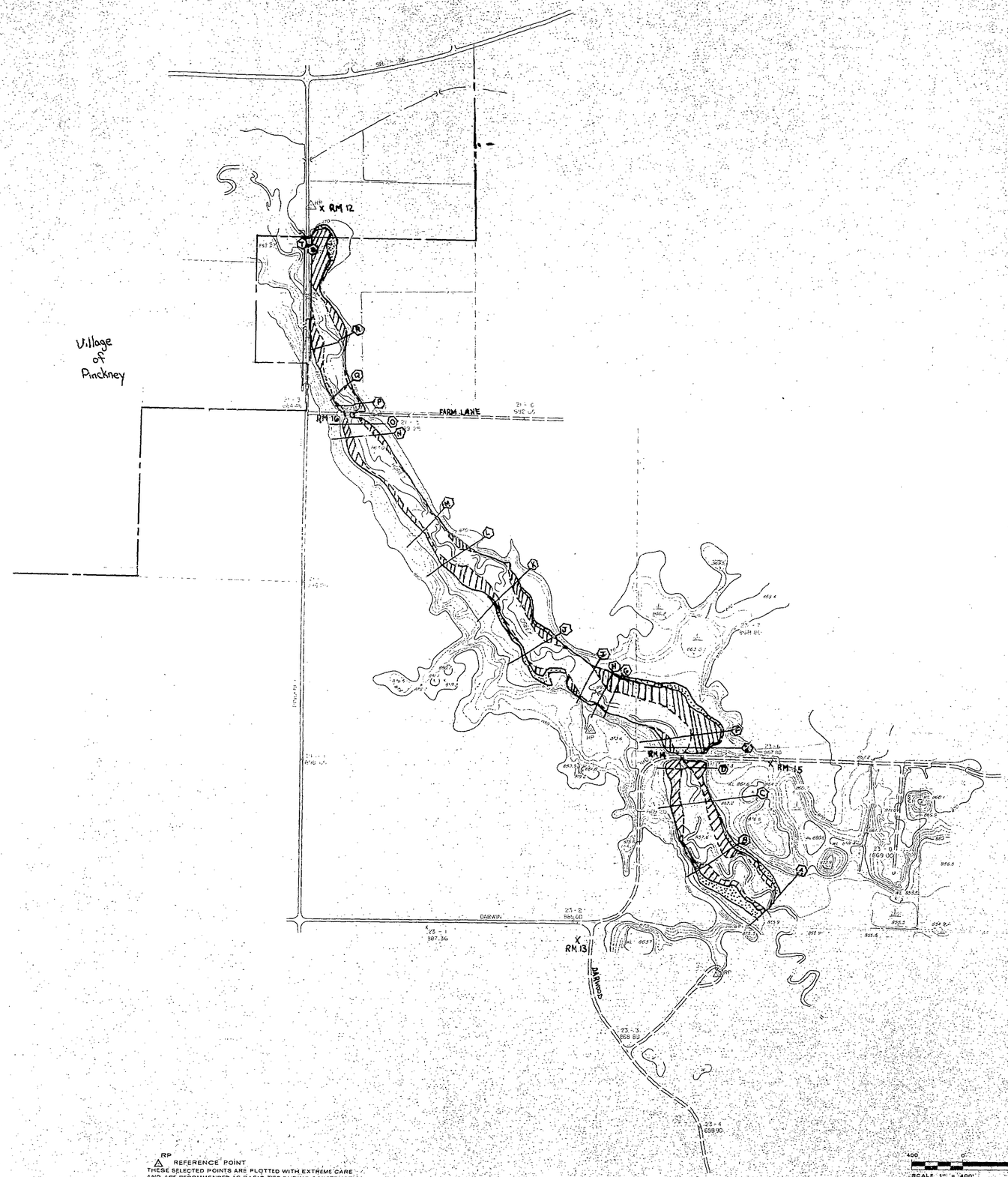


Putnam Township Flood Insurance Study
Livingston County
Honey Creek

LEGEND
500 YEAR FLOOD BOUNDARY
100 YEAR FLOOD BOUNDARY
FLOODWAY BOUNDARY
FLOODWAY
FLOODWAY BOUNDARY
100 YEAR FLOOD BOUNDARY
500 YEAR FLOOD BOUNDARY
CORPORATE LIMITS
CROSS SECTION LOCATION

N

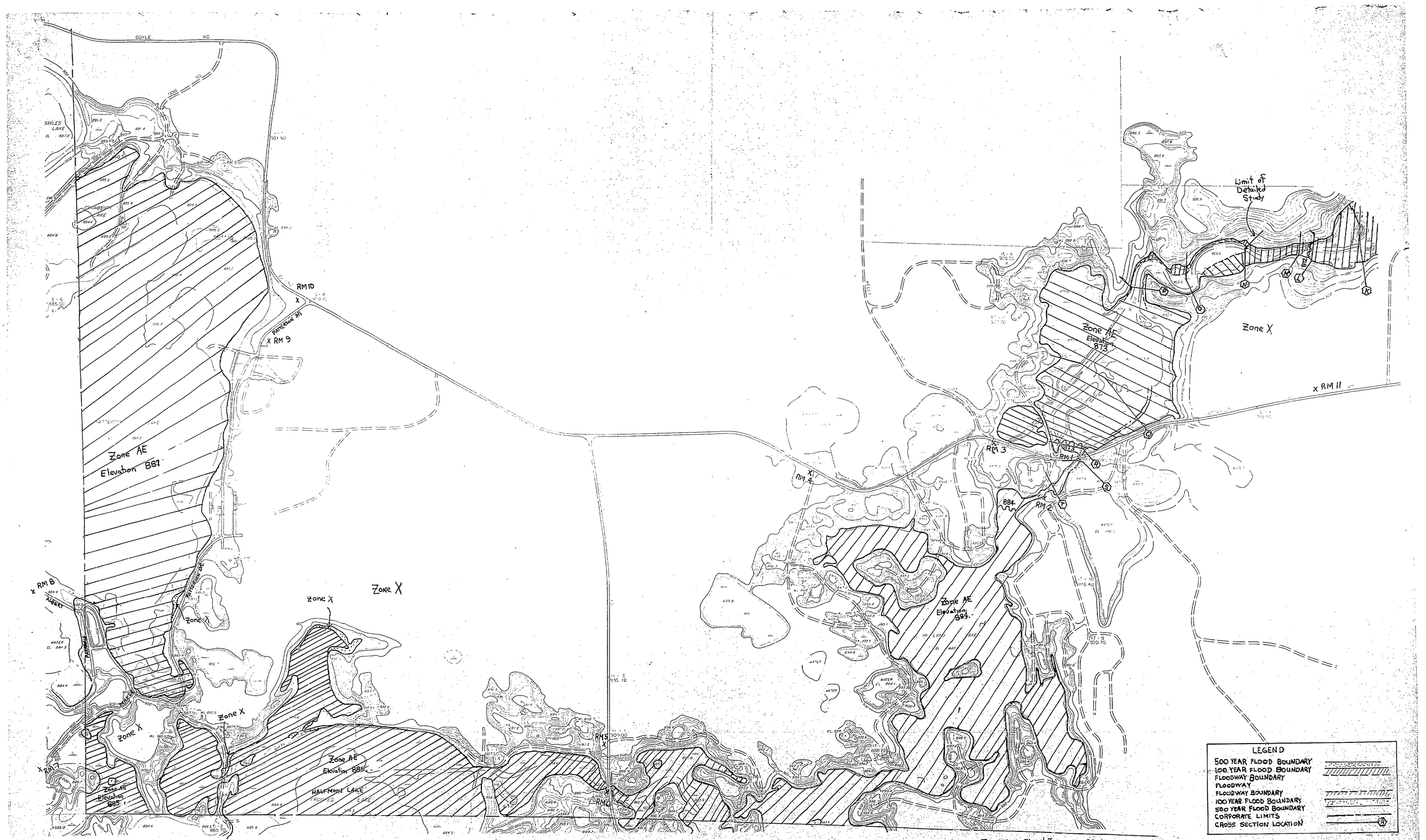
ABRAMS
AERIAL SURVEY CORPORATION
524 N. LARCH ST., LANSING, MICHIGAN 48910

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

400 0 400 800 1200
SCALE 1" = 400'
CONTOUR INTERVAL 2'
DATE OF PHOTOGRAPHY MARCH 1985
DATE OF MAPPING NOVEMBER 1985

PINCKNEY, MICHIGAN

A.A.S.C. 19613



Putnam Township Flood Insurance Study
Portage River

00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: FLOOD PLAIN MANAGEMENT STUDY

