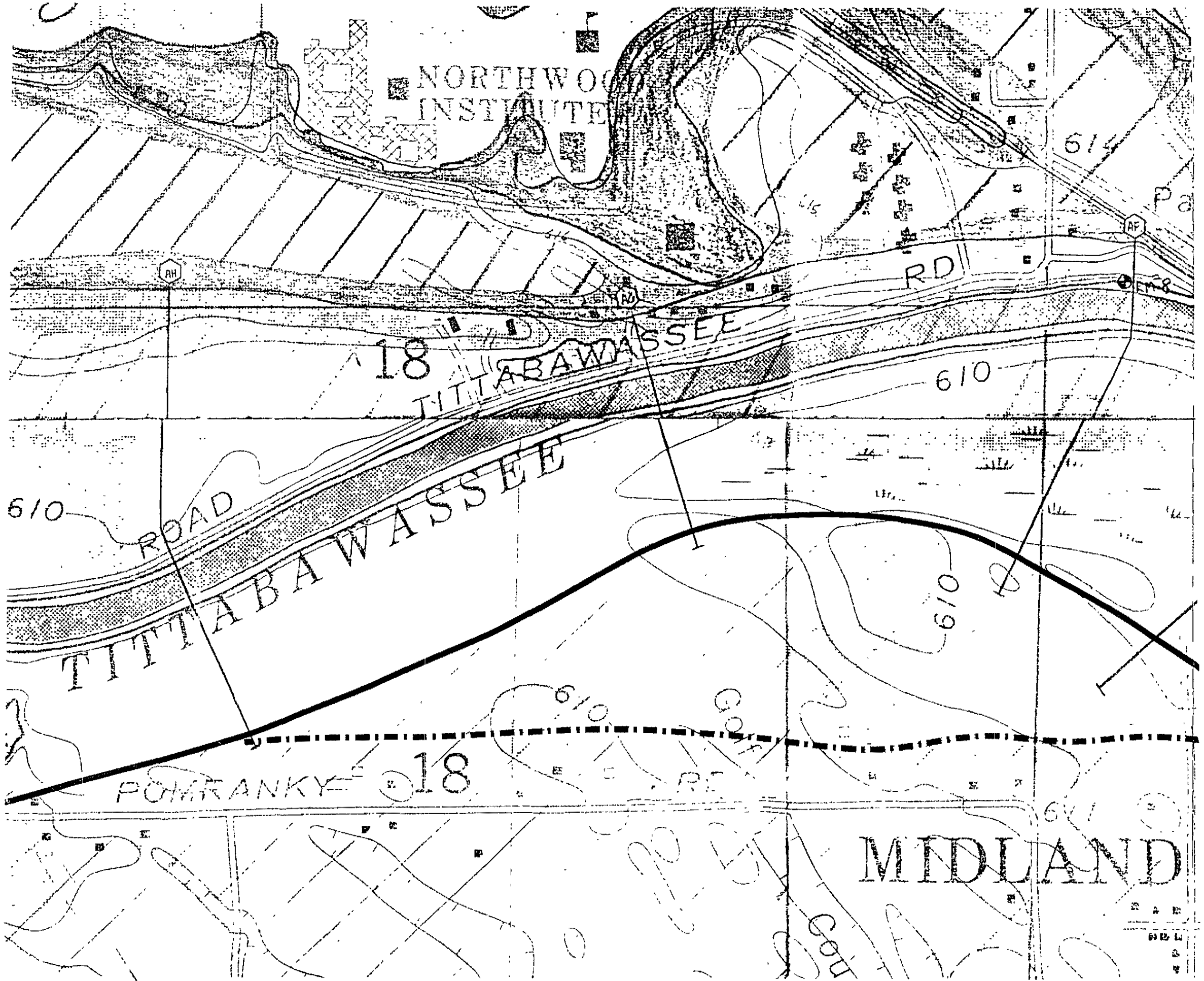


FIGURE 1

FLOODWAY DELINEATION

N

LEGEND

ORIGINAL FIS FLOODWAY DELINEATION

PROPOSED REVISION TO FIS FLOODWAY DELINEATION

0' 500' 1000'

SCALE: FEET

MIDLAND, MICHIGAN

FLOOD INSURANCE STUDY REVIEW

McNAMEE PORTER & SEELEY
ENGINEERS ARCHITECTS
ANN ARBOR, MICHIGAN

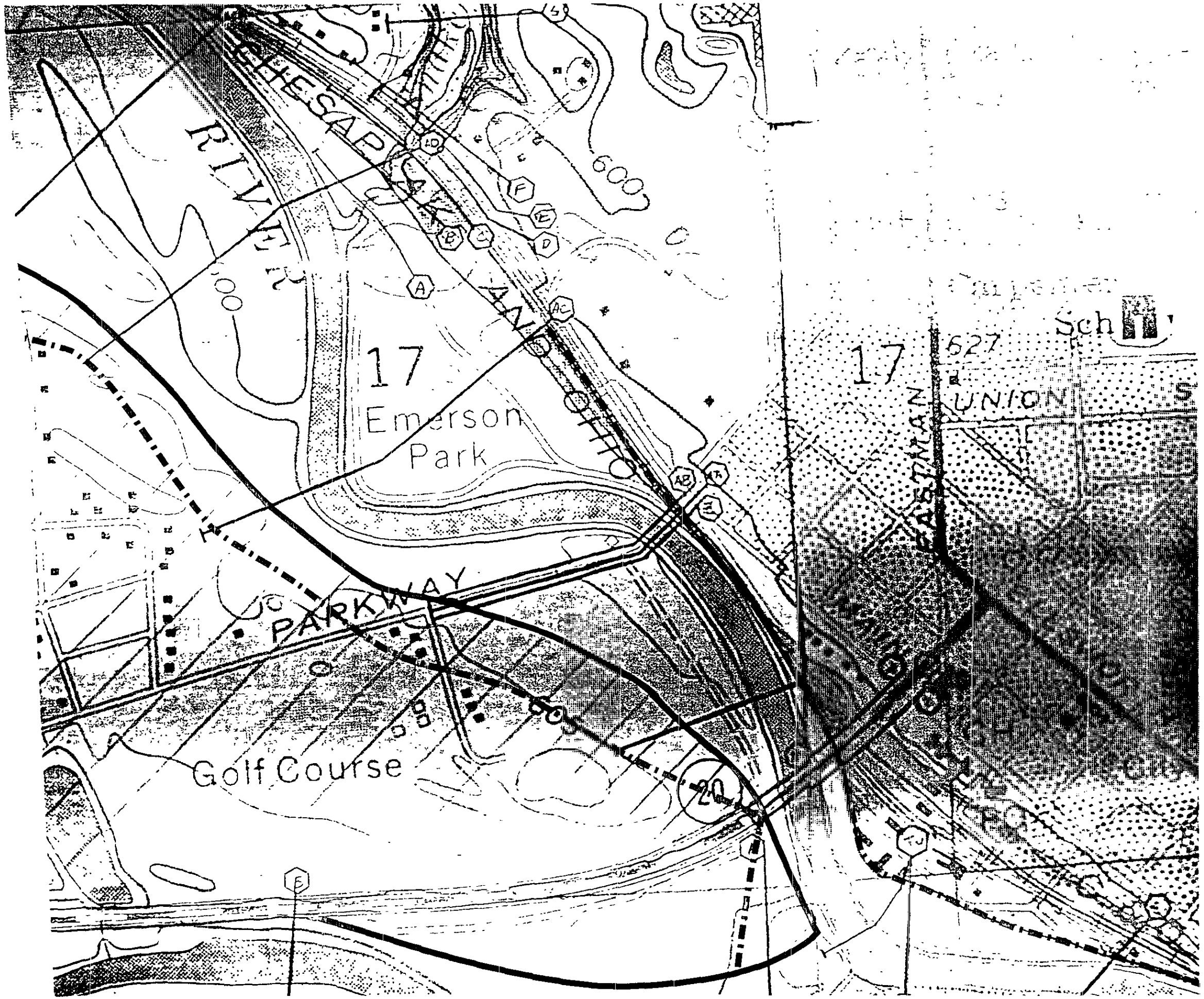


FIGURE 2

FLOODWAY DELINEATION

N

LEGEND

ORIGINAL FIS FLOODWAY DELINEATION

PROPOSED REVISION TO FIS FLOODWAY DELINEATION

0' 500' 1000'

SCALE: FEET

MIDLAND, MICHIGAN

FLOOD INSURANCE STUDY REVIEW

McNAMEE PORTER & SEELEY
ENGINEERS ARCHITECTS
ANN ARBOR, MICHIGAN

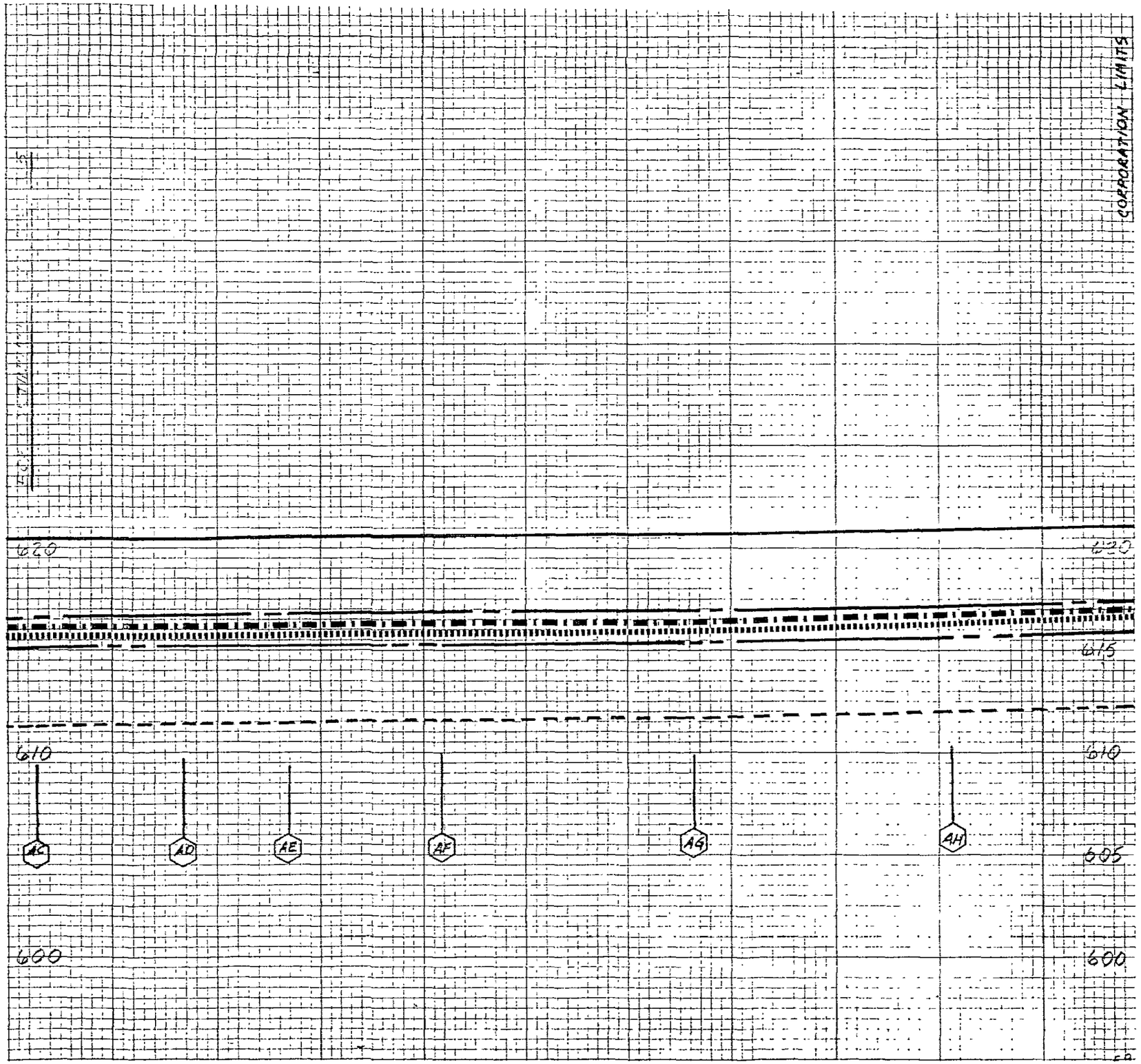


FIGURE 6

TITTABAWASSEE RIVER PROFILES

LEGEND

(ORIGINAL FIS PROFILES)

- 10 YEAR FLOOD
- 50 YEAR FLOOD
- 100 YEAR FLOOD
- 500 YEAR FLOOD
- (B) CROSS SECTION LOCATION

(REVISED PROFILES)

- REVISED 100 YEAR PROFILE WITH EXPANDED FLOODWAY
- REVISED 100 YEAR PROFILE WITH EXPANDED FLOODWAY AND REVISION AT DOW BRIDGE

MIDLAND, MICHIGAN

FLOOD INSURANCE STUDY REVIEW

McNAMEE PORTER & SEELEY
ENGINEERS ARCHITECTS
ANN ARBOR, MICHIGAN

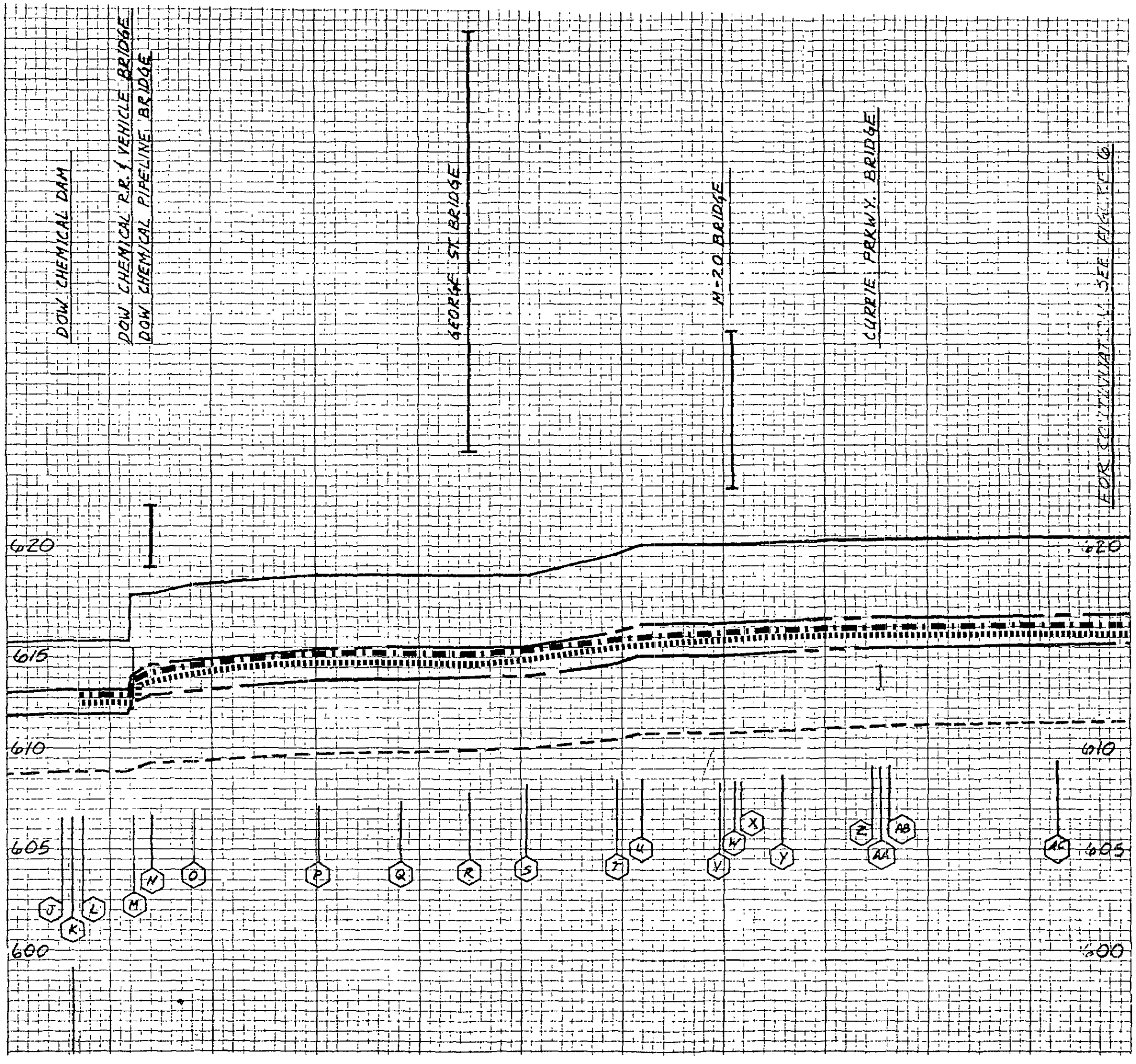


FIGURE 5

TITTABAWASSEE RIVER PROFILES

LEGEND

(ORIGINAL FIS PROFILES)

- 10 YEAR FLOOD
- 50 YEAR FLOOD
- 100 YEAR FLOOD
- 500 YEAR FLOOD
- CROSS SECTION LOCATION

(REVISED PROFILES)

- REVISED 100 YEAR PROFILE WITH EXPANDED FLOODWAY
- REVISED 100 YEAR PROFILE WITH EXPANDED FLOODWAY AND REVISION AT DOW BRIDGE

MIDLAND, MICHIGAN

FLOOD INSURANCE STUDY REVIEW

McNAMEE PORTER & SEELEY
ENGINEERS ARCHITECTS
ANN ARBOR, MICHIGAN

SECND	XLCH	ELTRD	ELLC	ELVIN	Q	CWSEL	CRTWS	EC	10K*S	VCH	AREA	.01K
137500.000	1500.00	0.00	0.00	590.20	21000.00	613.06	0.00	613.10	.47	2.38	20247.42	30770.96
137500.000	1500.00	0.00	0.00	590.20	26400.00	614.52	0.00	614.57	.47	2.51	24276.25	38549.92
137500.000	1500.00	0.00	0.00	590.20	30300.00	615.95	0.00	616.00	.41	2.47	28204.80	47053.43
137500.000	1500.00	0.00	0.00	590.20	39700.00	619.33	0.00	619.37	.32	2.38	37455.10	70483.16
140000.000	2450.00	0.00	0.00	590.20	21000.00	613.15	0.00	613.26	.77	3.12	14570.55	23957.62
140000.000	2450.00	0.00	0.00	590.20	26400.00	614.62	0.00	614.72	.79	3.31	17918.71	29774.43
140000.000	2450.00	0.00	0.00	590.20	30300.00	616.04	0.00	616.13	.70	3.27	21137.00	36087.30
140000.000	2450.00	0.00	0.00	590.20	39700.00	619.39	0.00	619.47	.55	3.16	28752.47	53669.71
142550.000	2500.00	0.00	0.00	590.20	21000.00	613.36	0.00	613.42	.52	2.55	19627.58	29037.29
142550.000	2500.00	0.00	0.00	590.20	26400.00	614.83	0.00	614.89	.54	2.71	23155.16	35552.08
142550.000	2500.00	0.00	0.00	590.20	30300.00	616.23	0.00	616.28	.49	2.70	26499.18	43176.28
142550.000	2500.00	0.00	0.00	590.20	39700.00	619.54	0.00	619.59	.40	2.67	34455.28	62786.40

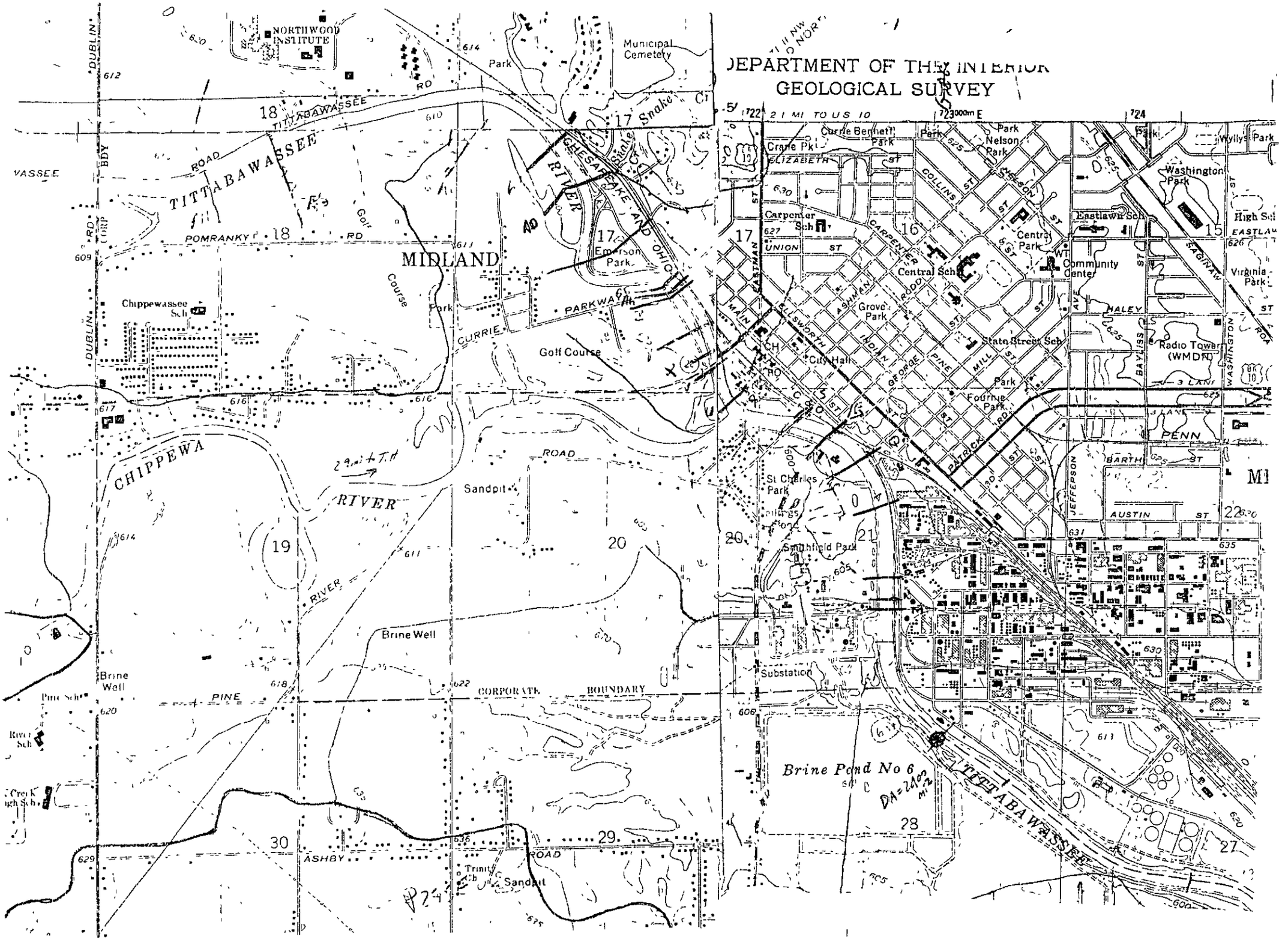
5/11/83 MID DOW 6
(3) Y3 CARDS ADDED

1948 FLOOD

SUMMARY PRINTOUT TABLE 150

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
123500.000	34000.00	610.80	0.00	0.00	0.00	534.32	100.00
123500.000	41000.00	611.73	.93	0.00	0.00	548.84	100.00
123500.000	47000.00	612.85	1.12	0.00	0.00	566.33	100.00
123500.000	61600.00	615.27	2.42	0.00	0.00	580.00	100.00
124100.000	34000.00	610.82	0.00	.02	0.00	296.00	450.00
124100.000	41000.00	611.72	.90	-.01	0.00	296.00	450.00
124100.000	47000.00	612.79	1.07	-.06	0.00	296.00	450.00
124100.000	61600.00	615.31	2.52	.04	0.00	500.00	450.00
124101.000	34000.00	610.86	0.00	.04	0.00	296.00	29.00
124101.000	41000.00	611.96	1.09	.23	0.00	296.00	29.00
124101.000	47000.00	613.26	1.30	.47	0.00	296.00	29.00
124101.000	61600.00	617.01	3.75	1.69	0.00	500.00	29.00
124300.000	34000.00	611.17	0.00	.31	0.00	304.21	150.00
124300.000	41000.00	612.35	1.17	.39	0.00	309.36	150.00
124300.000	47000.00	613.69	1.34	.43	0.00	314.00	150.00
124300.000	61600.00	617.05	3.37	.05	0.00	314.00	150.00
124700.000	34000.00	611.35	0.00	.18	0.00	548.16	400.00
124700.000	41000.00	612.60	1.25	.25	0.00	550.20	400.00
124700.000	47000.00	614.00	1.41	.32	0.00	670.00	400.00
124700.000	61600.00	617.54	3.54	.49	0.00	670.00	400.00
126000.000	34000.00	611.80	0.00	.45	0.00	840.91	1200.00
126000.000	40700.00	613.14	1.34	.54	0.00	843.45	1200.00
126000.000	45800.00	614.58	1.45	.58	0.00	846.21	1200.00
126000.000	54600.00	618.17	3.59	.63	0.00	853.05	1200.00
126800.000	34000.00	611.86	0.00	.07	0.00	641.03	800.00
126800.000	40700.00	613.20	1.34	.07	0.00	643.58	800.00
126800.000	45800.00	614.64	1.44	.06	0.00	646.32	800.00
126800.000	54600.00	618.20	3.56	.03	0.00	653.10	800.00
127550.000	34000.00	611.86	0.00	-.00	0.00	549.69	600.00
127550.000	41000.00	613.19	1.33	-.01	0.00	687.20	600.00
127550.000	47000.00	614.63	1.44	-.01	0.00	903.75	600.00
127550.000	61600.00	618.20	3.57	-.00	0.00	1800.24	600.00
127551.000	34000.00	611.87	0.00	.00	0.00	549.96	10.00
127551.000	41000.00	613.19	1.33	.00	0.00	687.50	10.00
127551.000	47000.00	614.64	1.44	.01	0.00	904.09	10.00
127551.000	61600.00	618.21	3.57	.00	0.00	1800.77	10.00
127552.000	34000.00	611.89	0.00	.03	0.00	552.80	64.00
127552.000	41000.00	613.23	1.33	.03	0.00	690.69	64.00
127552.000	47000.00	614.67	1.45	.04	0.00	907.71	64.00
127552.000	61600.00	618.23	3.56	.03	0.00	1806.40	64.00
127553.000	34000.00	611.90	0.00	.00	0.00	553.37	10.00
127553.000	41000.00	613.23	1.33	.00	0.00	691.39	10.00

5/11 A


DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
NORTHWOOD INSTITUTE
Municipal Cemetery
TITTABAWASSEE
ROAD
POMRANKY
RD
MIDLAND
Emerson Park
Golf Course
Chippewassee Sch
CURRIE
PARKWAY
CHESAPEAKE AND OHIO
RIVER
Snake Cr
CHIPPEWA
RIVER
ROAD
Sandpit
Brine Well
PINE
CORPORATE
BOUNDARY
ASHBY
ROAD
Trinity Ch
Sandpit
Brine Pond No 6
TITTABAWASSEE
Curtis Bennett Park
Crane Pk
ELIZABETH
Nelson Park
Washington Park
Carpenter Sch
UNION
CARPENTER
Central Park
Community Center
Eastlawn Sch
High Sch
Central Sch
Grove Park
State Street Sch
City Hall
Fournie Park
Radio Tower (WMDN)
Virginia Park
HALEY
PENN
BARTH
AUSTIN
JEFFERSON
WASHINGTON
SAGINAW
EASTLAWN
ELLSWORTH
MAIN
EASTMAN
ASHMAN
INDIAN
GEORGE
PINE
MILL
PATRICK
COLLINS
NELSON
Wyllys Park
St Charles Park
Smithfield Park
Substation
DUBLIN
BDY
CORP
Pine Sch
River Sch
Creek High Sch
DA=2400 MI2

McNAMEE, PORTER AND SEELEY
CONSULTING ENGINEERS
ANN ARBOR, MICHIGAN

[redacted]

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MAY 12 1983
WATER MANAGEMENT

MIDLAND, MICHIGAN
FLOOD INSURANCE STUDY
REVIEW

Prepared by

McNamee, Porter and Seeley
Consulting Engineers
Ann Arbor, Michigan

April 1983

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CONCLUSIONS AND RECOMMENDATIONS

A technical review has been made of the Midland Flood Insurance Study modeling of the Tittabawassee River. The review indicated that the floodway width models were unnecessarily restrictive, that the loss at the Dow Railroad and vehicular bridge was somewhat high and that minor errors were made in modeling the channel roughness. The FIS model was changed to account for the above comments. A comparison of the effect on the computed 100 year water surface elevations is shown in Table 1.

Table 1
Proposed Revisions to the Tittabawassee River
Base Flood (100 Year) Elevations

Location	Cross Section Designation	Base Flood Original	Elevation Revised
Downstream of George St. Bridge	Q	614.91	614.64
Upstream of confluence with the Chippewa River	U	616.14	615.46
Upstream of confluence with Snake Creek	AD	616.69	615.88
Upstream of confluence with Sturgeon Creek	AF	616.80	615.98

MIDLAND FLOOD INSURANCE STUDY REVIEW

INTRODUCTION

A Flood Insurance Study (FIS) for the City of Midland has been prepared by Gove Associates, Inc. on behalf of the Federal Emergency Management Agency (FEMA). A study was done by the U.S. Corps of Engineers in January 1977 and published as General Design Memorandum No. 8 (GDM) on the Tittabawassee River at Midland. Differences in the computed 100-year water surface profile of greater than 1 foot were noted by the City between the FIS and the GDM on the Tittabawassee River. Because of the flat topography in the area, numerous structures would be additionally included in the flood plain with the higher elevations.

The purpose of this study is to investigate the reasonableness of the City of Midland Flood Insurance Study (FIS), prepared by Gove Associates, Inc., and to examine its effect on the City of Midland. The work was done in two phases. The first phase identified where key judgments affecting water surface elevations were made. The second phase included a detailed investigation into those judgements which appeared to have the most effect on the computed water surface elevations. Specifically, the width of floodway channels, the loss at the Dow Railroad and Vehicular Bridge, and the calibration of the model against the 1948 flood profile were investigated.

FLOODWAY CHANNEL

The FIS modeling indicated large depths of flow (generally from 6 to 16 feet) on the overbanks upstream of the Dow Pipeline Bridge (cross section N), but were not included in the floodway, apparently because of existing development. The FIS model was revised to account for the larger floodway widths available. The access roads to the George Street Bridge (also known as the Putnam Bridge and Poseyville Road Bridge) and the M-20 Bridge were built higher than the surrounding land. Therefore, they do act as obstructions to flow in the overbanks.

The 100-year profile shown in the FIS indicates that overtopping of the George Street Bridge will occur in the right overbank. Therefore, the George Street Bridge model was extended using the construction plans for the bridge and roadway. The revised model indicated that approximately 1200 cfs overtops the right overbank of the George Street Bridge during the 100-year event. This results in a divided floodway channel. The overbanks are wide and deep upstream and downstream of the bridge. Therefore, the bridge itself, not the overbanks,

controls the amount of flow over the bridge. The flow at cross sections P, Q, S and T was reduced by 1200 cfs for account for the divided floodway channel. The floodway was drawn at a slightly larger width upstream and downstream than the effective width at the bridge. Figures 1 to 4 indicate the proposed revision to the floodway widths.

The Draft FIS indicated that the channel roughness was varied from 0.030 to 0.035. However, it appears that several errors were made in the use of the "NH" card, which in effect resulted in a roughness of 0.059 to be used for the channel at Sections T, AE and AF. The model was revised to maintain a channel roughness in the range of 0.030 to 0.035.

The revised 100-year profile accounting for the above changes is shown in Figures 5 and 6.

BRIDGE LOSSES

The loss in head at the Dow Railroad and Vehicular Bridge was indicated to be approximately 1 foot in the FIS. The bridge was modeled using the Special Bridge Routine. An XKOR value of 1.5 was used. Since the friction losses are very small (K_f = 0.02), this indicates that an entrance coefficient (K_e) of 0.5 was used. For a river this wide, with a floodplain confined to about the width of the river, this appears to be very high. An XKOR value of 1.25 was judged to be more reasonable.

The revised 100-year profile accounting for the revised floodway and the reduced bridge loss is shown in Figures 5 and 6.

CALIBRATION TO 1948 FLOOD

For comparison purposes, the revised model was run with the 1948 flood flows. Table 2 indicates the results.

The high water profile used for comparison is based on data obtained by Dow Chemical Corporation for the 1948 event. The Dow data appears to have been taken at consistent locations for a number of floods. The Corps of Engineers work in 1977 was based on the Dow profile. The data used for calibration of the FIS does not appear to be the best available data upstream of the confluence with the Chippewa River.

Table 2

Comparison of Revised Model

to 1948 High Water Data

Location	High Water Elevation	Computed Water Surface Elevation
Upstream of George St. Bridge	611.0	611.7
Upstream of confluence with Chippewa River	611.6	612.1
Upstream of confluence with Sturgeon Creek	611.9	612.7

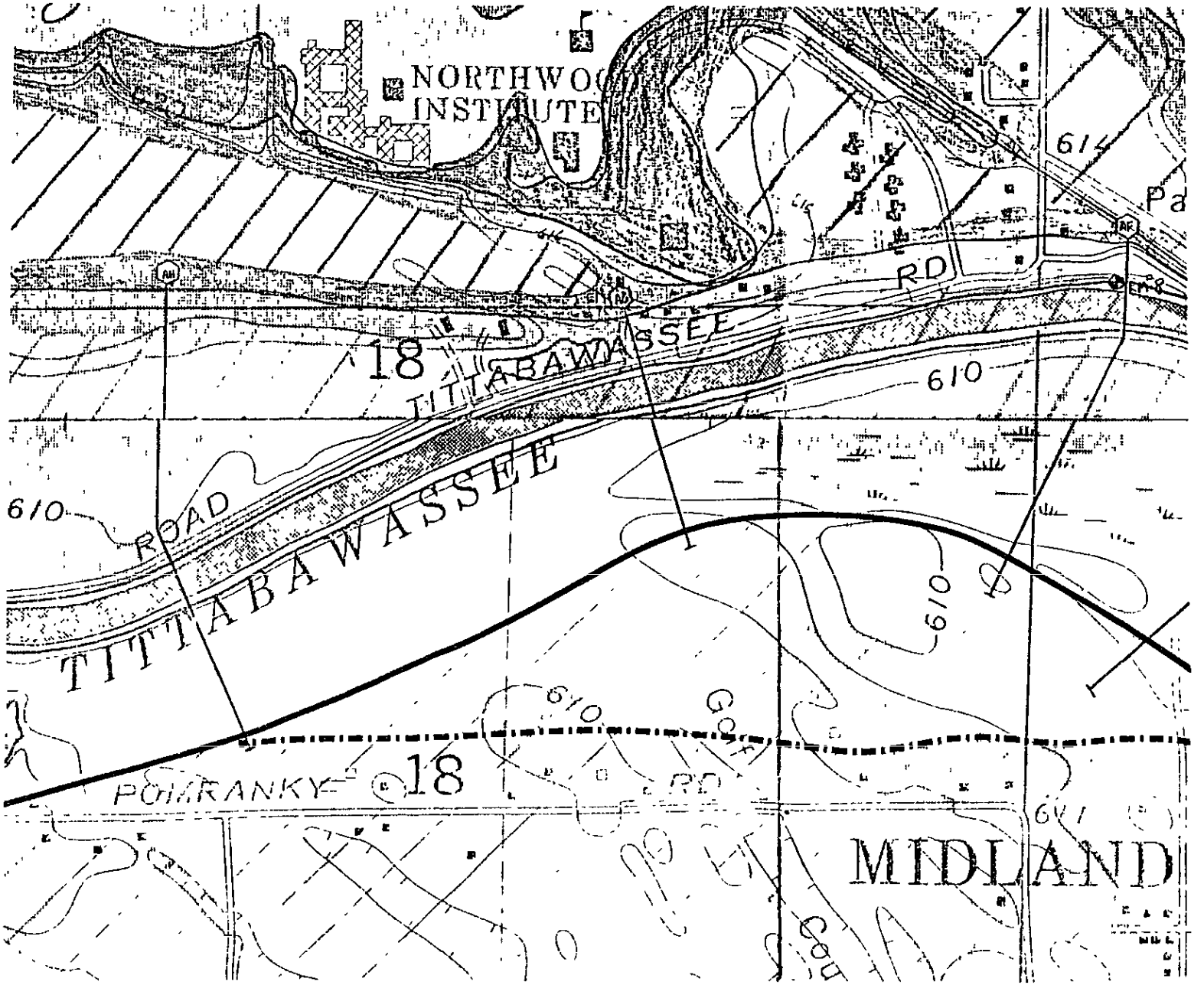


FIGURE 1

FLOODWAY DELINEATION

N

LEGEND

ORIGINAL FIS FLOODWAY DELINEATION

PROPOSED REVISION TO FIS FLOODWAY DELINEATION

0' 500' 1000'

SCALE: FEET

MIDLAND, MICHIGAN

FLOOD INSURANCE STUDY REVIEW

McNAMEE PORTER & SEELEY
ENGINEERS ARCHITECTS
ANN ARBOR, MICHIGAN

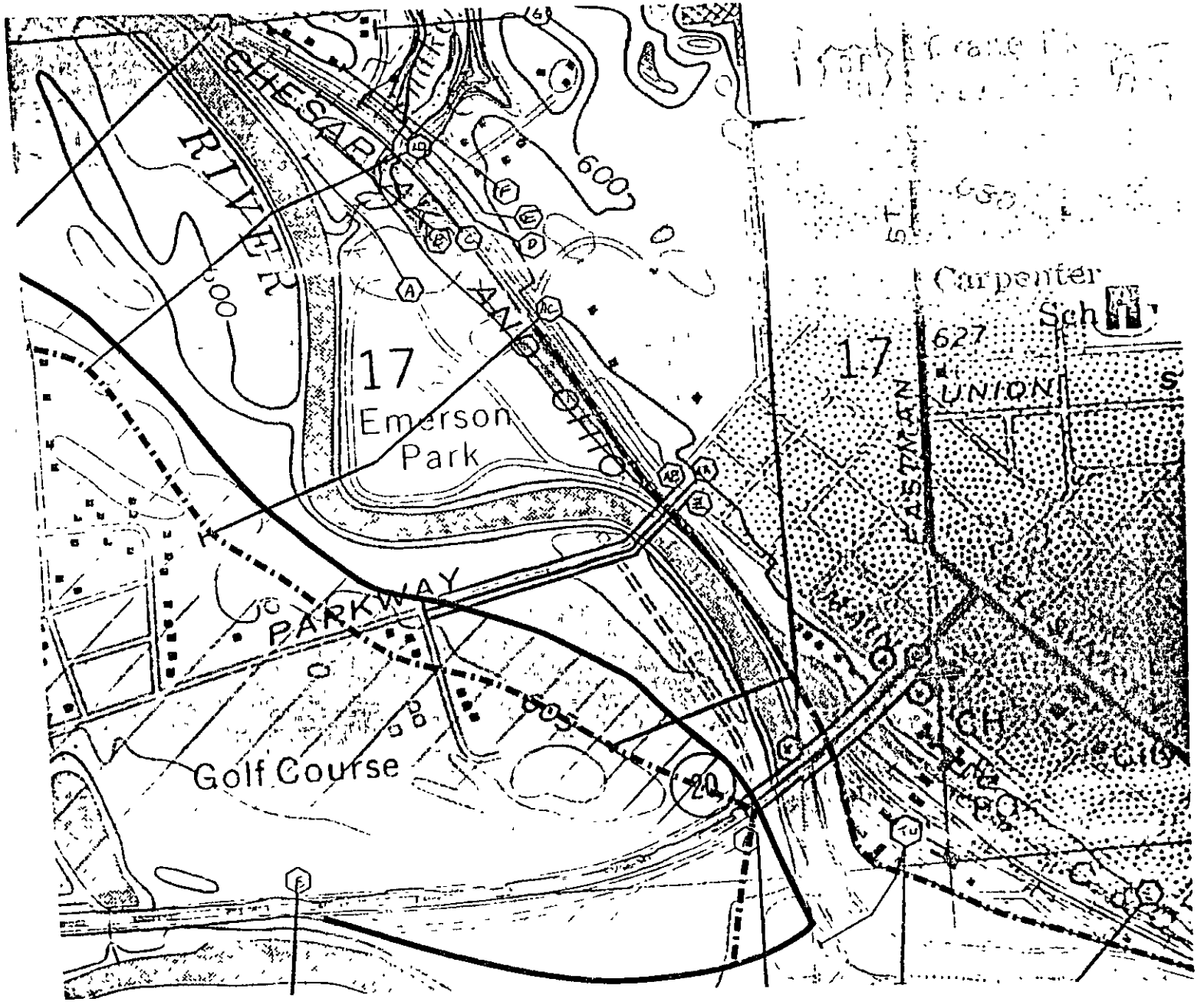


FIGURE 2

FLOODWAY DELINEATION

N

LEGEND

ORIGINAL FIS FLOODWAY DELINEATION

PROPOSED REVISION TO FIS FLOODWAY DELINEATION

0' 500' 1000'

SCALE: FEET

MIDLAND, MICHIGAN

FLOOD INSURANCE STUDY REVIEW

McNAMEE PORTER & SEELEY
ENGINEERS ARCHITECTS
ANN ARBOR, MICHIGAN

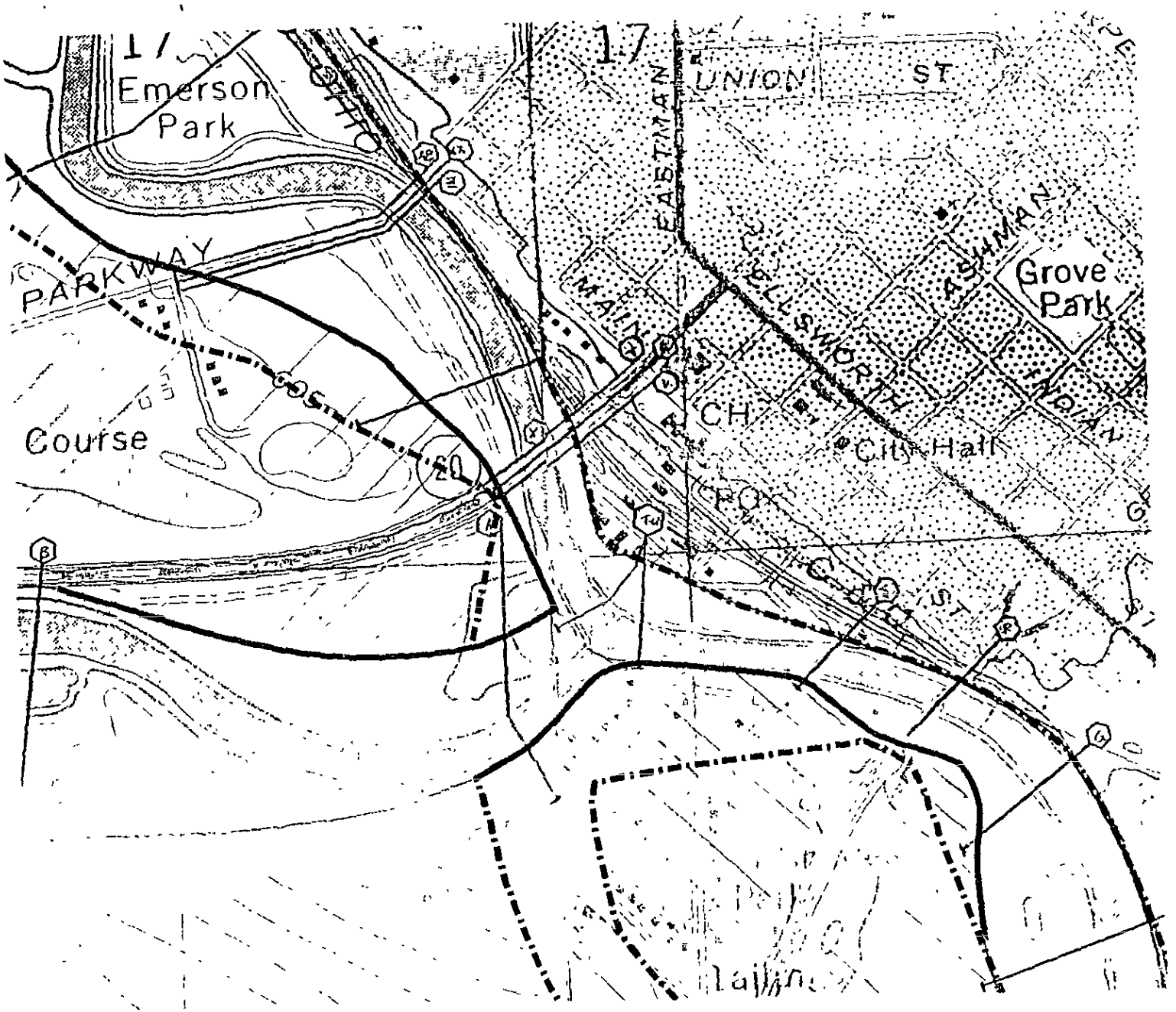


FIGURE 3

FLOODWAY DELINEATION

N

LEGEND

ORIGINAL FIS FLOODWAY DELINEATION

PROPOSED REVISION TO FIS FLOODWAY DELINEATION

0' 500' 1000'

SCALE: FEET

MIDLAND, MICHIGAN

FLOOD INSURANCE STUDY REVIEW

McNAMEE PORTER & SEELEY
ENGINEERS ARCHITECTS
ANN ARBOR, MICHIGAN

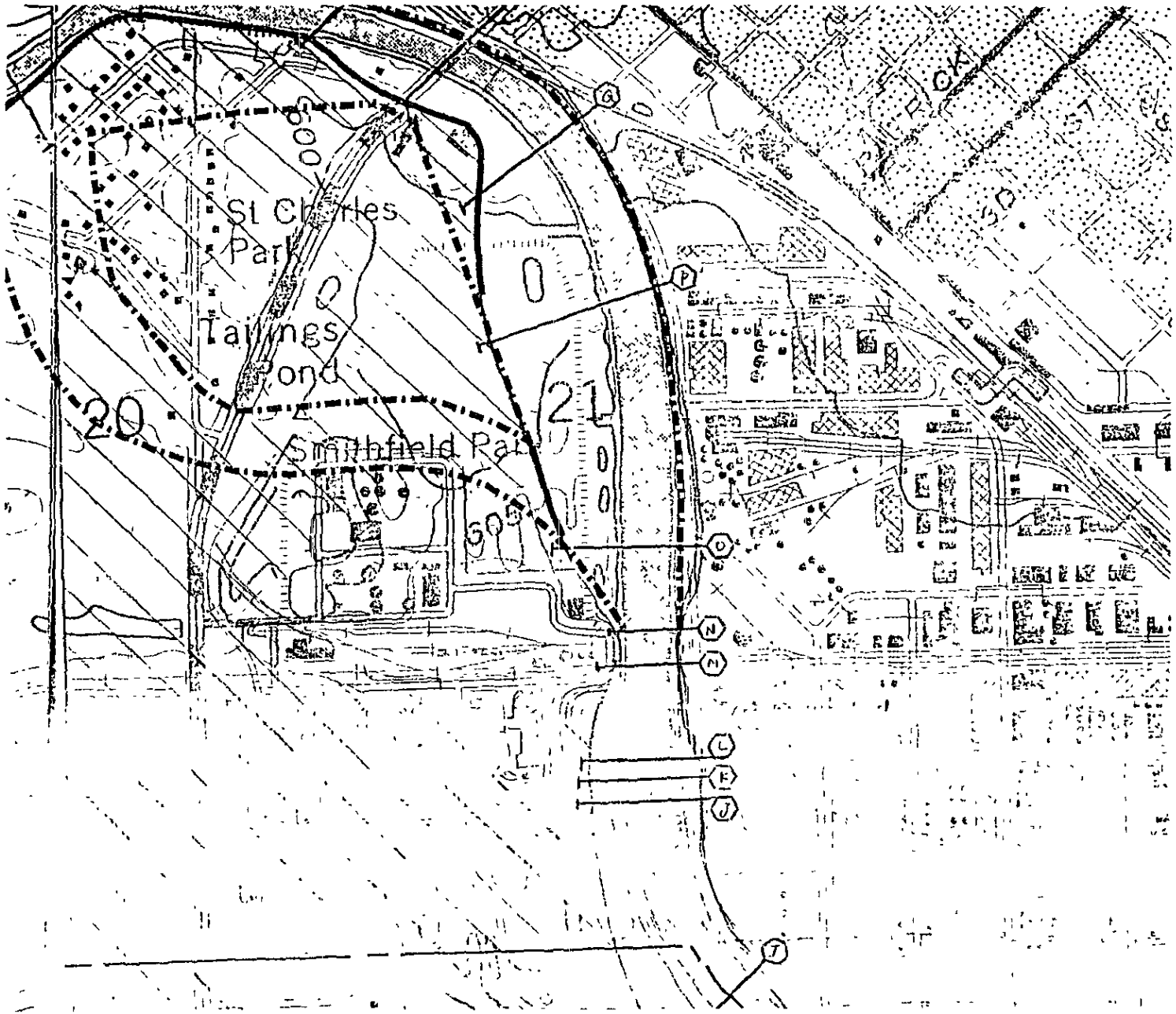


FIGURE 4

FLOODWAY DELINEATION

N

LEGEND

ORIGINAL FIS FLOODWAY DELINEATION

PROPOSED REVISION TO FIS FLOODWAY DELINEATION

0' 500' 1000'

SCALE: FEET

MIDLAND, MICHIGAN

FLOOD INSURANCE STUDY REVIEW

McNAMEE PORTER & SEELEY
ENGINEERS ARCHITECTS
ANN ARBOR, MICHIGAN

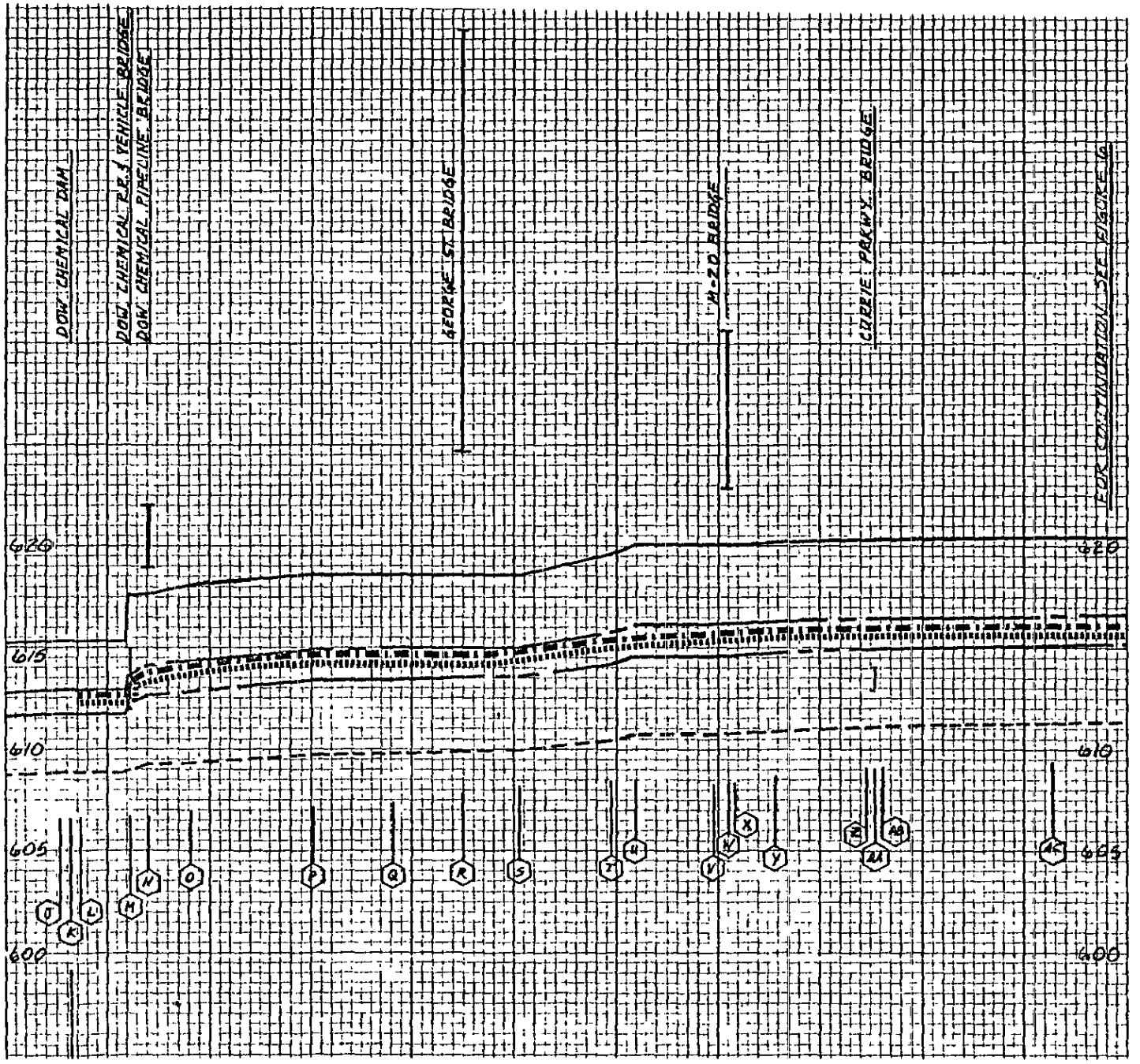


FIGURE 5

TITTABAWASSEE RIVER PROFILES

LEGEND

(ORIGINAL FIS PROFILES)

- 10 YEAR FLOOD
- 50 YEAR FLOOD
- 100 YEAR FLOOD
- 500 YEAR FLOOD
- CROSS SECTION LOCATION

(REVISED PROFILES)

- REVISED 100 YEAR PROFILE WITH EXPANDED FLOODWAY
- REVISED 100 YEAR PROFILE WITH EXPANDED FLOODWAY AND REVISION AT DOW BRIDGE

MIDLAND, MICHIGAN

FLOOD INSURANCE STUDY REVIEW

McNAMEE PORTER & SEELEY
ENGINEERS ARCHITECTS
ANN ARBOR, MICHIGAN

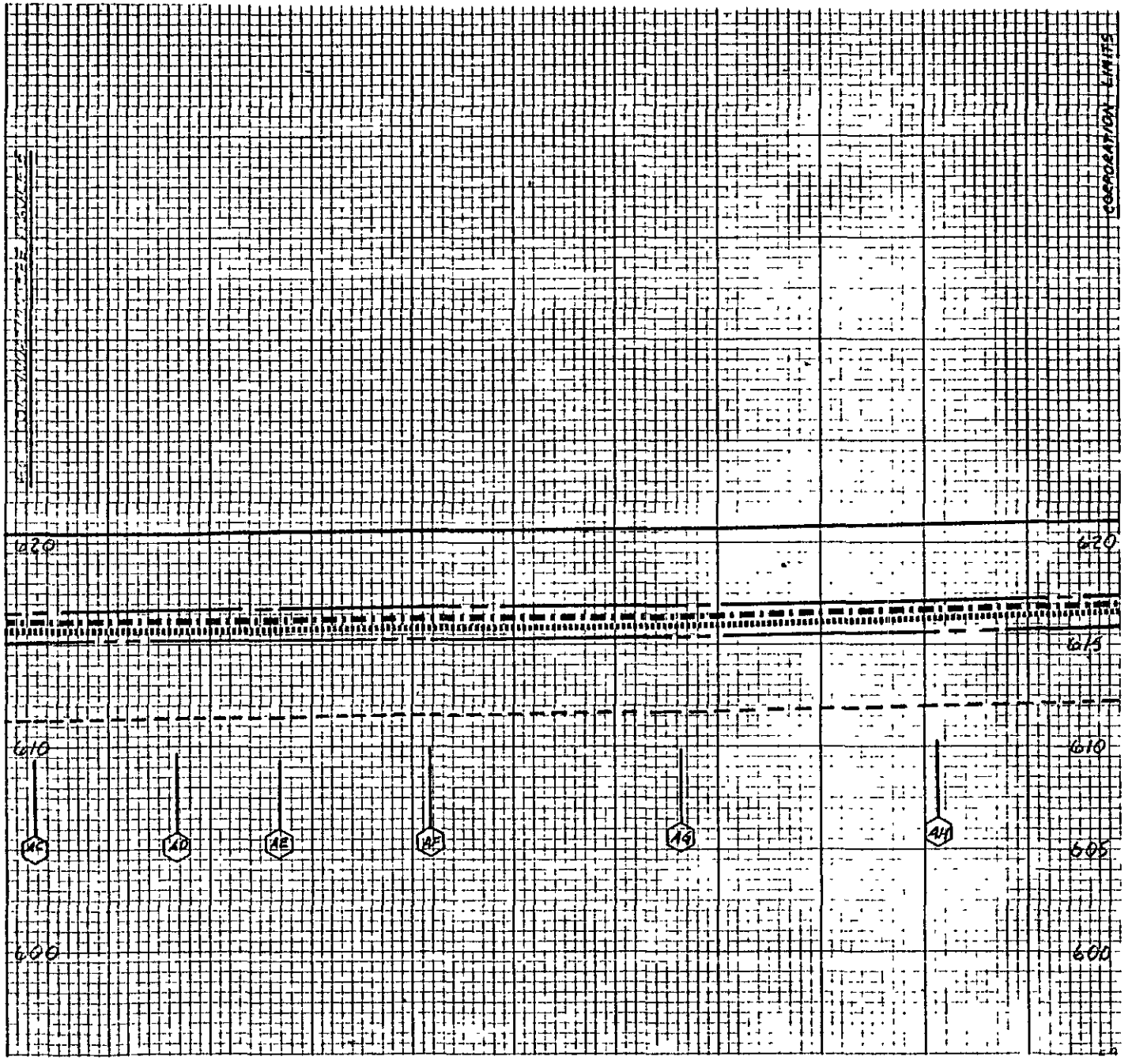


FIGURE 6

TITTABAWASSEE RIVER PROFILES

LEGEND

(ORIGINAL FIS PROFILES)

- 10 YEAR FLOOD
- 50 YEAR FLOOD
- 100 YEAR FLOOD
- 500 YEAR FLOOD
- CROSS SECTION LOCATION

(REVISED PROFILES)

- REVISED 100 YEAR PROFILE WITH EXPANDED FLOODWAY
- REVISED 100 YEAR PROFILE WITH EXPANDED FLOODWAY AND REVISION AT DOW BRIDGE

MIDLAND, MICHIGAN

FLOOD INSURANCE STUDY REVIEW

McNAMEE PORTER & SEELEY
ENGINEERS ARCHITECTS
ANN ARBOR, MICHIGAN

APPENDIX

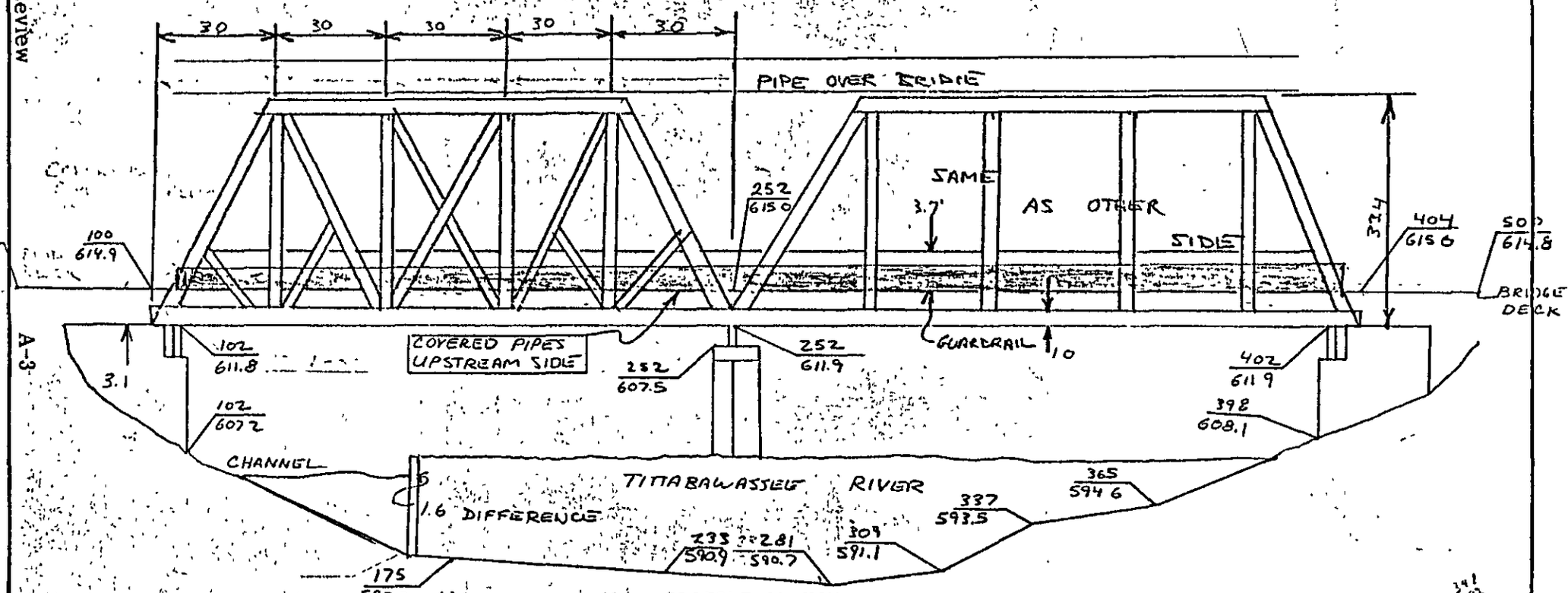
Dow Chemical Railroad and Vehicular Bridge Sketches

and

Summary Data for HEC-2 Modeling Revisions

Midland FIS Review

Community: MIDLAND	Structure: DOW CHEMICAL R.R. VEHICLE BRIDGE	Type: STEEL CANTILEVER	Station: 1241 +40



A-3

Length: 304.0 FT.	Width: 20 FT. BRIDGE SUPERSTRUC. 27 FT. W/ PIPELINES	Skew: —	Water Elevation: 596.8 - RIVER
No. of Piers: 1	Width of Piers: 6 FT.	Shape of Piers: SEE PAGE 2	595.2 CHANNEL

Notes:

3.1
302

6198
230
5968

Gove Associates Inc.
ARCHITECTS/ENGINEERS/PLANNERS/SURVEYORS

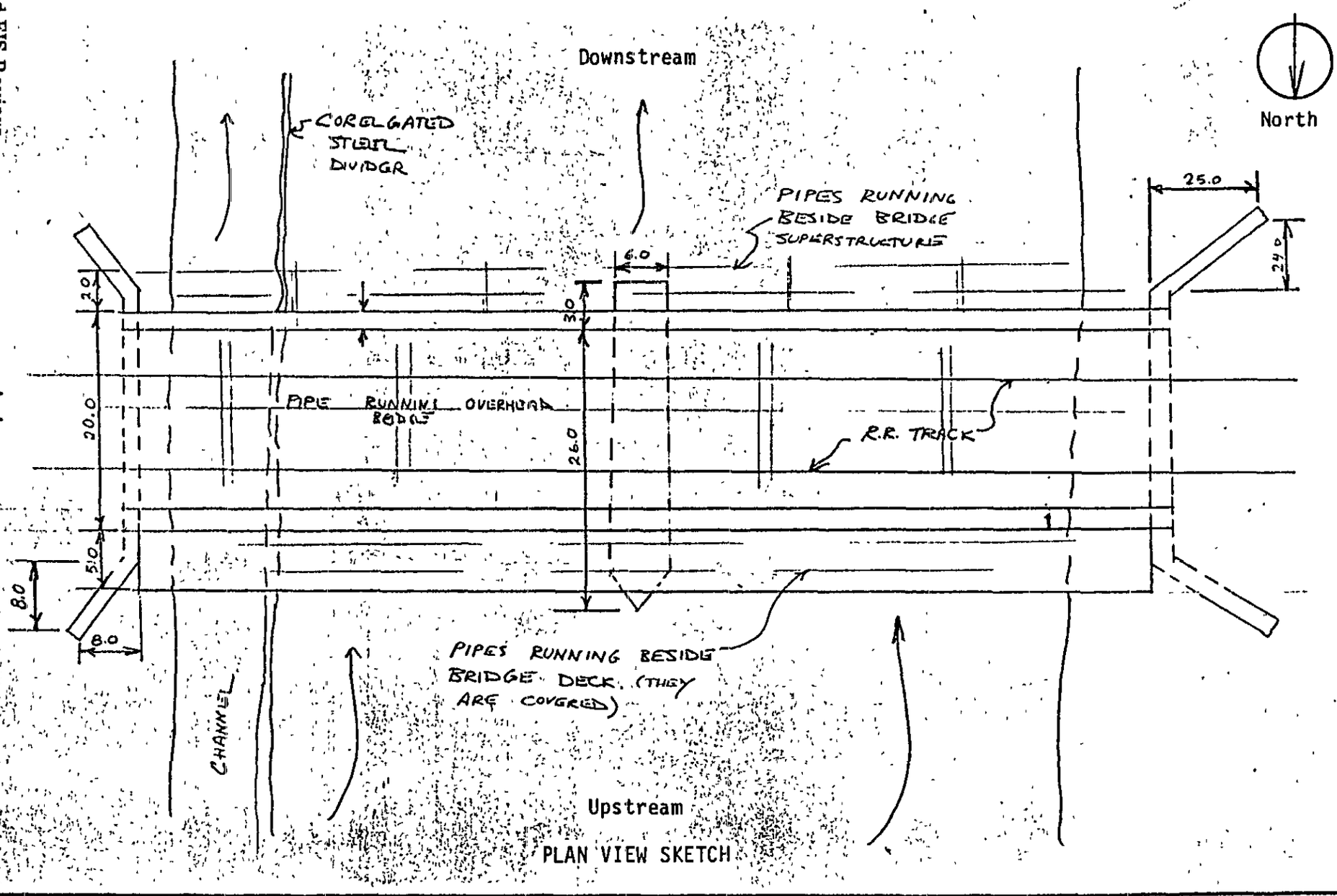
210 MILL STREET
LANSING, MICHIGAN 48933
(517) 485-0555

By: J. S.C.

Date: 1/15/80

Sheet 1 of 2

Community: MIDLAND	Structure: DOW CHEMICAL R.R VEHICLE BRIDGE	Type: STEEL CANTILEVER	Station: 1241+40



PLAN VIEW SKETCH

Gove Associates Inc.
[redacted]
210 MILL STREET
LANSING, MICHIGAN 48933
(517) 485-0555

By: [redacted]

Date [redacted]

Sheet 2 of 2

5/1/80
B

TITTABAWASSEE RIVER

1740 DOW CHEMICAL BRIDGE

20' WIDE X 296' LONG

RRD = 615.0
LCND = 611.9

PIER K = 1.05

11.9 ~~11.8~~							11.9						11.9
102	134	155	175	195	214	233	252	281	309	337	365	393	398
9.2	95.2	~~96.5~~ 93.0	92.2	91.6	91.3	90.9		90.7	91.1	93.5	94.6	96.8	8.1

OPS FORM 3308
PRINTED IN U.S.A.

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*****************************************************
*  WATER SURFACE PROFILES                           *
*  VERSION OF NOVEMBER 1976                         *
*  UPDATED JULY 1979                                *
*                                                   *
*  RUN DATE  04/26/83  TIME .09.51.56.              *
*****************************************************
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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    *
*************************************
```

C. Model with enlarged floodway
10, 50, 100, 500