3) WATERCOURSE: NORTH ORE CREEK

4) DOCUMENT TYPE: 100-YEAR NATURAL

00BREAK00

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
WSP2       20.
TITLE      NORTH ORE CREEK - FPMS - LIVINGSTON CO., MI
TITLE      FLOOD PLAIN MANAGEMENT STUDY - PRESENT CONDITIONS
DISCHARGE  -1.        385.       975.       1520.      1720.      2470.
STARTE     12.2       907.6      908.2      908.8      908.9      909.5
TRIB       12.75      14.35      14.9       17.55      18.55      18.65
TRIB       18.85      19.1
OUTPUT     PSK
REACH      12.2       1.         1.         1.
SEGMENT    12.2       1          N          -55.
NVALUE     0.04
SEGMENT    12.2       2          C          40.
NVALUE     0.03
SEGMENT    12.2       3          N          150.       917.0
NVALUE     0.04
SECTION    12.2
           -190.      917.0      -186.      913.76     -160.      912.0
           -145.      910.0      -80.       908.0      -55.       906.0
           -12.5      904.7      12.5       904.7      40.        906.0
           65.0       908.0      150.       908.0      150.       917.0
ENDTABLE
REACH      12.55      1.         5168.      5168.
SEGMENT    12.55      1          N          -30.
NVALUE     0.10
SEGMENT    12.55      2          C          42.
NVALUE     0.05
SEGMENT    12.55      3          N          154.
NVALUE     0.10
SECTION    12.55
           -408.      914.       -380.      906.       -30.       904.6
           -15.       902.       18.        902.       42.        906.
           57.        910.       154.       914.
ENDTABLE
REACH      12.65      1.         610.       410.
SEGMENT    12.65      1          N          -50.
NVALUE     0.10
SEGMENT    12.65      2          C          175.
NVALUE     0.05
SEGMENT    12.65      3          N          227.
NVALUE     0.10
SECTION    12.65
           -290.      916.       -225.      912.       -210.      908.
           -155.      908.       -50.       906.       -35.       902.1
           55.        902.1      175.       906.       227.       910.
           228.       916.
```

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
ENDTABLE
REACH     12.75     1.        290.      220.
SEGMENT   12.75     1         N         -10.
NVALUE    0.10
SEGMENT   12.75     2         C         10.
NVALUE    0.05
SEGMENT   12.75     3         N         155.
NVALUE    0.10
SECTION   12.75
          -150.     916.0     -135.     914.0     -130.     912.0
          -110.     910.0     -100.     908.0     -55.      906.0
          -25.      906.0     -10.      905.9     -9.       902.2
          10.       905.9     60.       906.0     70.       908.0
          80.       910.0     90.       912.0     100.      914.0
          130.      915.      155.      916.0     9.        902.2
ENDTABLE
--------------------DATA POINTS ON SECTION 12.75  REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
COMPUTE   12.2      12.75     12.2
-----------------------------END OF 80/80 LIST-----------------------------
```

COMPUTE 12.2 12.75 12.2

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

RATING TABLE FOR SECTION 12.2 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION S OPE
0	904.7	0.0	0.0						
BANK FULL	906.0	78.5	172.6	.00	.00	.00			
1	907.6	262.6	385.0	.00	.00	.00	385.00	906.0	.0032
2	908.2	369.7	975.0	.00	.00	.00	975.00	906.7	.0093
3	908.8	513.2	1520.0	.00	.00	.00	1520.00	907.2	.0106
4	908.9	538.2	1720.0	.00	.00	.00	1720.00	907.3	.0121
5	909.5	699.6	2470.0	.00	.00	.00	2470.00	908.0	.0130

SEGMENT TABLE FOR SECTION 12.2

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	385.	9.	366.	9.
385.	VELOCITY FPS	1.56	.58	1.59	.58
2	DISCHARGE CFS	975.	34.	902.	38.
975.	VELOCITY FPS	3.04	1.10	3.14	.75
3	DISCHARGE CFS	1520.	72.	1306.	142.
1520.	VELOCITY FPS	3.57	1.29	3.80	1.25
4	DISCHARGE CFS	1720.	84.	1463.	173.
1720.	VELOCITY FPS	3.86	1.39	4.14	1.39
5	DISCHARGE CFS	2470.	161.	1946.	363.
2470.	VELOCITY FPS	4.29	1.63	4.74	1.91
1	ELEV 907.6 KD	21519.	504.	20512.	504.
2	ELEV 908.2 KD	32028.	1109.	29688.	1230.
3	ELEV 908.8 KD	46422.	2184.	40167.	4072.
4	ELEV 908.9 KD	49435.	2425.	42050.	4960.
5	ELEV 909.5 KD	68494.	4476.	53950.	10067.

KD TABLE FOR CROSS SECTION 12.2

ELEVATION	AREA	KD	KD BY SEGMENT		
904.70	0.				
905.	10.	194.	1.	192.	1.
906.	78.	3462.	2.	3458.	2.
907.	186.	13053.	142.	12755.	142.
908.	332.	28321.	878.	26467.	936.
909.	565.	52359.	2702.	43938.	5619.
910.	845.	87214.	7132.	64721.	15090.
911.	1142.	132403.	15455.	88647.	28195.
912.	1448.	186362.	26812.	115469.	44045.
913.	1767.	247373.	39927.	145034.	62321.
914.	2097.	317294.	56872.	177256.	83027.
915.	2434.	397534.	79552.	212011.	105865.
916.	2772.	485340.	105361.	249211.	130688.
917.	3111.	580804.	134507.	288821.	157641.
918.	3450.	685354.	168466.	330888.	187384.
919.	3789.	799073.	207582.	375361.	219965.
920.	4128.	922039.	252195.	422196.	255426.

RATING TABLE FOR SECTION 12.55 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	902.0	0.0	0.0						
BANK FULL	904.6	132.6	169.7	.00	.00	.00			
1	907.9	1279.8	385.0	.00	.00	.00	385.00	903.5	.0005
2	909.0	1746.6	975.0	.00	.00	.00	975.00	904.9	.0012
3	909.8	2134.4	1520.0	.00	.00	.00	1520.00	905.4	.0017
4	910.1	2235.0	1720.0	.00	.00	.00	1720.00	905.5	.0018
5	910.9	2645.2	2470.0	.00	.00	.00	2470.00	905.8	.0023

SEGMENT TABLE FOR SECTION 12.55

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	385.	175.	209.	1.
385.	VELOCITY FPS	.46	.19	.59	.10
2	DISCHARGE CFS	975.	502.	470.	4.
975.	VELOCITY FPS	.81	.39	1.08	.21
3	DISCHARGE CFS	1520.	830.	682.	8.
1520.	VELOCITY FPS	1.00	.52	1.38	.29
4	DISCHARGE CFS	1720.	950.	761.	10.
1720.	VELOCITY FPS	1.07	.56	1.49	.31
5	DISCHARGE CFS	2470.	1417.	1037.	16.
2470.	VELOCITY FPS	1.29	.70	1.80	.29
1	ELEV 907.9 KD	56041.	25247.	30703.	91.
2	ELEV 909.0 KD	87752.	45006.	42441.	306.
3	ELEV 909.8 KD	118153.	64403.	53138.	612.
4	ELEV 910.1 KD	126633.	69885.	56040.	708.
5	ELEV 910.9 KD	162096.	92946.	68100.	1050.

KD TABLE FOR CROSS SECTION 12.55

ELEVATION	AREA	KD	KD BY SEGMENT		
902.00	0.				
903.	39.	1053.	1.	1051.	1.
904.	90.	3604.	1.	3602.	1.
905.	172.	7903.	102.	7800.	1.
906.	472.	16965.	2875.	13848.	2.
907.	892.	34474.	12324.	22007.	15.
908.	1325.	58903.	26924.	31767.	105.
909.	1765.	89160.	45867.	42921.	318.
910.	2212.	124763.	68688.	55382.	692.
911.	2676.	165017.	94874.	69063.	1080.
912.	3169.	210613.	124397.	83925.	2291.
913.	3689.	261493.	157103.	99924.	4466.
914.	4237.	317711.	192869.	117020.	7822.
915.	4786.	380043.	232920.	135320.	13099.
916.	5334.	448606.	277380.	154804.	21113.
917.	5882.	523509.	326368.	175457.	32928.

RATING TABLE FOR SECTION 12.65 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	902.1	0.0	0.0						
BANK FULL	906.0	616.5	258.4	.00	.00	.00			
1	907.9	1173.3	385.0	.00	.00	.00	385.00	902.9	.0002
2	909.0	1614.5	975.0	.00	.00	.00	975.00	903.5	.0006
3	909.9	1998.6	1520.0	.00	.00	.00	1520.00	903.9	.0008
4	910.1	2099.4	1720.0	.00	.00	.00	1720.00	904.1	.0009
5	911.0	2501.0	2470.0	.00	.00	.00	2470.00	904.5	.0011

SEGMENT TABLE FOR SECTION 12.65

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	385.	8.	375.	2.
385.	VELOCITY FPS	.36	.08	.36	.08
2	DISCHARGE CFS	975.	51.	913.	11.
975.	VELOCITY FPS	.69	.19	.71	.18
3	DISCHARGE CFS	1520.	122.	1373.	25.
1520.	VELOCITY FPS	.88	.29	.92	.25
4	DISCHARGE CFS	1720.	148.	1542.	31.
1720.	VELOCITY FPS	.95	.33	1.00	.28
5	DISCHARGE CFS	2470.	268.	2140.	62.
2470.	VELOCITY FPS	1.16	.44	1.23	.40
1	ELEV 907.9 KD	88225.	1668.	86151.	405.
2	ELEV 909.0 KD	130151.	6419.	122368.	1365.
3	ELEV 909.9 KD	171711.	13478.	155467.	2766.
4	ELEV 910.1 KD	183631.	15764.	164611.	3256.
5	ELEV 911.0 KD	233190.	25191.	202207.	5791.

KD TABLE FOR CROSS SECTION 12.65

ELEVATION	AREA	KD	KD BY SEGMENT		
902.10	0.				
903.	96.	2406.	1.	2403.	1.
904.	234.	9088.	1.	9085.	1.
905.	407.	20029.	1.	20026.	1.
906.	617.	36137.	4.	36129.	2.
907.	874.	60272.	284.	59863.	70.
908.	1208.	91462.	1891.	88927.	456.
909.	1616.	130598.	6441.	122479.	1368.
910.	2051.	177988.	14646.	160221.	3015.
911.	2497.	232809.	25090.	201849.	5762.
912.	2948.	294144.	37589.	247243.	9242.
913.	3409.	360323.	50752.	296246.	13289.
914.	3886.	432488.	65883.	348730.	17845.
915.	4381.	510723.	83274.	404540.	22828.
916.	4877.	595580.	103375.	464041.	28606.
917.	5374.	687156.	126415.	527242.	35289.
918.	5871.	785478.	152582.	594100.	42942.
919.	6367.	890571.	182063.	664578.	51634.

RATING TABLE FOR SECTION 12.75 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FR CTION S OPE
0	902.2	0.0	0.0						
BANK FULL	905.9	77.5	243.0	.00	.00	.00			
1	908.1	372.0	385.0	.00	.00	.00	385.00	904.6	.0062
2	909.3	589.9	975.0	.00	.00	.00	975.00	906.6	.0123
3	910.2	765.5	1520.0	.00	.00	.00	1520.00	907.1	.0148
4	910.5	813.8	1720.0	.00	.00	.00	1720.00	907.2	.0162
5	911.4	1007.0	2470.0	.00	.00	.00	2470.00	907.7	.0188

SEGMENT TABLE FOR SECTION 12.75

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	385.	84.	224.	77.
385.	VELOCITY FPS	1.59	.59	1.98	.66
2	DISCHARGE CFS	975.	295.	442.	238.
975.	VELOCITY FPS	2.33	1.15	3.20	1.22
3	DISCHARGE CFS	1520.	519.	600.	401.
1520.	VELOCITY FPS	2.68	1.49	3.82	1.55
4	DISCHARGE CFS	1720.	601.	657.	462.
1720.	VELOCITY FPS	2.84	1.60	4.06	1.67
5	DISCHARGE CFS	2470.	920.	853.	697.
2470.	VELOCITY FPS	3.21	1.92	4.72	2.01
1	ELEV 908.1 KD	15337.	3223.	9096.	3018.
2	ELEV 909.3 KD	27742.	8361.	12632.	6750.
3	ELEV 910.2 KD	39512.	13490.	15611.	10411.
4	ELEV 910.5 KD	42714.	14864.	16416.	11434.
5	ELEV 911.4 KD	56948.	21155.	19745.	16048.

KD TABLE FOR CROSS SECTION 12.75

ELEVATION	AREA	KD	KD BY SEGMENT		
902.20	0.				
903.	15.	357.	1.	355.	1.
904.	33.	1316.	1.	1314.	1.
905.	53.	2648.	1.	2645.	1.
906.	87.	4421.	7.	4302.	7.
907.	204.	8248.	869.	6442.	937.
908.	361.	14919.	3040.	8932.	2874.
909.	536.	24420.	6894.	11739.	5719.
910.	721.	36379.	12087.	14844.	9413.
911.	919.	50364.	18197.	18234.	13904.
912.	1132.	66797.	25650.	21897.	19225.
913.	1355.	86294.	35068.	25824.	25376.
914.	1587.	107281.	45754.	30006.	31503.
915.	1845.	127605.	56856.	34435.	36285.
916.	2110.	148999.	69134.	39108.	40864.
917.	2374.	172103.	82922.	44022.	45640.
918.	2639.	196924.	98283.	49172.	50606.
919.	2904.	223469.	115280.	54552.	55759.