```
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
```

FIS Based on next run.

Do Not use

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*************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
*************************************************

C
T1        TITTABAWASSEE RIVER AT MIDLAND
T2        FIS REVIEW
T3        10 YR FLOOD

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      0.        2.        0.        0.  0.000000      0.00      0.0       0.    608.800    0.000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLOC     IBW       CHNIM     ITRACE

      1.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

QT      5.000  27500.000  41000.000  47000.000  61600.000  34000.000      0.000      0.000      0.000      0.000
NC       .035       .035       .030       .100       .300      0.000      0.000      0.000      0.000      0.000

X1 123500.000     14.000    132.000    429.000    100.000    100.000    100.000      0.000      0.000      0.000
GR    613.700      0.000    605.600     92.000    596.400    112.000    595.200    132.000    596.800    184.000
GR    595.700    225.000    593.200    226.000    591.100    307.000    592.600    348.000    594.900    389.000
GR    556.700    429.000    603.500    457.000    607.000    553.000    613.800    580.000      0.000      0.000

          DOW CHEMICAL R.R. AND VEHICLE BRIDGE

X1 124100.000     18.000    102.000    398.000    500.000    500.000    450.000      0.000      0.000      0.000
X3     10.000      0.000      0.000      0.000      0.000      0.000      0.000    614.900    614.900      0.000
GR    614.900      0.000    607.200    102.000    595.200    134.000    596.800    150.000    592.200    175.000
GR    591.600    195.000    591.300    214.000    590.900    233.000    590.900    249.000    607.500    249.000
GR    607.500    255.000    590.500    255.000    590.700    281.000    591.100    309.000    593.500    337.000
GR    594.600    365.000    596.800    398.000    614.800    500.000      0.000      0.000      0.000      0.000
SR      1.150      1.500      2.500      0.000    256.000      6.000   5310.000       .900    595.000    595.000

X1 124101.000      0.000      0.000      0.000     29.000     29.000     29.000      0.000      0.000      0.000
X2      0.000      0.000      1.000    612.000    618.600      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    614.900    614.900      0.000
BT      4.000      0.000    614.900    614.900    102.000    618.600    611.800    398.000    618.700    612.000
BT    500.000    614.800    614.800      0.000      0.000      0.000      0.000      0.000      0.000      0.000

X1 124300.000     23.000    105.000    423.000    100.000    100.000    150.000      0.000      0.000      0.000
X3     10.000      0.000      0.000      0.000      0.000      0.000      0.000    620.000    620.000      0.000
GR    613.800      0.000    614.100     42.000    621.000     54.000    613.400    105.000    608.400    127.000
GR    594.700    154.000    596.200    174.000    591.500    174.000    588.700    192.000    588.200    210.000
GR    587.800    228.000    586.900    246.000    586.900    267.000    618.800    262.000    618.800    266.000
GR    586.900    266.000    586.600    292.000    585.900    320.000    586.200    348.000    587.800    376.000
GR    596.300    403.000    604.300    423.000    620.400    500.000      0.000      0.000      0.000      0.000
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X1	124700.000	13.000	118.000	450.000	400.000	400.000	400.000	0.000	0.000	0.000
GR	613.800	0.000	613.700	118.000	594.700	149.000	596.300	169.000	587.400	209.000
GR	587.200	249.000	586.600	289.000	588.600	328.000	590.200	367.000	596.300	406.000
GR	605.000	450.000	610.000	550.000	607.000	670.000	0.000	0.000	0.000	0.000
QT	5.000	27500.000	40700.000	45800.000	54600.000	34000.000	0.000	0.000	0.000	0.000
X1	126000.000	15.000	87.000	398.000	1300.000	650.000	1200.000	0.000	0.000	0.000
GR	623.300	0.000	623.400	87.000	596.100	139.000	590.300	181.000	596.800	222.000
GR	586.300	263.000	587.800	304.000	589.100	345.000	596.100	386.000	604.700	398.000
GR	603.900	477.000	605.600	527.000	609.100	538.000	600.000	600.000	600.000	950.000
X1	126800.000	12.000	87.000	410.000	900.000	750.000	800.000	0.000	0.000	0.000
GR	623.400	87.000	596.100	139.000	590.300	181.000	586.800	222.000	586.300	263.000
GR	587.800	304.000	589.100	345.300	596.100	386.000	600.000	410.000	605.000	415.000
GR	600.000	420.000	600.000	750.000	0.000	0.000	0.000	0.000	0.000	0.000
QT	5.000	27500.000	41000.000	47000.000	61600.000	34000.000	0.000	0.000	0.000	0.000

GEORGE ST. BRIDGE,MAXLC.639.2,MIN TR 631.5,WIDTH 64,LENGTH 694

X1	127550.000	60.000	104.000	791.000	600.000	600.000	600.000	0.000	0.000	0.000
GR	641.000	0.000	624.700	104.000	624.100	183.000	638.700	183.000	638.700	187.000
GR	624.100	187.000	614.000	213.000	614.000	238.000	614.200	279.000	635.200	279.000
GR	639.200	283.000	614.200	283.000	595.800	298.000	589.800	322.000	584.700	345.000
GR	584.300	370.000	638.900	370.000	638.900	374.000	584.300	374.000	585.200	405.000
GR	585.000	430.000	589.300	460.000	637.100	460.000	637.100	464.000	589.300	464.000
GR	589.000	485.000	591.300	505.000	595.800	524.000	600.600	536.000	605.400	550.000
GR	634.700	550.000	634.700	554.000	605.400	554.000	605.400	640.000	631.200	640.000
GR	631.200	644.000	605.400	644.000	605.400	730.000	627.400	730.000	627.400	734.000
GR	605.400	734.000	607.400	756.000	620.000	791.000	629.000	865.000	626.000	965.000
GR	623.000	1065.000	621.700	1165.000	620.500	1265.000	619.800	1365.000	619.000	1465.000
GR	618.500	1565.000	618.000	1665.000	618.000	2065.000	617.600	2165.000	617.000	2265.000
GR	615.700	2465.000	614.000	2565.000	613.000	2665.000	612.000	2765.000	611.000	2865.000
X1	127551.000	0.000	0.000	0.000	10.000	10.000	10.000	0.000	0.000	0.000
BT	27.000	0.000	641.000	641.000	104.000	644.600	637.900	183.000	645.600	638.700
BT	279.000	646.000	639.200	370.000	645.400	638.600	460.000	644.000	637.100	550.000
BT	641.600	634.700	640.000	638.100	631.200	730.000	634.300	627.400	791.000	631.500
BT	624.700	865.000	629.000	629.000	565.000	626.000	626.000	1065.000	623.000	623.000
BT	1165.000	621.700	621.700	1265.000	620.500	620.500	1365.000	619.800	619.800	1465.000
BT	619.000	619.000	1565.000	618.500	618.500	1665.000	618.000	618.000	2065.000	618.000
BT	618.000	2165.000	617.600	617.600	2265.000	617.000	617.000	2465.000	615.000	615.000
BT	2565.000	614.000	614.000	2665.000	613.000	613.000	2765.000	612.000	612.000	2865.000
BT	611.000	611.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	127552.000	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
X1	127553.000	0.000	0.000	0.000	10.000	10.000	10.000	0.000	0.000	0.000
QT	5.000	27500.000	40700.000	45800.000	54600.000	34000.000	0.000	0.000	0.000	0.000
X1	128100.000	15.000	323.000	665.000	700.000	900.000	550.000	.840	0.000	0.000
GR	623.600	0.000	613.200	175.000	615.400	323.000	597.600	324.000	596.600	331.000
GR	594.700	365.000	591.500	405.000	590.000	440.000	589.000	475.000	586.000	510.000
GR	585.500	545.000	594.300	585.000	596.600	615.000	605.000	665.000	605.000	1350.000

NH	3.000	.016	413.000	.630	640.000	.060	1150.000	0.000	0.000	0.000

D/S OF CONFLUENCE WITH CHIPPEWA RIVER

X1	129100.000	12.000	413.000	640.000	1000.000	700.000	900.000	0.000	0.000	0.000
GR	607.200	0.000	607.000	368.000	600.300	413.000	596.500	418.000	591.500	455.000
GR	588.500	490.000	584.100	530.000	586.800	565.000	589.400	605.000	596.500	640.000
GR	605.000	690.000	605.000	1150.000	0.000	0.000	0.000	0.000	0.000	0.000
OT	5.000	17700.000	26400.000	30300.000	39700.000	21000.000	0.000	0.000	0.000	0.000
NC	.030	.030	.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000

U/S OF CONFLUENCE WITH CHIPPEWA RIVER

X1	129350.000	13.000	413.000	640.000	90.000	1000.000	250.000	0.000	0.000	0.000
GR	607.200	0.000	607.000	368.000	600.300	413.000	596.500	418.000	591.500	455.000
GR	588.500	490.000	584.100	530.000	586.800	565.000	589.400	605.000	596.500	640.000
GR	600.000	645.000	600.000	700.000	600.000	1300.000	0.000	0.000	0.000	0.000

X1	130175.000	22.000	600.000	870.000	750.000	750.000	750.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	490.000	0.000	1330.000	0.000	0.000	0.000	0.000
GR	628.600	0.000	630.800	100.000	623.200	200.000	611.400	285.000	612.200	370.000
GR	603.800	395.000	606.800	440.000	605.000	500.000	604.800	580.000	606.200	600.000
GR	595.600	628.000	591.300	660.000	589.300	690.000	595.200	720.000	587.200	750.000
GR	593.500	780.000	591.200	810.000	595.600	842.000	604.800	870.000	604.900	1000.000
GR	559.400	1100.000	601.000	1200.000	0.000	0.000	0.000	0.000	0.000	0.000

M-20 BRIDGE,MAX LC 634.5,MIN TR 626.6,WIDTH 68,LENGTH 671

X1	130225.000	52.000	620.000	826.000	50.000	50.000	50.000	0.000	0.000	0.000
GR	633.400	200.000	636.700	292.000	610.400	292.000	608.600	343.000	633.300	343.000
GR	633.300	350.000	608.400	350.000	611.000	383.000	604.900	394.000	634.400	394.000
GR	634.400	401.000	604.900	401.000	605.800	464.000	634.800	464.000	634.800	471.000
GR	605.800	471.000	604.600	523.000	634.900	523.000	634.900	530.000	604.600	530.000
GR	605.400	590.000	634.500	590.000	630.900	600.000	605.400	600.000	595.600	620.000
GR	588.200	640.000	588.600	659.000	627.700	659.000	627.700	666.000	588.600	666.000
GR	590.200	705.000	590.200	730.000	591.600	771.000	624.200	771.000	624.200	778.000
GR	591.600	778.000	592.900	810.000	595.600	818.000	601.800	826.000	602.800	845.000
GR	622.900	845.000	626.400	850.000	602.800	850.000	603.400	904.000	624.400	904.000
GR	624.400	909.000	603.400	909.000	604.800	964.000	626.600	964.000	625.600	1000.000
GR	622.700	1100.000	620.600	1200.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	130226.000	0.000	0.000	0.000	10.000	10.000	10.000	0.000	0.000	0.000
BT	15.000	200.000	633.400	633.400	292.000	636.700	631.900	343.000	638.200	633.300
BT	394.000	639.300	634.400	464.000	635.600	634.800	523.000	639.700	634.900	590.000
BT	639.300	634.500	600.000	639.300	630.900	659.000	636.800	627.700	771.000	633.300
BT	624.200	845.000	630.600	622.900	850.000	630.600	626.400	904.000	628.700	624.400
BT	964.000	626.600	622.500	1000.000	625.600	625.600	0.000	0.000	0.000	0.000

X1	130227.000	0.000	0.000	0.000	68.000	68.000	68.000	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

X1	130228.000	0.000	0.000	0.000	10.000	10.000	10.000	0.000	0.000	0.000

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X1 130275.000     22.000    580.000    821.000     50.000     50.000     50.000      0.000      0.000      0.000
X3     0.000      0.000      0.000    460.000      0.000   1020.000      0.000      0.000      0.000      0.000
GR   633.000      0.000    634.800    100.000    629.600    200.000    616.400    300.000    616.400    370.000
GR   609.600    392.000    611.900    440.000    609.600    470.000    610.900    580.000    595.600    615.000
GR   592.300    645.000    590.000    670.000    587.600    700.000    587.000    725.000    589.300    755.000
GR   591.300    780.000    595.600    810.000    607.100    821.000    606.900    950.000    609.800   1005.000
GR   604.600   1125.000    605.200   1200.000      0.000      0.000      0.000      0.000      0.000      0.000
NC      .050       .030       .035      0.000      0.000      0.000      0.000      0.000      0.000      0.000

X1 130750.000     19.000     88.000    284.000    430.000    430.000    430.000      0.000      0.000      0.000
GR   621.800      0.000    610.600     12.000    611.100     26.000    612.000     35.000    610.400     45.000
GR   609.400     65.000    607.400     88.000    595.800    105.000    591.600    135.000    588.100    165.000
GR   589.100    190.000    590.200    220.000    591.100    250.000    595.800    276.000    602.900    284.000
GR   604.000    483.000    602.100    660.000    603.900    760.000    605.000   1000.000      0.000      0.000

X1 131700.000     16.000     56.000    270.000    900.000    950.000    900.000      0.000      0.000      0.000
X3     0.000      0.000      0.000      0.000      0.000   1250.000      0.000      0.000      0.000      0.000
GR   615.000      0.000    612.200     56.000    596.500     81.000    590.400    110.000    587.600    140.000
GR   587.100    165.000    589.700    195.000    592.300    220.000    596.500    246.000    604.900    270.000
GR   607.500    303.000    606.600    500.000    605.700    700.000    606.900    810.000    606.700   1130.000
GR   608.500   1400.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000
NC      .035       .035       .035      0.000      0.000      0.000      0.000      0.000      0.000      0.000

          CURRIE PARKWAY BRIDGE, MAXLC 612.8,MIN TR 614,WIDTH 18

X1 131750.000     18.000    104.000    240.000     50.000     50.000     50.000      0.000      0.000      0.000
GR   615.600      0.000    614.000    104.000    612.700    104.000    596.300    108.000    594.800    130.000
GR   587.400    150.000    586.700    170.000    585.700    190.000    592.700    215.000    596.500    236.000
GR   612.700    240.000    614.100    240.000    611.600    303.000    606.000    500.000    605.400    700.000
GR   606.900    810.000    606.700   1130.000    607.500   1660.000      0.000      0.000      0.000      0.000
NC      .035       .035       .050      0.000      0.000      0.000      0.000      0.000      0.000      0.000

X1 131751.000      0.000      0.000      0.000      1.000      1.000      1.000      0.000      0.000      0.000
BT     9.000      0.000    615.600    615.600    104.000    614.000    612.700    240.000    614.100    612.800
BT   303.000    611.600    611.600    500.000    606.000    606.000    700.000    605.400    605.400    810.000
BT   606.900    606.900   1130.000    606.700    606.700   1660.000    607.500    607.500      0.000      0.000

X1 131752.000      0.000      0.000      0.000     18.000     18.000     18.000      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

X1 131753.000      0.000      0.000      0.000      1.000      1.000      1.000      0.000      0.000      0.000

X1 131800.000     16.000     77.000    256.000     50.000     50.000     50.000      0.000      0.000      0.000
GR   615.000      0.000    611.400     77.000    596.500     93.000    591.500    120.000    584.300    150.000
GR   586.900    175.000    590.300    200.000    591.800    230.000    596.500    254.000    599.200    256.000
GR   605.400    303.000    605.600    500.000    603.600    700.000    606.900    810.000    606.700   1130.000
GR   608.500   1660.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000
NH     5.000      .060   1147.000      .030   1234.000      .035   1413.000      .050   1423.000      .030
NH  1981.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000

X1 133600.000     17.000   1234.000   1413.000   1200.000   1300.000   1700.000      0.000      0.000      0.000
GR   601.700      0.000    604.100    330.000    605.300   1040.000    605.800   1147.000    604.700   1225.000
GR   602.600   1234.000    595.800   1245.000    589.000   1275.000    589.300   1300.000    590.000   1330.000
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GR	584.700	1360.000	592.100	1385.000	595.800	1413.000	603.900	1423.000	605.500	1533.000
GR	607.400	1768.000	610.200	1980.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	.030	.060	.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000

U/S OF CONFLUENCE WITH SNAKE CREEK

XL	135700.000	18.000	440.000	708.000	1200.000	1250.000	1400.000	0.000	0.000	0.000
GR	614.700	0.000	612.100	6.000	598.400	50.000	605.400	386.000	605.900	440.000
GR	596.200	454.000	591.600	490.000	591.900	530.000	592.900	570.000	593.200	610.000
GR	592.300	650.000	596.200	690.000	606.800	708.000	602.000	920.000	600.400	1200.000
GR	606.000	1450.000	608.000	1770.000	611.500	1980.000	0.000	0.000	0.000	0.000
NH	3.000	.030	115.000	.035	325.000	.060	2500.000	0.000	0.000	0.000

XL	136100.000	23.000	115.000	325.000	1000.000	900.000	1000.000	0.000	0.000	0.000
GR	614.200	0.000	612.600	10.000	609.100	22.000	607.600	105.000	605.900	115.000
GR	596.000	126.000	591.600	162.000	591.900	202.000	592.900	242.000	593.200	282.000
GR	596.000	325.000	603.400	332.000	602.100	348.000	606.400	362.000	604.800	510.000
GR	602.000	790.000	600.200	880.000	602.000	1250.000	603.900	1380.000	604.000	1450.000
GR	608.000	1750.000	610.000	1810.000	610.900	2500.000	0.000	0.000	0.000	0.000
NH	3.000	.030	233.000	.035	465.000	.060	2750.000	0.000	0.000	0.000

U/S OF CONFLUENCE WITH STURGEON CREEK

XL	137500.000	22.000	233.000	465.000	1500.000	1100.000	1500.000	0.000	0.000	0.000
GR	614.900	0.000	611.300	9.000	608.200	18.000	610.600	27.000	611.300	50.000
GR	610.000	233.000	596.500	263.000	591.600	290.000	590.200	320.000	591.300	350.000
GR	591.900	380.000	592.600	410.000	596.900	465.000	604.800	478.000	608.300	490.000
GR	609.700	550.000	608.500	700.000	601.500	1100.000	601.300	1500.000	606.000	1700.000
GR	609.000	1800.000	610.000	2750.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	.060	.060	.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000

XL	140000.000	20.000	291.000	509.000	2400.000	2000.000	2450.000	0.000	0.000	0.000
GR	610.100	0.000	598.500	142.000	604.800	245.000	605.300	291.000	595.600	307.000
GR	591.600	330.000	590.200	360.000	591.300	390.000	591.900	420.000	592.600	450.000
GR	595.600	496.000	604.500	509.000	605.800	532.000	603.300	548.000	605.500	575.000
GR	603.000	900.000	604.000	980.000	610.000	1040.000	611.300	1130.000	609.500	2280.000

XL	142550.000	21.000	1451.000	1644.000	2400.000	2500.000	2500.000	0.000	0.000	0.000
GR	607.400	0.000	602.500	310.000	604.200	410.000	604.000	600.000	601.900	820.000
GR	607.000	1200.000	606.400	1300.000	607.600	1376.000	607.500	1391.000	603.700	1408.000
GR	603.300	1451.000	595.600	1454.000	591.600	1480.000	590.200	1510.000	591.300	1540.000
GR	591.900	1570.000	592.600	1600.000	595.600	1620.000	609.300	1644.000	609.400	1800.000
GR	609.600	2400.000	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

FIS Based on next run
Do not use

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  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

10 YR FLOOD

SUMMARY PRINTOUT TABLE 150

SECNO	XICH	ELTRD	FLLC	ELMIN	Q	CWSEL	CRIWS	EG	LOK*S	VCH	AREA	.01K
123500.000	100.00	0.00	0.00	591.10	27500.00	608.80	0.00	609.25	3.56	5.60	5407.59	14566.66
123500.000	100.00	0.00	0.00	591.10	41000.00	611.73	0.00	612.35	3.97	6.67	6948.65	20569.33
123500.000	100.00	0.00	0.00	591.10	47000.00	612.85	0.00	613.54	4.12	7.07	7573.15	23157.50
123500.000	100.00	0.00	0.00	591.10	61600.00	615.27	0.00	616.12	4.40	7.93	8970.75	29357.39
124100.000	450.00	0.00	0.00	590.70	27500.00	608.88	0.00	609.49	5.06	6.24	4404.27	12224.18
124100.000	450.00	0.00	0.00	590.70	41000.00	611.72	0.00	612.67	6.28	7.82	5245.21	16356.97
124100.000	450.00	0.00	0.00	590.70	47000.00	612.79	0.00	613.90	6.79	8.45	5561.86	18035.67
124100.000	450.00	0.00	0.00	590.70	61600.00	615.31	0.00	616.44	6.30	8.85	7712.32	24550.45
124101.000	29.00	618.60	612.00	590.70	27500.00	608.91	0.00	609.52	5.03	6.23	4413.35	12766.20
124101.000	29.00	618.60	612.00	590.70	41000.00	612.21	0.00	613.11	5.73	7.60	5391.34	17123.52
124101.000	29.00	618.60	612.00	590.70	47000.00	613.60	0.00	614.62	5.90	8.10	5801.46	19349.18
124101.000	29.00	618.60	612.00	590.70	61600.00	617.59	0.00	618.45	4.25	7.78	8851.89	29893.31
124300.000	150.00	0.00	0.00	585.90	27500.00	609.29	0.00	609.59	2.66	5.03	5467.13	16875.87
124300.000	150.00	0.00	0.00	585.90	41000.00	612.59	0.00	613.21	3.61	6.31	6494.44	21590.54
124300.000	150.00	0.00	0.00	585.90	47000.00	614.01	0.00	614.72	3.89	6.77	6938.50	23830.91
124300.000	150.00	0.00	0.00	585.90	61600.00	617.52	0.00	618.52	4.14	7.63	8072.23	30285.79
124700.000	400.00	0.00	0.00	586.80	27500.00	609.32	0.00	609.69	2.29	4.90	5845.91	18186.25
124700.000	400.00	0.00	0.00	586.80	41000.00	612.84	0.00	613.34	2.57	5.81	7758.10	25587.62
124700.000	400.00	0.00	0.00	586.80	47000.00	614.32	0.00	614.86	2.58	6.09	8642.61	29263.66
124700.000	400.00	0.00	0.00	586.80	61600.00	618.10	0.00	618.67	2.32	6.42	11173.63	40476.25
126000.000	1200.00	0.00	0.00	586.30	27500.00	609.73	0.00	609.88	1.13	3.63	9733.39	25911.11
126000.000	1200.00	0.00	0.00	586.30	40700.00	613.36	0.00	613.55	1.14	4.05	12785.25	38139.33
126000.000	1200.00	0.00	0.00	586.30	45800.00	614.87	0.00	615.07	1.09	4.11	14066.28	43885.80
126000.000	1200.00	0.00	0.00	586.30	54600.00	618.68	0.00	618.86	.83	3.91	17303.72	59872.48
126800.000	800.00	0.00	0.00	586.30	27500.00	609.80	0.00	609.98	1.20	3.76	8803.73	25100.02
126800.000	800.00	0.00	0.00	586.30	40700.00	613.42	0.00	613.66	1.31	4.35	11120.65	35542.28
126800.000	800.00	0.00	0.00	586.30	45800.00	614.92	0.00	615.18	1.29	4.48	12092.71	40343.17
126800.000	800.00	0.00	0.00	586.30	54600.00	618.71	0.00	618.95	1.04	4.39	14552.06	53499.54
127550.000	600.00	0.00	0.00	584.30	27500.00	609.81	0.00	610.15	4.06	4.66	5903.29	13644.52
127550.000	600.00	0.00	0.00	584.30	41000.00	613.41	0.00	613.85	4.34	5.38	7854.66	19669.64
127550.000	600.00	0.00	0.00	584.30	47000.00	614.92	0.00	615.37	4.74	5.48	9103.54	21580.90
127550.000	600.00	0.00	0.00	584.30	61600.00	618.72	0.00	619.10	3.59	5.22	13838.28	32557.63

SECND	XLCH	FLTRD	FLLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
127551.000	10.00	611.00	641.00	584.30	27500.00	609.82	0.00	610.15	4.06	4.66	5904.49	13648.55
127551.000	10.00	611.00	641.00	584.30	41000.00	613.41	0.00	613.86	4.34	5.37	7856.66	19675.01
127551.000	10.00	611.00	641.00	584.30	47000.00	614.92	0.00	615.39	4.74	5.48	9106.34	21587.92
127551.000	10.00	611.00	641.00	584.30	61600.00	618.72	0.00	619.10	3.58	5.22	13842.67	32566.27
127552.000	64.00	611.00	641.00	584.30	27500.00	609.84	0.00	610.18	4.03	4.65	5917.07	13693.91
127552.000	64.00	611.00	641.00	584.30	41000.00	613.44	0.00	613.88	4.32	5.36	7877.66	19731.34
127552.000	64.00	611.00	641.00	584.30	47000.00	614.96	0.00	615.41	4.71	5.47	9136.61	21663.62
127552.000	64.00	611.00	641.00	584.30	61600.00	618.75	0.00	619.13	3.56	5.20	13889.23	32657.85
127553.000	10.00	0.00	0.00	584.30	27500.00	609.85	0.00	610.18	4.03	4.65	5919.59	13699.43
127553.000	10.00	0.00	0.00	584.30	41000.00	613.45	0.00	613.89	4.31	5.36	7882.22	19743.56
127553.000	10.00	0.00	0.00	584.30	47000.00	614.96	0.00	615.41	4.70	5.46	9143.60	21681.10
127553.000	10.00	0.00	0.00	584.30	61600.00	618.75	0.00	619.13	3.55	5.20	13900.22	32679.50
128100.000	550.00	0.00	0.00	585.50	27500.00	610.08	0.00	610.35	1.94	4.51	7759.06	19756.51
128100.000	550.00	0.00	0.00	585.50	41700.00	613.77	0.00	614.06	1.76	4.85	10794.17	30655.97
128100.000	550.00	0.00	0.00	585.50	45800.00	615.30	0.00	615.59	1.62	4.86	12198.99	35944.63
128100.000	550.00	0.00	0.00	585.50	54600.00	619.03	0.00	619.27	1.14	4.49	15935.55	51231.36
129100.000	900.00	0.00	0.00	584.10	27500.00	610.25	0.00	610.50	1.44	4.44	9029.58	22896.81
129100.000	900.00	0.00	0.00	584.10	40700.00	613.95	0.00	614.19	1.12	4.37	13289.57	38422.48
129100.000	900.00	0.00	0.00	584.10	45800.00	615.47	0.00	615.70	.99	4.27	15037.50	46108.45
129100.000	900.00	0.00	0.00	584.10	54600.00	619.14	0.00	619.34	.66	3.89	19260.05	67452.04
129350.000	250.00	0.00	0.00	584.10	17700.00	610.51	0.00	610.55	.28	1.69	13260.91	33465.52
129350.000	250.00	0.00	0.00	584.10	26400.00	614.20	0.00	614.23	.25	1.79	18045.80	52555.98
129350.000	250.00	0.00	0.00	584.10	30300.00	615.71	0.00	615.74	.24	1.82	20008.68	61556.60
129350.000	250.00	0.00	0.00	584.10	39700.00	619.33	0.00	619.38	.21	1.87	24725.37	85704.34
130175.000	750.00	0.00	0.00	585.20	17700.00	610.48	0.00	610.61	1.13	3.09	6440.11	16619.55
130175.000	750.00	0.00	0.00	585.20	26400.00	614.14	0.00	614.31	1.14	3.51	8415.37	24692.25
130175.000	750.00	0.00	0.00	585.20	30300.00	615.64	0.00	615.82	1.14	3.66	9225.77	28438.85
130175.000	750.00	0.00	0.00	585.20	39700.00	619.25	0.00	619.46	1.07	3.90	11174.89	38401.64
130225.000	50.00	0.00	0.00	588.20	17700.00	610.47	0.00	610.63	2.16	3.53	5861.93	12031.06
130225.000	50.00	0.00	0.00	588.20	26400.00	614.14	0.00	614.32	2.13	3.80	8095.89	18075.38
130225.000	50.00	0.00	0.00	588.20	30300.00	615.64	0.00	615.83	2.11	3.89	9011.32	20841.21
130225.000	50.00	0.00	0.00	588.20	39700.00	619.26	0.00	619.46	2.01	4.03	11212.96	27994.35
130226.000	10.00	625.60	634.90	588.20	17700.00	610.47	0.00	610.63	2.17	3.53	5858.08	12021.64
130226.000	10.00	625.60	634.90	588.20	26400.00	614.14	0.00	614.32	2.14	3.80	8093.22	18067.53
130226.000	10.00	625.60	634.90	588.20	30300.00	615.64	0.00	615.83	2.11	3.89	9010.81	20839.62
130226.000	10.00	625.60	634.90	588.20	39700.00	619.26	0.00	619.47	2.01	4.03	11217.04	28008.14
130227.000	68.00	625.60	634.90	588.20	17700.00	610.49	0.00	610.65	2.16	3.53	5867.16	12043.83
130227.000	68.00	625.60	634.90	588.20	26400.00	614.15	0.00	614.34	2.13	3.80	8102.32	18094.30
130227.000	68.00	625.60	634.90	588.20	30300.00	615.65	0.00	615.85	2.11	3.89	9019.87	20867.67
130227.000	68.00	625.60	634.90	588.20	39700.00	619.27	0.00	619.48	2.00	4.03	11225.76	28037.71
130228.000	10.00	0.00	0.00	588.20	17700.00	610.49	0.00	610.65	2.16	3.53	5868.80	12047.83
130228.000	10.00	0.00	0.00	588.20	26400.00	614.16	0.00	614.34	2.13	3.80	8103.90	18098.97
130228.000	10.00	0.00	0.00	588.20	30300.00	615.66	0.00	615.85	2.11	3.89	9021.42	20872.47
130228.000	10.00	0.00	0.00	588.20	39700.00	619.28	0.00	619.48	2.00	4.03	11227.20	28042.57

SECND	XICH	FLTRD	FLLC	FLMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
130275.000	50.00	0.00	0.00	587.00	17700.00	610.45	0.00	610.68	1.99	3.97	4850.19	12535.66
130275.000	50.00	0.00	0.00	587.00	26400.00	614.11	0.00	614.37	1.91	4.39	6889.63	19102.70
130275.000	50.00	0.00	0.00	587.00	30300.00	615.61	0.00	615.89	1.83	4.50	7731.92	22382.32
130275.000	50.00	0.00	0.00	587.00	39700.00	619.23	0.00	619.51	1.60	4.64	9758.54	31420.40
130750.000	430.00	0.00	0.00	588.10	17700.00	610.68	0.00	610.75	.65	2.40	9265.32	21281.12
130750.000	430.00	0.00	0.00	588.10	26400.00	614.36	0.00	614.43	.57	2.47	12894.12	34949.69
130750.000	430.00	0.00	0.00	588.10	30300.00	615.87	0.00	615.94	.54	2.50	14390.47	41418.49
130750.000	430.00	0.00	0.00	588.10	39700.00	619.49	0.00	619.57	.46	2.53	17991.84	58830.81
131700.000	900.00	0.00	0.00	587.10	17700.00	610.73	0.00	610.85	1.30	3.21	7697.20	15496.47
131700.000	900.00	0.00	0.00	587.10	26400.00	614.41	0.00	614.50	.83	2.89	12144.10	28970.31
131700.000	900.00	0.00	0.00	587.10	30300.00	615.92	0.00	616.00	.72	2.81	14023.82	35795.93
131700.000	900.00	0.00	0.00	587.10	39700.00	619.54	0.00	619.61	.52	2.65	18542.66	54888.13
131750.000	50.00	0.00	0.00	586.70	17700.00	610.72	0.00	610.87	2.12	3.90	7606.85	12149.62
131750.000	50.00	0.00	0.00	586.70	26400.00	614.43	0.00	614.51	1.09	3.06	13216.95	25338.03
131750.000	50.00	0.00	0.00	586.70	30300.00	615.94	0.00	616.01	.88	2.87	15676.13	32374.22
131750.000	50.00	0.00	0.00	586.70	39700.00	619.56	0.00	619.62	.56	2.54	21699.72	52824.31
131751.000	1.00	605.40	615.60	586.70	17700.00	610.77	0.00	610.87	3.00	3.25	7664.39	10223.89
131751.000	1.00	605.40	615.60	586.70	26400.00	614.44	0.00	614.51	1.84	1.41	13059.01	19449.72
131751.000	1.00	605.40	615.60	586.70	30300.00	615.95	0.00	616.01	1.38	1.28	15512.55	25811.85
131751.000	1.00	605.40	615.60	586.70	39700.00	619.56	0.00	619.62	.80	1.07	21523.01	44518.32
131752.000	18.00	605.40	615.60	586.70	17700.00	610.77	0.00	610.88	2.99	3.24	7671.09	10234.98
131752.000	18.00	605.40	615.60	586.70	26400.00	614.44	0.00	614.51	1.84	1.41	13073.43	19485.55
131752.000	18.00	605.40	615.60	586.70	30300.00	615.95	0.00	616.01	1.37	1.28	15526.28	25849.30
131752.000	18.00	605.40	615.60	586.70	39700.00	619.56	0.00	619.62	.80	1.07	21524.17	44522.35
131753.000	1.00	0.00	0.00	586.70	17700.00	610.77	0.00	610.88	2.99	3.24	7673.04	10239.50
131753.000	1.00	0.00	0.00	586.70	26400.00	614.45	0.00	614.51	1.35	2.39	13251.84	22759.21
131753.000	1.00	0.00	0.00	586.70	30300.00	615.95	0.00	616.01	1.06	2.21	15704.25	29476.20
131753.000	1.00	0.00	0.00	586.70	39700.00	619.57	0.00	619.62	.65	1.91	21701.46	49056.46
131800.000	50.00	0.00	0.00	584.30	17700.00	610.83	0.00	610.89	1.43	2.48	9765.39	14812.29
131800.000	50.00	0.00	0.00	584.30	26400.00	614.47	0.00	614.52	.80	2.08	15625.15	29435.59
131800.000	50.00	0.00	0.00	584.30	30300.00	615.97	0.00	616.02	.67	1.98	18115.64	36969.32
131800.000	50.00	0.00	0.00	584.30	39700.00	619.59	0.00	619.62	.46	1.81	24106.96	58248.73
133600.000	1700.00	0.00	0.00	584.70	17700.00	610.97	0.00	611.03	.65	2.50	14155.65	21983.40
133600.000	1700.00	0.00	0.00	584.70	26400.00	614.56	0.00	614.61	.46	2.35	21263.99	38786.98
133600.000	1700.00	0.00	0.00	584.70	30300.00	616.05	0.00	616.09	.41	2.32	24212.60	47118.58
133600.000	1700.00	0.00	0.00	584.70	39700.00	619.64	0.00	619.68	.32	2.23	31336.64	70196.61
135700.000	1400.00	0.00	0.00	591.60	17700.00	611.06	0.00	611.10	.42	1.80	15873.66	27318.07
135700.000	1400.00	0.00	0.00	591.60	26400.00	614.62	0.00	614.66	.34	1.84	22910.61	45106.00
135700.000	1400.00	0.00	0.00	591.60	30300.00	616.11	0.00	616.14	.32	1.86	25840.04	53737.87
135700.000	1400.00	0.00	0.00	591.60	39700.00	619.68	0.00	619.71	.26	1.87	32921.39	77300.20
136100.000	1300.00	0.00	0.00	591.60	17700.00	611.11	0.00	611.15	.65	2.28	15632.59	21973.25
136100.000	1300.00	0.00	0.00	591.60	26400.00	614.66	0.00	614.70	.49	2.23	24471.49	37854.24
136100.000	1300.00	0.00	0.00	591.60	30300.00	616.14	0.00	616.17	.44	2.21	28166.33	45916.93
136100.000	1300.00	0.00	0.00	591.60	39700.00	619.71	0.00	619.74	.34	2.14	37084.25	68428.10

SECND	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	LOK*S	VCH	AREA	.01K
137500.000	1500.00	0.00	0.00	590.20	17700.00	611.19	0.00	611.24	.74	2.40	15127.60	20569.81
137500.000	1500.00	0.00	0.00	590.20	26400.00	614.72	0.00	614.76	.50	2.25	24823.70	37154.91
137500.000	1500.00	0.00	0.00	590.20	30300.00	616.20	0.00	616.23	.44	2.19	28879.20	45766.68
137500.000	1500.00	0.00	0.00	590.20	39700.00	619.76	0.00	619.79	.32	2.07	38673.65	70120.62
140000.000	2450.00	0.00	0.00	590.20	17700.00	611.36	0.00	611.48	1.21	3.15	10459.31	16121.04
140000.000	2450.00	0.00	0.00	590.20	26400.00	614.84	0.00	614.92	.88	3.02	18391.15	28142.47
140000.000	2450.00	0.00	0.00	590.20	30300.00	616.30	0.00	616.37	.77	2.96	21719.22	34493.41
140000.000	2450.00	0.00	0.00	590.20	39700.00	619.83	0.00	619.89	.57	2.80	29779.33	52617.17
142550.000	2500.00	0.00	0.00	590.20	17700.00	611.66	0.00	611.71	.76	2.48	15543.71	20343.49
142550.000	2500.00	0.00	0.00	590.20	26400.00	615.06	0.00	615.10	.57	2.42	23689.43	34848.16
142550.000	2500.00	0.00	0.00	590.20	30300.00	616.49	0.00	616.53	.52	2.39	27123.96	42129.66
142550.000	2500.00	0.00	0.00	590.20	39700.00	619.97	0.00	620.01	.40	2.32	35483.64	62438.88

Do not use
FIS Based on
next run

10 YR FLOOD

SUMMARY PRINTOUT TABLE 150

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
123500.000	27500.00	608.80	0.00	0.00	0.00	503.98	100.00
123500.000	41000.00	611.73	2.93	0.00	0.00	548.84	100.00
123500.000	47000.00	612.85	1.12	0.00	0.00	566.33	100.00
123500.000	61600.00	615.27	2.42	0.00	0.00	580.00	100.00
124100.000	27500.00	608.88	0.00	.08	0.00	296.00	450.00
124100.000	41000.00	611.72	2.84	-.01	0.00	296.00	450.00
124100.000	47000.00	612.79	1.07	-.06	0.00	296.00	450.00
124100.000	61600.00	615.31	2.52	.04	0.00	500.00	450.00
124101.000	27500.00	608.91	0.00	.03	0.00	296.00	29.00
124101.000	41000.00	612.21	3.30	.49	0.00	296.00	29.00
124101.000	47000.00	613.60	1.38	.81	0.00	296.00	29.00
124101.000	61600.00	617.59	3.99	2.28	0.00	500.00	29.00
124300.000	27500.00	609.20	0.00	.28	0.00	295.51	150.00
124300.000	41000.00	612.59	3.39	.37	0.00	310.43	150.00
124300.000	47000.00	614.01	1.42	.41	0.00	314.00	150.00
124300.000	61600.00	617.62	3.61-	.03	0.00	314.00	150.00
124700.000	27500.00	609.32	0.00	.12	0.00	504.08	400.00
124700.000	41000.00	612.84	3.52	.25	0.00	550.59	400.00
124700.000	47000.00	614.32	1.48	.31	0.00	670.00	400.00
124700.000	61600.00	618.10	3.78	.48	0.00	670.00	400.00
126000.000	27500.00	609.73	0.00	.40	0.00	836.95	1200.00
126000.000	40700.00	613.36	3.63	.52	0.00	843.87	1200.00
126000.000	45800.00	614.87	1.52	.55	0.00	846.76	1200.00
126000.000	54600.00	618.68	3.81	.58	0.00	854.01	1200.00
126800.000	27500.00	609.80	0.00	.08	0.00	637.10	800.00
126800.000	40700.00	613.42	3.62	.06	0.00	643.99	800.00
126800.000	45800.00	614.92	1.51	.05	0.00	646.86	800.00
126800.000	54600.00	618.71	3.78	.03	0.00	654.06	800.00
127550.000	27500.00	609.81	0.00	.01	0.00	456.13	600.00
127550.000	41000.00	613.41	3.59	-.01	0.00	709.64	600.00
127550.000	47000.00	614.92	1.51	-.01	0.00	934.05	600.00
127550.000	61600.00	618.72	3.80	.01	0.00	1906.19	600.00
127551.000	27500.00	609.82	0.00	.00	0.00	456.14	10.00
127551.000	41000.00	613.41	3.59	.00	0.00	709.93	10.00
127551.000	47000.00	614.92	1.51	.01	0.00	934.38	10.00
127551.000	61600.00	618.72	3.80	.00	0.00	1906.57	10.00
127552.000	27500.00	609.84	0.00	.03	0.00	456.24	64.00
127552.000	41000.00	613.44	3.60	.03	0.00	712.98	64.00
127552.000	47000.00	614.96	1.52	.03	0.00	937.78	64.00
127552.000	61600.00	618.75	3.79	.03	0.00	1911.67	64.00
127553.000	27500.00	609.85	0.00	.00	0.00	456.26	10.00
127553.000	41000.00	613.45	3.60	.00	0.00	713.45	10.00

127553.000	47000.00	614.96	1.52	.01	0.00	938.57	10.00
127553.000	61600.00	616.75	3.79	.00	0.00	1912.85	10.00

SECNO	O	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XICH
128100.000	27500.00	610.08	0.00	.23	0.00	820.43	550.00
128100.000	40700.00	613.77	3.69	.33	0.00	860.35	550.00
128100.000	45800.00	615.30	1.53	.34	0.00	968.93	550.00
128100.000	54600.00	619.03	3.73	.28	0.00	1027.43	550.00
129100.000	27500.00	610.25	0.00	.17	0.00	1150.00	900.00
129100.000	40700.00	613.95	3.70	.18	0.00	1150.00	900.00
129100.000	45800.00	615.47	1.52	.17	0.00	1150.00	900.00
129100.000	54600.00	619.14	3.67	.11	0.00	1150.00	900.00
129350.000	17700.00	610.51	0.00	.27	0.00	1300.00	250.00
129350.000	26400.00	614.20	3.68	.24	0.00	1300.00	250.00
129350.000	30300.00	615.71	1.51	.23	0.00	1300.00	250.00
129350.000	39700.00	619.33	3.63	.19	0.00	1300.00	250.00
130175.000	17700.00	610.48	0.00	-.03	0.00	540.00	750.00
130175.000	26400.00	614.14	3.66	-.06	0.00	540.00	750.00
130175.000	30300.00	615.64	1.50	-.07	0.00	540.00	750.00
130175.000	39700.00	619.25	3.61	-.08	0.00	540.00	750.00
130225.000	17700.00	610.47	0.00	-.01	0.00	601.86	50.00
130225.000	26400.00	614.14	3.67	-.00	0.00	610.00	50.00
130225.000	30300.00	615.64	1.50	.00	0.00	610.00	50.00
130225.000	39700.00	619.26	3.62	.01	0.00	610.00	50.00
130226.000	17700.00	610.47	0.00	.00	0.00	601.76	10.00
130226.000	26400.00	614.14	3.67	.00	0.00	610.00	10.00
130226.000	30300.00	615.64	1.50	.00	0.00	610.00	10.00
130226.000	39700.00	619.26	3.62	.00	0.00	610.00	10.00
130227.000	17700.00	610.49	0.00	.02	0.00	602.00	68.00
130227.000	26400.00	614.15	3.67	.01	0.00	610.00	68.00
130227.000	30300.00	615.66	1.50	.01	0.00	610.00	68.00
130227.000	39700.00	619.27	3.62	.01	0.00	610.00	68.00
130228.000	17700.00	610.49	0.00	.00	0.00	602.04	10.00
130228.000	26400.00	614.16	3.67	.00	0.00	610.00	10.00
130228.000	30300.00	615.66	1.50	.00	0.00	610.00	10.00
130228.000	39700.00	619.28	3.62	.00	0.00	610.00	10.00
130275.000	17700.00	610.45	0.00	-.04	0.00	520.72	50.00
130275.000	26400.00	614.11	3.66	-.05	0.00	560.00	50.00
130275.000	30300.00	615.61	1.50	-.05	0.00	560.00	50.00
130275.000	39700.00	619.23	3.62	-.05	0.00	560.00	50.00
130750.000	17700.00	610.68	0.00	.23	0.00	959.15	430.00
130750.000	26400.00	614.36	3.68	.26	0.00	992.03	430.00
130750.000	30300.00	615.87	1.51	.26	0.00	993.65	430.00
130750.000	39700.00	619.49	3.62	.26	0.00	997.53	430.00
131700.000	17700.00	610.73	0.00	.05	0.00	1191.66	900.00
131700.000	26400.00	614.41	3.68	.05	0.00	1238.28	900.00
131700.000	30300.00	615.92	1.51	.05	0.00	1250.00	900.00
131700.000	39700.00	619.54	3.62	.05	0.00	1250.00	900.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
131750.000	17700.00	610.72	0.00	-.01	0.00	1461.28	50.00
131750.000	26400.00	614.43	3.71	.01	0.00	1583.48	50.00
131750.000	30300.00	615.94	1.51	.02	0.00	1660.00	50.00
131750.000	39700.00	619.56	3.62	.02	0.00	1660.00	50.00
131751.000	17700.00	610.77	0.00	.05	0.00	1462.68	1.00
131751.000	25400.00	614.44	3.68	.01	0.00	1584.26	1.00
131751.000	30300.00	615.95	1.50	.01	0.00	1660.00	1.00
131751.000	39700.00	619.56	3.61	-.00	0.00	1660.00	1.00
131752.000	17700.00	610.77	0.00	.01	0.00	1462.85	18.00
131752.000	25400.00	614.44	3.67	.00	0.00	1584.85	18.00
131752.000	30300.00	615.95	1.50	.00	0.00	1660.00	18.00
131752.000	39700.00	619.56	3.61	.00	0.00	1660.00	18.00
131753.000	17700.00	610.77	0.00	.00	0.00	1462.89	1.00
131753.000	26400.00	614.45	3.68	.00	0.00	1584.92	1.00
131753.000	30300.00	615.95	1.51	.01	0.00	1660.00	1.00
131753.000	39700.00	619.57	3.61	.01	0.00	1660.00	1.00
131800.000	17700.00	610.83	0.00	.06	0.00	1582.38	50.00
131800.000	26400.00	614.47	3.65	.02	0.00	1648.55	50.00
131800.000	30300.00	615.97	1.50	.02	0.00	1660.00	50.00
131800.000	39700.00	619.58	3.61	.01	0.00	1660.00	50.00
133600.000	17700.00	610.97	0.00	.15	0.00	1980.00	1700.00
133600.000	26400.00	614.56	3.59	.09	0.00	1980.00	1700.00
133600.000	30300.00	616.05	1.49	.08	0.00	1980.00	1700.00
133600.000	39700.00	619.64	3.59	.06	0.00	1980.00	1700.00
135700.000	17700.00	611.06	0.00	.09	0.00	1940.41	1400.00
135700.000	26400.00	614.62	3.56	.06	0.00	1979.75	1400.00
135700.000	30300.00	616.11	1.48	.05	0.00	1980.00	1400.00
135700.000	39700.00	619.68	3.57	.04	0.00	1980.00	1400.00
136100.000	17700.00	611.11	0.00	.04	0.00	2484.54	1000.00
136100.000	26400.00	614.66	3.55	.04	0.00	2500.00	1000.00
136100.000	30300.00	616.14	1.48	.04	0.00	2500.00	1000.00
136100.000	39700.00	619.71	3.57	.03	0.00	2500.00	1000.00
137500.000	17700.00	611.19	0.00	.08	0.00	2720.74	1500.00
137500.000	26400.00	614.72	3.53	.06	0.00	2749.55	1500.00
137500.000	30300.00	616.20	1.47	.05	0.00	2750.00	1500.00
137500.000	39700.00	619.76	3.56	.04	0.00	2750.00	1500.00
140000.000	17700.00	611.36	0.00	.17	0.00	2280.00	2450.00
140000.000	26400.00	614.84	3.47	.12	0.00	2280.00	2450.00
140000.000	30300.00	616.30	1.46	.10	0.00	2280.00	2450.00
140000.000	39700.00	619.83	3.53	.07	0.00	2280.00	2450.00
142550.000	17700.00	611.66	0.00	.30	0.00	2400.00	2500.00
142550.000	26400.00	615.06	3.39	.22	0.00	2400.00	2500.00
142550.000	30300.00	616.49	1.43	.19	0.00	2400.00	2500.00
142550.000	39700.00	619.97	3.48	.14	0.00	2400.00	2500.00

c14

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*****************************************************
*  WATER SURFACE PROFILES                           *
*  VERSION OF NOVEMBER 1976                         *
*  UPDATED JULY 1979                                *
*                                                   *
*  RUN DATE  04/26/83  TIME .09.54.07.              *
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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) 449-2105        *
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B. Model with enlarged floodway and reduced loss at Dow Railroad and Vehicular Bridge

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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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Use with FIS

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*************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
*************************************************

C
T1        TITTABAWASSEE RIVER AT MIDLAND
T2        FIS REVIEW
T3        10 YR FLOOD

J1  ICHECK    INO       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      0.        2.        0.        0.  0.000000      0.00      0.0       0.   608.800    0.000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     1.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

QT      5.000  27500.000  41000.000  47000.000  61600.000  34000.000      0.000      0.000      0.000      0.000
NC       .035       .035       .030       .100       .300      0.000      0.000      0.000      0.000      0.000

X1 123500.000     14.000    132.000    429.000    100.000    100.000    100.000      0.000      0.000      0.000
GR    613.700      0.000    605.800     92.000    596.400    112.000    595.700    132.000    596.800    184.000
GR    595.700    275.000    593.200    226.000    591.100    307.000    592.600    348.000    594.900    389.000
GR    596.700    429.000    603.500    457.000    607.000    553.000    613.800    580.000      0.000      0.000

          DOW CHEMICAL R.R. AND VEHICLE BRIDGE

X1 124100.000     18.000    102.000    398.000    500.000    500.000    450.000      0.000      0.000      0.000
X3     10.000      0.000      0.000      0.000      0.000      0.000      0.000    614.900    614.900      0.000
GR    614.900      0.000    607.200    102.000    595.200    134.000    596.800    150.000    592.200    175.000
GR    591.600    195.000    591.300    214.000    590.900    233.000    590.900    249.000    607.500    249.000
GR    607.500    255.000    590.900    255.000    590.700    281.000    591.100    309.000    592.500    337.000
GR    594.600    365.000    596.800    398.000    614.800    500.000      0.000      0.000      0.000      0.000
SB      1.150      1.250      2.500      0.000    256.000      6.000   5310.000       .900    595.000    595.000

X1 124101.000      0.000      0.000      0.000     29.000     29.000     29.000      0.000      0.000      0.000
X2      0.000      0.000      1.000    612.000    618.600      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    614.900    614.900      0.000
BT      4.000      0.000    614.900    614.900    102.000    618.600    611.800    398.000    618.700    612.000
BT    500.000    614.800    614.800      0.000      0.000      0.000      0.000      0.000      0.000      0.000

X1 124300.000     23.000    105.000    423.000    100.000    100.000    150.000      0.000      0.000      0.000
X3     10.000      0.000      0.000      0.000      0.000      0.000      0.000    620.000    620.000      0.000
GR    613.800      0.000    614.100     42.000    621.000     54.000    613.400    105.000    608.400    127.000
GR    594.700    154.000    596.300    174.000    591.500    174.000    588.700    192.000    588.200    210.000
GR    587.900    228.000    586.900    246.000    586.900    262.000    618.800    262.000    618.800    266.000
GR    586.900    266.000    586.600    292.000    585.900    320.000    596.200    348.000    587.800    376.000
GR    596.300    403.000    604.300    423.000    620.400    500.000      0.000      0.000      0.000      0.000
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X1 124700.000      13.000     118.000     450.000     400.000     400.000     400.000       0.000       0.000       0.000
GR     613.800       0.000     613.700     118.000     594.700     149.000     596.300     169.000     587.400     209.000
GR     587.200     249.000     586.800     289.000     588.600     328.000     590.200     367.000     596.300     406.000
GR     605.000     450.000     610.300     550.000     607.000     670.000       0.000       0.000       0.000       0.000
QT       5.000   27500.000   40700.000   45800.000   54600.000   34000.000       0.000       0.000       0.000       0.000

X1 126000.000      15.000      87.000     398.000    1300.000     650.000    1200.000       0.000       0.000       0.000
GR     623.000       0.000     623.400      87.000     596.100     139.000     590.300     181.000     586.800     222.000
GR     586.300     263.000     587.800     304.000     589.100     345.000     596.100     386.000     604.700     398.000
GR     603.900     477.000     605.600     527.000     609.100     538.000     600.000     600.000     600.000     950.000

X1 126800.000      12.000      87.000     410.000     900.000     750.000     800.000       0.000       0.000       0.000
GR     623.400      87.000     596.100     139.000     590.300     191.000     586.800     222.000     586.300     263.000
GR     587.800     304.000     589.100     345.000     596.100     386.000     600.000     410.000     605.000     415.000
GR     600.000     420.000     600.000     750.000       0.000       0.000       0.000       0.000       0.000       0.000
QT       5.000   27500.000   41300.000   47000.000   61600.000   34200.000       0.000       0.000       0.000       0.000

          GEORGE ST. BRIDGE,MAXLC.639.2,MIN TR 631.5,WIDTH 64,LENGTH 694

X1 127550.000      60.000     104.000     791.000     600.000     600.000     600.000       0.000       0.000       0.000
GR     641.000       0.000     624.700     104.000     624.100     183.000     638.700     183.000     638.700     187.000
GR     624.100     187.000     614.000     213.000     614.000     238.000     614.200     279.000     639.200     279.000
GR     639.200     283.000     614.200     283.000     595.800     298.000     589.800     322.000     584.700     345.000
GR     594.300     370.000     638.900     370.000     638.900     374.000     584.300     374.000     585.200     405.000
GR     585.900     430.000     589.300     460.000     637.100     460.000     637.100     464.000     589.300     464.000
GR     589.900     485.000     591.300     505.000     595.800     524.000     600.600     536.000     605.400     550.000
GR     634.700     550.000     634.700     554.000     605.400     554.000     605.400     640.000     631.200     640.000
GR     631.200     644.000     605.400     644.000     605.400     730.000     627.400     730.000     627.400     734.000
GR     605.400     734.000     607.400     756.000     620.000     791.000     629.000     865.000     626.000     965.000
GR     623.000    1065.000     621.700    1165.000     623.500    1265.000     619.800    1365.000     619.000    1465.000
GR     618.500    1565.000     618.000    1665.000     618.000    2065.000     617.600    2165.000     617.000    2265.000
GR     615.000    2465.000     614.000    2565.000     613.000    2665.000     612.000    2765.000     611.000    2865.000

X1 127551.000       0.000       0.000       0.000      10.000      10.000      10.000       0.000       0.000       0.000
BT      27.000       0.000     641.000     641.000     104.000     644.600     637.900     183.000     645.600     638.700
BT     279.000     646.000     639.200     370.000     645.400     638.600     460.000     644.000     637.100     551.000
BT     641.600     634.700     640.000     638.100     631.200     733.000     634.300     627.400     791.000     631.500
BT     624.700     865.000     629.000     629.000     565.000     626.000     626.000    1065.000     623.000     623.000
BT    1165.000     621.700     621.700    1265.000     620.500     620.500    1365.000     619.800     619.800    1465.000
BT     619.000     619.000    1565.000     618.500     618.500    1665.000     618.000     618.000    2065.000     618.000
BT     618.000    2165.000     617.600     617.600    2265.000     617.000     617.000    2465.000     615.000     615.000
BT    2565.000     614.000     614.000    2665.000     613.000     613.000    2765.000     612.000     612.000    2865.000
BT     611.000     611.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000

X1 127552.000       0.000       0.000       0.000      64.000      54.000      54.000       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

X1 127553.000       0.000       0.000       0.000      10.000      10.000      10.000       0.000       0.000       0.000
QT       5.000   27500.000   40700.000   45800.000   54600.000   34000.000       0.000       0.000       0.000       0.000

X1 128100.000      15.000     323.000     665.000     700.000     900.000     550.000       .840       0.000       0.000
GR     623.600       0.000     613.200     175.000     615.400     323.000     597.600     324.000     596.600     331.000
GR     594.700     365.000     591.500     405.000     590.000     440.000     589.000     475.000     586.000     510.000
GR     585.500     545.000     594.300     585.000     596.600     615.000     605.000     665.000     605.000    1300.000
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NH	3.000	.016	413.000	.030	640.000	.060	1150.000	0.000	0.000	0.000

D/S OF CONFLUENCE WITH CHIPPEWA RIVER

X1	129100.000	12.000	413.000	640.000	1000.000	700.000	900.000	0.000	0.000	0.000
GR	607.200	0.000	607.000	368.000	600.300	413.000	596.500	418.000	591.500	455.000
GR	588.500	490.000	584.100	530.000	586.800	565.000	589.400	605.000	596.500	640.000
GR	605.300	692.000	605.000	1150.000	0.000	0.000	0.000	0.000	0.000	0.000
OT	5.000	17700.000	26400.000	30300.000	39700.000	21000.000	0.000	0.000	0.000	0.000
NC	.030	.030	.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000

U/S OF CONFLUENCE WITH CHIPPEWA RIVER

X1	129350.000	13.000	413.000	640.000	90.000	1000.000	250.000	0.000	0.000	0.000
GR	607.200	0.000	607.000	368.000	600.300	413.000	596.500	418.000	591.500	455.000
GR	589.500	490.000	584.100	530.000	586.800	555.000	589.400	605.000	596.500	640.000
GR	600.000	645.000	600.000	700.000	600.000	1300.000	0.000	0.000	0.000	0.000

X1	130175.000	22.000	600.000	870.000	750.000	750.000	750.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	490.000	0.000	1030.000	0.000	0.000	0.000	0.000
GR	628.600	0.000	630.600	100.000	623.200	200.000	611.400	285.000	612.200	370.000
GR	603.800	395.000	606.800	440.000	605.000	500.000	604.800	580.000	606.200	600.000
GR	595.600	628.000	591.300	660.000	589.300	690.000	585.200	720.000	587.200	750.000
GR	590.500	780.000	591.200	810.000	595.600	842.000	604.800	870.000	604.900	1000.000
GR	559.400	1100.000	601.000	1200.000	0.000	0.000	0.000	0.000	0.000	0.000

M-20 BRIDGE,MAX LC 634.5,MIN TR 626.6,WIDTH 68,LENGTH 671

X1	130225.000	52.000	620.000	826.000	50.000	50.000	50.000	0.000	0.000	0.000
GR	633.400	200.000	636.700	292.000	610.400	292.000	608.600	343.000	633.300	343.000
GR	633.300	350.000	608.600	350.000	611.000	383.000	604.900	394.000	634.400	394.000
GR	634.400	401.000	604.900	401.000	605.800	464.000	634.800	464.000	634.800	471.000
GR	605.800	471.000	604.600	523.000	634.900	523.000	634.900	530.000	604.600	530.000
GR	605.400	590.000	634.500	590.000	630.900	600.000	605.400	600.000	595.600	620.000
GR	588.200	640.000	589.600	659.000	627.700	659.000	627.700	666.000	588.600	666.000
GR	590.200	705.000	550.200	730.000	591.600	771.000	624.200	771.000	624.200	778.000
GR	591.600	778.000	592.900	810.000	595.600	818.000	601.800	826.000	602.800	845.000
GR	622.900	845.000	626.400	850.000	603.800	850.000	603.400	904.000	624.400	904.000
GR	624.400	909.000	633.400	909.000	604.800	964.000	626.600	964.000	625.600	1000.000
GR	622.700	1100.000	620.600	1200.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	130226.000	0.000	0.000	0.000	10.000	10.000	10.000	0.000	0.000	0.000
BT	15.000	200.000	633.400	633.400	292.000	636.700	631.900	343.000	638.200	633.300
BT	394.000	639.300	634.400	464.000	635.600	634.800	523.000	639.700	634.900	590.000
BT	639.300	634.500	600.000	639.300	630.900	659.000	636.800	627.700	771.000	633.300
BT	624.200	845.000	630.600	622.900	850.000	633.600	626.400	904.000	628.700	624.400
BT	964.000	626.600	622.500	1000.000	625.600	625.600	0.000	0.000	0.000	0.000

X1	130227.000	0.000	0.000	0.000	68.000	68.000	68.000	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

X1	130228.000	0.000	0.000	0.000	10.000	10.000	10.000	0.000	0.000	0.000

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X1 130275.000     22.000    580.000    821.000     50.000     50.000     50.000      0.000      0.000      0.000
X3     0.000      0.000      0.000    460.000      0.000   1020.000      0.000      0.000      0.000      0.000
GR   633.000      0.000    634.830    100.000    629.000    200.000    616.400    300.000    616.400    370.000
GR   609.600    392.000    611.500    440.000    609.600    470.000    610.900    580.000    595.600    615.000
GR   592.300    645.000    590.000    670.000    587.600    700.000    587.000    725.000    589.300    755.000
GR   591.300    780.000    595.600    810.000    607.100    821.000    606.900    950.000    609.800   1075.000
GR   604.600   1125.000    605.200   1200.000      0.000      0.000      0.000      0.000      0.000      0.000
NC      .050       .030       .035      0.000      0.000      0.000      0.000      0.000      0.000      0.000

X1 130750.000     19.000     88.000    284.000    430.000    430.000    430.000      0.000      0.000      0.000
GR   621.830      0.000    610.600     12.000    611.100     26.000    612.000     35.000    610.400     45.000
GR   608.400     65.000    607.400     88.000    595.800    105.000    591.600    135.000    588.100    165.000
GR   589.100    190.000    590.200    220.000    591.100    250.000    595.800    276.000    602.900    284.000
GR   604.000    483.000    602.100    660.000    600.900    760.000    605.000   1000.000      0.000      0.000

X1 131700.000     16.000     56.000    270.000    900.000    950.000    900.000      0.000      0.000      0.000
X3     0.000      0.000      0.000      0.000      0.000   1250.000      0.000      0.000      0.000      0.000
GR   615.000      0.000    612.200     56.000    596.500     81.000    590.400    110.000    587.600    140.000
GR   587.100    165.000    589.700    195.000    592.300    220.000    596.500    246.000    604.900    270.000
GR   607.500    300.000    606.600    500.000    605.700    700.000    606.900    810.000    606.700   1130.000
GR   608.500   1400.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000
NC      .035       .035       .035      0.000      0.000      0.000      0.000      0.000      0.000      0.000

          CURRIE PARKWAY BRIDGE, MAXLC 612.8,MIN TR 614,WIDTH 18

X1 131750.000     18.000    104.000    240.000     50.000     50.000     50.000      0.000      0.000      0.000
GR   615.600      0.000    614.000    104.000    612.700    104.000    596.300    108.000    594.800    130.000
GR   587.400    150.000    586.700    170.000    589.700    190.000    592.700    215.000    596.500    236.000
GR   612.700    240.000    614.100    240.000    611.600    800.000    606.000    500.000    605.400    700.000
GR   606.900    810.000    606.700   1130.000    607.500   1660.000      0.000      0.000      0.000      0.000
NC      .035       .035       .050      0.000      0.000      0.000      0.000      0.000      0.000      0.000

X1 131751.000      0.000      0.000      0.000      1.000      1.000      1.000      0.000      0.000      0.000
BT     9.000      0.000    615.600    615.600    104.000    614.000    612.700    240.000    614.100    612.800
BT   303.000    611.600    611.600    500.000    606.000    606.000    700.000    605.400    605.400    810.000
BT   606.900    606.900   1130.000    606.700    606.700   1660.000    607.500    607.500      0.000      0.000

X1 131752.000      0.000      0.000      0.000     18.000     18.000     18.000      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

X1 131753.000      0.000      0.000      0.000      1.000      1.000      1.000      0.000      0.000      0.000

X1 131800.000     16.000     77.000    256.000     50.000     50.000     50.000      0.000      0.000      0.000
GR   615.000      0.000    611.400     77.000    596.500     93.000    591.500    120.000    584.300    150.000
GR   586.900    175.000    590.300    200.000    591.800    230.000    596.500    254.000    599.200    256.000
GR   605.400    303.000    605.600    500.000    603.600    700.000    606.900    810.000    606.700   1130.000
GR   608.500   1660.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000
NH     5.000       .060   1147.000       .030   1234.000       .035   1413.000       .050   1423.000       .030
NH  1980.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000

X1 133600.000     17.000   1234.000   1413.000   1200.000   1300.000   1700.000      0.000      0.000      0.000
GR   601.700      0.000    604.100    330.000    605.300   1040.000    605.800   1147.000    604.700   1225.000
GR   602.600   1234.000    595.800   1245.000    589.000   1275.000    589.300   1300.000    590.000   1330.000
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GR	584.700	1360.000	592.100	1385.000	595.800	1413.000	603.900	1423.000	605.500	1533.000
GR	607.400	1768.000	610.200	1980.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	.030	.060	.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000

U/S OF CONFLUENCE WITH SNAKE CREEK

XS	135700.000	18.000	440.000	708.000	1200.000	1250.000	1400.000	0.000	0.000	0.000
GR	614.700	0.000	613.100	6.000	598.400	60.000	605.400	386.000	605.900	440.000
GR	596.200	454.000	591.600	490.000	591.900	530.000	592.900	570.000	593.200	610.000
GR	592.300	650.000	596.200	690.000	606.800	708.000	602.000	920.000	600.400	1200.000
GR	606.000	1450.000	608.000	1770.000	611.500	1980.000	0.000	0.000	0.000	0.000
NH	0.000	.030	115.000	.035	325.000	.060	2500.000	0.000	0.000	0.000

XS	136100.000	23.000	115.000	325.000	1000.000	900.000	1000.000	0.000	0.000	0.000
GR	614.200	0.000	612.800	10.000	609.100	22.000	607.600	105.000	605.900	115.000
GR	596.000	126.000	591.600	162.000	591.900	202.000	592.900	242.000	593.200	282.000
GR	596.000	325.000	603.400	332.000	602.100	348.000	606.400	362.000	604.800	510.000
GR	602.000	790.000	600.200	880.000	602.000	1250.000	603.900	1380.000	604.000	1490.000
GR	608.000	1750.000	610.000	1810.000	610.900	2500.000	0.000	0.000	0.000	0.000
NH	0.000	.030	233.000	.035	465.000	.060	2750.000	0.000	0.000	0.000

U/S OF CONFLUENCE WITH STURGEON CREEK

XS	137500.000	22.000	233.000	465.000	1500.000	1100.000	1500.000	0.000	0.000	0.000
GR	614.900	0.000	611.300	9.300	608.200	18.000	610.600	27.000	611.300	50.000
GR	610.000	233.000	596.500	263.000	591.600	290.000	590.200	320.000	591.300	350.000
GR	591.900	380.000	592.600	410.000	596.900	465.000	604.800	478.000	608.300	490.000
GR	609.700	550.000	608.500	700.000	601.500	1100.000	601.300	1500.000	606.000	1700.000
GR	608.000	1800.000	610.000	2750.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	.060	.060	.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000

XS	140000.000	20.000	291.000	509.000	2400.000	2000.000	2450.000	0.000	0.000	0.000
GR	610.100	0.000	598.500	142.000	604.800	245.000	605.000	291.000	595.600	307.000
GR	591.600	330.000	590.200	360.000	591.300	390.000	591.900	420.000	592.600	450.000
GR	595.600	496.000	604.500	509.000	605.800	532.000	603.300	548.000	609.500	575.000
GR	603.000	900.000	604.000	980.000	610.000	1040.000	611.000	1130.000	609.500	2280.000

XS	142550.000	21.000	1451.000	1644.000	2400.000	2500.000	2500.000	0.000	0.000	0.000
GR	607.400	0.000	602.500	310.000	604.200	410.000	604.000	600.000	601.900	820.000
GR	607.000	1230.000	606.400	1300.000	607.600	1376.000	607.500	1391.000	603.700	1408.000
GR	603.300	1451.000	595.600	1454.000	591.600	1480.000	590.200	1510.000	591.300	1540.000
GR	591.900	1570.000	592.600	1600.000	595.600	1620.000	609.300	1644.000	609.400	1800.000
GR	609.600	2400.000	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

Use with FIS

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  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

10 YR FLOOD

SUMMARY PRINTOUT TABLE 150

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	LOK*S	VCH	AREA	.01K
123500.000	100.00	0.00	0.00	591.10	27500.00	608.80	0.00	609.25	3.56	5.60	5407.59	14566.66
123500.000	100.00	0.00	0.00	591.10	41000.00	611.73	0.00	612.35	3.97	6.67	6948.65	20569.33
123500.000	100.00	0.00	0.00	591.10	47000.00	612.85	0.00	613.54	4.12	7.07	7573.15	23157.50
123500.000	100.00	0.00	0.00	591.10	61600.00	615.27	0.00	616.12	4.40	7.93	8970.75	29357.39
124100.000	450.00	0.00	0.00	590.70	27500.00	608.88	0.00	609.49	5.06	6.24	4404.27	12224.18
124100.000	450.00	0.00	0.00	590.70	41000.00	611.72	0.00	612.67	6.28	7.82	5245.21	16356.97
124100.000	450.00	0.00	0.00	590.70	47000.00	612.79	0.00	613.90	6.79	8.45	5561.86	18035.67
124100.000	450.00	0.00	0.00	590.70	61600.00	615.31	0.00	616.44	6.30	8.85	7712.32	24550.45
124101.000	29.00	618.60	612.00	590.70	27500.00	608.91	0.00	609.52	5.03	6.23	4413.35	12266.20
124101.000	29.00	618.60	612.00	590.70	41000.00	611.96	0.00	612.89	6.01	7.71	5315.28	16722.81
124101.000	29.00	618.60	612.00	590.70	47000.00	613.26	0.00	614.31	6.25	8.24	5700.88	18793.28
124101.000	29.00	618.60	612.00	590.70	61600.00	617.01	0.00	617.92	4.68	8.03	8561.30	28483.51
124300.000	150.00	0.00	0.00	585.90	27500.00	609.20	0.00	609.59	2.66	5.03	5467.13	16875.87
124300.000	150.00	0.00	0.00	585.90	41000.00	612.35	0.00	612.98	3.73	6.39	6419.41	21236.20
124300.000	150.00	0.00	0.00	585.90	47000.00	613.69	0.00	614.42	4.07	6.87	6838.08	23284.95
124300.000	150.00	0.00	0.00	585.90	61600.00	617.05	0.00	618.00	4.43	7.80	7897.92	29259.65
124700.000	400.00	0.00	0.00	586.80	27500.00	609.32	0.00	609.69	2.29	4.90	5845.91	18186.25
124700.000	400.00	0.00	0.00	586.80	41000.00	612.63	0.00	613.12	2.68	5.90	7626.24	25930.64
124700.000	400.00	0.00	0.00	586.80	47000.00	614.00	0.00	614.57	2.73	6.21	8431.38	28431.73
124700.000	400.00	0.00	0.00	586.80	61600.00	617.54	0.00	618.16	2.53	6.62	10803.93	38708.41
126000.000	1200.00	0.00	0.00	586.30	27500.00	609.73	0.00	609.88	1.13	3.63	9733.39	25911.11
126000.000	1200.00	0.00	0.00	586.30	40700.00	613.14	0.00	613.33	1.19	4.11	12599.57	37335.27
126000.000	1200.00	0.00	0.00	586.30	45800.00	614.58	0.00	614.79	1.15	4.19	13822.07	42763.89
126000.000	1200.00	0.00	0.00	586.30	54600.00	618.17	0.00	618.36	.90	4.02	16870.74	57618.49
126800.000	800.00	0.00	0.00	586.30	27500.00	609.83	0.00	609.98	1.20	3.76	8803.73	25100.02
126800.000	800.00	0.00	0.00	586.30	40700.00	613.20	0.00	613.45	1.36	4.41	10981.38	34874.00
126800.000	800.00	0.00	0.00	586.30	45800.00	614.64	0.00	614.90	1.35	4.56	11908.88	39417.19
126800.000	800.00	0.00	0.00	586.30	54600.00	618.20	0.00	618.46	1.12	4.50	14223.23	51660.35
127550.000	600.00	0.00	0.00	584.30	27500.00	609.81	0.00	610.15	4.06	4.66	5903.29	13644.52
127550.000	600.00	0.00	0.00	584.30	41000.00	613.19	0.00	613.65	4.53	5.46	7703.37	19260.73
127550.000	600.00	0.00	0.00	584.30	47000.00	614.63	0.00	615.11	5.05	5.61	8839.16	20917.68
127550.000	600.00	0.00	0.00	584.30	61600.00	618.20	0.00	618.63	4.02	5.47	12882.11	30712.04

A1

SECNO	XLCH	FLTRD	ELLC	ELMIA	Q	CWSEL	CRIWS	FG	10K*S	VCH	AREA	.01K
127551.000	10.00	611.00	641.00	584.30	27500.00	609.82	0.00	610.15	4.06	4.66	5904.49	13648.55
127551.000	10.00	611.00	641.00	584.30	41000.00	613.19	0.00	613.65	4.53	5.46	7705.39	19266.22
127551.000	10.00	611.00	641.00	584.30	47000.00	614.64	0.00	615.11	5.05	5.61	8842.04	20924.91
127551.000	10.00	611.00	641.00	584.30	61600.00	618.21	0.00	618.63	4.02	5.47	12886.72	30720.77
127552.000	64.00	611.00	641.00	584.30	27500.00	609.84	0.00	610.18	4.03	4.65	5917.07	13690.91
127552.000	64.00	611.00	641.00	584.30	41000.00	613.23	0.00	613.68	4.50	5.45	7726.61	19323.89
127552.000	64.00	611.00	641.00	584.30	47000.00	614.67	0.00	615.15	5.01	5.60	8873.23	21003.37
127552.000	64.00	611.00	641.00	584.30	61600.00	618.23	0.00	618.66	4.00	5.45	12936.21	30814.45
127553.000	10.00	0.00	0.00	584.30	27500.00	609.85	0.00	610.18	4.03	4.65	5919.59	13699.43
127553.000	10.00	0.00	0.00	584.30	41000.00	613.23	0.00	613.69	4.50	5.44	7731.25	19336.49
127553.000	10.00	0.00	0.00	584.30	47000.00	614.68	0.00	615.15	5.00	5.59	8880.55	21021.76
127553.000	10.00	0.00	0.00	584.30	61600.00	618.24	0.00	618.66	3.99	5.45	12948.13	30837.05
128100.000	550.00	0.00	0.00	585.50	27500.00	610.08	0.00	610.35	1.94	4.51	7759.06	19756.51
128100.000	550.00	0.00	0.00	585.50	40700.00	613.57	0.00	613.87	1.84	4.93	10671.22	29993.95
128100.000	550.00	0.00	0.00	585.50	45800.00	615.04	0.00	615.34	1.71	4.95	11946.38	35002.40
128100.000	550.00	0.00	0.00	585.50	54600.00	618.56	0.00	618.81	1.23	4.63	15455.60	49146.18
129100.000	900.00	0.00	0.00	584.10	27500.00	610.25	0.00	610.50	1.44	4.44	9029.58	22896.81
129100.000	900.00	0.00	0.00	584.10	40700.00	613.76	0.00	614.00	1.18	4.46	13063.88	37482.61
129100.000	900.00	0.00	0.00	584.10	45800.00	615.22	0.00	615.46	1.05	4.37	14744.56	44771.09
129100.000	900.00	0.00	0.00	584.10	54600.00	618.59	0.00	618.90	.71	3.93	18724.04	64590.57
129350.000	250.00	0.00	0.00	584.10	17700.00	610.51	0.00	610.55	.28	1.69	13260.91	33465.52
129350.000	250.00	0.00	0.00	584.10	26400.00	614.01	0.00	614.05	.26	1.82	17803.10	51488.32
129350.000	250.00	0.00	0.00	584.10	30300.00	615.46	0.00	615.50	.25	1.86	19690.91	60956.06
129350.000	250.00	0.00	0.00	584.10	39700.00	618.89	0.00	618.93	.23	1.92	24145.42	82551.51
130175.000	750.00	0.00	0.00	585.20	17700.00	610.48	0.00	610.61	1.13	3.09	6440.11	16619.55
130175.000	750.00	0.00	0.00	585.20	26400.00	613.95	0.00	614.12	1.19	3.56	8314.07	24241.05
130175.000	750.00	0.00	0.00	585.20	30300.00	615.39	0.00	615.58	1.19	3.71	9093.03	27808.74
130175.000	750.00	0.00	0.00	585.20	39700.00	618.80	0.00	619.02	1.15	4.00	10932.37	37091.41
130225.000	50.00	0.00	0.00	588.20	17700.00	610.47	0.00	610.63	2.16	3.53	5861.93	12031.06
130225.000	50.00	0.00	0.00	588.20	26400.00	613.95	0.00	614.14	2.21	3.86	7981.54	17740.09
130225.000	50.00	0.00	0.00	588.20	30300.00	615.39	0.00	615.59	2.21	3.96	8861.47	20379.02
130225.000	50.00	0.00	0.00	588.20	39700.00	618.81	0.00	619.02	2.15	4.14	10939.14	27071.36
130226.000	10.00	625.60	634.90	588.20	17700.00	610.47	0.00	610.63	2.17	3.53	5868.08	12021.64
130226.000	10.00	625.60	634.90	588.20	26400.00	613.95	0.00	614.14	2.22	3.86	7978.48	17731.15
130226.000	10.00	625.60	634.90	588.20	30300.00	615.40	0.00	615.59	2.21	3.96	8860.59	20376.29
130226.000	10.00	625.60	634.90	588.20	39700.00	618.81	0.00	619.03	2.15	4.14	10942.68	27083.24
130227.000	68.00	625.60	634.90	588.20	17700.00	610.49	0.00	610.65	2.16	3.53	5867.16	12043.83
130227.000	68.00	625.60	634.90	588.20	26400.00	613.97	0.00	614.15	2.21	3.86	7987.91	17758.72
130227.000	68.00	625.60	634.90	588.20	30300.00	615.41	0.00	615.61	2.20	3.96	8870.05	20405.38
130227.000	68.00	625.60	634.90	588.20	39700.00	618.83	0.00	619.04	2.14	4.14	10952.00	27114.52
130228.000	10.00	0.00	0.00	588.20	17700.00	610.49	0.00	610.65	2.16	3.53	5868.80	12047.83
130228.000	10.00	0.00	0.00	588.20	26400.00	613.97	0.00	614.16	2.21	3.85	7989.57	17763.58
130228.000	10.00	0.00	0.00	588.20	30300.00	615.41	0.00	615.61	2.20	3.96	8871.69	20410.42
130228.000	10.00	0.00	0.00	588.20	39700.00	618.83	0.00	619.04	2.14	4.13	10953.56	27119.75

SECNO	XLCH	FLTRD	FLLC	ELMIN	Q	CWSEL	CRIWS	FG	10K*S	VCH	AREA	.01K
130275.000	50.00	0.00	0.00	587.00	17700.00	610.45	0.00	610.68	1.99	3.97	4850.19	12535.66
130275.000	50.00	0.00	0.00	587.00	26400.00	613.92	0.00	614.19	1.99	4.46	6783.65	18711.40
130275.000	50.00	0.00	0.00	587.00	30300.00	615.36	0.00	615.65	1.93	4.59	7593.16	21821.78
130275.000	50.00	0.00	0.00	587.00	39700.00	618.78	0.00	619.08	1.73	4.77	9505.41	30207.72
130750.000	430.00	0.00	0.00	588.10	17700.00	610.68	0.00	610.75	.69	2.40	9265.32	21281.12
130750.000	430.00	0.00	0.00	588.10	26400.00	614.13	0.00	614.26	.60	2.51	12715.48	34209.20
130750.000	430.00	0.00	0.00	588.10	30300.00	615.63	0.00	615.71	.56	2.54	14155.45	40371.51
130750.000	430.00	0.00	0.00	588.10	39700.00	619.05	0.00	619.14	.49	2.60	17557.64	56599.58
131700.000	900.00	0.00	0.00	587.10	17700.00	610.73	0.00	610.85	1.30	3.21	7697.20	15496.47
131700.000	900.00	0.00	0.00	587.10	26400.00	614.24	0.00	614.33	.88	2.95	11923.72	28210.57
131700.000	900.00	0.00	0.00	587.10	30300.00	615.69	0.00	615.77	.76	2.88	13730.95	34688.03
131700.000	900.00	0.00	0.00	587.10	39700.00	619.10	0.00	619.19	.57	2.74	18002.01	52413.85
131750.000	50.00	0.00	0.00	586.70	17700.00	610.72	0.00	610.87	2.12	3.90	7606.85	12149.67
131750.000	50.00	0.00	0.00	586.70	26400.00	614.25	0.00	614.33	1.15	3.14	12935.74	24555.68
131750.000	50.00	0.00	0.00	586.70	30300.00	615.71	0.00	615.78	.94	2.96	15287.49	31220.53
131750.000	50.00	0.00	0.00	586.70	39700.00	619.13	0.00	619.19	.63	2.64	20983.42	50152.82
131751.000	1.00	605.40	615.60	586.70	17700.00	610.77	0.00	610.87	3.00	3.25	7664.39	10222.89
131751.000	1.00	605.40	615.60	586.70	26400.00	614.26	0.00	614.34	1.98	1.46	12778.57	18756.29
131751.000	1.00	605.40	615.60	586.70	30300.00	615.71	0.00	615.78	1.50	1.32	15123.92	24762.24
131751.000	1.00	605.40	615.60	586.70	39700.00	619.13	0.00	619.19	.89	1.12	20806.72	42058.11
131752.000	18.00	605.40	615.60	586.70	17700.00	610.77	0.00	610.88	2.99	3.24	7671.09	10234.98
131752.000	18.00	605.40	615.60	586.70	26400.00	614.27	0.00	614.34	1.97	1.45	12794.40	18795.24
131752.000	18.00	605.40	615.60	586.70	30300.00	615.72	0.00	615.78	1.49	1.32	15139.74	24834.53
131752.000	18.00	605.40	615.60	586.70	39700.00	619.13	0.00	619.19	.89	1.12	20808.60	42064.49
131753.000	1.00	0.00	0.00	586.70	17700.00	610.77	0.00	610.88	2.99	3.24	7673.74	10238.50
131753.000	1.00	0.00	0.00	586.70	26400.00	614.27	0.00	614.34	1.44	2.45	12972.95	22028.60
131753.000	1.00	0.00	0.00	586.70	30300.00	615.72	0.00	615.79	1.14	2.28	15317.85	28375.99
131753.000	1.00	0.00	0.00	586.70	39700.00	619.14	0.00	619.19	.73	2.00	20985.97	46486.18
131800.000	50.00	0.00	0.00	584.30	17700.00	610.83	0.00	610.89	1.43	2.48	9765.39	14812.29
131800.000	50.00	0.00	0.00	584.30	26400.00	614.30	0.00	614.35	.85	2.13	15335.74	28610.18
131800.000	50.00	0.00	0.00	584.30	30300.00	615.74	0.00	615.79	.72	2.04	17730.93	35752.63
131800.000	50.00	0.00	0.00	584.30	39700.00	619.15	0.00	619.20	.51	1.88	23393.60	55494.52
133600.000	1700.00	0.00	0.00	584.70	17700.00	610.97	0.00	611.03	.65	2.50	14155.65	21983.40
133600.000	1700.00	0.00	0.00	584.70	26400.00	614.39	0.00	614.44	.49	2.40	20926.38	37981.43
133600.000	1700.00	0.00	0.00	584.70	30300.00	615.83	0.00	615.87	.44	2.37	23764.33	45803.95
133600.000	1700.00	0.00	0.00	584.70	39700.00	619.22	0.00	619.26	.35	2.30	30477.62	67203.07
135700.000	1400.00	0.00	0.00	591.60	17700.00	611.06	0.00	611.10	.42	1.80	15873.66	27318.07
135700.000	1400.00	0.00	0.00	591.60	26400.00	614.46	0.00	614.49	.36	1.87	22560.12	44119.26
135700.000	1400.00	0.00	0.00	591.60	30300.00	615.88	0.00	615.92	.33	1.89	25399.54	52396.59
135700.000	1400.00	0.00	0.00	591.60	39700.00	619.26	0.00	619.30	.29	1.92	32081.03	74312.75
136100.000	1000.00	0.00	0.00	591.60	17700.00	611.11	0.00	611.15	.65	2.28	15632.59	21973.25
136100.000	1000.00	0.00	0.00	591.60	26400.00	614.50	0.00	614.53	.51	2.27	24057.68	37303.70
136100.000	1000.00	0.00	0.00	591.60	30300.00	615.92	0.00	615.96	.46	2.26	27613.52	44661.19
136100.000	1000.00	0.00	0.00	591.60	39700.00	619.33	0.00	619.33	.37	2.21	36040.29	65581.50

SECNO	XLCH	ELTRD	ELIC	ELMIN	Q	CWSEL	CRTWS	EG	10K*S	VCH	AREA	.01K
137500.000	1500.00	0.00	0.00	590.20	17700.00	611.19	0.00	611.24	.74	2.40	15127.60	20569.81
137500.000	1500.00	0.00	0.00	590.20	26400.00	614.56	0.00	614.60	.53	2.29	24374.98	36259.00
137500.000	1500.00	0.00	0.00	590.20	30300.00	615.98	0.00	616.01	.47	2.24	28278.05	44432.98
137500.000	1500.00	0.00	0.00	590.20	39700.00	619.34	0.00	619.37	.35	2.14	37534.38	67043.29
140000.000	2450.00	0.00	0.00	590.20	17700.00	611.36	0.00	611.48	1.21	3.15	10459.31	16121.04
140000.000	2450.00	0.00	0.00	590.20	26400.00	614.53	0.00	614.77	.92	3.08	18032.23	27500.26
140000.000	2450.00	0.00	0.00	590.20	30300.00	616.08	0.00	616.16	.82	3.03	21235.02	33526.04
140000.000	2450.00	0.00	0.00	590.20	39700.00	619.42	0.00	619.48	.62	2.89	28850.87	50343.04
142550.000	2500.00	0.00	0.00	590.20	17700.00	611.66	0.00	611.71	.76	2.48	15543.71	20343.49
142550.000	2500.00	0.00	0.00	590.20	26400.00	614.91	0.00	614.95	.60	2.46	23336.83	34137.78
142550.000	2500.00	0.00	0.00	590.20	30300.00	616.29	0.00	616.33	.54	2.44	26641.41	41067.65
142550.000	2500.00	0.00	0.00	590.20	39700.00	619.58	0.00	619.61	.44	2.40	34537.49	59964.90

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SUMMARY PRINTOUT TABLE 150

SECNO	C	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
123500.000	27500.00	608.80	0.00	0.00	0.00	503.08	100.00
123500.000	41000.00	611.73	2.93	0.00	0.00	548.84	100.00
123500.000	47000.00	612.85	1.12	0.00	0.00	566.33	100.00
123500.000	61600.00	615.27	2.42	0.00	0.00	580.00	100.00
124100.000	27500.00	608.88	0.00	.08	0.00	296.00	450.00
124100.000	41000.00	611.72	2.84	-.01	0.00	296.00	450.00
124100.000	47000.00	612.79	1.07	-.06	0.00	296.00	450.00
124100.000	61600.00	615.31	2.52	.04	0.00	500.00	450.00
124101.000	27500.00	608.91	0.00	.03	0.00	296.00	29.00
124101.000	41000.00	611.96	3.04	.23	0.00	296.00	29.00
124101.000	47000.00	613.26	1.30	.47	0.00	296.00	29.00
124101.000	61600.00	617.01	3.75	1.69	0.00	500.00	29.00
124300.000	27500.00	609.20	0.00	.28	0.00	295.51	150.00
124300.000	41000.00	612.35	3.15	.39	0.00	309.35	150.00
124300.000	47000.00	613.69	1.34	.43	0.00	314.00	150.00
124300.000	61600.00	617.05	3.37	.05	0.00	314.00	150.00
124700.000	27500.00	609.32	0.00	.12	0.00	504.08	400.00
124700.000	41000.00	612.60	3.28	.25	0.00	550.20	400.00
124700.000	47000.00	614.00	1.41	.32	0.00	670.00	400.00
124700.000	61600.00	617.54	3.54	.49	0.00	670.00	400.00
126000.000	27500.00	609.73	0.00	.40	0.00	836.95	1200.00
126000.000	40700.00	613.14	3.41	.54	0.00	843.45	1200.00
126000.000	45800.00	614.58	1.45	.58	0.00	846.21	1200.00
126000.000	54600.00	618.17	3.59	.63	0.00	853.05	1200.00
126800.000	27500.00	605.80	0.00	.08	0.00	637.10	800.00
126800.000	40700.00	613.20	3.40	.07	0.00	643.58	800.00
126800.000	45800.00	614.64	1.44	.06	0.00	646.32	800.00
126800.000	54600.00	618.20	3.56	.03	0.00	653.10	800.00
127550.000	27500.00	605.81	0.00	.01	0.00	456.13	600.00
127550.000	41000.00	613.19	3.38	-.01	0.00	687.20	600.00
127550.000	47000.00	614.63	1.44	-.01	0.00	903.75	600.00
127550.000	61600.00	618.20	3.57	-.00	0.00	1800.24	600.00
127551.000	27500.00	605.82	0.00	.00	0.00	456.14	10.00
127551.000	41000.00	613.19	3.38	.00	0.00	687.50	10.00
127551.000	47000.00	614.64	1.44	.01	0.00	904.09	10.00
127551.000	61600.00	618.21	3.57	.00	0.00	1800.77	10.00
127552.000	27500.00	605.84	0.00	.03	0.00	456.24	64.00
127552.000	41000.00	613.23	3.38	.03	0.00	690.69	64.00
127552.000	47000.00	614.67	1.45	.04	0.00	907.71	64.00
127552.000	61600.00	618.23	3.56	.03	0.00	1806.40	64.00
127553.000	27500.00	605.85	0.00	.00	0.00	456.26	10.00
127553.000	41000.00	613.23	3.38	.00	0.00	691.39	10.00

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127553.000	47000.00	614.68	1.45	.01	0.00	908.56	10.00
127553.000	61600.00	618.24	3.56	.00	0.00	1807.76	10.00

SECNO	Q	CWSEL	DIFWSP	DIFNSX	DIFKWS	TOPWID	XLCH
128100.000	27500.00	610.08	0.00	.23	0.00	820.43	550.00
128100.000	40700.00	613.57	3.49	.34	0.00	846.02	550.00
128100.000	45800.00	615.04	1.47	.36	0.00	950.32	550.00
128100.000	54600.00	618.56	3.52	.32	0.00	1020.80	550.00
129100.000	27500.00	610.25	0.00	.17	0.00	1150.00	900.00
129100.000	40700.00	613.76	3.51	.19	0.00	1150.00	900.00
129100.000	45800.00	615.22	1.46	.18	0.00	1150.00	900.00
129100.000	54600.00	618.69	3.47	.12	0.00	1150.00	900.00
129350.000	17700.00	610.51	0.00	.27	0.00	1300.00	250.00
129350.000	26400.00	614.01	3.49	.25	0.00	1300.00	250.00
129350.000	30300.00	615.46	1.45	.24	0.00	1300.00	250.00
129350.000	39700.00	618.89	3.43	.20	0.00	1300.00	250.00
130175.000	17700.00	610.48	0.00	-.03	0.00	540.00	750.00
130175.000	26400.00	613.95	3.47	-.06	0.00	540.00	750.00
130175.000	30300.00	615.39	1.44	-.07	0.00	540.00	750.00
130175.000	39700.00	618.80	3.41	-.09	0.00	540.00	750.00
130225.000	17700.00	610.47	0.00	-.01	0.00	601.86	50.00
130225.000	26400.00	613.95	3.48	-.00	0.00	610.00	50.00
130225.000	30300.00	615.35	1.45	.00	0.00	610.00	50.00
130225.000	39700.00	618.81	3.41	.01	0.00	610.00	50.00
130226.000	17700.00	610.47	0.00	.00	0.00	601.76	10.00
130226.000	26400.00	613.95	3.48	.00	0.00	610.00	10.00
130226.000	30300.00	615.40	1.45	.00	0.00	610.00	10.00
130226.000	39700.00	618.81	3.41	.00	0.00	610.00	10.00
130227.000	17700.00	610.49	0.00	.02	0.00	602.00	68.00
130227.000	26400.00	613.97	3.48	.02	0.00	610.00	68.00
130227.000	30300.00	615.41	1.45	.02	0.00	610.00	68.00
130227.000	39700.00	618.83	3.41	.02	0.00	610.00	68.00
130228.000	17700.00	610.49	0.00	.00	0.00	602.04	10.00
130228.000	26400.00	613.97	3.48	.00	0.00	610.00	10.00
130228.000	30300.00	615.41	1.45	.00	0.00	610.00	10.00
130228.000	39700.00	618.83	3.41	.00	0.00	610.00	10.00
130275.000	17700.00	610.45	0.00	-.04	0.00	520.72	50.00
130275.000	26400.00	613.92	3.47	-.05	0.00	560.00	50.00
130275.000	30300.00	615.36	1.45	-.05	0.00	560.00	50.00
130275.000	39700.00	618.78	3.41	-.05	0.00	560.00	50.00
130750.000	17700.00	610.68	0.00	.23	0.00	959.15	430.00
130750.000	26400.00	614.18	3.50	.27	0.00	991.84	430.00
130750.000	30300.00	615.63	1.45	.27	0.00	993.40	430.00
130750.000	39700.00	619.05	3.42	.28	0.00	997.06	430.00
131700.000	17700.00	610.72	0.00	.05	0.00	1191.66	900.00
131700.000	26400.00	614.24	3.51	.05	0.00	1234.71	900.00
131700.000	30300.00	615.69	1.45	.05	0.00	1250.00	900.00
131700.000	39700.00	619.10	3.42	.05	0.00	1250.00	900.00

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SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
131750.000	17700.00	610.72	0.00	-.01	0.00	1461.28	50.00
131750.000	26400.00	614.25	3.53	.01	0.00	1571.90	50.00
131750.000	30300.00	615.71	1.46	.02	0.00	1660.00	50.00
131750.000	39700.00	619.13	3.42	.03	0.00	1660.00	50.00
131751.000	17700.00	610.77	0.00	.05	0.00	1462.68	1.00
131751.000	26400.00	614.26	3.50	.01	0.00	1572.71	1.00
131751.000	30300.00	615.71	1.45	.01	0.00	1660.00	1.00
131751.000	39700.00	619.13	3.42	-.00	0.00	1660.00	1.00
131752.000	17700.00	610.77	0.00	.01	0.00	1462.85	18.00
131752.000	26400.00	614.27	3.50	.00	0.00	1573.36	18.00
131752.000	30300.00	615.72	1.45	.00	0.00	1660.00	18.00
131752.000	39700.00	619.13	3.41	.00	0.00	1660.00	18.00
131753.000	17700.00	610.77	0.00	.00	0.00	1462.89	1.00
131753.000	26400.00	614.27	3.50	.00	0.00	1573.44	1.00
131753.000	30300.00	615.72	1.45	.01	0.00	1660.00	1.00
131753.000	39700.00	619.14	3.42	.01	0.00	1660.00	1.00
131800.000	17700.00	610.83	0.00	.06	0.00	1582.38	50.00
131800.000	26400.00	614.30	3.47	.02	0.00	1644.79	50.00
131800.000	30300.00	615.74	1.45	.02	0.00	1660.00	50.00
131800.000	39700.00	619.15	3.41	.02	0.00	1660.00	50.00
133600.000	17700.00	610.97	0.00	.15	0.00	1980.00	1700.00
133600.000	26400.00	614.39	3.42	.09	0.00	1980.00	1700.00
133600.000	30300.00	615.83	1.43	.08	0.00	1980.00	1700.00
133600.000	39700.00	619.22	3.39	.06	0.00	1980.00	1700.00
135700.000	17700.00	611.06	0.00	.09	0.00	1940.41	1400.00
135700.000	26400.00	614.46	3.39	.07	0.00	1979.09	1400.00
135700.000	30300.00	615.88	1.43	.06	0.00	1980.00	1400.00
135700.000	39700.00	619.26	3.38	.04	0.00	1980.00	1400.00
136100.000	17700.00	611.11	0.00	.04	0.00	2484.54	1000.00
136100.000	26400.00	614.50	3.39	.04	0.00	2500.00	1000.00
136100.000	30300.00	615.92	1.42	.04	0.00	2500.00	1000.00
136100.000	39700.00	619.30	3.38	.04	0.00	2500.00	1000.00
137500.000	17700.00	611.19	0.00	.08	0.00	2720.74	1500.00
137500.000	26400.00	614.56	3.37	.06	0.00	2749.14	1500.00
137500.000	30300.00	615.98	1.42	.06	0.00	2750.00	1500.00
137500.000	39700.00	619.34	3.36	.05	0.00	2750.00	1500.00
140000.000	17700.00	611.36	0.00	.17	0.00	2280.00	2450.00
140000.000	26400.00	614.68	3.32	.12	0.00	2280.00	2450.00
140000.000	30300.00	616.08	1.40	.11	0.00	2280.00	2450.00
140000.000	39700.00	619.42	3.34	.08	0.00	2280.00	2450.00
142550.000	17700.00	611.66	0.30	.30	0.00	2400.00	2500.00
142550.000	26400.00	614.91	3.25	.23	0.00	2400.00	2500.00
142550.000	30300.00	616.25	1.38	.20	0.00	2400.00	2500.00
142550.000	39700.00	619.58	3.29	.16	0.00	2400.00	2500.00

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*****************************************************
*  WATER SURFACE PROFILES                           *
*  VERSION OF NOVEMBER 1976                         *
*  UPDATED JULY 1979                                *
*                                                   *
*  RUN DATE  04/27/83  TIME .11.05.19.              *
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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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A. Model with enlarged floodway run with 1948 flood flows

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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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  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
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C
T1        TITTABAWASSEE RIVER AT MIDLAND
T2        FIS REVIEW
T3        1949 FLOOD

J1   ICHECK     INQ       NINV      IDIR      STRT      METRIC    HVINS     D         WSEL      FQ

       0.        6.        7.        0.  0.000000      0.00      0.0       0.   610.800    0.000

J2   NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     1.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

QT       5.000  27500.000  41000.000  47000.000  61600.000  34000.000      0.000      0.000      0.000      0.000
NC        .035       .035       .030       .100       .300      0.000      0.000      0.000      0.000      0.000

X1  124700.000     13.000    118.000    450.000    400.000    400.000    400.000      0.000      0.000      0.000
GR     613.800      0.000    613.700    118.000    594.700    149.000    596.300    169.000    587.400    209.000
GR     587.200    249.000    586.800    289.000    588.600    328.000    590.200    367.000    596.300    406.000
GR     605.000    450.000    610.000    550.000    607.300    670.000      0.000      0.000      0.000      0.000
QT       5.000  27500.000  40700.000  45800.000  54600.000  34000.000      0.000      0.000      0.000      0.000

X1  126000.000     15.000     87.000    398.000   1300.000    650.000   1200.000      0.000      0.000      0.000
GR     623.000      0.000    623.400     87.000    596.100    139.000    590.300    181.000    586.800    222.000
GR     586.300    263.000    587.600    304.000    589.100    345.000    596.100    386.000    604.700    398.000
GR     603.900    477.000    605.600    527.000    609.100    538.000    600.000    600.000    600.000    950.000

X1  126800.000     12.000     87.000    410.000    500.000    750.000    800.000      0.000      0.000      0.000
GR     623.400     87.000    596.100    139.000    590.300    181.000    586.800    222.000    586.300    263.000
GR     587.800    304.000    589.100    345.000    596.100    386.000    600.000    410.000    605.000    415.000
GR     600.000    420.000    600.000    750.000      0.000      0.000      0.000      0.000      0.000      0.000
QT       5.000  27500.000  41000.000  47000.000  61600.000  34000.000      0.000      0.000      0.000      0.000

          GEORGE ST. BRIDGE,MAXIC.639.2,MIN TR 631.5,WIDTH 64,LENGTH 694

X1  127550.000     60.000    104.000    791.000    600.000    600.000    600.000      0.000      0.000      0.000
GR     641.000      0.000    624.700    104.000    624.100    183.000    638.700    183.000    638.700    187.000
GR     624.100    187.000    614.000    213.000    614.000    238.000    614.200    279.000    639.200    279.000
GR     639.200    283.000    614.200    283.000    595.800    298.000    589.800    322.000    584.700    345.000
GR     584.300    370.000    638.500    370.000    638.900    374.000    584.300    374.000    585.200    405.000
GR     585.900    430.000    589.300    460.000    637.100    460.000    637.100    464.000    589.300    464.000
GR     589.000    485.000    591.300    505.000    595.800    524.000    600.600    536.000    605.400    550.000
GR     634.700    550.000    634.700    554.000    605.400    554.000    605.400    640.000    631.200    640.000
GR     631.200    644.000    605.400    644.300    605.400    730.000    627.400    730.000    627.400    734.000
GR     605.400    734.000    607.400    756.000    620.000    791.000    629.300    865.000    626.000    965.000
GR     623.000.  1065.000    621.700   1165.000    620.500   1265.000    619.800   1365.000    619.000   1465.000
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GR     618.500    1565.000    618.000    1665.000    618.000    2065.000    617.000    2165.000    617.000    2265.000
GR     615.000    2465.000    614.000    2565.000    613.000    2665.000    612.000    2765.000    611.000    2865.000

X1 127551.000       0.000       0.000       0.000      10.000      10.000      10.000       0.000       0.000       0.000
BT     27.000       0.000     641.000     641.000     104.000     644.600     637.900     183.000     645.600     638.700
BT    279.000     646.000     639.200     370.000     645.400     638.600     460.000     644.000     637.100     550.000
BT    641.600     634.700     640.000     638.100     631.200     730.000     634.300     627.400     791.000     631.500
BT    624.700     865.000     629.000     629.000     965.000     626.000     626.000    1065.000     623.000     623.000
BT   1165.000     621.700     621.700    1265.000     620.500     620.500    1365.000     619.800     619.800    1465.000
BT    619.000     619.000    1565.000     618.500     618.500    1665.000     618.000     618.000    2065.000     618.000
BT    618.000    2165.000     617.600     617.600    2265.000     617.000     617.000    2465.000     615.000     615.000
BT   2565.000     614.000     614.000    2665.000     613.000     613.000    2765.000     612.000     612.000    2865.000
BT    611.000     611.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000

X1 127552.000       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

X1 127553.000       0.000       0.000       0.000      10.000      10.000      10.000       0.000       0.000       0.000
QT     5.000   27500.000   40700.000   45800.000   54600.000   34000.000       0.000       0.000       0.000       0.000

X1 128100.000      15.000     323.000     665.000     700.000     900.000     550.000        .840       0.000       0.000
GR     623.600       0.000     613.200     175.000     615.400     373.000     597.600     324.000     596.600     331.000
GR     594.700     365.000     591.500     405.000     590.000     440.000     589.000     475.000     586.000     510.000
GR     585.500     545.000     594.300     585.000     596.600     615.000     605.000     665.000     605.000    1300.000
NH       3.000        .016     413.000        .030     640.000        .060    1150.000       0.000       0.000       0.000

          D/S OF CONFLUENCE WITH CHIPPEWA RIVER

X1 129100.000      12.000     413.000     640.000    1000.000     700.000     900.000       0.000       0.000       0.000
GR     607.200       0.000     607.000     368.000     600.300     413.000     596.500     418.000     591.500     455.000
GR     589.500     490.000     584.100     530.000     586.800     565.000     589.400     605.000     596.500     640.000
GR     605.000     690.000     605.000    1150.000       0.000       0.000       0.000       0.000       0.000       0.000
QT     5.000   17700.000   26400.000   30300.000   39700.000   21000.000       0.000       0.000       0.000       0.000
NC       .030        .030        .030       0.000       0.000       0.000       0.000       0.000       0.000       0.000

          U/S OF CONFLUENCE WITH CHIPPEWA RIVER

X1 129350.000      13.000     413.000     640.000      90.000    1000.000     250.000       0.000       0.000       0.000
GR     607.200       0.000     607.000     368.000     600.300     413.000     596.500     418.000     591.500     455.000
GR     589.500     490.000     584.100     530.000     586.800     565.000     589.400     605.000     596.500     640.000
GR     600.000     645.000     600.000     700.000     670.000    1300.000       0.000       0.000       0.000       0.000

X1 130175.000      22.000     600.000     870.000     750.000     750.000     750.000       0.000       0.000       0.000
X3     0.000       0.000       0.000     490.000       0.000    1030.000       0.000       0.000       0.000       0.000
GR     629.600       0.000     630.800     100.000     623.200     200.000     611.400     285.000     612.200     370.000
GR     603.800     395.000     606.600     440.000     605.000     500.000     604.800     580.000     606.200     600.000
GR     595.600     628.000     591.300     660.000     589.300     690.000     585.200     720.000     587.200     750.000
GR     590.500     780.000     591.200     810.000     595.600     842.000     604.800     870.000     604.900    1000.000
GR     599.400    1130.000     601.000    1200.000       0.000       0.000       0.000       0.000       0.000       0.000

          M-20 BRIDGE,MAX LC 634.5,MIN TR 626.6,WIDTH 68,LENGTH 671

X1 130225.000      52.000     620.000     926.000      50.000      50.000      50.000       0.000       0.000       0.000
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GR     633.430     200.000     636.700     292.000     616.400     292.000     608.600     343.000     633.300     343.000
GR     633.300     350.000     608.600     350.000     611.000     383.000     604.900     394.000     634.400     394.000
GR     634.400     401.000     604.500     401.000     605.800     464.000     634.800     464.000     634.800     471.000
GR     605.800     471.000     604.600     523.000     634.500     523.000     634.900     530.000     604.600     530.000
GR     605.400     590.000     634.500     590.000     633.900     600.000     605.400     600.000     595.600     620.000
GR     588.200     640.000     588.600     659.000     627.700     659.000     627.700     666.000     588.600     666.000
GR     590.200     705.000     590.200     730.000     591.600     771.000     624.200     771.000     624.200     778.000
GR     591.600     778.000     592.500     810.000     595.600     818.000     601.800     826.000     602.800     845.000
GR     622.900     845.000     626.400     850.000     602.800     850.000     603.400     904.000     624.400     904.000
GR     624.400     909.000     603.400     909.000     604.800     964.000     626.600     964.000     625.600     1000.000
GR     622.700     1100.000    620.600     1200.000    0.000       0.000       0.000       0.000       0.000       0.000

X1 130226.000      0.000       0.000       0.000       10.000      10.000      10.000      0.000       0.000       0.000
BT     15.000      200.000     633.400     633.400     292.000     636.700     631.900     343.000     638.200     633.300
BT     354.000     639.300     634.400     464.000     639.600     634.800     523.000     639.700     634.900     590.000
BT     639.300     634.500     600.000     639.300     630.900     659.000     636.800     627.700     771.000     633.300
BT     624.200     845.000     633.600     622.900     850.000     630.600     626.400     904.000     628.700     624.400
BT     964.000     626.600     622.500     1000.000    625.600     625.600     0.000       0.000       0.000       0.000

X1 130227.000      0.000       0.000       0.000       68.000      68.000      68.000      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

X1 130229.000      0.000       0.000       0.000       10.000      10.000      10.000      0.000       0.000       0.000

X1 130275.000      22.000      580.000     821.000     50.000      50.000      50.000      0.000       0.000       0.000
X3     0.000       0.000       0.000       460.000     0.000       1020.000    0.000       0.000       0.000       0.000
GR     623.000     0.000       634.800     100.000     629.000     200.000     616.400     300.000     616.400     370.000
GR     609.600     392.000     611.500     440.000     609.600     470.000     610.900     580.000     595.600     615.000
GR     592.300     645.000     590.000     670.000     587.600     700.000     587.000     725.000     589.300     755.000
GR     591.300     780.000     595.600     810.000     607.100     821.000     606.900     950.000     609.800     1005.000
GR     604.600     1125.000    605.200     1200.000    0.000       0.000       0.000       0.000       0.000       0.000
NC     .050        .030        .030        0.000       0.000       0.000       0.000       0.000       0.000       0.000

X1 130750.000      19.000      88.000      284.000     430.000     430.000     430.000     0.000       0.000       0.000
GR     621.800     0.000       610.600     12.000      611.100     26.000      612.300     35.000      610.400     45.000
GR     609.400     65.000      607.400     88.000      595.800     105.000     591.600     135.000     588.100     165.000
GR     589.100     190.000     590.200     220.000     591.100     250.000     595.800     276.000     602.900     284.000
GR     604.300     483.000     602.100     660.000     600.900     760.000     605.000     1000.000    0.000       0.000

X1 131700.000      16.000      56.000      270.000     900.000     959.000     900.000     0.000       0.000       0.000
X3     0.000       0.000       0.000       0.000       0.000       1250.000    0.000       0.000       0.000       0.000
GR     615.000     0.000       612.200     56.000      596.500     81.000      590.400     110.000     587.600     140.000
GR     587.100     165.000     589.700     195.000     592.300     220.000     596.500     246.000     604.900     270.000
GR     607.500     303.000     606.600     500.000     605.700     700.000     606.900     810.000     606.700     1130.000
GR     608.500     1400.000    0.000       0.000       0.000       0.000       0.000       0.000       0.000       0.000
NC     .035        .035        .030        0.000       0.000       0.000       0.000       0.000       0.000       0.000

          CURRIE PARKWAY BRIDGE. MAXLC 612.8,MIN TR 614.WIDTH 18

X1 131750.000      18.000      104.000     240.000     50.000      50.000      50.000      0.000       0.000       0.000
GR     615.600     0.000       614.000     104.000     612.700     104.000     596.300     108.000     594.800     130.000
GR     587.400     150.000     586.300     170.000     589.700     190.000     592.700     215.000     596.500     236.000
GR     612.700     240.000     614.100     240.000     611.600     303.000     606.000     500.000     605.400     700.000
GR     606.900     810.000     606.700     1130.000    607.500     1660.000    0.000       0.000       0.000       0.000
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NC	.035	.035	.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	131751.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
BT	9.000	0.000	615.600	615.600	104.000	614.000	612.700	240.000	614.100	612.800
BT	303.000	611.600	611.600	500.000	606.300	606.000	700.000	605.400	605.400	810.000
BT	606.900	606.900	1130.000	606.700	606.700	1660.000	607.500	607.500	0.000	0.000
X1	131752.000	0.000	0.000	0.000	18.000	18.000	18.000	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
X1	131753.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X1	131800.000	16.000	77.000	256.000	50.000	50.000	50.000	0.000	0.000	0.000
GR	615.000	0.000	611.400	77.000	596.500	93.000	591.500	120.000	584.300	150.000
GR	586.900	175.000	590.300	200.000	591.800	230.000	596.500	254.000	599.200	256.000
GR	605.400	303.000	605.600	500.000	603.600	700.000	606.900	810.000	606.700	1130.000
GR	608.500	1660.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NH	5.000	.060	1147.000	.030	1234.000	.030	1413.000	.050	1423.000	.030
NH	1580.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	133600.000	17.000	1234.000	1413.000	1200.000	1300.000	1700.000	0.000	0.000	0.000
GR	601.700	0.000	604.100	330.000	605.300	1040.000	605.800	1147.000	604.700	1225.000
GR	602.600	1234.000	595.800	1245.000	589.000	1275.000	589.300	1300.000	590.000	1330.000
GR	584.700	1360.000	592.100	1385.000	595.800	1413.000	603.900	1423.000	605.500	1533.000
GR	607.600	1768.000	610.200	1980.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	.030	.060	.030	0.000	0.000	0.000	0.000	0.000	0.000	0.000

U/S OF CONFLUENCE WITH SNAKE CREEK

X1	135700.000	18.000	440.000	708.000	1200.000	1250.000	1430.000	0.000	0.000	0.000
GR	614.700	0.000	613.100	6.000	598.400	60.000	605.400	386.000	605.900	440.000
GR	596.200	454.000	591.600	490.000	591.900	530.000	592.900	570.000	593.200	610.000
GR	592.300	650.000	596.200	690.000	606.800	708.000	602.000	920.000	600.400	1200.000
GR	606.000	1450.000	609.000	1770.000	611.500	1980.000	0.000	0.000	0.000	0.000
NH	3.000	.030	115.000	.030	325.000	.060	2500.000	0.000	0.000	0.000
X1	136100.000	23.000	115.000	325.000	1000.000	900.000	1000.000	0.000	0.000	0.000
GR	614.200	0.000	612.800	10.000	609.100	22.000	607.600	105.000	605.900	115.000
GR	596.000	126.000	591.600	162.000	591.900	202.000	592.900	242.000	593.200	282.000
GR	596.300	325.000	603.400	332.000	602.100	348.000	606.400	362.000	604.800	510.000
GR	602.000	790.000	600.200	880.000	602.000	1250.000	603.900	1380.000	604.000	1490.000
GR	608.000	1750.000	610.000	1810.000	610.900	2500.000	0.000	0.000	0.000	0.000
NH	3.000	.030	233.000	.030	465.000	.060	2750.000	0.000	0.000	0.000

U/S OF CONFLUENCE WITH STURGEON CREEK

X1	137500.000	22.000	233.000	465.000	1500.000	1130.000	1500.000	0.000	0.000	0.000
GR	614.900	0.000	611.300	9.000	608.200	18.000	610.600	27.000	611.300	50.000
GR	610.300	233.000	596.900	263.000	591.600	290.000	590.200	320.000	591.300	350.000
GR	591.900	380.000	592.600	410.000	596.900	465.000	604.800	478.000	608.300	490.000
GR	609.700	550.000	608.500	700.000	601.500	1100.000	601.300	1500.000	606.000	1700.000
GR	608.000	1800.000	610.000	2750.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	.060	.060	.030	0.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	140000.000	20.000	291.000	509.000	2400.000	2000.000	2450.000	0.000	0.000	0.000
GR	610.100	0.000	598.900	142.000	604.800	245.000	605.000	291.000	595.600	307.000
GR	591.600	330.000	592.200	360.000	591.300	390.000	591.900	420.000	592.600	450.000
GR	595.600	496.000	604.500	509.000	605.800	532.000	603.300	548.000	609.500	575.000
GR	603.000	930.000	604.000	980.000	610.000	1040.000	611.000	1130.000	605.500	2280.000
X1	142550.000	21.000	1451.000	1644.000	2400.000	2500.000	2500.000	0.000	0.000	0.000
GR	607.400	0.000	602.500	310.000	604.200	410.000	604.000	600.000	601.900	820.000
GR	607.000	1200.000	606.400	1300.000	607.600	1376.000	607.500	1391.000	603.700	1408.000
GR	603.300	1451.000	595.600	1454.100	591.600	1480.000	590.200	1510.000	591.300	1540.000
GR	591.900	1570.000	592.600	1600.000	595.600	1620.000	609.300	1644.000	609.400	1800.000
GR	609.600	2400.000	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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*PRCF 1

CCHV=     .100 CEHV=     .300
*SECNC 124700.000
3280 CROSS SECTION 124700.00 EXTENDED       3.80 FEET

   SECNC     DEPTH     CWSEL     CRWS     WSELK     EG        HV        HL        OLOSS   BANK ELEV
   Q         QLOB      QCH       QRCB     ALOB      ACH       ARCB      VOL       TWA   LEFT/RIGHT
   TIME      VLOB      VCH       VRCB     XNL       XNCH      XNR       WTN       ELMIN      SSTA
   SLOPE     XLOBL     XLCH      XLCBR    ITRIAL    IDC       ICONT     CORAR     TOPWID     ENDST

124700.00    24.00    610.80      0.00   610.80    611.26       .46      0.00      0.00    613.70
   34000.       0.    33177.      823.       0.     6034.      606.        0.        0.    605.00
     0.00     0.00      5.50      1.36     .035      .030      .035     0.000    586.80    122.73
  .000260     400.      400.      400.        0         0         0      0.00    547.27    670.00

*SECNC 126000.000
3280 CROSS SECTION 126000.00 EXTENDED      11.29 FEET

126000.00    24.99    611.29      0.00     0.00    611.47       .18       .19       .03    623.40
   34000.       0.    22687.    11313.       0.     5753.     5292.      205.       14.    604.70
     .09     0.00      3.94      2.14     .035      .030      .035      .033    586.30    110.07
  .000121    1300.     1200.      650.        2         0         0      0.00    839.94    950.00

*SECNO 126800.000
3280 CROSS SECTION 126800.00 EXTENDED      11.37 FEET

126800.00    25.07    611.37      0.00     0.00    611.58       .22       .10       .01    623.40
   34000.       0.    24757.     9243.       0.     5563.     3839.      393.       27.    600.00
     .15     0.00      4.15      2.41     .035      .030      .035      .032    586.30    105.92
  .000134     900.      800.      750.        2         0         0      0.00    640.08    750.00

*SECNC 127550.000

3265 DIVIDED FLOW

3280 CROSS SECTION 127550.00 EXTENDED        .37 FEET


          GEORGE ST. BRIDGE,MAXLC.639.2,MIN TR 631.5,WIDTH 64,LENGTH 694

127550.00    27.07    611.37      0.00     0.00    611.78       .41       .13       .06    624.70
   34000.       0.    33998.        2.       0.     6616.        7.      505.       35.    620.00
     .18     0.00      5.14       .29     .035      .030      .035      .031    584.30    285.31
  .000446     600.      600.      600.        2         0         0      0.00    498.30   2865.00

*SECNC 127551.000

3265 DIVIDED FLOW
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3280 CROSS SECTION 127551.00 EXTENDED        .37 FEET

   SECNO     DEPTH     CWSEL     CRIWS     WSELK     FG        HV        HL        QLOSS    BANK ELEV
   C         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLCBR     ITRIAL    IDC       ICCNT     CORAR     TOPWID      ENDST


3370 NORMAL BRIDGE,NRD= 27 MIN ELTRD=  611.00 MAX ELLC=  641.00

127551.00    27.07    611.37      0.00      0.00    611.78       .41       .00       .00    624.70
   34000.       0.    33998.        2.        0.     6617.        7.      507.       35.    620.00
      .19     0.00      5.14       .29      .035      .030      .035      .031    584.30    285.31
  .000446      10.       10.       10.         0         0         0      0.00    498.60   2865.00

*SECNO 127552.000

3265 DIVIDED FLOW

3280 CROSS SECTION 127552.00 EXTENDED        .40 FEET


3370 NORMAL BRIDGE,NRD= 27 MIN ELTRD=  611.00 MAX ELLC=  641.00

127552.00    27.10    611.40      0.00      0.00    611.81       .41       .03       .00    624.70
   34000.       0.    33998.        2.        0.     6631.        8.      517.       36.    620.00
      .19     0.00      5.13       .30      .035      .030      .035      .031    584.30    285.28
  .000443      64.       64.       64.         0         0         0      0.00    501.73   2865.00

*SECNO 127553.000

3265 DIVIDED FLOW

3280 CROSS SECTION 127553.00 EXTENDED        .41 FEET


127553.00    27.11    611.41      0.00      0.00    611.81       .41       .00       .00    624.70
   34000.       0.    33997.        3.        0.     6634.        8.      513.       36.    620.00
      .19     0.00      5.12       .31      .035      .030      .035      .031    584.30    285.28
  .000443      10.       10.       10.         0         0         0      0.00    502.38   2865.00

*SECNO 128100.000
3280 CROSS SECTION 128100.00 EXTENDED        6.70 FEET


128100.00    26.20    611.70      0.00      0.00    611.99       .29       .17       .01    615.40
   34000.       0.    26506.     7494.        0.     5516.     3572.      632.       47.    605.00
      .23     0.00      4.81      2.10      .035      .030      .035      .031    585.50    271.49
  .000197     710.      550.      500.         2         0         0      0.00    820.51   1092.00


1490 NH CARD USED
*SECNO 129100.000
3280 CROSS SECTION 129100.00 EXTENDED        6.89 FEET
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          D/S OF CONFLUENCE WITH CHIPPEWA RIVER

129100.00    27.79    611.89     0.60     0.00   612.14      .25      .14      .00   600.30
   34000.    6994.   22934.    4071.    2132.    5058.    3724.     824.      65.    556.50
      .29     3.28     4.53     1.09     .016     .030     .060     .031   584.10     0.00
  .006136    1000.     900.     700.        2        0        0     0.00  1150.00  1150.00

*SECNO 129350.000
3280 CROSS SECTION 129350.00 EXTENDED     12.15 FEET

   SECNO     DEPTH     CWSEL     CRWS     WSELK     EG        HV        HI        DLOSS    BANK ELEV
   Q         OLOB      OCH       ORCB     ALOB      ACH       ARCB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VRCB     XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBI     XLCH      XLCRB    ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST


          U/S OF CONFLUENCE WITH CHIPPEWA RIVER

129350.00    28.05    612.15     0.00     0.00   612.18      .04      .03      .02   600.30
   71000.    1644.    9514.    9841.    2240.    5118.    8027.     993.      81.    556.50
      .37      .73     1.86     1.23     .030     .030     .030     .029   584.10     0.00
  .000022      90.     750.    1000.        2        0        0     0.00  1300.00  1300.00

*SECNO 130175.000
3280 CROSS SECTION 130175.00 EXTENDED     11.10 FEET


3470 ENCROACHMENT STATIONS=     490.0    1030.0  TYPE=     1  TARGET=     540.000
130175.00    26.90    612.10     0.00     0.00   612.25      .15      .03      .03   606.20
   71000.    1276.   17739.    1986.     777.    5353.    1183.    1188.      97.    604.80
      .44     1.64     3.31     1.68     .030     .030     .030     .029   585.20   490.00
  .000085     750.     750.     750.        2        0        0     0.00   540.00  1030.00

*SECNO 130225.000

3265 DIVIDED FLOW


          4-20 BRIDGE,MAX LC 634.5,MIN TR 626.6,WIDTH 68,LENGTH 671

130225.00    23.88    612.08     0.00     0.00   612.26      .18      .01      .01   595.60
   71000.    3314.   15207.    2490.    1694.    4040.    1111.    1197.      97.    601.80
      .45     1.06     3.76     2.23     .030     .030     .030     .029   588.20   292.00
  .000167      50.      50.      50.        1        0        0     0.00   610.00   964.00

*SECNO 130226.000

3265 DIVIDED FLOW


3370 BERYAL BRIDGE,NRC= 15 MIN ELTRD=  625.60 MAX ELLC=  634.90
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130226.00     23.89    612.39      0.00      0.00    612.28       .18       .03       .00    595.60
   21000.     3311.    15211.     2479.     1692.     4039.     1110.     1198.       97.    601.80
      .45      1.96      3.77      2.23      .030      .030      .030      .029    588.20    292.00
  .000168       10.       10.       10.         0         0         0      0.00    610.00    964.00

*SECNO 130227.000

3265 DIVIDED FLOW

3370 NORMAL BRIDGE,NRD= 15 MIN ELTRD=  625.60 MAX ELLC=  634.90

130227.00     23.90    612.10      0.00      0.00    612.28       .18       .01       .00    595.60
   21000.     3316.    15204.     2481.     1695.     4041.     1112.     1209.       98.    601.80
      .45      1.96      3.76      2.23      .030      .030      .030      .029    588.20    292.00
  .000167       68.       68.       68.         0         0         0      0.00    610.00    964.00

*SECNO 130228.000

3265 DIVIDED FLOW

   SECNO     DEPTH     CWSEL     CRIWS     WSELK      EG        HV        HL       OLOSS   BANK ELEV
   Q         QLOB      QCH       QRCB      ALOB       ACH       ARCB      VOL       TWA   LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL        XNCH      XNR       WTN       ELMIN      SSTA
   SLOPE     XLOBL     XLCH      XLCBR     ITRIAL     IDC       ICONT     CORAR     TOPWID     ENDST

130228.00     23.90    612.10      0.00      0.00    612.28       .18       .00       .00    595.60
   21000.     3316.    15203.     2481.     1696.     4041.     1112.     1210.       99.    601.80
      .45      1.96      3.76      2.23      .030      .030      .030      .029    588.20    292.00
  .000167       10.       10.       10.         0         0         0      0.00    610.00    964.00

*SECNO 130275.000
3280 CROSS SECTION 130275.00 EXTENDED      6.85 FEET


3470 ENCROACHMENT STATIONS=      460.0     1020.0  TYPE=      1  TARGET=      560.000
130275.00     25.05    612.05      0.00      0.00    612.31       .25       .01       .02    610.90
   21000.      194.    19330.     1476.      219.     4627.      895.     1218.       99.    607.10
      .46      .88      4.18      1.65      .030      .030      .030      .029    587.00    460.00
  .000145       50.       50.       50.         2         0         0      0.00    560.00   1020.00

*SECNO 130750.000
3280 CROSS SECTION 130750.00 EXTENDED      7.29 FEET

130750.00     24.19    612.29      0.00      0.00    612.36       .07       .04       .02    607.40
   21000.       93.    10190.    10717.      198.     3927.     6715.     1300.      107.    602.90
      .51      .47      2.60      1.60      .050      .030      .030      .029    588.10     10.19
  .000053      430.      430.      430.         2         0         0      0.00    989.81   1000.00

*SECNO 131700.000
3280 CROSS SECTION 131700.00 EXTENDED      3.82 FEET
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3470 ENCROACHMENT STATIONS=          .0     1250.0  TYPE=     *1  TARGET=     1249.999
131700.00     25.22    612.32      0.00      0.00    612.43       .11       .06       .01    612.20
   21000.        0.    12970.    8030.        0.     4067.     5533.     1518.      130.    604.90
      .62       .04      3.15     1.45      .053      .030      .030      .029    587.10     53.52
  .000085      900.      900.      950.         2         0         0      0.00   1196.48   1250.00

*SECNO 131750.000

3265 DIVIDED FLOW

3280 CROSS SECTION 131750.00 EXTENDED       4.83 FEET


          CURRIE PARKWAY BRIDGE, MAXLC 612.9,MIN TR 614,WIDTH 18

131750.00     25.62    612.32      0.00      0.00    612.44       .12       .01       .00    614.00
   21000.        0.    10171.   10829.        0.     2744.     7246.     1529.      132.    614.10
      .62      0.30      3.71     1.49      .035      .030      .035      .029    586.70    104.09
  .000130       50.       50.      50.         0         0         0      0.00   1511.15   1660.00

*SECNO 131751.000

3265 DIVIDED FLOW

3280 CROSS SECTION 131751.00 EXTENDED       4.87 FEET

   SECNO     DEPTH     CWSEL     CRIWS     WSELK     FG        HV        HL        QLOSS    BANK ELEV
   Q         QLOB      CCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XACH      XAR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST


3370 NORMAL BRIDGE,NRC=  0 MIN ELTRD=  605.40 MAX ELLC=  615.60

131751.00     25.67    612.37      0.00      0.00    612.45       .08       .00       .00    614.00
   21000.        0.     7519.    13481.        0.     2750.     7307.     1529.      132.    614.10
      .62      0.30      2.73     1.84      .035      .050      .035      .029    586.70    104.08
  .000196        1.        1.       1.         2         0         0      0.00   1512.29   1660.00

*SECNO 131752.000

3265 DIVIDED FLOW

3280 CROSS SECTION 131752.00 EXTENDED       4.87 FEET


3370 NORMAL BRIDGE,NRC=  0 MIN ELTRD=  605.40 MAX ELLC=  615.60

131752.00     25.68    612.39      0.00      0.00    612.45       .08       .00       .00    614.00
   21000.        0.     7516.    13484.        0.     2751.     7311.     1533.      133.    614.10
      .62      0.30      2.73     1.84      .035      .050      .035      .029    586.70    104.08
  .000195       18.       18.      18.         0         0         0      0.00   1512.36   1660.00
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*SECNO 131753.000

3265 DIVIDED FLOW

3280 CROSS SECTION 131753.00 EXTENDED       4.88 FEET


131753.00     25.68    612.38      0.00      0.00    612.45       .08       .00       .00    614.00
   21000.        0.     7515.    13485.        0.     2751.     7312.     1534.      123.    614.10
      .62      0.00      2.73      1.84      .035      .050      .035      .029    586.70    104.08
  .000195        1.        1.        1.         0         0         0      0.00   1512.38   1660.00


*SECNO 131800.000
3280 CROSS SECTION 131800.00 EXTENDED       3.91 FEET


131800.00     28.11    612.41      0.00      0.00    612.46       .05       .01       .00    611.40
   21000.        3.     8346.    12651.       11.     3741.     8529.     1546.      134.    599.20
      .63       .28      2.23      1.48      .035      .050      .035      .030    584.30     55.42
  .000105       50.       50.       50.         2         0         0      0.00   1604.58   1660.00


1490 NH CARD USED
*SECNO 133600.000
3280 CROSS SECTION 133600.00 EXTENDED      10.80 FEET


133600.00     27.80    612.50      0.00      0.00    612.56       .06       .10       .00    602.60
   21000.     7367.    10133.     2500.     10055.     3856.     3193.     2010.      188.    595.80
      .87       .73      2.60      1.10      .057      .030      .031      .035    584.70      0.00
  .000047     1200.     1700.     1300.         2         0         0      0.00   1980.00   1980.00


*SECNO 135700.000
3280 CROSS SECTION 135700.00 EXTENDED       1.08 FEET


   SECNO     DEPTH     CWSEL     CRIWS     WSELK     FG        HV        HL        OLOSS    BANK ELEV
   Q         OLOB      OCH       OROB      ALOB      ACH       AROB      VOI       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLCBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST


          U/S OF CONFLUENCE WITH SNAKE CREEK

135700.00     20.98    612.58      0.00      0.00    612.61       .04       .05       .00    605.50
   21000.     5541.     9742.     5716.     4224.     4580.     5641.     2534.      245.    606.80
     1.13      1.31      1.96       .59      .030      .030      .060      .034    591.60      7.92
  .000033     1200.     1400.     1250.         2         0         0      0.00   1972.08   1980.00


1490 NH CARD USED
*SECNO 136100.000
3280 CROSS SECTION 136100.00 EXTENDED       1.72 FEET


136100.00     21.01    612.61      0.00      0.00    612.65       .05       .04       .00    605.90
   21000.      398.     9776.    10826.      433.     4006.    14921.     2944.      292.    596.00
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     1.30      .92     2.44      .73     .030     .030     .060     .034   591.60    10.60
  .000049    1000.    1000.     900.        0        0        0     0.00  2489.40  2500.00

1490 NF CARD USED
*SECNO 137500.000
3280 CROSS SECTION 137500.00 EXTENDED       2.66 FEET


          U/S OF CONFLUENCE WITH STURGEON CREEK

137500.00    22.47   612.67     0.00     0.00   612.72      .05      .07      .00   610.00
   21000.     274.   10797.    9529.     466.    4313.   14399.    3473.     362.   596.90
     1.53      .59     2.50      .69     .030     .030     .060     .034   590.20     5.59
  .000051    1500.    1500.    1100.        0        0        0     0.00  2744.41  2750.00

*SECNO 140000.000
3280 CROSS SECTION 140000.00 EXTENDED       3.28 FEET

140000.00    22.58   612.78     0.00     0.00   612.89      .11      .15      .02   605.00
   21000.    2699.   13842.    4460.    2665.    4235.    6814.    4287.     482.   604.50
     1.79     1.01     3.27      .65     .060     .030     .060     .034   590.20     0.00
  .000086    2400.    2450.    2000.        0        0        0     0.00  2280.00  2280.00

*SECNO 142550.000
3280 CROSS SECTION 142550.00 EXTENDED       5.61 FEET

142550.00    22.81   613.01     0.00     0.00   613.07      .06      .17      .01   603.30
   21000.    9791.   10034.    1175.   12335.    3774.    2680.    5202.     614.   609.30
     2.20      .79     2.66      .44     .060     .030     .060     .033   590.20     0.00
  .000058    2400.    2500.    2500.        2        0        0     0.00  2400.00  2400.00
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*****************************************************
*  WATER SURFACE PROFILES                           *
*  VERSION OF NOVEMBER 1976                         *
*  UPDATED JULY 1979                                *
*                                                   *
*  RUN DATE  05/11/83  TIME 15.03.31.               *
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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) 449-2105        *
*****************************************
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5/11/83 MID DOWN 8

(3) X3 CARDS ADDED

```
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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5/11
A-1

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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CODE -  01,02,03
  MODIFICATION -  50,51,52,53
*****************************************************


C
T1        TETTABAWASSEE RIVER AT MIDLAND
T2        FIS REVIEW
T3        1948 FLOOD

J1  ICHECK     INQ       NINV      IDIR      STRT      METRIC    HVINS     O         WSEL      FQ

      0.        6.        0.        0.  0.000000      0.00      0.0       0.   610.800     0.000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHAIM     ITRACE

      1.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

QT      5.000  27500.000  41000.000  47000.000  61600.000  34000.000      0.000      0.000      0.000      0.000
NC       .035       .035       .030       .100       .300      0.000      0.000      0.000      0.000      0.000

X1 123500.000     14.000    132.000    429.000    100.000    100.000    100.000      0.000      0.000      0.000
GR    613.700      0.000    605.600     92.000    596.400    112.000    595.200    132.000    596.800    184.000
GR    595.700    225.000    593.200    226.000    591.100    307.000    592.600    348.000    594.900    389.000
GR    596.700    429.000    603.500    457.000    607.000    553.000    613.900    580.000      0.000      0.000

          DOW CHEMICAL R.R. AND VEHICLE BRIDGE

X1 124100.000     18.000    102.000    398.000    500.000    500.000    450.000      0.000      0.000      0.000
X3     10.000      0.000      0.000      0.000      0.000      0.000      0.000    614.900    614.900      0.000
GR    614.900      0.000    607.200    102.000    595.200    134.000    596.800    150.000    592.200    175.000
GR    591.600    195.000    591.300    214.000    590.900    233.000    590.900    249.000    607.500    249.000
GR    607.500    255.000    590.500    255.000    590.700    281.000    591.100    309.000    593.500    327.000
GR    594.600    365.000    596.800    398.000    614.800    500.000      0.000      0.000      0.000      0.000
SB      1.150      1.250      2.500      0.000    256.000      6.000   5310.000       .900    555.000    555.000

X1 124101.000      0.000      0.000      0.000     29.000     29.000     29.000      0.000      0.000      0.000
X2      0.000      0.000      1.000    612.000    618.600      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    614.900    614.900      0.000
BT      4.000      0.000    614.500    614.900    102.000    618.600    611.800    398.000    618.700    612.000
BT    503.300    614.800    614.800      0.000      0.000      0.000      0.000      0.000      0.000      0.000

X1 124300.000     23.000    105.000    423.000    100.000    100.000    150.000      0.000      0.000      0.000
X3     10.000      0.000      0.000      0.000      0.000      0.000      0.000    620.000    620.000      0.000
GR    613.800      0.000    614.100     42.000    621.000     54.000    613.400    105.000    608.400    127.000
GR    594.700    154.000    596.300    174.000    591.500    174.000    598.700    192.000    588.200    210.000
GR    587.800    228.000    586.900    246.000    586.900    262.000    618.800    262.000    618.800    266.000
GR    585.900    266.000    586.600    292.000    585.900    320.000    596.200    348.000    587.800    376.000
GR    596.300    402.000    604.300    423.000    620.400    500.000      0.000      0.000      0.000      0.000
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X1 124300.000     13.000    118.000    450.000    400.000    400.000    400.000      0.000      0.000      0.000
GR     613.800      0.000    613.700    118.000    594.700    149.000    596.300    169.000    587.400    209.000
GR     587.200    249.000    586.800    289.000    588.600    328.000    590.200    367.000    596.300    406.000
GR     605.000    450.000    613.000    550.000    607.000    670.000      0.000      0.000      0.000      0.000
OT       5.000  27500.000  40700.000  45800.000  54600.000  34000.000      0.000      0.000      0.000      0.000

X1 124600.000     15.000     87.000    398.000   1300.000    650.000   1200.000      0.000      0.000      0.000
GR     623.000      0.000    623.400     87.000    596.100    139.000    590.300    181.000    586.800    222.000
GR     586.300    263.000    587.600    304.000    589.100    345.000    596.100    386.000    604.700    398.000
GR     603.900    477.000    605.600    527.000    605.100    538.000    600.000    600.000    600.000    950.000

X1 126800.000     12.000     87.000    410.000    900.000    750.000    800.000      0.000      0.000      0.000
GR     623.400     87.000    596.100    139.000    590.300    181.000    586.800    222.000    586.300    263.000
GR     587.800    304.000    585.100    345.000    596.100    386.000    600.000    410.000    605.000    415.000
GR     600.000    420.000    600.000    750.000      0.000      0.000      0.000      0.000      0.000      0.000
OT       5.000  27500.000  41000.000  47000.000  61600.000  34000.000      0.000      0.000      0.000      0.000
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GEORGE ST. BRIDGE,MAXIC.639.2,MIN TR 631.5,WIDTH 64,LENGTH 694

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X1 127550.000     60.000    104.000    791.000    600.000    600.000    600.000      0.000      0.000      0.000
GR     641.000      0.000    624.700    104.000    624.100    183.000    638.700    183.000    638.700    187.000
GR     624.100    187.000    614.000    213.000    614.000    238.000    614.200    279.000    635.200    275.000
GR     639.200    283.000    614.200    283.000    595.800    298.000    589.800    322.000    584.700    345.000
GR     584.300    370.000    638.900    370.000    638.900    374.000    584.300    374.000    585.200    405.000
GR     585.900    430.000    585.300    460.000    637.100    460.000    637.100    464.000    589.300    464.000
GR     589.000    485.000    591.300    505.000    595.800    524.000    600.600    536.000    605.400    550.000
GR     634.700    550.000    634.700    554.000    605.400    554.000    605.400    640.000    631.200    640.000
GR     631.200    644.000    605.400    644.000    605.400    730.000    627.400    730.000    627.400    734.000
GR     605.400    734.000    607.400    756.000    620.000    791.000    629.000    865.000    626.000    965.000
GR     623.000   1065.000    621.700   1165.000    620.500   1265.000    619.800   1365.000    615.000   1465.000
GR     618.500   1565.000    618.000   1665.000    618.000   2065.000    617.600   2165.000    617.000   2265.000
GR     615.000   2465.000    614.000   2565.000    613.000   2665.000    612.000   2765.000    611.000   2865.000

X1 127551.000      0.000      0.000      0.000     10.000     10.000     10.000      0.000      0.000      0.000
BT      27.000      0.000    641.000    641.000    104.000    644.600    637.900    183.000    645.600    638.700
BT     279.000    646.000    639.200    370.000    645.400    638.600    460.000    644.000    637.100    550.000
BT     641.600    634.700    640.000    638.100    631.200    730.000    634.300    627.400    791.000    631.500
BT     624.700    865.000    625.000    629.300    565.000    626.000    626.000   1065.000    623.000    623.000
BT    1165.000    621.700    621.700   1265.000    620.500    620.500   1365.000    615.800    615.800   1465.000
BT     619.300    615.000   1565.000    618.500    618.500   1665.000    618.000    618.000   2065.000    618.000
BT     618.000   2165.000    617.600    617.600   2265.000    617.000    617.000   2465.000    615.000    615.000
BT    2565.000    614.000    614.000   2665.000    613.000    613.000   2765.000    612.000    612.000   2865.000
BT     611.000    611.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000

X1 127552.000      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

X1 127553.000      0.000      0.000      0.000     10.000     10.000     10.000      0.000      0.000      0.000
OT       5.000  27500.000  40700.000  45800.000  54600.000  34000.000      0.000      0.000      0.000      0.000

X1 128100.000     15.000    323.000    665.000    700.000    900.000    550.000      .843      0.000      0.000
X3       1.300      0.000      0.000    300.000      0.000      0.000      0.000      0.000      0.000      0.000
GR     623.600      0.000    613.200    175.000    615.400    323.000    597.600    324.000    596.600    331.000
GR     594.700    365.000    591.500    405.000    591.000    440.000    589.000    475.000    586.000    510.000
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GR	585.500	545.000	594.300	585.000	594.600	615.000	605.000	665.000	605.000	1300.000
NH	3.030	.016	413.000	.033	640.000	.060	1150.000	0.000	0.000	0.000

D/S OF CONFLUENCE WITH CHIPPEWA RIVER

X1	129100.000	12.000	413.000	640.000	1000.000	700.000	900.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	150.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	607.200	0.000	607.000	368.000	600.300	413.000	596.500	418.000	591.500	455.000
GR	588.500	490.000	584.100	530.000	586.900	565.000	589.400	605.000	596.500	640.000
GR	605.000	690.000	605.000	1150.000	0.000	0.000	0.000	0.000	0.000	0.000
OT	5.000	17700.000	26400.000	30300.000	39700.000	21000.000	0.000	0.000	0.000	0.000
NC	.030	.030	.030	0.000	0.000	0.000	0.000	0.000	0.000	0.000

U/S OF CONFLUENCE WITH CHIPPEWA RIVER

X1	129350.000	13.000	413.000	640.000	90.000	1000.000	250.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	150.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	607.200	0.000	607.000	368.000	600.300	413.000	596.500	418.000	591.500	455.000
GR	588.500	490.000	594.100	530.000	586.800	565.000	589.400	605.000	596.500	640.000
GR	600.000	645.000	600.000	700.000	600.000	1300.000	0.000	0.000	0.000	0.000

X1	130175.000	22.000	600.000	870.000	750.000	750.000	750.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	490.000	0.000	1030.000	0.000	0.000	0.000	0.000
GR	628.600	0.000	630.800	100.000	622.200	200.000	611.400	285.000	612.200	370.000
GR	603.800	395.000	606.800	440.000	605.000	500.000	604.800	580.000	606.200	600.000
GR	595.600	628.000	591.200	660.000	586.300	690.000	585.200	720.000	587.200	750.000
GR	590.500	780.000	591.200	810.000	595.600	842.000	604.800	870.000	604.900	1000.000
GR	599.400	1100.000	601.000	1200.000	0.000	0.000	0.000	0.000	0.000	0.000

M-20 BRIDGE,MAX LC 634.5,MIN TR 626.6,WIDTH 68,LENGTH 671

X1	130225.000	52.000	620.000	826.000	50.000	50.000	50.000	0.000	0.000	0.000
GR	633.400	200.000	636.700	292.000	610.400	292.000	608.600	343.000	633.300	343.000
GR	633.300	350.000	608.600	350.000	611.000	383.000	604.900	394.000	634.400	394.000
GR	634.400	401.000	604.900	401.000	605.800	464.000	634.800	464.000	634.800	471.000
GR	605.800	471.000	604.600	523.000	634.900	523.000	634.900	530.000	604.600	530.000
GR	605.400	590.000	634.500	590.000	630.900	600.000	605.400	600.000	595.600	620.000
GR	588.300	640.000	588.600	659.000	627.700	659.000	627.700	666.000	586.600	666.000
GR	590.200	705.000	590.200	730.000	591.600	771.000	624.200	771.000	624.200	778.000
GR	591.630	778.000	592.900	810.000	595.600	818.000	601.800	826.000	602.800	845.000
GR	622.900	845.000	626.400	850.000	602.800	850.000	603.400	904.000	624.400	904.000
GR	624.400	909.000	603.400	909.000	604.800	964.000	626.600	964.000	625.600	1000.000
GR	622.700	1100.000	620.600	1200.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	130226.000	0.000	0.000	0.000	10.000	10.000	10.000	0.000	0.000	0.000
BT	15.000	200.000	633.400	633.400	292.000	636.700	631.900	343.000	638.200	633.300
BT	354.000	630.300	634.400	464.000	639.600	634.800	523.000	639.700	634.900	590.000
BT	639.300	634.500	600.000	639.300	630.900	659.000	636.800	627.700	771.000	633.300
BT	624.200	845.000	630.600	622.900	850.000	630.600	626.400	904.000	629.700	624.400
BT	564.700	626.600	622.500	1000.000	625.600	625.600	0.000	0.000	0.000	0.000

X1	130227.000	0.000	0.000	0.000	68.000	68.000	68.000	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

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X1 130228.000      0.000      0.000      0.000     10.000     10.000     10.000      0.000      0.000      0.000

X1 130275.000     22.000    580.000    821.000     50.000     50.000     50.000      0.000      0.000      0.000
X3      0.000      0.000      0.000    460.000      0.000   1020.000      0.000      0.000      0.000      0.000
GR    623.700      0.000    634.800    100.000    629.000    200.000    616.400    300.000    616.400    370.000
GR    609.600    297.000    611.500    440.000    605.600    470.000    610.900    580.000    595.600    615.000
GR    592.200    645.000    590.000    675.000    587.600    700.000    587.000    725.000    589.300    755.000
GR    591.300    780.000    595.600    810.000    607.100    821.000    606.900    950.000    605.800   1005.000
GR    604.600   1125.000    605.200   1200.000      0.000      0.000      0.000      0.000      0.000      0.000
NC       .050       .030       .030      0.000      0.000      0.000      0.000      0.000      0.000      0.000

X1 130750.000     19.000     88.000    284.000    430.000    430.000    430.000      0.000      0.000      0.000
GR    621.800      0.000    610.600     12.000    611.100     26.000    612.000     35.000    610.400     45.000
GR    608.400     65.000    607.400     88.000    595.800    105.000    591.600    135.000    588.100    165.000
GR    585.100    190.000    590.200    220.000    591.100    250.000    595.800    276.000    602.500    284.000
GR    604.000    483.000    602.100    660.000    600.900    760.000    605.000   1000.000      0.000      0.000

X1 131700.000     16.000     56.000    270.000    900.000    950.000    900.000      0.000      0.000      0.000
X3      0.000      0.000      0.000      0.000      0.000   1250.000      0.000      0.000      0.000      0.000
GR    615.000      0.000    612.200     56.000    596.500     81.000    590.400    110.000    587.600    140.000
GR    587.100    165.000    586.700    195.000    592.300    220.000    596.500    246.000    604.900    270.000
GR    607.500    303.000    606.600    500.000    605.700    700.000    606.900    810.000    606.700   1130.000
GR    608.500   1400.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000
NC       .035       .035       .030      0.000      0.000      0.000      0.000      0.000      0.000      0.000

          CURRIE PARKWAY BRIDGE, MAXLC 612.8,MIN TR 614,WIDTH 18

X1 131750.000     18.000    104.000    240.000     50.000     50.000     50.000      0.000      0.000      0.000
GR    615.600      0.000    614.000    104.000    612.700    104.000    596.300    108.000    594.800    130.000
GR    587.400    150.000    586.700    170.000    589.700    190.000    592.700    215.000    596.500    236.000
GR    612.700    240.000    614.100    240.000    611.600    303.000    606.000    500.000    605.400    700.000
GR    606.900    810.000    606.700   1130.000    607.500   1660.000      0.000      0.000      0.000      0.000
NC       .035       .035       .050      0.000      0.000      0.000      0.000      0.000      0.000      0.000

X1 131751.000      0.000      0.000      0.000      1.000      1.000      1.000      0.000      0.000      0.000
BT      0.000      0.000    615.600    615.600    104.000    614.000    612.700    240.000    614.100    612.800
BT    303.000    611.600    611.600    500.000    606.000    606.000    700.000    605.400    605.400    810.000
BT    606.900    606.900   1130.000    605.700    606.700   1660.000    607.500    607.500      0.000      0.000

X1 131752.000      0.000      0.000      0.000     18.000     18.000     18.000      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

X1 131753.000      0.000      0.000      0.000      1.000      1.000      1.000      0.000      0.000      0.000

X1 131800.000     16.000     77.000    256.000     50.000     50.000     50.000      0.000      0.000      0.000
GR    615.300      0.000    611.400     77.000    596.500     93.000    591.500    120.000    584.300    150.000
GR    586.900    175.000    590.300    201.000    591.800    230.000    596.500    254.000    599.200    256.000
GR    605.400    303.000    605.600    500.000    603.600    700.000    606.900    810.000    606.700   1130.000
GR    609.500   1660.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000
NH      5.000       .060   1147.000       .030   1234.000       .030   1413.000       .050   1423.000       .030
NH   1980.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000
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X1	133600.000	17.000	1234.000	1413.000	1200.000	1300.000	1700.000	0.000	0.000	0.000
GR	601.700	0.000	604.100	330.000	605.300	1040.000	605.800	1147.000	604.700	1225.000
GR	602.600	1234.000	595.600	1245.000	585.000	1275.000	589.300	1300.000	590.000	1330.000
GR	584.700	1360.000	592.100	1385.000	595.800	1413.000	603.000	1423.000	605.500	1533.000
GR	607.400	1768.000	610.200	1980.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	.030	.060	.030	0.000	0.000	0.000	0.000	0.000	0.000	0.000

U/S OF CONFLUENCE WITH SNAKE CREEK

X1	135700.000	18.000	440.000	708.000	1200.000	1250.000	1400.000	0.000	0.000	0.000
GR	614.700	0.000	613.100	6.000	598.400	60.000	605.400	396.000	605.900	440.000
GR	596.200	454.000	591.600	490.000	591.900	530.000	592.900	570.000	593.200	610.000
GR	592.300	650.000	596.200	690.000	606.800	708.000	602.000	920.000	600.400	1200.000
GR	606.000	1450.000	608.000	1770.000	611.500	1980.000	0.000	0.000	0.000	0.000
NH	3.000	.030	115.000	.030	325.000	.060	2500.000	0.000	0.000	0.000

X1	136100.000	23.000	115.000	325.000	1000.000	900.000	1000.000	0.000	0.000	0.000
GR	614.200	0.000	612.800	10.000	609.100	22.000	607.600	105.000	605.900	115.000
GR	596.000	126.000	591.600	162.000	591.900	202.000	592.900	242.000	593.200	282.000
GR	596.000	325.000	603.400	332.000	602.100	348.000	606.400	362.000	604.800	510.000
GR	602.300	790.000	600.200	880.000	602.000	1250.000	603.900	1380.000	604.000	1490.000
GR	608.300	1750.000	610.000	1910.000	610.900	2500.000	0.000	0.000	0.000	0.000
NH	3.000	.030	233.000	.030	465.000	.060	2750.000	0.000	0.000	0.000

U/S OF CONFLUENCE WITH STURGEON CREEK

X1	137500.000	22.000	233.000	465.000	1500.000	1100.000	1500.000	0.000	0.000	0.000
GR	614.900	0.000	611.300	9.000	608.200	18.000	610.600	23.000	611.300	50.000
GR	610.000	233.000	596.500	263.000	591.600	290.000	590.700	320.000	591.300	350.000
GR	591.900	380.000	592.600	410.000	596.900	465.000	604.800	478.000	608.300	490.000
GR	609.700	550.000	608.500	700.000	601.500	1100.000	601.300	1500.000	606.000	1700.000
GR	608.000	1800.000	610.000	2750.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	.060	.060	.030	0.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	140000.000	20.000	291.000	599.000	2400.000	2000.000	2450.000	0.000	0.000	0.000
GR	610.100	0.000	598.500	142.000	604.800	245.000	605.000	291.000	595.600	307.000
GR	591.600	330.000	590.200	360.000	591.300	390.000	591.900	420.000	592.600	450.000
GR	595.600	496.000	604.500	509.000	605.900	532.000	603.300	548.000	605.500	575.000
GR	603.000	900.000	604.000	980.000	610.000	1040.000	611.000	1130.000	609.500	2280.000

X1	142550.000	21.000	1451.000	1644.000	2400.000	2500.000	2500.000	0.000	0.000	0.000
GR	607.400	0.000	602.500	310.000	604.200	410.000	604.000	600.000	601.900	820.000
GR	607.000	1200.000	606.400	1300.000	607.600	1376.000	607.500	1391.000	603.700	1408.000
GR	603.300	1451.000	595.600	1454.000	591.600	1480.000	590.200	1510.000	591.300	1540.000
GR	591.900	1570.000	592.600	1600.000	595.600	1620.000	600.300	1644.000	605.400	1800.000
GR	609.600	2400.000	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

5/11/83

MID DOW B

(3) X3 CARDS ADDED

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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CODE -  01,02,03
  MODIFICATION -  50,51,52,53
*****************************************************

T1        TITTABAWASSEE RIVER AT MIDLAND
T2        EIS REVIEW
T3        100 YR FLOOD

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     0         WSEL      FQ

      0.        4.        0.        0.  0.000000      0.00      0.0       0.   612.850     0.000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     3.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
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*PROF 3

CCHV=     .100 CEHV=     .200
*SECNO 123500.000
   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      XLCBR     ITRIAL    IDC       ICONT     CORAR     TOPWID     ENDST

123500.00    21.75   612.85      0.00   612.85   613.54       .69      0.00      0.00   595.20
   47000.    3500.   39458.    4042.     865.    5578.     1130.        0.        0.    596.70
      0.00     4.04     7.07     3.59     .035     .030      .035     0.000    591.10     9.90
  .000412     100.     100.     100.        0        0         0      0.00    566.33   576.23

*SECNO 124100.000

3455 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=       614.90 ELREA=       614.90

          DOW CHEMICAL R.R. AND VEHICLE BRIDGE

124100.00    22.09   612.79      0.00      0.00   613.90      1.11       .24       .13   607.20
   47000.       0.   47000.        0.        0.    5562.        0.       69.        5.    596.80
      .01     0.00     8.45      0.00     .035     .030      .035      .030    590.70   102.00
  .000679     500.     450.      500.        2        0         0      0.00    296.00   398.00


SPECIAL BRIDGE

SB   XK        XKOR      COEQ      ROLEN     BWC       BWP       BAREA     SS        ELCHL     ELCHD
     1.15      1.25      2.50      0.00    256.00      6.00   5310.00       .90    595.00    595.00

*SECNO 124101.000
PRESSURE FLOW

 EGPRS      EGLWC       H3       QWEIR      QPR       BAREA   TRAPEZOID      ELLC      ELTRD
                                                                 AREA
   614.31    618.96      .07        0.    47000.     5310.     4510.      612.00    618.60


3455 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=       614.90 ELREA=       614.90

124101.00    22.56   613.26      0.00      0.00   614.31      1.06       .41      0.00   607.20
   47000.       0.   47000.        0.        0.    5701.        0.       73.        5.    596.80
      .02     0.00     8.24      0.00     .035     .030      .035      .030    590.70   102.00
  .000625      29.      29.       29.        2        0         0      0.00    296.00   398.00

*SECNO 124300.000

3265 DIVIDED FLOW

3455 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=       620.00 ELREA=       620.00
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124300.00    27.79    613.69      0.00      0.00    614.42       .73       .07       .03    613.40
   47000.       0.    47000.       0.        0.    6838.       0.       94.        6.    604.30
      .02     0.00      6.87      0.00      .035      .030      .035      .030    595.90    105.00
  .000407     100.      150.      100.         2         0         0      0.00    314.00    423.00

*SECNO 124700.000
3280 CROSS SECTION 124700.00 EXTENDED      7.00 FEET

   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EC        HV        HL        CLOSS    BANK ELEV
   C         OLOB      OCH       ORCB      ALOB      ACH       ARCB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VRCB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XICH      XLCBF     ITRIAL    IEC       ICCNT     CORAR     TOPWID      ENDST

124700.00    27.20    614.00      0.00      0.00    614.57       .57       .13       .02    613.70
   47000.       8.    44011.    2580.       30.     7091.    1311.      164.       10.    605.00
      .04      .28      6.21      2.27      .035      .030      .035      .030    586.80      0.00
  .000273     400.      400.      400.         2         0         0      0.00    670.00    670.00

*SECNO 126000.000
3280 CROSS SECTION 126000.00 EXTENDED     14.58 FEET

126000.00    28.28    614.58      0.00      0.00    614.79       .20       .18       .04    623.40
   45800.       0.    28106.   17654.        0.     6712.    7110.      418.       27.    604.70
      .13     0.00      4.19      2.49      .035      .030      .035      .032    586.30    103.79
  .000115    1300.     1200.      650.         2         0         0      0.00    846.21    950.00

*SECNO 126800.000
3280 CROSS SECTION 126800.00 EXTENDED     14.64 FEET

126800.00    28.34    614.64      0.00      0.00    614.90       .26       .10       .02    623.40
   45800.       0.    31691.   14109.        0.     6556.    4953.      647.       40.    600.00
      .18     0.00      4.56      2.85      .035      .030      .035      .031    586.30    103.68
  .000135     900.      800.      750.         2         0         0      0.00    646.32    750.00

*SECNO 127550.000

3265 DIVIDED FLOW

3280 CROSS SECTION 127550.00 EXTENDED      3.63 FEET


          GEORGE ST. BRIDGE,MAXIC.639.2,MIN TR 621.5,WIDTH 64,LENGTH 694

127550.00    30.33    614.63      0.00      0.00    615.11       .48       .14       .07    624.70
   47000.       0.    45914.    1086.        0.     8180.     659.      790.       50.    620.00
      .21     0.00      5.61      1.65      .035      .030      .035      .031    584.30    211.38
  .000505     600.      600.      600.         2         0         0      0.00    903.75   2865.00

*SECNO 127551.000
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3265 DIVIDED FLOW

3280 CROSS SECTION 127551.00 EXTENDED      3.63 FEET


3370 NORMAL BRIDGE,NRD= 27 MIN ELTRD=  611.00 MAX ELLC=  641.00

127551.00    30.34   614.64     0.00     0.00   615.11      .48      .01      .00   624.70
   47000.       0.   45911.    1089.       0.    8182.     660.     792.      51.   620.00
      .21     0.00     5.61     1.65     .035     .030     .035     .031   584.30   211.37
  .000505      10.      10.      10.        0        0        0     0.00   904.09  2865.00

*SECNO 127552.000

3265 DIVIDED FLOW

3280 CROSS SECTION 127552.00 EXTENDED      3.67 FEET

   SECNO    DEPTH    CWSEL    CRIWS    WSELK    FC       FV       HL       QLOSS   BANK ELEV
   Q        QLOB     QCH      QRCB     ALOB     ACH      ARCB     VOL      TWA   LEFT/RIGHT
   TIME     VLOB     VCH      VRCB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
   SLOPE    XLOBL    XLCH     XLCBR    ITRIAL   ICC      ICCNT    CORAR    TOPWID     ENDST


3370 NORMAL BRIDGE,NRD= 27 MIN ELTRD=  611.00 MAX ELLC=  641.00

127552.00    30.37   614.67     0.00     0.00   615.15      .48      .03      .00   624.70
   47000.       0.   45888.    1112.       0.    8201.     673.     805.      52.   620.00
      .21     0.00     5.60     1.65     .035     .030     .035     .031   584.30   211.28
  .000501      64.      64.      64.        0        0        0     0.00   907.71  2865.00

*SECNO 127553.000

3265 DIVIDED FLOW

3280 CROSS SECTION 127553.00 EXTENDED      3.68 FEET


127553.00    30.38   614.68     0.00     0.00   615.15      .48      .01      .00   624.70
   47000.       0.   45882.    1118.       0.    8205.     676.     807.      52.   620.00
      .21     0.00     5.59     1.65     .035     .030     .035     .031   584.30   211.26
  .000500      10.      10.      10.        0        0        0     0.00   908.56  2865.00

*SECNO 128100.000
3280 CROSS SECTION 128100.00 EXTENDED     10.04 FEET


3470 ENCROACHMENT STATIONS=      252.0    1092.0  TYPE=     1  TARGET=    -300.000
128100.00    29.54   615.04     0.00     0.00   615.34      .30      .17      .02   615.40
   45800.       0.   32116.   13684.       0.    6475.    5353.     962.      67.   605.00
      .25     0.00     4.96     2.56     .035     .030     .035     .030   585.50   271.34
  .000172     700.     550.     900.        0        0        0     0.00   820.66  1052.00
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1490 AE CARD USED
*SECNO 129100.000
3280 CROSS SECTION 129100.00 EXTENDED      10.16 FEET


3470 ENCROACHMENT STATIONS=      150.0     1150.0  TYPE=      1  TARGET=     -150.000

          D/S OF CONFLUENCE WITH CHIPPEWA RIVER

129100.00     31.06    615.16      0.00      0.00    615.47       .30       .13       .00    600.30
   45000.    13191.    28294.     7325.     2285.     5812.     5396.     1202.       83.    556.50
      .71      4.46      4.88      1.36      .016      .030      .060      .031    584.10    150.00
  .000131     1000.      900.      700.         2         0         0      0.00   1000.00   1150.00


*SECNO 129350.000
3280 CROSS SECTION 129350.00 EXTENDED      15.47 FEET


3470 ENCROACHMENT STATIONS=      150.0     1300.0  TYPE=      1  TARGET=     -150.000

          U/S OF CONFLUENCE WITH CHIPPEWA RIVER

129350.00     31.37    615.47      0.00      0.00    615.52       .05       .03       .03    600.30
   30300.     2487.     12494.    15320.     2366.     5872.    10219.     1419.       95.    556.50
      .39      1.05      2.13      1.50      .033      .030      .030      .029    584.10    150.00
  .000025       90.       250.     1000.         2         0         0      0.00   1150.00   1300.00


*SECNO 130175.000
3280 CROSS SECTION 130175.00 EXTENDED      14.40 FEET

   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       WTA       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    ICC       ICONT     CORAR     TOPWID      ENDST


3470 ENCROACHMENT STATIONS=      490.0     1030.0  TYPE=      1  TARGET=      540.000
130175.00     30.20    615.40      0.00      0.00    615.60       .20       .03       .04    606.20
   30300.     2508.     23993.     3609.     1140.     6244.     1711.     1656.      113.    604.80
      .45      2.70      3.84      2.23      .030      .030      .030      .029    585.20    450.00
  .000053       750.      750.      750.         2         0         0      0.00    540.00   1030.00


*SECNO 130225.000

3265 DIVIDED FLOW


          M-20 BRIDGE,MAX LC 634.5,MIN TR 626.6,WIDTH 68,LENGTH 671

130225.00     27.19    615.25      0.00      0.00    615.61       .21       .01       .00    595.60
   30300.     6523.     19615.    4162.     2654.     4675.     1535.     1667.      114.    601.80
      .45      2.46      4.20      2.71      .030      .030      .030      .029    588.20    292.00
  .000182       50.       50.       50.         0         0         0      0.00    610.00    964.00
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*SECNO 130226.000

3265 DIVIDED FLOW


3370 NORMAL BRIDGE,NRE= 15 MIN ELTRD=  625.60 MAX ELLC=  634.50

130226.00    27.20   615.40     0.00     0.00   615.61      .21      .00      .00   595.60
   30300.    6520.   19619.    4161.    2652.    4674.    1536.    1669.     114.   601.80
      .46     2.46     4.20     2.71     .030     .030     .030     .029   588.20   292.00
  .000182      10.      10.      10.        0        0        0     0.00   610.00   964.00


*SECNO 130227.000

3265 DIVIDED FLOW


3370 NORMAL BRIDGE,NRE= 15 MIN ELTRD=  625.60 MAX ELLC=  634.50

130227.00    27.21   615.41     0.00     0.00   615.62      .21      .01      .00   595.60
   30300.    6526.   19611.    4163.    2655.    4677.    1536.    1682.     115.   601.80
      .46     2.46     4.19     2.71     .030     .030     .030     .029   588.20   292.00
  .000182      68.      68.      68.        0        0        0     0.00   610.00   964.00


*SECNO 130228.000

3265 DIVIDED FLOW

130228.00    27.21   615.41     0.00     0.00   615.62      .21      .00      .00   595.60
   30300.    6527.   19610.    4163.    2656.    4677.    1536.    1684.     115.   601.80
      .46     2.46     4.19     2.71     .030     .030     .030     .029   588.20   292.00
  .000182      10.      10.      10.        0        0        0     0.00   610.00   964.00


*SECNO 130275.000
3280 CROSS SECTION 130275.00 EXTENDED      10.16 FEET


   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      XAR       WTN       FLMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IFC       ICONT     CORAR     TOPWID      ENDST


3470 ENCROACHMENT STATIONS=      460.0     1020.0  TYPE=      1  TARGET=      560.000
130275.00    28.36   615.36     0.00     0.00   615.66      .30      .01      .03   610.90
   30300.    1084.   25538.    3678.     615.    5423.    1551.    1694.     116.   607.10
      .46     1.76     4.71     2.37     .030     .030     .030     .029   587.00   460.00
  .000149      50.      50.      50.        2        0        0     0.00   560.00  1020.00


*SECNO 130750.000
3280 CROSS SECTION 130750.00 EXTENDED      10.63 FEET


130750.00    27.53   615.63     0.00     0.00   615.71      .08      .03      .02   607.40
   30300.     322.   12777.   17200.     464.    4582.    5109.    1801.     123.   602.50
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      .51       .65      2.75      1.89      .050      .030      .030      .029    588.10      6.61
  .000050      430.      430.      430.         2         0         0      0.00    993.39   1000.00

*SECNO 131700.000
3280 CROSS SECTION 131700.00 EXTENDED       7.17 FEET


3470 ENCROACHMENT STATIONS=          .0     1250.0  TYPE=      1  TARGET=     1249.999
131700.00     28.57    615.67      0.00      0.00    615.77       .10       .05       .03    612.20
   30300.       45.     14954.    15300.      116.     4183.     8815.     2099.      148.    604.90
      .63       .39      3.13      1.74      .050      .030      .030      .029    587.10       .00
  .000066      900.      900.      550.         2         0         0      0.00   1250.00   1250.00

*SECNO 131750.000
3280 CROSS SECTION 131750.00 EXTENDED       8.18 FEET


          CURRIE PARKWAY BRIDGE, MAXLC 612.8,MIN TR 614,WIDTH 18

131750.00     28.99    615.65      0.00      0.00    615.78       .09       .00       .00    614.00
   30300.       33.     10522.    19744.       92.     3201.    11572.     2116.      149.    614.10
      .63       .36      3.29      1.65      .035      .030      .035      .029    586.70      0.00
  .000085       50.       50.       50.         1         0         0      0.00   1660.00   1660.00

*SECNO 131751.000
3280 CROSS SECTION 131751.00 EXTENDED       8.20 FEET


3370 NORMAL BRIDGE,NRC=  9 MIN ELTRD=  605.40 MAX ELLC=  615.60

131751.00     29.01    615.71      0.00      0.00    615.78       .07       .00       .00    614.00
   30300.       45.     4010.    26245.       94.     3026.    11597.     2116.      149.    614.10
      .63       .48      1.32      2.19      .035      .050      .035      .029    586.70      0.00
  .000150        1.        1.        1.         1         0         0   -176.80   1660.00   1660.00

*SECNO 131752.000
3280 CROSS SECTION 131752.00 EXTENDED       8.21 FEET

   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      XAL       XACH      XAR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IOC       ICONT     CORAR     TOPWID      ENDST


3370 NORMAL BRIDGE,NRC=  9 MIN ELTRD=  605.40 MAX ELLC=  615.60

131752.00     29.01    615.71      0.00      0.00    615.78       .07       .00       .00    614.00
   30300.       46.     4004.    26249.       95.     3028.    12014.     2123.      150.    614.10
      .63       .49      1.32      2.18      .035      .050      .035      .029    586.70      0.00
  .000149       18.       18.       18.         0         0         0   -176.80   1660.00   1660.00
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*SECND 131753.000
3280 CROSS SECTION 131753.00 EXTENDED       8.21 FEET

131753.00    29.32    615.72      0.00      0.00    615.78       .06       .00       .00    614.00
   30300.      41.     7311.    22948.       95.     3205.    12015.     2123.      150.    614.10
      .63      .43      2.28      1.51      .035      .050      .035      .029    586.70      0.00
  .000114       1.        1.        1.         0         0         0      0.00   1660.00   1660.00

*SECND 131800.000
3280 CROSS SECTION 131800.00 EXTENDED       7.22 FEET

131800.00    31.44    615.74      0.00      0.00    615.79       .05       .00       .00    611.40
   30300.     130.     8841.    21330.      195.     4336.    13197.     2142.      152.    609.20
      .64      .66      2.04      1.62      .035      .050      .035      .030    584.30      0.00
  .000073      50.      50.       50.         1         0         0      0.00   1660.00   1660.00

1490 NF CARD USED
*SECND 133600.000
3280 CROSS SECTION 133600.00 EXTENDED      14.11 FEET

133600.00    31.11    615.81      0.00      0.00    615.86       .05       .07       .00    602.60
   30300.    11837.    11727.     6736.    14181.     4488.     5068.     2785.      206.    595.80
      .88      .83      2.61      1.33      .056      .030      .030      .034    584.70      0.00
  .000039     1200.     1700.     1300.         2         0         0      0.00   1980.00   1980.00

*SECND 135700.000
3280 CROSS SECTION 135700.00 EXTENDED       4.38 FEET


          U/S OF CONFLUENCE WITH SNAKE CREEK

135700.00    24.27    615.87      0.00      0.00    615.91       .04       .04       .00    605.50
   30300.     8532.    12214.     9554.     5667.     5865.    13837.     3496.      262.    606.80
      1.12     1.51      2.08       .69      .030      .030      .060      .034    591.60      0.00
  .000039     1200.     1400.     1250.         1         0         0      0.00   1980.00   1980.00

1490 NF CARD USED
*SECND 136100.000
3280 CROSS SECTION 136100.00 EXTENDED       5.00 FEET

   SECND     DEPTH     CWSEL     CRIWS    WSELK     EG        HV        HL        CLOSS    BANK ELEV
   C         QLOB      CCH       QRCB     ALCB      ACH       ARCB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VRCB     XNL       XACH      XAR       WTA       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLCBR    ITRIAL    ICC       ICONT     CORAR     TOPWID      ENDST

136100.00    24.30    615.90      0.00      0.00    615.94       .04       .03       .00    605.90
   30300.      960.    11710.    17631.      802.     4696.    22070.     4062.      310.    596.00
      1.30     1.20      2.45       .80      .030      .030      .060      .034    591.60      0.00
  .000041     1000.     1000.      500.         0         0         0      0.20   2500.00   2500.00
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1490 NF CARD USED
*SECNO 137500.000
3280 CROSS SECTION 137500.00 EXTENDED        5.95 FEET


          U/S OF CONFLUENCE WITH STURGEON CREEK

137500.00    25.75   615.95     0.00     0.00   616.00      .04      .05      .00   610.00
   30300.    1184.   12539.   16578.    1225.    5075.   21905.    4821.     380.   596.90
     1.54      .97     2.47      .76     .030     .030     .060     .034   590.20     0.00
  .000041    1500.    1500.    1100.        1        0        0     0.00  2750.00  2750.00

*SECNO 140000.000
3280 CROSS SECTION 140000.00 EXTENDED        6.54 FEET

140000.00    25.84   616.04     0.00     0.00   616.13      .09      .12      .02   605.00
   30300.    4001.   16194.   10104.    3613.    4545.   12579.    6027.     501.   604.50
     1.83     1.11     3.27      .80     .060     .030     .060     .034   590.20     0.00
  .000070    2400.    2450.    2000.        1        0        0     0.00  2280.00  2280.00

*SECNO 142550.000
3280 CROSS SECTION 142550.00 EXTENDED        8.83 FEET

142550.00    26.03   616.23     0.00     0.00   616.28      .05      .14      .00   602.30
   30300.   15259.   11884.    3156.   16996.    4394.    5109.    7371.     633.   605.30
     2.26      .90     2.70      .62     .060     .030     .060     .033   590.20     0.00
  .000048    2400.    2500.    2500.        2        0        0     0.00  2400.00  2400.00
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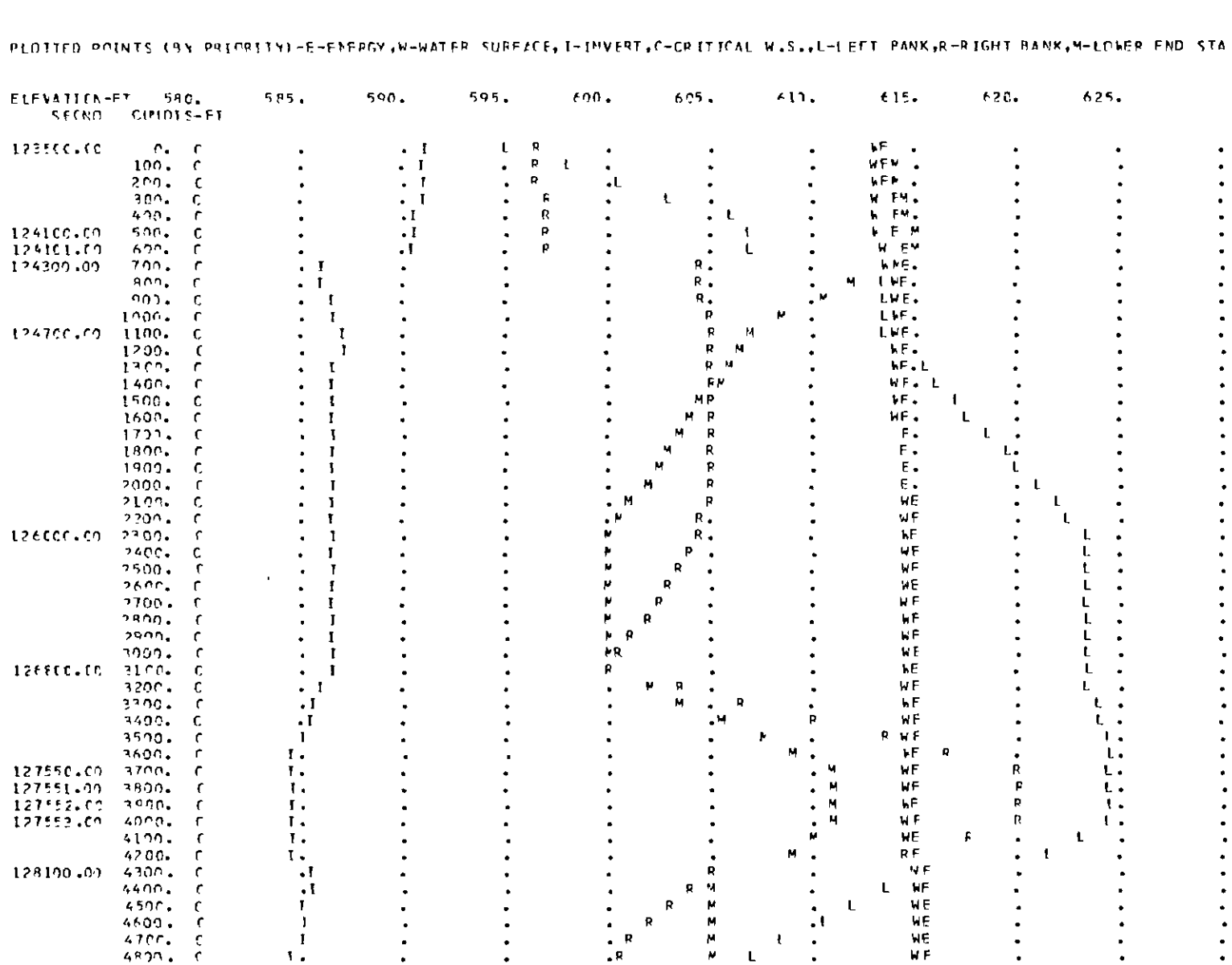
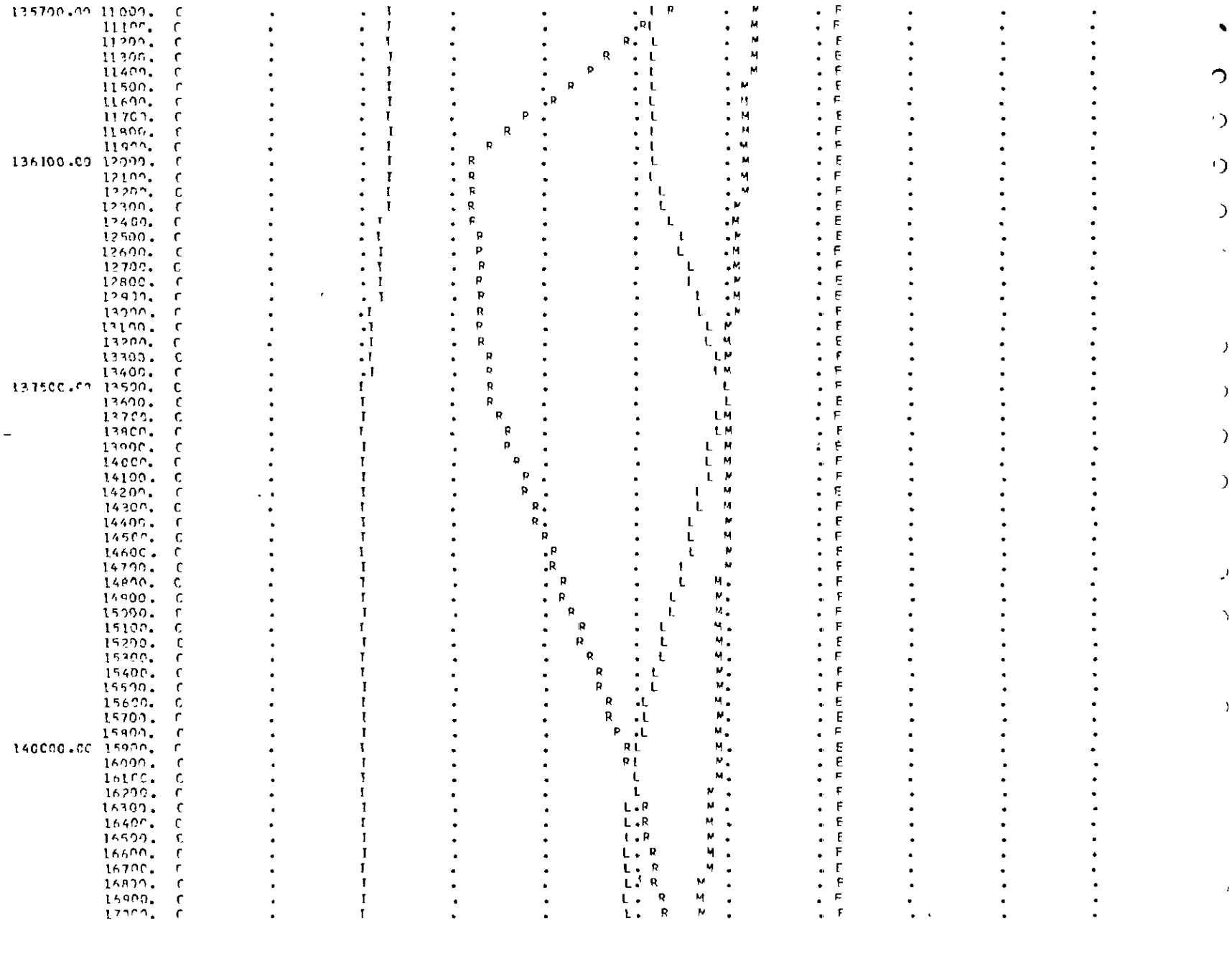
PROFILE FOR STREAM 103 YR FLOOD

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



5/n
4-10



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          17100.  C        .        I        .        .        L .   R   M   .        . E        .        .        .
          17200.  C        .        I        .        .        L .   R   M   .        . F        .        .        .
          17300.  C        .        I        .        .        L .   R   M   .        . F        .        .        .
          17400.  C        .        I        .        .        L .     PM    .        . F        .        .        .
          17500.  C        .        I        .        .        L .     RM    .        . F        .        .        .
          17600.  C        .        I        .        .        L .      R    .        . F        .        .        .
          17700.  C        .        I        .        .        L .      R    .        . F        .        .        .
          17800.  C        .        I        .        .        L .      R    .        . F        .        .        .
          17900.  C        .        I        .        .        L .     MR    .        . F        .        .        .
          18000.  C        .        I        .        .        L .    M R    .        . WF       .        .        .
          18100.  C        .        I        .        .        L .    M R    .        . WF       .        .        .
          18200.  C        .        I        .        .        L .    M   R  .        . WF       .        .        .
          18300.  C        .        I        .        .        L .    M   R  .        . WF       .        .        .
142550.00 18400.  C        .        I        .        .        L .    M    R.        . WF       .        .        .
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5/4/83 MAIDOW B
(3) Y3 CARDS ADDED

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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

1948 FLOOD

SUMMARY PRINTOUT TABLE 150

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	ICK*S	VCH	AREA	.01K
123500.000	100.00	0.00	0.00	591.10	34000.00	610.80	0.00	611.29	3.36	5.92	6444.99	18543.91
123500.000	100.00	0.00	0.00	591.10	41000.00	611.73	0.00	612.35	3.97	6.67	6948.65	20569.33
123500.000	100.00	0.00	0.00	591.10	47000.00	612.85	0.00	613.54	4.12	7.07	7573.15	22157.50
123500.000	100.00	0.00	0.00	591.10	61600.00	615.27	0.00	616.12	4.40	7.93	8970.75	29357.39
124100.000	450.00	0.00	0.00	590.70	34000.00	610.82	0.00	611.55	5.14	6.83	4979.10	14997.40
124100.000	450.00	0.00	0.00	590.70	41000.00	611.72	0.00	612.67	6.28	7.82	5245.21	16356.97
124100.000	450.00	0.00	0.00	590.70	47000.00	612.79	0.00	613.90	6.79	8.45	5561.86	18035.67
124100.000	450.00	0.00	0.00	590.70	61600.00	615.31	0.00	616.44	6.30	8.85	7712.32	24550.45
124101.000	29.00	618.60	612.00	590.70	34000.00	610.86	0.00	611.58	5.10	6.81	4990.12	15052.74
124101.000	29.00	618.60	612.00	590.70	41000.00	611.96	0.00	612.88	6.01	7.71	5315.28	16727.81
124101.000	29.00	618.60	612.00	590.70	47000.00	613.26	0.00	614.31	6.25	8.24	5700.88	18793.78
124101.000	29.00	618.60	612.00	590.70	61600.00	617.01	0.00	617.92	4.68	8.03	8561.30	28493.51
124300.000	150.00	0.00	0.00	585.90	34000.00	611.17	0.00	611.66	3.02	5.61	6060.03	19560.31
124300.000	150.00	0.00	0.00	585.90	41000.00	612.35	0.00	612.99	3.73	6.39	6419.41	21236.20
124300.000	150.00	0.00	0.00	585.90	47000.00	613.69	0.00	614.42	4.07	6.87	6838.08	23284.95
124300.000	150.00	0.00	0.00	585.90	61600.00	617.05	0.00	618.30	4.43	7.60	7857.92	29259.65
124700.000	400.00	0.00	0.00	586.80	34000.00	611.35	0.00	611.77	2.34	5.30	6937.53	22230.44
124700.000	400.00	0.00	0.00	586.80	41000.00	612.50	0.00	613.12	2.68	5.90	7626.24	25030.64
124700.000	400.00	0.00	0.00	586.80	47000.00	614.00	0.00	614.57	2.73	6.21	8431.38	28431.73
124700.000	400.00	0.00	0.00	586.80	61600.00	617.54	0.00	618.16	2.53	6.62	10803.93	38708.41
126000.000	1200.00	0.00	0.00	586.30	34000.00	611.80	0.00	611.97	1.09	3.79	11473.42	32620.92
126000.000	1200.00	0.00	0.00	586.30	40700.00	613.14	0.00	613.33	1.19	4.11	12599.57	37335.27
126000.000	1200.00	0.00	0.00	586.30	45800.00	614.58	0.00	614.79	1.15	4.19	13822.07	42763.89
126000.000	1200.00	0.00	0.00	586.30	54600.00	618.17	0.00	618.36	.90	4.02	16870.74	57618.49
126800.000	800.00	0.00	0.00	586.30	34000.00	611.86	0.00	612.07	1.21	4.01	10122.37	30864.22
126800.000	800.00	0.00	0.00	586.30	40700.00	613.20	0.00	613.45	1.36	4.41	10981.38	34974.00
126800.000	800.00	0.00	0.00	586.30	45800.00	614.64	0.00	614.90	1.35	4.56	11508.88	39417.19
126800.000	800.00	0.00	0.00	586.30	54600.00	618.20	0.00	618.46	1.12	4.50	14223.23	51660.35
127550.000	600.00	0.00	0.00	584.30	34000.00	611.86	0.00	612.24	4.04	4.56	6882.45	16915.21
127550.000	600.00	0.00	0.00	584.30	41000.00	613.19	0.00	613.65	4.53	5.46	7703.37	19260.73
127550.000	600.00	0.00	0.00	584.30	47000.00	614.63	0.00	615.11	5.05	5.61	8839.16	20917.68
127550.000	600.00	0.00	0.00	584.30	61600.00	618.20	0.00	618.63	4.02	5.47	12882.11	30712.04

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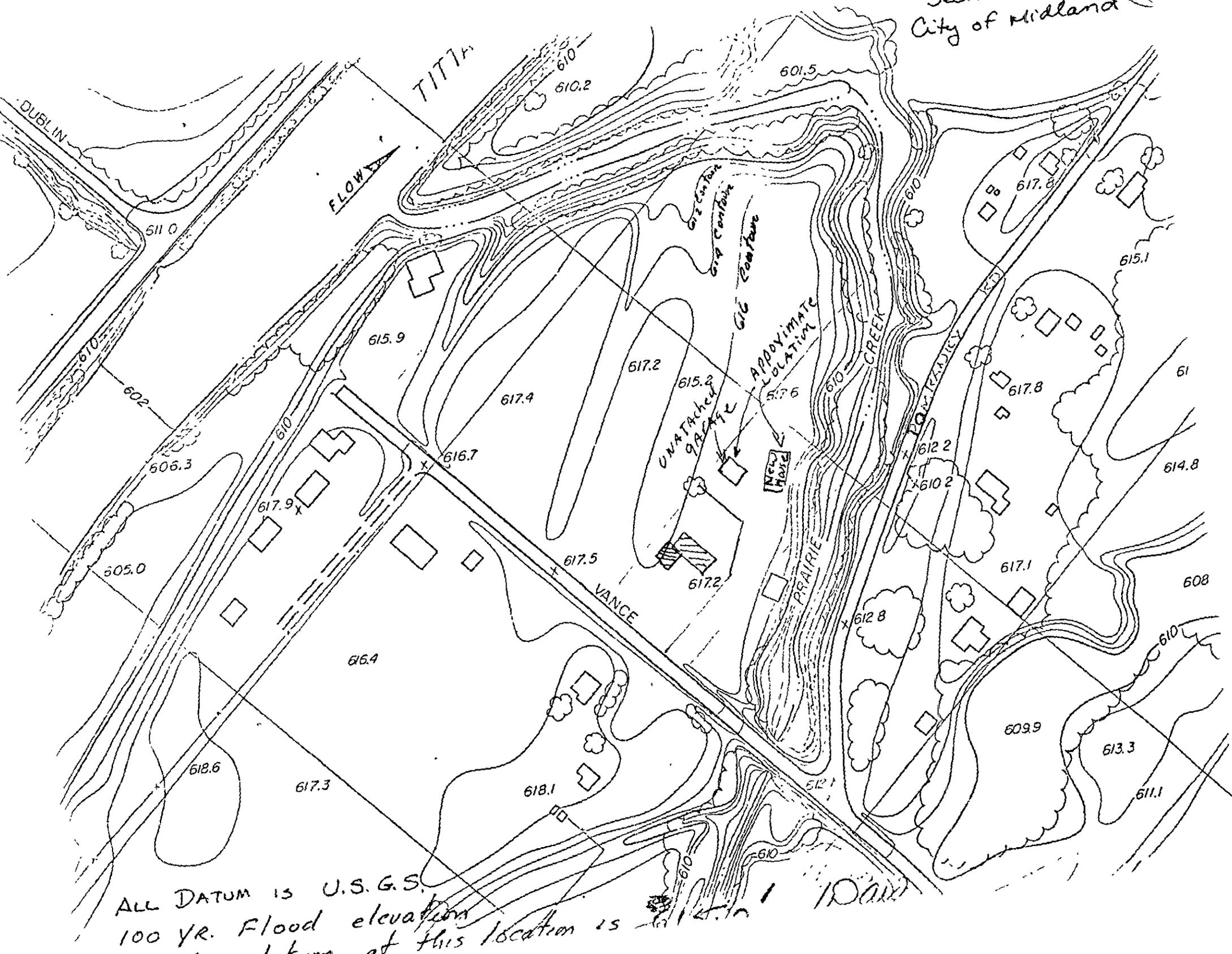
SECND	XLCH	FLTRC	FLLC	FLMIN	Q	CWSEL	CRTWS	EG	10K*S	VCH	AREA	.01K
127551.000	10.00	611.00	641.00	584.30	34000.00	611.87	0.00	612.25	4.04	4.56	6883.89	16919.60
127551.000	10.00	611.00	641.00	584.30	41000.00	613.19	0.00	613.65	4.53	5.46	7705.39	19266.22
127551.000	10.00	611.00	641.00	584.30	47000.00	614.64	0.00	615.11	5.05	5.61	8842.04	20924.91
127551.000	10.00	611.00	641.00	584.30	61600.00	618.21	0.00	618.63	4.02	5.47	12886.72	30720.77
127552.000	64.00	611.00	641.00	584.30	34000.00	611.89	0.00	612.27	4.02	4.95	6899.01	16965.55
127552.000	64.00	611.00	641.00	584.30	41000.00	613.23	0.00	613.68	4.50	5.45	7726.61	19323.89
127552.000	64.00	611.00	641.00	584.30	47000.00	614.67	0.00	615.15	5.01	5.60	8873.23	21003.37
127552.000	64.00	611.00	641.00	584.30	61600.00	618.23	0.00	618.66	4.00	5.45	12936.21	30814.45
127553.000	10.00	0.00	0.00	584.30	34000.00	611.90	0.00	612.28	4.01	4.95	6902.09	16974.89
127553.000	10.00	0.00	0.00	584.30	41000.00	613.23	0.00	613.69	4.50	5.44	7731.25	19336.49
127553.000	10.00	0.00	0.00	584.30	47000.00	614.68	0.00	615.15	5.00	5.59	8880.55	21021.76
127553.000	10.00	0.00	0.00	584.30	61600.00	618.24	0.00	618.66	3.99	5.45	12948.13	30837.05
128100.000	550.00	0.00	0.00	585.50	34000.00	612.17	0.00	612.44	1.75	4.61	9483.19	25675.22
128100.000	550.00	0.00	0.00	585.50	40700.00	613.57	0.00	613.87	1.84	4.93	10616.63	29993.19
128100.000	550.00	0.00	0.00	585.50	45800.00	615.04	0.00	615.34	1.72	4.96	11827.38	34954.70
128100.000	550.00	0.00	0.00	585.50	54600.00	618.55	0.00	618.81	1.27	4.70	14778.64	48403.21
129100.000	900.00	0.00	0.00	584.10	34000.00	612.30	0.00	612.58	1.40	4.65	10623.03	28786.68
129100.000	900.00	0.00	0.00	584.10	40700.00	613.71	0.00	614.01	1.43	4.90	12025.43	34056.62
129100.000	900.00	0.00	0.00	584.10	45800.00	615.16	0.00	615.47	1.31	4.88	13482.15	40033.23
129100.000	900.00	0.00	0.00	584.10	54600.00	618.64	0.00	618.91	.94	4.51	16959.49	56170.00
129350.000	250.00	0.00	0.00	584.10	21000.00	612.59	0.00	612.63	.21	1.84	15144.45	45426.24
129350.000	250.00	0.00	0.00	584.10	26400.00	614.02	0.00	614.06	.25	2.06	16784.44	52965.05
129350.000	250.00	0.00	0.00	584.10	30300.00	615.47	0.00	615.52	.25	2.13	18456.51	61183.60
129350.000	250.00	0.00	0.00	584.10	39700.00	618.93	0.00	618.95	.22	2.24	22400.88	82571.09
130175.000	750.00	0.00	0.00	585.20	21000.00	612.54	0.00	612.65	.78	3.21	7554.22	23829.27
130175.000	750.00	0.00	0.00	585.20	26400.00	613.95	0.00	614.13	.93	3.67	8315.02	27430.32
130175.000	750.00	0.00	0.00	585.20	30300.00	615.40	0.00	615.60	.93	3.84	9095.22	31365.67
130175.000	750.00	0.00	0.00	585.20	39700.00	618.81	0.00	619.04	.91	4.16	10937.05	41577.15
130225.000	50.00	0.00	0.00	588.20	21000.00	612.53	0.00	612.70	1.52	3.62	7118.48	17023.07
130225.000	50.00	0.00	0.00	588.20	26400.00	613.94	0.00	614.15	1.81	4.07	7578.70	18631.84
130225.000	50.00	0.00	0.00	588.20	30300.00	615.39	0.00	615.61	1.82	4.20	8863.54	22462.71
130225.000	50.00	0.00	0.00	588.20	39700.00	618.81	0.00	619.04	1.80	4.42	10944.07	29596.32
130226.000	10.00	625.60	634.90	588.20	21000.00	612.54	0.00	612.70	1.52	3.63	7115.09	17013.12
130226.000	10.00	625.60	634.90	588.20	26400.00	613.95	0.00	614.15	1.81	4.07	7975.97	19623.30
130226.000	10.00	625.60	634.90	588.20	30300.00	615.40	0.00	615.61	1.82	4.20	8859.78	22450.40
130226.000	10.00	625.60	634.90	588.20	39700.00	618.81	0.00	619.05	1.80	4.42	10945.32	29600.76
130227.000	68.00	625.60	634.90	588.20	21000.00	612.55	0.00	612.71	1.52	3.62	7121.57	17037.15
130227.000	68.00	625.60	634.90	588.20	26400.00	613.96	0.00	614.16	1.81	4.07	7983.68	19647.35
130227.000	68.00	625.60	634.90	588.20	30300.00	615.41	0.00	615.62	1.82	4.19	8867.52	22475.75
130227.000	68.00	625.60	634.90	588.20	39700.00	618.93	0.00	619.06	1.80	4.42	10953.09	29628.48
130228.000	10.00	0.00	0.00	588.20	21000.00	612.55	0.00	612.71	1.52	3.62	7122.71	17035.50
130228.000	10.00	0.00	0.00	588.20	26400.00	613.96	0.00	614.16	1.80	4.06	7985.06	19651.66
130228.000	10.00	0.00	0.00	588.20	30300.00	615.41	0.00	615.62	1.82	4.19	8868.89	22480.25
130228.000	10.00	0.00	0.00	588.20	39700.00	618.83	0.00	619.06	1.79	4.41	10954.41	29633.71

Sh 1
1A

SECNO	XLCH	ELTPC	ELLC	ELVIN	Q	CWSEL	CRINS	EG	10K*S	VCH	AREA	.01K
130275.000	50.00	0.00	0.00	587.00	21000.00	612.51	0.00	612.74	1.31	4.03	5592.56	18335.68
130275.000	50.00	0.00	0.00	587.00	26400.00	613.91	0.00	614.20	1.53	4.55	6778.99	21366.24
130275.000	50.00	0.00	0.00	587.00	30300.00	615.36	0.00	615.66	1.49	4.71	7589.29	24791.24
130275.000	50.00	0.00	0.00	587.00	39700.00	618.77	0.00	619.10	1.37	4.95	9503.76	33978.47
130750.000	430.00	0.00	0.00	588.10	21000.00	612.72	0.00	612.79	.47	2.49	11267.72	30541.04
130750.000	430.00	0.00	0.00	588.10	26400.00	614.18	0.00	614.25	.52	2.74	12708.16	36503.38
130750.000	430.00	0.00	0.00	588.10	30300.00	615.63	0.00	615.71	.50	2.79	14153.53	42950.37
130750.000	430.00	0.00	0.00	588.10	39700.00	615.06	0.00	619.15	.44	2.87	17565.71	59891.05
131700.000	900.00	0.00	0.00	587.10	21000.00	612.75	0.00	612.85	.74	3.02	10115.86	24371.10
131700.000	900.00	0.00	0.00	587.10	26400.00	614.22	0.00	614.32	.75	3.18	11858.65	30472.02
131700.000	900.00	0.00	0.00	587.10	30300.00	615.67	0.00	615.77	.66	3.13	13714.83	37254.19
131700.000	900.00	0.00	0.00	587.10	39700.00	619.10	0.00	619.19	.51	3.01	18001.93	55745.66
131750.000	50.00	0.00	0.00	586.70	21000.00	612.75	0.00	612.86	1.10	3.45	10641.56	20017.69
131750.000	50.00	0.00	0.00	586.70	26400.00	614.23	0.00	614.32	1.04	3.47	12894.99	25916.57
131750.000	50.00	0.00	0.00	586.70	30300.00	615.69	0.00	615.78	.85	3.29	15264.74	32779.88
131750.000	50.00	0.00	0.00	586.70	39700.00	619.13	0.00	619.20	.58	2.96	20984.76	52199.88
131751.000	1.00	605.40	615.60	586.70	21000.00	612.80	0.00	612.86	2.06	1.89	10703.51	14633.26
131751.000	1.00	605.40	615.60	586.70	26400.00	614.26	0.00	614.33	1.98	1.46	12777.92	18754.70
131751.000	1.00	605.40	615.60	586.70	30300.00	615.71	0.00	615.78	1.50	1.32	15116.70	24742.93
131751.000	1.00	605.40	615.60	586.70	39700.00	619.14	0.00	619.20	.89	1.12	20808.05	42062.60
131752.000	18.00	605.40	615.60	586.70	21000.00	612.81	0.00	612.87	2.06	1.89	10706.63	14640.21
131752.000	18.00	605.40	615.60	586.70	26400.00	614.26	0.00	614.33	1.98	1.46	12782.19	18765.21
131752.000	18.00	605.40	615.60	586.70	30300.00	615.71	0.00	615.78	1.49	1.32	15136.64	24796.25
131752.000	18.00	605.40	615.60	586.70	39700.00	619.14	0.00	619.20	.85	1.12	20822.02	42110.04
131753.000	1.00	0.00	0.00	586.70	21000.00	612.80	0.00	612.87	1.62	2.51	10715.71	16499.82
131753.000	1.00	0.00	0.00	586.70	26400.00	614.26	0.00	614.33	1.44	2.46	12960.72	21996.69
131753.000	1.00	0.00	0.00	586.70	30300.00	615.72	0.00	615.78	1.14	2.29	15314.95	28367.92
131753.000	1.00	0.00	0.00	586.70	39700.00	619.15	0.00	619.20	.73	1.55	20959.59	46534.54
131800.000	50.00	0.00	0.00	584.30	21000.00	612.83	0.00	612.87	.90	2.09	12942.62	22169.92
131800.000	50.00	0.00	0.00	584.30	26400.00	614.29	0.00	614.34	.85	2.13	15323.01	28574.09
131800.000	50.00	0.00	0.00	584.30	30300.00	615.74	0.00	615.79	.72	2.04	17728.05	35743.59
131800.000	50.00	0.00	0.00	584.30	39700.00	619.16	0.00	619.21	.51	1.88	23407.18	55546.41
133600.000	1700.00	0.00	0.00	584.70	21000.00	612.91	0.00	612.96	.41	2.47	17994.30	32633.33
133600.000	1700.00	0.00	0.00	584.70	26400.00	614.37	0.00	614.42	.43	2.64	20884.07	40193.27
133600.000	1700.00	0.00	0.00	584.70	30300.00	615.81	0.00	615.86	.39	2.61	23726.50	48400.05
133600.000	1700.00	0.00	0.00	584.70	39700.00	619.21	0.00	619.26	.32	2.56	30474.40	70500.29
135700.000	1400.00	0.00	0.00	591.60	21000.00	612.98	0.00	613.01	.29	1.88	19631.64	38789.05
135700.000	1400.00	0.00	0.00	591.60	26400.00	614.44	0.00	614.47	.32	2.05	22534.64	46903.16
135700.000	1400.00	0.00	0.00	591.60	30300.00	615.87	0.00	615.91	.30	2.08	25368.81	55499.66
135700.000	1400.00	0.00	0.00	591.60	39700.00	619.26	0.00	619.30	.26	2.13	32084.38	78388.22
136100.000	1000.00	0.00	0.00	591.60	21000.00	613.00	0.00	613.05	.43	2.33	20341.76	31867.26
136100.000	1000.00	0.00	0.00	591.60	26400.00	614.47	0.00	614.51	.45	2.50	23991.68	39197.65
136100.000	1000.00	0.00	0.00	591.60	30300.00	615.90	0.00	615.94	.41	2.49	27567.89	47162.07
136100.000	1000.00	0.00	0.00	591.60	39700.00	619.29	0.00	619.33	.33	2.46	36027.63	68840.30

City of Midland



ALL DATUM IS U.S.G.S.
100 YR. Flood elevation
at this location is

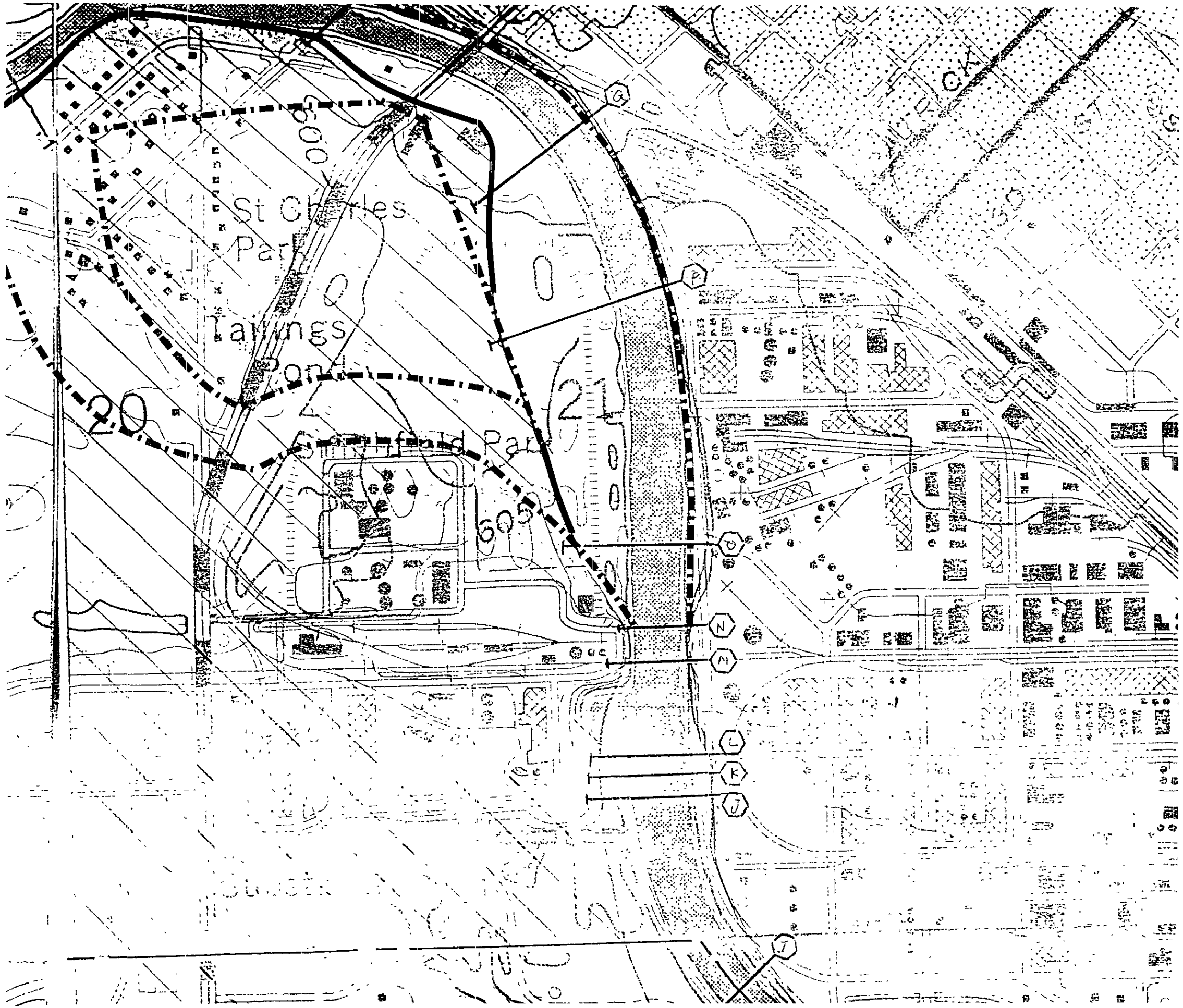


FIGURE 4

FLOODWAY DELINEATION

N

LEGEND

ORIGINAL FIS FLOODWAY DELINEATION

PROPOSED REVISION TO FIS FLOODWAY DELINEATION

0' 500' 1000'

SCALE: FEET

MIDLAND, MICHIGAN

FLOOD INSURANCE STUDY REVIEW

McNAMEE PORTER & SEELEY
ENGINEERS ARCHITECTS
ANN ARBOR, MICHIGAN

FLOOD INSURANCE STUDY

HYDRAULIC ANALYSIS OF THE TITTABAWASSEE RIVER, CHIPPEWA RIVER, SNAKE CREEK, STURGEON CREEK, AND THE INMAN DRAIN THROUGH THE CITY OF MIDLAND, MICHIGAN

Gove Associates Inc.
ARCHITECTS/ENGINEERS/PLANNERS/SURVEYORS

1601 PORTAGE STREET
KALAMAZOO, MICHIGAN 49001
(616) 385-0011

November 26, 1980

Mr. Daniel H. Morgan, P.E.
Flood Insurance Unit
Flood Plain Management Section
Water Management Division
Michigan Department of Natural Resources
P. O. Box 30028
Lansing, Michigan 48909

Re: City of Midland Flood Insurance Study

Dear Mr. Morgan:

Enclosed for your review is our Hydraulic Analysis of the Tittabawassee River, Chippewa River, Snake Creek, Sturgeon Creek, and the Inman Drain through the City of Midland, Michigan.