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
CHANGE    DISCHARGE
DISCHARGE -1        125.      370.      605.      700.      1070.
END
REACH     12.8      1.        260.      200.
SEGMENT   12.8      1         N         -10.
NVALUE    0.10
SEGMENT   12.8      2         C         10.
NVALUE    0.05
SEGMENT   12.8      3         N         200.
NVALUE    0.10
SECTION   12.8
          -150.     913.0     -100.     909.6     -50.      909.1
          -25.      906.0     -10.      905.9      -9.      902.3
          10.       905.9     25.       905.5     50.       905.2
          125.      905.1     150.      905.1     200.      913.0
          9.        902.3
ENDTABLE
--------------------DATA POINTS ON SECTION 12.8   REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
REACH     12.9      1.        150.      150.
SEGMENT   12.9      1         N         -20.
NVALUE    0.10
SEGMENT   12.9      2         C         20.
NVALUE    0.05
SEGMENT   12.9      3         N         230.
NVALUE    0.10
SECTION   12.9
          -200.     914.0     -165.     910.0     -20.      906.0
          -15.      901.4     15.       901.4     20.       906.
          50.       910.0     200.      912.0     230.      914.0
ENDTABLE
ROAD      13.0      2.7       10.       10.
CULV1     13.0      1.        32111
CULV2     6.5       11.0      66.6      901.48    901.48
CULV1     13.0      1.        32111
CULV2     6.5       11.0      66.6      901.64    901.64
SECTION   13.0
          -300.     914.1     -250.     913.2     -200.     912.1
          -150.     911.3     -100.     910.6     -50.      910.2
          0.        910.2     50.       910.6     100.      911.0
          150.      911.1     200.      911.2     250.      911.2
          300.      910.8     300.      914.1
ENDTABLE
REACH     13.1      1.        10.       10.
REACH2    12.9      0.15
REACH     13.55     1.        190.      160.
SEGMENT   13.55     1         N         -15.
```

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
NVALUE     0.10
SEGMENT    13.55     2         C         15.
NVALUE     0.05
SEGMENT    13.55     3         N         50.
NVALUE     0.10
SECTION    13.55
           -350.     916.0     -280.     914.0     -260.     912.
           -250.     910.0     -240.     908.0     -150.     906.2
           -15.      906.0     -9.       902.4     15.       906.0
           20.       908.0     30.       910.0     35.       912.0
           40.       914.0     50.       916.0     9.        902.4
ENDTABLE
--------------------DATA POINTS ON SECTION 13.55  REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
REACH      13.75     1.        550.      400.
SEGMENT    13.75     1         N         -10.
NVALUE     0.10
SEGMENT    13.75     2         C         15.
NVALUE     0.05
SEGMENT    13.75     3         N         245.
NVALUE     0.10
SECTION    13.75
           -35.      916.0     -30.      914.0     -25.      912.0
           -18.      910.0     -12.      908.0     -10.      906.0
           -9.       902.6     15.       906.0     80.       906.2
           155.      908.0     220.      910.0     230.      912.0
           240.      914.0     245.      916.0     9.        902.6
ENDTABLE
--------------------DATA POINTS ON SECTION 13.75  REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
REACH      13.9      1.        450.      350.
SEGMENT    13.9      1         N         -10.
NVALUE     0.10
SEGMENT    13.9      2         C         10.
NVALUE     0.05
SEGMENT    13.9      3         N         30.       916.0
NVALUE     0.10
SECTION    13.9
           -100.     916.0     -100.     911.5     -75.      908.8
           -50.      907.3     -25.      907.4     -10.      906.4
           -9.       902.8     10.       906.6     20.       909.2
           25.       911.0     30.       913.8     30.       916.0
           9.        902.8
ENDTABLE
--------------------DATA POINTS ON SECTION 13.9   REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
ROAD       14.0      2.7       60.       50.
BPR        14.0      A         1.
GIRDER     912.12    911.82    0.        .8        2.7
           -10.      914.23    -10.      911.82    10.       911.82
           10.       914.23
```

```
----------------------------80/80 LIST OF INPUT DATA----------------------------
ENDTABLE
SECTION   14.0
          -400.     920.0     -400.     911.43    -350.     910.33
          -300.     909.83    -250.     909.83    -100.     911.73
          -50.      912.83    -10.      914.23    10.       914.23
          50.       916.73    100.      919.73    -9.9      903.67
          9.9       903.67
ENDTABLE
--------------------DATA POINTS ON SECTION 14.0   REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
REACH     14.25     1.        100.      90.
SEGMENT   14.25     1         N         -8.
NVALUE    0.09
SEGMENT   14.25     2         C         8.
NVALUE    0.05
SEGMENT   14.25     3         N         115.
NVALUE    0.09
SECTION   14.25
          -130.     918.0     -120.     916.0     -80.      916.0
          -75.      914.0     -60.      912.0     -50.      910.0
          -40.      908.0     -6.       903.7     50.       908.0
          65.       910.0     80.       912.0     100.      914.0
          110.      916.0     115.      918.0     6.        903.7
          -8.       908.0     8.        908.0
ENDTABLE
--------------------DATA POINTS ON SECTION 14.25  REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
REACH     14.35     1.        240.      230.
SEGMENT   14.35     1         N         -10.
NVALUE    0.09
SEGMENT   14.35     2         C         10.
NVALUE    0.05
SEGMENT   14.35     3         N         70.
NVALUE    0.09
SECTION   14.35
          -300.     916.0     -285.     910.0     -275.     907.5
          -10.      907.5     -6.       903.8     10.       907.5
          40.       908.0     50.       910.0     70.       916.0
          6.        903.8
ENDTABLE
--------------------DATA POINTS ON SECTION 14.35  REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
COMPUTE   12.8      14.35     12.75
----------------------------END OF 80/80 LIST----------------------------
```

```
COMPUTE   12.8      14.35     12.75

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

RATING TABLE FOR SECTION 12.8 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	902.3	0.0	0.0						
BANK FULL	905.9	163.4	77.5	.00	.00	.00			
1	908.1	594.2	125.0	.00	.00	.00	125.00	903.4	.0003
2	909.4	882.9	370.0	.00	.00	.00	370.00	904.6	.0008
3	910.4	1149.4	605.0	.00	.00	.00	605.00	905.6	.0011
4	910.6	1227.0	700.0	.00	.00	.00	700.00	905.7	.0012
5	911.6	1531.8	1070.0	.00	.00	.00	1070.00	906.0	.0016

SEGMENT TABLE FOR SECTION 12.8

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	125.	6.	46.	73.
125.	VELOCITY FPS	.28	.12	.41	.17
2	DISCHARGE CFS	370.	21.	113.	236.
370.	VELOCITY FPS	.54	.20	.81	.37
3	DISCHARGE CFS	605.	49.	163.	392.
605.	VELOCITY FPS	.67	.27	1.03	.49
4	DISCHARGE CFS	700.	65.	182.	453.
700.	VELOCITY FPS	.72	.30	1.12	.53
5	DISCHARGE CFS	1070.	132.	251.	687.
1070.	VELOCITY FPS	.87	.41	1.37	.67
1	ELEV 908.1 KD	24225.	1134.	9009.	14082.
2	ELEV 909.4 KD	41647.	2378.	12714.	26555.
3	ELEV 910.4 KD	58529.	4728.	15816.	37985.
4	ELEV 910.6 KD	63592.	5661.	16684.	41248.
5	ELEV 911.6 KD	85779.	10439.	20193.	55147.

KD TABLE FOR CROSS SECTION 12.8

ELEVATION	AREA	KD	KD BY SEGMENT		
902.30	0.				
903.	13.	288.	1.	285.	1.
904.	31.	1203.	1.	1200.	1.
905.	59.	2540.	1.	2502.	11.
906.	182.	5659.	3.	4121.	1470.
907.	369.	12762.	290.	6253.	6171.
908.	571.	23017.	1034.	8726.	13238.
909.	791.	35932.	2064.	11517.	22330.
910.	1046.	51704.	3620.	14610.	33413.
911.	1341.	71740.	7298.	17990.	46334.
912.	1658.	95538.	12708.	21646.	61094.
913.	1981.	123418.	20367.	25574.	78100.
914.	2305.	155824.	31294.	29767.	97671.
915.	2629.	193012.	46416.	34218.	119925.
916.	2952.	235226.	66820.	38921.	144976.

RATING TABLE FOR SECTION 12.9 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FR CTION S OPE
0	901.4	0.0	0.0						
BANK FULL	906.0	161.6	85.7	.00	.00	.00			
1	908.1	345.9	125.0	.00	.00	.00	125.00	902.2	.0003
2	909.4	550.5	370.0	.00	.00	.00	370.00	903.0	.0010
3	910.4	757.4	605.0	.00	.00	.00	605.00	903.7	.0015
4	910.6	829.9	700.0	.00	.00	.00	700.00	903.9	.0017
5	911.6	1134.0	1070.0	.00	.00	.00	1070.00	904.7	.0023

SEGMENT TABLE FOR SECTION 12.9

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	125.	7.	117.	1.
125.	VELOCITY FPS	.46	.08	.48	.08
2	DISCHARGE CFS	370.	44.	317.	9.
370.	VELOCITY FPS	.99	.21	1.07	.21
3	DISCHARGE CFS	605.	111.	478.	17.
605.	VELOCITY FPS	1.27	.32	1.42	.22
4	DISCHARGE CFS	700.	141.	536.	23.
700.	VELOCITY FPS	1.38	.37	1.55	.23
5	DISCHARGE CFS	1070.	271.	738.	61.
1070.	VELOCITY FPS	1.62	.50	1.91	.29
1	ELEV 908.1 KD	24531.	1204.	23080.	248.
2	ELEV 909.4 KD	37121.	4444.	31764.	913.
3	ELEV 910.4 KD	49293.	8972.	38960.	1361.
4	ELEV 910.6 KD	53111.	10475.	40967.	1670.
5	ELEV 911.6 KD	70644.	17781.	49061.	3801.

KD TABLE FOR CROSS SECTION 12.9

ELEVATION	AREA	KD	KD BY SEGMENT		
901.40	0.				
902.	18.	382.	1.	380.	1.
903.	51.	1947.	1.	1945.	1.
904.	85.	4379.	1.	4377.	1.
905.	122.	7560.	1.	7558.	1.
906.	162.	11510.	2.	11507.	2.
907.	223.	16763.	170.	16558.	35.
908.	331.	23747.	1051.	22403.	216.
909.	481.	32829.	3130.	28940.	644.
910.	678.	44402.	6920.	36128.	1175.
911.	938.	59410.	12960.	43943.	2265.
912.	1276.	79120.	20994.	52358.	5394.
913.	1666.	104077.	30652.	61353.	11706.
914.	2070.	134282.	42615.	70934.	22631.
915.	2473.	169912.	57774.	81107.	41601.
916.	2877.	211436.	76651.	91862.	73238.
917.	3281.	259321.	99808.	103187.	124191.

ROAD SECTION 13.0

NO.	HW	CFS	HL	TW	CSM
0	901.48	0.00	0.00	0.00	0.00
1	908.11	125.00	.00	908.11	125.00
2	909.88	370.00	.48	909.40	370.00
3	910.85	605.00	.48	910.37	605.00
4	911.03	700.00	.40	910.63	700.00
5	911.70	1070.00	.08	911.62	1070.00

MIN ROAD ELEVATION 910.20

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	32111.	6.77	10.22	66.60	901.48	901.48	.032
2	1	32111.	6.77	10.22	66.60	901.64	901.64	.032

RATING TABLE FOR SECTION 13.1 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	901.5	0.0	0.0						
BANK FULL	906.1	161.6	87.7	.00	.00	.00			
1	908.1	325.5	125.0	.00	.00	.00	125.00	902.4	.0003
2	909.9	621.2	370.0	.00	.00	.00	370.00	903.2	.0008
3	910.9	851.3	605.0	.00	.00	.00	605.00	903.8	.0012
4	911.0	902.8	700.0	.00	.00	.00	700.00	904.0	.0015
5	911.7	1108.6	1070.0	.00	.00	.00	1070.00	904.8	.0024

SEGMENT TABLE FOR SECTION 13.1

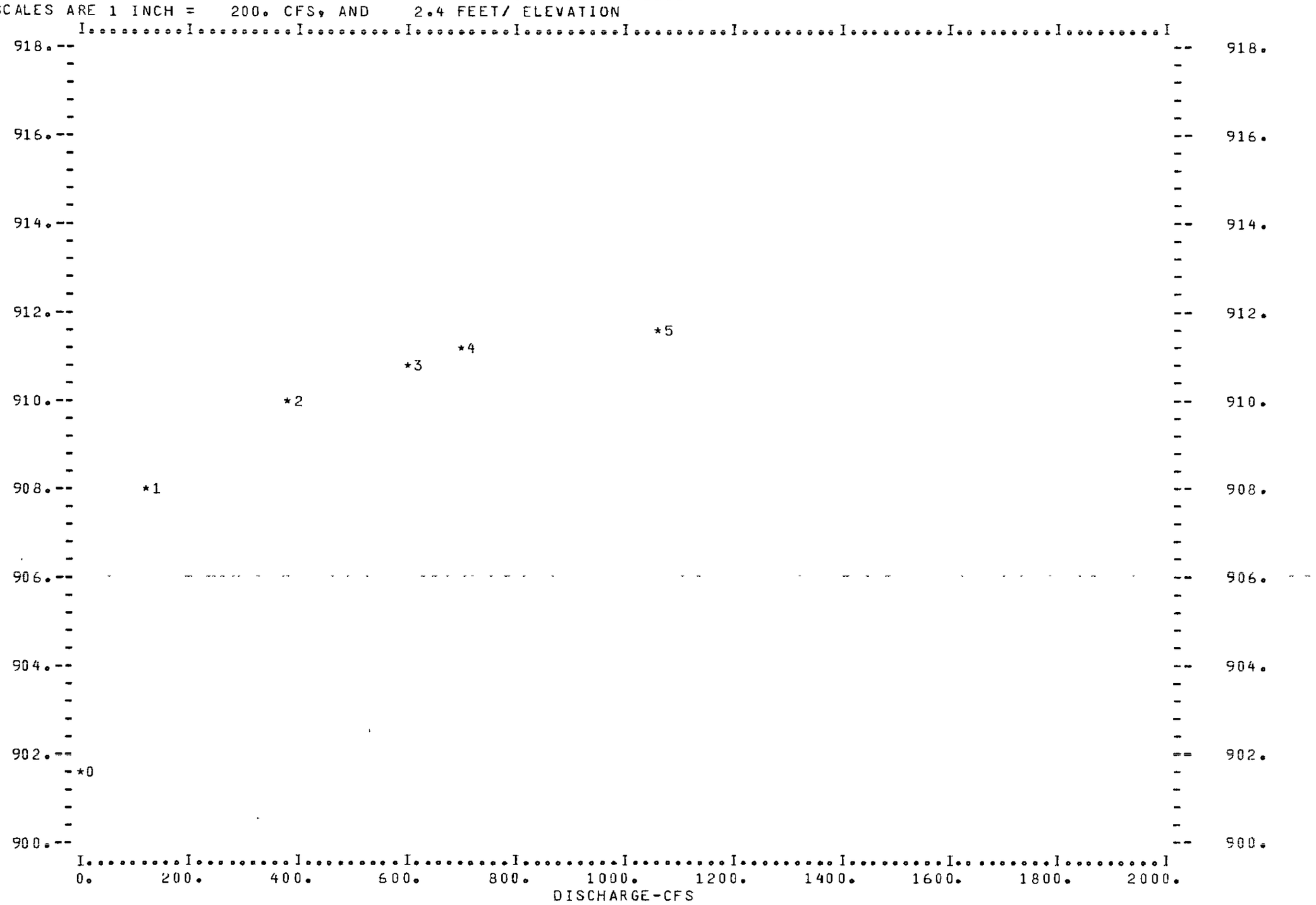
CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	125.	6.	118.	1.
125.	VELOCITY FPS	.48	.08	.49	.08
2	DISCHARGE CFS	370.	54.	307.	10.
370.	VELOCITY FPS	.91	.21	.99	.17
3	DISCHARGE CFS	605.	124.	460.	21.
605.	VELOCITY FPS	1.17	.32	1.32	.20
4	DISCHARGE CFS	700.	152.	522.	27.
700.	VELOCITY FPS	1.29	.36	1.46	.21
5	DISCHARGE CFS	1070.	267.	745.	58.
1070.	VELOCITY FPS	1.65	.51	1.94	.29
1	ELEV 908.1 KD	23353.	998.	22150.	205.
2	ELEV 909.9 KD	40904.	5701.	34150.	1052.
3	ELEV 910.9 KD	54259.	10933.	41550.	1775.
4	ELEV 911.0 KD	57124.	12105.	42966.	2054.
5	ELEV 911.7 KD	69295.	17249.	48481.	3565.

KD TABLE FOR CROSS SECTION 13.1

ELEVATION	AREA	KD	KD BY SEGMENT		
901.55	0.				
902.	14.	237.	1.	235.	1.
903.	46.	1653.	1.	1650.	1.
904.	80.	3964.	1.	3962.	1.
905.	117.	7038.	1.	7036.	1.
906.	155.	10857.	1.	10855.	1.
907.	213.	15897.	80.	15736.	21.
908.	311.	22553.	868.	21485.	179.
909.	456.	31308.	2734.	27918.	562.
910.	646.	42501.	6210.	35009.	1105.
911.	894.	56884.	11906.	42732.	2006.
912.	1220.	75826.	19689.	51058.	4711.
913.	1605.	99985.	29103.	59967.	10553.
914.	2009.	129417.	40629.	69459.	20570.
915.	2413.	164204.	55276.	79544.	38081.
916.	2817.	204813.	73561.	90212.	67450.
917.	3221.	251714.	96038.	101452.	114985.

CROSS SECTION 13.1

SCALES ARE 1 INCH = 200. CFS, AND 2.4 FEET/ ELEVATION