The following information is included:

1. HEC-2 run for 100-year flood
2. Summary tables for 10-, 50-, 100- and 500-year floods
3. IPLOT for 100-year flow
4. Topograhpic map
5. Hydraulic Analysis Report

If you have any questions on this information, please call me.

Very truly yours,

GOVE ASSOCIATES INC.

William J. McDonough, P.E.
Associate

WJM/tk

Enclosure: as listed above

HYDRAULIC ANALYSIS

1. INTRODUCTION

The streams being studied are Tittabawassee River, Chippewa River, Snake Creek, Sturgeon Creek, and Inman Drain in the City of Midland, Michigan. Chippewa River, Snake Creek, and Sturgeon Creek are the tributaries of Tittabawassee River while Inman Drain is the tributary of Sturgeon Creek. All the flows used in this study have been approved by the Michigan Department of Natural Resources and shown in Table 1.

The project managers for the Flood Insurance Studies are William McDonough and Duane Ellis.

2. METHOD OF ANALYSIS

Water surface profiles for 10-, 50-, 100-, and 500-year were computed through the HEC-2 computer program, developed by the U. S. Army, Corps of Engineers (Ref. 1).

2.1 Cross Sections

Valley and cross sections used in this study were surveyed in October, November, and December of 1979. Table 2 to Table 6 show the locations of cross sections used in this report. Whether to use the Special Bridge Routine or the Normal Bridge Routine for the bridge coding depends on the bridge opening and the water surface elevation (Ref. 1).

2.2 Roughness Coefficients

The roughness coefficients were determined from field description, which was made in August of 1979. The material and photographs shown in page 101 to page 123 in Chow's Open Channel Hydraulics (Ref. 2) served as the guidance. The roughness coefficients used in the model are shown in Table 7.

2.3 Starting Points and Starting Elevations

The starting point for Tittabawassee River is about 1200 feet downstream from the City limit. The starting elevations were determined through the calibration of the USGS gaging station, located 9300 feet upstream.

The starting point for Chippewa River is the mouth to Tittabawassee River. The Chippewa River in Midland contributes about 40 percent of flow to the Tittabawassee River and the study reach is quite short. We, therefore, assumed that the Chippewa River has the same concentration time at the confluence point with the Tittabawassee River and the backwater of Tittabawassee River was used as the starting elevation.

For Snake Creek, Sturgeon Creek, and Inman Drain, they are all started at the mouth with critical depths. Because the backwater of Tittabawassee River is so high that all the water surface profiles eventually will converge within the influence of backwater region.

3. DISCUSSION

3.1 Tittabawassee River at Midland has been studied by the Corps of Engineers (Ref. 3) and Consumers Power Company of Michigan (Ref. 4). The study purpose of the Corps of Enginers was to provide for flood protection to the City of Midland while the study purpose of Consumers Power Company was to provide information related to their nuclear power plant safety which is located at the southern city limit. The design flow of the Corps of Enginers was the same of this study while the maximum probable flood flow was used by the Consumers Power Company. Because the study characters and the study limits of the Consumers Power Company's report are different from this analysis, no comparison with their report was attempted.

In the Corps of Engineers Report, a water surface profile of 1948 flood was included. Another surface profile of the same 1948 flood was available from the City Engineer. Using these two profiles, the n factors can easily be calibrated. The flood of 1948 from this study and the other two available profiles were shown in Figure 1 (In pocket of the rear cover page of this report). The result shows good agreement with the historical flood.

Since the n factors have been excellently calibrated by the 1948 flood, the only problem left is the starting elevation. In Corps of Engineers report, a rating curve at 343 feet upstream from our station 1137+00 (Station C) is available (Figure 2, data from Dow Chemical). Also, the station 1214+40 (Station H) is the USGS gaging station No. 1560 (data available from March 1937 to current year).

The rating curve of Corps of Engineers was used to calibrate our starting elevations and the rating curve of the gaging station was used to check the continuity. In Figure 3, it is clearly observed that the developed water surface elevations of 10-, 50-, 100-, and 500-years fit into the recorded data very well. The developed 100-year water surface profile was further compared with the Corps of Engineers report as shown in Figure 4 (In pocket of this report). The maximum elevation difference from this study and the Corps of Engineers report is only 2.0 feet upstream of the confluence with the Chippewa River. Finally the rating curve at the plant site developed by Consumers Power Company was included in this report for completeness (Figure 5).

3.2 Since the backwater of Tittabawassee River is very high in the tributaries, it is suggested that floodway encroachment of 0.1 feet criteria cannot be allowed in this area.

TABLE 1

APPROVED DISCHARGES

	STATION	DA (Mi^2)	Peak Flows (cfs) 10-year	50-year	100-year	500-year
1.	Tittabawassee River (at Mapleton)	2,448	28,000	41,700	47,800	62,700
2.	Tittabawassee River (gage #1560)	2,400	27,500	41,000	47,000	61,600
3.	Tittabawassee River (U/S of Chippewa River)	1,386	17,700	26,400	30,300	39,700
4.	Chippewa River (at confluence with Tittabawassee River)	1,011	11,200	15,600	17,500	21,900
5.	Snake River (mouth)	4.67	900	1,170	1,300	1,600
6.	Snake River (U/S of unnamed tributary)	2.50	480	640	710	860
7.	Snake River (at Sylvan Lane)	1.60	450	600	660	800
8.	Sturgeon Creek (mouth)	58.85	1,050	1,600	1,850	2,500
9.	Sturgeon Creek (U/S of Inman Drain)	51.55	900	1,400	1,600	2,200
10.	Inman Drain (at confluence with Sturgeon Creek)	7.29	330	470	540	700

TABLE 2

LOCATIONS OF CROSS SECTIONS (TATTABAWASSEE RIVER)

SECTION	SECNO	LOCATION
A	111550	1200' D/S from corporate limit
B	112950 112951 112952 112953	Consumers Power R.R. Bridge Width = 14', Length = 497'
C	113700	900' U/S from U/S face of Consumers Power R.R. Bridge Rating Curve developed by COE, 1977
D	116450	2600' U/S of C Consumers Power Nuclear Power Plant at Right bank Rating curve developed by Consumers Power Company, 1978
E	117600 117601 117602 117603	Dow Chemical Pipeline Bridge Width = 23', Length = 510'
F	118100	550' U/S from the U/S face of Dow Chemical Pipeline Bridge
G	119940	1900' U/S of F
H	121440	USGS Gage #1560 Rating curve has been established by this study
I	122300	900' U/S of Gage Station
J	123300	100' D/S from Dow Chemical Dam
K	123400 123401	Dow Chemical Dam, Top Cres = 599.12 regarded as Step dam
L	123500	100' U/S from Dow Chemical Dam
M	124100 124101	Dow Chemical R.R. and Vehicle Bridge Width = 20', Length = 304'
N	124300 124301 124302 124303	Dow Chemical Pipeline Bridge Width = 25', Length = 264'

SECTION	SECNO	LOCATION
O	124700	400' U/S of U/S face of Dow Chemical Pipeline Bridge
P	126000	1200' U/S of O
Q	126800	800' U/S of P
R	127550 127551 127552 127553	George St. Bridge, Width - 64', Length = 694'
S	128100	550' U/S from U/S face of George St. Bridge
T	129100	D/S of confluence with Chippewa River
U	129350	U/S of confluence with Chippewa River
V	130175	750' U/S of U
W	130225 130226 130227 130228	M-20 Bridge, Width = 68', Length = 671
X	130275	50' U/S from U/S face of M-20 Bridge
Y	130750	430' U/S of X
Z	131700	900' U/S of Y
AA	131750 131751 131752 131753	Currie Parkway Bridge Width = 18', Length = 136'
AB	131800	50' U/S from U/S face of Currie Parkway Bridge
AC	133600	1700' U/S of AB
AD	135700	U/S of confluence with Snake River
AE	136100	1000' U/S of AD
AF	137500	U/S of confluence with Sturgeon Creek
AG	140000	2450' U/S of AF
AH	142550	2500' U/S of AG

TABLE 3

LOCATIONS OF CROSS SECTIONS (CHIPPEWA RIVER)

SECTION	SECNO	LOCATION
A	675	U/S of confluence with Tittabawassee River
B	2625	2650' U/S of A
C	5425	2730' U/S of B
D	7925	2670' U/S of C
E	11525	3525' U/S of D

TABLE 4

LOCATIONS OF CROSS SECTIONS (SNAKE RIVER)

SECTION	SECNO	LOCATION
A	250 251 252 253	Emerson Park Driveway Culvert Width = 28', Length = 16' Backwater of Tittabawassee River 100-year - 616.56
B	500	210' U/S from U/S face of Emerson Park Driveway
C	750 751	C & O R.R. Culvert 7.5 & 9.0 x 53 CMP
D	875 876	Main St. Bridge, Width = 28', Length = 17'
E	903 904	Foot Bridge, Width = 6.5', Length = 40'
F	935	100' U/S from U/S face of Foot Bridge
G	1545	610' U/S of F
H	1630	880' U/S of G
I	1680 1681 1682 1683	St. Andrews Culvert 2 - 8.0 x 80 CMP
J	1730	50' U/S from U/S face of St. Andrews Culvert
K	2050	480' U/S of J
L	2100 2101 2102 2103	Private Drive Culvert, Width = 12', Length = 12'
M	2150	50' U/S from U/S face of Private Drive Culvert
N	3500	550' U/S of M
O	4200	500' U/S of N
P	4250 4251	Eastman Rd. Culvert, Width = 84', Length 20'

SECTION	SECNO	LOCATION
Q	4300	100' U/S from U/S face of Eastman Rd. Culvert
R	5010	620' U/S of Q
S	5525	815' U/S of R
T	5575 5576 5577 5578	Country Club Drive Culvert 7 x 22.5 concrete pipe
U	5625	50' U/S from U/S face of Country Club Drive Culvert
V	6500	570' U/S of U
W	7700	1200' U/S of V
X	7750 7751	Sunget Rd. Culvert, Width = 26', Length - 16'
Y	7800	200' U/S from U/S face of Sunget Rd. Culvert
Z	8250	590' U/S of Y
AA	8680	U/S of confluence with an unnamed tributary
AB	9450	545' U/S of AA
AC	9500 9501	Cresent Drive Culvert, Width = 80', Length = 16'
AD	9625	150' U/S from U/S face of Crescent Drive Culvert
AE	9750 9751	Saginaw St. Culvert 4.5 x 116 concrete pipe
AF	9800	100' U/S from U/S face of Saginaw St. Culvert
AG	10700	868' U/S of AF
AH	10750 10751 10752 10753	Wheeler Rd. Culvert 7.5 x 85 CMP
AI	10800	310' U/S from face of Wheeler Rd. Culvert

SECTION	SECNO	LOCATION
AJ	11480	630' U/S of AI
AK	12450	910' U/S of AJ
AL	12500 12501 12502 12503	Sylvan Lane Culvert 4.3 & 4.0 x 98 concrete pipes
AM	12550	50' U/S from U/S face of Sylvan Lane Culvert
AN	13300	700' U/S of AM
AO	14075	620' U/S of AN
AP	14125 14126	Dilloway Rd. Culvert 6 x 346 concrete pipe
AQ	14250	100' U/S from U/S face of Dilloway Rd. Culvert
AR	15500	1180' U/S of AQ
AS	16450	945' U/S of AR
AT	16500 16501	Wackerly Rd. Culvert 5 x 60 concrete pipe
AU	16550	100' U/S from U/S face of Wackerly Rd. Culvert

TABLE 5

LOCATIONS OF CROSS SECTIONS (STURGEON CREEK)

SECTION	SECNO	LOCATION
A	50	Emerson Park Rd. Bridge, Width = 32',
	51	Length - 32'
	52	Backwater of Tittabawassee River
	53	100-year - 616.67
B	100	C & O R.R. Bridge, Width = 10', Lenght = 38'
	101	
	102	
	103	
C	150	Main St. Culvert
	151	15 x 65 CMP
	152	
	153	
D	650	Ponding Area
E	1950	1320' U/S of D
F	3825	1815' U/S of E
G	5550	1620' U/S of F
H	5700	Sugnet Rd. Culvert
	5701	13.5 x 67 CMP
	5702	
	5703	
I	5900	105' U/S from U/S face of Sugnet Rd. Culvert
J	6250	400' U/S of I
K	6750	U/S of the confluence with Inman Drain
L	7875	1240' U/S of K
M	8125	610' U/S of L
N	8175	Saginaw Rd. Bridge, Width = 48', Length - 46'
	8176	
	8177	
	8178	
O	8225	Foot Bridge, Width - 6', Length = 65'
	8226	
	8227	
	8228	

127553.000	47000.00	614.68	1.45	.01	0.00	908.56	10.00
127553.000	61600.00	618.24	3.56	.00	0.00	1807.76	10.00

SECNO	C	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
128100.000	34000.00	612.17	0.00	.27	0.00	820.53	550.00
128100.000	40700.00	613.57	1.40	.34	0.00	820.59	550.00
128100.000	45800.00	615.04	1.47	.36	0.00	820.66	550.00
128100.000	54600.00	618.55	3.52	.31	0.00	840.00	550.00
129100.000	34000.00	612.30	0.00	.13	0.00	1000.00	900.00
129100.000	40700.00	613.71	1.40	.14	0.00	1000.00	900.00
129100.000	45800.00	615.16	1.46	.13	0.00	1000.00	900.00
129100.000	54600.00	618.64	3.48	.09	0.00	1000.00	900.00
129350.000	21000.00	612.59	0.00	.29	0.00	1150.00	250.00
129350.000	26400.00	614.02	1.43	.31	0.00	1150.00	250.00
129350.000	30300.00	615.47	1.45	.31	0.00	1150.00	250.00
129350.000	39700.00	618.90	3.43	.26	0.00	1150.00	250.00
130175.000	21000.00	612.54	0.00	-.05	0.00	540.00	750.00
130175.000	26400.00	613.95	1.41	-.06	0.00	540.00	750.00
130175.000	30300.00	615.40	1.44	-.07	0.00	540.00	750.00
130175.000	39700.00	618.81	3.41	-.09	0.00	540.00	750.00
130225.000	21000.00	612.53	0.00	-.01	0.00	610.00	50.00
130225.000	26400.00	613.94	1.41	-.01	0.00	610.00	50.00
130225.000	30300.00	615.39	1.45	-.00	0.00	610.00	50.00
130225.000	39700.00	618.81	3.42	.00	0.00	610.00	50.00
130226.000	21000.00	612.54	0.00	.00	0.00	610.00	10.00
130226.000	26400.00	613.95	1.41	.00	0.00	610.00	10.00
130226.000	30300.00	615.40	1.45	.00	0.00	610.00	10.00
130226.000	39700.00	618.81	3.42	.00	0.00	610.00	10.00
130227.000	21000.00	612.55	0.00	.01	0.00	610.00	68.00
130227.000	26400.00	613.96	1.41	.01	0.00	610.00	68.00
130227.000	30300.00	615.41	1.45	.01	0.00	610.00	68.00
130227.000	39700.00	618.83	3.42	.01	0.00	610.00	68.00
130228.000	21000.00	612.55	0.00	.00	0.00	610.00	10.00
130228.000	26400.00	613.96	1.41	.00	0.00	610.00	10.00
130228.000	30300.00	615.41	1.45	.00	0.00	610.00	10.00
130228.000	39700.00	618.83	3.42	.00	0.00	610.00	10.00
130275.000	21000.00	612.51	0.00	-.04	0.00	560.00	50.00
130275.000	26400.00	613.91	1.40	-.05	0.00	560.00	50.00
130275.000	30300.00	615.36	1.45	-.05	0.00	560.00	50.00
130275.000	39700.00	618.77	3.42	-.05	0.00	560.00	50.00
130750.000	21000.00	612.72	0.00	.22	0.00	990.28	430.00
130750.000	26400.00	614.18	1.45	.27	0.00	991.83	430.00
130750.000	30300.00	615.63	1.46	.28	0.00	993.39	430.00
130750.000	39700.00	619.06	3.43	.29	0.00	997.07	430.00
131700.000	21000.00	612.75	0.00	.03	0.00	1205.07	900.00
131700.000	26400.00	614.22	1.46	.04	0.00	1234.31	900.00
131700.000	30300.00	615.67	1.46	.04	0.00	1250.00	900.00
131700.000	39700.00	619.10	3.43	.04	0.00	1250.00	900.00

SECNO	C	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
131750.000	21000.00	612.75	0.00	.00	0.00	1522.15	50.00
131750.000	26400.00	614.23	1.47	.01	0.00	1570.21	50.00
131750.000	30300.00	615.65	1.46	.02	0.00	1660.00	50.00
131750.000	39700.00	619.13	3.44	.03	0.00	1660.00	50.00
131751.000	21000.00	612.80	0.00	.05	0.00	1523.29	1.00
131751.000	26400.00	614.26	1.46	.03	0.00	1572.69	1.00
131751.000	30300.00	615.71	1.45	.02	0.00	1660.00	1.00
131751.000	39700.00	619.14	3.43	.01	0.00	1660.00	1.00
131752.000	21000.00	612.81	0.00	.00	0.00	1523.35	18.00
131752.000	26400.00	614.26	1.45	.00	0.00	1572.86	18.00
131752.000	30300.00	615.71	1.45	.00	0.00	1660.00	18.00
131752.000	39700.00	619.14	3.42	.00	0.00	1660.00	18.00
131753.000	21000.00	612.80	0.00	-.00	0.00	1523.38	1.00
131753.000	26400.00	614.26	1.46	.00	0.00	1572.93	1.00
131753.000	30300.00	615.72	1.46	.01	0.00	1660.00	1.00
131753.000	39700.00	619.15	3.43	.01	0.00	1660.00	1.00
131800.000	21000.00	612.83	0.00	.03	0.00	1613.37	50.00
131800.000	26400.00	614.29	1.46	.02	0.00	1644.63	50.00
131800.000	30300.00	615.74	1.45	.02	0.00	1660.00	50.00
131800.000	39700.00	619.16	3.42	.01	0.00	1660.00	50.00
133600.000	21000.00	612.91	0.00	.08	0.00	1980.00	1700.00
133600.000	26400.00	614.37	1.46	.08	0.00	1980.00	1700.00
133600.000	30300.00	615.81	1.44	.07	0.00	1980.00	1700.00
133600.000	39700.00	619.21	3.40	.05	0.00	1980.00	1700.00
135700.000	21000.00	612.98	0.00	.06	0.00	1973.54	1400.00
135700.000	26400.00	614.44	1.46	.06	0.00	1975.04	1400.00
135700.000	30300.00	615.87	1.43	.06	0.00	1980.00	1400.00
135700.000	39700.00	619.26	3.39	.04	0.00	1980.00	1400.00
136100.000	21000.00	613.00	0.00	.03	0.00	2491.50	1000.00
136100.000	26400.00	614.47	1.46	.03	0.00	2500.00	1000.00
136100.000	30300.00	615.90	1.43	.03	0.00	2500.00	1000.00
136100.000	39700.00	619.29	3.39	.03	0.00	2500.00	1000.00
137500.000	21000.00	613.06	0.00	.05	0.00	2745.38	1500.00
137500.000	26400.00	614.52	1.47	.06	0.00	2749.35	1500.00
137500.000	30300.00	615.95	1.43	.05	0.00	2750.00	1500.00
137500.000	39700.00	619.33	3.38	.04	0.00	2750.00	1500.00
140000.000	21000.00	613.15	0.00	.10	0.00	2280.00	2450.00
140000.000	26400.00	614.62	1.47	.10	0.00	2280.00	2450.00
140000.000	30300.00	616.04	1.42	.08	0.00	2280.00	2450.00
140000.000	39700.00	619.39	3.36	.06	0.00	2280.00	2450.00
142550.000	21000.00	613.36	0.00	.21	0.00	2400.00	2500.00
142550.000	26400.00	614.83	1.47	.21	0.00	2400.00	2500.00
142550.000	30300.00	616.22	1.39	.19	0.00	2400.00	2500.00
142550.000	39700.00	619.54	3.32	.15	0.00	2400.00	2500.00

SECTION	SECNO	LOCATION
P	8325	12' U/S from U/S face of Foot Bridge
Q	10100	1215' U/S of P
R	12100	1980' U/S of Q
S	12900	800' U/S of R
T	14400	1400' U/S of S
U	15625	1245' U/S of T
V	15825 15826 15827 15828	Proposed Wackerly Rd. Bridge Width - 96.8', Length = 41'
W	16225 16226 16227 16228	M-11 Bridge, Width - 118', Length = 40'
X	16375 16376 16377 16378	Airport Rd. Bridge, Width = 29.6', Lenth = 40'
Y	16450	130' U/S from U/S face of Airport Rd. Bridge
Z	24250	810' U/S of Y
AA	25500	1250' U/S of Z
AB	26350	810' U/S of AA
AC	26400 26401	South of Mobile Home Park Culvert 3 - 3 x 41 CMP
AD	26450	45' U/S from U/S face of South of Mobile Home Park Culvert
AE	27200	630' U/S of AD

TABLE 6

LOCATIONS OF CROSS SECTIONS (INMAN DRAIN)

SECTION	SECNO	LOCATION
A	1350	1190' U/S of confluence with Sturgeon Creek, Backwater of Sturgeon Creek, 100-year - 606.89, Backwater of Tittabawassee River by Sturgeon Creek, 100-year - 616.67
B	2525	1430' U/S of A
C	2725 2726 2727 2728	Saginaw Rd. Culvert 20 x 9.7 x 94 CMP
D	2825	80' U/S from U/S face of Saginaw Rd. Culvert
E	3425	680' U/S of D
F	3925	560' U/S of E
G	4225 4226 4227 4228	Perrine Rd. Culvert 2 - 11.x x 7.6 x 55 CMP
H	4325	100' U/S from U/S face of Perrine Rd. Culvert
I	5525	1200' U/S of H
J	5725	660' U/S of I
K	5775 5776 5777 5778	Moreland Drive Culvert 12.8 x 8.3 x 122 CMP
L	5825	150' U/S from U/S face of Moreland Drive Culvert
M	6825	820' U/S of L
N	8625	1755' U/S of M

TABLE 7

"N" FACTORS USED IN THE MODEL

RIVER	FLOODPLAINS	CHANNEL
Tittabawassee River	0.03 - 0.06	0.03 - 0.035
Chippewa River	0.06	0.035
Snake River	0.3 - 0.12	0.03 - 0.055
Sturgeon Creek	0.035 - 0.1	0.035 - 0.05
Inaman Drain	0.04 - 0.1	0.031 - 0.045

Reference

1. HEC-2 Water Surface Profiles, Users Manual, Hydrological Engineering Center, U.S. Army Corps of Engineers, August 1979.
2. Open Channel Hydraulics, Ven Ten Chow, McGraw-Hill, 1959.
3. Flood Control on Saginaw River, Michigan, and Tributaries; Tittabawassee River at Midland; Phase I, Design Memorandum No. 8, General; U. S. Army Engineer District Detroit, Corps of Engineers, Detroit, Michigan, January 1977.
4. Midland Plant Final Safety Analysis Report, Consumers Power Company, Initially submitted to the Nuclear Regulatory Commission, August 1977.

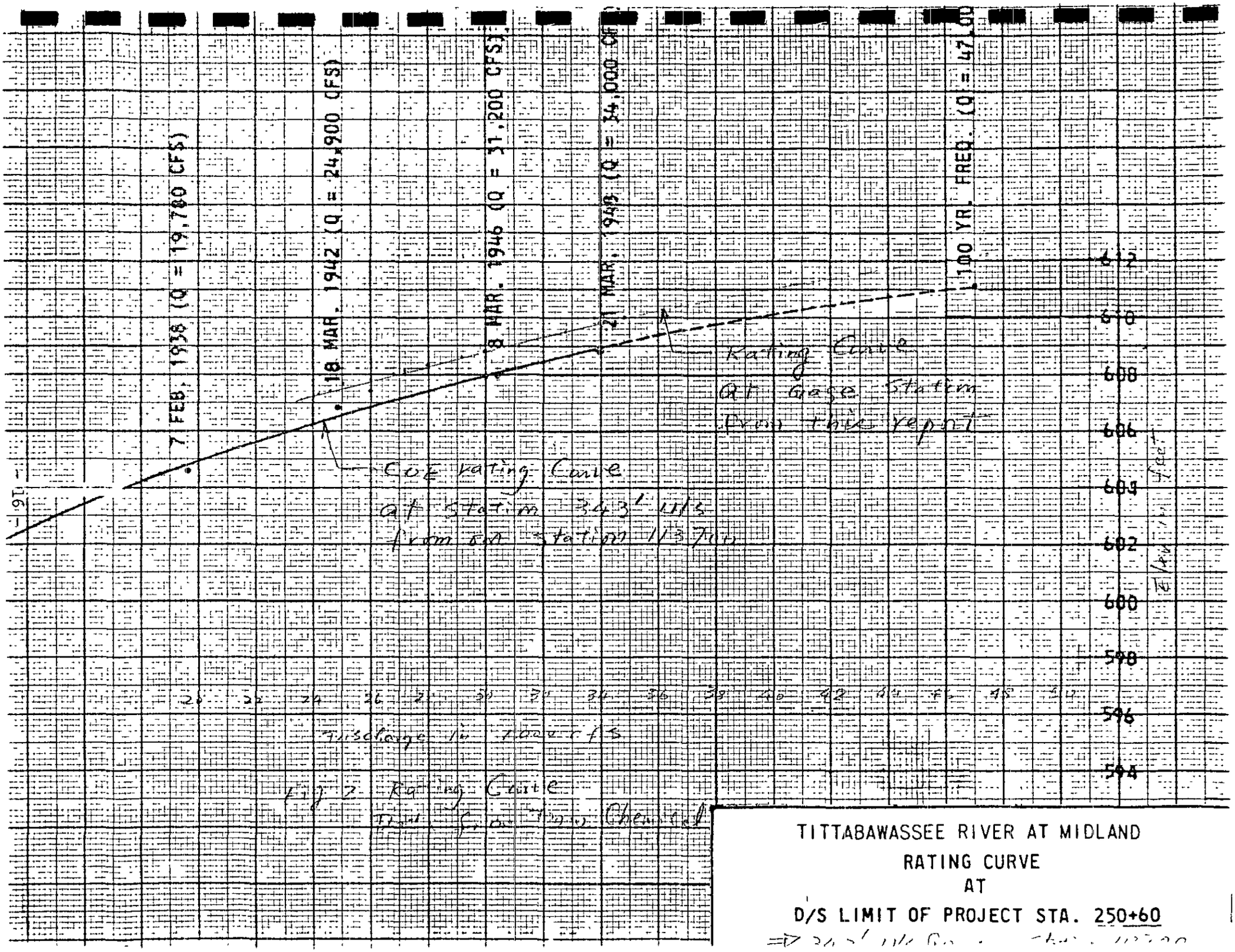


Fig 2 Rating Curve
Data from Town Chemical

TITTABAWASSEE RIVER AT MIDLAND
RATING CURVE
AT
D/S LIMIT OF PROJECT STA. 250+60

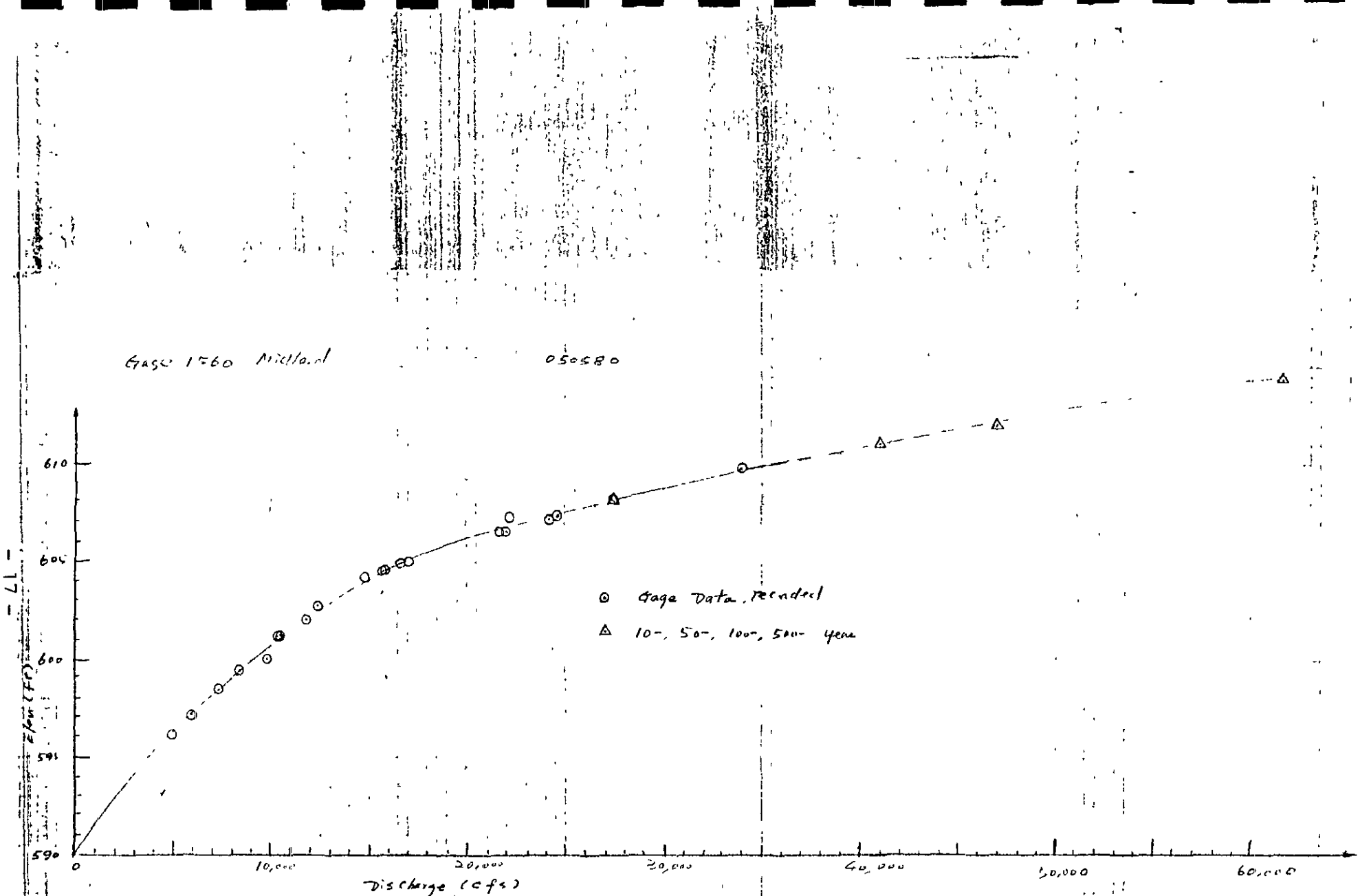
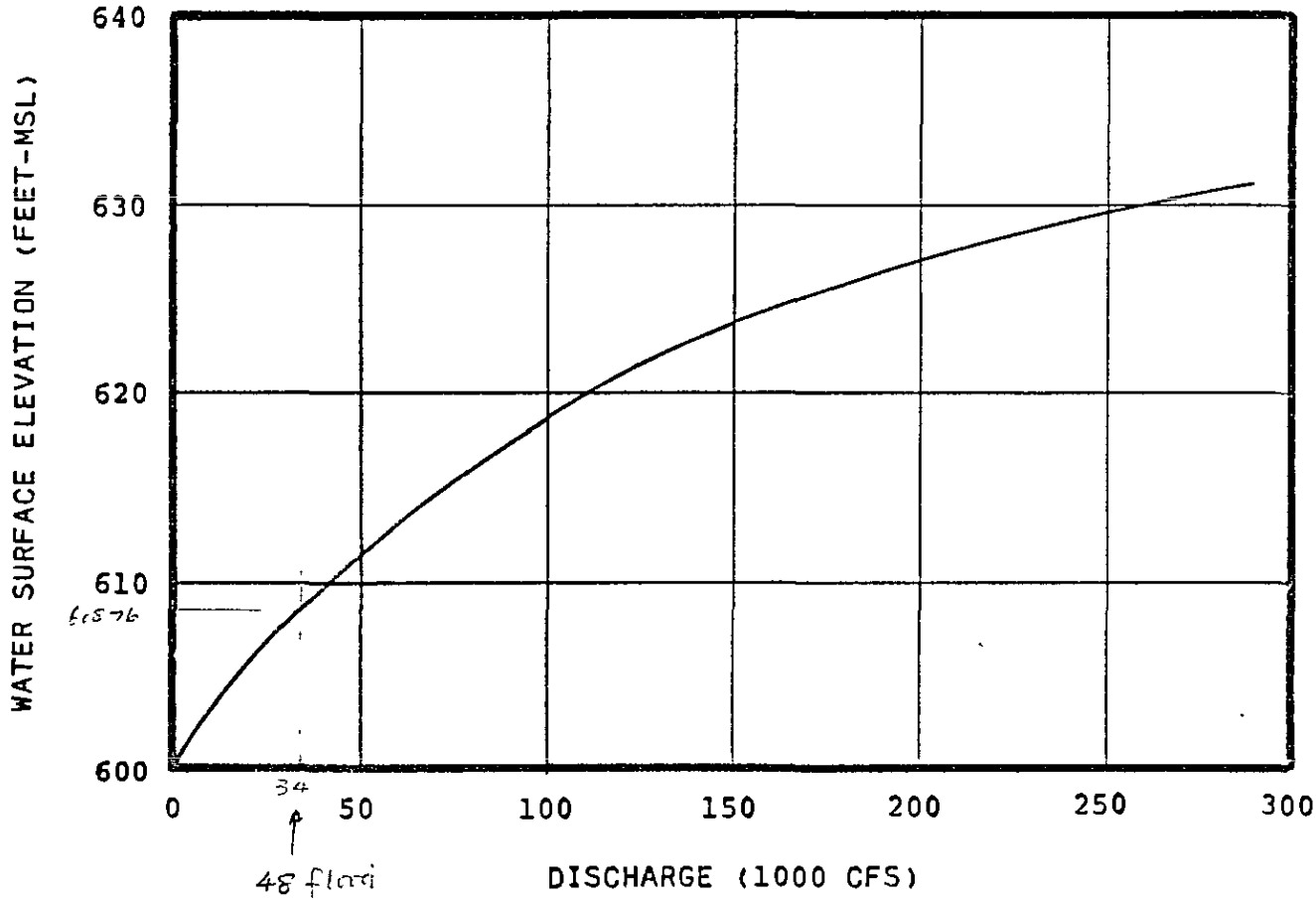


Fig. 3 Rating Curve at Gage 1560. Tittabawassee River



- the model for Consumer Power Company was based on the probable maximum flood.
- The encroachment of Dikes and embankments were not considered in the model.
- This rating curve can only be used as a reference.

Q	27500	41000	47000	61600	34000
Elev	607.22	609.30	611.24	612.51	608.76

Fig 5. Rating Curve at plant site

CONSUMERS POWER COMPANY
MIDLAND PLANT UNITS 1 & 2
FINAL SAFETY ANALYSIS REPORT

Rating Curve Tittabawassee River at Plant Site

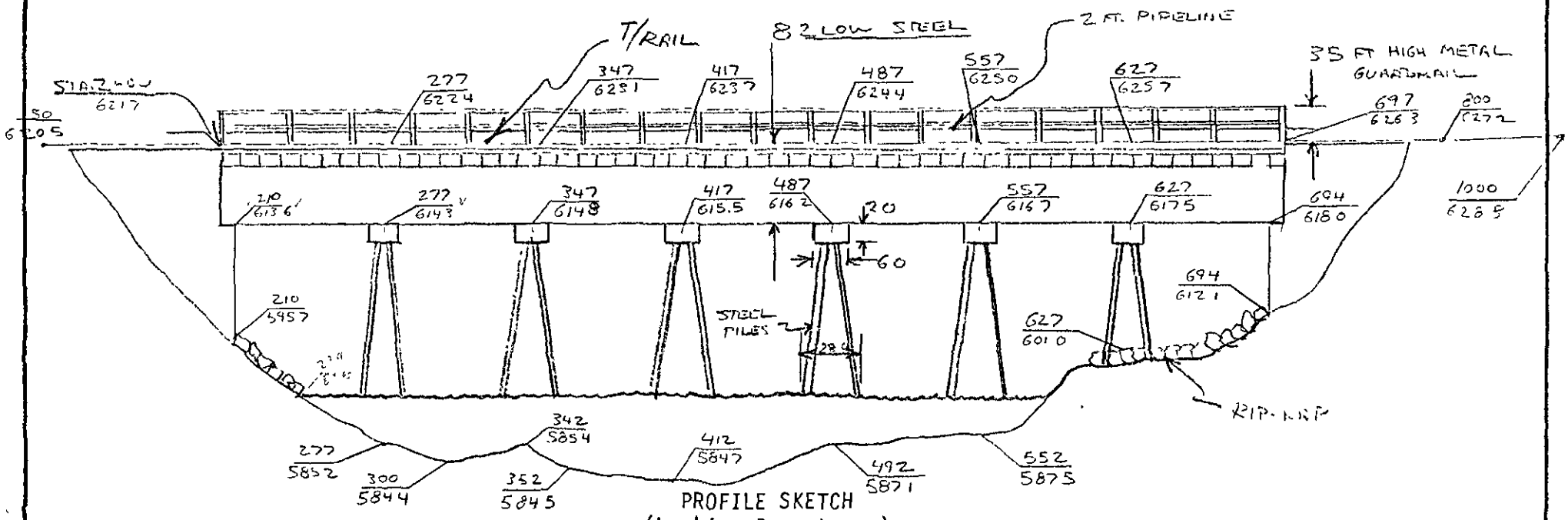
(SK-G-143, Rev 1)

FSAR Figure 2.4-22

11/77 Revision 1

BRIDGE DATA

Community: MIDLAND	Structure: CONSUMERS POWER R.R. BRIDGE	Type: STEEL PILE W/ STEEL T-BEAM	Station: 1129+50



PROFILE SKETCH
(Looking Downstream)

Length: 4970	Width: 140	Skew: —	Water Elevation: 588.8
No. of Piers: 6	Width of Piers: 6 FT - 28 FT	Shape of Piers: SEE DRAWING	

Notes:

Gove Associates Inc.
ARCHITECTS/ENGINEERS/PLANNERS/SURVEYORS

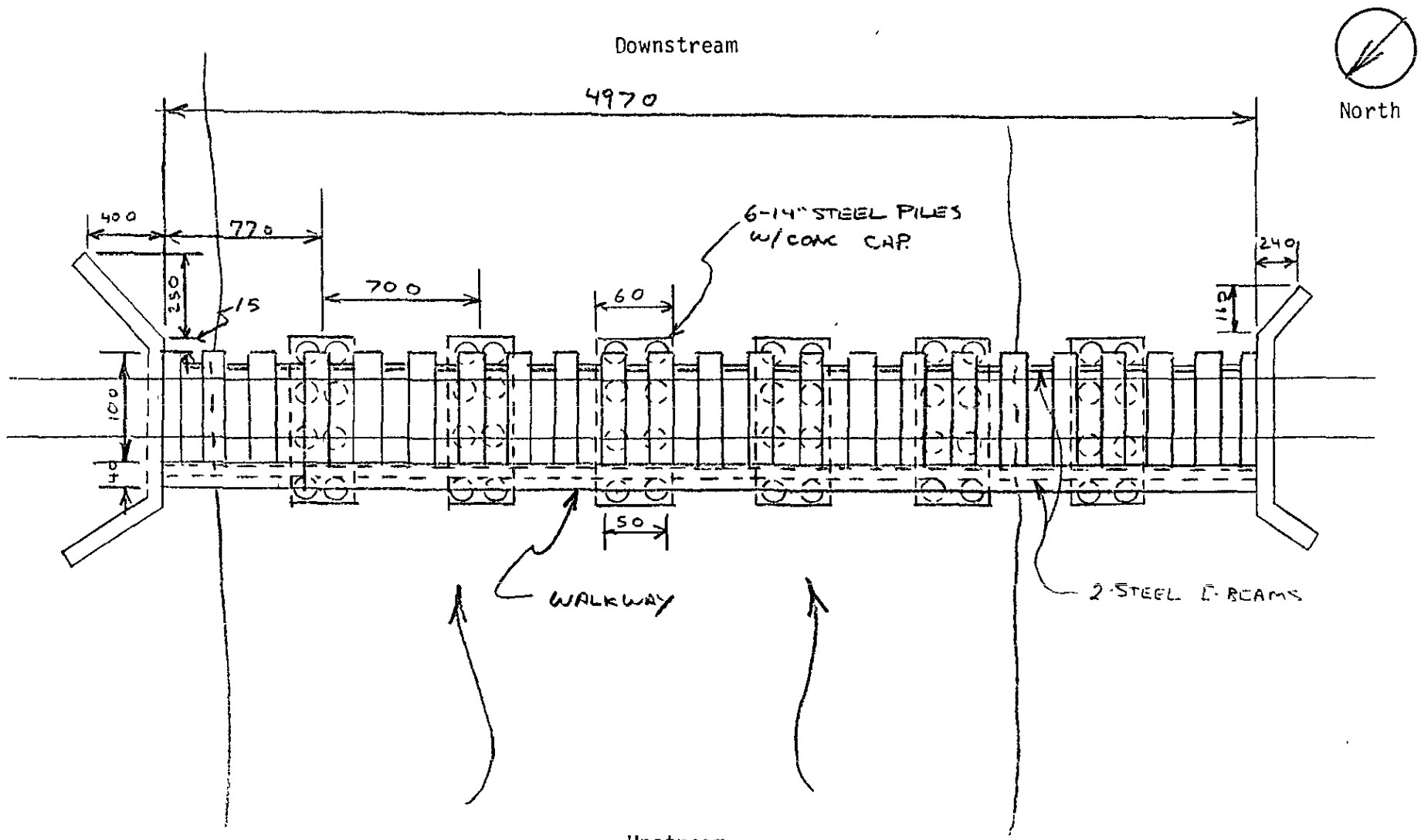
210 MILL STREET
LANSING, MICHIGAN 48933
(517) 485-0555

By: JSC

Date: 1/17/80

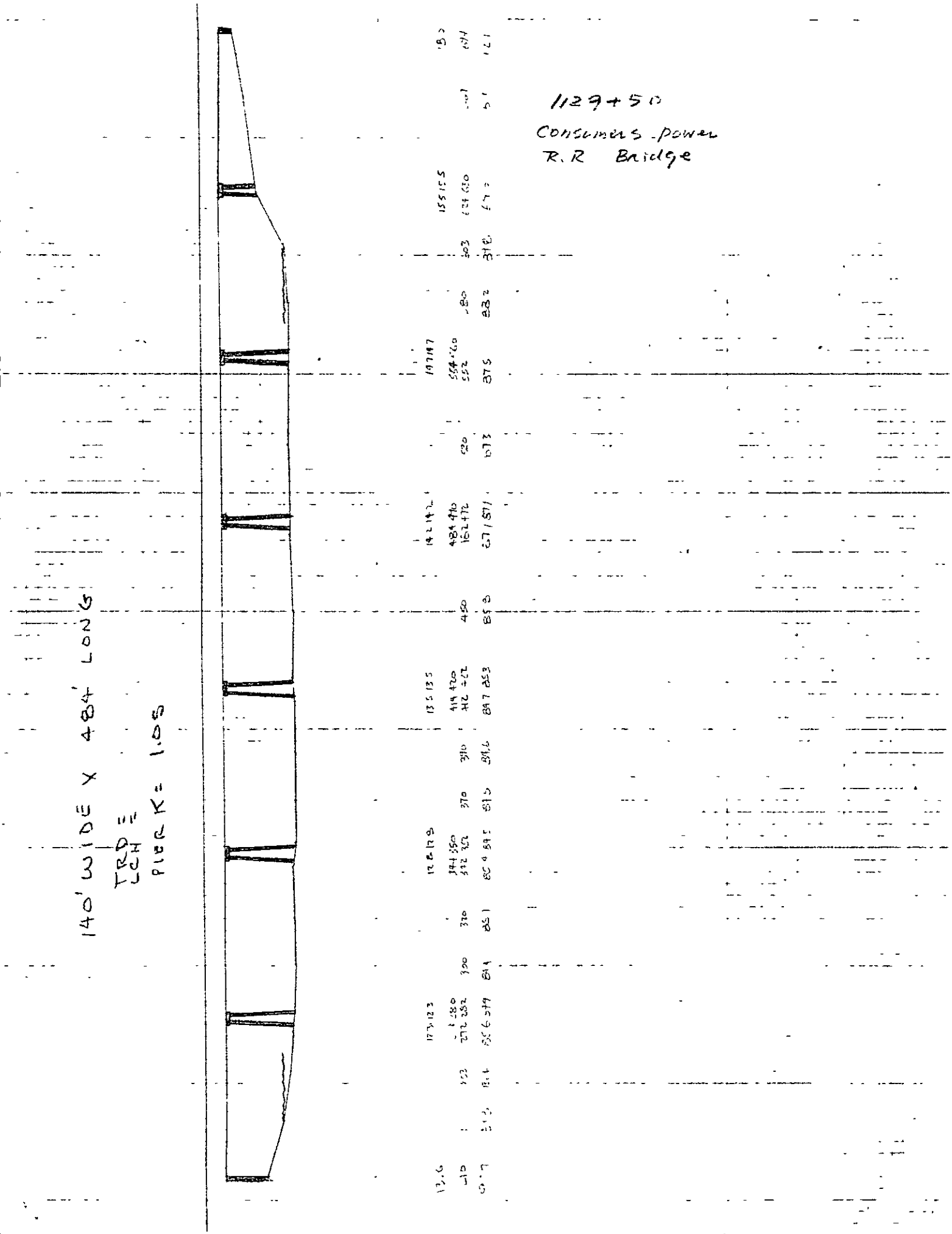
Sheet 1 of 2

Community: MIDLAND	Structure: CONSUMER'S PWR. R.R. BRIDGE	Type: STEEL PILES W/STEEL L-BEAMS	Station: 1129+50

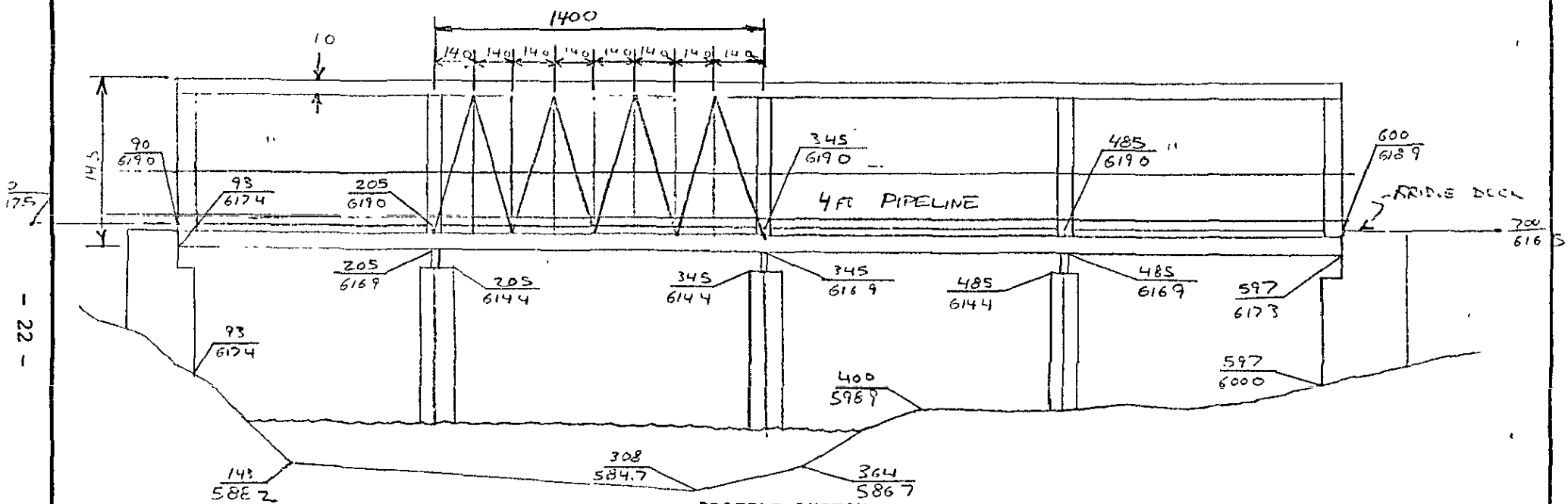


PLAN VIEW SKETCH

Gove Associates Inc. ARCHITECTS/ENGINEERS/PLANNERS/SURVEYORS	210 MILL STREET LANSING, MICHIGAN 48933 (517) 485-0555	By: S.C. Date: 1/17/80	Sheet 2 of 2


1129+50
Consumers power
R.R Bridge
140' WIDE X 484' LONG
TRD =
LCH =
PIER K = 1.05

Community: MIDLAND	Structure: [illegible] PIPELINE BRIDGE	Type: STEEL CANTILEVER	Station: 1176+00



PROFILE SKETCH
(Looking Downstream)

Length: 517 FT	Width: 23 FT	Skew: –	Water Elevation: 510 ft
No. of Piers: 3	Width of Piers: 4 FT	Shape of Piers: SEE NEXT PAGE	

Notes:

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LANSING, MICHIGAN 48933
(517) 485-0555

By: JSC

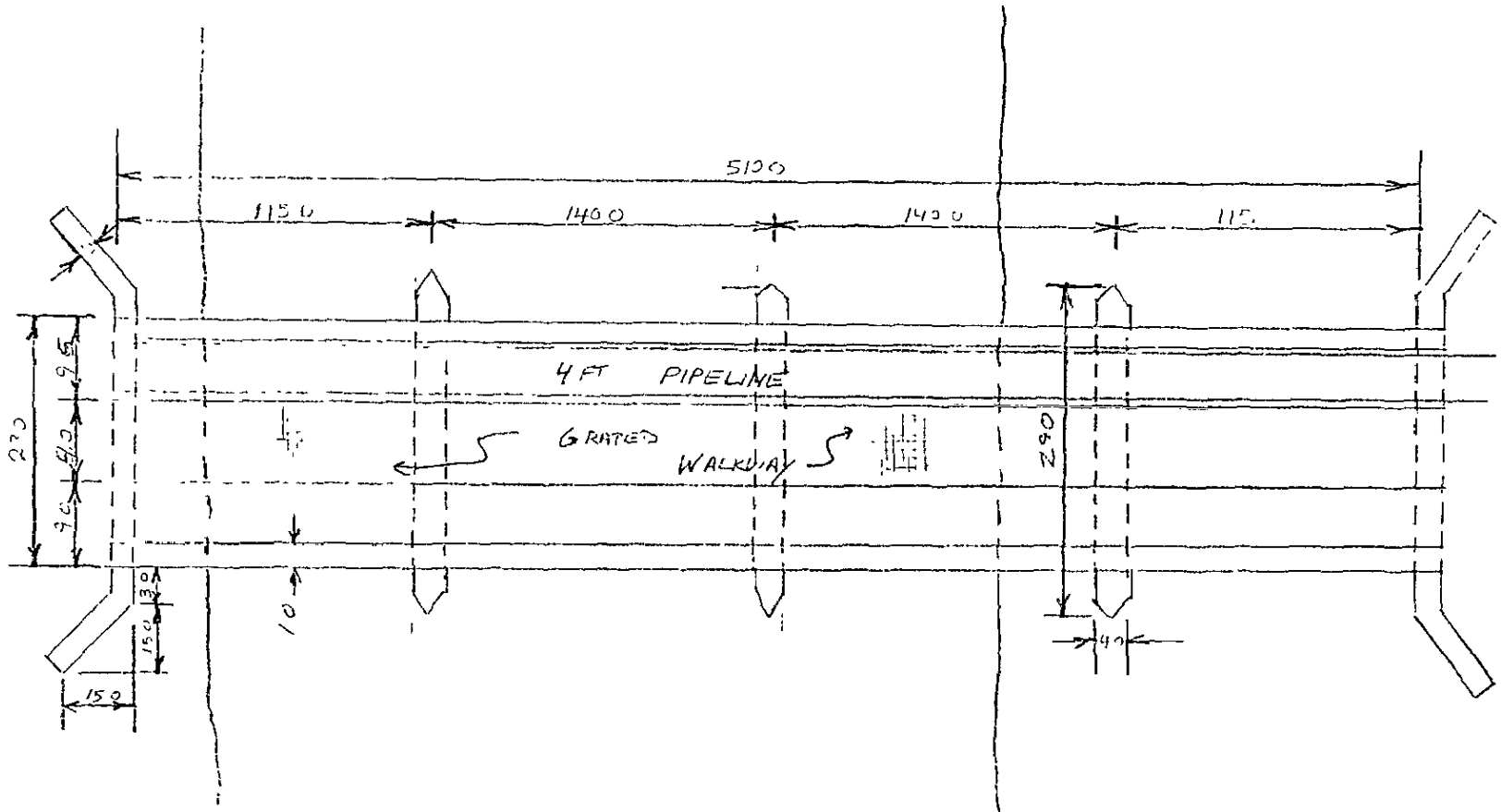
Date: 1/16/80

Sheet 1 of 2

Community: MIDLAND	Structure: DOW CHEMICAL PIPELINE BRIDGE	Type: STEEL CANTILEVER	Station: 1176+00

Downstream

North



Upstream

PLAN VIEW SKETCH

Gove Associates Inc.
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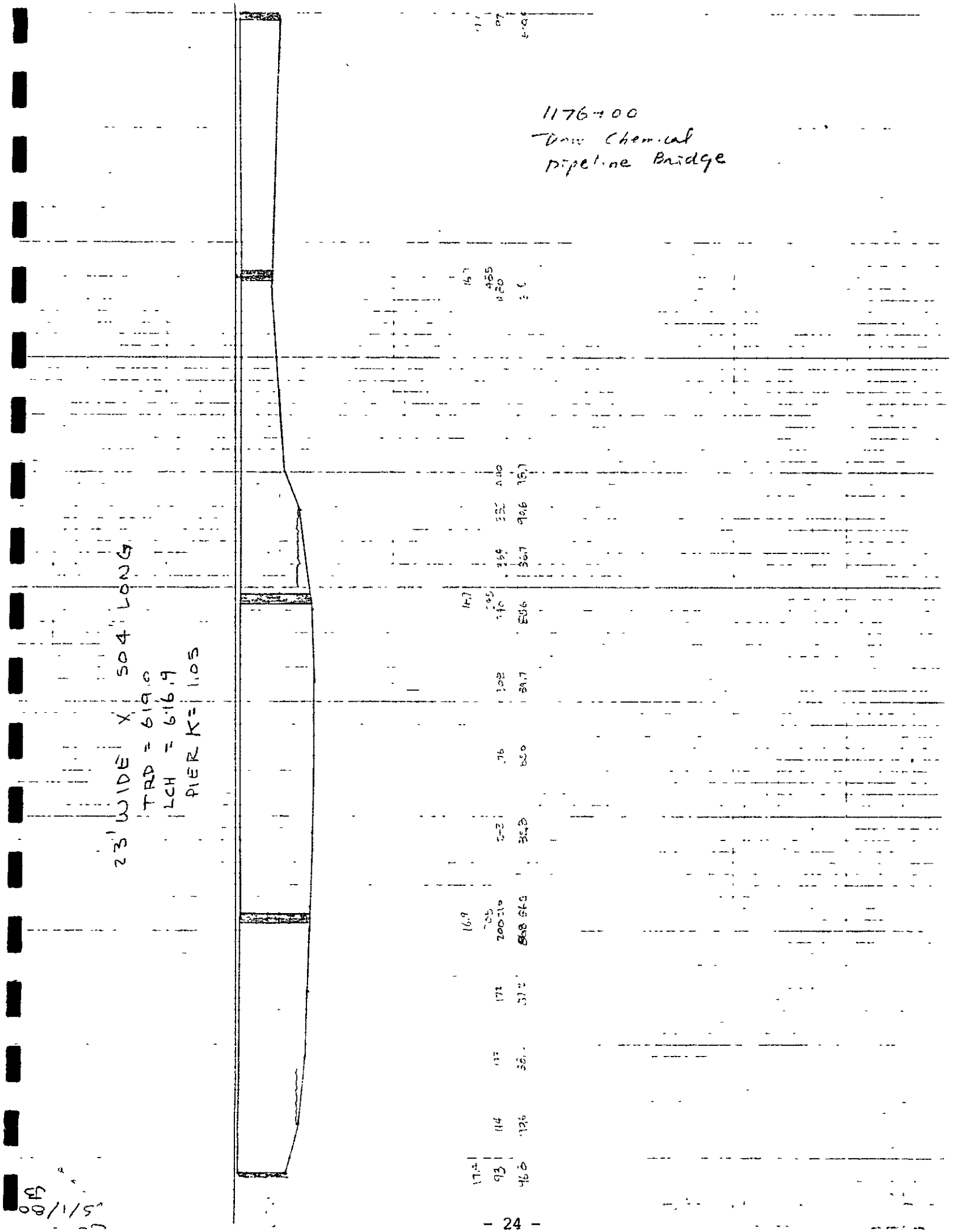
(517) 485-0555

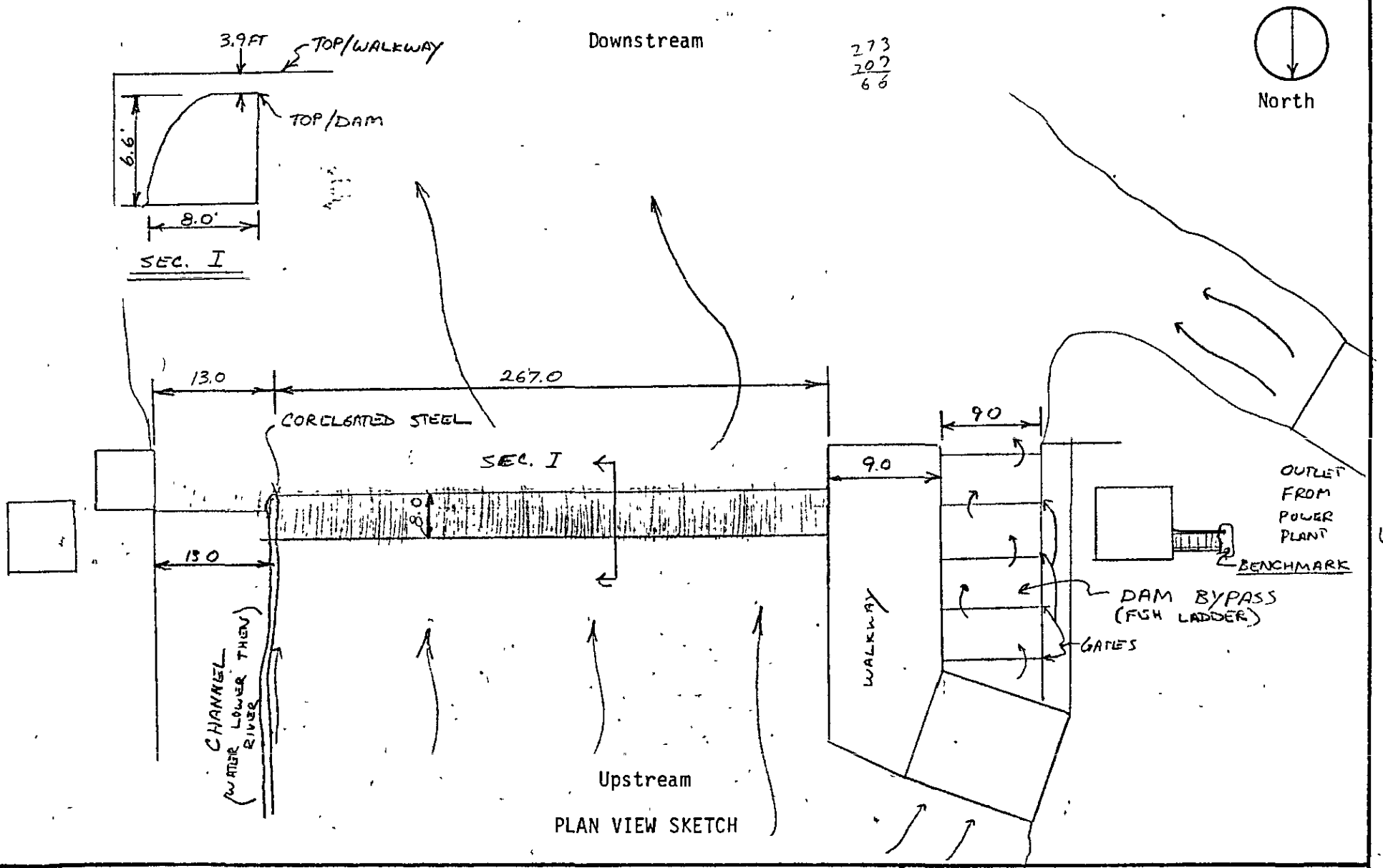
By: JSC

Date: 1/16/80

Sheet 2 of 2


1176+00
Dow Chemical
pipeline Bridge
23' WIDE X 504' LONG
TRD = 619.0
LCH = 616.9
PIER K = 1.05

Community: MIDLAND	Structure: DOW CHEMICAL DAM TITTABAWASSEE RIVER	Type: CONC.	Station: 1234 +00



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By: J.S.C.

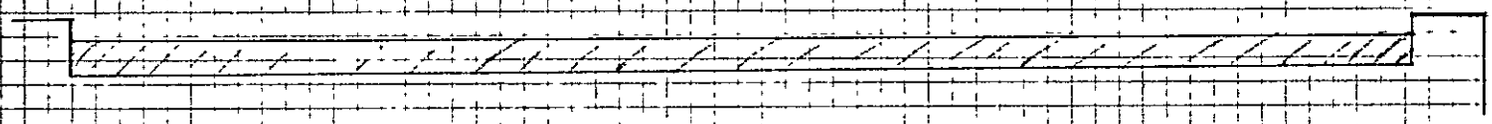
Date: 1/15/80

Sheet 2 of 2

0075

TITTABAWASSEE RIVER 5/2/80

1234+00 DOW CHEMICAL DAM B



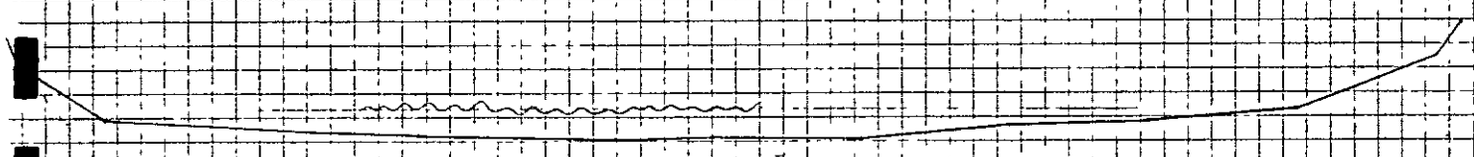
98.5 98.7 98.6

94.7 94.8

132' 412 428'

87.9 88.2

100' UP STREAM



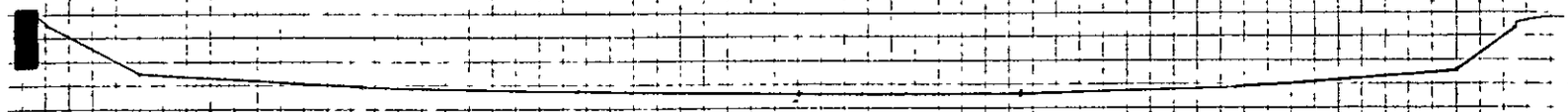
4.4 619.5

408

124 147 168 190 210 231 252 283 313 343 374 404

99.7 91.8 91.1 90.8 90.8 90.3 90.6 93.0 94.1 96.3 607.6

100' DOWNSTREAM



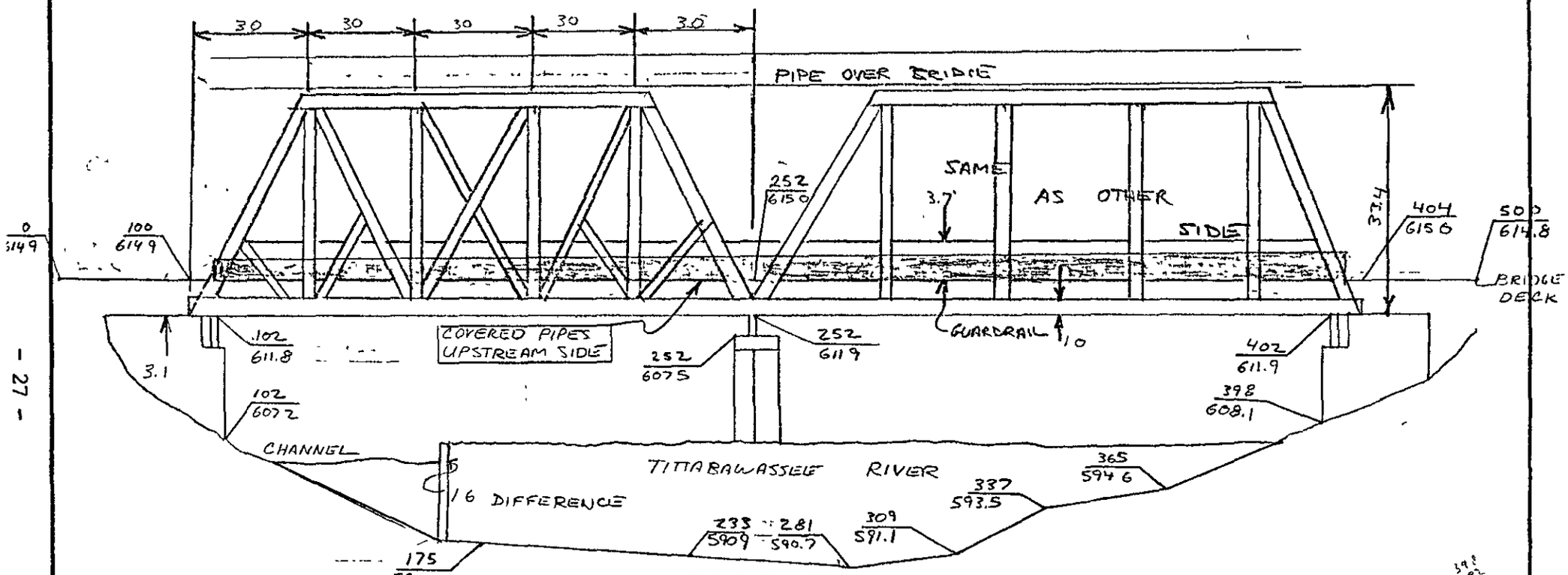
2 64 111 157 204 251 297 344 356

2.6 92.7 89.5 88.5 87.6 87.4 89.0 92.7 1.6

TOPS FORM 3308

LITHO IN U.S.A.

Community: MIDLAND	Structure: DOW CHEMICAL RR VEHICLE BRIDGE	Type: STEEL CANTILEVER	Station: 1241+40



PROFILE SKETCH
(Looking Downstream)

Length: 304.0 FT.	Width: 20 FT BRIDGE SUPERSTRUC 27 FT W/ PIPELINES	Skew: —	Water Elevation: 596.8 - RIVER
No. of Piers: 1	Width of Piers: 6 FT	Shape of Piers: SEE PAGE 2	595.2 CHANNEL

Notes:

3.1
30.2

6198
230
5968

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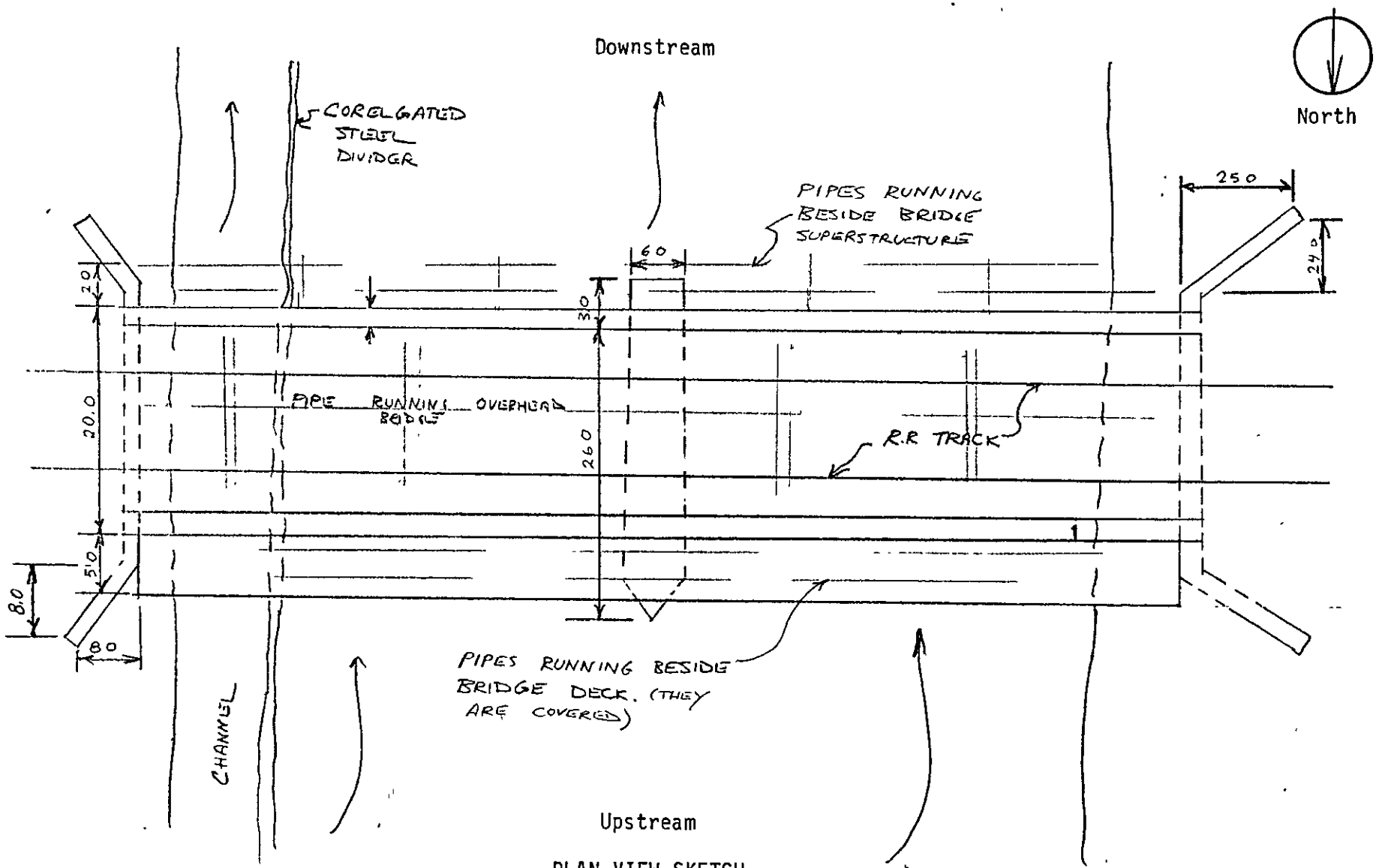
By: J. S.C.

Date: 1/15/80

Sheet 1 of 2

Community: MIDLAND	Structure: DOW CHEMICAL R R VEHICLE BRIDGE	Type: STEEL CANTILEVER	Station: 1241+40



PLAN VIEW SKETCH

Gove Associates Inc.
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210 MILL STREET
LANSING, MICHIGAN 48933
(517) 485-0555

By: J.S.C.

Date: 1/15/80

Sheet 2 of 2

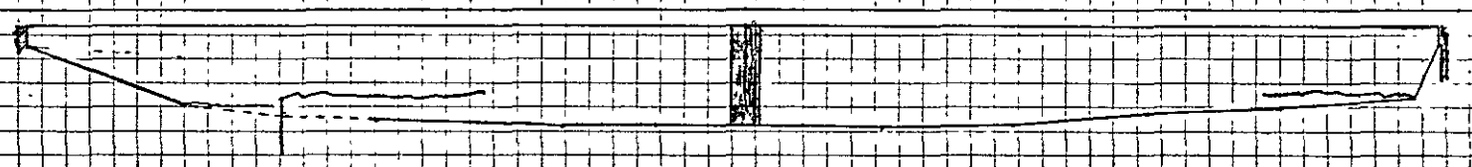
#8543
5/1/80
B

TITTABAWASSEE RIVER

241+40 DOW CHEMICAL BRIDGE

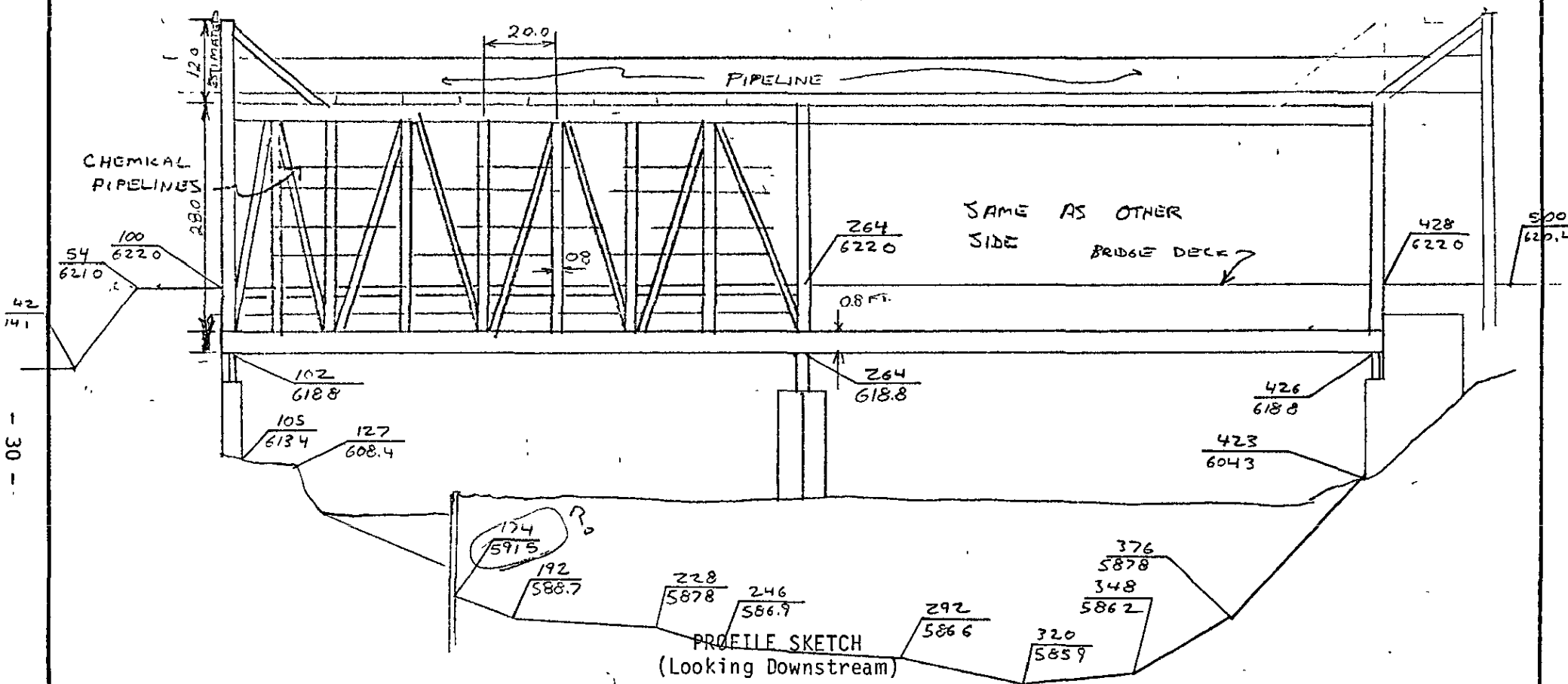
20' WIDE X 296' LONG

TRD = 615.0
LCHD = 611.9
PIER K = 1.05



11.9 ~~11.8~~							11.9					11.9
102	134	155	175	195	214	233	252	281	309	337	365	393 398
9.2	95.2	~~96.8~~ 93.0	92.2	91.6	91.3	90.9		90.7	91.1	93.5	94.6	96.8 8.1

Community: MIDLAND	Structure: DOW CHEMICAL PIPELINE BRIDGE	Type: STEEL CANTILEVER	Station: 1243+00



PROFILE SKETCH
(Looking Downstream)

Length: 2640	Width: 25 FT	Skew: —	Water Elevation: 5963 - RIVER
No. of Piers: 1	Width of Piers: 4 FT	Shape of Piers: SQUARE	5947 - CHANNEL

Notes:

423 105 318

270 307 5963

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ARCHITECTS/ENGINEERS/PLANNERS/SURVEYORS

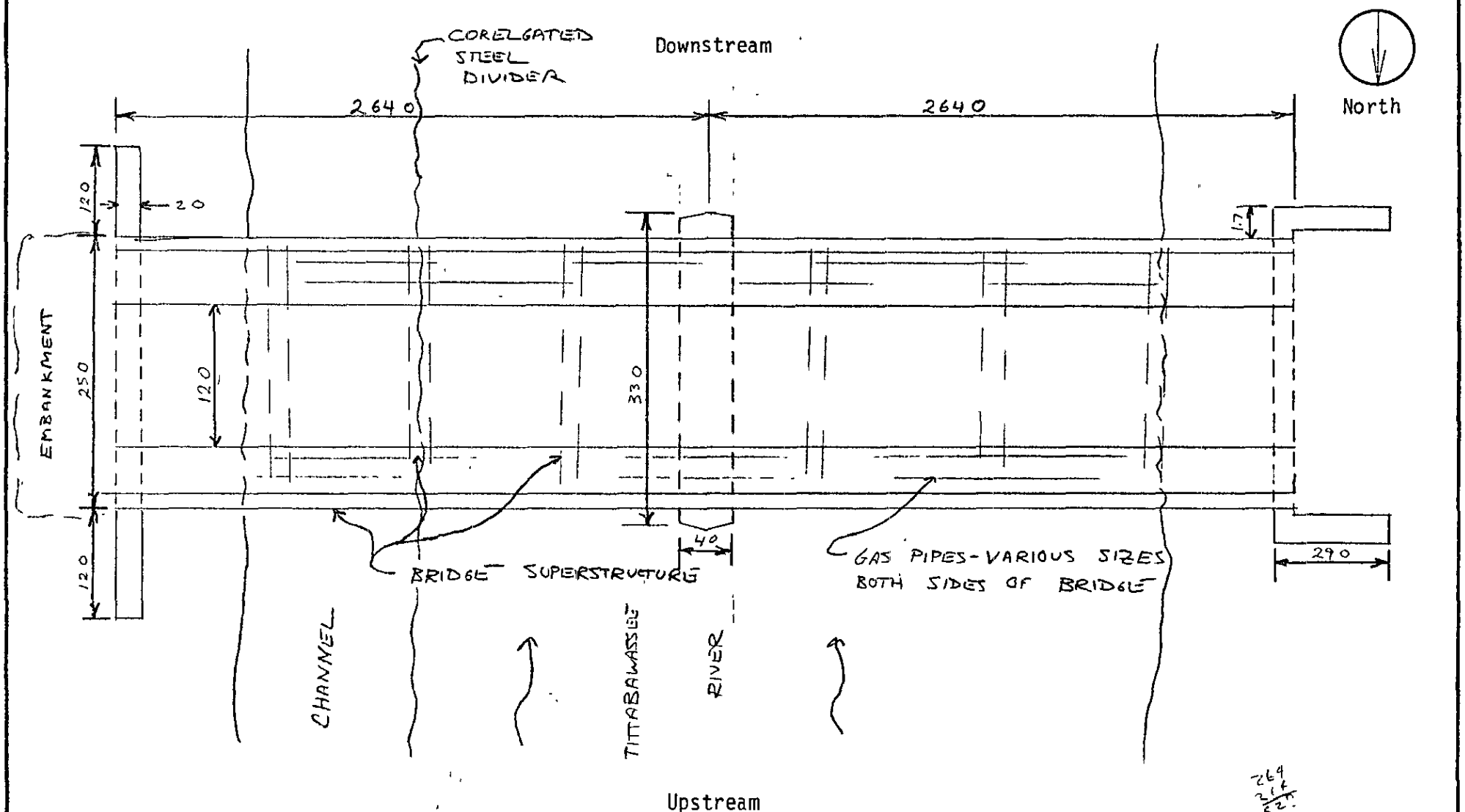
210 MILL STREET
LANSING, MICHIGAN 48933
(517) 485-0555

By: JSC

Date: 1/15/80

Sheet 1 of 2

Community: MIDLAND	Structure: DOW CHEMICAL PIPELINE BRIDGE	Type: STEEL CANTILEVER	Station: 1243+00



PLAN VIEW SKETCH

Gove Associates Inc.
ARCHITECTS/ENGINEERS/PLANNERS/SURVEYORS
210 MILL STREET
LANSING, MICHIGAN 48933
(517) 485-0555

By: J.S.C.

Date: 1/15/80

Sheet 2 of 2

#8543
5/2/80
B

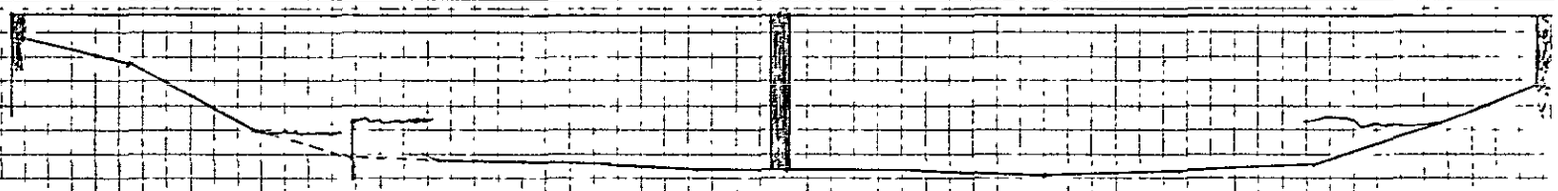
TITTABAWASSEE RIVER

1243+00 DOW CHEMICAL BRIDGE

25' WIDE X

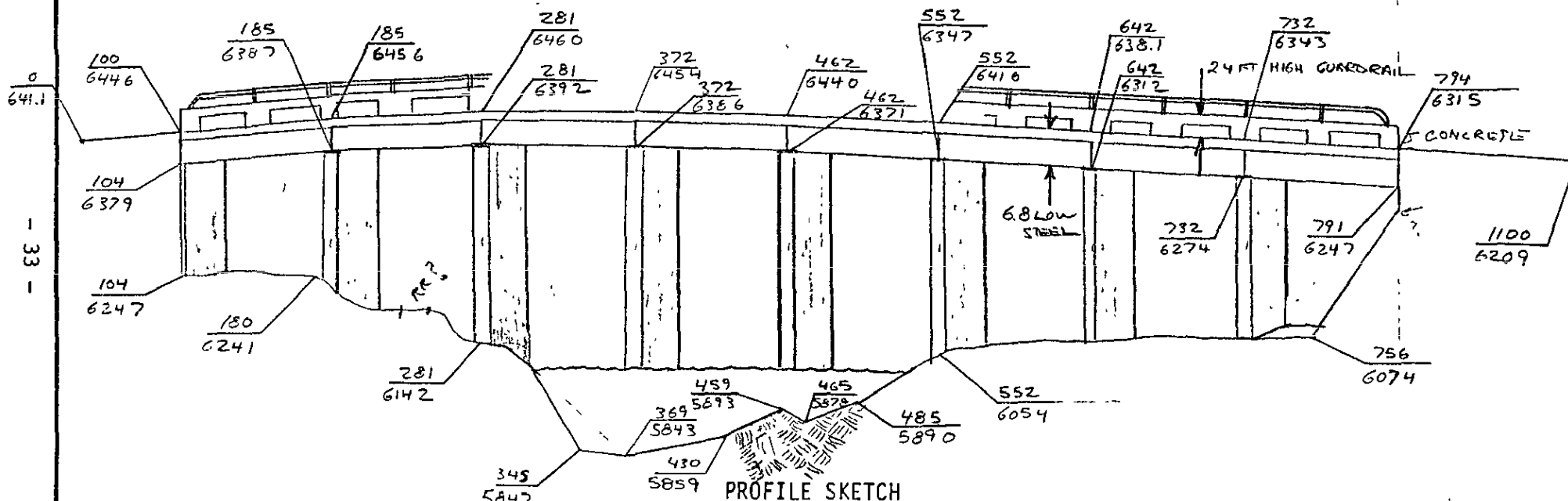
TRD = 622.0
LCH = 618.8

PIER K = 1.10



188								18.8						18.8
02	127	154	174	192	210	228	246	264	292	320	348	376	403	423
105	8.4	94.7	96.3	88.7	88.2	87.8	86.9		86.6	85.9	86.2	87.8	96.3	4.3
13.4			88.9											

Community: MIDLAND	Structure: GEORGE ST BRIDGE	Type: CONC. PIERS & BEAMS	Station: 1275+50



PROFILE SKETCH
(Looking Downstream)

Length: 694.0	Width: 64.0	Skew: 64.0 FT x 15.0 FT = 13°	Water Elevation: 595.8
No. of Piers: 7	Width of Piers: 4.0	Shape of Piers:	

Notes:

Gove Associates Inc.
ARCHITECTS/ENGINEERS/PLANNERS/SURVEYORS

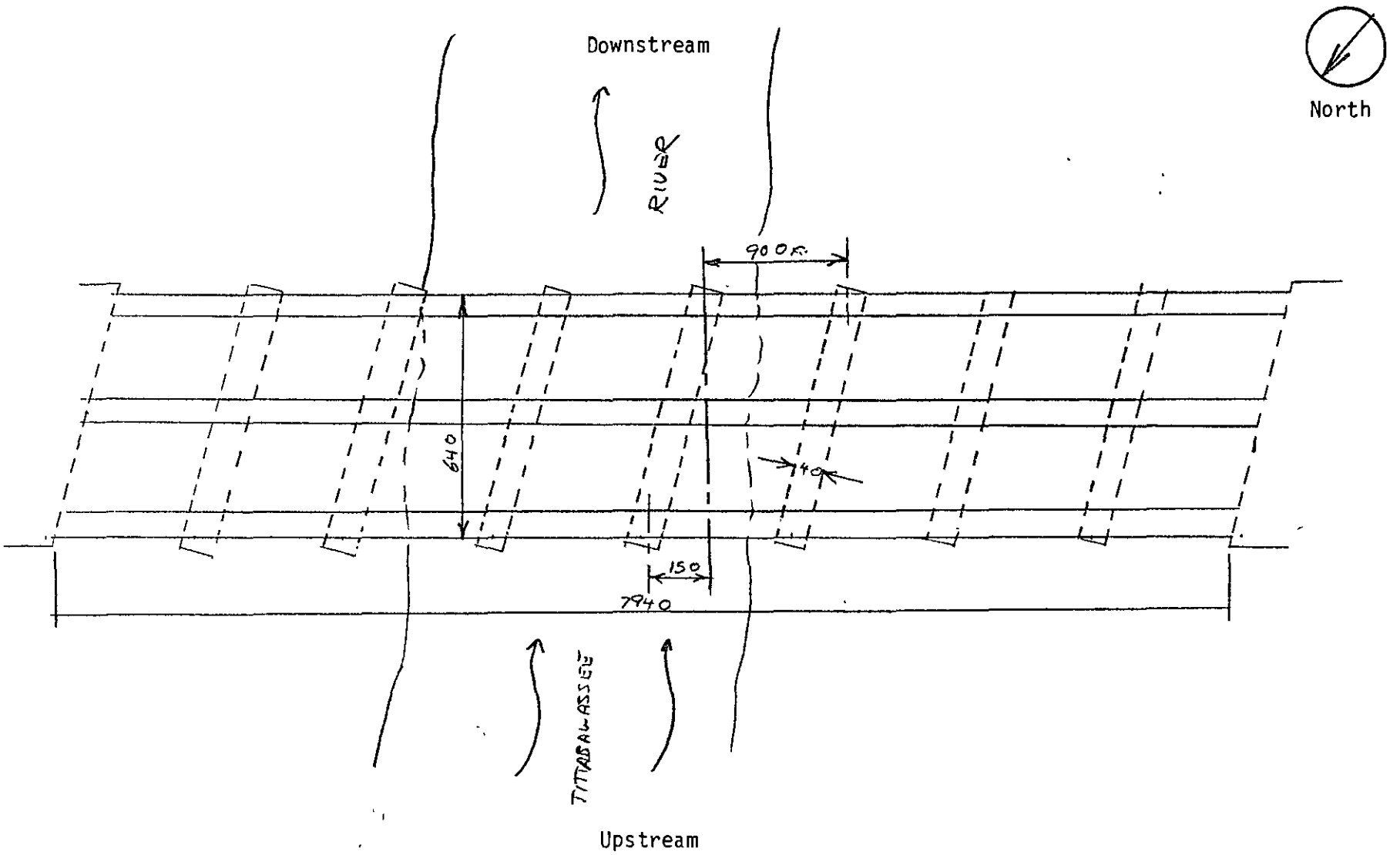
210 MILL STREET
LANSING, MICHIGAN 48933
(517) 485-0555

By: J.S.C.

Date: 11/26/79

Sheet 1 of 2

Community: MIDLAND	Structure: GEORGE ST. BRIDGE	Type: CONCRETE PIERS & BEAMS	Station: 1275+50



PLAN VIEW SKETCH

Gove Associates Inc.
ARCHITECTS/ENGINEERS/PLANNERS/SURVEYORS

210 MILL STREET
LANSING, MICHIGAN 48933
(517) 485-0555

By: J.S.C.

Date: 11/23/79

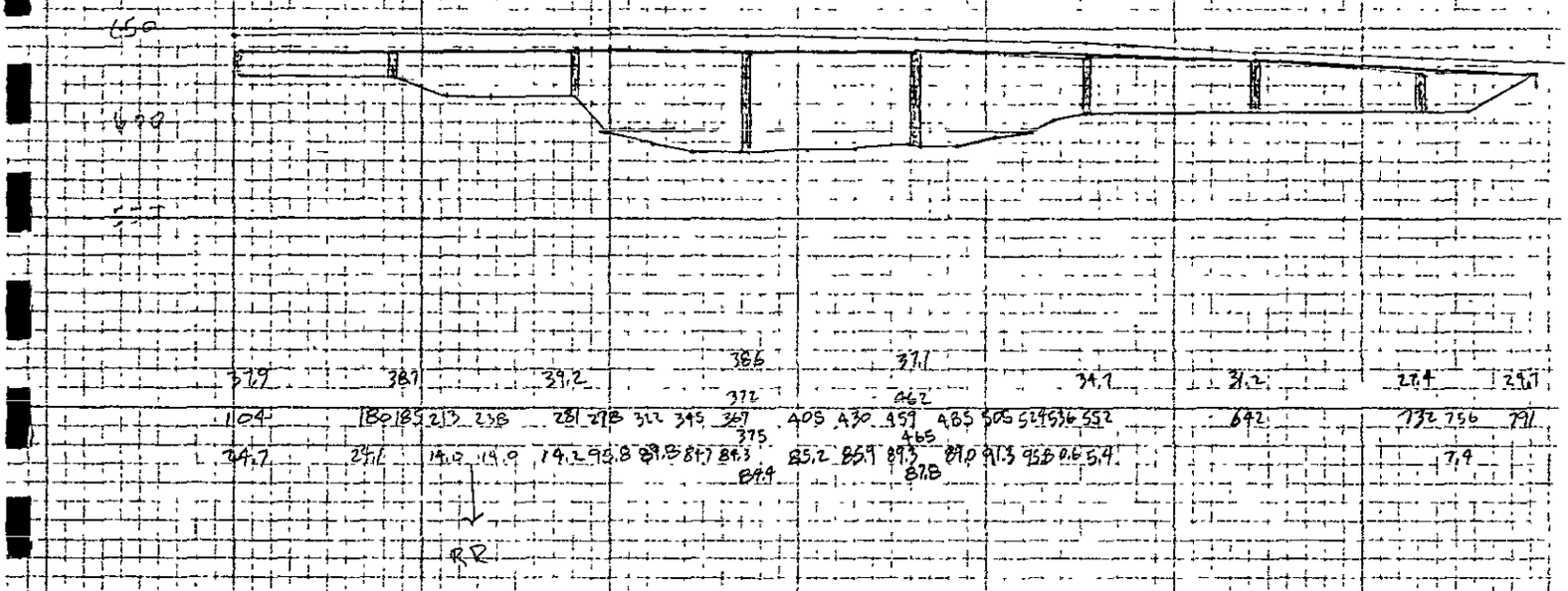
Sheet 2 of 2

#8543
4/15/80
JB

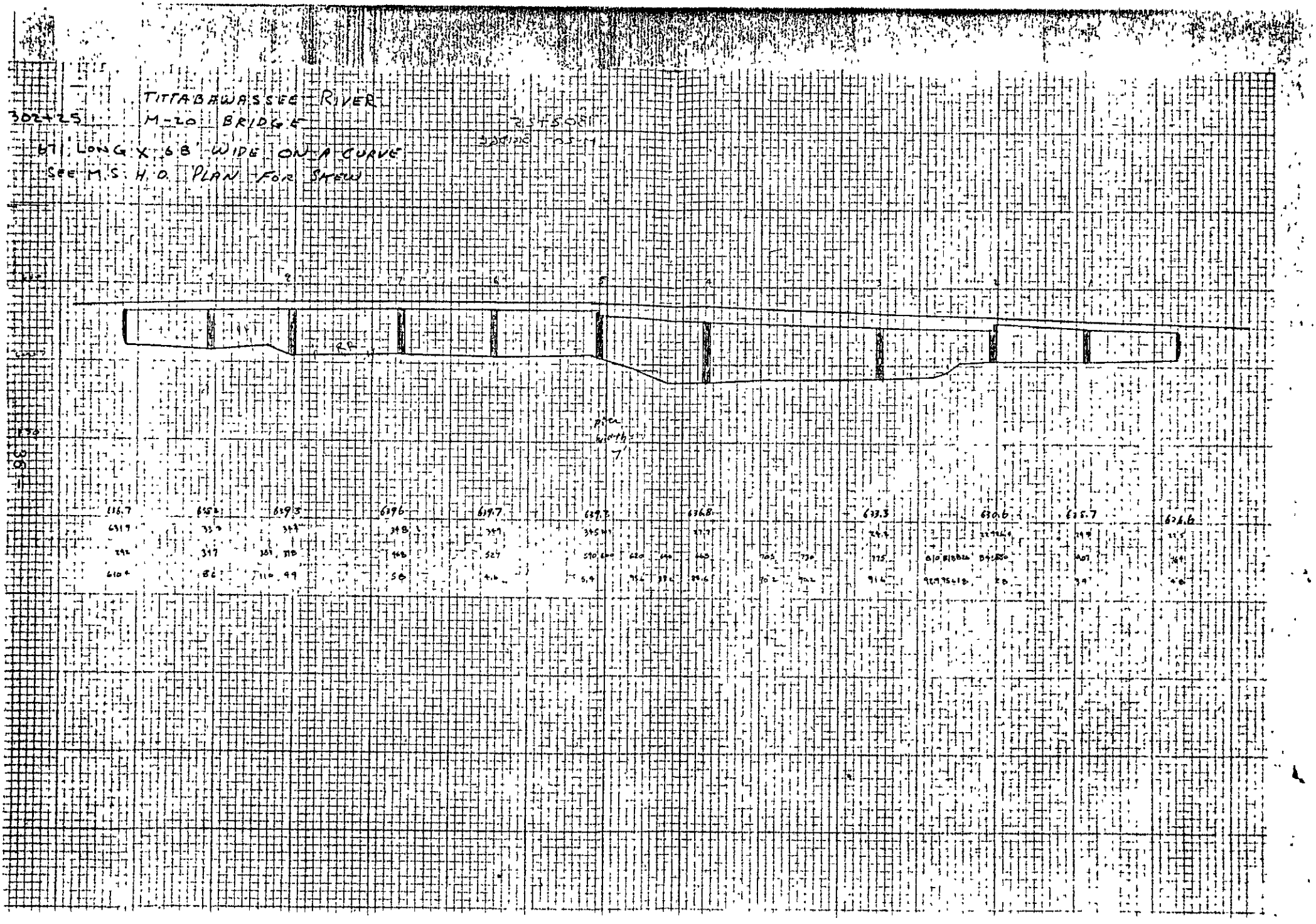
TITTABAWASSEE RIVER

1275+50 GEORGE STREET BRIDGE

694' LONG X 64' WIDE



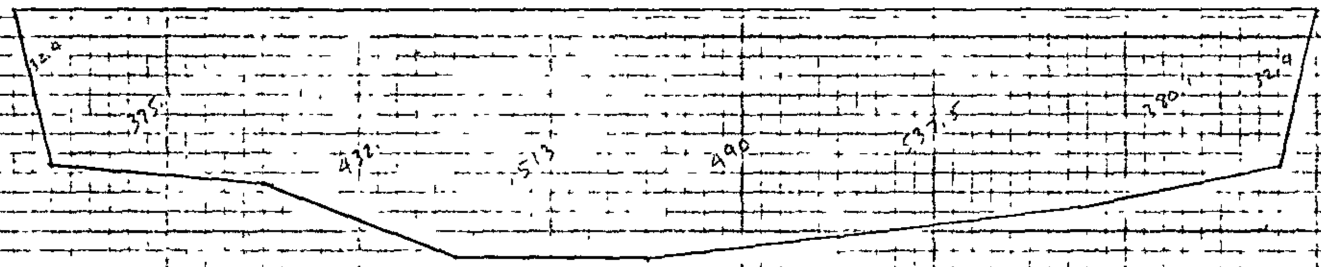
TITTABAWASSEE RIVER
302+25 M-20 BRIDGE
67' LONG X 68' WIDE ON A CURVE
SEE M.S.H.O. PLAN FOR SKEW



#8543
4/15/80

TITTABAWASSEE RIVER

1317+50 CURRIE PARKWAY BRIDGE



12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7
104	108	130	150	170	190	215	236 240
96.5		94.8	87.4	86.7	89.7	92.7	96.5
16.2		17.7	23.3	26.0	23.0	20.0	16.2

A = 2808.7 □′

#8543

4/8/80
JB

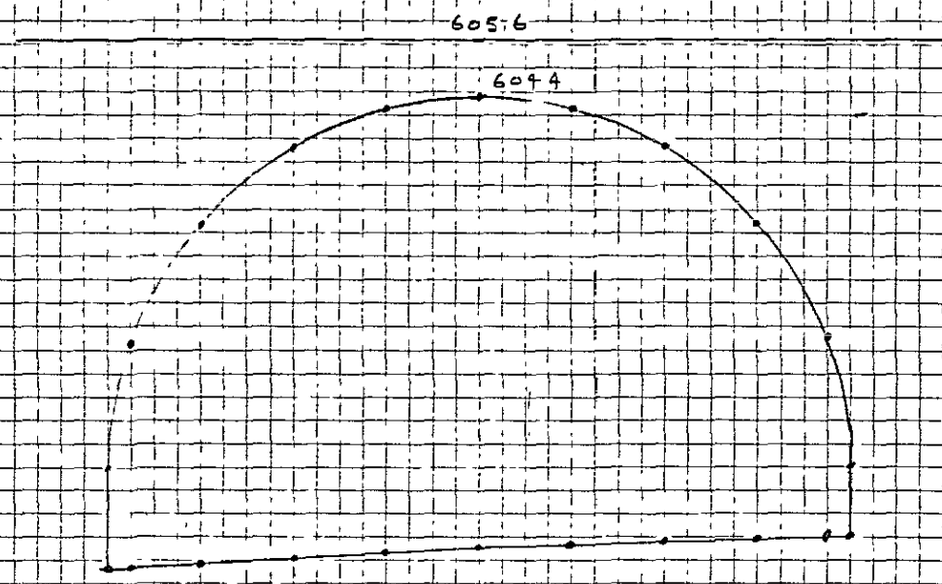
SNAKE CREEK

2+50 EMERSON PARK DR.

POURED CONCRETE CULVERT

AREA = 127.8 FT.^{2}

28' WIDE



201.6
+ 5.6
206.66

2)201.6
100.8
5.6
106.4
+ 24.0
130.4

96.4 99.3 1.7 3.3 4.2 604.4 4.2 3.3 601.7 99.3 96.6

408 408.5 410 412 414 416 418 420 422 423.5 424

94.3 94.3 94.4 94.5 94.6 594.8 94.85 94.9 94.95 95.0 95.0

A = 127.8 □'

Ke =

n = .1 NOT CONCRETE FLOOR

TOPS FORM 3308
THU IN U.S.A.

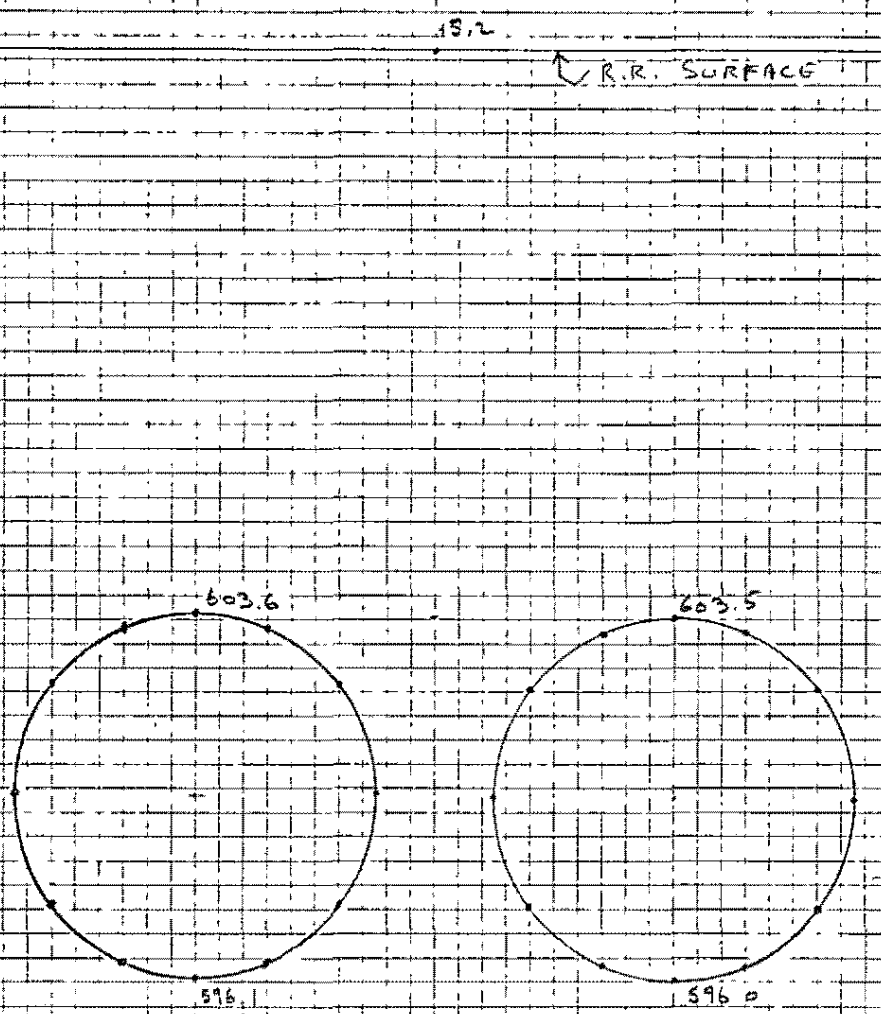
SNAKE CREEK

7+50 C. + O. RAILROAD

1- 7.5' ϕ x 53' LONG = STRUCTURAL PLATE PIPES

7.5" ϕ x 53' LONG SEE NOTES FOR SKEW

Skew effect negligible



99.85 2.1 3.3 603.6 13.3 2.1 99.85 99.75 2.0 3.2 603.5 3.2 2.0 99.75

96.25 97.0 498.5 500 1.5 3.0 375 625 7 8.5 510 11.5 13 13.75

99.85 97.6 96.9 96.1 96.4 97.6 99.85 99.75 97.5 96.3 96.0 96.3 97.5 99.75

A = 44.2 A = 44.2 TOT A = 88.4 □'

R = 1.875 Ke = .7

$R^{4/3}$ = 2.31 n = .024

$K_f = \frac{29.1 \times 0.024^2 \times 53}{2.31} = 0.38$

XKOR = 1 + 0.7 + 0.38 = 2.08

OPS FORM 3308

#8575

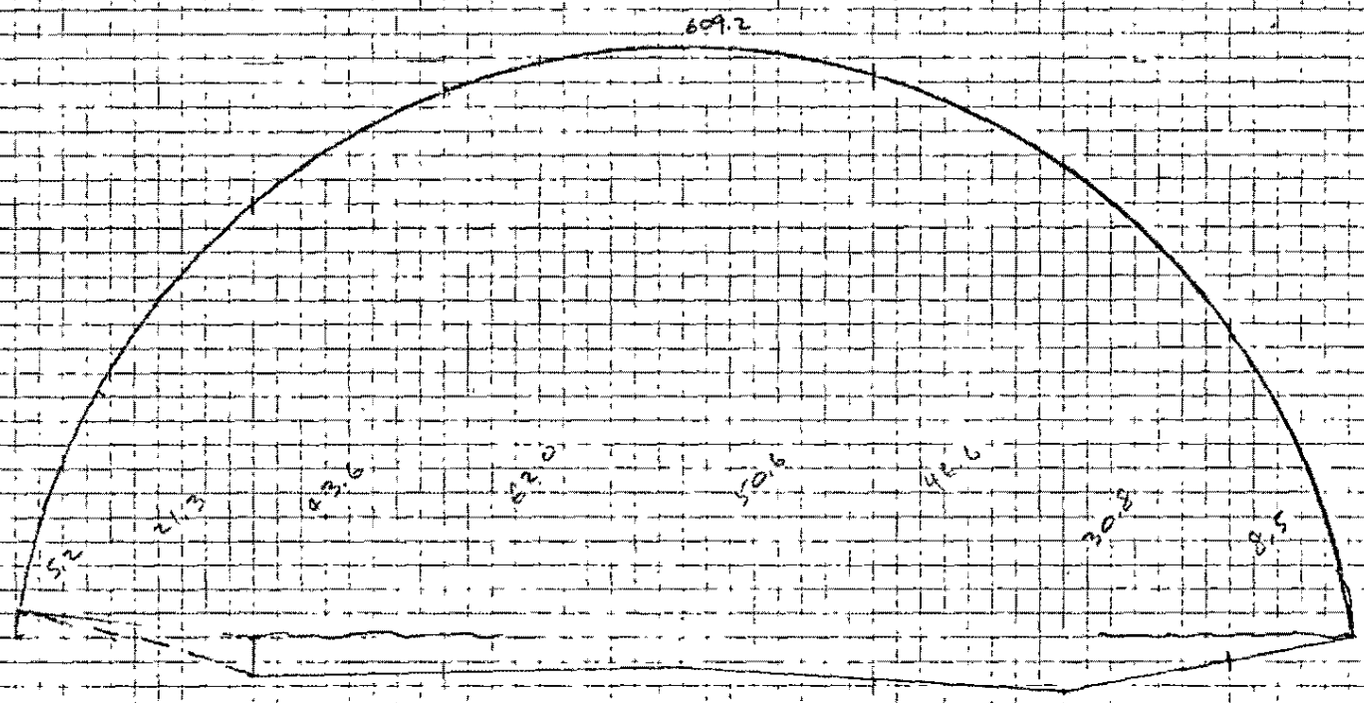
8+75 SNAKE CREEK 6/20/80 B

MAIN ST. BRIDGE

POURED CONCRETE CONSTRUCTION

28' WIDE

T.P. 615.2



597.5	602.5	606.0	608.3	609.2	608.7	606.7	603.3	597.0
513	515	518	522	527	531	535	538.5	541
597.5	597.5		596.3	596.4	596.2	597.0	596.5	597.0
		596.2				595.9		
	5.2		12.0	12.9	12.5		6.9	
		9.0				10.8		
		9.9						

$K_{entrance} = 0$ at this Case

$A = 269$ □' ✓ XKOR = 1.06

$R = 3.74$ $R^{4/3} = 5.78$

TOPS FORM 3308

$K_f = \frac{29.1 \times 0.02^2 \times 28}{5.78} = 0.06$

#8543
4/9/20
B

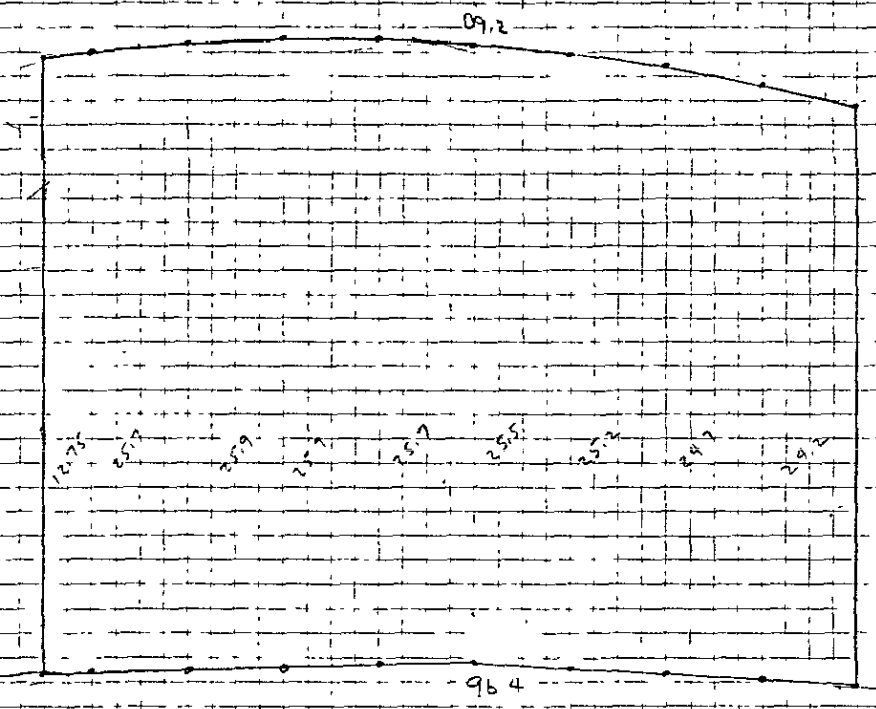
SNAKE CREEK

8+75 MAIN STREET BRIDGE

POURED CONCRETE CONSTRUCTION

28' WIDE

1" = 40'



NOTE:
THIS IS TAKEN DIRECTLY FROM FIELD NOTES

WATER SURFACE

8.9	9.0	9.2	9.3	9.3	609.2	9.0	8.7	8.3	7.9
518	519	521	523	525	527	529	531	533	535
96.2	96.2	96.3	96.3	96.4	96.4	96.3	96.2	96.1	95.9
12.7	12.8	12.9	13.0	13.0	12.8	12.7	12.5	12.2	12.0

A = 216 □'

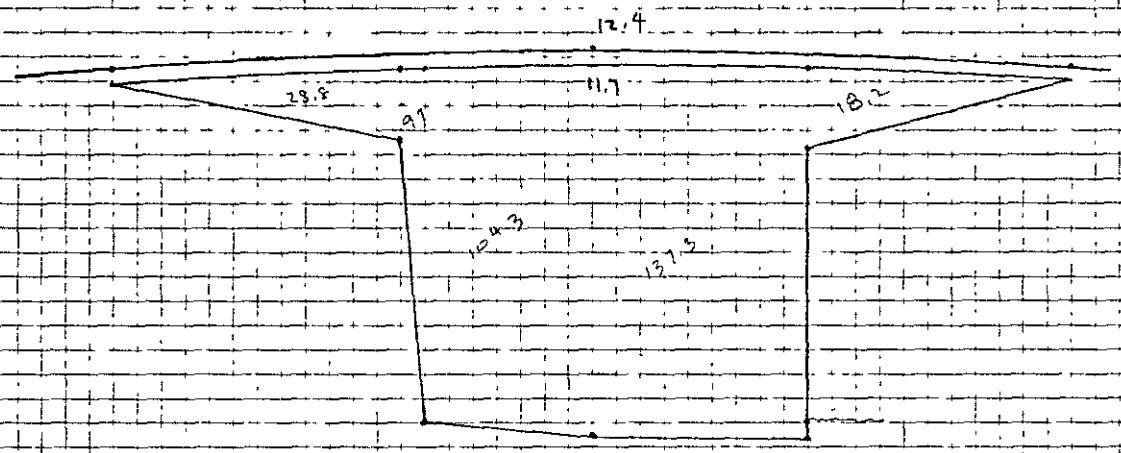
OPS FORM 2308

#8543
4/9/20
B

SNAKE CREEK

9+03 FOOT BRIDGE

6.5' WIDE



12.4
11.7
0.7

11.5						11.7
~~10.6~~		11.4 11.5		11.7	11.6	~~11.0~~
510	27.8	522 523	104.3	530	539	550
610.8		608.6 97.0		96.4	608.3	611.0
		9.7			96.4	
		4.3 14.5		5.3		
					3.3	
					15.2	

A = 298.15 □'

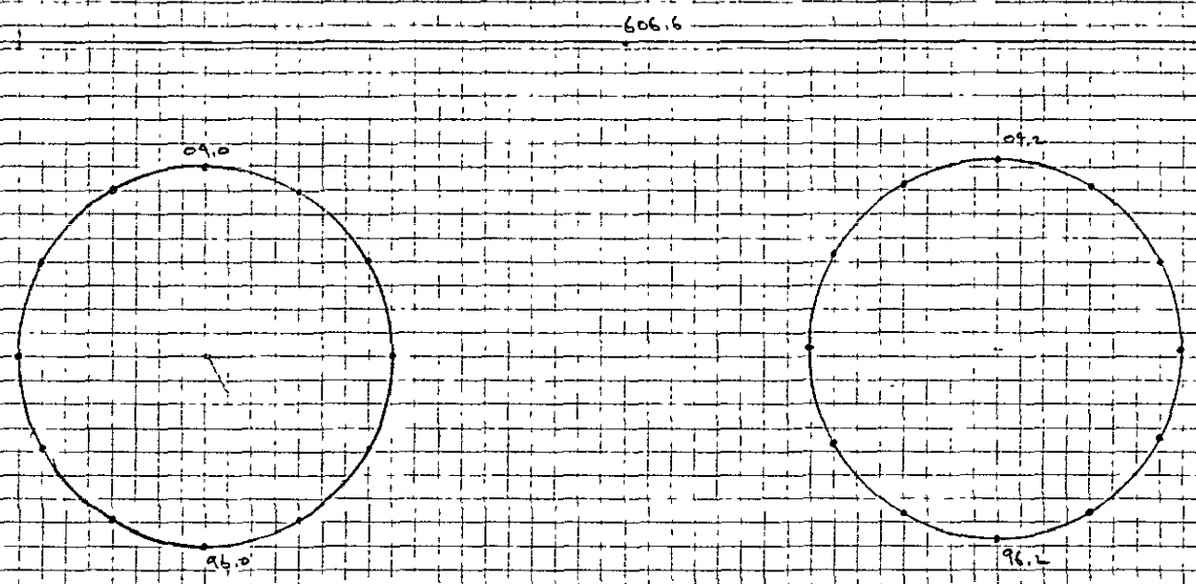
#8543
4/9/20
B

SNAKE CREEK

16+80 ST. ANDREWS CULVERT

2 - 8.0' ϕ X 80' LONG - SEE NOTES FOR SKEW

STRUCTURAL PLATE METAL PIPES



600.0 2.0 03.5 604.0 03.5 02.0 600.0

296 296.5 298 300 302 303.5 304

600.0 98.0 96.5 596.0 96.5 98.0 600.0

600.2 2.1 3.6 609.2 3.6 2.1 600.2

313 313.5 315 317 319 320.5 321

600.2 98.2 96.7 596.2 96.7 98.2 600.2

A = 50.3 □'

Ke = .5

n = .0315

A = 50.3 □

Ke = .5

n = .0315

TOT. A = 100.6 □'

Ke =

n =

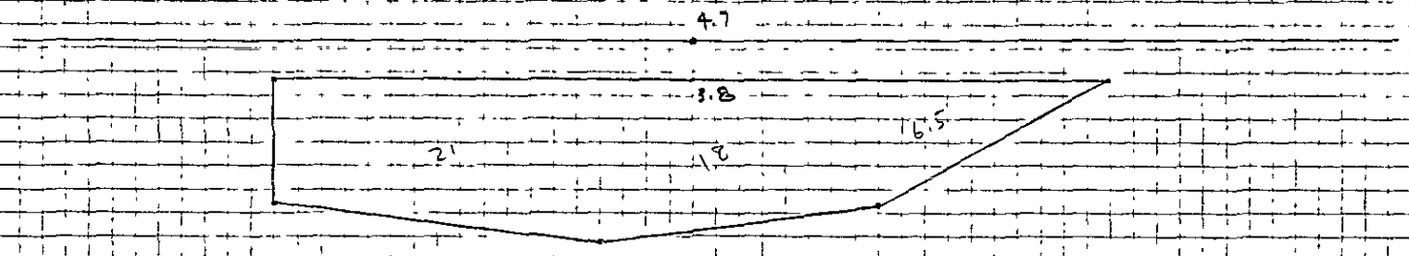
TOPS FORM 3308

#8543
1/9/8
B

SNAKE CREEK

21+00 PRIVATE DRIVE BRIDGE

12' WIDE



3.8	3.8	3.8	3.8
202	209	215	220
1.2	0.4	1.2	
2.6	5.4	2.6	

A = 45.5 □'

OPS FORM 3308
PRO IN U S A

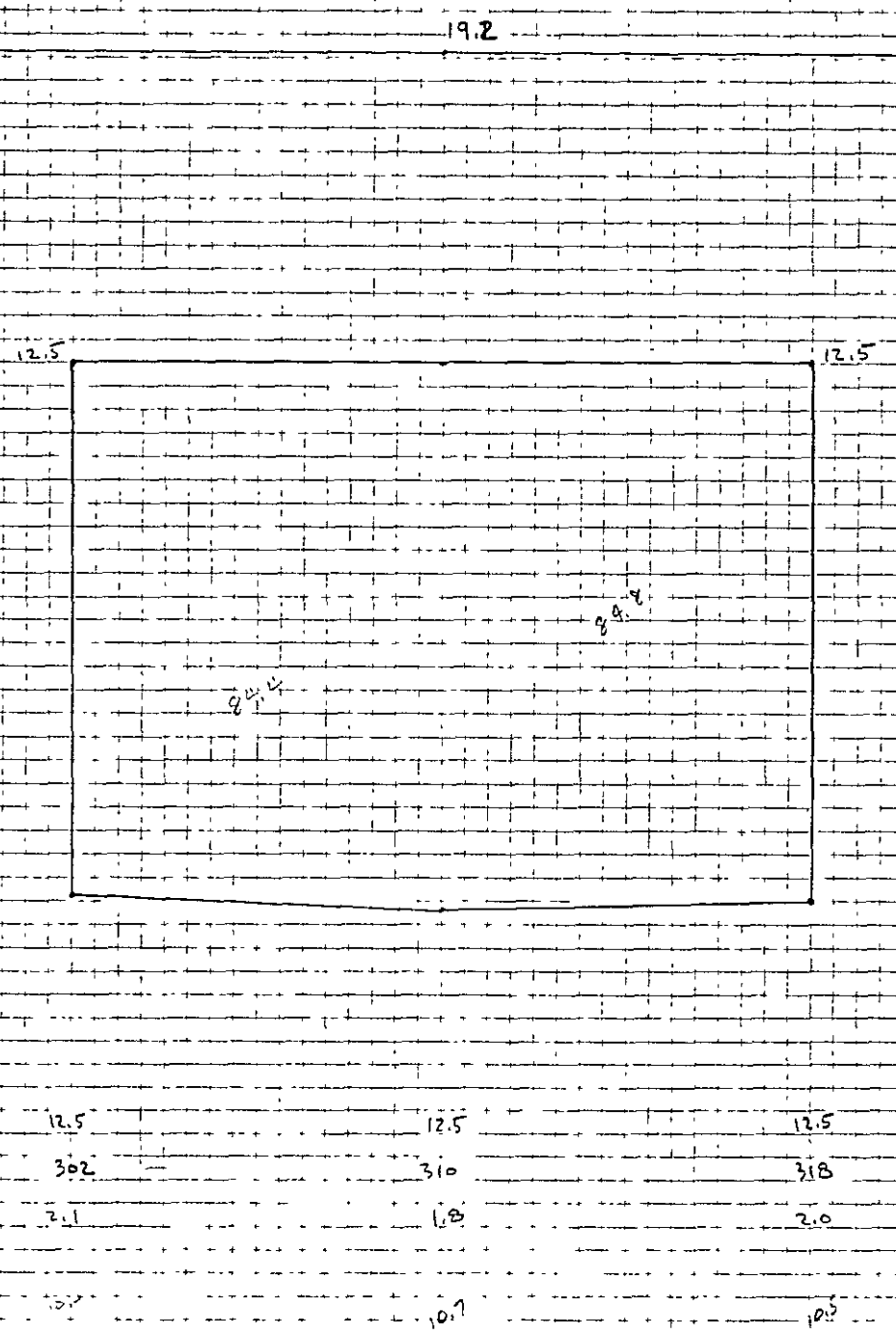
#8543
4/9/80
B

SNAKE CREEK

42750 EASTMAN ROAD BRIDGE

84' LONG

POURED CONCRETE CONSTRUCTION



A = 169.2 □'

OPS FORM 3308

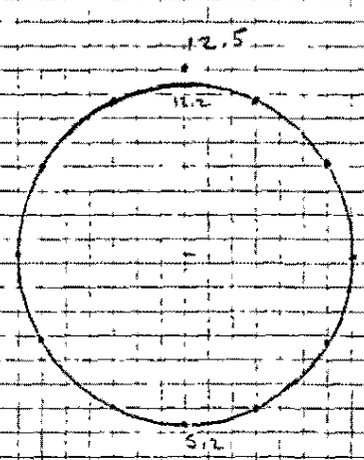
#8543
4/9/80
B

SNAKE CREEK

55+75 COUNTRY CLUB CULVERT

7.0' ϕ ROUND CONCRETE PIPE
(84") ~~LENGTH~~

USE 22.5' FROM PHOTO



7' ϕ SECTIONS ARE 7.5' LONG

8.7	10.5	11.8	12.2	11.8	10.5	8.7
341.5	42	43.5	345	46.5	348	348.5
8.7	6.9	5.5	5.2	5.5	6.9	8.7

A = 38.5 □'

Ke = .5

n = .012

#8543

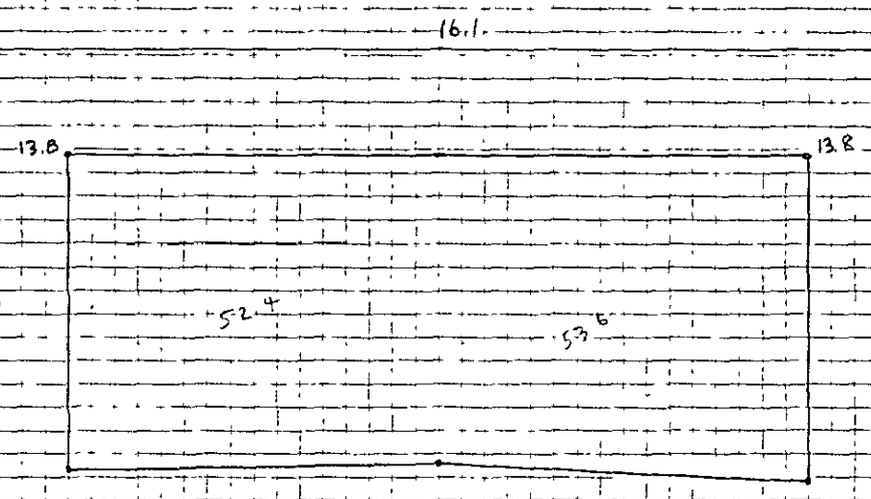
4/9/80
JB

SNAKE CREEK

77+50 SUGNET ROAD BRIDGE

POURED CONCRETE CONSTRUCTION

NO LENGTH GIVEN — 26'± FROM PHOTO



13.8 613.8 13.8

401 409 417

7.2 607.3 6.9

6.5 6.9

6.6

A = 106 □'

$K_e = 0.5$ $R = \frac{106}{45.6} = 2.36$ $R^{4/3} = 3.07$

$K_f = \frac{29.1 \times 0.02^2 \times 26}{3.07} = 0.1$

XKOR = 1.6

#8543

4/9/80

JB

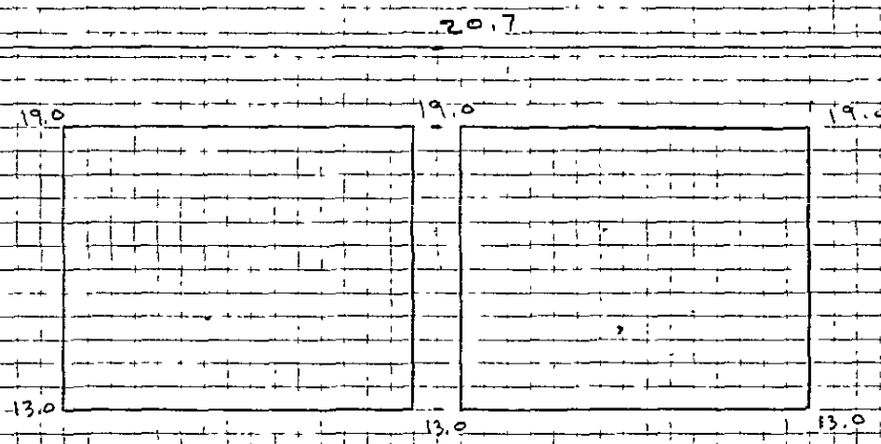
SNAKE CREEK

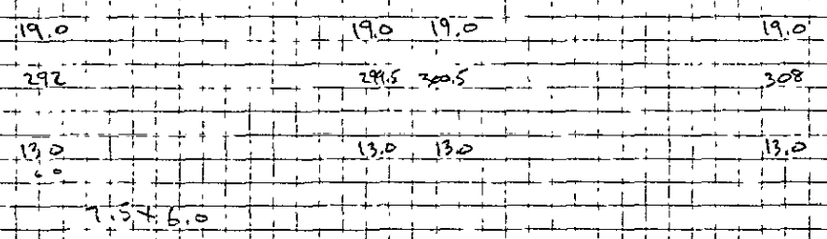
~~94+50~~
95+00

CRESENT DRIVE CULVERT

POURED CONCRETE CONSTRUCTION

80' LONG - SEE NOTES FOR SKEW





A = 450 □' A = 450 □' TOT. A = 900 □'

$R = \frac{90}{54} = 1.67$ Ke = .4

$R^{4/3} = 1.97$ n = .012

$K_f = \frac{29.1 \times 0.012^2 \times 80}{1.97} = 0.17$

XKOR = 1.62

From preliminary result

D = 622.31 − 620.7 = 1.61

H = 622.61 − 620.7 = 1.91

D/H = 0.84 Cs/Cf = 0.98

$H/\ell = \frac{1.91}{80} = 0.023$

Cf = 3.04 Cs = 2.98

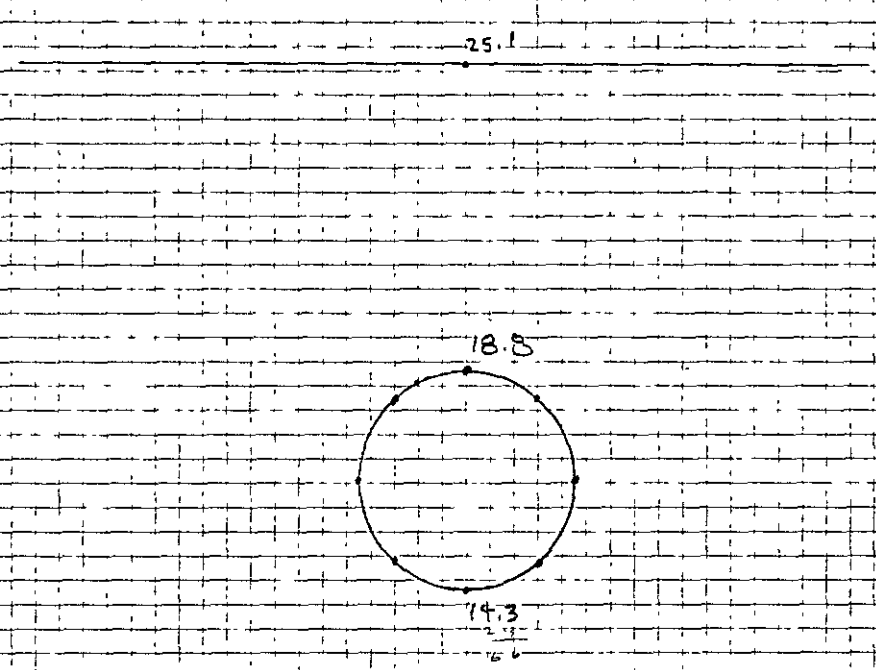
TOPS FORM 3308
ITHO IN U.S.A.

#8543
4/10/80
JB

SNAKE CREEK

97+50 SAGINAW ROAD CULVERT

4.5' (54") ϕ X 116' LONG - ROUND CONCRETE PIPE



16.6 18.2 18.8 18.2 16.6

297.8 298.5 300 301.5 302.3

16.6 14.9 14.3 14.9 16.6

A = 15.9 □'

Ke = .2

n = .012

R = 1.175 $R^{4/3}$ = 1.17

$$K_f = \frac{29.1 \times 0.012^2 \times 116}{1.17} = 0.42$$

XKOR = 1.62

OPS FORM 3308

#8543

SNAKE CREEK

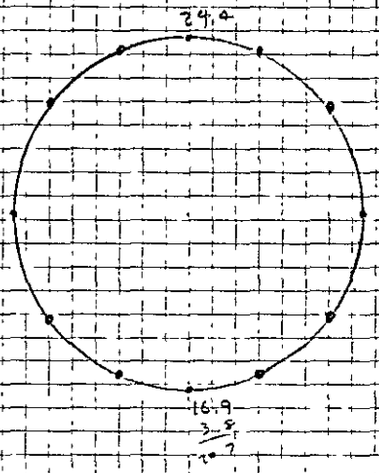
4/10/80

107+50 WHEELER ROAD CULVERT

B

7.5' ϕ X 85' LONG CORRUGATED METAL PIPE
(90")

29.8



20.7 22.9 24.0 24.4 24.0 22.9 20.7

49=2.97 98.5 500 1.5 3 503.8

20.7 18.4 17.2 16.9 17.2 18.4 20.7

$A = 44\ \square'$ $R = 1.875$ $R^{4/3} = 2.31$

$K_e = .5$

$n = .027$

$K_p = \frac{29.1 \times 0.027^2 \times 85}{2.31} = 0.78$

$\times K_{OR} = 2.28$

TOPS FORM 3308
THO N U S A

#8543

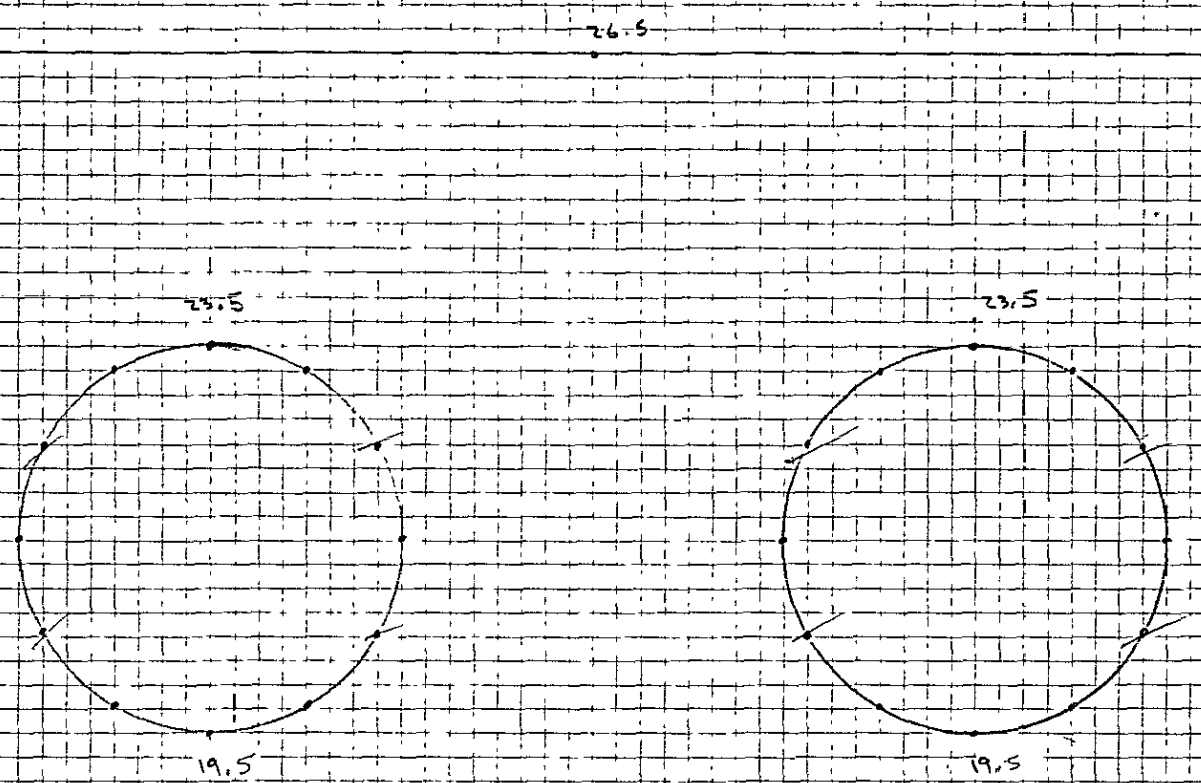
4/10/80
B

SNAKE CREEK

125+00 SYLVAN LANE CULVERT

1 - 4.3' ϕ = CONCRETE PIPES

1 - 4.0' ϕ X 98' LONG



21.5 ~~22.5~~ 23.25 23.5 23.25 ~~22.5~~ 21.5

348 ~~348.25~~ 349 350 351 ~~351.5~~ 352

21.5 ~~20.6~~ 19.8 19.5 19.8 ~~20.6~~ 21.5

21.5 ~~22.5~~ 23.25 23.5 23.25 ~~22.5~~ 21.5

356 ~~356.25~~ 357 358 359 ~~359.25~~ 360

21.5 ~~20.6~~ 19.8 19.5 19.8 ~~20.6~~ 21.5

A = 12.6 □'

Ke = .2

n = .012

Tot A = 25.2 □'

A = 12.6 □'

Ke = .2

n = .012

Ke =

n =

TOPS FORM 3308
THO IN U.S.A.

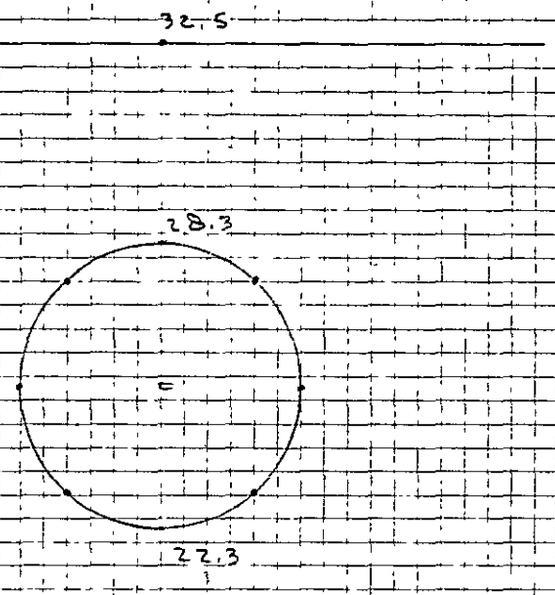
#8543
4/10/80
JB

SNAKE CREEK

141725 DILLOWAY ROAD CULVERT

6.0' ϕ X 346' ± LONG CONCRETE PIPE

(SEE FIELD NOTES FOR ANGLE)



25.3 27.5 28.3 27.5 25.3

227 228 230 232 233

25.3 23.0 22.3 23.0 25.3

$A = 28.3\ \square'$ $R = 1.25$, $R^{4/3} = 1.35$

$K_e = .2$

$n = .012$

$K_f = \frac{29.1 \times 0.012^2 \times 346}{1.35} = 1.07$

$XKOR = 2.37$

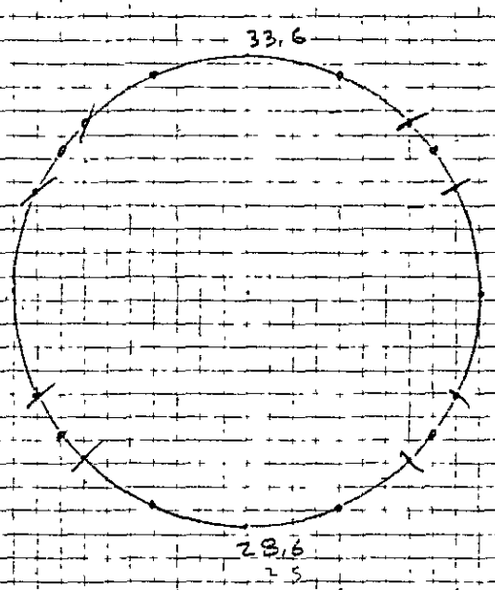
#8543

SNAKE CREEK 4/10/80

165+00 WACKERLY ROAD CULVERT 3

5.0' Φ X 60' LONG ROUND CONCRETE PIPE
(60")

36.3



32.6 32.6
398 402
29.6 29.6
311 ~~32~~ ~~32.8~~ 33.3 33.6 33.3 ~~32.8~~ ~~32~~ 31.1
397.5 ~~397.5~~ ~~398.5~~ 399 400 401 ~~402~~ ~~402.5~~ 402.5
31.1 ~~32~~ ~~28.3~~ 28.8 28.6 28.8 ~~28.3~~ ~~32~~ 31.1

A = 19.6 □' R = 1.25 $R^{4/3}$ = 1.35

Ke = .2

n = .012

$$K_f = \frac{29.1 \times 0.012^2 \times 60}{1.35} = 0.19$$

XKoR = 7.39

#8543
4/10/20
JB

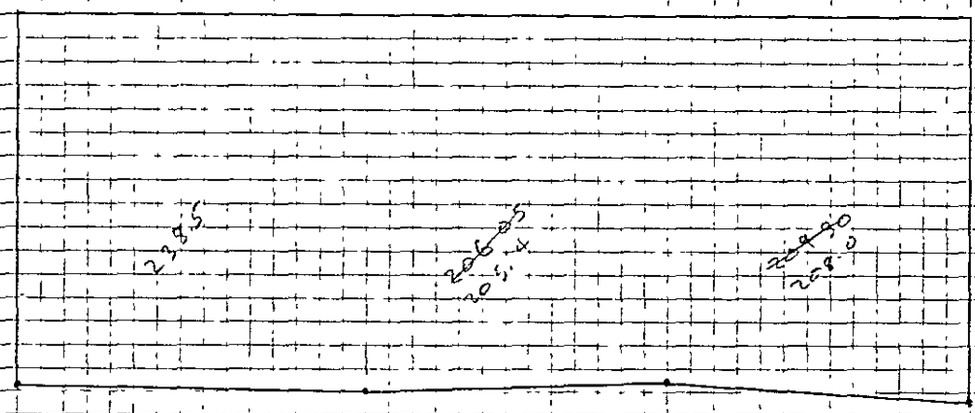
STURGEON CREEK

0+50 EMERSON PARK ROAD BRIDGE

CONCRETE CONSTRUCTION

32' WIDE – SEE NOTES FOR SKEW

10.4



607.0	7.0	7.0	607.0
505	520	533	546
S 91.2	91.0	91.4	90.6
15.8	16.0	15.76	16.64

A = 6519 □'

OPS FORM 3308

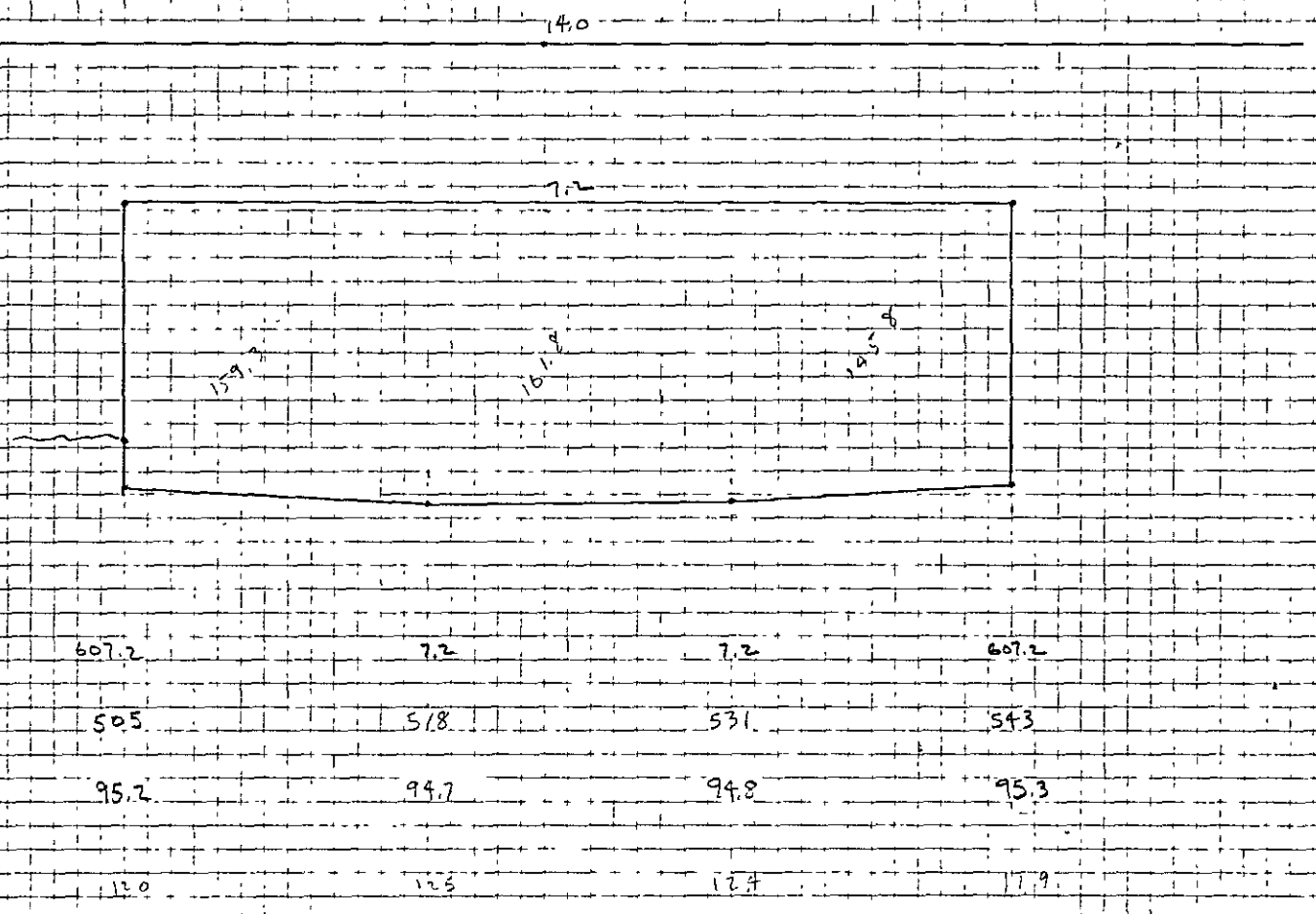
#8543
4/10/80
JB

STURGEON CREEK

1400 C. & O. RAILROAD BRIDGE

CONCRETE AND STEEL CONSTRUCTION

10' WIDE



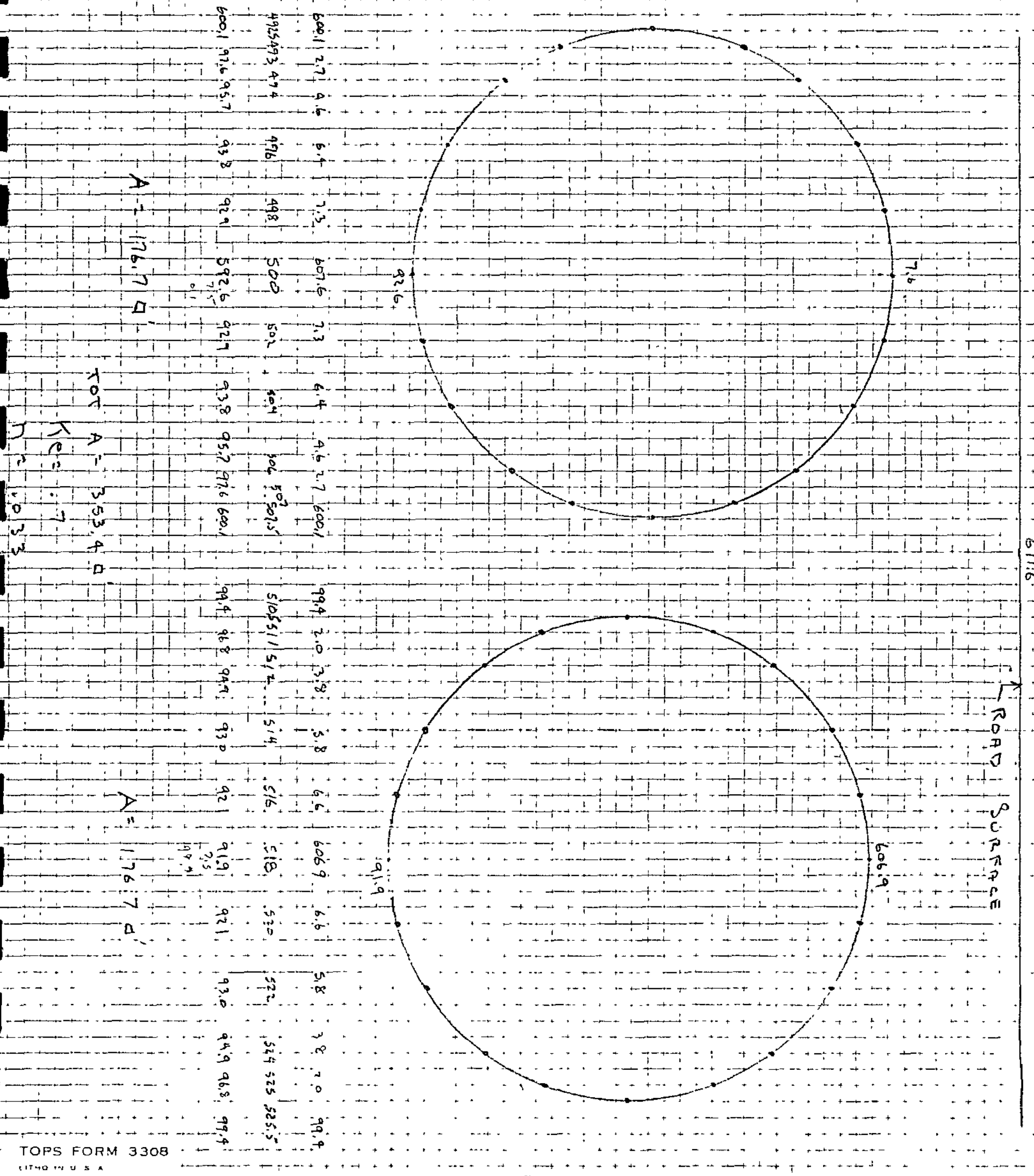
A = 466.9 d'

#8543
4/10/20
JB

STURGEON CREEK

1450 MAIN STREET BRIDGE

15' Φ x 65' LONG STRUCTURAL PLATE CORRUGATED METAL PIPE



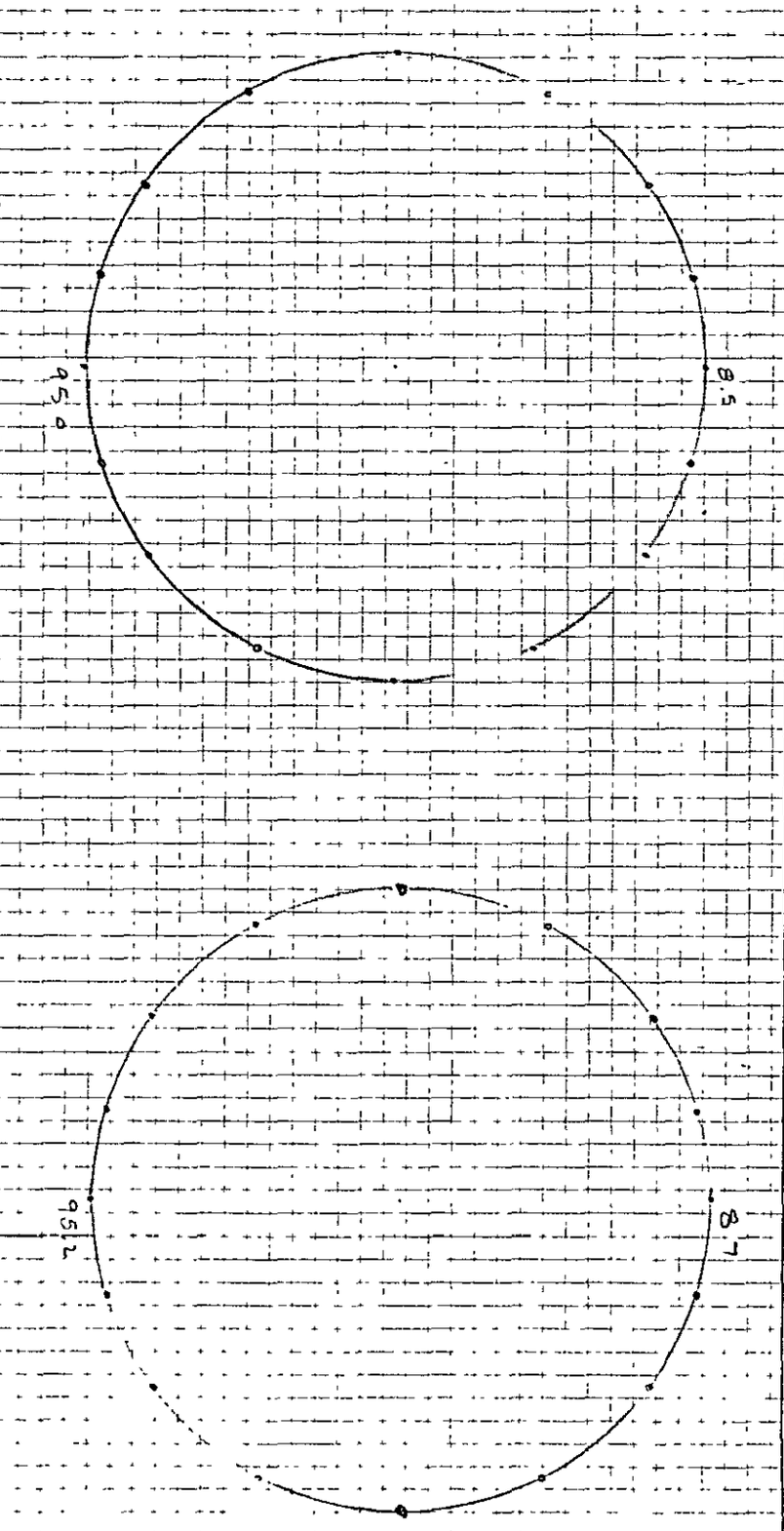
TOPS FORM 3308
LITHO IN U.S.A.

#8543
4/10/80
JB

STURGEON CREEK

57+00 SUGNET ROAD CULVERT

13.5' Φ X 67' LONG STRUCTURAL PLATE PIPE
(162')



1.8	4.8	7.2	8.2	8.5	8.2	7.2	4.8	1.8	2.0	5.0	7.4	8.4	8.7	8.4	7.4	5.0	2.0
493	494	496	498	500	502	504	506	507	511	512	514	516	518	520	522	524	525
601.8	98.6	96.3	95.3	95.0	95.3	96.3	98.6	601.8	2.0	98.8	96.5	95.4	95.2	95.4	96.5	98.8	602.0

A = 143.1 □'

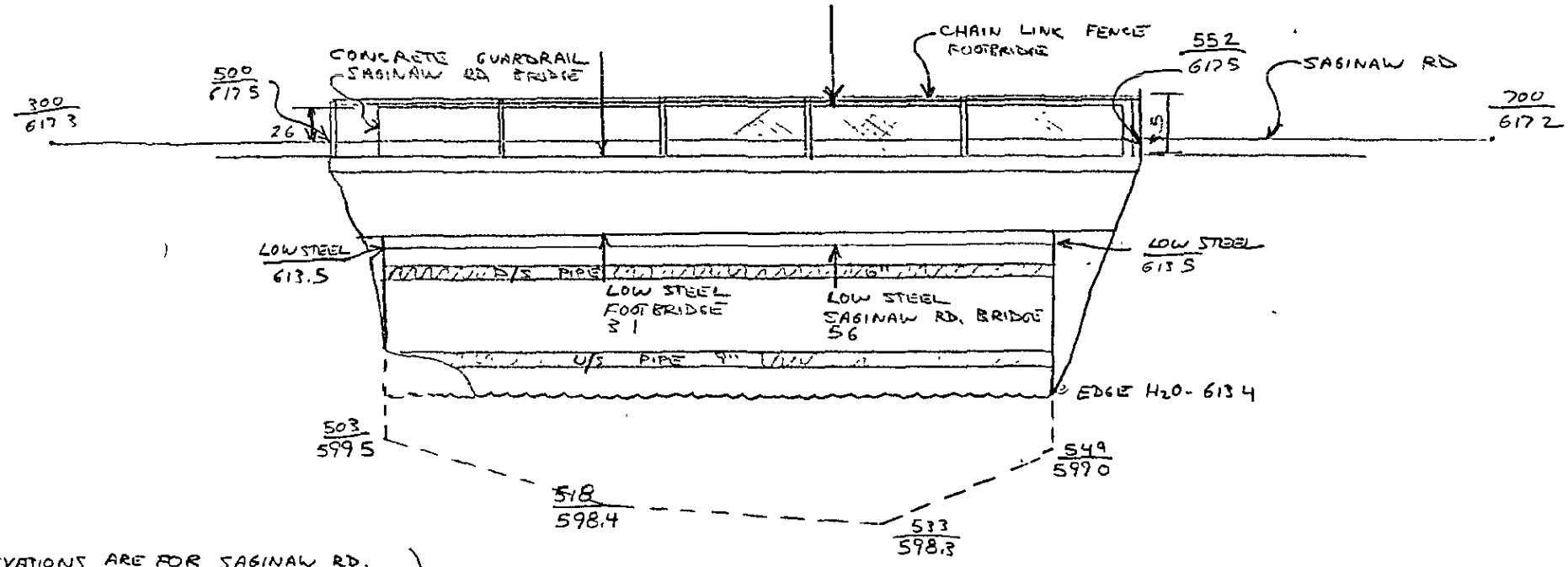
TOT A = 286.2
Ke = .7
n = .033

A = 143.1 □'

TOPS FORM 3308

Community: MIDLAND	Structure: SAGINAW ST BRIDGE	Type: CONCRETE CROWN BRIDGES	Station: 82+25 - 81+75

STURGEON CREEK



(ELEVATIONS ARE FOR SAGINAW RD. CULVERT. FOR FOOT BRIDGE PROFILE SEE SKETCH ON FIELD NOTES)

PROFILE SKETCH
(Looking Downstream)

Length: 52 + 69 FT	Width: 480 - SAGINAW ST 60 - FOOT BRIDGE	Skew: —	Water Elevation: 620.4
No. of Piers: —	Width of Piers: —	Shape of Piers: —	

Notes:

86
49

622.0
2.16
620.4

Gove Associates Inc.
ARCHITECTS/ENGINEERS/PLANNERS/SURVEYORS

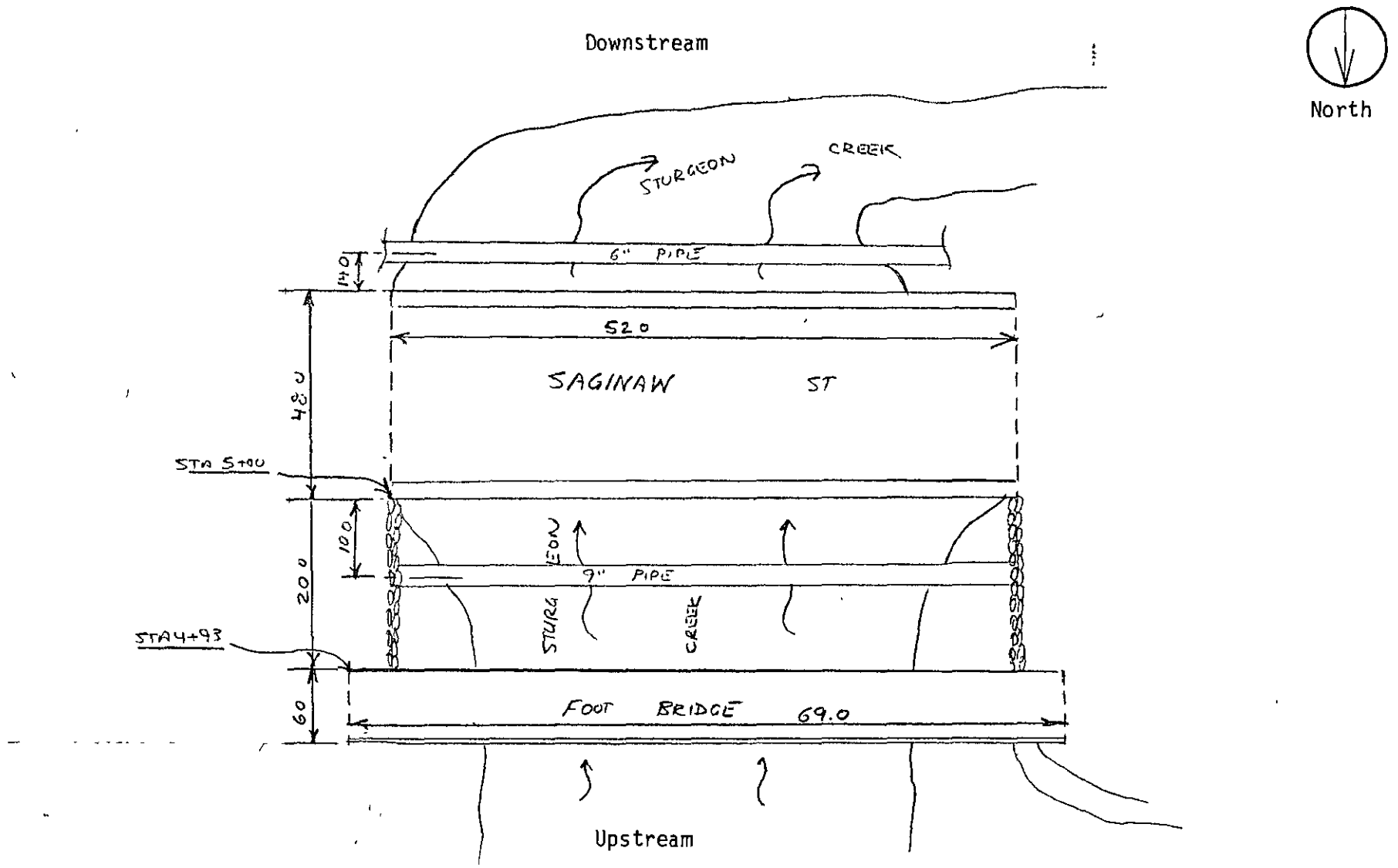
210 MILL STREET
LANSING, MICHIGAN 48933
(517) 485-0555

By: S.C.

Date: 10/25/79

Sheet 1 of 2

Community: MIDLAND	Structure: SAGINAW ST BRIDGE STURGEON CREEK	Type: CONCRETE	Station: 82+25 & 81+75



PLAN VIEW SKETCH

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ARCHITECTS/ENGINEERS/PLANNERS/SURVEYORS
210 MILL STREET
LANSING, MICHIGAN 48933
(517) 485-0555

By: J.S.C.