RATING TABLE FOR SECTION 13.55 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FR CTION S OPE
0	902.4	0.0	0.0						
BANK FULL	906.0	86.4	78.7	.00	.00	.00			
1	908.1	519.8	125.0	.00	.00	.00	125.00	903.5	.0004
2	909.9	1002.4	370.0	.00	.00	.00	370.00	904.6	.0006
3	910.9	1279.3	605.0	.00	.00	.00	605.00	905.4	.0008
4	911.1	1331.9	700.0	.00	.00	.00	700.00	905.6	.0009
5	911.8	1532.3	1070.0	.00	.00	.00	1070.00	906.7	.0014

SEGMENT TABLE FOR SECTION 13.55

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	125.	49.	75.	1.
125.	VELOCITY FPS	.40	.14	.50	.10
2	DISCHARGE CFS	370.	210.	156.	4.
370.	VELOCITY FPS	.54	.27	.77	.17
3	DISCHARGE CFS	605.	370.	226.	9.
605.	VELOCITY FPS	.66	.37	.97	.24
4	DISCHARGE CFS	700.	432.	256.	12.
700.	VELOCITY FPS	.73	.41	1.07	.27
5	DISCHARGE CFS	1070.	682.	367.	21.
1070.	VELOCITY FPS	.95	.56	1.42	.38
1	ELEV 908.1 KD	20556.	7990.	12478.	88.
2	ELEV 909.9 KD	48945.	27664.	20766.	516.
3	ELEV 910.9 KD	69262.	42218.	25993.	1051.
4	ELEV 911.1 KD	73457.	45252.	27026.	1179.
5	ELEV 911.8 KD	90063.	57288.	31049.	1726.

KD TABLE FOR CROSS SECTION 13.55

ELEVATION	AREA	KD	KD BY SEGMENT		
902.40	0.				
903.	11.	233.	1.	230.	1.
904.	33.	1212.	1.	1210.	1.
905.	58.	2804.	1.	2802.	1.
906.	86.	4983.	1.	4981.	1.
907.	257.	10113.	1745.	8181.	11.
908.	489.	19238.	7162.	11998.	77.
909.	755.	33169.	16512.	16366.	226.
910.	1030.	50878.	28991.	21265.	558.
911.	1314.	72042.	44177.	26663.	1133.
912.	1605.	96344.	61812.	32542.	1945.
913.	1907.	123323.	81427.	38880.	2984.
914.	2222.	151658.	101768.	45661.	4213.
915.	2566.	180259.	121760.	52868.	5616.
916.	2926.	210259.	142507.	60512.	7272.
917.	3286.	242586.	164936.	68600.	9245.
918.	3646.	277243.	189056.	77126.	11567.
919.	4006.	314232.	214872.	86082.	14273.

RATING TABLE FOR SECTION 13.75 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	902.6	0.0	0.0						
BANK FULL	906.0	77.5	76.5	.00	.00	.00			
1	908.2	342.9	125.0	.00	.00	.00	125.00	903.7	.0007
2	910.0	713.2	370.0	.00	.00	.00	370.00	904.9	.0011
3	911.0	953.3	605.0	.00	.00	.00	605.00	906.4	.0014
4	911.2	1001.9	700.0	.00	.00	.00	700.00	906.5	.0016
5	911.9	1183.7	1070.0	.00	.00	.00	1070.00	906.9	.0024

SEGMENT TABLE FOR SECTION 13.75

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	125.	0.	85.	40.
125.	VELOCITY FPS	.56	.11	.67	.19
2	DISCHARGE CFS	370.	3.	180.	187.
370.	VELOCITY FPS	.78	.22	1.05	.35
3	DISCHARGE CFS	605.	6.	250.	349.
605.	VELOCITY FPS	.90	.29	1.27	.47
4	DISCHARGE CFS	700.	8.	281.	411.
700.	VELOCITY FPS	.98	.33	1.39	.53
5	DISCHARGE CFS	1070.	15.	392.	663.
1070.	VELOCITY FPS	1.23	.44	1.78	.71
1	ELEV 908.2 KD	15035.	32.	10232.	4771.
2	ELEV 910.0 KD	34722.	240.	17005.	17477.
3	ELEV 911.0 KD	51066.	520.	21283.	29264.
4	ELEV 911.2 KD	54719.	594.	22174.	31951.
5	ELEV 911.9 KD	69444.	941.	25596.	42908.

KD TABLE FOR CROSS SECTION 13.75

ELEVATION	AREA	KD	KD BY SEGMENT		
902.60	0.				
903.	7.	118.	1.	115.	1.
904.	27.	926.	1.	924.	1.
905.	49.	2271.	1.	2269.	1.
906.	78.	4134.	2.	4116.	9.
907.	172.	7697.	4.	6656.	958.
908.	319.	13877.	26.	9718.	4031.
909.	501.	22969.	91.	13231.	9648.
910.	722.	35317.	248.	17158.	17852.
911.	964.	51970.	536.	21483.	29858.
912.	1215.	72105.	1010.	26192.	44837.
913.	1474.	95258.	1713.	31266.	62229.
914.	1740.	121438.	2644.	36694.	82059.
915.	2012.	150720.	3809.	42462.	104404.
916.	2288.	183266.	5254.	48569.	129486.
917.	2564.	219725.	7081.	55020.	158124.
918.	2840.	260245.	9354.	61807.	190521.
919.	3116.	304973.	12141.	68925.	226878.

RATING TABLE FOR SECTION 13.9 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	902.8	0.0	0.0						
BANK FULL	906.4	68.3	82.8	.00	.00	.00			
1	908.2	160.9	125.0	.00	.00	.00	125.00	903.9	.0020
2	910.1	342.9	370.0	.00	.00	.00	370.00	905.1	.0038
3	911.1	463.7	605.0	.00	.00	.00	605.00	906.0	.0050
4	911.4	491.7	700.0	.00	.00	.00	700.00	906.3	.0058
5	912.2	593.1	1070.0	.00	.00	.00	1070.00	908.0	.0084

SEGMENT TABLE FOR SECTION 13.9

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	125.	12.	112.	1.
125.	VELOCITY FPS	1.02	.23	1.07	.21
2	DISCHARGE CFS	370.	101.	258.	11.
370.	VELOCITY FPS	1.55	.57	1.81	.48
3	DISCHARGE CFS	605.	208.	371.	26.
605.	VELOCITY FPS	1.86	.79	2.27	.68
4	DISCHARGE CFS	700.	250.	418.	31.
700.	VELOCITY FPS	2.02	.89	2.49	.76
5	DISCHARGE CFS	1070.	429.	586.	56.
1070.	VELOCITY FPS	2.50	1.21	3.18	1.02
1	ELEV 908.2 KD	8763.	700.	7992.	71.
2	ELEV 910.1 KD	19006.	5143.	13288.	574.
3	ELEV 911.1 KD	26973.	9185.	16666.	1122.
4	ELEV 911.4 KD	28975.	10254.	17446.	1274.
5	ELEV 912.2 KD	36942.	14691.	20344.	1907.

KD TABLE FOR CROSS SECTION 13.9

ELEVATION	AREA	KD	KD BY SEGMENT		
902.80	0.				
903.	4.	38.	1.	36.	1.
904.	22.	687.	1.	685.	1.
905.	41.	1810.	1.	1808.	1.
906.	60.	3264.	1.	3262.	1.
907.	83.	5129.	20.	5107.	2.
908.	143.	7985.	410.	7398.	45.
909.	229.	12333.	2036.	10018.	202.
910.	330.	18279.	4802.	12947.	530.
911.	446.	25779.	8538.	16166.	1031.
912.	570.	35068.	13606.	19667.	1756.
913.	697.	46210.	20069.	23437.	2677.
914.	827.	58717.	27422.	27467.	3808.
915.	957.	72536.	35576.	31748.	5194.
916.	1087.	87523.	44539.	36275.	6709.
917.	1217.	104168.	54852.	41045.	8507.
918.	1347.	122518.	66601.	46054.	10613.
919.	1477.	142617.	79873.	51296.	13055.

TABLE OF VALUES FOR BPR EQUATION

COEFK	AKB	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
.2612	.2612	.0000	.0000	.0000	.0000	.7959	1.0000	1.0000	90.8793	90.6965	10 .2959
DCRIT	904.74	KBCRIT=									
1.0345	1.0345	.0000	.0000	.0000	.0000	.5248	1.0000	1.0000	128.1998	295.5311	25 .2149
DCRIT	905.68	KBCRIT=									
1.3311	1.3311	.0000	.0000	.0000	.0000	.4469	1.0000	1.0000	148.9453	425.6851	36 .8046
DCRIT	905.55	KBCRIT=									
1.3797	1.3797	.0000	.0000	.0000	.0000	.4348	1.0000	1.0000	153.5310	455.8629	38 .8202
DCRIT	905.72	KBCRIT=									
.0000	.0000	.0000	.0000	.0000	.0000	.0000	1.0000	1.0000	161.9439	455.8629	38 .8202
DCRIT	-1.00	KBCRIT=									

ROAD SECTION 14.0

NO.	HW	CFS	HL	TW	CSM
0	903.67	0.00	0.00	0.00	0.00
1	908.25	125.00	.00	908.25	125.00
2	910.20	370.00	.08	910.12	370.00
3	911.25	605.00	.08	911.17	605.00
4	911.48	700.00	.08	911.40	700.00
5	912.33	1070.00	.12	912.21	1070.00

Large portion of weir not effective, may raise stage ≈ .3' if eliminated (neglect)

MIN ROAD ELEVATION 909.83

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 911.82 OPENING NO.= 1

RATING TABLE FOR SECTION 14.25 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	903.7	0.0	0.0						
BANK FULL	908.0	66.6	115.9	.00	.00	.00			
1	908.3	93.7	125.0	.00	.00	.00	125.00	905.2	.0081
2	910.3	299.3	370.0	.00	.00	.00	370.00	906.7	.0076
3	911.3	430.5	605.0	.00	.00	.00	605.00	907.8	.0082
4	911.6	462.1	700.0	.00	.00	.00	700.00	908.6	.0092
5	912.5	587.5	1070.0	.00	.00	.00	1070.00	908.9	.0117

SEGMENT TABLE FOR SECTION 14.25

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	125.	4.	116.	5.
125.	VELOCITY FPS	1.72	.31	1.77	.31
2	DISCHARGE CFS	370.	67.	215.	88.
370.	VELOCITY FPS	1.78	.77	2.22	.76
3	DISCHARGE CFS	605.	134.	292.	179.
605.	VELOCITY FPS	1.94	.99	2.57	.98
4	DISCHARGE CFS	700.	160.	327.	214.
700.	VELOCITY FPS	2.07	1.09	2.78	1.08
5	DISCHARGE CFS	1070.	266.	446.	359.
1070.	VELOCITY FPS	2.44	1.37	3.39	1.36
1	ELEV 908.3 KD	4217.	48.	4110.	59.
2	ELEV 910.3 KD	13370.	2371.	7846.	3152.
3	ELEV 911.3 KD	21041.	4621.	10239.	6181.
4	ELEV 911.6 KD	23104.	5249.	10824.	7031.
5	ELEV 912.5 KD	31243.	7726.	13084.	10433.

KD TABLE FOR CROSS SECTION 14.25

ELEVATION	AREA	KD	KD BY SEGMENT		
903.70	0.				
904.	4.	50.	1.	47.	1.
905.	16.	522.	1.	520.	1.
906.	30.	1305.	1.	1303.	1.
907.	45.	2327.	1.	2325.	1.
908.	67.	3636.	3.	3577.	3.
909.	157.	6631.	509.	5266.	672.
910.	266.	11650.	1876.	7239.	2490.
911.	387.	18452.	3847.	9452.	5137.
912.	522.	26904.	6389.	11894.	8589.
913.	671.	36953.	9494.	14558.	12875.
914.	836.	49094.	13394.	17432.	18236.
915.	1015.	64023.	18444.	20510.	25042.
916.	1210.	80225.	23274.	23784.	33115.
917.	1432.	95564.	25702.	27252.	42639.
918.	1655.	112399.	28179.	30919.	53904.
919.	1877.	130758.	30704.	34781.	67073.
920.	2099.	150665.	33274.	38835.	82313.

RATING TABLE FOR SECTION 14.35 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	903.8	0.0	0.0						
BANK FULL	907.5	82.6	100.0	.00	.00	.00			
1	908.4	346.1	125.0	.00	.00	.00	125.00	905.2	.0018
2	910.4	981.1	370.0	.00	.00	.00	370.00	906.6	.0009
3	911.4	1340.3	605.0	.00	.00	.00	605.00	907.5	.0010
4	911.7	1426.1	700.0	.00	.00	.00	700.00	907.6	.0010
5	912.6	1743.5	1070.0	.00	.00	.00	1070.00	908.0	.0013

SEGMENT TABLE FOR SECTION 14.35

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	125.	54.	68.	4.
125.	VELOCITY FPS	.69	.22	.87	.18
2	DISCHARGE CFS	370.	247.	97.	25.
370.	VELOCITY FPS	.51	.32	.84	.27
3	DISCHARGE CFS	605.	427.	131.	47.
605.	VELOCITY FPS	.57	.40	.95	.34
4	DISCHARGE CFS	700.	498.	146.	56.
700.	VELOCITY FPS	.61	.44	1.03	.38
5	DISCHARGE CFS	1070.	778.	200.	92.
1070.	VELOCITY FPS	.74	.56	1.24	.48
1	ELEV 908.4 KD	9090.	3654.	5217.	219.
2	ELEV 910.4 KD	38571.	25740.	10214.	2617.
3	ELEV 911.4 KD	62029.	43707.	13489.	4834.
4	ELEV 911.7 KD	68376.	48599.	14319.	5458.
5	ELEV 912.6 KD	93272.	67792.	17508.	7972.

KD TABLE FOR CROSS SECTION 14.35

ELEVATION	AREA	KD	KD BY SEGMENT		
903.80	0.				
904.	2.	26.	1.	24.	1.
905.	16.	485.	1.	483.	1.
906.	32.	1348.	1.	1346.	1.
907.	50.	2573.	1.	2570.	1.
908.	210.	5760.	1409.	4301.	50.
909.	532.	15879.	8437.	6560.	688.
910.	862.	31764.	20491.	9196.	2004.
911.	1200.	52549.	36447.	12177.	3925.
912.	1544.	77267.	55429.	15476.	6341.
913.	1893.	106132.	77718.	19088.	9311.
914.	2249.	138764.	102945.	22996.	12812.
915.	2610.	175018.	130966.	27190.	16853.
916.	2976.	215032.	161906.	31666.	21475.
917.	3342.	259941.	196837.	36438.	26847.
918.	3708.	309906.	235914.	41501.	33020.
919.	4074.	365078.	279283.	46852.	40044.

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
CHANGE    DISCHARGE
DISCHARGE -1        100.      335.      555.      645.      965.
END
REACH     14.55     1.        1970.     1130.
SEGMENT   14.55     1         N         -15.
NVALUE    0.10
SEGMENT   14.55     2         C         10.
NVALUE    0.06
SEGMENT   14.55     3         N         430.
NVALUE    0.10
SECTION   14.55
          -310.     916.0     -290.     912.0     -170.     911.5
          -135.     910.0     -120.     908.0     -15.      907.5
          -6.       904.8     10.       907.5     155.      908.0
          335.      910.0     390.      912.0     420.      914.0
          430.      916.0     6.        904.8
ENDTABLE
--------------------DATA POINTS ON SECTION 14.55  REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
REACH     14.59     1.        2680.     1480.
SEGMENT   14.59     1         N         -9.
NVALUE    0.09
SEGMENT   14.59     2         C         10.
NVALUE    0.06
SEGMENT   14.59     3         N         250.
NVALUE    0.09
SECTION   14.59
          -240.     916.0     -230.     914.0     -180.     912.0
          -100.     910.0     -20.      908.0     -6.       905.6
          10.       908.0     30.       910.0     65.       912.0
          75.       914.0     80.       916.0     150.      916.0
          250.      918.0     -9.       908.0     6.        905.6
ENDTABLE
--------------------DATA POINTS ON SECTION 14.59  REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
REACH     14.6      1.        60.       60.
SEGMENT   14.6      1         N         -18.6     911.7
NVALUE    0.07
SEGMENT   14.6      2         C         18.6      911.7
NVALUE    0.05
SEGMENT   14.6      3         N         300.      922.0
NVALUE    0.07
SECTION   14.6
          -300.     922.      -300.     917.4     -250.     915.9
          -200.     915.0     -150.     913.6     -100.     912.5
          -50.      911.4     0.        905.7     50.       913.6
          100.      914.7     150.      915.1     200.      916.0
          250.      915.9     300.      917.4     300.      922.0
          -18.6     911.7     -18.5     905.7     18.5      905.7
```