Date: 10/23/79

Sheet 2 of 2

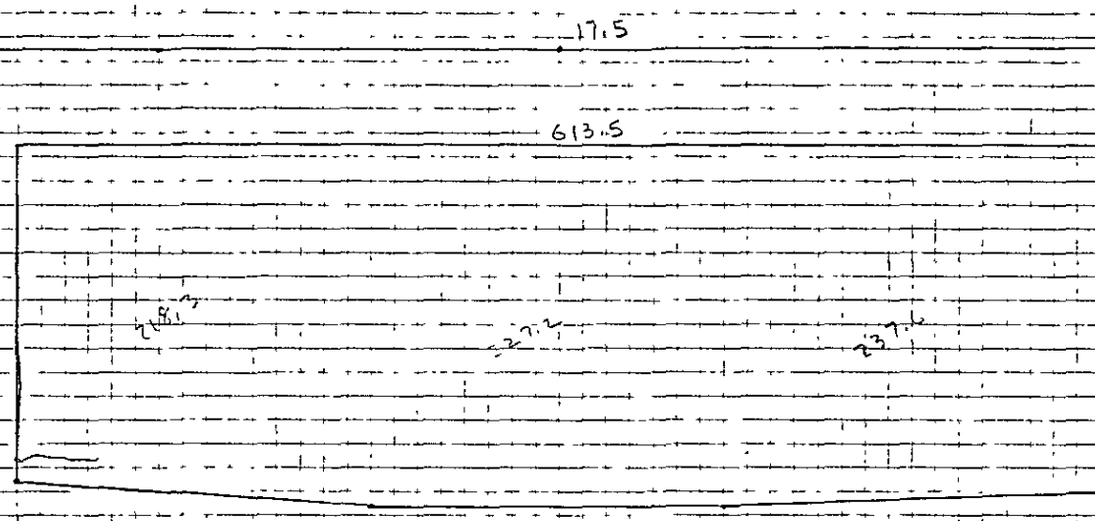
#8543
4/14/80
JB

STURGEON CREEK

81+7.5 SAGINAW ROAD BRIDGE

48' WIDE

THIS BRIDGE LIES 20' DOWNSTREAM FROM FOOTBRIDGE STATION 82+25



613.5		13.5		13.5		613.5
503	15	518	15	533	16	549
599.5		984		983		599.0
150		151		152		15

A = 683.1 □'

OPS FORM 3308

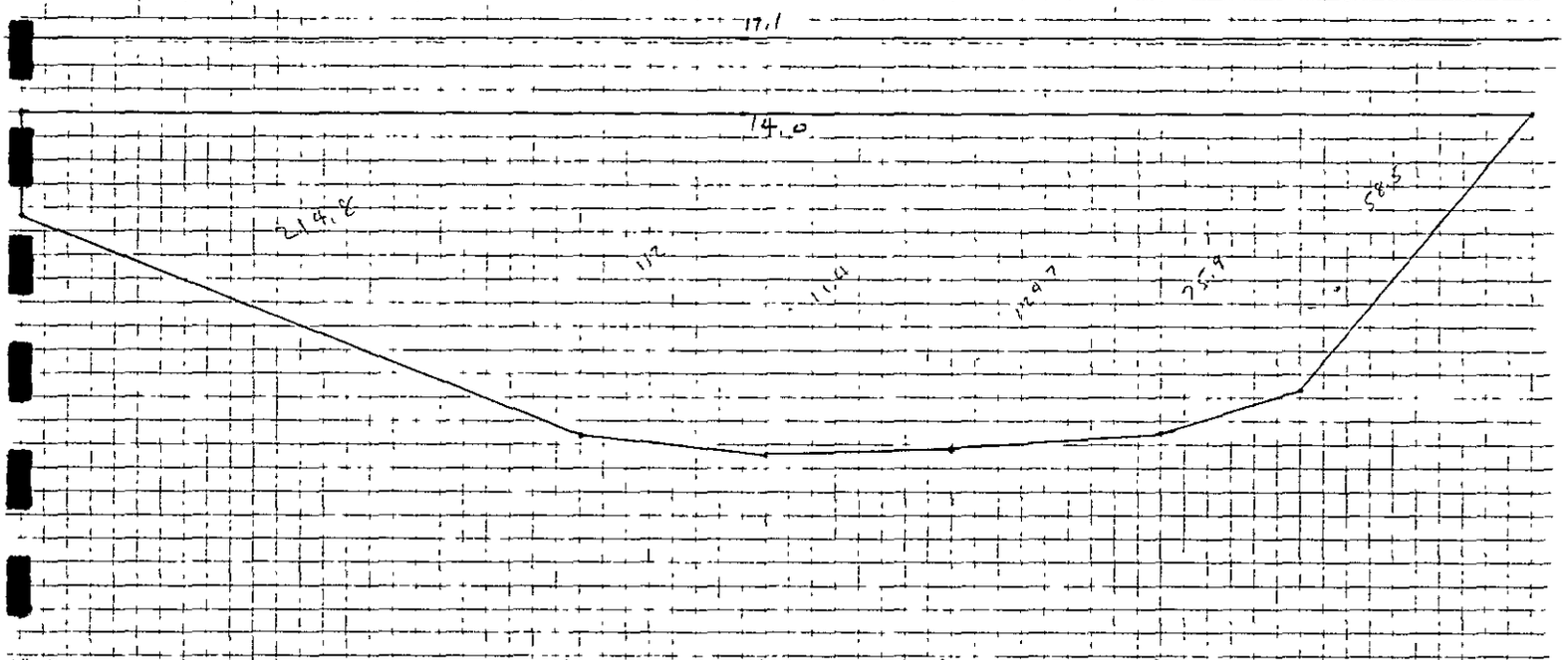
#8543
4/11/80
JB

STURGEON CREEK

82+25 FOOT BRIDGE

6' WIDE CONCRETE CONSTRUCTION

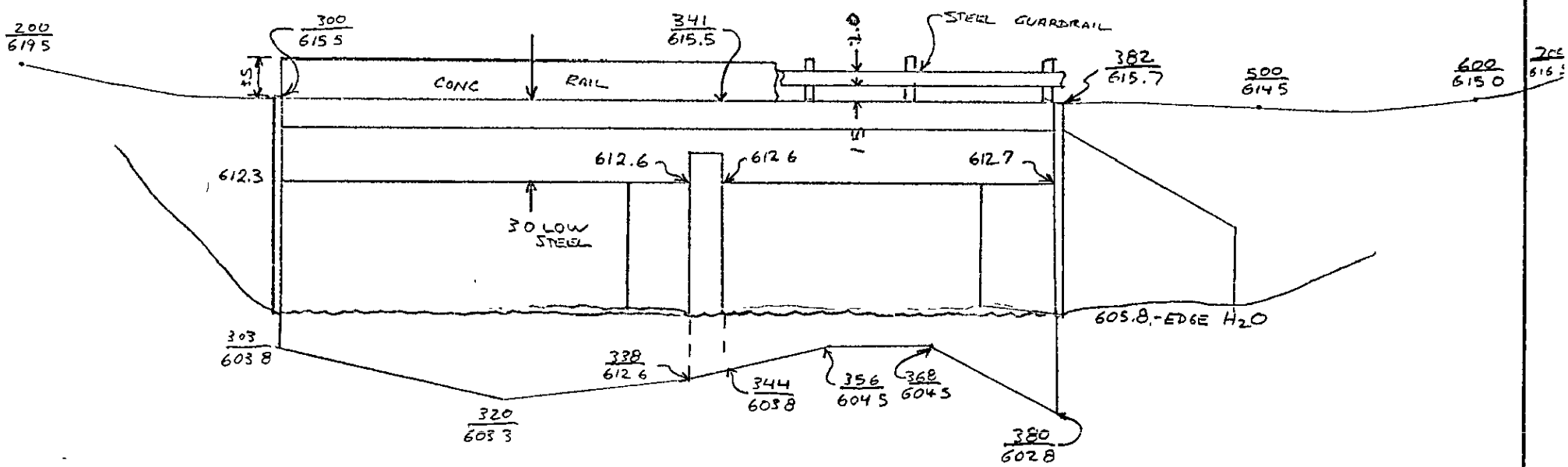
THIS BRIDGES LIES 20' UPSTREAM FROM THE SAGINAW RD. BRIDGE



A = 699.85 ✓

Community: MIDLAND	Structure: WACKERLY RD. BRIDGE	Type: T-BEAM CONCRETE	Station: [illegible]

STURGEON CREEK



PROFILE SKETCH
(Looking Downstream)

Length: 82.0	Width: 22.0	Skew: 22.0 × 12.5	Water Elevation: 605.8
No. of Piers: 1	Width of Piers: 4.0	Shape of Piers:	

Notes:

622.08
16.2
605.8

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ARCHITECTS/ENGINEERS/PLANNERS/SURVEYORS

210 MILL STREET
LANSING, MICHIGAN 48933
(517) 485-0555

By: 4 S C.

Date: 10/23/79

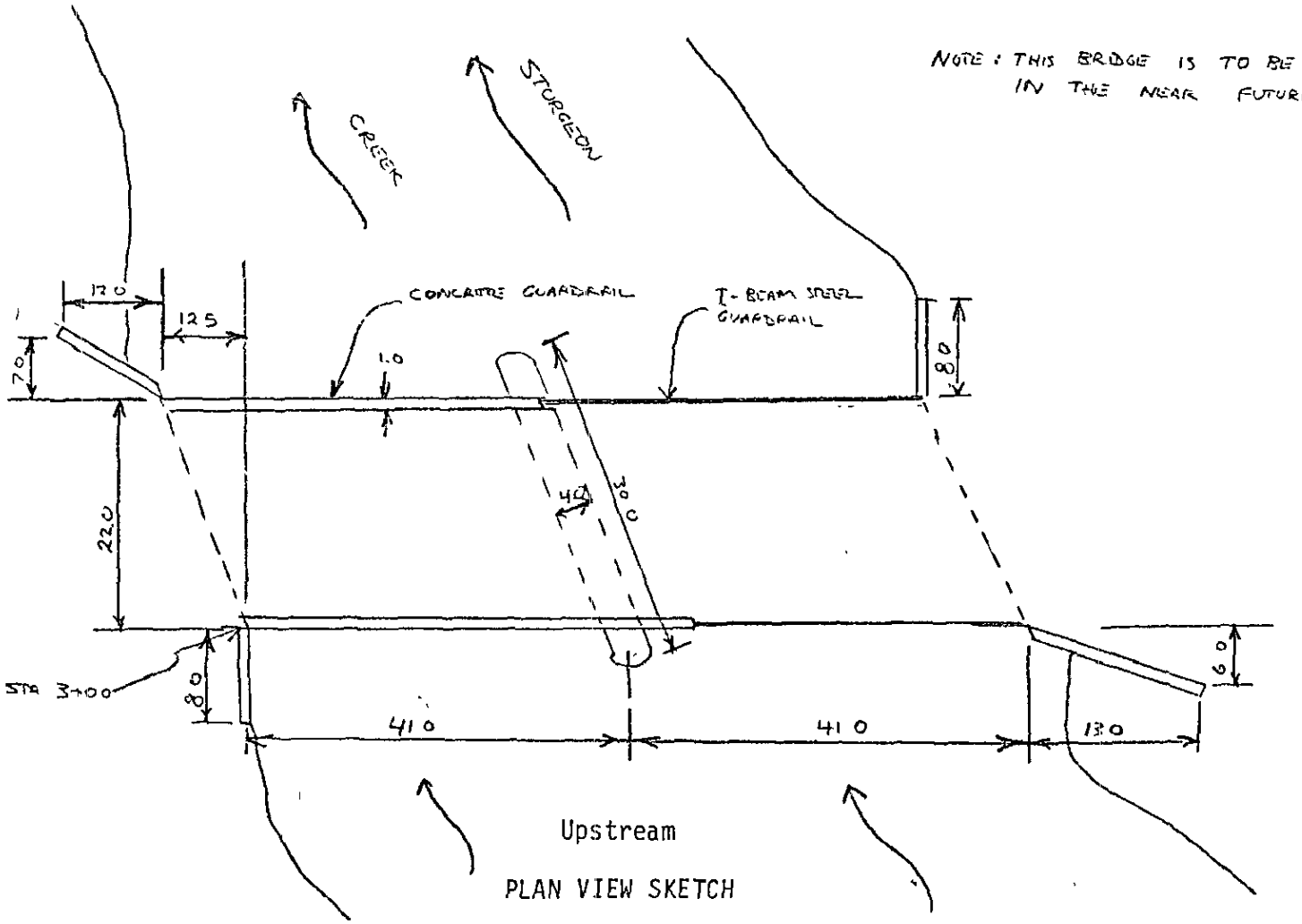
Sheet 1 of 2

Community: MIDLAND	Structure: WACKERLY RD. BRIDGE	Type: I-BEAM, CONCRETE	Station: 15+25

STURGEON CREEK

Downstream

North



Upstream

PLAN VIEW SKETCH

Gove Associates Inc.
ARCHITECTS/ENGINEERS/PLANNERS/SURVEYORS

210 MILL STREET
LANSING, MICHIGAN 48933
(517) 485-0555

By: J.S.C.

Date: 10/23/79

Sheet 2 of 2

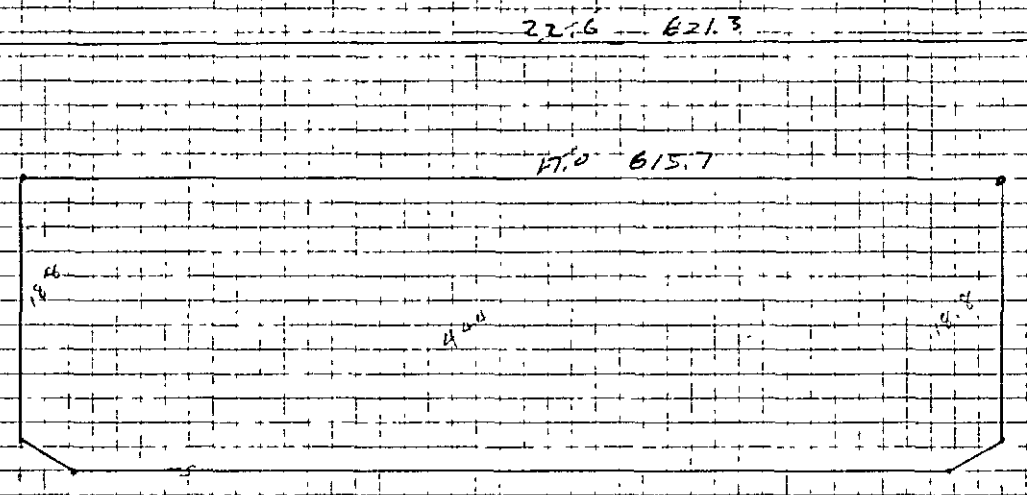
STURGEON ~~SNAKE~~ CREEK

#8543
4/14/80
JB

158+25 - A PROPOSED WACKERLY ROAD BRIDGE

96.8' LONG - SEE PLANS FOR SKEW

Skew factor = 0.72 — 1.32 FOR USC&GS



617.0 17.0 613.7

17.0 17.0 615.7

300 302

339 341

606.2 5.0
604.9 603.7

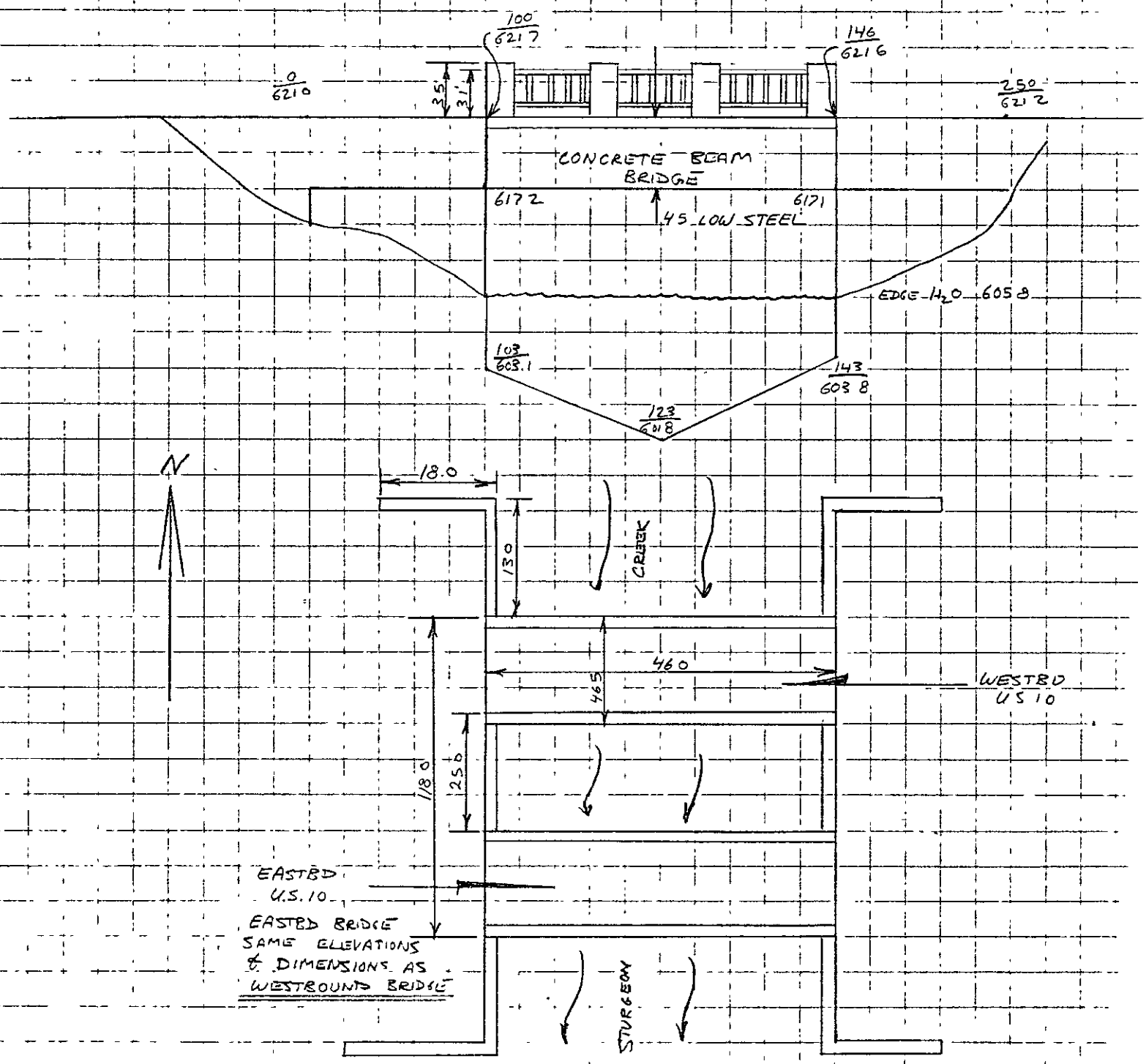
5.0 6.2
603.7 604.9

A = 481.6 □

TOPS FORM 3308
LITHO IN U.S.A.

SUBJECT CITY OF MIDLAND
STURGEON CREEK
STA 162+25 WESTBD U.S 10 BRIDGE
10/22/79

PROJ. NO. | SH. NO.
DESIGN A.S.C. | DATE 2/6/80
CHECK | DATE

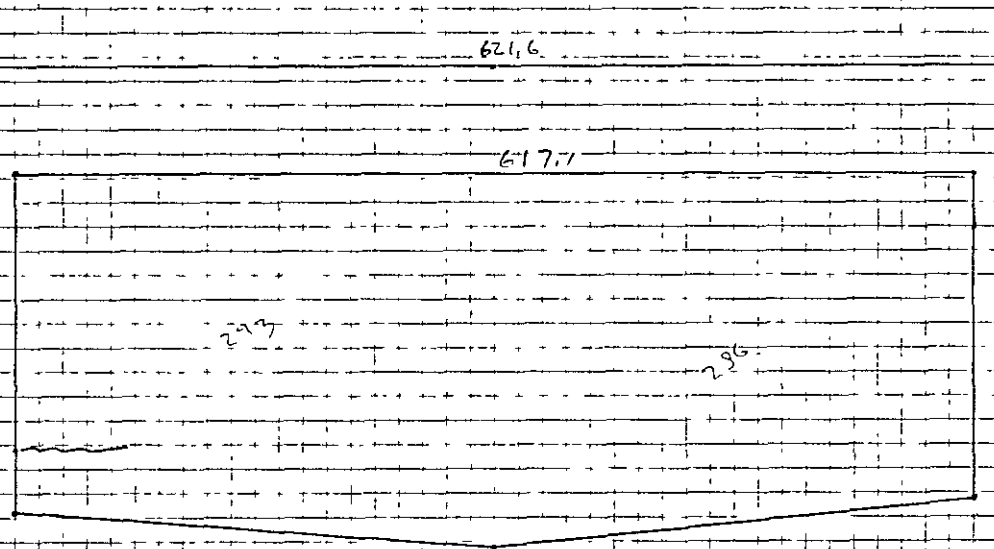


STURGEON CREEK

#8543
4/14/80
JB

162+25 M-10 HIWAY BRIDGE

118' LONG WITH 25' OPEN AREA IN MIDDLE - SIDE WALLS ARE CONTINUOUS



617.1 17.1 17.1

10.3 2.0 12.3 2.0 14.3

3.1 1.8 3.8

1.5 1.5.3 13.3

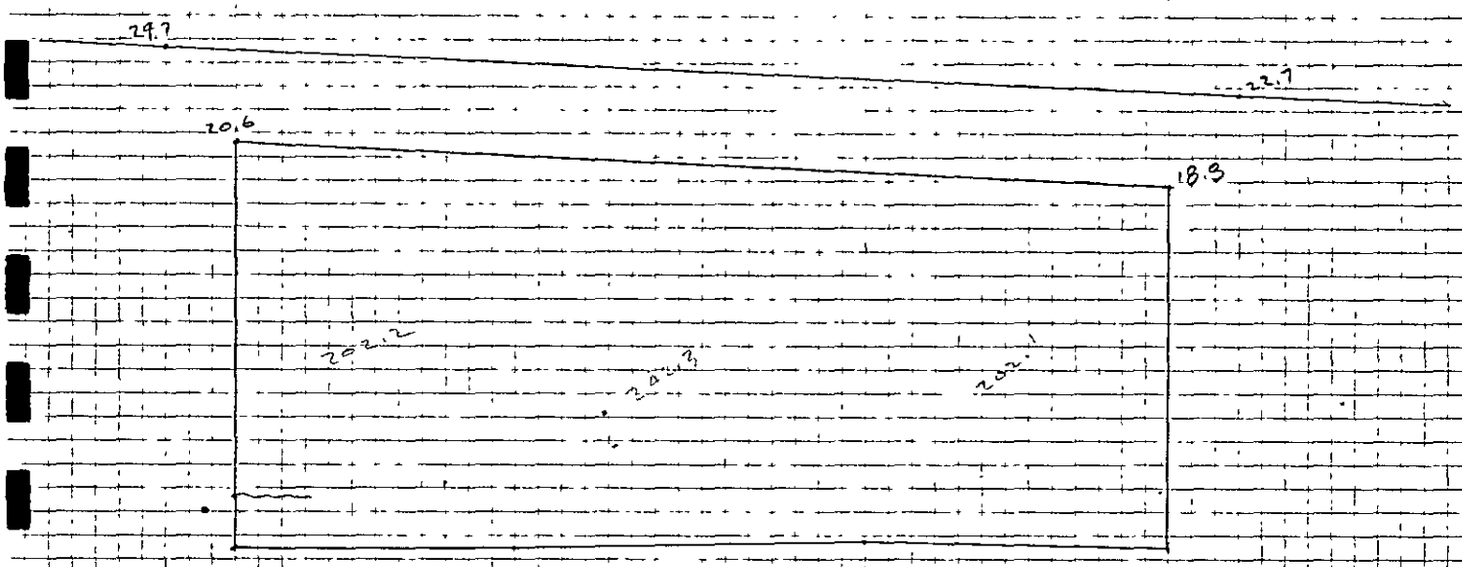
A = 579.0 □'

OPS FORM 3308

STURGEON CREEK
163775 AIRPORT ROAD BRIDGE

#8543
4/14/20
B

29.6' LONG



620.6		20.1		19.4		18.9
53	12	65	15	80	13	93
603.5		3.5		3.7		3.4
111		116		57		15

A = 646.6 □'

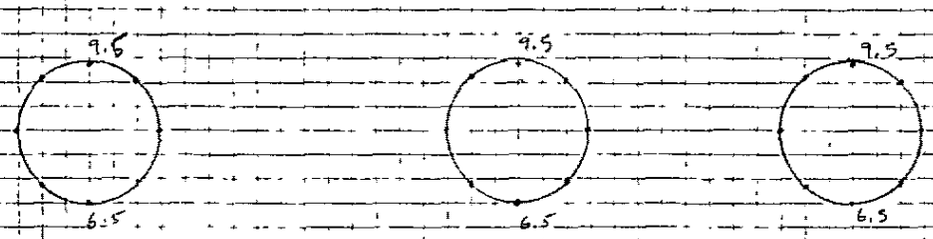
#8593
4/14/80
B

STURGEON CREEK

264+00 CULVERT SOUTH OF MOBILE HOME PARK

3 - 36" ϕ X 41' LONG (SEE NOTES FOR SKEW) CORRUGATED METAL PIPE

611.6



8.0 9.0 609.5 9.0 8.0 | 8.0 9.0 9.9 9.0 8.0 | 8.0 9.0 9.5 9.0 8.0

38.5 39 39.0 41.5 | 47.5 48 49 50.5 | 54.5 55 56 57.5

8.0 6.9 606.5 6.9 8.0 | 8.0 6.9 6.5 6.9 8.0 | 8.0 6.9 6.5 6.9 8.0

A = 7.1 □' | A = 7.0 □' | A = 7.1 □' TOT A = 21.2 □'

R = 0.75

Ke = .5 CHECK PHOTOS

$K_f = \frac{29.1 \times 0.024^2 \times 41}{0.68} = 1.0$

n = .024

XKOR = 1 + 1 + 0.5 = 2.5

From Usual Normal Bridge Routine

D = 613.56 - 611.6 = 1.96

H = 613.67 - 611.6 = 2.07

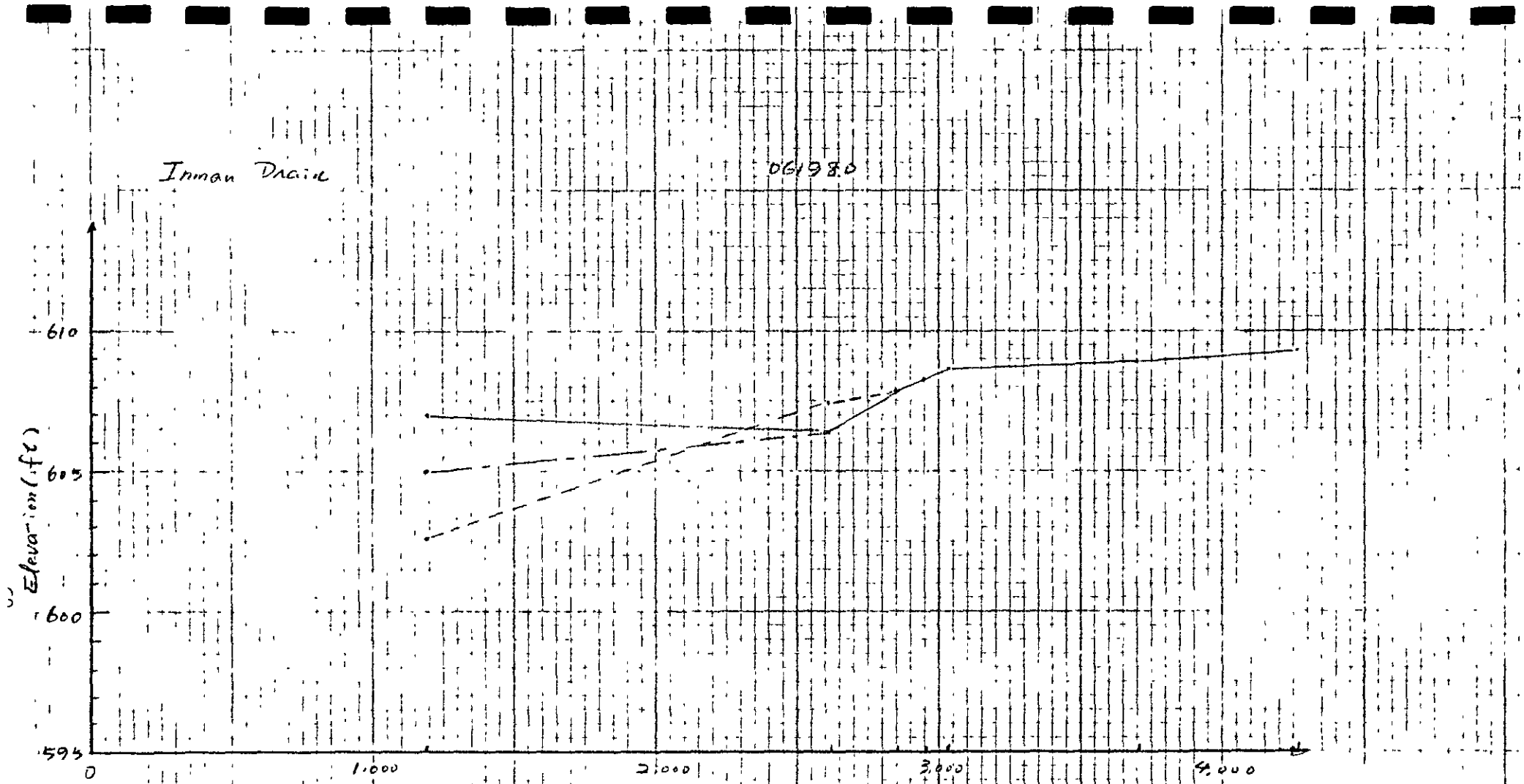
$\frac{D}{H} = \frac{1.96}{2.07} = 0.95 \rightarrow C_s/C_f = 0.78$

$\frac{H}{d} = \frac{2.07}{41} = 0.05 < 0.115$

For H = 2.07 → $C_f = 3.045$

$C_s = 2.38 \rightarrow 2.4$ (Ref. Hydraulics of Bridge Waterways)

OPS FORM 3308


Inman Drain
061980
610
605
600
595
Elevation (ft)
0
1,000
2,000
3,000
4,000
Reach Distance from Mouth (ft)

INMAN DRAIN — AREA 4X

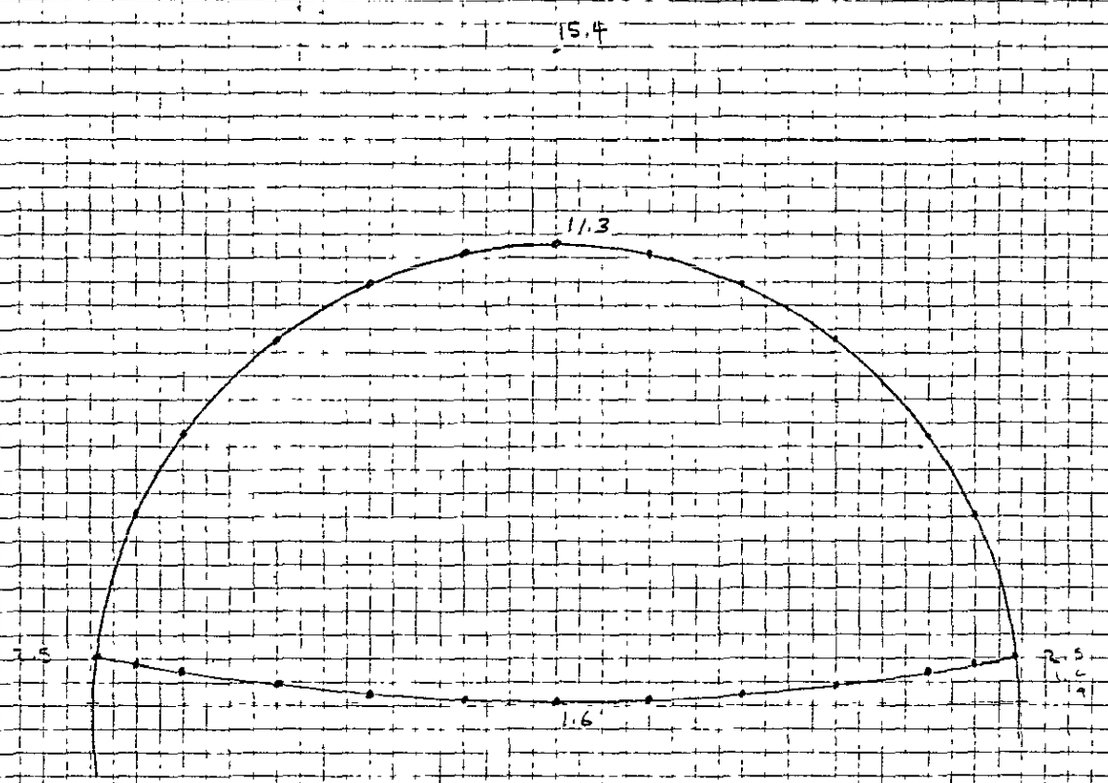
27+25 — SAGINAW ROAD

20.0' X 9.7' X 94' LONG

STRUCTURAL PLATE ARCH

①	14,707	147.1
②	14,621	146.2
③	14,725	147.3
④	14,529	145.3

146.5



1314.16
− 8 ±
1306.2 ±

2 | 1314.16
157.08
− 8
~~146.5~~
149

2.5	5.5	7.2	9.3	10.5	11.0	611.3	11.0	10.5	9.3	7.2	5.5	2.5
490	491	492	494	496	498	500	502	504	506	508	509	510
2.5	2.4	2.2	1.9	1.7	1.6	601.6	1.6	1.7	1.9	2.2	2.4	2.5

A = 146.5 □'

Ke =

n = NOT PLATE FLOOR

OPS FORM 3308

#3543
4/8/80
B

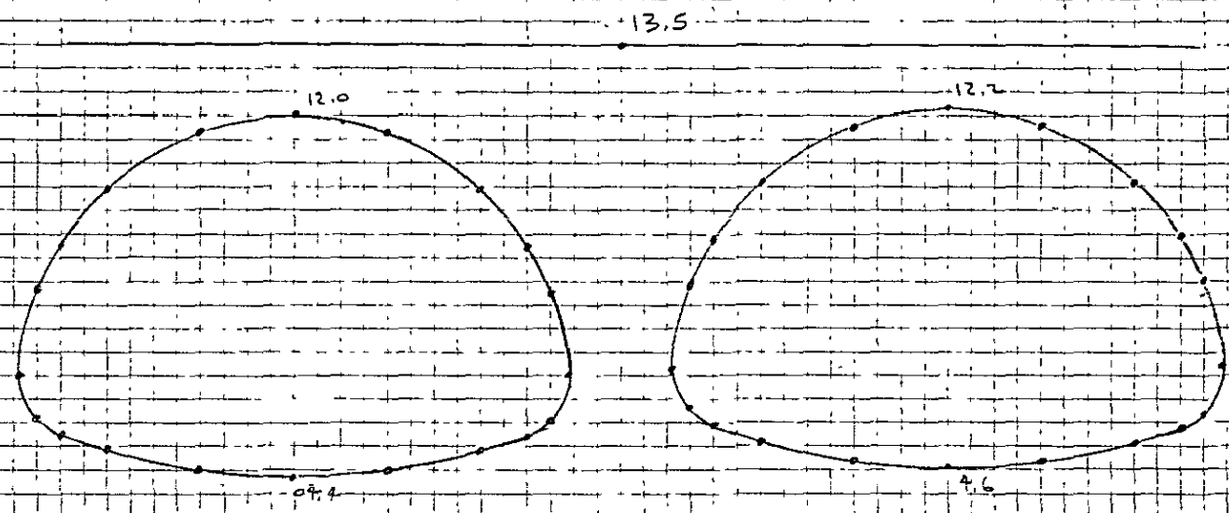
INMAN DRAIN

42+25 PERRINE RD.

2- STRUCTURAL PLATE PIPE ARCHES

12.0' X 7.5' =

11'10" X 7'7" X 55 LONG
(11.8) (7.6')



6.5	8.3	9.2	10.5	11.6	612.0	11.6	10.5	9.2	8.3	6.5	6.7	8.5	9.5	10.6	11.8	612.2	11.8	10.6	9.5	8.5	6.7
494	494.5	495	496	498	500	502	504	505	505.5	506	508	508.5	509	510	512	514	516	518	519	519.5	520
6.5	5.5	5.2	4.9	4.5	604.4	4.5	4.9	5.2	5.5	6.5	6.7	5.7	5.4	5.1	4.7	604.6	4.7	5.1	5.4	5.7	6.7

SUB A = 710'
Ke = .7

SUB A = 710 TOT A = 1420'
Ke = .7 Ke =
n = .0314

OPS FORM 3308

#8543
4/8/80
B

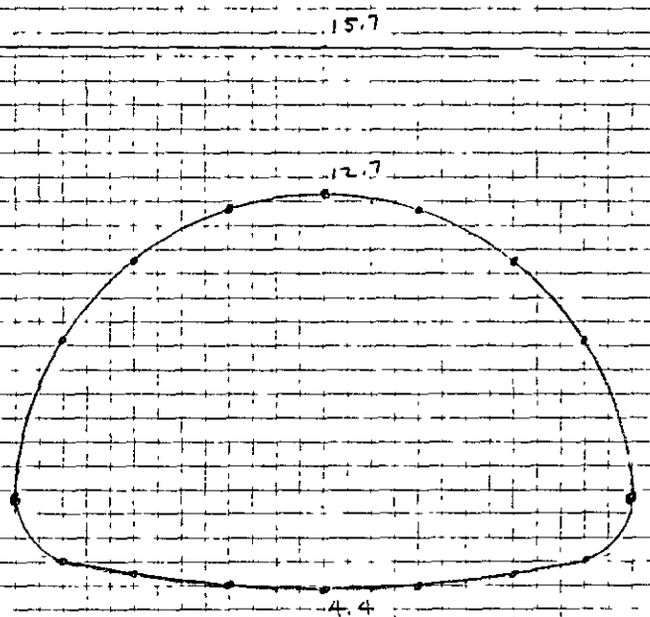
INMAN DRAIN

57+75 MORELAND DRIVE

STRUCTURAL PLATE PIPE ARCH

13.0' X 8.5' =

12'10" X 8'4" X 122' LONG
(12.8') (8.5')



6.4 9.6 11.2 12.3 6 12.7 12.3 11.2 9.6 6.4

493.5 494.5 496 498 500 502 504 505.5 506.5

6.4 5.0 4.7 4.5 6 04.4 4.5 4.7 5.0 6.4

A = 85 □'

Ke = .6

n = .0313

OPS FORM 3308

FLOOD INSURANCE STUDY

CITY OF MIDLAND, MICHIGAN

MIDLAND AND BAY COUNTIES

PRELIMINARY

MAY 18 1994

REVISED

Federal Emergency Management Agency

COMMUNITY NUMBER - 260140

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program (NFIP) have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

Part or all of this FIS may be revised and republished at any time. In addition, part of this FIS may be revised by the Letter of Map Revision (LOMR) process, which does not involve republication or redistribution of the FIS. It is, therefore, the responsibility of the user to consult with community officials and to check the community repository to obtain the most current FIS components.

Initial FIS Effective Date:

Revised FIS Date:

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Figure 1 - Vicinity Map 3

Figure 2 - Floodway Schematic 15

TABLES

Table 1 - Summary of Discharges 6-7

Table 2 - Floodway Data 11-14

EXHIBITS

Exhibit 1 - Flood Profiles

Tittabawassee River	Panels 01P-02P
Chippewa River	Panels 03P-04P
Sturgeon Creek	Panels 05P-06P
Snake Creek	Panels 07P-08P
Inman Drain	Panel 09P

Exhibit 2 - Flood Insurance Rate Map
Flood Insurance Rate Map Index

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study (FIS) revises and updates a previous FIS/Flood Insurance Rate Map (FIRM) for the City of Midland, Midland and Bay Counties, Michigan. This information will be used by the City of Midland to update existing floodplain regulations as part of the Regular Phase of the National Flood Insurance Program (NFIP). The information will also be used by local and regional planners to further promote sound land use and floodplain development.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the state (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this FIS are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

In the original study, the hydrologic and hydraulic analyses were performed by Gove Associates, Inc., for the Federal Emergency Management Agency (FEMA), under Contract No. H-4728. That work was completed in December 1981.

In the January 5, 1989, revision, the hydrologic and hydraulic analyses were obtained from a report entitled "City of Midland, Michigan, Stormwater Management Study, 100-Year Floodplain Analysis, Final Report," performed by McNamee, Porter, and Seeley of Ann Arbor, Michigan (Reference 1).

In this revision, the hydrologic and hydraulic analyses for the Tittabawassee River were prepared by the Michigan Department of Natural Resources (MDNR). This work was completed in April 1993.

1.3 Coordination

The purpose of an initial Consultation Coordination Officer's (CCO) meeting is to discuss the scope of the FIS. A final CCO meeting is held to review the results of the study.

For the original study, relevant information was requested from local officials, the East Central Michigan Planning and Development Region, the U.S. Geological Survey (USGS), the U.S. Army Corps of

Engineers (USACE), and the MDNR. Periodic informational contacts were made with the City of Midland during the course of the study. As state-coordinating agency, the MDNR, Water Management Division, assisted in the selection of flooding sources to be studied and reviewed and approved the hydrologic and hydraulic calculations. The initial CCO meeting was held on November 20, 1978, with representatives of the City of Midland, FEMA, the MDNR, and Gove Associates, Inc. On July 14, 1982, a final CCO meeting was held with representatives of Gove Associates, Inc., FEMA, and the city.

For this revision, the city was notified by letter on September 1, 1993, that a revision to its FIS would be performed using the analyses prepared by the MDNR.

2.0 AREA STUDIED

2.1 Scope of Study

This FIS covers the incorporated area of the City of Midland, Midland and Bay Counties, Michigan. The area of study is shown on the Vicinity Map (Figure 1).

In the original study, the following streams were studied by detailed methods: the Tittabawassee River, the Chippewa River, Sturgeon Creek, Snake Creek, and Inman Drain.

In the January 5, 1989, revision, Snake Creek was restudied by detailed methods. The revision also incorporated corporate limits changes due to annexations by the city.

This revision incorporates recent annexations by the city. As a result of these annexations, detailed flooding was extended for the following flooding sources: the Tittabawassee River, from Dublin Road to a point approximately 1.16 miles upstream of Dublin Road east of Miller Road; the Chippewa River, from the corporate limits to a point approximately 1 mile upstream of the corporate limits; Sturgeon Creek, from a point approximately 1,100 feet upstream of Cemetery Road Crossing to a point approximately .51 mile upstream of Cemetery Road entrance; and Inman Drain, from Dublin Road to a point approximately 1,280 feet upstream of Dublin Road.

Limits of detailed study are indicated on the Flood Profiles (Exhibit 1) and on the FIRM (Exhibit 2). The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction.

Portions of the Tittabawassee River, Snake Creek and several unnamed streams were studied by approximate methods. Approximate analyses

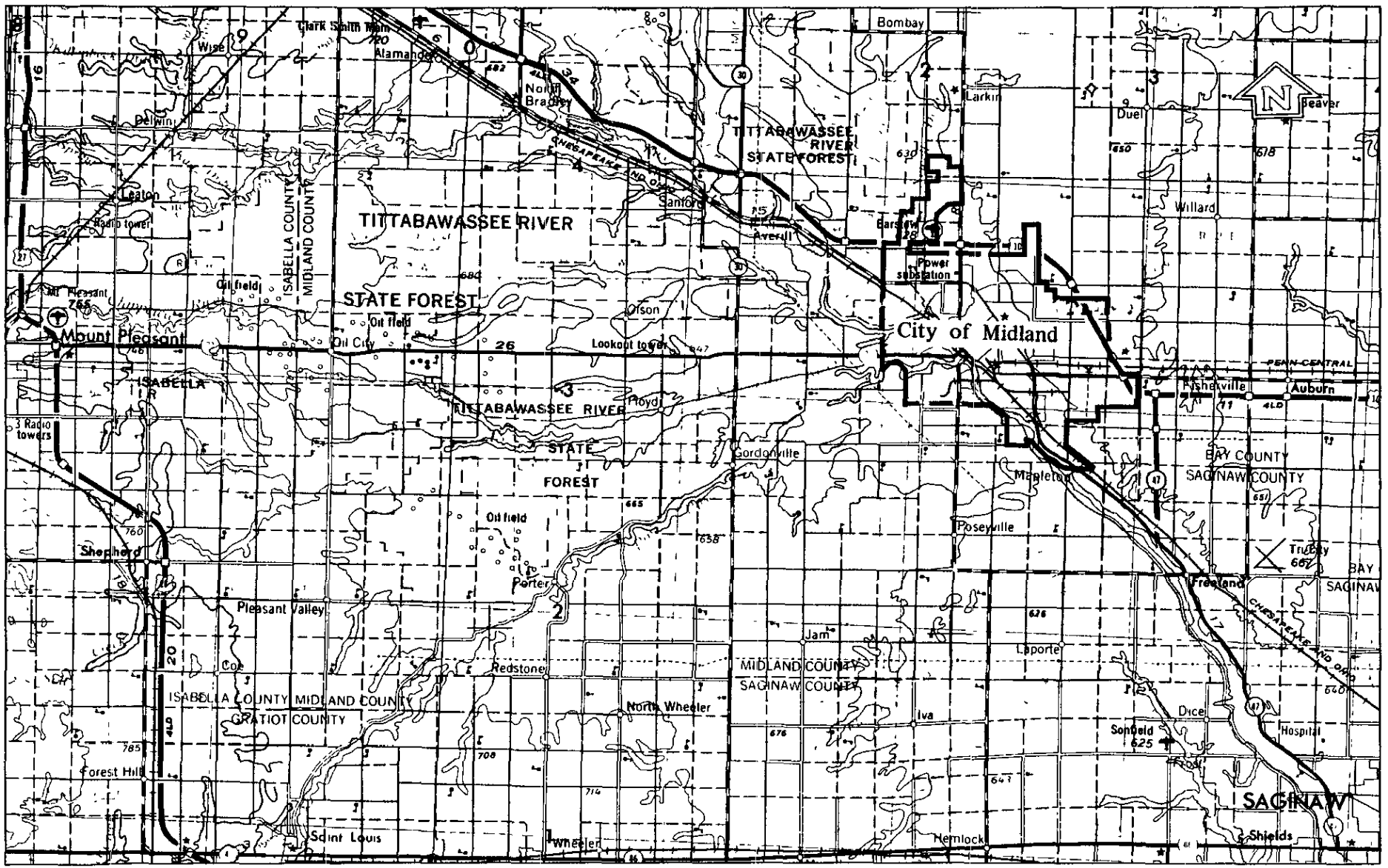


FIGURE 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF MIDLAND, MI
(MIDLAND AND BAY COUNTIES)

APPROXIMATE SCALE

4 0 4 8 12 MILES

VICINITY MAP

were used to study those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to, and agreed upon by, FEMA and the City of Midland.

2.2 Community Description

The City of Midland is located in east-central Midland County, which is approximately 130 miles northwest of Detroit, and Bay County and is 15 miles west of Saginaw Bay. Midland is the county seat for Midland County. The city is located at the confluence of the Tittabawassee and Chippewa Rivers and is served by U.S. Highway 10 and State Highway 20. The City of Midland is bordered by the Township of Midland to the south, the Township of Homer to the west, the Township of Larkin to the north, and the Township of Williams to the east.

Midland's distance from the Great Lakes substantially reduces the climatic influence, and as a result, the climate is continental in character. The average minimum daily temperature in the winter is 16.0 degrees Fahrenheit (°F), and the average maximum daily summer temperature is 82.8°F. Average annual precipitation is 29.6 inches, which includes an average annual snowfall of 36.3 inches (Reference 2).

The topography of the City of Midland is typical of central Michigan, gently rolling with some limited areas of sharper relief near the river systems. The soils are mostly loams and clay loams to the south and east, with sandy loams dominant in the west and northern portions of the county. Major agricultural crops raised in the area include beans, corn, and wheat (Reference 3).

The Tittabawassee River, which flows from east to southwest through the city, is the major stream within the community. The Chippewa River flows from east to west and meets with the Tittabawassee River within the city limits. Sturgeon Creek flows from north to south and discharges to the Tittabawassee River. The Inman Drain is a tributary of Sturgeon Creek. Snake Creek is also a tributary of the Tittabawassee River and flows in a north-to-south direction to its confluence with the Tittabawassee River.

Approximately 65 percent of the land area within the city is developed, with approximately 20 percent in residential use and 10 percent in industrial use. Within the floodplains of the streams studied in detail, the land uses include residential, commercial, and industrial development. Along the Tittabawassee River floodplain, a major portion of the river shoreline is developed for industrial purposes.

2.3 Principal Flood Problems

Flooding occurs in the City of Midland when high runoff causes the principle flooding sources to overflow their banks. A USGS gage is located on the Tittabawassee River (No. 04156000) approximately 0.25 mile downstream of the Dow Chemical Company Dam. A gage is also located on the Chippewa River (No. 04154500) upstream of the city limits. The maximum recorded flow at the Midland gage of the Tittabawassee River was recorded in 1916 with a flow of 34,800 cubic feet per second (cfs). A similar flow of 34,000 cfs was recorded during the 1948 flood of the Tittabawassee River. Each of these floods was slightly less than the predicted 50-year flood for the Tittabawassee River. In 1976, a flow of 26,400 cfs, the approximate equivalent to the expected 10-year storm, was recorded at the gage (Reference 4).

2.4 Flood Protection Measures

Due to the intensive development along the Tittabawassee River, many areas that are developed have been filled above the normal flood stage of the Tittabawassee River. This fill area effectively limits the boundary of the 100-year flood and removes much of the industrial area from the floodplain. The area of the nuclear power plant development also has been extensively filled to eliminate that area from the floodplain of the Tittabawassee River. Along the Chippewa River, some filling has also occurred that serves to protect against periodic annual flooding but not for the higher levels of the 100-year flood.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude which are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10, 2, 1, and 0.2 percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood which equals or exceeds the 100-year flood (1 percent chance of annual exceedence) in any 50-year period is approximately 40 percent (4 in 10), and, for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for each flooding source studied in detail affecting the community.

Frequency relationships for the Tittabawassee and Chippewa Rivers, which are gaged streams, were determined by statistical analysis using the log-Pearson Type III method (Reference 5). For the Chippewa River analysis, 29 years of records were analyzed at USGS gage No. 04154500, and for the Tittabawassee River, the analysis was based upon the 66 years of data available at USGS gage No. 04156000.

The peak discharges for Sturgeon Creek and Inman Drain, which are ungaged streams, were determined utilizing the U.S. Department of Agriculture, Soil Conservation Service (SCS) methodology for "Estimation of Direct Runoff from Storm Rainfall" as outlined in the SCS National Engineering Handbook (Reference 6).

The USACE HEC-1 computer program was used to determine the peak discharges of the 10-, 50-, 100-, and 500-year floods for Snake Creek (Reference 7).

A summary of the drainage area-peak discharge relationships for the streams studied by detailed methods is shown in Table 1, "Summary of Discharges."

TABLE 1 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs)			
		10-YEAR	50-YEAR	100-YEAR	500-YEAR
TITTABAWASSEE RIVER					
At Mapleton	2,448	28,000	41,700	47,800	62,700
At USGS gage approximately 1,300 feet downstream of Dow Chemical Company Dam	2,400	27,500	41,000	47,000	61,600
Upstream of confluence of Chippewa River	1,386	17,700	26,400	30,300	39,700
CHIPPEWA RIVER					
At confluence with Tittabawassee River	1,011	10,500	15,000	16,900	21,700
SNAKE CREEK					
At mouth	5.50	1,150	2,250	2,300	3,400
At Crescent Drive	2.50	280	610	570	710
At Sylvan Lane	1.60	260	390	490	605

TABLE 1 - SUMMARY OF DISCHARGES - continued

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
STURGEON CREEK					
At mouth	58.85	1,050	1,600	1,850	2,500
Upstream of Inman Drain	51.55	900	1,400	1,600	2,200
INMAN DRAIN					
At confluence with Sturgeon Creek	7.29	330	470	540	700

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals.

Cross sections for the flooding sources studied by detailed methods were obtained from field surveys. All bridges and dams were field surveyed to obtain elevation data and structural geometry.

In this revision, the hydraulic model for the Tittabawassee River was extended for approximately 1.16 miles upstream from Dublin Road using the last valley cross section downstream of Dublin Road.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 4.2), selected cross-section locations are also shown on the FIRM (Exhibit 2).

Water-surface elevations of floods of the selected recurrence intervals were computed using the USACE HEC-2 step-backwater computer program (Reference 8).

Starting water-surface elevations for the Tittabawassee River were calculated using the rating curve developed in the USACE report (Reference 9). The rating curve at the gaging station was used to check continuity. The starting water-surface elevation for the Chippewa River was based upon the flood elevations of the Tittabawassee River at the confluence. For Sturgeon Creek and Snake Creek, the starting water-surface elevation was the mean annual high-water elevation of the Tittabawassee River. The Inman Drain starting water-surface elevation was based upon the flood elevations of Sturgeon Creek.

Flood profiles were drawn showing computed water-surface elevations for floods of the selected recurrence intervals.

Roughness factors (Manning's "n") used in the hydraulic computations were estimated by field inspection. These estimates were then compared with the photographs and descriptions in Open-Channel Hydraulics to obtain the final values (Reference 10). The following tabulation shows the channel and overbank "n" values for the streams studied by detailed methods:

Stream	Channel "n"	Overbank "n"
Tittabawassee River	0.030-0.060	0.030-0.035
Chippewa River	0.060	0.035
Snake Creek	0.030-0.120	0.030-0.055
Sturgeon Creek	0.035-0.100	0.035-0.050
Inman Drain	0.040-0.100	0.031-0.045

Elevations for the portion of the Tittabawassee River that was studied by approximate methods in the original study were determined by normal depth analysis and engineering judgment. In the January 5, 1989, revision, the approximately studied areas west of Dublin Road, along Snake Creek, and along Sturgeon Creek were determined using topographic maps (Reference 11).

The hydraulic analyses for this study were based on unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

All elevations are referenced to the National Geodetic Vertical Datum of 1929. Elevation reference marks used in this study, and their descriptions, are shown on the maps.

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. Therefore, each FIS provides 100-year flood elevations and delineations of the 100- and 500-year floodplain boundaries and 100-year floodway to assist in developing floodplain management measures.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1 percent annual chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2 percent annual chance (500-year) flood is employed to indicate additional areas of flood risk in the community. For the streams studied in detail, the 100- and 500-year floodplain boundaries have been delineated using the flood elevations determined at each cross section.

In the original study, the boundaries were interpolated between cross sections using topographic maps at scales of 1:24,000, 1:600, 1:1,200, and 1:2,400 with contour intervals of 2 and 5 feet (References 11, 12, 13, and 14).

In the January 5, 1989, revision, the boundaries were interpolated between cross sections using topographic maps at a scale of 1:1,200 with a contour interval of 1 foot (Reference 15).

In this revision, the boundaries were interpolated between cross sections using topographic maps at a scale of 1:24,000 with a contour interval of 5 feet (Reference 11).

For the streams studied by approximate methods, the 100-year floodplain boundaries were delineated using topographic maps at scales of 1:24,000, 1:600, 1:1,200, and 1:2,400 with contour intervals of 2 and 5 feet (References 11, 12, 13, and 14).

The 100- and 500-year floodplain boundaries are shown on the FIRM (Exhibit 2). On this map, the 100-year floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A and AE), and the 500-year floodplain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 100- and 500-year floodplain boundaries are close together, only the 100-year floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

For the streams studied by approximate methods, only the 100-year floodplain boundary is shown on the FIRM (Exhibit 2).

4.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the NFIP, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 100-year floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 100-year flood can be carried without substantial increases in flood heights. Minimum federal standards limit such increases to 1.0 foot, provided that

hazardous velocities are not produced. The Michigan Flood Plain Act (Act 167, P.A. 1968), however, limits floodplain encroachments to that which will cause only insignificant increases in flood heights (less than 0.1 foot) (Reference 16). Thus, a floodway having no more than 0.1-foot surcharge has been delineated for this study. The floodways in this study are presented to local agencies as a minimum standard that can be adopted directly or that can be used as a basis for additional floodway studies.

The floodways presented in this study were computed for certain stream segments on the basis of equal conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. The results of the floodway computations are tabulated for selected cross sections (Table 2). The computed floodways are shown on the FIRM (Exhibit 2). In cases where the floodway and 100-year floodplain boundaries are either close together or collinear, only the floodway boundary is shown.

Several cross sections along the Chippewa and Tittabawassee Rivers extend beyond the corporate limits.

Encroachment into areas subject to inundation by floodwaters having hazardous velocities aggravates the risk of flood damage, and heightens potential flood hazards by further increasing velocities. A listing of stream velocities at selected cross sections is provided in Table 2, "Floodway Data." In order to reduce the risk of property damage in areas where the stream velocities are high, the community may wish to restrict development in areas outside the floodway.

Near the mouths of streams studied in detail, floodway computations are made without regard to flood elevations on the receiving water body. Therefore, "Without Floodway" elevations presented in Table 2 for certain downstream cross sections of Sturgeon Creek, Snake Creek, and Inman Drain are lower than the regulatory flood elevations in that area, which must take into account the 100-year flooding due to backwater from other sources.

The area between the floodway and 100-year floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood by more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 2.

The floodway for the Tittabawassee River, from Dublin Road to a point approximately 1.1 miles upstream of Dublin Road, was delineated by the MDNR based on the engineering judgement. Therefore cross-sections X and Y for the Tittabawassee River are not included in Table 2, Floodway Data.

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (NGVD)	WITHOUT FLOODWAY (NGVD)	WITH FLOODWAY (FEET)	INCREASE
TITTABAWASSEE RIVER								
A	112,974	476	10,101	4.7	610.5	610.5	610.6	0.1
B	113,884	696	11,732	4.1	610.8	610.8	610.9	0.1
C	116,484	713	12,114	3.9	611.2	611.2	611.3	0.1
D	117,657	504	9068	5.3	611.4	611.4	611.5	0.1
E	118,217	524	9474	5.0	611.6	611.6	611.7	0.1
F	120,117	682/140[2]	13,327	3.6	612.2	612.2	612.3	0.1
G	121,617	501/100[2]	8026	5.9	612.2	612.2	612.3	0.1
H	122,517	629/160[2]	9351	5.0	612.6	612.6	612.7	0.1
I	123,725	566	7573	7.0	612.9	612.9	613.0	0.1
J	124,204	296	5700	8.2	613.3	613.3	613.3	0.0
K	124,397	314	6838	6.9	613.7	613.7	613.7	0.0
L	124,807	670	8431	6.2	614.0	614.0	614.0	0.0
M	127,481	508	8873	5.6	614.7	614.7	614.7	0.0
N	130,129	560	7593	4.6	615.4	615.4	615.4	0.0
O	130,559	993	14,156	2.5	615.6	615.6	615.6	0.0
P	131,528	1660	15,140	1.3	615.7	615.7	615.7	0.0
Q	131,579	1660	17,731	2.0	615.7	615.7	615.7	0.0
R	133,279	1980	23,764	2.4	615.8	615.8	615.8	0.0
S	135,679	2500	27,614	2.3	615.9	615.9	615.9	0.0
T	137,179	2750	28,278	2.2	616.0	616.0	616.0	0.0
U	139,629	2280	21,235	3.0	616.1	616.1	616.1	0.0
V	142,129	2400	26,641	2.4	616.3	616.3	616.3	0.0

[1]FEET ABOVE MOUTH
[2]TOTAL WIDTH / WIDTH WITHIN CORPORATE LIMITS

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF MIDLAND, MI

(MIDLAND AND BAY CO.)

FLOODWAY DATA

TITTABAWASSEE RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC.)	REGULATORY (NGVD)	WITHOUT FLOODWAY (NGVD)	WITH FLOODWAY (FEET)	INCREASE
CHIPPEWA RIVER								
A	3250	1356	18,021	1.6	616.1	616.1	616.1	0.0
B	5950	2300	22,404	1.6	616.2	616.2	616.2	0.0
C	8500	2350	23,294	1.6	616.2	616.2	616.2	0.0
D	11,850	2750/115[3]	32,320	1.6	616.3	616.3	616.3	0.0
STURGEON CREEK								
A	713[2]	221	3509	0.5	615.9	608.9[4]	608.9	0.0
B	2033[2]	374	4394	0.4	615.9	608.9[4]	608.9	0.0
C	3848[2]	321	2908	0.6	615.9	608.9[4]	608.9	0.0
D	5675[2]	32	282	6.6	615.9	609.3[4]	609.3	0.0
E	6590[2]	230	1669	1.0	615.9	610.2[4]	610.3	0.1
F	7830[2]	230	1875	0.9	615.9	610.3[4]	610.4	0.1
G	8440[2]	310	2073	0.8	615.9	610.3[4]	610.4	0.1
H	8718[2]	62	470	3.4	615.9	610.3[4]	610.4	0.1
I	10,053[2]	318	2198	0.7	615.9	610.7[4]	610.8	0.1
J	12,033[2]	250	1539	1.0	615.9	610.9[4]	611.0	0.1
K	12,833[2]	205	1037	1.5	615.9	611.1[4]	611.2	0.1
L	14,233[2]	239	1073	1.5	615.9	611.7[4]	611.8	0.1
M	15,767[2]	30/15[3]	265	6.0	615.9	612.7[4]	612.8	0.1
N	16,216[2]	40	442	3.6	615.9	613.6[4]	613.7	0.1
O	16,328[2]	40	407	3.9	615.9	613.7[4]	613.8	0.1
P	17,293[2]	335	1387	1.2	615.9	614.1[4]	614.1	0.0
Q	18,474[2]	320	1193	1.3	615.9	614.3[4]	614.3	0.0
R	20,111[2]	189	805	2.0	615.9	614.7[4]	614.7	0.0

[1]FEET ABOVE MOUTH
[2]FEET ABOVE CONFLUENCE WITH TITTABAWASSEE RIVER
[3]TOTAL WIDTH / WIDTH WITHIN CORPORATE LIMITS
[4]ELEVATIONS WITHOUT CONSIDERING BACKWATER EFFECT FROM TITTABAWASSEE RIVER

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF MIDLAND, MI

(MIDLAND AND BAY COS.)

FLOODWAY DATA

CHIPPEWA RIVER - STURGEON CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC.)	REGULATORY (FEET NGVD)	WITHOUT FLOODWAY (FEET NGVD)	WITH FLOODWAY (FEET NGVD)	INCREASE (FEET)
SNAKE CREEK								
A	1078	105	1715	0.8	615.9	606.3[2,3]	606.3[3]	0.0
B	1688	258	2569	0.5	615.9	607.0[2,3]	607.0[3]	0.0
C	3228	210	2110	0.6	615.9	609.1[2,3]	609.1[3]	0.0
D	3959	135	1487	0.9	615.9	610.2[2,3]	610.2[3]	0.0
E	4409	130	986	1.3	615.9	610.8[2,3]	610.8[3]	0.0
F	4593	16	220	5.9	615.9	611.0[2,3]	611.0[3]	0.0
G	5313	290	2530	0.5	615.9	612.0[2,3]	612.0[3]	0.0
H	6012	270	1484	0.9	615.9	613.0[2,3]	613.0[3]	0.0
I	6792	168	707	4.6	615.9	614.2[2,3]	614.2[3]	0.1
J	8118	236	697	7.2	616.9	616.9	617.0	0.1
K	8788	200	1421	2.5	618.0	618.0	618.1	0.1
L	9763	23	82	6.9	618.0	618.0	618.1	0.1
M	9943	75	180	4.1	620.0	620.0	620.0	0.0
N	10,359	150	514	1.2	625.1	625.1	625.1	0.0
O	10,459	140	670	0.8	625.1	625.1	625.1	0.0
P	11,429	200	514	1.5	628.0	628.0	628.0	0.0
Q	12,139	300	519	1.6	628.2	628.2	628.2	0.0
R	13,138	120	326	2.0	628.8	628.8	628.8	0.0
S	13,889	49	260	1.6	629.0	629.0	629.0	0.0
T	14,509	38	146	2.1	629.2	629.2	629.2	0.0
U	14,905	80	345	1.3	632.7	632.7	632.7	0.0
V	15,955	92	351	0.6	632.8	632.8	632.8	0.0
W	16,900	32	88	1.7	632.9	632.9	632.9	0.0

[1]FEET ABOVE CONFLUENCE WITH TITTABAWASSEE RIVER
[2]ELEVATIONS WITHOUT CONSIDERING THE BACKWATER EFFECT FROM TITTABAWASSEE RIVER
[3]ELEVATIONS DETERMINED BY APPROXIMATE METHODS

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF MIDLAND, MI
(MIDLAND AND BAY COS.)

FLOODWAY DATA

SNAKE CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC.)	REGULATORY (NGVD)	WITHOUT FLOODWAY[2] (NGVD)	WITH FLOODWAY (NGVD)	INCREASE (FEET)
INMAN DRAIN								
A	1190	325	195	2.8	615.9	602.6	602.7	0.1
B	2950	20	113	4.8	615.9	608.2	608.2	0.0
C	3711	225	460	1.2	615.9	609.3	609.3	0.0
D	4552	26	111	4.9	615.9	609.8	609.8	0.0
E	5853	100	260	2.1	615.9	611.1	611.1	0.0
F	6721	13	81	6.6	615.9	612.3	612.3	0.0
G	7692	129	346	1.6	615.9	613.3	613.3	0.0
H	9447	130	386	1.4	615.9	613.7	613.7	0.0

[1]FEET ABOVE CONFLUENCE WITH STURGEON CREEK
[2]ELEVATIONS WITHOUT CONSIDERING BACKWATER EFFECT FROM TITTABAWASSEE RIVER

TABLE 2

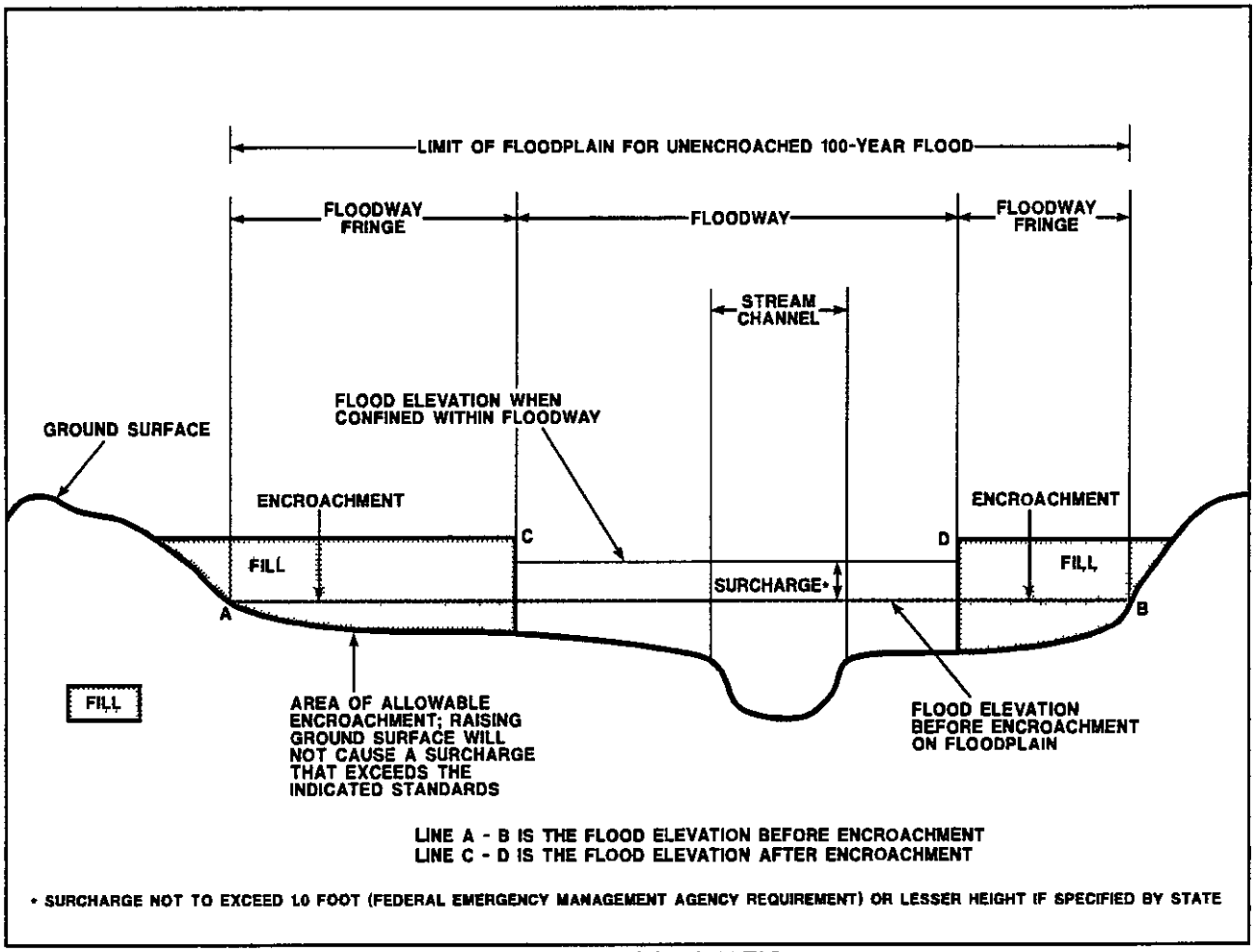
FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF MIDLAND, MI

(MIDLAND AND BAY COS.)

FLOODWAY DATA

INMAN DRAIN



FLOODWAY SCHEMATIC Figure 2

5.0 INSURANCE APPLICATIONS

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. The zones are as follows:

Zone A

Zone A is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the FIS by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base flood elevations or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the FIS by detailed methods. In most instances, whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AH

Zone AH is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AO

Zone AO is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-depths derived from the detailed hydraulic analyses are shown within this zone.

Zone A99

Zone A99 is the flood insurance rate zone that corresponds to areas of the 100-year floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No base flood elevations or depths are shown within this zone.

Zone V

Zone V is the flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. Because approximate hydraulic analyses are performed for such areas, no base flood elevations are shown within this zone.

Zone VE

Zone VE is the flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 500-year floodplain, areas within the 500-year floodplain, and to areas of 100-year flooding where average depths

are less than 1 foot, areas of 100-year flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 100-year flood by levees. No base flood elevations or depths are shown within this zone.

Zone D

Zone D is the flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.

6.0 FLOOD INSURANCE RATE MAP

The FIRM is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 100-year floodplains that were studied by detailed methods, shows selected whole-foot base flood elevations or average depths. Insurance agents use the zones and base flood elevations in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 100- and 500-year floodplains. Floodways and the locations of selected cross sections used in the hydraulic analyses and floodway computations are shown where applicable. The FIRM includes flood hazard information that was presented separately on the Flood Boundary and Floodway Map in the previously printed FIS for the City of Midland.

7.0 OTHER STUDIES

The Tittabawassee River has been studied by the USACE and Consumers Power Company (Reference 9). The purpose of the USACE study was to evaluate flood protection measures in the city, while the Consumers Power Company study was to provide information related to the safety of the nuclear power plant.

Because it is based on more up-to-date analyses, this FIS supersedes the previously printed FIS for the City of Midland (Reference 17). This FIS also supersedes the Flood Boundary and Floodway Map for the City of Midland, which was published as part of the previously printed FIS. The information on the Flood Boundary and Floodway Map has been added to the FIRM accompanying this FIS.

8.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this study can be obtained by contacting the FEMA, Mitigation Division, 175 West Jackson Boulevard, Fourth Floor, Chicago, Illinois 60604.

9.0 BIBLIOGRAPHY AND REFERENCES

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2. Michigan Department of Agriculture, Climate of Michigan by Stations, Lansing, Michigan, December 1971.

3. U.S. Department of Agriculture, Agricultural Research Administration, Soil Survey, Midland County, Michigan, May 1950.

4. U.s. Geological Survey Water-Data Report, U.S. Department of the Interior, Water Resources Data for Michigan, Water Year 1980.

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9. U.S. Army Corps of Engineers, Detroit District, Flood Control on Saginaw River, Michigan and Tributaries, Tittabawassee River at Midland; Phase I, Design Memorandum No. 8, Michigan, January 1977.

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11. U.S. Department of the Interior, Geological Survey, 7.5-Minute Series Topographic Maps, Scale 1:24,000, Contour Interval 5 Feet: Averill, Michigan, 1973; Gorndonville, Michigan, 1973; Midland North, Michigan, 1962, Photorevised 1973; Midland South, Michigan, 1962, Photorevised 1973.

12. City of Midland, Michigan, Topographic Map of Huron Park, Scale 1:600, Contour Interval 2 Feet, January 1975.

13. City of Midland, Michigan, Topographic Map, Scale 1:2,400, Contour Interval 2 Feet, 1975.

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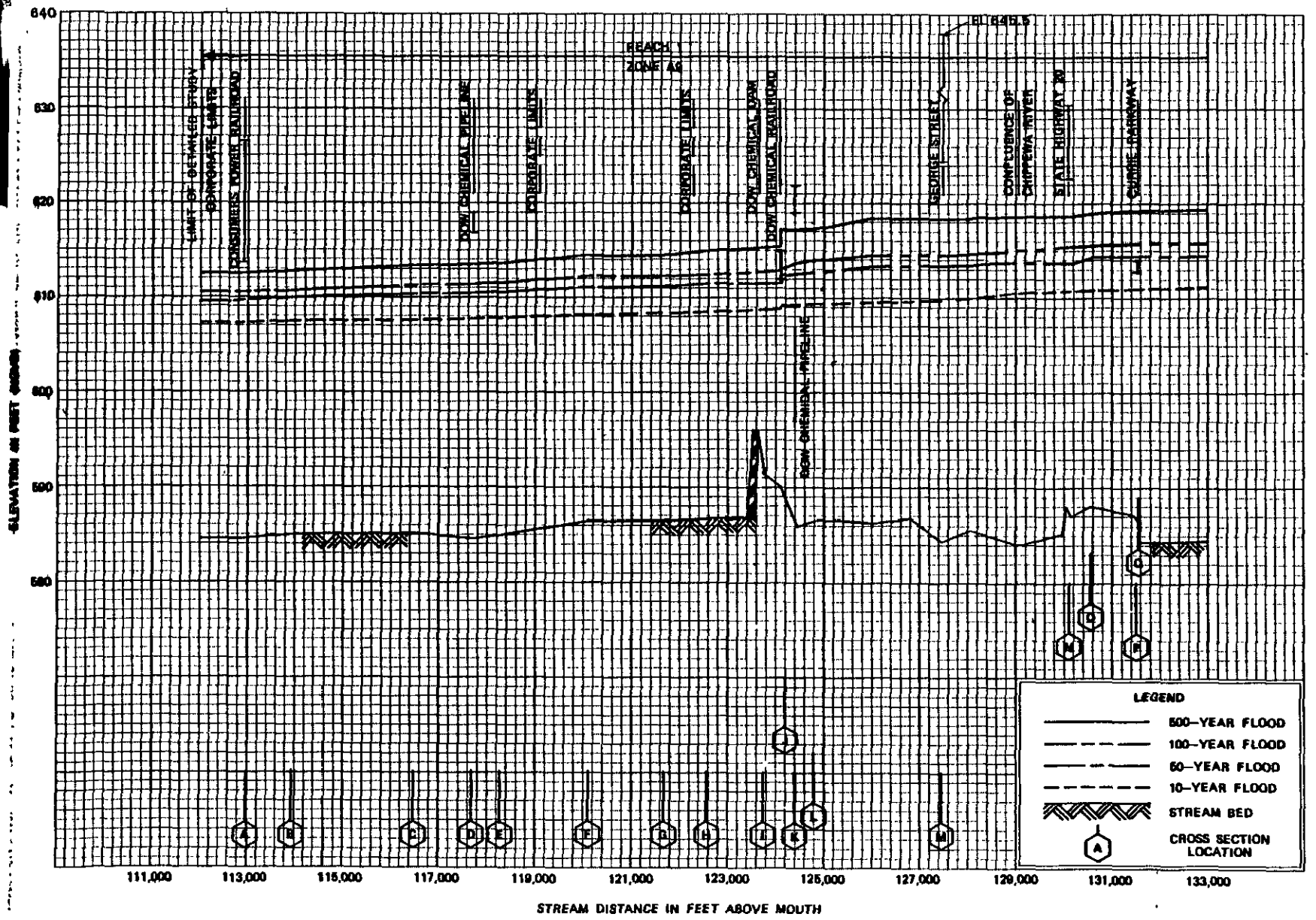
15. Abrams Aerial Survey Corporation, City of Midland, Michigan, Scale 1:1,200, Contour Interval 1 Foot: Midland, Michigan, 1983.

16. State of Michigan, Flood Plain Control Act in 1968, Act 245, P.A. 1929 as amended by Act 167, P.O. 1968, Michigan Water Resources Commission, Lansing, Michigan, 1968.

17. Federal Emergency Management Agency, Flood Insurance Study, City of Midland, Midland and Bay Counties, Michigan, Washington, D.C., January 5, 1989.



FLOOD PROFILES

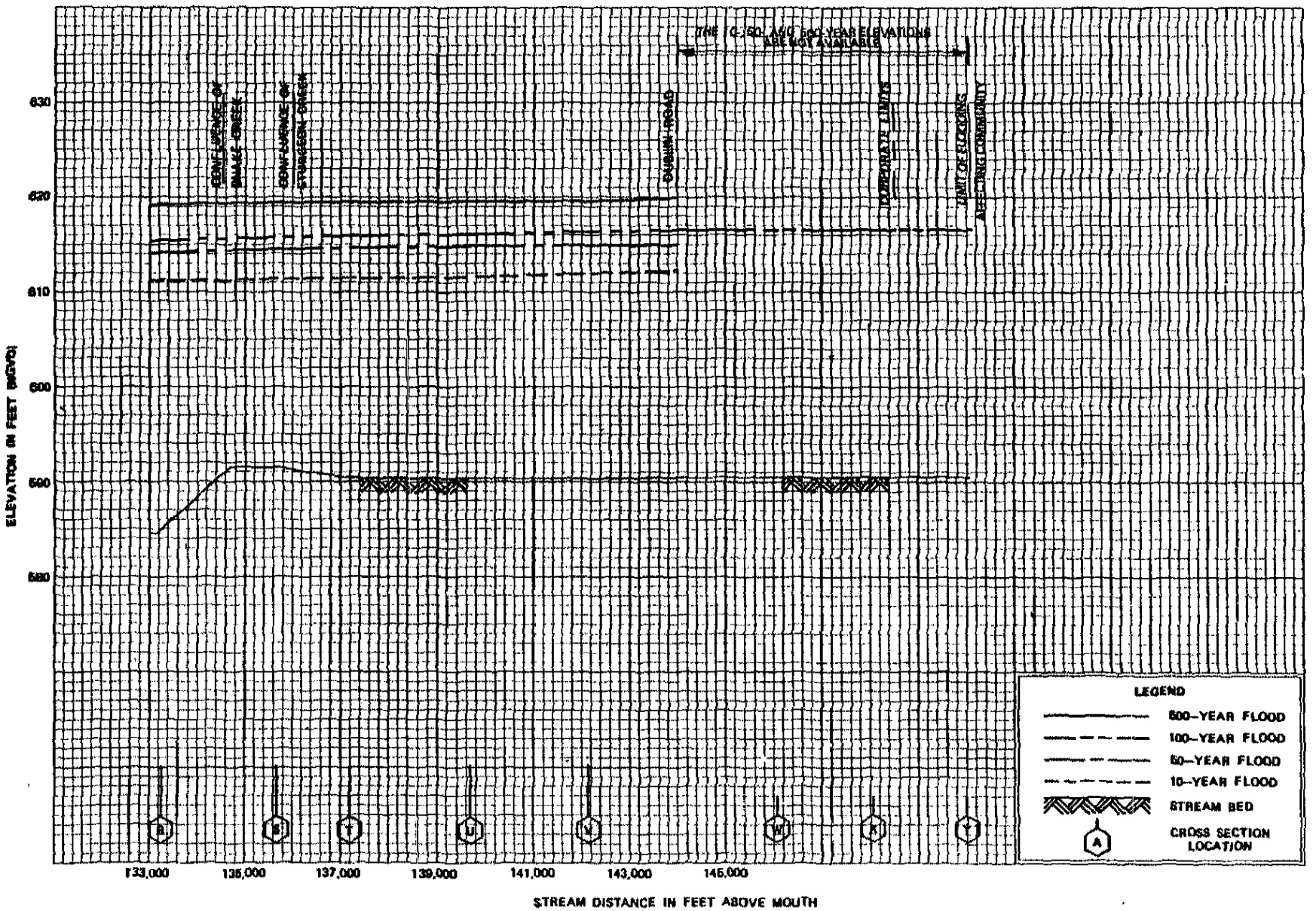
TITTABAWASSEE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF MIDLAND, MI

(MIDLAND AND BAY CO.)

01P



FLOOD PROFILES

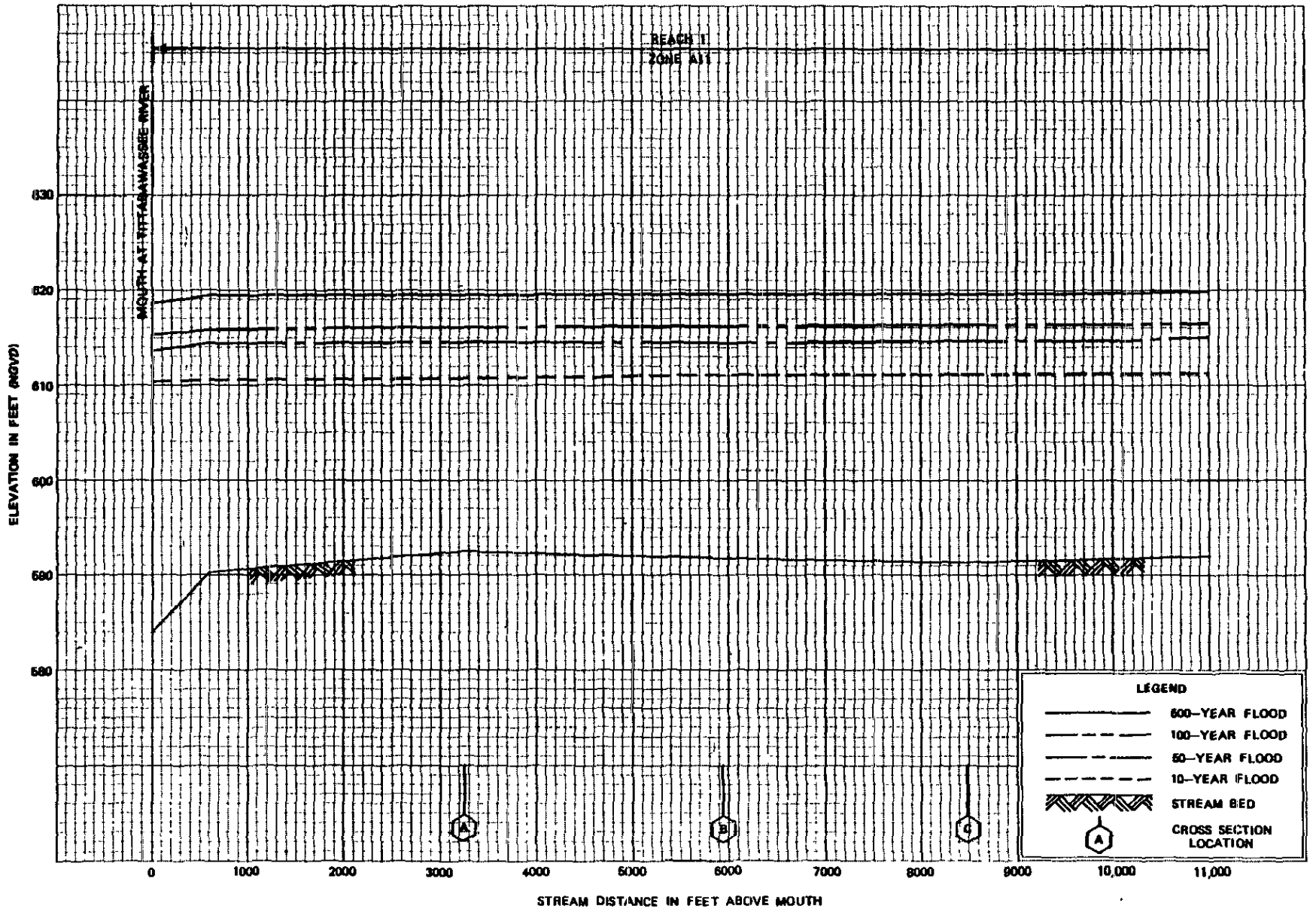
TITTABAWASSEE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF MIDLAND, MI

MIDLAND AND BAY COS.

02



FLOOD PROFILES

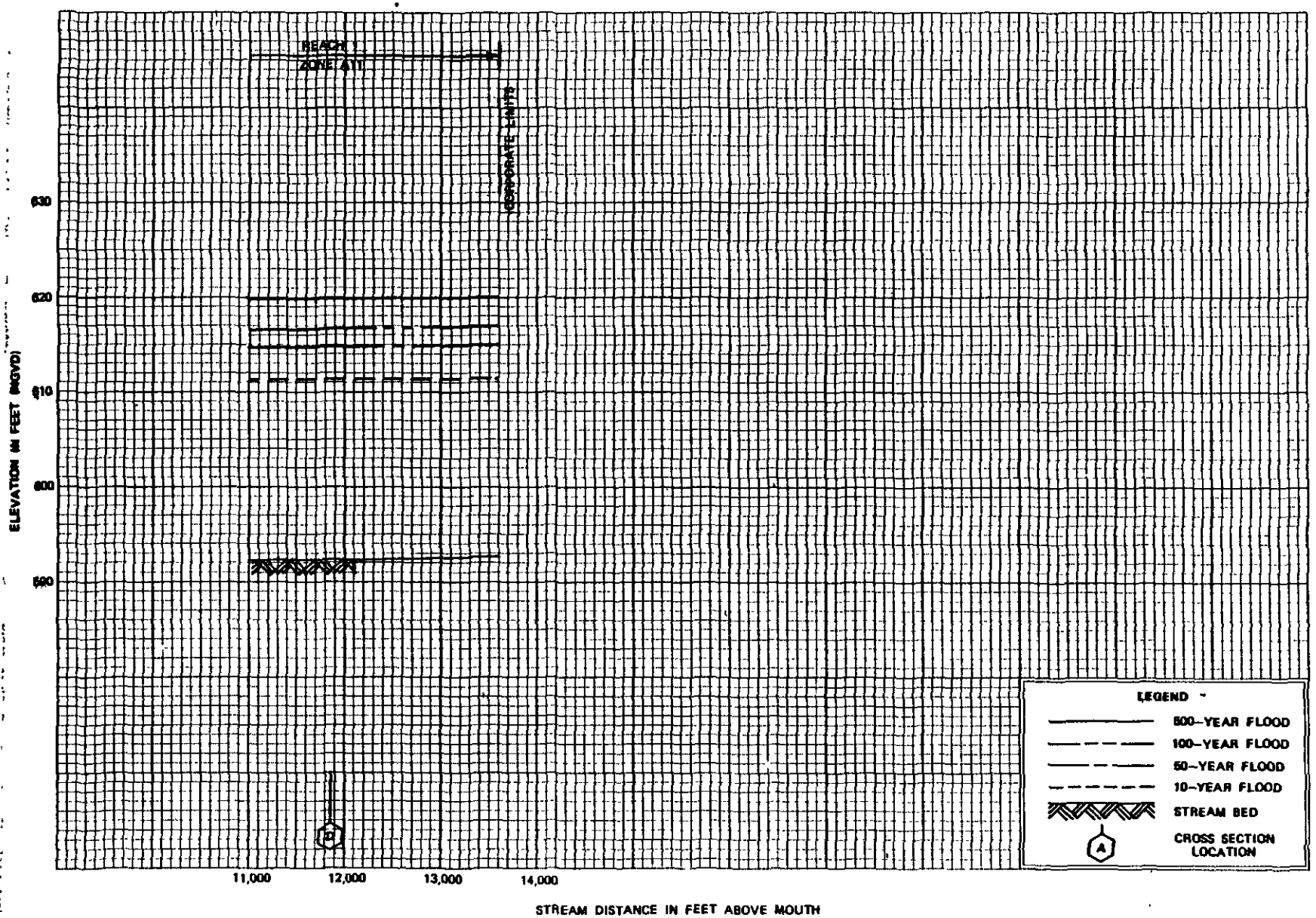
CHIPPEWA RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF MIDLAND, MI

(MIDLAND AND BAY COS.)

03



FLOOD PROFILES

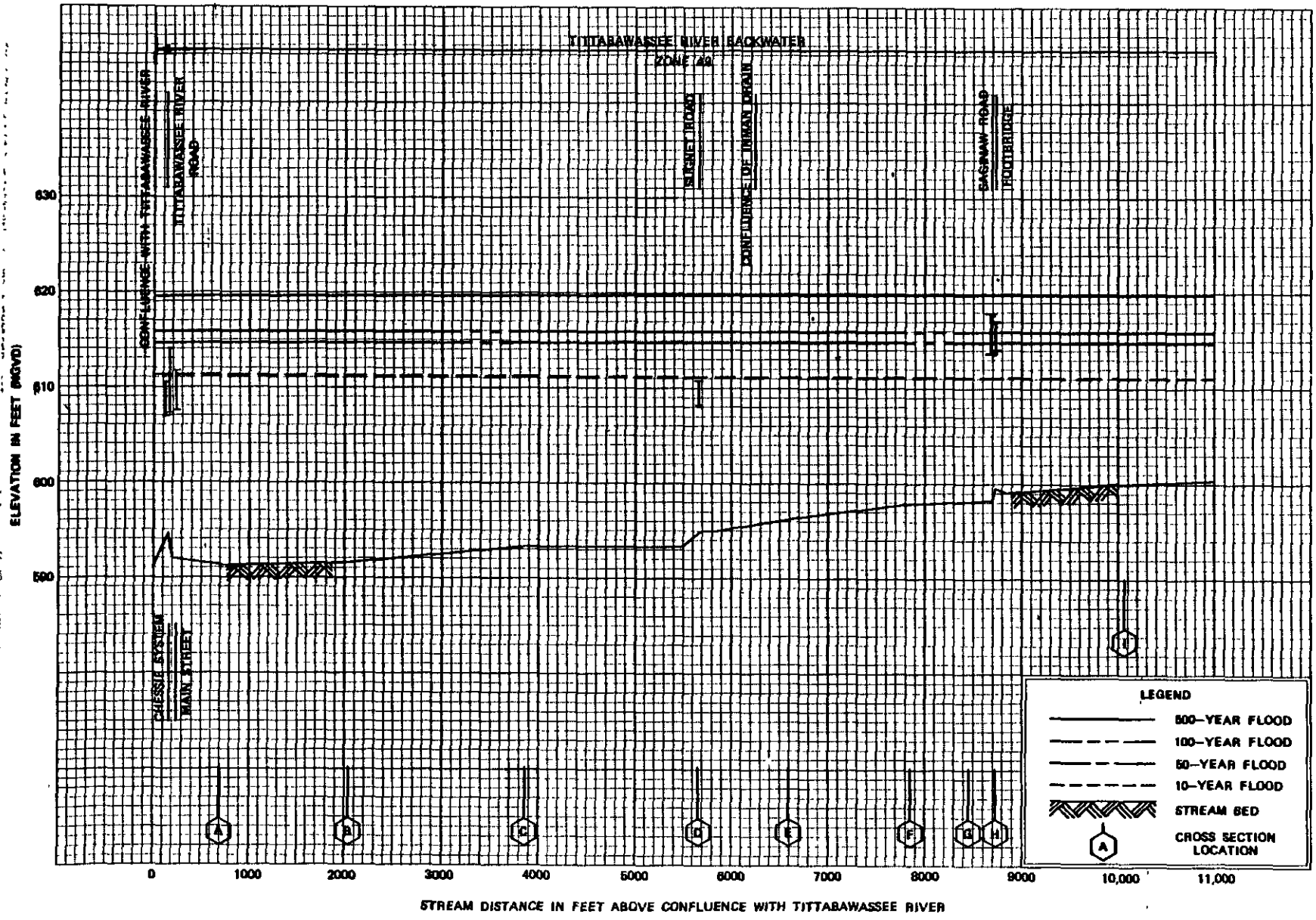
CHIPPEWA RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF MIDLAND, MI

(MIDLAND AND BAY COS.)

04P



FLOOD PROFILES

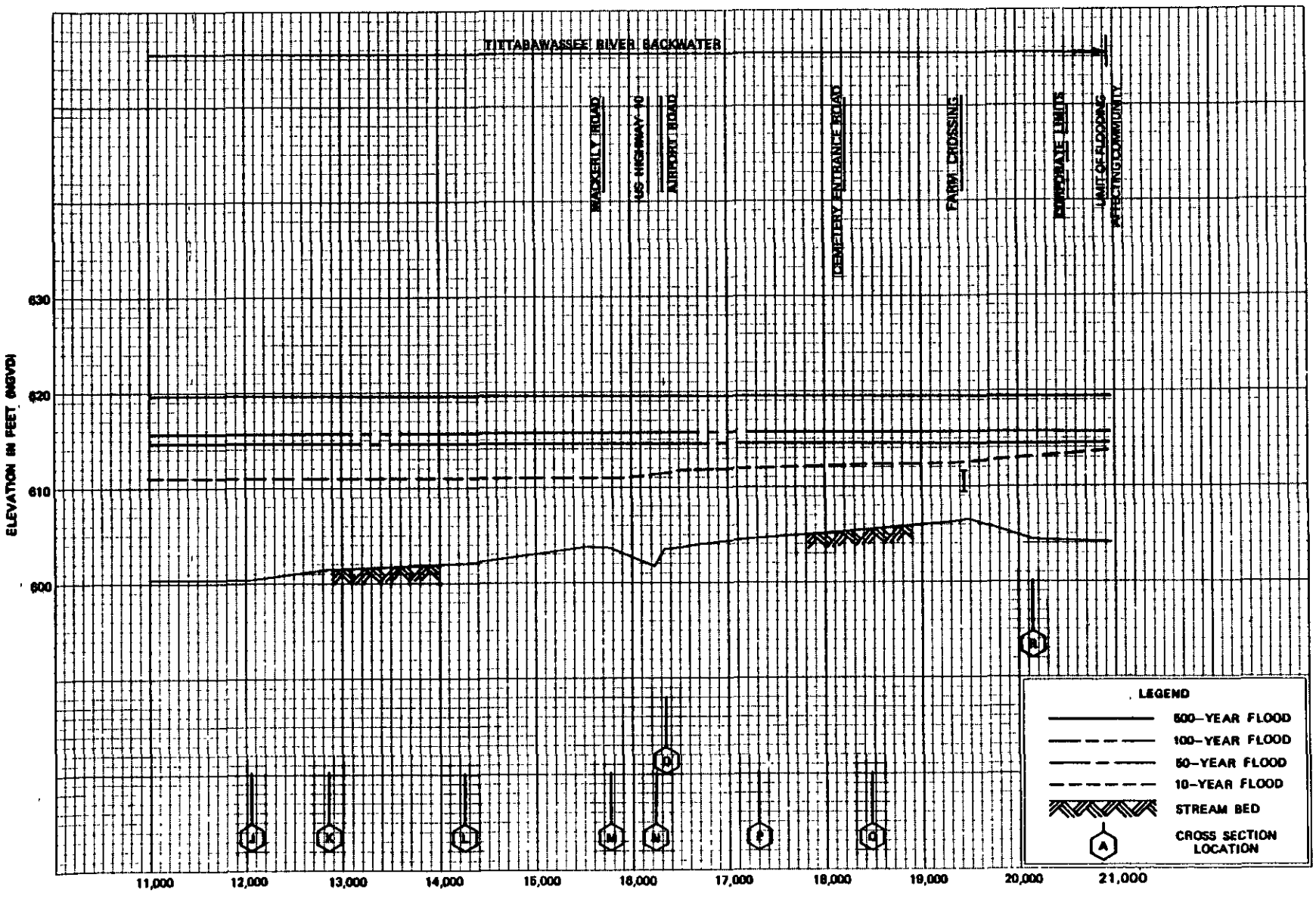
STURGEON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF MIDLAND, MI

MIDLAND AND BAY COS.

05P



FLOOD PROFILES

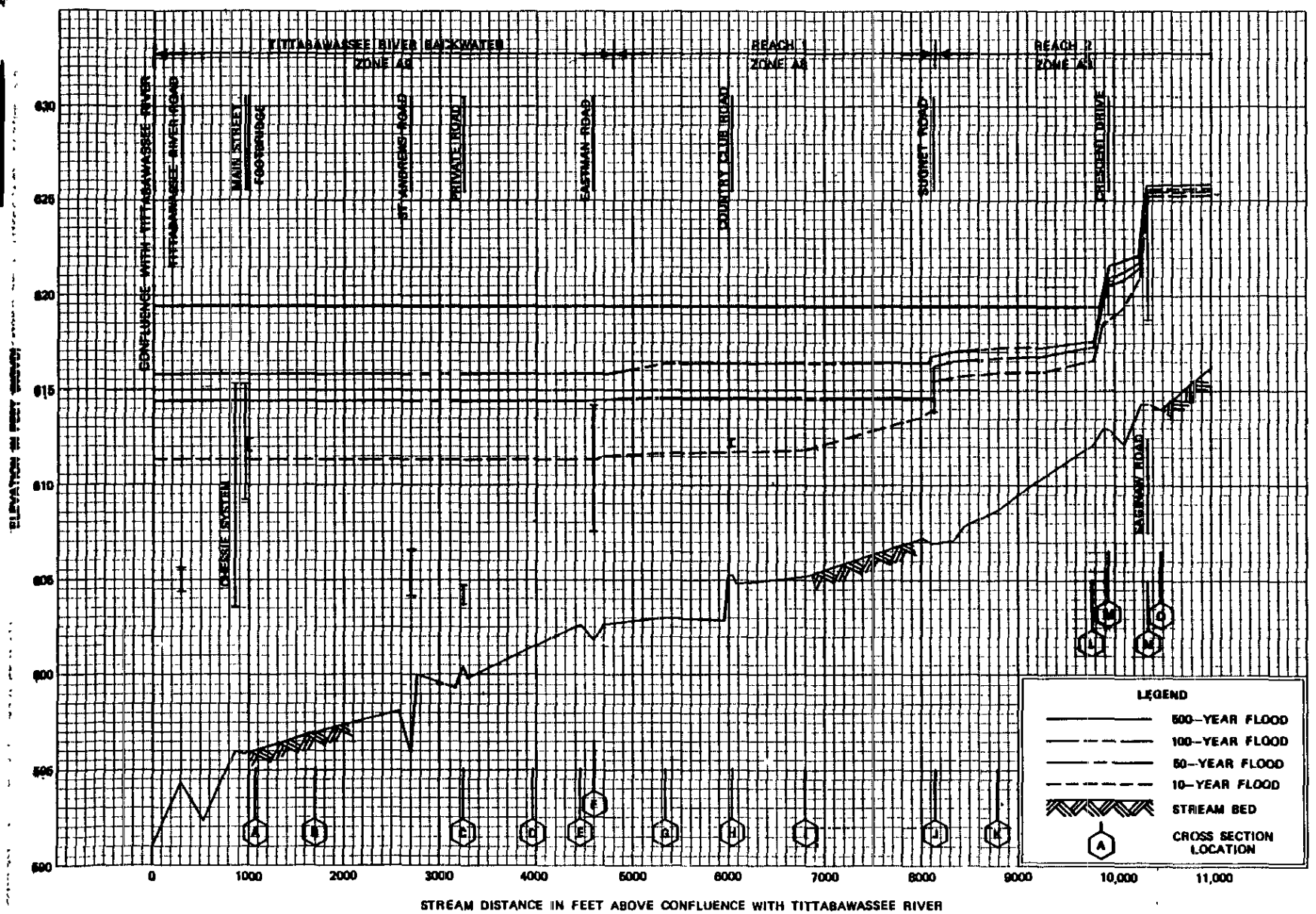
STURGEON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF MIDLAND, MI

[illegible]

06P



FLOOD PROFILES

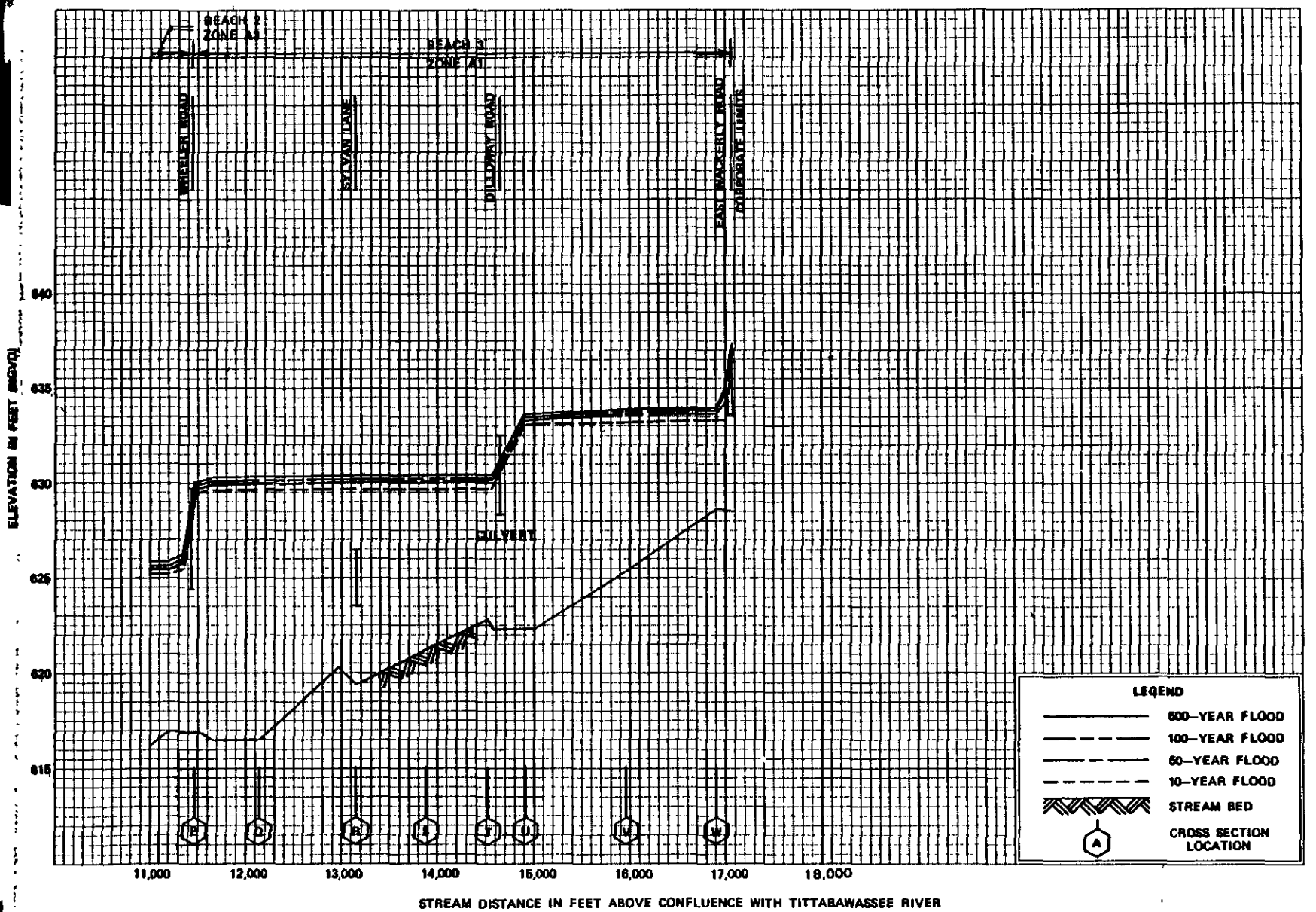
SNAKE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF MIDLAND, MI

(MIDLAND AND BAY CO'S.)

07P



FLOOD PROFILES

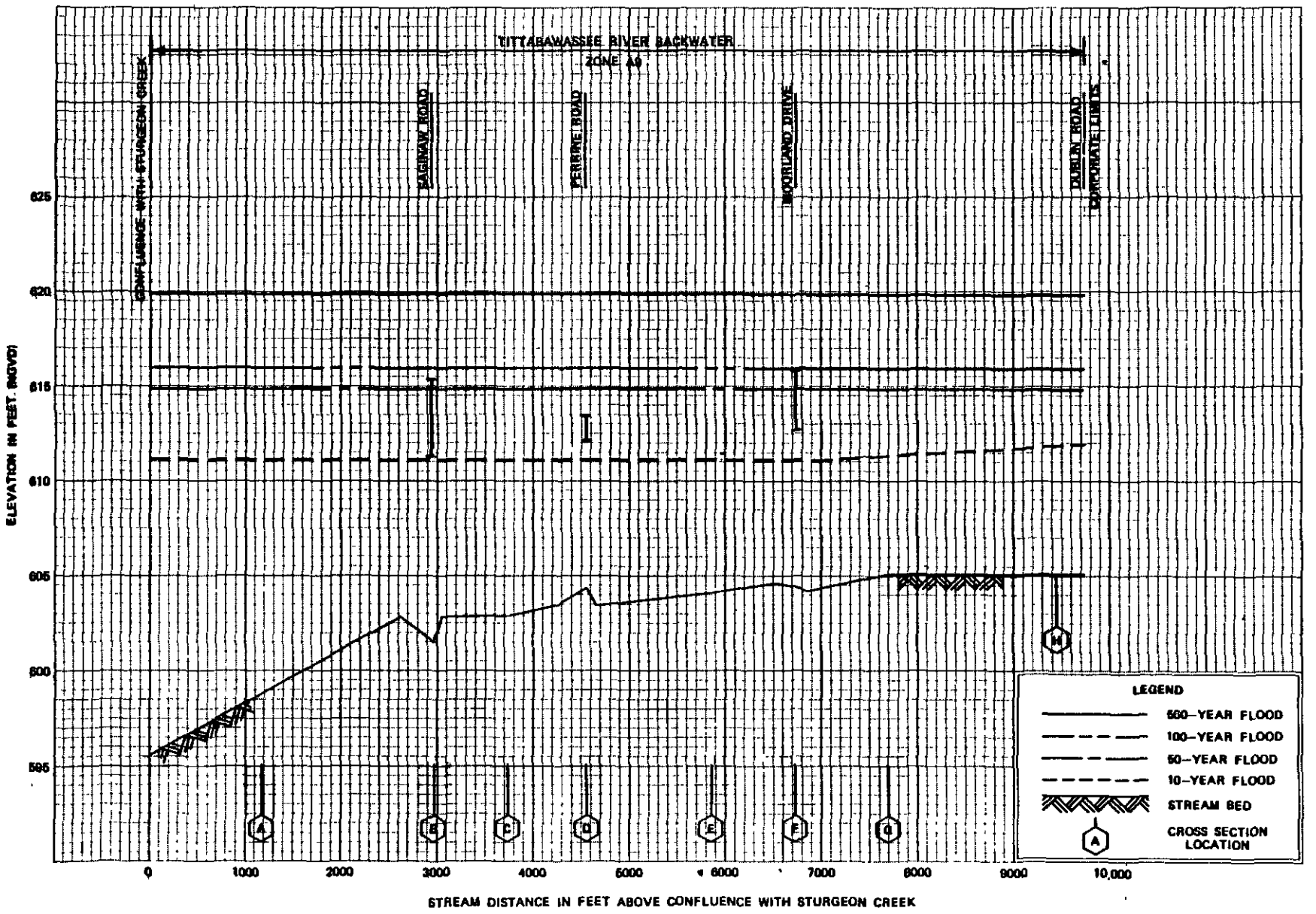
SNAKE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF MIDLAND, MI

(MIDLAND AND BAY COS.)

08P



FLOOD PROFILES

INMAN DRAIN

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF MIDLAND, MI

(MIDLAND AND BAY CO.)

09P

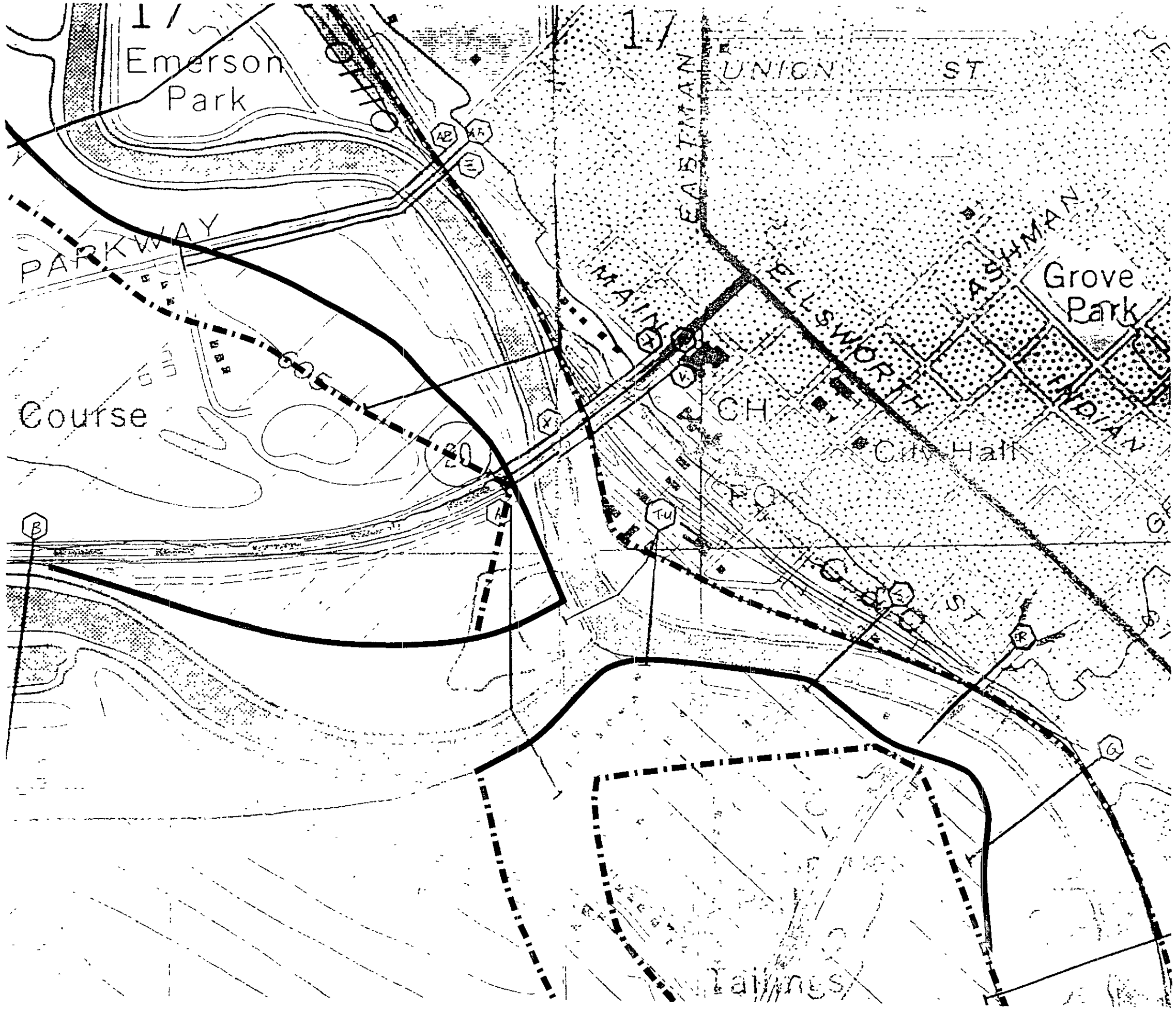


FIGURE 3

FLOODWAY DELINEATION

N

LEGEND

ORIGINAL FIS FLOODWAY DELINEATION

PROPOSED REVISION TO FIS FLOODWAY DELINEATION

0' 500' 1000'

SCALE: FEET

MIDLAND, MICHIGAN

FLOOD INSURANCE STUDY REVIEW

McNAMEE PORTER & SEELEY
ENGINEERS ARCHITECTS
ANN ARBOR, MICHIGAN

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

INTEROFFICE COMMUNICATION

TO: Hope Meyers Croskey
Hydrologic Studies

FROM: Suzanne Elms
Technical Programs Unit

DATE:

SUBJECT: FIS Review

Community:
County:
Watercourse:
Contractor:

1) Are discharges those that were approved?

✓ yes, ___ no

2) Was TR20 used?

___ yes ✓ no

3) Were there any special problems of which we should be made aware?

SE: mjb

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

INTEROFFICE COMMUNICATION

TO: Hope Meyers Croskey
Hydrologic Studies

FROM: Suzanne Elms
Technical Programs Unit

DATE:

SUBJECT: FIS Review

Community: Midland
County:
Watercourse:
Contractor:

1) Are discharges those that were approved?

✓ yes, ___ no

2) Was TR20 used?

___ yes ✓ no

3) Were there any special problems of which we should be made aware?

SE: mjb

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

INTEROFFICE COMMUNICATION

TO: Hope Meyers Croskey
Hydrologic Studies

FROM: Suzanne Elms
Technical Programs Unit

DATE:

SUBJECT: FIS Review

Community: Midland
County: Midland
Watercourse: [illegible]
Contractor: [illegible]

1) Are discharges those that were approved?

✓ yes, ___ no

2) Was TR20 used?

___ yes ✓ no

3) Were there any special problems of which we should be made aware?

SE: mjb

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

INTEROFFICE COMMUNICATION

TO: Hope Meyers Croskey
Hydrologic Studies

FROM: Suzanne Elms
Technical Programs Unit

DATE:

SUBJECT: FIS Review

Community: Middlebury
County: "
Watercourse: [illegible]
Contractor: Gove

1) Are discharges those that were approved?

✓ yes, ___ no

2) Was TR20 used?

___ yes ✓ no

3) Were there any special problems of which we should be made aware?

SE: mjb

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

INTEROFFICE COMMUNICATION

TO: Hope Meyers Croskey
Hydrologic Studies

FROM: Suzanne Elms
Technical Programs Unit

DATE:

SUBJECT: FIS Review

Community: [illegible]
County: [illegible]
Watercourse: [illegible]
Contractor: [illegible]

1) Are discharges those that were approved?

✓ yes, ___ no

2) Was TR20 used?

___ yes ✓ no

3) Were there any special problems of which we should be made aware?

SE: mjb

00BREAK00

1) COUNTY: Midland

2) STUDY NAME: City of Midland

3) WATERCOURSE: Tittabawassee, Chippewa, Sturgeon Cr. Inman Drain, Snake Creek

4) DOCUMENT TYPE: 10 yr

00BREAK00

McNamee, Porter & Seeley | Engineers / Architects | Ann Arbor, Michigan

```
RRRRRRRR    UU      UU  DDDDDDDD    YY      YY
RRRRRRRR    UU      UU  DDDDDDDD    YY      YY
RR      RR  UU      UU  DD      DD  YY      YY
RR      RR  UU      UU  DD      DD  YY      YY
RR      RR  UU      UU  DD      DD    YY  YY
RR      RR  UU      UU  DD      DD    YY  YY
RRRRRRRR    UU      UU  DD      DD      YY
RRRRRRRR    UU      UU  DD      DD      YY
RR  RR      UU      UU  DD      DD      YY
RR  RR      UU      UU  DD      DD      YY
RR    RR    UU      UU  DD      DD      YY
RR    RR    UU      UU  DD      DD      YY
RR      RR  UUUUUUUUUU  DDDDDDDD        YY
RR      RR  UUUUUUUUUU  DDDDDDDD        YY

 SSSS  N   N        1     000
S      N   N       11    0   0
S      NN  N        1    0  00
 SSS   N N N        1    0 0 0
    S  N  NN        1    00  0
    S  N   N        1    0   0
SSSS   N   N      111     000

  J   000   8888      999    000    666
  J  0   0  8   8    9   9  0   0  6
  J  0   0  8   8    9   9  0  00  6
  J  0   0  8888      9999  0 0 0  6666
J J  0   0  8   8        9  00  0  6   6
J J  0   0  8   8        9  0   0  6   6
 JJJ   000   8888      999    000    666
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Digital Equipment Corporation - VAX/VMS Version V4.5

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FLOOD HYDROGRAPH PACKAGE  (HEC-1)
          FEBRUARY 1981
        REVISED 04 NOV 81

RUN DATE 20-APR-1987   TIME 16:26:53
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U.S. ARMY CORPS OF ENGINEERS
THE HYDROLOGIC ENGINEERING CENTER
609 SECOND STREET
DAVIS, CALIFORNIA 95616
(916) 440-3285 OR (FTS) 448-3285


```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X       XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KU.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. SEE SEPTEMBER 1981 INPUT DESCRIPTION FOR NEW DEFINITIONS.

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  1           ID   MIDLAND FIS
  2           ID   SNAKE CREEK BASIN
  3           ID   10 - YEAR FREQUENCY EVENT
              %DIAGRAM
  4           IT      15 16DEC83       0      80
  5           IN      15 16DEC83       0
  6           IO       3       0       0

  7           KK    EXPS
  8           KM   INPUT HYDRO-DRAINAGE AREA TO EXPRESSWAY
  9           BA     1.0
 10           PB       0
 11           PI      0.      0.      0.      0.      0.    .075    .386    .178    .125    .089
 12           PI    .067    .043
 13           LU       0       0       0
 14           UI      0.      2.      3.      6       8.     12.     18.     27.     36.     45.
 15           UI     56.     76.     86.     88.     90.     86.     76.     68.     62.     58.
 16           UI     56.     54.     52.     49.     47.     45.     44.     42.     41.     40.
 17           UI     38.     37.     36.     35.     34.     34.     33.     32.     31.     31.
 18           UI     30.     30.     29.     29.     28.     28.     28.     27.     27.     26.
 19           UI     26.     25.     24.     24.     23.     23.     22.     21.     20.     20.
 20           UI     19.     19.     18.     17.     17.     16.     15.     15.     14.     13.
 21           UI     13.     12.     11.     10.     10.      9.      8.      8.      7.      6.
 22           UI      6.      5.      4.      4.      3.      2.      2.      1.      0.      0.

 23           KK    EXPS
 24           KM   STORAGE ROUTE UPSTREAM OF US-10
 25           KO       3       2
 26           RS       1    ELEV   630.0
 27           SV      0.     .10     .250     .50     1.0     1.5     2.5     4.0     6.1
 28           SE   630.0  634.70  635.00  635.25  635.60  635.85  636.10  636.30  636.68
 29           SQ      0.     70.     80.     90.    105.    130.    150.    165.    210.    275.
 30           SE    630.  634.61  634.83  635.07  635.52  635.92  636.22  636.39  637.01  637.89

 31           KK    WACK
 32           KM    STORAGE ROUTE UPSTREAM OF WACKERLY
 33           KO      3.      2.
 34           RS      1.    ELEV    630.
 35           SV      0.     .17     .68    1.04    1.61    2.56
 36           SE    630.    633.    635.    636.    637.    638.
 37           SQ      0.     50.     80.    130.    200.    360.
 38           SE    630.    633.    635     636.    637.    638.

 39           KK    WACK
 40           KM    INPUT HYDRO-DRAINAGE AREA TO DILLOWAY
 41           BA     .39
 42           PB      0.
 43           PI      0.      0.      0.      0.      0.    .181    .153    .071    .050    .036
 44           PI    .027    .017
 45           LU      0.      0.      0.
 46           UI      .5      1.      3.      5.      7.     12.     20.    105.    167.    195.
 47           UI    200.    199.    178.    156.    136    122.    102.     92.     84.     77.
 48           UI     68.     61.     54.     49.     43.     41.     37.     32.     29.     25.
 49           UI     21.     17.     12.      9.      5.      0.
```

```
LINE          ID.......1.......2.......3.......4.......5 .......6.......7.......8.......9......10

  50          KK   WACK
  51          KM   COMBINE HYDRO-DRAINAGE AREAS AT DILLOWAY
  52          HC     2.

  53          KK   DILL
  54          KM   STORAGE ROUTE UPSTREAM OF DILLOWAY
  55          KO     1.      2.
  56          RS     1.    ELEV    624.
  57          SV     0.     0.2     5.2     8.6    16.1     24.
  58          SE   624.    628.    632.    633.    634.    635.
  59          SQ     0.     60.    170.    220.    400.   1100.
  60          SE   624.    628.    632.    633.    634.    635.

  61          KK   DILL
  62          KM   INPUT HYDRO-DRAINAGE  AREA TO SYLVAN
  63          BA    .21
  64          PB     0.
  65          PI     0.      0.      0.      0.      0.    .086    .080    .037    .026    .019
  66          PI   .014    .009
  67          LU     0.      0.      0.
  68          UI     0.      8.     24.     75.    153.    290.    293.    274.    244.    204.
  69          UI   165     134.    110.     89.     73.     58.     50.     44.     38.     33.
  70          UI    28.     24.     20.     14.     11.      7.      2.      0.

  71          KK   DILL
  72          KM   INPUT HYDRO-DRAINAGE AREA TO WHEELER
  73          BA    .34
  74          PB     0.
  75          PI     0.      0.      0.      0.      0.    .153    .130    .060    .043    .031
  76          PI   .023    .015
  77          LU     0.      0.      0.
  78          UI     0.     17.     53.    158.    350.    395.    356.    298.    225.    159.
  79          UI   114.     93.     79.     67.     59.     50.     45.     37.     30.     22.
  80          UI    15.      9.      3.      0.

  81          KK   DILL
  82          KM   COMBINE HYDRO-DRAINAGE AREAS AT WHEELER
  83          HC     3.

  84          KK  WHEEL
  85          KM   STORAGE ROUTE UPSTREAM OF WHEELER
  86          KO     1.      2.
  87          RS     1.    ELEV    617.
  88          SV     0.      2.      6.3    12.8    25.1     45.     57.     70.
  89          SE   617.    625.    627.    628.    629.    630.   630.5    631.
  90          SQ     0.     80.    240.    300.    360.    430.    600.    730.
  91          SE   617.    625.    627.    628.    629.    630.   630.5    631.

  92          KK  WHEEL
  93          KM   DIVERT FLOW TO MEADOWBROOK
  94          DT   DFLO
  95          DI     0.    410.    460.    520.    600.    680.    730.
  96          DQ     0.      0.     40.     60.    120.    190.    230.
```

```
LINE          ID.......1.......2.......3 .....4.......5.......6 .....7.......8.......9......10

  97          KK   WHEEL
  98          KM    INPUT HYDRO-DRAINAGE AREA SOUTH OF WHEELER
  99          BA     .57
 100          PB     0.
 101          PI     0.      0.      0.      0.      0.      0.      0.    .059    .072    .052
 102          PI    .039    .025
 103          LU     0.      0.      0.
 104          UI     0.      5.     15.     39.     70.    118.    185.    234.    240.    234.
 105          UI    223.    202.    169.    141.    117.     98.     77.     63.     55.     50.
 106          UI     45.     41.     36.     33      29.     25.     21.     18.     15.     12.
 107          UI      8.      5.      2.      0.

 108          KK   WHEEL
 109          KM    COMBINE HYDRO SOUTH OF WHEELER
 110          HC      2.

 111          KK   CONFL
 112          KM    CHANNEL ROUTE SIEBERT TO CONFLUENCE SECTION 1330
 113          KO      3.      2.
 114          RS      1.    STOR     -1.
 115          RC     .06    .045     .06   2200.    .001
 116          RX      6.     13.     43.     47.     53.     60.    150.    229.
 117          RY    620.   619.2   616.5   612.6   612.6   616.8   617.9    620.

 118          KK    SAG
 119          KM    INPUT HYDRO-MEADOWBROOK DRAIN
 120          BA    1.27
 121          PB     0.
 122          PI     0.      0.      0.      0.      0.    .559    .493    .229    .161    .116
 123          PI    .081    .057
 124          LU     0.      0.      0.
 125          UI     0.      4.     11.     22.     47.     85.    131.    188.    211.    220.
 126          UI    216.    204.    186.    168.    146.    127.    110.     88.     71.     58.
 127          UI     49.     44.     39.     34.     31.     28.     24.     22.     20.     17.
 128          UI     15.     13.     11.      9.      7.      5.      3.      2.      0.

 129          KK    SAG
 130          KM    RETRIEVE DIVERTED FLOW AT WHEELER
 131          DR    OFLO

 132          KK    SAG
 133          KM    ADD MEADOWBROOK AND DIVERSION HYDROS
 134          HC      2.

 135          KK   CONFL
 136          KM    ROUTE TO CONFLUENCE  - SECTION 200
 137          KO      1.      2.
 138          RS      1.    STOR     -1.
 139          RC     .07    .045     .07   3500.    .001
 140          RX      0.     50.    118.    127.    132.    142.    230.    240.
 141          RY   620.9   619.1   616.8   611.9   611.9   616.3   619.0   620.9
 142          ZZ
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FLOOD HYDROGRAPH PACKAGE  (HEC-1)
          FEBRUARY 1981
        REVISED 04 NOV 81

RUN DATE 28-APR-1987   TIME 16:26:53

U.S. ARMY CORPS OF ENGINEERS
THE HYDROLOGIC ENGINEERING CENTER
        609 SECOND STREET
      DAVIS, CALIFORNIA 95616
(916) 440-3285 OR (FTS) 448-3285
```

```
                    MIDLAND FIS
                    SNAKE CREEK BASIN
                    10 - YEAR FREQUENCY EVENT

  6 IO        OUTPUT CONTROL VARIABLES
                IPRNT          3  PRINT CONTROL
                IPLOT          0  PLOT CONTROL
                QSCAL         0.  HYDROGRAPH PLOT SCALE

    IT        HYDROGRAPH TIME DATA
                 NMIN         15  MINUTES IN COMPUTATION INTERVAL
                IDATE     16DEC83  STARTING DATE
                ITIME        0000  STARTING TIME
                   NQ          80  NUMBER OF HYDROGRAPH ORDINATES
               NDDATE     16DEC83  ENDING DATE
               NDTIME        1945  ENDING TIME

             COMPUTATION INTERVAL     0.25 HOURS
                  TOTAL TIME BASE    19.75 HOURS

        ENGLISH UNITS
            DRAINAGE AREA          SQUARE MILES
            PRECIPITATION DEPTH    INCHES
            LENGTH, ELEVATION      FEET
            FLOW                   CUBIC FEET PER SECOND
            STORAGE VOLUME         ACRE-FEET
            SURFACE AREA           ACRES
            TEMPERATURE            DEGREES FAHRENHEIT

XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX

          EXPS

                    INPUT HYDRO-DRAINAGE AREA TO EXPRESSWAY

  5 IN        TIME DATA FOR INPUT TIME SERIES
                JXMIN          15  TIME INTERVAL IN MINUTES
               JXDATE     16DEC83  STARTING DATE
               JXTIME           0  STARTING TIME
```

```
                SUBBASIN RUNOFF DATA

 9 BA             SUBBASIN CHARACTERISTICS
                       TAREA          1.00  SUBBASIN AREA

                  PRECIPITATION DATA

10 PB                  STORM          0.96  BASIN TOTAL PRECIPITATION

11 PI               INCREMENTAL PRECIPITATION PATTERN
                      0.00      0.00      0.00      0.00      0.00      0.08      0.39      0.18      0.13      0.09
                      0.07      0.04

13 LU             UNIFORM LOSS RATE
                       STRTL          0.00  INITIAL LOSS
                       CNSIL          0.00  UNIFORM LOSS RATE
                       RTIMP          0.00  PERCENT IMPERVIOUS AREA

13 UI             INPUT UNITGRAPH,  88 ORDINATES,  VOLUME = 0.97
                       0.0       2.0       3.0       6.0       8.0      12.0      18.0      27.0      36.0      45.0
                      56.0      76.0      86.0      88.0      90.0      86.0      76.0      68.0      62.0      58.0
                      56.0      54.0      52.0      49.0      47.0      45.0      44.0      42.0      41.0      40.0
                      38.0      37.0      36.0      35.0      34.0      34.0      33.0      32.0      31.0      31.0
                      30.0      30.0      29.0      29.0      28.0      28.0      28.0      27.0      27.0      26.0
                      26.0      25.0      24.0      24.0      23.0      23.0      22.0      21.0      20.0      20.0
                      19.0      19.0      18.0      17.0      17.0      16.0      15.0      15.0      14.0      13.0
                      13.0      12.0      11.0      10.0      10.0       9.0       8.0       8.0       7.0       6.0
                       6.0       5.0       4.0       4.0       3.0       2.0       2.0       1.0

                                                          XXX

      XXX            XXX            XXX            XXX            XXX

                          HYDROGRAPH AT STATION     EXPS

       TOTAL RAINFALL =  0.96, TOTAL LOSS =  0.00, TOTAL EXCESS =  0.96

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)        (HR)                   6-HR       24-HR      72-HR     19.75-HR
     81.        5.50        (CFS)      55.        29.        29.        29.
                          (INCHES)    0.507      0.897      0.897      0.897
                          (AC-FT)     27.        48.        48.        48.

                         CUMULATIVE AREA =    1.00 SQ MI

[illegible]

            XXXXXXXXXXXXXX
            X            X
 23 KK      X     EXPS   X
            X            X
            XXXXXXXXXXXXXX
                     STORAGE ROUTE UPSTREAM OF US-10

 25 KO            OUTPUT CONTROL VARIABLES
                       IPRNT          3  PRINT CONTROL
```

```
                IPLOT          2  PLOT CONTROL
                QSCAL         0.  HYDROGRAPH PLOT SCALE

          HYDROGRAPH ROUTING DATA

26 RS        STORAGE ROUTING
                NSTPS          1  NUMBER OF SUBREACHES
                 ITYP       ELEV  TYPE OF INITIAL CONDITION
               RSVRIC     630.00  INITIAL CONDITION
                    X       0.00  WORKING R AND D COEFFICIENT

27 SV        STORAGE        0.0       0.1       0.3       0.5       1.0       1.5       2.5       4.0       6.1

28 SE        ELEVATION    630.00    634.70    635.00    635.25    635.60    635.85    636.10    636.30    636.68

29 SQ        DISCHARGE        0.        70.       80.       90.      105.      130.      150.      165.      210.      275.

30 SF        ELEVATION    630.00    634.61    634.83    635.07    635.52    635.92    636.22    636.39    637.01    637.89

                                                   XXX

                                  COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

          STORAGE      0.00      0.10      0.10      0.17      0.25      0.32      0.50      0.89      1.00      1.50
          OUTFLOW      0.00     70.00     74.09     80.00     87.08     90.00     96.00    105.00    110.00    125.62
        ELEVATION    630.00    634.61    634.70    634.83    635.00    635.07    635.25    635.52    635.60    635.85

          STORAGE      1.78      2.50      3.40      4.00      4.50      6.10      7.92     12.79
          OUTFLOW    130.00    142.00    150.00    157.06    165.00    186.05    210.00    275.00
        ELEVATION    635.92    636.10    636.22    636.30    636.39    636.68    637.01    637.89

XXX WARNING XXX MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS BETWEEN        0. TO       74.
              THE ROUTED HYDROGRAPH SHOULD BE EXAMINED FOR OSCILLATIONS OR OUTFLOWS GREATER THAN PEAK INFLOWS.
              THIS CAN BE CORRECTED BY DECREASING THE TIME INTERVAL OR INCREASING STORAGE (USE A LONGER REACH.)

     XXX          XXX          XXX          XXX          XXX

                    HYDROGRAPH AT STATION     EXPS

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR     19.75-HR
    80.       5.50        (CFS)      55.         29.         29.         29.
                        (INCHES)   0.507       0.896       0.896       0.896
                         (AC-FT)     27.         48.         48.         48.

PEAK STORAGE   TIME                          MAXIMUM AVERAGE STORAGE
  (AC-FT)      (HR)                  6-HR       24-HR       72-HR     19.75-HR
     0.        5.50                    0.          0.          0.          0.

PEAK STAGE     TIME                          MAXIMUM AVERAGE STAGE
  (FEET)       (HR)                  6-HR       24-HR       72-HR     19.75-HR
  634.84       5.50                633.52      631.91      631.91      631.91

                    CUMULATIVE AREA =     1.00 SQ MI
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XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX

          XXXXXXXXXXXXXX
          X            X
 31 KK    X     WACK   X
          X            X
          XXXXXXXXXXXXXX
                    STORAGE ROUTE UPSTREAM OF WACKERLY

 33 KO        OUTPUT CONTROL VARIABLES
                   IPRNT          3  PRINT CONTROL
                   IPLOT          2  PLOT CONTROL
                   QSCAL         0.  HYDROGRAPH PLOT SCALE

            HYDROGRAPH ROUTING DATA

 34 RS        STORAGE ROUTING
                   NSTPS          1  NUMBER OF SUBREACHES
                    ITYP       ELEV  TYPE OF INITIAL CONDITION
                  RSVRIC     630.00  INITIAL CONDITION
                       X       0.00 WORKING R AND D COEFFICIENT

 35 SV          STORAGE        0.0       0.2       0.7       1.0       1.6       2.6

 36 SE        ELEVATION     630.00    633.00    635.00    636.00    637.00    638.00

 37 SQ        DISCHARGE         0.        50.       80.      130.      200.      360.

 38 SF        ELEVATION     630.00    633.00    635.00    636.00    637.00    638.00

                                                          XXX

                                  COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

          STORAGE      0.00      0.17      0.68      1.04      1.61      2.56
          OUTFLOW      0.00     50.00     80.00    130.00    200.00    360.00
        ELEVATION    630.00    633.00    635.00    636.00    637.00    638.00

XXX WARNING XXX MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS BETWEEN        0. TO      360.
              THE ROUTED HYDROGRAPH SHOULD BE EXAMINED FOR OSCILLATIONS OR OUTFLOWS GREATER THAN PEAK INFLOWS.
              THIS CAN BE CORRECTED BY DECREASING THE TIME INTERVAL OR INCREASING STORAGE (USE A LONGER REACH.)

     XXX            XXX            XXX            XXX            XXX

                     HYDROGRAPH AT STATION     WACK

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR     19.75-HR
    79.       5.75       (CFS)       55.         29.         29.         29.
                       (INCHES)    0.507       0.896       0.896       0.896
                        (AC-FT)      27.         48.         48.         48.

PEAK STORAGE  TIME                          MAXIMUM AVERAGE STORAGE
  (AC-FT)     (HR)                  6-HR       24-HR       72-HR     19.75-HR
     1.       5.75                    0.          0.          0.          0.
```

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	19.75-HR
634.96	5.75	633.33	631.77	631.77	631.77

CUMULATIVE AREA = 1.00 SQ MI

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XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX

              ***************
              *             *
  39 KK       *    WACK     *
              *             *
              ***************
                        INPUT HYDRO-DRAINAGE AREA TO DILLOWAY

   5 IN             TIME DATA FOR INPUT TIME SERIES
                          JXMIN          15  TIME INTERVAL IN MINUTES
                          JXDATE    16DEC83  STARTING DATE
                          JXTIME          0  STARTING TIME

                  SUBBASIN RUNOFF DATA

  41 BA             SUBBASIN CHARACTERISTICS
                          TAREA        0.39  SUBBASIN AREA

                    PRECIPITATION DATA

  42 PB                   STORM        0.54  BASIN TOTAL PRECIPITATION

  43 PI               INCREMENTAL PRECIPITATION PATTERN
                         0.00      0.00      0.00      0.00      0.00      0.18      0.15      0.07      0.05      0.04
                         0.03      0.02

  45 LU             UNIFORM LOSS RATE
                          STRTL        0.00  INITIAL LOSS
                          CNSTL        0.00  UNIFORM LOSS RATE
                          RTIMP        0.00  PERCENT IMPERVIOUS AREA

  45 UI             INPUT UNITGRAPH,  35 ORDINATES,  VOLUME = 2.35
                          0.5       1.0       3.0       5.0       7.0      12.0      20.0     105.0     167.0     195.0
                        200.0     199.0     178.0     156.0     136.0     122.0     102.0      92.0      84.0      77.0
                         68.0      61.0      54.0      49.0      43.0      41.0      37.0      32.0      29.0      25.0
                         21.0      17.0      12.0       9.0       5.0

                                                                 ***

      ***            ***            ***            ***            ***

                          HYDROGRAPH AT STATION     WACK

       TOTAL RAINFALL =  0.54, TOTAL LOSS =  0.00, TOTAL EXCESS =  0.54

  PEAK FLOW      TIME                            MAXIMUM AVERAGE FLOW
    (CFS)        (HR)                      6-HR        24-HR        72-HR     19.75-HR
      96.        4.50           (CFS)       50.          16.          16.          16.
                             (INCHES)     1.194        1.257        1.257        1.257
                              (AC-FT)       25.          26.          26.          26.

                         CUMULATIVE AREA =    0.39 SQ MI
```

```
*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

                ***************
                *             *
   50 KK        *    WACK     *
                *             *
                ***************
                                COMBINE HYDRO-DRAINAGE AREAS AT DILLOWAY

   52 HC           HYDROGRAPH COMBINATION
                        ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                ***

        ***             ***             ***             ***             ***

                          HYDROGRAPH AT STATION     WACK

  PEAK FLOW     TIME                                   MAXIMUM AVERAGE FLOW
    (CFS)       (HR)                      6-HR        24-HR       72-HR      19.75-HR
     155.       5.00          (CFS)       103.         45.         45.          45.
                            (INCHES)     0.686       0.997       0.997        0.997
                             (AC-FT)       51.         74.         74.          74.

                          CUMULATIVE AREA =     1.39 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

                ***************
                *             *
   53 KK        *    DILL     *
                *             *
                ***************
                                STORAGE ROUTE UPSTREAM OF DILLOWAY

   55 KO           OUTPUT CONTROL VARIABLES
                        IPRNT          1  PRINT CONTROL
                        IPLOT          2  PLOT CONTROL
                        QSCAL         0.  HYDROGRAPH PLOT SCALE

                HYDROGRAPH ROUTING DATA

   56 RS           STORAGE ROUTING
                        NSTPS          1  NUMBER OF SUBREACHES
                        ITYP        ELEV  TYPE OF INITIAL CONDITION
                        RSVRIC    624.00  INITIAL CONDITION
                        X           0.00  WORKING R AND D COEFFICIENT

   57 SV            STORAGE          0.0       0.2       5.2       8.6      16.1      24.0

   58 SE            ELEVATION     624.00    628.00    632.00    633.00    634.00    635.00

   59 SQ            DISCHARGE         0.       60.      170.      220.      400.     1100.
```

60 SA ELEVATION 624.00 628.00 632.00 633.00 634.00 635.00

***

COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	0.00	0.20	5.20	8.60	16.10	24.00
OUTFLOW	0.00	60.00	170.00	220.00	400.00	1100.00
ELEVATION	624.00	628.00	632.00	633.00	634.00	635.00

*** WARNING *** MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS BETWEEN 0. TO 60.
THE ROUTED HYDROGRAPH SHOULD BE EXAMINED FOR OSCILLATIONS OR OUTFLOWS GREATER THAN PEAK INFLOWS.
THIS CAN BE CORRECTED BY DECREASING THE TIME INTERVAL OR INCREASING STORAGE (USE A LONGER REACH.)

HYDROGRAPH AT STATION DILL

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
16	DEC	0000	1	0.	0.0	624.0	16	DEC	0645	28	121.	3.0	630.2	16	DEC	1330	55	27.	0.1	625.8
16	DEC	0015	2	0.	0.0	624.0	16	DEC	0700	29	112.	2.6	629.9	16	DEC	1345	56	26.	0.1	625.8
16	DEC	0030	3	0.	0.0	624.0	16	DEC	0715	30	104.	2.2	629.6	16	DEC	1400	57	26.	0.1	625.7
16	DEC	0045	4	0.	0.0	624.0	16	DEC	0730	31	96.	1.9	629.3	16	DEC	1415	58	26.	0.1	625.7
16	DEC	0100	5	0.	0.0	624.0	16	DEC	0745	32	90.	1.5	629.1	16	DEC	1430	59	25.	0.1	625.7
16	DEC	0115	6	0.	0.0	624.0	16	DEC	0800	33	83.	1.2	628.8	16	DEC	1445	60	24.	0.1	625.6
16	DEC	0130	7	0.	0.0	624.0	16	DEC	0815	34	77.	1.0	628.6	16	DEC	1500	61	24.	0.1	625.6
16	DEC	0145	8	0.	0.0	624.0	16	DEC	0830	35	72.	0.8	628.4	16	DEC	1515	62	23.	0.1	625.5
16	DEC	0200	9	1.	0.0	624.1	16	DEC	0845	36	67.	0.5	628.3	16	DEC	1530	63	23.	0.1	625.5
16	DEC	0215	10	3.	0.0	624.2	16	DEC	0900	37	63.	0.4	628.1	16	DEC	1545	64	22.	0.1	625.5
16	DEC	0230	11	5.	0.0	624.3	16	DEC	0915	38	58.	0.2	627.8	16	DEC	1600	65	21.	0.1	625.4
16	DEC	0245	12	8.	0.0	624.6	16	DEC	0930	39	45.	0.1	627.0	16	DEC	1615	66	21.	0.1	625.4
16	DEC	0300	13	13.	0.0	624.9	16	DEC	0945	40	46.	0.2	627.1	16	DEC	1630	67	20.	0.1	625.3
16	DEC	0315	14	31.	0.1	626.0	16	DEC	1000	41	41.	0.1	626.7	16	DEC	1645	68	19.	0.1	625.3
16	DEC	0330	15	60.	0.2	628.0	16	DEC	1015	42	39.	0.1	626.6	16	DEC	1700	69	19.	0.1	625.3
16	DEC	0345	16	68.	0.6	628.3	16	DEC	1030	43	36.	0.1	626.4	16	DEC	1715	70	18.	0.1	625.2
16	DEC	0400	17	82.	1.2	628.8	16	DEC	1045	44	34.	0.1	626.3	16	DEC	1730	71	18.	0.1	625.2
16	DEC	0415	18	98.	1.9	629.4	16	DEC	1100	45	33.	0.1	626.2	16	DEC	1745	72	17.	0.1	625.1
16	DEC	0430	19	114.	2.7	630.0	16	DEC	1115	46	32.	0.1	626.1	16	DEC	1800	73	16.	0.1	625.1
16	DEC	0445	20	127.	3.3	630.4	16	DEC	1130	47	31.	0.1	626.0	16	DEC	1815	74	16.	0.1	625.0
16	DEC	0500	21	137.	3.7	630.8	16	DEC	1145	48	30.	0.1	626.0	16	DEC	1830	75	15.	0.1	625.0
16	DEC	0515	22	143.	4.0	631.0	16	DEC	1200	49	29.	0.1	626.0	16	DEC	1845	76	15.	0.0	625.0
16	DEC	0530	23	146.	4.1	631.1	16	DEC	1215	50	29.	0.1	625.9	16	DEC	1900	77	14.	0.0	624.9
16	DEC	0545	24	145.	4.1	631.1	16	DEC	1230	51	28.	0.1	625.9	16	DEC	1915	78	13.	0.0	624.9
16	DEC	0600	25	142.	3.9	631.0	16	DEC	1245	52	28.	0.1	625.9	16	DEC	1930	79	13.	0.0	624.8
16	DEC	0615	26	137.	3.7	630.8	16	DEC	1300	53	28.	0.1	625.8	16	DEC	1945	80	12.	0.0	624.8
16	DEC	0630	27	129.	3.3	630.5	16	DEC	1315	54	27.	0.1	625.8							

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	19.75-HR
146.	5.50	(CFS)	103.	45.	45.	45.
		(INCHES)	0.687	0.996	0.996	0.996
		(AC-FT)	51.	74.	74.	74.

PEAK STORAGE TIME MAXIMUM AVERAGE STORAGE

(AC-FT)	(HR)	6-HR	24-HR	72-HR	19.75-HR
4.	5.50	2.	1.	1.	1.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	19.75-HR
631.12	5.50	629.54	626.62	626.62	626.62

CUMULATIVE AREA = 1.39 SQ MI

```
*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

              ***************
              *             *
 61 KK        *    DILL     *
              *             *
              ***************
                      INPUT HYDRO-DRAINAGE  AREA TO SYLVAN

  5 IN          TIME DATA FOR INPUT TIME SERIES
                    JXMIN         15  TIME INTERVAL IN MINUTES
                    JXDATE   16DEC83  STARTING DATE
                    JXTIME         0  STARTING TIME

              SUBBASIN RUNOFF DATA

 63 BA          SUBBASIN CHARACTERISTICS
                    TAREA       0.21  SUBBASIN AREA

                PRECIPITATION DATA

 64 PB              STORM       0.27  BASIN TOTAL PRECIPITATION

 65 PI            INCREMENTAL PRECIPITATION PATTERN
                   0.00      0.00      0.00      0.00      0.00      0.09      0.08      0.04      0.03      0.02
                   0.01      0.01

 67 LU          UNIFORM LOSS RATE
                    STRTL       0.00  INITIAL LOSS
                    CNSTL       0.00  UNIFORM LOSS RATE
                    RTIMP       0.00  PERCENT IMPERVIOUS AREA

 67 UI          INPUT UNITGRAPH,  27 ORDINATES,  VOLUME = 4.55
                    0.0       8.0      24.0      75.0     153.0     290.0     293.0     274.0     244.0     204.0
                  165.0     134.0     110.0      89.0      73.0      58.0      50.0      44.0      38.0      33.0
                   28.0      24.0      20.0      14.0      11.0       7.0       2.0

                                                 ***

       ***         ***         ***         ***         ***

                    HYDROGRAPH AT STATION     DILL

         TOTAL RAINFALL =  0.27, TOTAL LOSS =  0.00, TOTAL EXCESS =  0.27

  PEAK FLOW     TIME                                MAXIMUM AVERAGE FLOW
    (CFS)       (HR)                      6-HR        24-HR       72-HR      19.75-HR
      63.       3.50           (CFS)       28.           8.          8.           8.
                             (INCHES)    1.221        1.232       1.232        1.232
                             (AC-FT)       14.          14.         14.          14.

                    CUMULATIVE AREA =     0.21 SQ MI
```

```
                 XXXXXXXXXXXXXX
                 X            X
 71 KK           X     DILL   X
                 X            X
                 XXXXXXXXXXXXXX
                          INPUT HYDRO-DRAINAGE AREA TO WHEELER

  5 IN          TIME DATA FOR INPUT TIME SERIES
                     JXMIN          15  TIME INTERVAL IN MINUTES
                    JXDATE     16DEC83  STARTING DATE
                    JXTIME           0  STARTING TIME

               SUBBASIN RUNOFF DATA

 73 BA          SUBBASIN CHARACTERISTICS
                     TAREA        0.34  SUBBASIN AREA

                PRECIPITATION DATA

 74 PB               STORM        0.45  BASIN TOTAL PRECIPITATION

 75 PI            INCREMENTAL PRECIPITATION PATTERN
                    0.00      0.00      0.00      0.00      0.00      0.15      0.13      0.06      0.04      0.03
                    0.02      0.01

 77 LU          UNIFORM LOSS RATE
                     STRTL        0.00  INITIAL LOSS
                     CNSTL        0.00  UNIFORM LOSS RATE
                     RTIMP        0.00  PERCENT IMPERVIOUS AREA

 77 UI          INPUT UNITGRAPH,  23 ORDINATES,  VOLUME = 3.00
                     0.0      17.0      53.0     158.0     350.0     395.0     356.0     298.0     225.0     159.0
                   114.0      93.0      79.0      67.0      59.0      50.0      45.0      37.0      30.0      22.0
                    15.0       9.0       3.0

                                                                XXX

     XXX            XXX            XXX            XXX            XXX

                       HYDROGRAPH AT STATION     DILL

      TOTAL RAINFALL =  0.45, TOTAL LOSS =  0.00, TOTAL EXCESS =  0.45

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR     19.75-HR
    137.       3.25       (CFS)       50.         15.         15.          15.
                        (INCHES)    1.363       1.366       1.366        1.366
                         (AC-FT)      25.         25.         25.          25.

                       CUMULATIVE AREA =    0.34 SQ MI
```

```
                XXXXXXXXXXXXXX
                X            X
81 KK           X    DILL    X
                X            X
                XXXXXXXXXXXXXX
                          COMBINE HYDRO-DRAINAGE AREAS AT WHEELER

83 HC           HYDROGRAPH COMBINATION
                     ICOMP          3  NUMBER OF HYDROGRAPHS TO COMBINE
                                                                  XXX
   XXX             XXX             XXX             XXX             XXX
                          HYDROGRAPH AT STATION     DILL

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR     19.75-HR
   213.       3.50        (CFS)     169.        69.         69.         69.
                          (INCHES)  0.811      1.087       1.087       1.087
                          (AC-FT)    84.       112.        112.        112.

                          CUMULATIVE AREA =    1.94 SQ MI

XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX

                XXXXXXXXXXXXXX
                X            X
84 KK           X    WHEEL   X
                X            X
                XXXXXXXXXXXXXX
                          STORAGE ROUTE UPSTREAM OF WHEELER

86 KO           OUTPUT CONTROL VARIABLES
                     IPRNT          1  PRINT CONTROL
                     IPLOT          2  PLOT CONTROL
                     QSCAL         0.  HYDROGRAPH PLOT SCALE

              HYDROGRAPH ROUTING DATA

87 RS           STORAGE ROUTING
                     NSTPS          1  NUMBER OF SUBREACHES
                      ITYP       ELEV  TYPE OF INITIAL CONDITION
                    RSVRIC     617.00  INITIAL CONDITION
                         X       0.00  WORKING R AND D COEFFICIENT

88 SV             STORAGE        0.0       2.0       6.3      12.8      20.1      45.0      57.0      70.0

89 SE           ELEVATION     617.00    625.00    627.00    628.00    629.00    630.00    630.50    631.00

90 SQ           DISCHARGE        0.        80.       240.      300.      360.      430.      600.      730.

91 OR           ELEVATION     617.00    625.00    627.00    628.00    629.00    630.00    630.50    631.00
                                                                XXX
```

COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	0.00	2.00	6.30	12.80	25.10	45.00	57.00	70.00
OUTFLOW	0.00	80.00	240.00	300.00	360.00	430.00	600.00	730.00
ELEVATION	617.00	625.00	627.00	628.00	629.00	630.00	630.50	631.00

HYDROGRAPH AT STATION WHEEL

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
16	DEC	0000	1	0.	0.0	617.0	16	DEC	0645	28	154.	4.0	625.9	16	DEC	1330	55	27.	0.7	619.7
16	DEC	0015	2	0.	0.0	617.0	16	DEC	0700	29	142.	3.7	625.8	16	DEC	1345	56	27.	0.7	619.7
16	DEC	0030	3	0.	0.0	617.0	16	DEC	0715	30	129.	3.3	625.6	16	DEC	1400	57	26.	0.7	619.6
16	DEC	0045	4	0.	0.0	617.0	16	DEC	0730	31	118.	3.0	625.5	16	DEC	1415	58	26.	0.7	619.6
16	DEC	0100	5	0.	0.0	617.0	16	DEC	0745	32	107.	2.7	625.3	16	DEC	1430	59	26.	0.6	619.6
16	DEC	0115	6	0.	0.0	617.0	16	DEC	0800	33	98.	2.5	625.2	16	DEC	1445	60	25.	0.6	619.5
16	DEC	0130	7	0.	0.0	617.0	16	DEC	0815	34	89.	2.2	625.1	16	DEC	1500	61	24.	0.6	619.4
16	DEC	0145	8	1.	0.0	617.1	16	DEC	0830	35	82.	2.0	625.0	16	DEC	1515	62	24.	0.6	619.4
16	DEC	0200	9	6.	0.1	617.6	16	DEC	0845	36	75.	1.9	624.5	16	DEC	1530	63	23.	0.6	619.3
16	DEC	0215	10	19.	0.5	618.9	16	DEC	0900	37	70.	1.7	624.0	16	DEC	1545	64	23.	0.6	619.3
16	DEC	0230	11	51.	1.3	622.1	16	DEC	0915	38	64.	1.6	623.4	16	DEC	1600	65	22.	0.6	619.2
16	DEC	0245	12	99.	2.5	625.2	16	DEC	0930	39	57.	1.4	622.7	16	DEC	1615	66	22.	0.5	619.2
16	DEC	0300	13	148.	3.8	625.8	16	DEC	0945	40	50.	1.3	622.0	16	DEC	1630	67	21.	0.5	619.1
16	DEC	0315	14	187.	4.9	626.3	16	DEC	1000	41	45.	1.2	621.6	16	DEC	1645	68	20.	0.5	619.0
16	DEC	0330	15	217.	5.7	626.7	16	DEC	1015	42	42.	1.1	621.2	16	DEC	1700	69	20.	0.5	619.0
16	DEC	0345	16	234.	6.1	626.9	16	DEC	1030	43	39.	1.0	620.9	16	DEC	1715	70	19.	0.5	618.9
16	DEC	0400	17	234.	6.1	626.9	16	DEC	1045	44	37.	0.9	620.7	16	DEC	1730	71	18.	0.5	618.8
16	DEC	0415	18	229.	6.0	626.9	16	DEC	1100	45	35.	0.9	620.5	16	DEC	1745	72	18.	0.4	618.8
16	DEC	0430	19	222.	5.8	626.8	16	DEC	1115	46	33.	0.8	620.3	16	DEC	1800	73	17.	0.4	618.7
16	DEC	0445	20	216.	5.7	626.7	16	DEC	1130	47	32.	0.8	620.2	16	DEC	1815	74	17.	0.4	618.7
16	DEC	0500	21	210.	5.5	626.6	16	DEC	1145	48	31.	0.8	620.1	16	DEC	1830	75	16.	0.4	618.6
16	DEC	0315	22	205.	5.4	626.6	16	DEC	1200	49	30.	0.8	620.0	16	DEC	1845	76	15.	0.4	618.5
16	DEC	0530	23	199.	5.2	626.5	16	DEC	1215	50	30.	0.7	620.0	16	DEC	1900	77	15.	0.4	618.5
16	DEC	0545	24	193.	5.0	626.4	16	DEC	1230	51	29.	0.7	619.9	16	DEC	1915	78	14.	0.3	618.4
16	DEC	0600	25	185.	4.8	626.3	16	DEC	1245	52	29.	0.7	619.9	16	DEC	1930	79	13.	0.3	618.3
16	DEC	0615	26	176.	4.6	626.2	16	DEC	1300	53	28.	0.7	619.8	16	DEC	1945	80	13.	0.3	618.3
16	DEC	0630	27	166.	4.3	626.1	16	DEC	1315	54	28.	0.7	619.8							

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	19.75-HR
234.	4.00	(CFS)	168.	69.	69.	69.
		(INCHES)	0.804	1.083	1.083	1.083
		(AC-FT)	83.	112.	112.	112.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	19.75-HR
6.	4.00	4.	2.	2.	2.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	19.75-HR
626.93	4.00	626.09	621.52	621.52	621.52

CUMULATIVE AREA = 1.94 SQ MI

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XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX

              XXXXXXXXXXXXXXX
              X             X
   92 KK      X     WHEEL   X
              X             X
              XXXXXXXXXXXXXXX
                             DIVERT FLOW TO MEADOWBROOK

   DT            DIVERSION
                      ISTAD         OFLO  DIVERSION HYDROGRAPH IDENTIFICATION

   DI                 INFLOW        0.00     410.00     460.00     520.00     600.00     680.00     730.00

   DQ          DIVERTED FLOW        0.00       0.00      40.00      60.00     120.00     190.00     230.00
                                                                     XXX

   XXX            XXX            XXX            XXX            XXX

                    DIVERSION HYDROGRAPH      OFLO

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR        24-HR        72-HR      19.75-HR
      0.       0.25        (CFS)        0.           0.           0.           0.
                         (INCHES)    0.000        0.000        0.000        0.000
                         (AC-FT)        0.           0.           0.           0.

                    CUMULATIVE AREA =      1.94 SQ MI

   XXX            XXX            XXX            XXX            XXX

                    HYDROGRAPH AT STATION     WHEEL

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR        24-HR        72-HR      19.75-HR
    234.       4.00        (CFS)      168.          69.          69.          69.
                         (INCHES)    0.804        1.083        1.083        1.083
                         (AC-FT)       83.         112.         112.         112.

                    CUMULATIVE AREA =      1.94 SQ MI

XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX

              XXXXXXXXXXXXXXX
              X             X
   97 KK      X     WHEEL   X
              X             X
              XXXXXXXXXXXXXXX
                             INPUT HYDRO-DRAINAGE AREA SOUTH OF WHEELER
```

```
  5 IN          TIME DATA FOR INPUT TIME SERIES
                     JXMIN          15  TIME INTERVAL IN MINUTES
                    JXDATE    16DEC83  STARTING DATE
                    JXTIME           0  STARTING TIME

               SUBBASIN RUNOFF DATA

 99 BA          SUBBASIN CHARACTERISTICS
                     TAREA        0.57  SUBBASIN AREA

                PRECIPITATION DATA

100 PB                STORM        0.25  BASIN TOTAL PRECIPITATION

101 PI            INCREMENTAL PRECIPITATION PATTERN
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.06      0.07      0.05
                    0.04      0.03

103 LU          UNIFORM LOSS RATE
                      STRTL       0.00  INITIAL LOSS
                      CNSTL       0.00  UNIFORM LOSS RATE
                      RTIMP       0.00  PERCENT IMPERVIOUS AREA

103 UI          INPUT UNITGRAPH,  33 ORDINATES,  VOLUME = 1.78
                    0.0       5.0      15.0      39.0      70.0     118.0     185.0     234.0     240.0     234.0
                  223.0     202.0     169.0     141.0     117.0      98.0      77.0      63.0      55.0      50.0
                   45.0      41.0      36.0      33.0      29.0      25.0      21.0      18.0      15.0      12.0
                    8.0       5.0       2.0

                                                   XXX

   XXX            XXX            XXX            XXX            XXX

                     HYDROGRAPH AT STATION    WHEEL

     TOTAL RAINFALL =  0.25, TOTAL LOSS =  0.00, TOTAL EXCESS =  0.25

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR      72-HR     19.75-HR
    56.       4.50        (CFS)     26.         8.         8.         8.
                        (INCHES)   0.424      0.441      0.441      0.441
                         (AC-FT)    13.        13.        13.        13.

                     CUMULATIVE AREA =    0.57 SQ MI

XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX

            XXXXXXXXXXXXXX
            X            X
103 KK      X    WHEEL   X
            X            X
            XXXXXXXXXXXXXX
                     COMBINE HYDRO SOUTH OF WHEELER

110 HC          HYDROGRAPH COMBINATION
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                    ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                  XXX

   XXX            XXX            XXX            XXX            XXX

                     HYDROGRAPH AT STATION    WHEEL

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR     19.75-HR
   282.       4.25        (CFS)     194.         77.         77.         77.
                        (INCHES)   0.718       0.938       0.938       0.938
                         (AC-FT)     96.        126.        126.        126.

                     CUMULATIVE AREA =    2.51 SQ MI


XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX

            XXXXXXXXXXXXXX
            X            X
111 KK      X    CONFL   X
            X            X
            XXXXXXXXXXXXXX
                     CHANNEL ROUTE SIEBERT TO CONFLUENCE SECTION 1330

113 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          3  PRINT CONTROL
                     IPLOT          2  PLOT CONTROL
                     QSCAL         0.  HYDROGRAPH PLOT SCALE

              HYDROGRAPH ROUTING DATA

114 RS          STORAGE ROUTING
                     NSTPS          1  NUMBER OF SUBREACHES
                      ITYP       STOR  TYPE OF INITIAL CONDITION
                    RSVRIC      -1.00  INITIAL CONDITION
                         X       0.00 WORKING R AND D COEFFICIENT

115 RC          NORMAL DEPTH CHANNEL ROUTING
                       ANL      0.060  LEFT OVERBANK N-VALUE
                      ANCH      0.045  MAIN CHANNEL N-VALUE
                       ANR      0.060  RIGHT OVERBANK N-VALUE
                     RLNTH      2200.  REACH LENGTH
                       SEL     0.0010  ENERGY SLOPE
                     ELMAX        0.0  MAX. ELEV. FOR STORAGE/OUTFLOW CALCULATION

                                  CROSS-SECTION DATA
                     --- LEFT OVERBANK --- + ------ MAIN CHANNEL ------- + --- RIGHT OVERBANK ---
117 RY        ELEVATION   620.00   619.20   616.50   612.60   612.60   616.80   617.90   620.00
116 RX        DISTANCE      6.00    13.00    43.00    47.00    53.00    60.00   150.00   229.00

                                                                  XXX

                                  COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

          STORAGE      0.00     0.13     0.28     0.45     0.64     0.85     1.08     1.33     1.60     1.90
```

OUTFLOW	0.00	1.31	4.25	8.57	14.23	21.31	29.83	39.84	51.42	64.65
ELEVATION	612.60	612.99	613.38	613.77	614.16	614.55	614.94	615.33	615.72	616.11
STORAGE	2.21	2.60	3.51	5.13	7.44	10.18	13.30	16.79	20.64	24.85
OUTFLOW	79.58	98.56	124.95	162.88	218.11	293.23	386.95	500.36	635.22	791.82
ELEVATION	616.49	616.88	617.27	617.66	618.05	618.44	618.83	619.22	619.61	620.00

XXX XXX XXX XXX XXX

HYDROGRAPH AT STATION CONFL

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	19.75-HR
270.	4.75	(CFS)	192.	77.	77.	77.
		(INCHES)	0.713	0.933	0.933	0.933
		(AC-FT)	95.	123.	125.	125.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	19.75-HR
9.	4.75	6.	3.	3.	3.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	19.75-HR
618.32	4.75	617.78	615.52	615.52	615.52

CUMULATIVE AREA = 2.51 SQ MI

```
XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX

          XXXXXXXXXXXXXX
          X            X
118 KK    X      SAG   X
          X            X
          XXXXXXXXXXXXXX
                    INPUT HYDRO-MEADOWBROOK DRAIN

  5 IN        TIME DATA FOR INPUT TIME SERIES
                  JXMIN          15  TIME INTERVAL IN MINUTES
                 JXDATE     16DEC83  STARTING DATE
                 JXTIME           0  STARTING TIME

            SUBBASIN RUNOFF DATA

120 BA        SUBBASIN CHARACTERISTICS
                  TAREA        1.27  SUBBASIN AREA

              PRECIPITATION DATA

121 PB            STORM        1.70  BASIN TOTAL PRECIPITATION

122 PI          INCREMENTAL PRECIPITATION PATTERN
                 0.00      0.00      0.00      0.00      0.00      0.56      0.49      0.23      0.16      0.12
                 0.08      0.06

124 LU        UNIFORM LOSS RATE
                  STRTL        0.00  INITIAL LOSS
                  CNSTL        0.00  UNIFORM LOSS RATE
                  RTIMP        0.00  PERCENT IMPERVIOUS AREA

124 UI        INPUT UNITGRAPH,  38 ORDINATES,  VOLUME = 0.81
                  0.0       4.0      11.0      22.0      47.0      85.0     131.0     188.0     211.0     220.0
                216.0     204.0     186.0     168.0     146.0     127.0     110.0      88.0      71.0      58.0
                 49.0      44.0      39.0      34.0      31.0      28.0      24.0      22.0      20.0      17.0
                 15.0      13.0      11.0       9.0       7.0       5.0       3.0       2.0

                                                          XXX

    XXX          XXX          XXX          XXX          XXX

                    HYDROGRAPH AT STATION      SAG

     TOTAL RAINFALL =  1.70, TOTAL LOSS =  0.00, TOTAL EXCESS =  1.70

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR     19.75-HR
   342.       4.25       (CFS)      177.         57.         57.         57.
                       (INCHES)    1.297       1.379       1.379       1.379
                        (AC-FT)      88.         93.         93.         93.

                    CUMULATIVE AREA =    1.27 SQ MI
```

```
129 KK      SAG

                    RETRIEVE DIVERTED FLOW AT WHEELER

131 DR          RETRIEVE DIVERSION HYDROGRAPH
                    ISTAD        OFLO  DIVERSION HYDROGRAPH IDENTIFICATION

                                                          XXX

     XXX            XXX            XXX            XXX            XXX

                    HYDROGRAPH AT STATION      SAG

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR      19.75-HR
     0.       0.25       (CFS)       0.          0.          0.           0.
                       (INCHES)    0.000       0.000       0.000        0.000
                        (AC-FT)      0.          0.          0.           0.

                    CUMULATIVE AREA =    0.00 SQ MI


132 KK      SAG

                    ADD MEADOWBROOK AND DIVERSION HYDROS

134 HC          HYDROGRAPH COMBINATION
                    ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                          XXX

     XXX            XXX            XXX            XXX            XXX

                    HYDROGRAPH AT STATION      SAG

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR      19.75-HR
   342.       4.25       (CFS)     177.         57.         57.          57.
                       (INCHES)    1.297       1.379       1.379        1.379
                        (AC-FT)      88.         93.         93.          93.

                    CUMULATIVE AREA =    1.27 SQ MI
```

```
                 XXXXXXXXXXXXXXX
                 X             X
135 KK           X     CONFL   X
                 X             X
                 XXXXXXXXXXXXXXX
                          ROUTE TO CONFLUENCE  - SECTION 200

137 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          1  PRINT CONTROL
                     IPLOT          2  PLOT CONTROL
                     QSCAL         0.  HYDROGRAPH PLOT SCALE

              HYDROGRAPH ROUTING DATA

133 RS          STORAGE ROUTING
                     NSTPS          1  NUMBER OF SUBREACHES
                      ITYP       STOR  TYPE OF INITIAL CONDITION
                    RSVRIC      -1.00  INITIAL CONDITION
                         X       0.00 WORKING R AND D COEFFICIENT

139 RC          NORMAL DEPTH CHANNEL ROUTING
                       AXL      0.070  LEFT OVERBANK N-VALUE
                      ANCH      0.045  MAIN CHANNEL N-VALUE
                       ANR      0.070  RIGHT OVERBANK N-VALUE
                     RLNTH      3500.  REACH LENGTH
                       SEL     0.0010  ENERGY SLOPE
                     ELMAX        0.0  MAX. ELEV. FOR STORAGE/OUTFLOW CALCULATION

                                  CROSS-SECTION DATA
                        --- LEFT OVERBANK --- + ------ MAIN CHANNEL ------- + --- RIGHT OVERBANK ---
141 RY        ELEVATION   620.90   619.10   616.80   611.90   611.90   616.30   619.00   620.90
140 RX        DISTANCE      0.00    50.00   118.00   127.00   132.00   142.00   230.00   240.00

                                                  XXX

                                  COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

          STORAGE      0.00     0.23     0.53     0.90     1.35     1.88     2.48     3.15     3.89     4.71
          OUTFLOW      0.00     1.59     5.46    11.62    20.29    31.72    46.16    63.85    85.03   109.93
        ELEVATION    611.90   612.37   612.85   613.32   613.79   614.27   614.74   615.22   615.69   616.16

          STORAGE      5.75     7.48    10.31    14.26    19.33    25.52    32.57    40.22    48.46    57.30
          OUTFLOW    141.70   184.36   240.96   314.72   409.41   528.46   683.93   866.58  1076.88  1315.59
        ELEVATION    616.64   617.11   617.58   618.06   618.53   619.01   619.48   619.95   620.43   620.90

                                  HYDROGRAPH AT STATION    CONFL

DA MON HRMN ORD  OUTFLOW  STORAGE   STAGE  DA MON HRMN ORD  OUTFLOW  STORAGE   STAGE  DA MON HRMN ORD  OUTFLOW  STORAGE   STAGE
16 DEC 0000  1       0.       0.0   611.9  16 DEC 0645  28     152.       6.2   616.8  16 DEC 1330  55       1.       0.2   612.2
```

16 DEC	0015	2	0.	0.0	611.9	*	16 DEC	0700	29	125.	5.2	616.4	*	16 DEC	1345	56	1.	0.1	612.2
16 DEC	0030	3	0.	0.0	611.9	*	16 DEC	0715	30	103.	4.5	616.0	*	16 DEC	1400	57	1.	0.1	612.2
16 DEC	0045	4	0.	0.0	611.9	*	16 DEC	0730	31	87.	4.0	615.7	*	16 DEC	1415	58	1.	0.1	612.1
16 DEC	0100	5	0.	0.0	611.9	*	16 DEC	0745	32	75.	3.5	615.5	*	16 DEC	1430	59	1.	0.1	612.1
16 DEC	0115	6	0.	0.0	611.9	*	16 DEC	0800	33	66.	3.2	615.3	*	16 DEC	1445	60	1.	0.1	612.1
16 DEC	0130	7	0.	0.0	611.9	*	16 DEC	0815	34	58.	2.9	615.1	*	16 DEC	1500	61	0.	0.1	612.0
16 DEC	0145	8	0.	0.0	611.9	*	16 DEC	0830	35	51.	2.7	614.9	*	16 DEC	1515	62	0.	0.1	612.0
16 DEC	0200	9	1.	0.1	612.1	*	16 DEC	0845	36	46.	2.5	614.7	*	16 DEC	1530	63	0.	0.1	612.0
16 DEC	0215	10	3.	0.4	612.6	*	16 DEC	0900	37	41.	2.3	614.6	*	16 DEC	1545	64	0.	0.0	612.0
16 DEC	0230	11	10.	0.8	613.2	*	16 DEC	0915	38	37.	2.1	614.4	*	16 DEC	1600	65	0.	0.0	612.0
16 DEC	0245	12	27.	1.7	614.1	*	16 DEC	0930	39	32.	1.9	614.3	*	16 DEC	1615	66	0.	0.0	612.0
16 DEC	0300	13	58.	2.9	615.1	*	16 DEC	0945	40	29.	1.7	614.1	*	16 DEC	1630	67	0.	0.0	612.0
16 DEC	0315	14	108.	4.6	616.1	*	16 DEC	1000	41	25.	1.6	614.0	*	16 DEC	1645	68	0.	0.0	612.0
16 DEC	0330	15	163.	6.6	616.9	*	16 DEC	1015	42	22.	1.4	613.8	*	16 DEC	1700	69	0.	0.0	611.9
16 DEC	0345	16	208.	8.7	617.3	*	16 DEC	1030	43	18.	1.3	613.7	*	16 DEC	1715	70	0.	0.0	611.9
16 DEC	0400	17	246.	10.6	617.6	*	16 DEC	1045	44	15.	1.1	613.5	*	16 DEC	1730	71	0.	0.0	611.9
16 DEC	0415	18	275.	12.2	617.8	*	16 DEC	1100	45	12.	0.9	613.4	*	16 DEC	1745	72	0.	0.0	611.9
16 DEC	0430	19	296.	13.3	617.9	*	16 DEC	1115	46	10.	0.8	613.2	*	16 DEC	1800	73	0.	0.0	611.9
16 DEC	0445	20	307.	13.8	618.0	*	16 DEC	1130	47	7.	0.6	613.0	*	16 DEC	1815	74	0.	0.0	611.9
16 DEC	0500	21	307.	13.8	618.0	*	16 DEC	1145	48	6.	0.5	612.9	*	16 DEC	1830	75	0.	0.0	611.9
16 DEC	0515	22	298.	13.4	618.0	*	16 DEC	1200	49	4.	0.4	612.7	*	16 DEC	1845	76	0.	0.0	611.9
16 DEC	0530	23	283.	12.5	617.9	*	16 DEC	1215	50	3.	0.4	612.6	*	16 DEC	1900	77	0.	0.0	611.9
16 DEC	0545	24	262.	11.4	617.7	*	16 DEC	1230	51	3.	0.3	612.5	*	16 DEC	1915	78	0.	0.0	611.9
16 DEC	0600	25	237.	10.1	617.6	*	16 DEC	1245	52	2.	0.3	612.4	*	16 DEC	1930	79	0.	0.0	611.9
16 DEC	0615	26	209.	8.7	617.3	*	16 DEC	1300	53	2.	0.2	612.4	*	16 DEC	1945	80	0.	0.0	611.9
16 DEC	0630	27	182.	7.4	617.1	*	16 DEC	1315	54	1.	0.2	612.3	*						
						*							*						

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	19.75-HR
307.	5.00	(CFS)	175.	57.	57.	57.
		(INCHES)	1.279	1.379	1.379	1.379
		(AC-FT)	87.	93.	93.	93.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	19.75-HR
14.	5.00	8.	3.	3.	3.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	19.75-HR
618.01	5.00	616.68	613.77	613.77	613.77

CUMULATIVE AREA = 1.27 SQ MI

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	EXPS	81.	5.50	55.	29.	29.	1.00		
ROUTED TO	EXPS	80.	5.50	55.	29.	29.	1.00	634.84	5.50
ROUTED TO	WACK	79.	5.75	55.	29.	29.	1.00	634.96	5.75
HYDROGRAPH AT	WACK	96.	4.50	50.	16.	16.	0.39		
2 COMBINED AT	WACK	155.	5.00	103.	45.	45.	1.39		
ROUTED TO	DILL	146.	5.50	103.	45.	45.	1.39	631.12	5.50
HYDROGRAPH AT	DILL	65.	3.50	28.	8.	8.	0.21		
HYDROGRAPH AT	DILL	137.	3.25	50.	15.	15.	0.34		
3 COMBINED AT	DILL	253.	3.50	169.	69.	69.	1.94		
ROUTED TO	WHEEL	234.	4.00	168.	69.	69.	1.94	626.93	4.00
DIVERSION TO	OFLO	0.	4.00	0.	0.	0.	1.94		
HYDROGRAPH AT	WHEEL	234.	4.00	168.	69.	69.	1.94		
HYDROGRAPH AT	WHEEL	56.	4.50	26.	8.	8.	0.57		
2 COMBINED AT	WHEEL	282.	4.25	194.	77.	77.	2.51		
ROUTED TO	CONFL	270.	4.75	192.	77.	77.	2.51	618.32	4.75
HYDROGRAPH AT	SAG	342.	4.25	177.	57.	57.	1.27		
HYDROGRAPH AT	SAG	0.	0.25	0.	0.	0.	0.00		
2 COMBINED AT	SAG	342.	4.25	177.	57.	57.	1.27		
ROUTED TO	CONFL	307.	5.00	175.	57.	57.	1.27	618.01	5.00

XXX NORMAL END OF HEC-1 XXX

00BREAK00

1) COUNTY: Midland

2) STUDY NAME: City of Midland

3) WATERCOURSE: Tittabawassee, Chippewa, Sturgeon, Inman Drain, Snake Creek

4) DOCUMENT TYPE: 100yr.

00BREAK00

McNamee, Porter & Seeley ! Engineers / Architects ! Ann Arbor, Michigan

```
RRRRRRRR    UU      UU  DDDDDDDD    YY      YY
RRRRRRRR    UU      UU  DDDDDDDD    YY      YY
RR      RR  UU      UU  DD      DD  YY      YY
RR      RR  UU      UU  DD      DD  YY      YY
RR      RR  UU      UU  DD      DD    YY  YY
RR      RR  UU      UU  DD      DD    YY  YY
RRRRRRRR    UU      UU  DD      DD      YY
RRRRRRRR    UU      UU  DD      DD      YY
RR  RR      UU      UU  DD      DD      YY
RR  RR      UU      UU  DD      DD      YY
RR    RR    UU      UU  DD      DD      YY
RR    RR    UU      UU  DD      DD      YY
RR      RR  UUUUUUUUUU  DDDDDDDD        YY
RR      RR  UUUUUUUUUU  DDDDDDDD        YY

 SSSS  N   N        55555   000    000
S      N   N        5      0   0  0   0
S      NN  N        555    0  00  0  00
 SSS   N N N           5   0 0 0  0 0 0
    S  N  NN           5  00  0  00  0
    S  N   N        5   5  0   0  0   0
SSSS   N   N         555    000    000

    J   000   BBBB        999     1     000
    J  0   0  B   B      9   9   11    0   0
    J  0   0  B   B      9   9    1    0  00
    J  0   0  BBBB        9999    1    0 0 0
J   J  0   0  B   B          9    1    00  0
J   J  0   0  B   B          9    1    0   0
 JJJ    000   BBBB        999    111    000
```

Job SN_500 (910) queued to SYS$PRINT on 28-APR-1987 16:31 by user RUDY, UIC [COMPUTER,RUDY], under account COMPUTER at priority 100, started on printer _LCA0: on 28-APR-1987 16:46 from queue SYS$PRINT.

Digital Equipment Corporation - VAX/VMS Version V4.5

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FLOOD HYDROGRAPH PACKAGE  (HEC-1)
          FEBRUARY 1981
        REVISED 04 NOV 81

RUN DATE 20-APR-1987   TIME 16:30:12
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U.S. ARMY CORPS OF ENGINEERS
THE HYDROLOGIC ENGINEERING CENTER
          609 SECOND STREET
       DAVIS, CALIFORNIA 95616
(916) 440-3285 OR (FTS) 448-3285
```


```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X       XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX          XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIOR- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. SEE SEPTEMBER 1981 INPUT DESCRIPTION FOR NEW DEFINITIONS.

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  1           ID   MIDLAND STORM WATER MGT STUDY
  2           ID   SNAKE CREEK BASIN
  3           ID   100 -YEAR FREQUENCY EVENT
              XDIAGRAM
  4           IT      15 16DEC83       0      90
  5           IM      15 16DEC83       0
  6           IO       3       0       0

  7           KK    EXPS
  8           KM   INPUT HYDRO-DRAINAGE AREA TO EXPRESSWAY
  9           BA     1.0
 10           PB       0
 11           PI       0.      0.      0.      0.      0.   1.223    .798    .394    .290    .220
 12           PI    .177    .131
 13           LU       0       0       0
 14           UI       0.      2.      3.      6.      8.     12.     18.     27.     36.     45.
 15           UI      56.     76.     86.     88.     90.     86.     76.     68.     62.     58.
 16           UI      56.     54.     52.     49.     47.     45     44.     42.     41.     40.
 17           UI      38.     37.     36.     35.     34.     34.     33.     32.     31.     31.
 18           UI      30.     30.     29.     29.     28.     28.     28.     27.     27.     26.
 19           UI      26.     25.     24.     24.     23.     23.     22.     21     20.     20.
 20           UI      19.     19.     18.     17.     17.     16.     15.     15.     14.     13.
 21           UI      13.     12.     11.     10.     10.      9.      8.      8.      7.      6.
 22           UI       6.      5.      4.      4.      3.      2.      2.      1.      0.      0.

 23           KK    EXPS
 24           KM   STORAGE ROUTE UPSTREAM OF US-10
 25           KO       3       2
 26           RS       1    ELEV   630.0
 27           SV      0.     .10    .250     .50     1.0     1.5     2.5     4.0     6.1
 28           SF   630.0  634.70  635.00  635.25  635.60  635.85  636.10  636.30  636.68
 29           SQ      0.     70.     80.     90.    105.    130.    150.    165.    210.    275.
 30           SF    630.  634.61  634.83  635.07  635.52  635.92  636.22  636.39  637.01  637.89

 31           KK    WACK
 32           KM    STORAGE ROUTE UPSTREAM OF WACKERLY
 33           KO      3.      2.
 34           RS      1.    ELEV    630.
 35           SV      0.     .17     .68    1.04    1.61    2.56
 36           SF    630.    633.    635.    636.    637.    638.
 37           SQ      0.     50.     80.    130.    200.    360.
 38           SF    630.    633.     635    636.    637.    638.

 39           KK    WACK
 40           KM    INPUT HYDRO-DRAINAGE AREA TO DILLOWAY
 41           BA     .39
 42           PB      0.
 43           PI      0.      0.      0.      0.    .145    .491    .316    .156    .115    .088
 44           PI    .070    .052
 45           LU      0.      0.      0.
 46           UI      .5      1.      3.      5.      7.     12.     20.    105.    167.    195.
 47           UI    200.    199.    178.    156.    136.    122.    102.     92.     84.     77.
 48           UI     68.     61.     54.     49.     43.     41.     37.     32.     29.     25.
 49           UI     21.     17.     12.      9.      5.      0.
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LINE          ID.......1 .......2.......3.......4.......5 .......6.......7.......8.......9.......10

  50          KK    WACK
  51          KM    COMBINE HYDRO-DRAINAGE AREAS AT DILLOWAY
  52          HC      2.

  53          KK    DILL
  54          KM    STORAGE ROUTE UPSTREAM OF DILLOWAY
  55          KO      1.      2.
  56          RS      1.    ELEV    624.
  57          SV      0.      0.2     5.2     8.6    16.1     24.
  58          SE    624.    628.    632.    633.    634.    635.
  59          SQ      0.     60.    170.    220.    400.   1100.
  60          SE    624.    628.    632.    633.    634.    635.

  61          KK    DILL
  62          KM    INPUT HYDRO-DRAINAGE  AREA TO SYLVAN
  63          BA     .21
  64          PB      0.
  65          PI      0.      0.      0.      0.    .068    .256    .165    .082    .060    .045
  66          PI    .037    .027
  67          LU      0.      0.      0.
  68          UI      0.      8.     24.     75.    153.    290.    293.    274.    244.    204.
  69          UI    165.    134.    110.     89.     73.     58.     50.     44.     38.     33.
  70          UI     28.     24.     20.     14.     11.      7.      2.      0.

  71          KK    DILL
  72          KM    INPUT HYDRO-DRAINAGE AREA TO WHEELER
  73          BA     .34
  74          PB      0.
  75          PI      0.      0.      0.      0.    .124    .416    .269    .133    .098    .075
  76          PI    .060    .045
  77          LU      0.      0.      0.
  78          UI      0.     17.     53.    158.    350.    395.    356.    298.    225.    159.
  79          UI    114.     93.     79.     67.     59.     50.     45.     37.     30.     22.
  80          UI     15.      9.      3.      0.

  81          KK    DILL
  82          KM    COMBINE HYDRO-DRAINAGE AREAS AT WHEELER
  83          HC      3.

  84          KK   WHEEL
  85          KM    STORAGE ROUTE UPSTREAM OF WHEELER
  86          KO      1.      2.
  87          RS      1.    ELEV    617.
  88          SV      0.      2.      6.3    12.8    25.1     45.     57.     70.
  89          SE    617.    625.    627.    628.    629.    630.    630.5   631.
  90          SQ      0.     80.    240.    300.    360.    430.    600.    730.
  91          SE    617.    625.    627.    628.    629.    630.    630.5   631.

  92          KK   WHEEL
  93          KM    DIVERT FLOW TO MEADOWBROOK
  94          DT    OFLO
  95          DI      0.    410.    460.    520.    600.    680.    730.
  96          DQ      0.      0.     40.     60.    120.    190.    230.
```

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  97          KK   WHEEL
  98          KM    INPUT HYDRO-DRAINAGE AREA SOUTH OF WHEELER
  99          BA     .57
 100          PB      0.
 101          PI      0.      0.      0.      0.      0.    .390    .453    .224    .165    .126
 102          PI    .101    .079
 103          LU      0.      0.      0.
 104          UI      0.      5.     15.     39.     70.    118.    185.    234.    240.    234.
 105          UI    223.    202.    169.    141.    117.     98.     77.     63.     55.     50.
 106          UI     45.     41.     36.     33.     29.     25.     21.     18.     15.     12.
 107          UI      8.      5.      2.      0.