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
          18.6       911.7
ENDTABLE
--------------------DATA POINTS ON SECTION 14.6   REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
REACH     14.7      1.         70.        50.
SEGMENT   14.7      1          N          -8.
NVALUE    0.09
SEGMENT   14.7      2          C          8.
NVALUE    0.06
SEGMENT   14.7      3          N          125.
NVALUE    0.09
SECTION   14.7
          -300.     915.3      -250.      911.9      -200.      911.0
          -150.     910.1      -100.      909.4      -50.       908.6
          -8.       908.6      6.         905.8      8.         908.4
          25.       909.4      50.        910.2      75.        914.6
          100.      916.7      125.       917.6      -301.      917.6
ENDTABLE
--------------------DATA POINTS ON SECTION 14.7   REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
REACH     14.71     1.         2030.      980.
SEGMENT   14.71     1          N          -8.
NVALUE    0.10
SEGMENT   14.71     2          C          10.
NVALUE    0.06
SEGMENT   14.71     3          N          380.
NVALUE    0.10
SECTION   14.71
          -60.      920.0      -45.       918.0      -38.       916.0
          -30.      912.0      -25.       910.0      -20.       909.0
          -6.       907.3      10.        909.0      30.        910.0
          210.      912.0      270.       914.0      300.       916.0
          330.      918.0      380.       920.0      -8.        909.9
          6.        907.3
ENDTABLE
--------------------DATA POINTS ON SECTION 14.71  REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
REACH     14.72     1.         1610.      1020.
SEGMENT   14.72     1          N          -10.
NVALUE    0.10
SEGMENT   14.72     2          C          10.
NVALUE    0.06
SEGMENT   14.72     3          N          220.
NVALUE    0.10
SECTION   14.72
          -210.     920.0      -195.      918.0      -175.      914.0
          -150.     912.0      -100.      910.0      -10.       909.5
          -6.       908.6      10.        909.6      90.        910.0
          110.      912.0      170.       914.0      195.       916.0
          210.      918.0      220.       920.0      6.         908.6
ENDTABLE
```

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
---------------------DATA POINTS ON SECTION 14.72  REORDERED BY PROGRAM ACCORDING TO X VALUES
                     DUPLICATE X POINTS NOT CHANGED---------------------
REACH      14.73     1.        1240.     800.
SEGMENT    14.73     1         N         -8.
NVALUE     0.10
SEGMENT    14.73     2         C         8.
NVALUE     0.06
SEGMENT    14.73     3         N         220.
NVALUE     0.10
SECTION    14.73
           -590.     920.0     -575.     918.0     -480.     916.0
           -400.     914.0     -230.     912.0     -100.     911.0
           -20.      911.0     -6.       909.6     20.       911.0
           175.      912.0     220.      920.0     -8.       911.0
           6.        909.6     8.        911.0
ENDTABLE
---------------------DATA POINTS ON SECTION 14.73  REORDERED BY PROGRAM ACCORDING TO X VALUES
                     DUPLICATE X POINTS NOT CHANGED---------------------
REACH      14.75     1.        590.      330.
SEGMENT    14.75     1         N         -10.
NVALUE     0.10
SEGMENT    14.75     2         C         10.
NVALUE     0.06
SEGMENT    14.75     3         N         640.
NVALUE     0.10
SECTION    14.75
           -540.     920.0     -550.     918.0     -430.     916.0
           -350.     914.0     -175.     912.0     -10.      911.0
           -6.       909.8     10.       910.5     220.      912.0
           330.      914.0     430.      916.0     510.      916.0
           620.      918.0     640.      920.0     6.        909.8
ENDTABLE
---------------------DATA POINTS ON SECTION 14.75  REORDERED BY PROGRAM ACCORDING TO X VALUES
                     DUPLICATE X POINTS NOT CHANGED---------------------
REACH      14.76     1.        1740.     830.
SEGMENT    14.76     1         N         -15.
NVALUE     0.10
SEGMENT    14.76     2         C         20.
NVALUE     0.06
SEGMENT    14.76     3         N         990.
NVALUE     0.10
SECTION    14.76
           -220.     920.0     -200.     918.0     -185.     916.0
           -170.     914.0     -80.      914.0     -15.      912.0
           -6.       911.2     20.       912.0     115.      913.0
           350.      912.7     550.      913.7     720.      914.0
           910.      916.0     970.      918.0     990.      920.0
           6.        911.2
ENDTABLE
---------------------DATA POINTS ON SECTION 14.76  REORDERED BY PROGRAM ACCORDING TO X VALUES
                     DUPLICATE X POINTS NOT CHANGED---------------------
REACH      14.77     1.        750.      380.
```