 108          KK   WHEEL
 109          KM    COMBINE HYDRO SOUTH OF WHEELER
 110          HC      2.

 111          KK   CONFL
 112          KM    CHANNEL ROUTE SIFBERT TO CONFLUENCE SECTION 1330
 113          KO      3.      2.
 114          RS      1.    STOR     -1.
 115          RC     .06    .045     .06    2200.    .001
 116          RX      6.     13.     43.     47.     53.     60.    150.    229.
 117          RY    620.   619.2   616.5   612.6   612.6   616.8   617.9    620.

 118          KK     SAG
 119          KM    INPUT HYDRO-MEADOWBROOK DRAIN
 120          BA    1.27
 121          PB      0.
 122          PI      0.      0.      0.      0.    .447   1.575   1.016    .503    .371    .282
 123          PI    .227    .169
 124          LU      0.      0.      0.
 125          UI      0.      4.     11.     22.     47.     85.    131.    188.    211.    220.
 126          UI    216.    204.    186.    168.    146.    127.    110.     88.     71.     58.
 127          UI     49.     44.     39.     34.     31      28.     24.     22.     20.     17.
 128          UI     15.     13.     11.      9.      7.      5.      3.      2.      0.

 129          KK     SAG
 130          KM    RETRIEVE DIVERTED FLOW AT WHEELER
 131          DR    DFLO

 132          KK     SAG
 133          KM    ADD MEADOWBROOK AND DIVERSION HYDROS
 134          HC      2.

 135          KK   CONFL
 136          KM    ROUTE TO CONFLUENCE  - SECTION 200
 137          KO      1.      2.
 138          RS      1.    STOR     -1.
 139          RC     .07    .045     .07    3500.    .001
 140          RX      0.     50.    118.    127.    132.    142.    230.    240.
 141          RY   620.9   619.1   616.8   611.9   611.9   616.3   619.0   620.9
 142          ZZ
```

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FLOOD HYDROGRAPH PACKAGE  (HEC-1)
          FEBRUARY 1981
        REVISED 04 NOV 81

RUN DATE 28-APR-1987   TIME 16:30:12
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```
U.S. ARMY CORPS OF ENGINEERS
THE HYDROLOGIC ENGINEERING CENTER
609 SECOND STREET
DAVIS, CALIFORNIA 95616
(916) 440-3285 OR (FTS) 448-3285
```

```
                    MIDLAND STORM WATER MGT STUDY
                    SNAKE CREEK BASIN
                    100 -YEAR FREQUENCY EVENT

 6 IO        OUTPUT CONTROL VARIABLES
                IPRNT          3  PRINT CONTROL
                IPLOT          0  PLOT CONTROL
                QSCAL         0.  HYDROGRAPH PLOT SCALE

   IT        HYDROGRAPH TIME DATA
                 NMIN         15  MINUTES IN COMPUTATION INTERVAL
                IDATE    16DEC83  STARTING DATE
                ITIME       0000  STARTING TIME
                   NQ         90  NUMBER OF HYDROGRAPH ORDINATES
               NDDATE    16DEC83  ENDING DATE
               NDTIME       2215  ENDING TIME

            COMPUTATION INTERVAL    0.25 HOURS
                TOTAL TIME BASE    22.25 HOURS

      ENGLISH UNITS
          DRAINAGE AREA          SQUARE MILES
          PRECIPITATION DEPTH    INCHES
          LENGTH, ELEVATION      FEET
          FLOW                   CUBIC FEET PER SECOND
          STORAGE VOLUME         ACRE-FEET
          SURFACE AREA           ACRES
          TEMPERATURE            DEGREES FAHRENHEIT
```

```
          XXXXXXXXXXXXXX
          X            X
 7 KK     X     EXPS   X
          X            X
          XXXXXXXXXXXXXX
                    INPUT HYDRO-DRAINAGE AREA TO EXPRESSWAY

 5 IN        TIME DATA FOR INPUT TIME SERIES
                JXMIN         15  TIME INTERVAL IN MINUTES
               JXDATE    16DEC83  STARTING DATE
               JXTIME          0  STARTING TIME
```

```
              SUBBASIN RUNOFF DATA

  9 BA          SUBBASIN CHARACTERISTICS
                   TAREA          1.00  SUBBASIN AREA

                PRECIPITATION DATA

 10 PB             STORM          3.23  BASIN TOTAL PRECIPITATION

 11 PI           INCREMENTAL PRECIPITATION PATTERN
                   0.00      0.00      0.00      0.00      0.00      1.22      0.80      0.39      0.29      0.22
                   0.18      0.13

 13 LU          UNIFORM LOSS RATE
                   STRTL          0.00  INITIAL LOSS
                   CNSTL          0.00  UNIFORM LOSS RATE
                   RTIMP          0.00  PERCENT IMPERVIOUS AREA

 13 UI          INPUT UNITGRAPH,  88 ORDINATES,  VOLUME = 0.97
                    0.0       2.0       3.0       6.0       8.0      12.0      18.0      27.0      36.0      45.0
                   56.0      76.0      86.0      88.0      90.0      86.0      76.0      68.0      62.0      58.0
                   56.0      54.0      52.0      49.0      47.0      45.0      44.0      42.0      41.0      40.0
                   38.0      37.0      36.0      35.0      34.0      34.0      33.0      32.0      31.0      31.0
                   30.0      30.0      29.0      29.0      28.0      28.0      28.0      27.0      27.0      26.0
                   26.0      25.0      24.0      24.0      23.0      23.0      22.0      21.0      20.0      20.0
                   19.0      19.0      18.0      17.0      17.0      16.0      15.0      15.0      14.0      13.0
                   13.0      12.0      11.0      10.0      10.0       9.0       8.0       8.0       7.0       6.0
                    6.0       5.0       4.0       4.0       3.0       2.0       2.0       1.0

                                                      ***

       ***          ***          ***          ***          ***

                      HYDROGRAPH AT STATION     EXPS

         TOTAL RAINFALL =  3.23, TOTAL LOSS =  0.00, TOTAL EXCESS =  3.23

 PEAK FLOW      TIME                            MAXIMUM AVERAGE FLOW
   (CFS)        (HR)                     6-HR         24-HR       72-HR      22.25-HR
     249.       5.25          (CFS)      183.          90.         90.          90.
                           (INCHES)     1.699        3.119       3.119        3.119
                            (AC-FT)       91.         166.        166.         166.

                      CUMULATIVE AREA =     1.00 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

              **************
              *            *
 23 KK        *    EXPS    *
              *            *
              **************
                        STORAGE ROUTE UPSTREAM OF US-10

 25 KO          OUTPUT CONTROL VARIABLES
                   IPRNT              3  PRINT CONTROL
```

```
                IPLOT          2  PLOT CONTROL
                QSCAL         0.  HYDROGRAPH PLOT SCALE

          HYDROGRAPH ROUTING DATA

26 RS        STORAGE ROUTING
                NSTPS          1  NUMBER OF SUBREACHES
                 ITYP       ELEV  TYPE OF INITIAL CONDITION
                RSVRIC     630.00  INITIAL CONDITION
                     X       0.00 WORKING R AND D COEFFICIENT

27 SV          STORAGE       0.0      0.1      0.3      0.5      1.0      1.5      2.5      4.0      6.1

28 SE        ELEVATION    630.00   634.70   635.00   635.25   635.60   635.85   636.10   636.30   636.68

29 SQ        DISCHARGE       0.      70.      80.      90.     105.     130.     150.     165.     210.     275.

30 SE        ELEVATION    630.00   634.61   634.83   635.07   635.52   635.92   636.22   636.39   637.01   637.89

                                                   XXX

                                  COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

          STORAGE      0.00     0.10     0.10     0.17     0.25     0.32     0.50     0.89     1.00     1.50
          OUTFLOW      0.00    70.00    74.09    80.00    87.08    90.00    96.00   105.00   110.00   125.62
        ELEVATION    630.00   634.61   634.70   634.83   635.00   635.07   635.25   635.52   635.60   635.85

          STORAGE      1.78     2.50     3.40     4.00     4.50     6.10     7.92    12.79
          OUTFLOW    130.00   142.00   150.00   157.06   165.00   186.05   210.00   275.00
        ELEVATION    635.92   636.10   636.22   636.30   636.39   636.68   637.01   637.89

XXX WARNING XXX MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS BETWEEN        0. TO       74.
                THE ROUTED HYDROGRAPH SHOULD BE EXAMINED FOR OSCILLATIONS OR OUTFLOWS GREATER THAN PEAK INFLOWS.
                THIS CAN BE CORRECTED BY DECREASING THE TIME INTERVAL OR INCREASING STORAGE (USE A LONGER REACH.)

     XXX            XXX            XXX            XXX            XXX

                      HYDROGRAPH AT STATION     EXPS

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR     22.25-HR
   231.       6.00       (CFS)      181.        90.         90.         90.
                       (INCHES)    1.683      3.119       3.119       3.119
                        (AC-FT)      90.       166.        166.        166.

PEAK STORAGE  TIME                          MAXIMUM AVERAGE STORAGE
  (AC-FT)     (HR)                  6-HR       24-HR       72-HR     22.25-HR
     9.       6.00                    6.         2.          2.          2.

PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
  (FEET)      (HR)                  6-HR       24-HR       72-HR     22.25-HR
  637.29      6.00                636.62     634.23      634.23      634.23

                       CUMULATIVE AREA =    1.00 SQ MI
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*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

              ***************
              *             *
   31 KK      *    WACK     *
              *             *
              ***************
                     STORAGE ROUTE UPSTREAM OF WACKERLY

   33 KO          OUTPUT CONTROL VARIABLES
                        IPRNT          3  PRINT CONTROL
                        IPLOT          2  PLOT CONTROL
                        QSCAL         0.  HYDROGRAPH PLOT SCALE

                 HYDROGRAPH ROUTING DATA

   34 RS          STORAGE ROUTING
                        NSTPS          1  NUMBER OF SUBREACHES
                        ITYP        ELEV  TYPE OF INITIAL CONDITION
                        RSVRIC    630.00  INITIAL CONDITION
                        X           0.00  WORKING R AND D COEFFICIENT

   35 SV           STORAGE        0.0       0.2       0.7       1.0       1.6       2.6

   36 SE          ELEVATION    630.00    633.00    635.00    636.00    637.00    638.00

   37 SQ          DISCHARGE        0.       50.       80.      130.      200.      360.

   38 SE          ELEVATION    630.00    633.00    635.00    636.00    637.00    638.00

                                                              ***

                                   COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

              STORAGE       0.00      0.17      0.68      1.04      1.61      2.56
              OUTFLOW       0.00     50.00     80.00    130.00    200.00    360.00
            ELEVATION     630.00    633.00    635.00    636.00    637.00    638.00

*** WARNING *** MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS BETWEEN        0. TO      360.
                THE ROUTED HYDROGRAPH SHOULD BE EXAMINED FOR OSCILLATIONS OR OUTFLOWS GREATER THAN PEAK INFLOWS.
                THIS CAN BE CORRECTED BY DECREASING THE TIME INTERVAL OR INCREASING STORAGE (USE A LONGER REACH.)

        ***             ***             ***             ***             ***

                     HYDROGRAPH AT STATION     WACK

   PEAK FLOW      TIME                       MAXIMUM AVERAGE FLOW
     (CFS)        (HR)                 6-HR        24-HR        72-HR      22.25-HR
      230.        6.00       (CFS)     181.          90.          90.          90.
                          (INCHES)    1.681        3.118        3.118        3.118
                           (AC-FT)      90.         166.         166.         166.

   PEAK STORAGE   TIME                      MAXIMUM AVERAGE STORAGE
     (AC-FT)      (HR)                 6-HR        24-HR        72-HR      22.25-HR
         2.       6.00                   1.           1.           1.           1.
```

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	22.25-HR
637.19	6.00	636.67	634.19	634.19	634.19

CUMULATIVE AREA = 1.00 SQ MI

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XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX

          XXXXXXXXXXXXXX
          X            X
 39 KK    X     WACK   X
          X            X
          XXXXXXXXXXXXXX
                    INPUT HYDRO-DRAINAGE AREA TO DILLOWAY

  5 IN        TIME DATA FOR INPUT TIME SERIES
                  JXMIN          15  TIME INTERVAL IN MINUTES
                 JXDATE     16DEC83  STARTING DATE
                 JXTIME           0  STARTING TIME

            SUBBASIN RUNOFF DATA

 41 BA        SUBBASIN CHARACTERISTICS
                  TAREA        0.39  SUBBASIN AREA

              PRECIPITATION DATA

 42 PB            STORM        1.43  BASIN TOTAL PRECIPITATION

 43 PI          INCREMENTAL PRECIPITATION PATTERN
                 0.00      0.00      0.00      0.00      0.14      0.49      0.32      0.16      0.12      0.09
                 0.07      0.05

 45 LU        UNIFORM LOSS RATE
                  STRTL        0.00  INITIAL LOSS
                  CNSTL        0.00  UNIFORM LOSS RATE
                  RTIMP        0.00  PERCENT IMPERVIOUS AREA

 45 UI        INPUT UNITGRAPH,  35 ORDINATES,  VOLUME = 2.35
                  0.5       1.0       3.0       5.0       7.0      12.0      20.0     105.0     167.0     195.0
                200.0     199.0     178.0     156.0     136.0     122.0     102.0      92.0      84.0      77.0
                 68.0      61.0      54.0      49.0      43.0      41.0      37.0      32.0      29.0      25.0
                 21.0      17.0      12.0       9.0       5.0

                                                        XXX

    XXX          XXX          XXX          XXX          XXX

                    HYDROGRAPH AT STATION     WACK

     TOTAL RAINFALL =  1.43, TOTAL LOSS =  0.00, TOTAL EXCESS =  1.43

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR     22.25-HR
   250.       4.50        (CFS)     134.         38.         38.         38.
                        (INCHES)   3.194       3.366       3.366       3.366
                         (AC-FT)     66.         70.         70.         70.

                    CUMULATIVE AREA =    0.39 SQ MI
```

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50 KK      WACK

           COMBINE HYDRO-DRAINAGE AREAS AT DILLOWAY

52 HC      HYDROGRAPH COMBINATION
                ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                   HYDROGRAPH AT STATION     WACK

PEAK FLOW     TIME                                MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR      24-HR      72-HR     22.25-HR
   401.       5.25       (CFS)     304.       129.       129.       129.
                       (INCHES)   2.034      3.187      3.187      3.187
                        (AC-FT)    151.       236.       236.       236.

                       CUMULATIVE AREA =    1.39 SQ MI

53 KK      DILL

           STORAGE ROUTE UPSTREAM OF DILLOWAY

55 KO      OUTPUT CONTROL VARIABLES
                IPRNT          1  PRINT CONTROL
                IPLOT          2  PLOT CONTROL
                QSCAL         0.  HYDROGRAPH PLOT SCALE

           HYDROGRAPH ROUTING DATA

56 RS      STORAGE ROUTING
                NSTPS          1  NUMBER OF SUBREACHES
                 ITYP       ELEV  TYPE OF INITIAL CONDITION
               RSVRIC     624.00  INITIAL CONDITION
                    X       0.00  WORKING R AND D COEFFICIENT

57 SV        STORAGE        0.0       0.2       5.2       8.6      16.1      24.0

58 SE      ELEVATION     624.00    628.00    632.00    633.00    634.00    635.00

59 SQ      DISCHARGE        0.        60.       170.      220.      400.      1100.
```

60 SE ELEVATION 624.00 628.00 632.00 633.00 634.00 635.00

XXX

COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	0.00	0.20	5.20	8.60	16.10	24.00
OUTFLOW	0.00	60.00	170.00	220.00	400.00	1100.00
ELEVATION	624.00	628.00	632.00	633.00	634.00	635.00

XXX WARNING XXX MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS BETWEEN 0. TO 60.
THE ROUTED HYDROGRAPH SHOULD BE EXAMINED FOR OSCILLATIONS OR OUTFLOWS GREATER THAN PEAK INFLOWS.
THIS CAN BE CORRECTED BY DECREASING THE TIME INTERVAL OR INCREASING STORAGE (USE A LONGER REACH.)

HYDROGRAPH AT STATION DILL

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
16	DEC	0000	1	0.	0.0	624.0	16	DEC	0730	31	304.	12.1	633.5	16	DEC	1500	61	84.	1.3	628.9
16	DEC	0015	2	0.	0.0	624.0	16	DEC	0745	32	287.	11.4	633.4	16	DEC	1515	62	82.	1.2	628.8
16	DEC	0030	3	0.	0.0	624.0	16	DEC	0800	33	272.	10.8	633.3	16	DEC	1530	63	81.	1.1	628.7
16	DEC	0045	4	0.	0.0	624.0	16	DEC	0815	34	257.	10.2	633.2	16	DEC	1545	64	79.	1.1	628.7
16	DEC	0100	5	0.	0.0	624.0	16	DEC	0830	35	243.	9.6	633.1	16	DEC	1600	65	77.	1.0	628.6
16	DEC	0115	6	0.	0.0	624.0	16	DEC	0845	36	229.	9.0	633.1	16	DEC	1615	66	74.	0.8	628.5
16	DEC	0130	7	0.	0.0	624.0	16	DEC	0900	37	218.	8.4	633.0	16	DEC	1630	67	72.	0.7	628.4
16	DEC	0145	8	2.	0.0	624.1	16	DEC	0915	38	209.	7.9	632.8	16	DEC	1645	68	70.	0.6	628.4
16	DEC	0200	9	6.	0.0	624.4	16	DEC	0930	39	200.	7.3	632.6	16	DEC	1700	69	68.	0.6	628.3
16	DEC	0215	10	13.	0.0	624.8	16	DEC	0945	40	191.	6.6	632.4	16	DEC	1715	70	66.	0.5	628.2
16	DEC	0230	11	21.	0.1	625.4	16	DEC	1000	41	181.	6.0	632.2	16	DEC	1730	71	64.	0.4	628.1
16	DEC	0245	12	33.	0.1	626.2	16	DEC	1015	42	171.	5.3	632.0	16	DEC	1745	72	61.	0.3	628.1
16	DEC	0300	13	59.	0.2	627.9	16	DEC	1030	43	157.	4.6	631.5	16	DEC	1800	73	58.	0.2	627.8
16	DEC	0315	14	75.	0.9	628.6	16	DEC	1045	44	145.	4.1	631.1	16	DEC	1815	74	52.	0.2	627.4
16	DEC	0330	15	112.	2.5	629.9	16	DEC	1100	45	134.	3.6	630.7	16	DEC	1830	75	52.	0.2	627.4
16	DEC	0345	16	160.	4.8	631.7	16	DEC	1115	46	126.	3.2	630.4	16	DEC	1845	76	47.	0.2	627.1
16	DEC	0400	17	201.	7.3	632.6	16	DEC	1130	47	119.	2.9	630.1	16	DEC	1900	77	45.	0.1	627.0
16	DEC	0415	18	249.	9.8	633.2	16	DEC	1145	48	113.	2.6	629.9	16	DEC	1915	78	43.	0.1	626.9
16	DEC	0430	19	300.	11.9	633.4	16	DEC	1200	49	109.	2.4	629.8	16	DEC	1930	79	41.	0.1	626.7
16	DEC	0445	20	337.	13.5	633.6	16	DEC	1215	50	106.	2.3	629.7	16	DEC	1945	80	38.	0.1	626.5
16	DEC	0500	21	361.	14.5	633.8	16	DEC	1230	51	103.	2.2	629.6	16	DEC	2000	81	36.	0.1	626.4
16	DEC	0515	22	377.	15.1	633.9	16	DEC	1245	52	101.	2.1	629.5	16	DEC	2015	82	34.	0.1	626.2
16	DEC	0530	23	385.	15.5	633.9	16	DEC	1300	53	99.	2.0	629.4	16	DEC	2030	83	31.	0.1	626.1
16	DEC	0545	24	388.	15.6	633.9	16	DEC	1315	54	97.	1.9	629.3	16	DEC	2045	84	29.	0.1	625.9
16	DEC	0600	25	385.	15.5	633.9	16	DEC	1330	55	95.	1.8	629.3	16	DEC	2100	85	27.	0.1	625.8
16	DEC	0615	26	377.	15.2	633.9	16	DEC	1345	56	93.	1.7	629.2	16	DEC	2115	86	25.	0.1	625.6
16	DEC	0630	27	366.	14.7	633.8	16	DEC	1400	57	92.	1.6	629.2	16	DEC	2130	87	22.	0.1	625.5
16	DEC	0645	28	352.	14.1	633.7	16	DEC	1415	58	90.	1.6	629.1	16	DEC	2145	88	21.	0.1	625.4
16	DEC	0700	29	337.	13.5	633.6	16	DEC	1430	59	88.	1.5	629.0	16	DEC	2200	89	18.	0.1	625.2
16	DEC	0715	30	320.	12.8	633.6	16	DEC	1445	60	86.	1.4	628.9	16	DEC	2215	90	16.	0.1	625.1

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	22.25-HR
388.	5.75	(CFS)	297.	128.	128.	128.
		(INCHES)	1.989	3.187	3.187	3.187

	(AC-FT)	147.	236.	236.	236.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	22.25-HR
16.	5.75	12.	4.	4.	4.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	22.25-HR
633.93	5.75	633.37	629.25	629.25	629.25

CUMULATIVE AREA = 1.39 SQ MI

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*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

             ***************
             *             *
  61 KK      *     DILL    *
             *             *
             ***************
                      INPUT HYDRO-DRAINAGE  AREA TO SYLVAN

   5 IN           TIME DATA FOR INPUT TIME SERIES
                        JXMIN          15  TIME INTERVAL IN MINUTES
                        JXDATE    16DEC83  STARTING DATE
                        JXTIME          0  STARTING TIME

             SUBBASIN RUNOFF DATA

  63 BA           SUBBASIN CHARACTERISTICS
                        TAREA        0.21  SUBBASIN AREA

                  PRECIPITATION DATA

  64 PB                 STORM        0.74  BASIN TOTAL PRECIPITATION

  65 PI             INCREMENTAL PRECIPITATION PATTERN
                       0.00      0.00      0.00      0.00      0.07      0.26      0.17      0.08      0.06      0.05
                       0.04      0.03

  67 LU           UNIFORM LOSS RATE
                        STRTL        0.00  INITIAL LOSS
                        CNSTL        0.00  UNIFORM LOSS RATE
                        RTIMP        0.00  PERCENT IMPERVIOUS AREA

  67 UI           INPUT UNITGRAPH,  27 ORDINATES,  VOLUME = 4.55
                        0.0       8.0      24.0      75.0     153.0     290.0     293.0     274.0     244.0     204.0
                      165.0     134.0     110.0      89.0      73.0      58.0      50.0      44.0      38.0      33.0
                       28.0      24.0      20.0      14.0      11.0       7.0       2.0

                                                             ***

     ***          ***          ***          ***          ***

                    HYDROGRAPH AT STATION      DILL

        TOTAL RAINFALL =  0.74, TOTAL LOSS =  0.00, TOTAL EXCESS =  0.74

  PEAK FLOW      TIME                        MAXIMUM AVERAGE FLOW
    (CFS)        (HR)               6-HR        24-HR       72-HR     22.25-HR
     173.        3.50      (CFS)     75.          21.         21.          21.
                         (INCHES)   3.331        3.370       3.370        3.370
                          (AC-FT)    37.          38.         38.          38.

                    CUMULATIVE AREA =    0.21 SQ MI
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71 KK      DILL

                    INPUT HYDRO-DRAINAGE AREA TO WHEELER

 5 IN          TIME DATA FOR INPUT TIME SERIES
                    JXMIN          15  TIME INTERVAL IN MINUTES
                   JXDATE    16DEC83  STARTING DATE
                   JXTIME           0  STARTING TIME

              SUBBASIN RUNOFF DATA

73 BA          SUBBASIN CHARACTERISTICS
                    TAREA        0.34  SUBBASIN AREA

               PRECIPITATION DATA

74 PB               STORM        1.22  BASIN TOTAL PRECIPITATION

75 PI            INCREMENTAL PRECIPITATION PATTERN
                   0.00      0.00      0.00      0.00      0.12      0.42      0.27      0.13      0.10      0.08
                   0.06      0.04

77 LU          UNIFORM LOSS RATE
                    STRTL        0.00  INITIAL LOSS
                    CNSTL        0.00  UNIFORM LOSS RATE
                    RTIMP        0.00  PERCENT IMPERVIOUS AREA

77 UI          INPUT UNITGRAPH,  23 ORDINATES,  VOLUME = 3.00
                    0.0      17.0      53.0     158.0     350.0     395.0     356.0     298.0     225.0     159.0
                  114.0      93.0      79.0      67.0      59.0      50.0      45.0      37.0      30.0      22.0
                   15.0       9.0       3.0

                                                                  XXX

     XXX            XXX            XXX            XXX            XXX

                    HYDROGRAPH AT STATION     DILL

     TOTAL RAINFALL =  1.22, TOTAL LOSS =  0.00, TOTAL EXCESS =  1.22

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR     22.25-HR
   358.       3.00        (CFS)     134.         36.         36.         36.
                        (INCHES)   3.652       3.661       3.661       3.661
                         (AC-FT)     66.         66.         66.         66.

                    CUMULATIVE AREA =    0.34 SQ MI
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                 XXXXXXXXXXXXXX
                 X            X
 81 KK           X    DILL    X
                 X            X
                 XXXXXXXXXXXXXX
                          COMBINE HYDRO-DRAINAGE AREAS AT WHEELER

 83 HC                HYDROGRAPH COMBINATION
                           ICOMP          3  NUMBER OF HYDROGRAPHS TO COMBINE
                                                                   XXX
      XXX                 XXX                XXX                XXX                XXX
                            HYDROGRAPH AT STATION     DILL

 PEAK FLOW      TIME                                MAXIMUM AVERAGE FLOW
   (CFS)        (HR)                    6-HR        24-HR        72-HR      22.25-HR
     603.       3.50          (CFS)     461.         185.         185.         185.
                            (INCHES)   2.210        3.290        3.290        3.290
                             (AC-FT)     229.         340.         340.         340.

                            CUMULATIVE AREA =    1.94 SQ MI

XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX

                 XXXXXXXXXXXXXX
                 X            X
 84 KK           X   WHEEL    X
                 X            X
                 XXXXXXXXXXXXXX
                          STORAGE ROUTE UPSTREAM OF WHEELER

 86 KO                OUTPUT CONTROL VARIABLES
                           IPRNT          1  PRINT CONTROL
                           IPLOT          2  PLOT CONTROL
                           QSCAL         0.  HYDROGRAPH PLOT SCALE

                    HYDROGRAPH ROUTING DATA

 87 RS                STORAGE ROUTING
                           NSTPS          1  NUMBER OF SUBREACHES
                            ITYP       ELEV  TYPE OF INITIAL CONDITION
                          RSVRIC     617.00  INITIAL CONDITION
                               X       0.00  WORKING R AND D COEFFICIENT

 88 SV                  STORAGE        0.0       2.0       6.3      12.8      25.1      45.0      57.0      70.0

 89 SF                ELEVATION     617.00    625.00    627.00    628.00    629.00    630.00    630.50    631.00

 90 SQ                DISCHARGE        0.        80.       240.      300.      360.      430.      600.      730.

 91 SF                ELEVATION     617.00    625.00    627.00    628.00    629.00    630.00    630.50    631.00
                                                                   XXX
```

COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	0.00	2.00	6.30	12.80	25.10	45.00	57.00	70.00
OUTFLOW	0.00	80.00	240.00	300.00	360.00	430.00	600.00	730.00
ELEVATION	617.00	625.00	627.00	628.00	629.00	630.00	630.50	631.00

HYDROGRAPH AT STATION WHEEL

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
16	DEC	0000	1	0.	0.0	617.0	16	DEC	0730	31	419.	41.9	629.8	16	DEC	1500	61	87.	2.2	625.1
16	DEC	0015	2	0.	0.0	617.0	16	DEC	0745	32	411.	39.7	629.7	16	DEC	1515	62	85.	2.1	625.1
16	DEC	0030	3	0.	0.0	617.0	16	DEC	0800	33	403.	37.3	629.6	16	DEC	1530	63	83.	2.1	625.0
16	DEC	0045	4	0.	0.0	617.0	16	DEC	0815	34	394.	34.6	629.5	16	DEC	1545	64	81.	2.0	625.0
16	DEC	0100	5	0.	0.0	617.0	16	DEC	0830	35	384.	31.8	629.3	16	DEC	1600	65	79.	2.0	624.9
16	DEC	0115	6	0.	0.0	617.0	16	DEC	0845	36	373.	28.9	629.2	16	DEC	1615	66	77.	1.9	624.7
16	DEC	0130	7	1.	0.0	617.1	16	DEC	0900	37	363.	26.0	629.0	16	DEC	1630	67	75.	1.9	624.5
16	DEC	0145	8	7.	0.2	617.7	16	DEC	0915	38	350.	23.0	628.8	16	DEC	1645	68	72.	1.8	624.2
16	DEC	0200	9	28.	0.7	619.8	16	DEC	0930	39	336.	20.2	628.6	16	DEC	1700	69	70.	1.8	624.0
16	DEC	0215	10	81.	2.0	625.0	16	DEC	0945	40	322.	17.4	628.4	16	DEC	1715	70	68.	1.7	623.8
16	DEC	0230	11	178.	4.6	626.2	16	DEC	1000	41	309.	14.7	628.2	16	DEC	1730	71	66.	1.7	623.6
16	DEC	0245	12	262.	8.7	627.4	16	DEC	1015	42	294.	12.1	627.9	16	DEC	1745	72	64.	1.6	623.4
16	DEC	0300	13	305.	13.8	628.1	16	DEC	1030	43	271.	9.7	627.5	16	DEC	1800	73	61.	1.5	623.1
16	DEC	0315	14	332.	19.4	628.5	16	DEC	1045	44	250.	7.4	627.2	16	DEC	1815	74	57.	1.4	622.7
16	DEC	0330	15	358.	24.7	629.0	16	DEC	1100	45	211.	5.5	626.6	16	DEC	1830	75	54.	1.4	622.4
16	DEC	0345	16	375.	29.5	629.2	16	DEC	1115	46	166.	4.3	626.1	16	DEC	1845	76	51.	1.3	622.1
16	DEC	0400	17	390.	33.7	629.4	16	DEC	1130	47	142.	3.7	625.8	16	DEC	1900	77	48.	1.2	621.8
16	DEC	0415	18	403.	37.3	629.6	16	DEC	1145	48	128.	3.3	625.6	16	DEC	1915	78	46.	1.1	621.6
16	DEC	0430	19	414.	40.5	629.8	16	DEC	1200	49	118.	3.0	625.5	16	DEC	1930	79	44.	1.1	621.4
16	DEC	0445	20	424.	43.3	629.9	16	DEC	1215	50	112.	2.9	625.4	16	DEC	1945	80	41.	1.0	621.1
16	DEC	0500	21	438.	45.6	630.0	16	DEC	1230	51	108.	2.8	625.4	16	DEC	2000	81	39.	1.0	620.9
16	DEC	0515	22	460.	47.1	630.1	16	DEC	1245	52	105.	2.7	625.3	16	DEC	2015	82	36.	0.9	620.6
16	DEC	0530	23	474.	48.1	630.1	16	DEC	1300	53	102.	2.6	625.3	16	DEC	2030	83	34.	0.9	620.4
16	DEC	0545	24	479.	48.5	630.1	16	DEC	1315	54	100.	2.5	625.2	16	DEC	2045	84	32.	0.8	620.2
16	DEC	0600	25	479.	48.5	630.1	16	DEC	1330	55	98.	2.5	625.2	16	DEC	2100	85	30.	0.7	620.0
16	DEC	0615	26	474.	48.1	630.1	16	DEC	1345	56	96.	2.4	625.2	16	DEC	2115	86	27.	0.7	619.7
16	DEC	0630	27	464.	47.4	630.1	16	DEC	1400	57	94.	2.4	625.2	16	DEC	2130	87	25.	0.6	619.5
16	DEC	0645	28	450.	46.4	630.1	16	DEC	1415	58	92.	2.3	625.2	16	DEC	2145	88	23.	0.6	619.3
16	DEC	0700	29	433.	45.2	630.0	16	DEC	1430	59	91.	2.3	625.1	16	DEC	2200	89	21.	0.5	619.1
16	DEC	0715	30	425.	43.7	629.9	16	DEC	1445	60	89.	2.2	625.1	16	DEC	2215	90	19.	0.5	618.9

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	22.25-HR
479.	5.75	(CFS)	418.	185.	185.	185.
		(INCHES)	2.003	3.285	3.285	3.285
		(AC-FT)	207.	340.	340.	340.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	22.25-HR
48.	5.75	39.	13.	13.	13.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	22.25-HR

630.15	5.75	629.69	625.05	625.05	625.05

CUMULATIVE AREA = 1.94 SQ MI

92 KK WHEEL

DIVERT FLOW TO MEADOWBROOK

DT	DIVERSION ISTAD	OFLO	DIVERSION HYDROGRAPH IDENTIFICATION					
DI	INFLOW	0.00	410.00	460.00	520.00	600.00	680.00	730.00
DQ	DIVERTED FLOW	0.00	0.00	40.00	60.00	120.00	190.00	230.00

DIVERSION HYDROGRAPH OFLO

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	22.25-HR
46.	5.75	(CFS)	15.	4.	4.	4.
		(INCHES)	0.074	0.074	0.074	0.074
		(AC-FT)	8.	8.	8.	8.

CUMULATIVE AREA = 1.94 SQ MI

HYDROGRAPH AT STATION WHEEL

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	22.25-HR
433.	5.75	(CFS)	402.	181.	181.	181.
		(INCHES)	1.929	3.211	3.211	3.211
		(AC-FT)	200.	332.	332.	332.

CUMULATIVE AREA = 1.94 SQ MI

97 KK WHEEL

INPUT HYDRO-DRAINAGE AREA SOUTH OF WHEELER

```
  5 IN          TIME DATA FOR INPUT TIME SERIES
                     JXMIN          15  TIME INTERVAL IN MINUTES
                    JXDATE     16DEC83  STARTING DATE
                    JXTIME           0  STARTING TIME

               SUBBASIN RUNOFF DATA

 99 BA          SUBBASIN CHARACTERISTICS
                     TAREA        0.57  SUBBASIN AREA

               PRECIPITATION DATA

100 PB               STORM        1.53  BASIN TOTAL PRECIPITATION

101 PI            INCREMENTAL PRECIPITATION PATTERN
                    0.00      0.00      0.00      0.00      0.00      0.39      0.45      0.22      0.16      0.13
                    0.10      0.08

103 LU          UNIFORM LOSS RATE
                     STRTL        0.00  INITIAL LOSS
                     CNSTL        0.00  UNIFORM LOSS RATE
                     RTIMP        0.00  PERCENT IMPERVIOUS AREA

103 UI          INPUT UNITGRAPH,  33 ORDINATES,  VOLUME = 1.78
                     0.0       5.0      15.0      39.0      70.0     118.0     185.0     234.0     240.0     234.0
                   223.0     202.0     169.0     141.0     117.0      98.0      77.0      63.0      55.0      50.0
                    45.0      41.0      36.0      33.0      29.0      25.0      21.0      18.0      15.0      12.0
                     8.0       5.0       2.0

                                                                  XXX

     XXX            XXX            XXX            XXX            XXX

                       HYDROGRAPH AT STATION    WHEEL

      TOTAL RAINFALL =  1.53, TOTAL LOSS =  0.00, TOTAL EXCESS =  1.53

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)        (HR)                  6-HR        24-HR        72-HR      22.25-HR
    329.       4.25        (CFS)     161.          45.          45.          45.
                         (INCHES)   2.622        2.737        2.737        2.737
                          (AC-FT)     80.          83.          83.          83.

                       CUMULATIVE AREA =    0.57 SQ MI

XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX

              XXXXXXXXXXXXXX
              X            X
108 KK        X    WHEEL   X
              X            X
              XXXXXXXXXXXXXX
                       COMBINE HYDRO SOUTH OF WHEELER

110 HC          HYDROGRAPH COMBINATION
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                    ICOMP        2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                    XXX

   XXX            XXX            XXX            XXX            XXX

                    HYDROGRAPH AT STATION    WHEEL

PEAK FLOW    TIME                          MAXIMUM AVERAGE FLOW
 (CFS)       (HR)                   6-HR       24-HR      72-HR     22.25-HR
  732.       4.25          (CFS)    556.       226.       226.       226.
                         (INCHES)  2.061      3.103      3.103      3.103
                          (AC-FT)   276.       415.       415.       415.

                    CUMULATIVE AREA =    2.51 SQ MI

111 KK          XX<OOOOOOOOOOOX
                X             X
                X     CONFL   X
                X             X
                XXXXXXXXXXXXXXX
                    CHANNEL ROUTE SIEBERT TO CONFLUENCE SECTION 1330

113 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          3  PRINT CONTROL
                      IPLOT          2  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE

              HYDROGRAPH ROUTING DATA

114 RS          STORAGE ROUTING
                      NSTPS          1  NUMBER OF SUBREACHES
                       ITYP       STOR  TYPE OF INITIAL CONDITION
                     RSVRIC      -1.00  INITIAL CONDITION
                          X       0.00 WORKING R AND D COEFFICIENT

115 RC          NORMAL DEPTH CHANNEL ROUTING
                       AML      0.060  LEFT OVERBANK N-VALUE
                      ANCH      0.045  MAIN CHANNEL N-VALUE
                       ANR      0.060  RIGHT OVERBANK N-VALUE
                     RLNTH      2200.  REACH LENGTH
                       SFL     0.0010  ENERGY SLOPE
                     ELMAX        0.0  MAX. ELEV. FOR STORAGE/OUTFLOW CALCULATION

                                  CROSS-SECTION DATA
                      --- LEFT OVERBANK --- + ------ MAIN CHANNEL -------- + --- RIGHT OVERBANK ---
117 RY     ELEVATION   620.00   619.20   616.50   612.60   612.60   616.80   617.90   620.00
116 RX     DISTANCE      6.00    13.00    43.00    47.00    53.00    60.00   150.00   229.00

                                                    XXX

                          COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

         STORAGE      0.00     0.13     0.28     0.45     0.64     0.85     1.08     1.33     1.60     1.90
```

OUTFLOW	0.00	1.31	4.25	8.57	14.25	21.31	29.83	39.84	51.42	64.65
ELEVATION	612.60	612.99	613.38	613.77	614.16	614.55	614.94	615.33	615.72	616.11
STORAGE	2.21	2.60	3.51	5.13	7.44	10.18	13.30	16.79	20.64	24.85
OUTFLOW	79.58	98.56	124.95	162.88	218.11	293.23	386.95	500.36	635.22	791.82
ELEVATION	616.49	616.88	617.27	617.66	618.05	618.44	618.83	619.22	619.61	620.00

XXX XXX XXX XXX XXX

HYDROGRAPH AT STATION CONFL

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	22.25-HR
711.	4.75	(CFS)	550.	225.	225.	225.
		(INCHES)	2.038	3.097	3.097	3.097
		(AC-FT)	273.	415.	415.	415.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	22.25-HR
23.	4.75	18.	7.	7.	7.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	22.25-HR
619.80	4.75	619.33	617.02	617.02	617.02

CUMULATIVE AREA = 2.51 SQ MI

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 XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX XXX

                 XXXXXXXXXXXXXXX
                 X             X
  118 KK         X      SAG    X
                 X             X
                 XXXXXXXXXXXXXXX
                             INPUT HYDRO-MEADOWBROOK DRAIN

   5 IN              TIME DATA FOR INPUT TIME SERIES
                          JXMIN          15   TIME INTERVAL IN MINUTES
                          JXDATE    16DEC83   STARTING DATE
                          JXTIME          0   STARTING TIME

                   SUBBASIN RUNOFF DATA

  120 BA             SUBBASIN CHARACTERISTICS
                          TAREA        1.27   SUBBASIN AREA

                     PRECIPITATION DATA

  121 PB                  STORM        4.59   BASIN TOTAL PRECIPITATION

  122 PI               INCREMENTAL PRECIPITATION PATTERN
                          0.00      0.00      0.00      0.00      0.45      1.58      1.02      0.50      0.37      0.28
                          0.23      0.17

  123 LU             UNIFORM LOSS RATE
                          STRTL        0.00   INITIAL LOSS
                          CNSTL        0.00   UNIFORM LOSS RATE
                          RTIMP        0.00   PERCENT IMPERVIOUS AREA

  124 UI             INPUT UNITGRAPH,  38 ORDINATES,  VOLUME = 0.81
                          0.0       4.0      11.0      22.0      47.0      85.0     131.0     188.0     211.0     220.0
                        216.0     204.0     186.0     168.0     146.0     127.0     110.0      88.0      71.0      58.0
                         49.0      44.0      39.0      34.0      31.0      28.0      24.0      22.0      20.0      17.0
                         15.0      13.0      11.0       9.0       7.0       5.0       3.0       2.0

                                                                  XXX

         XXX            XXX            XXX            XXX            XXX

                          HYDROGRAPH AT STATION       SAG

           TOTAL RAINFALL =   4.59, TOTAL LOSS =   0.00, TOTAL EXCESS =   4.59

  PEAK FLOW      TIME                              MAXIMUM AVERAGE FLOW
    (CFS)        (HR)                      6-HR        24-HR       72-HR     22.25-HR
     910.        4.25          (CFS)       478.         137.        137.         137.
                             (INCHES)     3.503        3.733       3.733        3.733
                              (AC-FT)      237.         253.        253.         253.

                           CUMULATIVE AREA =    1.27 SQ MI
```

```
129 KK      SAG

                    RETRIEVE DIVERTED FLOW AT WHEELER

131 DR          RETRIEVE DIVERSION HYDROGRAPH
                    ISTAD        OFLO  DIVERSION HYDROGRAPH IDENTIFICATION

                                                                  XXX

     XXX            XXX            XXX            XXX            XXX

                    HYDROGRAPH AT STATION      SAG

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR     22.25-HR
    46.       5.75        (CFS)      15.          4.          4.          4.
                        (INCHES)   0.113       0.113       0.113       0.113
                         (AC-FT)      8.          8.          8.          8.

                    CUMULATIVE AREA =    0.00 SQ MI


132 KK      SAG

                    ADD MEADOWBROOK AND DIVERSION HYDROS

134 HC          HYDROGRAPH COMBINATION
                    ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                  XXX

     XXX            XXX            XXX            XXX            XXX

                    HYDROGRAPH AT STATION      SAG

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                  6-HR       24-HR       72-HR     22.25-HR
   910.       4.25        (CFS)     494.        142.        142.        142.
                        (INCHES)   3.616       3.846       3.846       3.846
                         (AC-FT)     245.        260.        260.        260.

                    CUMULATIVE AREA =    1.27 SQ MI
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135 KK      CONFL

                    ROUTE TO CONFLUENCE  - SECTION 200

137 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          1  PRINT CONTROL
                      IPLOT          2  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE

              HYDROGRAPH ROUTING DATA

138 RS          STORAGE ROUTING
                      NSTPS          1  NUMBER OF SUBREACHES
                       ITYP       STOR  TYPE OF INITIAL CONDITION
                     RSVRIC      -1.00  INITIAL CONDITION
                          X       0.00 WORKING R AND D COEFFICIENT

139 RC          NORMAL DEPTH CHANNEL ROUTING
                        ANL      0.070  LEFT OVERBANK N-VALUE
                       ANCH      0.045  MAIN CHANNEL N-VALUE
                        ANR      0.070  RIGHT OVERBANK N-VALUE
                      RLNTH      3500.  REACH LENGTH
                        SEL     0.0010  ENERGY SLOPE
                      ELMAX        0.0  MAX. ELEV. FOR STORAGE/OUTFLOW CALCULATION

                                  CROSS-SECTION DATA
                      --- LEFT OVERBANK --- + ------ MAIN CHANNEL ------- + --- RIGHT OVERBANK ---
141 RY        ELEVATION   620.90   619.10   616.80   611.90   611.90   616.30   619.00   620.90
140 RX        DISTANCE      0.00    50.00   118.00   127.00   132.00   142.00   230.00   240.00

                                                  XXX

                          COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

          STORAGE      0.00     0.23     0.53     0.90     1.35     1.88     2.48     3.15     3.89     4.71
          OUTFLOW      0.00     1.59     5.46    11.62    20.29    31.72    46.16    63.85    85.03   109.93
        ELEVATION    611.90   612.37   612.85   613.32   613.79   614.27   614.74   615.22   615.69   616.16

          STORAGE      5.75     7.48    10.31    14.26    19.33    25.52    32.57    40.22    48.46    57.30
          OUTFLOW    141.70   184.36   240.96   314.72   409.41   528.46   683.93   866.58  1076.88  1315.59
        ELEVATION    616.64   617.11   617.58   618.06   618.53   619.01   619.48   619.95   620.43   620.90

                                  HYDROGRAPH AT STATION    CONFL

DA MON HRMN ORD  OUTFLOW  STORAGE   STAGE  DA MON HRMN ORD  OUTFLOW  STORAGE   STAGE  DA MON HRMN ORD  OUTFLOW  STORAGE   STAGE
16 DEC 0000  1       0.      0.0   611.9  16 DEC 0730  31     288.     12.8   617.9  16 DEC 1500  61       1.      0.1   612.1
```

16	DEC	0015	2	0.	0.0	611.9	*	16	DEC	0745	32	248.	10.7	617.6	*	16	DEC	1515	62	1.	0.1	612.1
16	DEC	0030	3	0.	0.0	611.9	*	16	DEC	0800	33	213.	8.9	617.3	*	16	DEC	1530	63	1.	0.1	612.0
16	DEC	0045	4	0.	0.0	611.9	*	16	DEC	0815	34	183.	7.4	617.1	*	16	DEC	1545	64	0.	0.1	612.0
16	DEC	0100	5	0.	0.0	611.9	*	16	DEC	0830	35	156.	6.3	616.8	*	16	DEC	1600	65	0.	0.1	612.0
16	DEC	0115	6	0.	0.0	611.9	*	16	DEC	0845	36	131.	5.4	616.5	*	16	DEC	1615	66	0.	0.0	612.0
16	DEC	0130	7	0.	0.0	611.9	*	16	DEC	0900	37	111.	4.7	616.2	*	16	DEC	1630	67	0.	0.0	612.0
16	DEC	0145	8	1.	0.1	612.2	*	16	DEC	0915	38	95.	4.2	615.9	*	16	DEC	1645	68	0.	0.0	612.0
16	DEC	0200	9	5.	0.5	612.8	*	16	DEC	0930	39	82.	3.8	615.6	*	16	DEC	1700	69	0.	0.0	612.0
16	DEC	0215	10	19.	1.3	613.7	*	16	DEC	0945	40	71.	3.4	615.4	*	16	DEC	1715	70	0.	0.0	612.0
16	DEC	0230	11	53.	2.7	614.9	*	16	DEC	1000	41	61.	3.1	615.2	*	16	DEC	1730	71	0.	0.0	611.9
16	DEC	0245	12	120.	5.0	616.3	*	16	DEC	1015	42	52.	2.7	614.9	*	16	DEC	1745	72	0.	0.0	611.9
16	DEC	0300	13	206.	8.6	617.3	*	16	DEC	1030	43	43.	2.3	614.6	*	16	DEC	1800	73	0.	0.0	611.9
16	DEC	0315	14	304.	13.7	618.0	*	16	DEC	1045	44	35.	2.0	614.4	*	16	DEC	1815	74	0.	0.0	611.9
16	DEC	0330	15	422.	20.0	618.6	*	16	DEC	1100	45	27.	1.7	614.1	*	16	DEC	1830	75	0.	0.0	611.9
16	DEC	0345	16	545.	26.3	619.1	*	16	DEC	1115	46	21.	1.4	613.8	*	16	DEC	1845	76	0.	0.0	611.9
16	DEC	0400	17	665.	31.7	619.4	*	16	DEC	1130	47	15.	1.1	613.5	*	16	DEC	1900	77	0.	0.0	611.9
16	DEC	0415	18	757.	35.7	619.7	*	16	DEC	1145	48	11.	0.9	613.3	*	16	DEC	1915	78	0.	0.0	611.9
16	DEC	0430	19	815.	38.0	619.8	*	16	DEC	1200	49	8.	0.7	613.1	*	16	DEC	1930	79	0.	0.0	611.9
16	DEC	0445	20	838.	39.0	619.9	*	16	DEC	1215	50	6.	0.6	612.9	*	16	DEC	1945	80	0.	0.0	611.9
16	DEC	0500	21	833.	38.8	619.9	*	16	DEC	1230	51	5.	0.5	612.7	*	16	DEC	2000	81	0.	0.0	611.9
16	DEC	0515	22	806.	37.7	619.8	*	16	DEC	1245	52	4.	0.4	612.6	*	16	DEC	2015	82	0.	0.0	611.9
16	DEC	0530	23	769.	35.9	619.7	*	16	DEC	1300	53	3.	0.3	612.5	*	16	DEC	2030	83	0.	0.0	611.9
16	DEC	0545	24	704.	33.4	619.5	*	16	DEC	1315	54	2.	0.3	612.4	*	16	DEC	2045	84	0.	0.0	611.9
16	DEC	0600	25	638.	30.5	619.3	*	16	DEC	1330	55	2.	0.2	612.4	*	16	DEC	2100	85	0.	0.0	611.9
16	DEC	0615	26	568.	27.3	619.1	*	16	DEC	1345	56	1.	0.2	612.3	*	16	DEC	2115	86	0.	0.0	611.9
16	DEC	0630	27	502.	24.1	618.9	*	16	DEC	1400	57	1.	0.2	612.3	*	16	DEC	2130	87	0.	0.0	611.9
16	DEC	0645	28	442.	21.0	618.7	*	16	DEC	1415	58	1.	0.1	612.2	*	16	DEC	2145	88	0.	0.0	611.9
16	DEC	0700	29	386.	18.1	618.4	*	16	DEC	1430	59	1.	0.1	612.2	*	16	DEC	2200	89	0.	0.0	611.9
16	DEC	0715	30	334.	15.3	618.2	*	16	DEC	1445	60	1.	0.1	612.1	*	16	DEC	2215	90	0.	0.0	611.9

PEAK FLOW (CFS)	TIME (HR)		6-HR	MAXIMUM AVERAGE FLOW 24-HR	72-HR	22.25-HR
838.	4.75	(CFS)	499.	142.	142.	142.
		(INCHES)	3.581	3.846	3.846	3.846
		(AC-FT)	243.	260.	260.	260.

PEAK STORAGE (AC-FT)	TIME (HR)	6-HR	MAXIMUM AVERAGE STORAGE 24-HR	72-HR	22.25-HR
39.	4.75	23.	7.	7.	7.

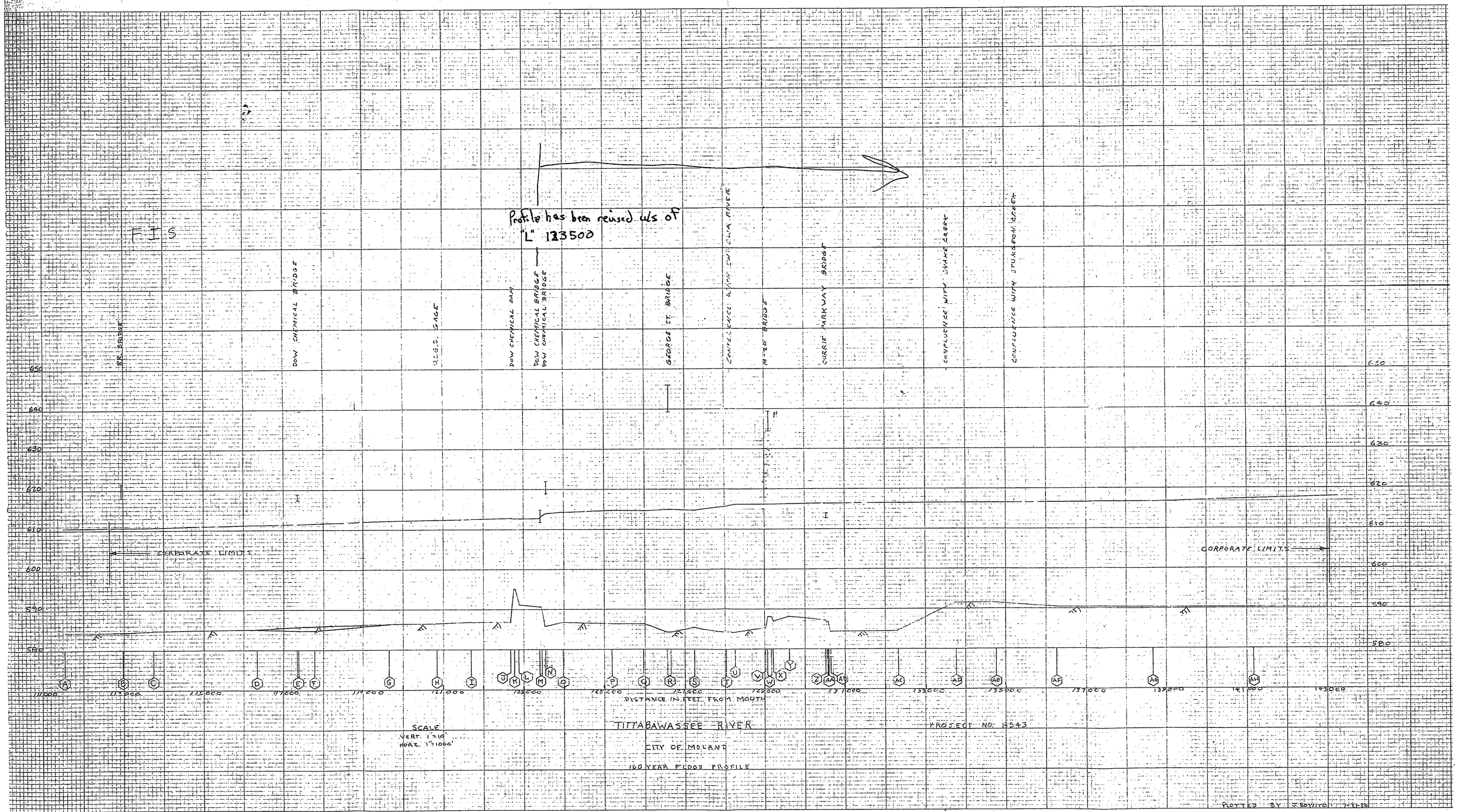
PEAK STAGE (FEET)	TIME (HR)	6-HR	MAXIMUM AVERAGE STAGE 24-HR	72-HR	22.25-HR
619.88	4.75	618.60	614.30	614.30	614.30

CUMULATIVE AREA = 1.27 SQ MI

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

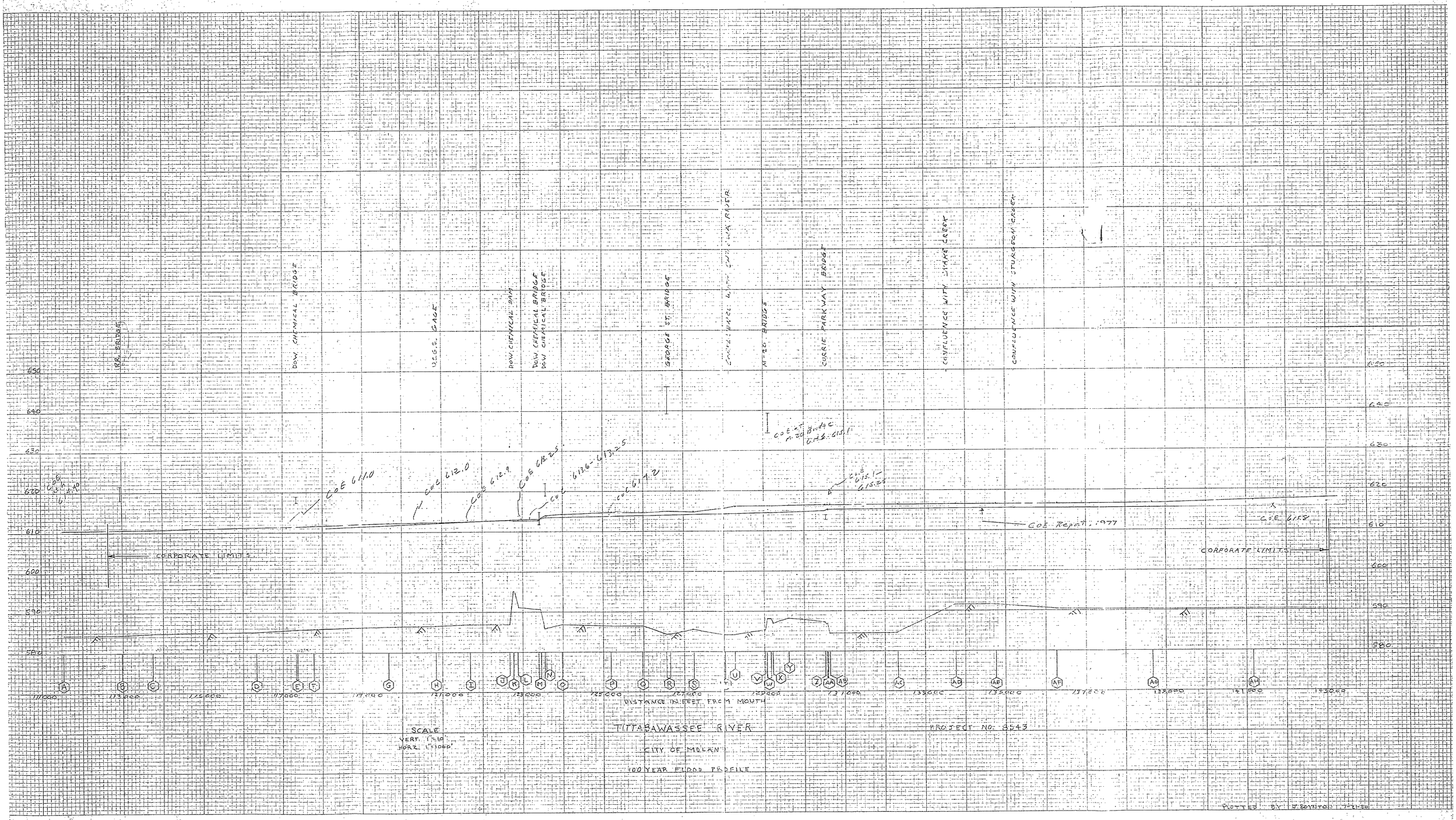
OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	EXPS	269.	5.25	183.	90.	90.	1.00		
ROUTED TO	EXPS	231.	6.00	181.	90.	90.	1.00	637.29	6.00
ROUTED TO	WACK	230.	6.00	181.	90.	90.	1.00	637.19	6.00
HYDROGRAPH AT	WACK	250.	4.50	134.	38.	38.	0.39		
2 COMBINED AT	WACK	401.	5.25	304.	129.	129.	1.39		
ROUTED TO	DILL	388.	5.75	297.	128.	128.	1.39	633.93	5.75
HYDROGRAPH AT	DILL	173.	3.50	75.	21.	21.	0.21		
HYDROGRAPH AT	DILL	358.	3.00	134.	36.	36.	0.34		
3 COMBINED AT	DILL	603.	3.50	461.	185.	185.	1.94		
ROUTED TO	WHEEL	479.	5.75	418.	185.	185.	1.94	630.15	5.75
DIVERSION TO	DFLO	46.	5.75	15.	4.	4.	1.94		
HYDROGRAPH AT	WHEEL	433.	5.75	402.	181.	181.	1.94		
HYDROGRAPH AT	WHEEL	329.	4.25	161.	45.	45.	0.57		
2 COMBINED AT	WHEEL	732.	4.25	556.	226.	226.	2.51		
ROUTED TO	CONFL	711.	4.75	550.	225.	225.	2.51	619.80	4.75
HYDROGRAPH AT	SAG	910.	4.25	478.	137.	137.	1.27		
HYDROGRAPH AT	SAG	46.	5.75	15.	4.	4.	0.00		
2 COMBINED AT	SAG	910.	4.25	494.	142.	142.	1.27		
ROUTED TO	CONFL	838.	4.75	489.	142.	142.	1.27	619.88	4.75

XXX NORMAL END OF HEC-1 XXX



K&E STANDARD ® CROSS SECTION 10 X 10 TO THE INCH
KEUFFEL & ESSER CO. MADE IN U.S.A.
K&E STANDARD ® CROSS SECTION 10 X 10 TO THE INCH
KEUFFEL & ESSER CO. MADE IN U.S.A.

TITTABAWASSEE MIDLAND



K&E STANDARD © CROSS SECTION 10X10 TO THE INCH
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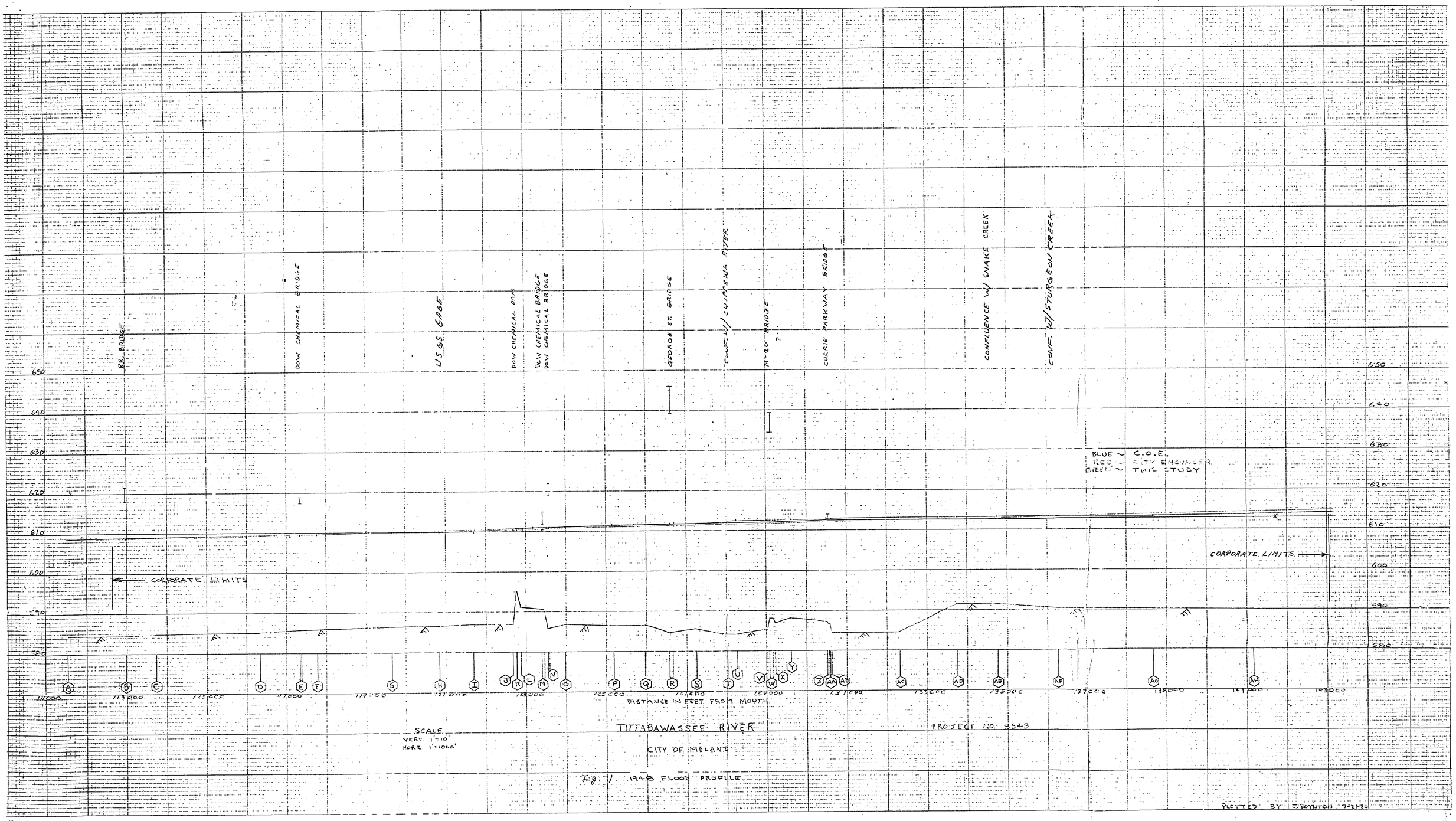
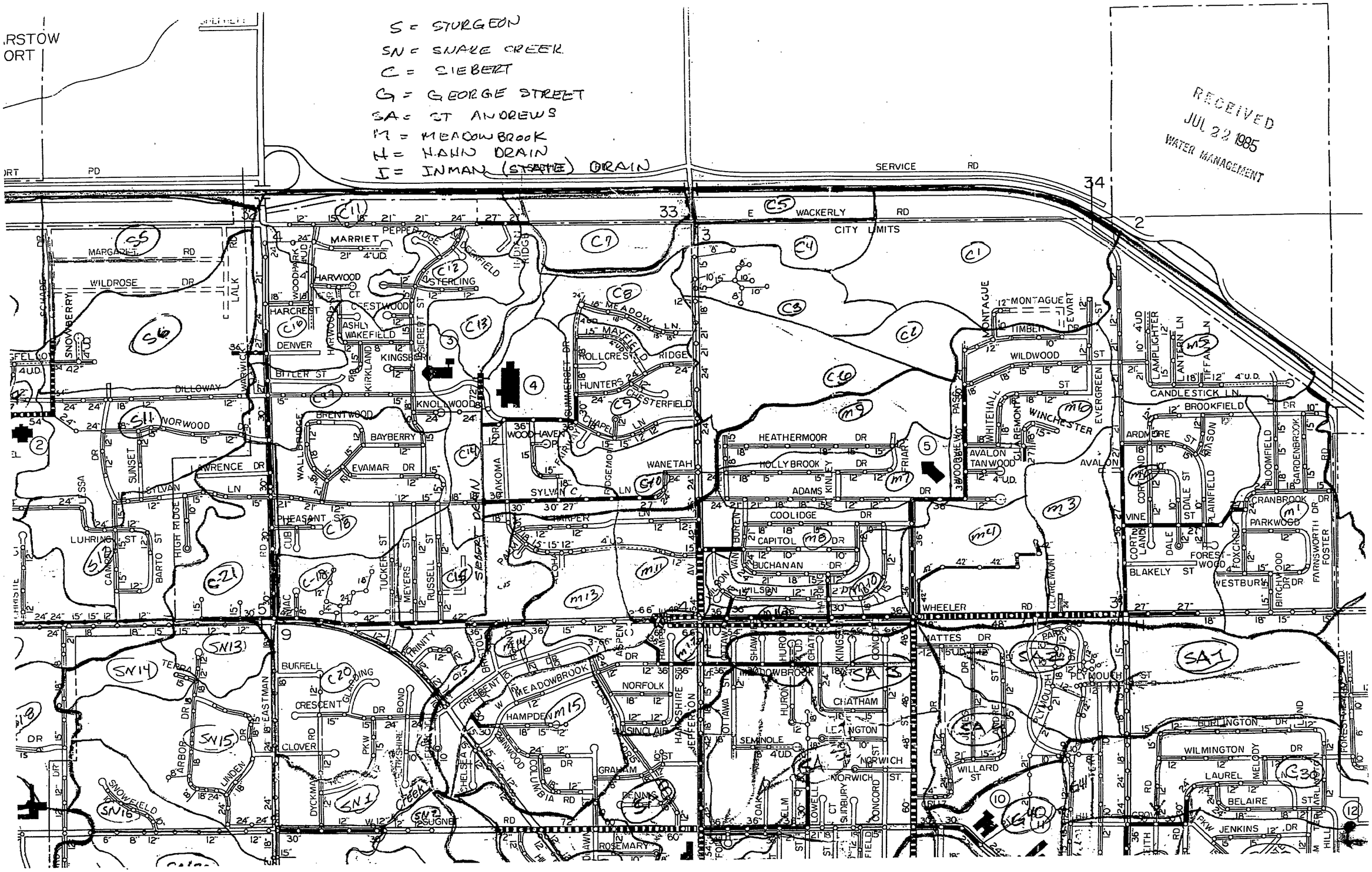
K&E STANDARD © CROSS SECTION 10X10 TO THE INCH
KEUFFEL & ESSER CO. MADE IN U.S.A.

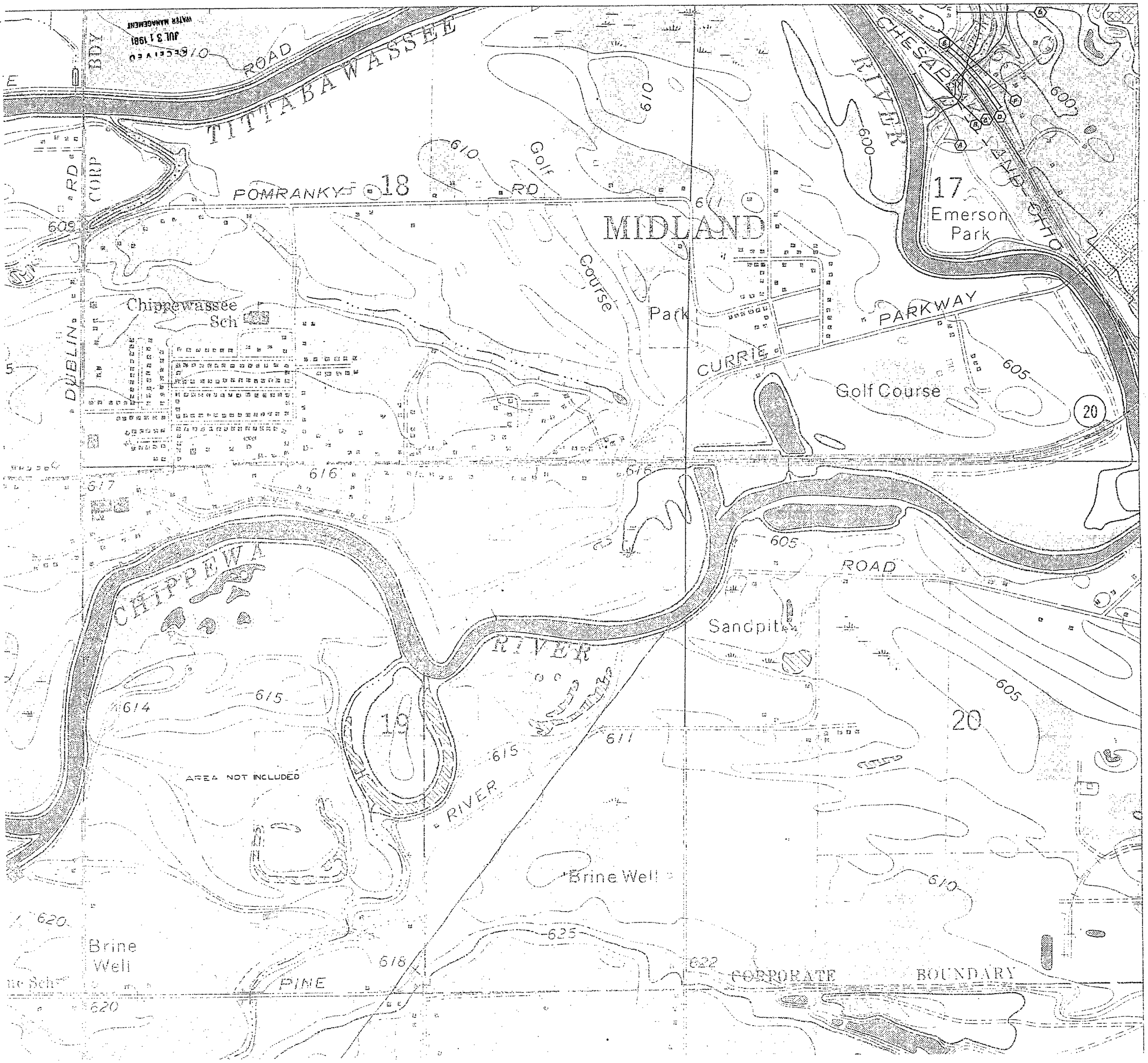
TITTABAWASSEE MIDLAND



K+E STANDARD ® CROSS SECTION 10 X 10 TO THE INCH
KEUFFEL & ESSER CO. MADE IN U.S.A.
K+E STANDARD ® CROSS SECTION 10 X 10 TO THE INCH
KEUFFEL & ESSER CO. MADE IN U.S.A.

TITTABAWASSEE
MIDLAND


S = STURGEON
SN = SNAKE CREEK
C = SIEBERT
G = GEORGE STREET
SA = ST ANDREWS
M = MEADOWBROOK
H = HAHN DRAIN
I = INMAN (STARKE) DRAIN
SERVICE RD
E WACKERLY RD
CITY LIMITS
MARRIET
PEPPERRIDGE
HARWOOD
STERLING
HARCREST
WESTWOOD
ASHLY
WAKEFIELD
DENVER
KINGSBERY
BITLER ST
DILLOWAY
KNOLLWOOD
BRENTWOOD
BAYBERRY
EVAMAR DR
LAWRENCE DR
SYLVAN LN
PHEASANT ST
LUHRING ST
MEADOW LN
MAYFIELD RIDGE
ROLLCREST
HUNTERS
CHESTERFIELD
WANETAH
HEATHERMOOR DR
HOLLYBROOK DR
ADAMS
COOLIDGE DR
CAPITOL DR
BUCHANAN DR
WILSON
WHEELER RD
MATTES DR
MONTAGUE
TIMBER
WILDWOOD ST
WHITEHALL
WINCHESTER
AVALON
TANWOOD
CANDLESTICK LN
BROOKFIELD DR
ARDMORE
CORTLAND
DALE ST
VINE
BLAKELY ST
CRANBROOK DR
PARKWOOD
FOREST WOOD
WESTBURY
BLOOMFIELD
GARDENBROOK
PLAINFIELD
BURRELL
CRESCENT DR
CLOVER
MEADOWBROOK
HAMPDEN
NORFOLK
SINCLAIR
GRAHAM
DENNIS
ROSEMARY
CHATHAM
LEXINGTON
SEMINOLE
NORWICH
WILLARD ST
PLYMOUTH ST
BURLINGTON DR
WILMINGTON DR
LAUREL
BELAIRE
JENKINS DR
SNOWFIELD
EASTMAN
SCHADE
SNOWBERRY
MARGARET RD
WILDROSE DR
LALK
SUNSET
LESSA
CANDO
BARTO ST
HIGH RIDGE
TUCKER ST
MEYERS ST
RUSSELL ST
SIEBERT DRAIN
SIEBERT ST
SUMMERSET DR
OAKOMA
WOODHAVEN
CHAPEL LN
EDGEMOOR
FRIAR
WOODBELMONT PASS
CLAREMONT
EVERGREEN
LAMPLIGHTER
LANTERN LN
TIFFANY LN
MATSON
FOSTER
FARNSWORTH
BIRCHWOOD
DARWOOD
FOXCROFT
CORTLAND
VAN BUREN
HARDING
WILSON
TRINITY
BRISTOL
ASPEN
HAMPSHIRE
JEFFERSON
OTTAWA
HURON
SHAWNEE
KINGSLEY
CONCORD
OAKLAND
ELM
LOWELL CT
SUDBURY
FIELD
ANDRE
PARK
TERRA
LINDEN
ARBOR
DYCKMAN
COLUMBIA RD
CHELSEA
Creek
RECEIVED
JUL 22 1985
WATER MANAGEMENT



Snake Creek

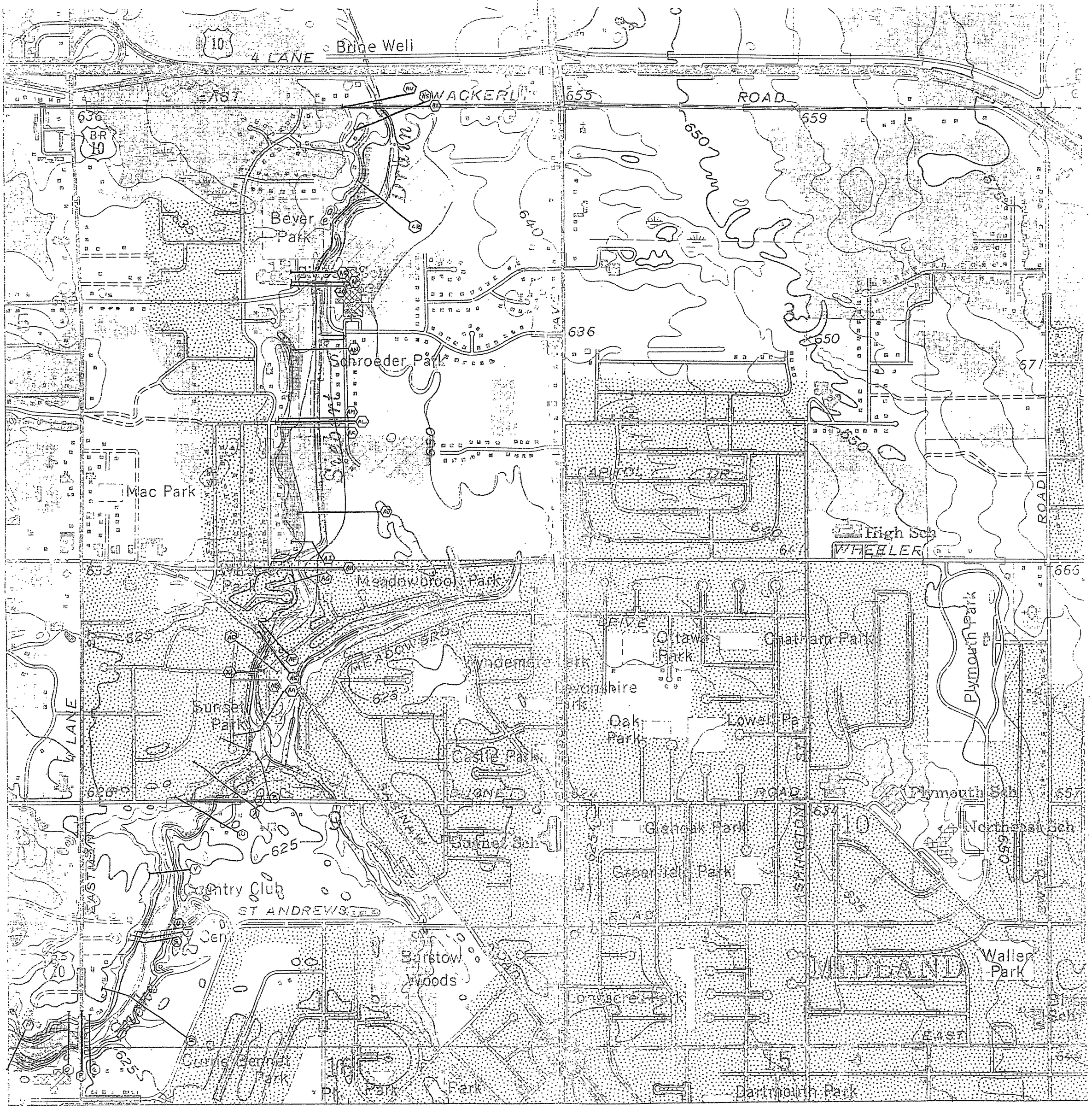
— FLOODWAY

SCALE IN FEET
0 500 1000

N

MIDLAND
MIDLAND COUNTY, MICHIGAN
7/31/81

3 OF 4



Delineation Superseded by MPS Study

From original FIS

100 YR. FLOOD

FLOOD WAY

SCALE IN FEET

0 500 1000

N

MIDLAND
MIDLAND COUNTY, MICHIGAN

4 OF 4