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-----------------------------80/80 LIST OF INPUT DATA-----------------------------
NVALUE    0.10
SEGMENT   14.77     2         C         10.
NVALUE    0.06
SEGMENT   14.77     3         N         130.
NVALUE    0.10
SECTION   14.77
          -260.     922.0     -240.     920.0     -230.     918.0
          -190.     916.0     -150.     914.0     -10.      913.7
          -6.       911.8     10.       913.7     80.       914.0
          120.      920.0     130.      922.0     6.        911.8
ENDTABLE
--------------------DATA POINTS ON SECTION 14.77  REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
REACH     14.78     1.        650.      400.
SEGMENT   14.78     1         N         -20.
NVALUE    0.10
SEGMENT   14.78     2         C         15.
NVALUE    0.06
SEGMENT   14.78     3         N         295.
NVALUE    0.10
SECTION   14.78
          -230.     924.0     -200.     920.0     -180.     918.0
          -170.     916.0     -20.      914.0     -6.       912.3
          15.       914.0     40.       916.0     55.       918.0
          65.       920.0     70.       922.0     290.      922.0
          170.      923.2     295.      924.0     6.        912.3
ENDTABLE
--------------------DATA POINTS ON SECTION 14.78  REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
REACH     14.8      1.        800.      570.
SEGMENT   14.8      1         N         -15.
NVALUE    0.10
SEGMENT   14.8      2         C         10.
NVALUE    0.06
SEGMENT   14.8      3         N         140.
NVALUE    0.10
SECTION   14.8
          -225.     924.5     -200.     920.9     -150.     916.6
          -100.     917.3     -50.      915.6     -15.      914.5
          -6.       912.9     10.       916.2     25.       917.9
          50.       918.6     100.      920.6     125.      923.1
          140.      924.7     6.        912.9
ENDTABLE
--------------------DATA POINTS ON SECTION 14.8   REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
REACH     14.9      1.0       820.      570.
SEGMENT   14.9      1         N         -8.
NVALUE    0.11
SEGMENT   14.9      2         C         8.
NVALUE    0.06
SEGMENT   14.9      3         N         200.
```

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
NVALUE    0.11
SECTION   14.9
          -300.     926.85    -250.     926.45    -200.     924.85
          -150.     923.15    -100.     920.85    -50.      919.15
          -25.      918.75    -8.       918.35    -6.       913.95
          8.        917.55    25.       919.25    75.       922.35
          100.      923.35    125.      925.15    150.      926.55
          200.      927.25    6.        913.95
ENDTABLE
--------------------DATA POINTS ON SECTION 14.9   REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED---------------------
COMPUTE   14.55     14.9      14.35
-----------------------------END OF 80/80 LIST-----------------------------
```

COMPUTE 14.55 14.9 14.35

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

RATING TABLE FOR SECTION 14.55 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	904.8	0.0	0.0						
BANK FULL	907.5	61.3	69.7	.00	.00	.00			
1	908.7	335.8	100.0	.00	.00	.00	100.00	906.0	.0015
2	910.5	1112.7	335.0	.00	.00	.00	335.00	907.8	.0007
3	911.5	1671.1	555.0	.00	.00	.00	555.00	908.0	.0006
4	911.8	1825.4	645.0	.00	.00	.00	645.00	908.0	.0007
5	912.7	2433.8	965.0	.00	.00	.00	965.00	908.2	.0007

SEGMENT TABLE FOR SECTION 14.55

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	100.	22.	47.	31.
100.	VELOCITY FPS	.47	.22	.60	.20
2	DISCHARGE CFS	335.	91.	72.	172.
335.	VELOCITY FPS	.36	.29	.58	.26
3	DISCHARGE CFS	555.	133.	95.	327.
555.	VELOCITY FPS	.38	.28	.63	.31
4	DISCHARGE CFS	645.	145.	108.	392.
645.	VELOCITY FPS	.41	.27	.68	.34
5	DISCHARGE CFS	965.	243.	133.	588.
965.	VELOCITY FPS	.44	.32	.74	.40
1	ELEV 908.7 KD	8112.	1676.	4097.	2340.
2	ELEV 910.5 KD	40433.	10982.	8763.	20689.
3	ELEV 911.5 KD	69449.	16817.	12020.	40613.
4	ELEV 911.8 KD	77015.	17449.	12909.	46657.
5	ELEV 912.7 KD	116565.	29235.	16176.	71153.

KD TABLE FOR CROSS SECTION 14.55

ELEVATION	AREA	KD	KD BY SEGMENT		
904.80	0.				
905.	2.	23.	1.	21.	1.
906.	18.	438.	1.	435.	1.
907.	38.	1300.	1.	1297.	1.
908.	134.	3408.	149.	2753.	204.
909.	449.	12155.	2990.	4836.	4328.
910.	876.	28713.	7837.	7348.	13407.
911.	1368.	54216.	14430.	10274.	29444.
912.	1939.	82982.	17914.	13580.	51489.
913.	2630.	130971.	34182.	17236.	79474.
914.	3340.	189263.	54892.	21237.	113086.
915.	4065.	257998.	79404.	25565.	152995.
916.	4798.	336744.	107980.	30215.	198607.
917.	5531.	429619.	143027.	35203.	252125.
918.	6263.	537687.	185297.	40524.	314100.
919.	6996.	661997.	235562.	46171.	385076.

RATING TABLE FOR SECTION 14.59 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FR CTION S OPE
0	905.6	0.0	0.0						
BANK FULL	908.0	37.2	60.8	.00	.00	.00			
1	909.5	145.9	100.0	.00	.00	.00	100.00	906.8	.0037
2	911.4	439.6	335.0	.00	.00	.00	335.00	908.3	.0034
3	912.4	673.8	555.0	.00	.00	.00	555.00	908.9	.0032
4	912.7	743.6	645.0	.00	.00	.00	645.00	909.1	.0033
5	913.6	995.6	965.0	.00	.00	.00	965.00	909.5	.0033

SEGMENT TABLE FOR SECTION 14.59

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	100.	27.	69.	5.
100.	VELOCITY FPS	.90	.40	1.03	.37
2	DISCHARGE CFS	335.	166.	134.	35.
335.	VELOCITY FPS	.97	.61	1.32	.53
3	DISCHARGE CFS	555.	308.	172.	75.
555.	VELOCITY FPS	.99	.71	1.42	.64
4	DISCHARGE CFS	645.	365.	188.	92.
645.	VELOCITY FPS	1.03	.75	1.49	.69
5	DISCHARGE CFS	965.	575.	234.	156.
965.	VELOCITY FPS	1.10	.86	1.64	.83
1	ELEV 909.5 KD	5145.	1308.	3620.	217.
2	ELEV 911.4 KD	18105.	8900.	7346.	1859.
3	ELEV 912.4 KD	31005.	17126.	9750.	4129.
4	ELEV 912.7 KD	35627.	20120.	10456.	5051.
5	ELEV 913.6 KD	53341.	31763.	12954.	8624.

KD TABLE FOR CROSS SECTION 14.59

ELEVATION	AREA	KD	KD BY SEGMENT		
905.60	0.				
906.	5.	68.	1.	65.	1.
907.	20.	540.	1.	538.	1.
908.	37.	1373.	1.	1371.	1.
909.	94.	3314.	464.	2724.	64.
910.	199.	7319.	2420.	4429.	430.
911.	359.	14294.	6498.	6448.	1284.
912.	572.	25179.	13384.	8762.	3033.
913.	834.	41693.	24053.	11347.	6254.
914.	1124.	63265.	38450.	14193.	10551.
915.	1432.	90944.	57574.	17290.	16026.
916.	1768.	121506.	80805.	20626.	19883.
917.	2168.	155063.	107660.	24194.	23140.
918.	2613.	199423.	138552.	27991.	33069.
919.	3058.	251516.	174851.	32020.	45967.
920.	3503.	311959.	216994.	36276.	62398.

RATING TABLE FOR SECTION 14.6 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	905.7	0.0	0.0						
1	909.6	143.1	100.0	.00	.00	.00	100.00	906.3	.0012
2	911.4	215.3	335.0	.00	.00	.00	335.00	907.1	.0039
BANK FULL	911.7	237.5	402.1	.00	.00	.00			
3	912.4	303.9	555.0	.00	.00	.00	555.00	907.6	.0060
4	912.6	338.9	645.0	.00	.00	.00	645.00	907.8	.0068
5	913.5	488.4	965.0	.00	.00	.00	965.00	908.5	.0084

SEGMENT TABLE FOR SECTION 14.6

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	100.	0.	100.	0.
100.	VELOCITY FPS	.70	.00	.70	.00
2	DISCHARGE CFS	335.	1.	334.	0.
335.	VELOCITY FPS	1.58	.25	1.58	.00
3	DISCHARGE CFS	555.	22.	532.	2.
555.	VELOCITY FPS	2.11	.43	2.14	.34
4	DISCHARGE CFS	645.	37.	605.	3.
645.	VELOCITY FPS	2.29	.50	2.35	.38
5	DISCHARGE CFS	965.	126.	823.	16.
965.	VELOCITY FPS	2.64	.75	2.83	.57
1	ELEV 909.6 KD	9239.	1.	9237.	1.
2	ELEV 911.4 KD	16837.	2.	16834.	1.
3	ELEV 912.4 KD	22389.	649.	21712.	28.
4	ELEV 912.6 KD	24380.	1134.	23174.	73.
5	ELEV 913.5 KD	33010.	4120.	28373.	517.

KD TABLE FOR CROSS SECTION 14.6

ELEVATION	AREA	KD	KD BY SEGMENT		
905.70	0.				
906.	11.	148.	1.	146.	1.
907.	48.	1631.	1.	1629.	1.
908.	85.	4085.	1.	4083.	1.
909.	122.	7229.	1.	7227.	1.
910.	159.	10917.	1.	10915.	1.
911.	197.	15041.	1.	15039.	1.
912.	260.	20036.	177.	19723.	7.
913.	391.	27667.	2158.	25196.	213.
914.	592.	38953.	6447.	31222.	957.
915.	875.	54717.	13721.	37755.	2894.
916.	1280.	76854.	23999.	44775.	7602.
917.	1809.	109489.	39296.	52266.	17376.
918.	2397.	154960.	60244.	60214.	33969.
919.	2997.	212918.	87579.	68605.	56605.
920.	3597.	278750.	118282.	77429.	82885.
921.	4197.	351924.	152283.	86674.	112729.
922.	4797.	436946.	192374.	96333.	149587.
923.	5397.	535562.	239660.	106397.	195179.
924.	5997.	648968.	294905.	116857.	250887.
925.	6597.	778390.	358899.	127707.	318216.

RATING TABLE FOR SECTION 14.7 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FR CTION S OPE
0	905.8	0.0	0.0						
BANK FULL	908.4	23.3	67.7	.00	.00	.00			
1	909.6	134.7	100.0	.00	.00	.00	100.00	908.2	.0108
2	911.5	538.9	335.0	.00	.00	.00	335.00	909.1	.0036
3	912.5	846.1	555.0	.00	.00	.00	555.00	909.5	.0028
4	912.7	935.8	645.0	.00	.00	.00	645.00	909.6	.0028
5	913.7	1243.6	965.0	.00	.00	.00	965.00	909.9	.0027

SEGMENT TABLE FOR SECTION 14.7

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	100.	41.	52.	7.
100.	VELOCITY FPS	1.08	.51	1.33	.44
2	DISCHARGE CFS	335.	206.	79.	50.
335.	VELOCITY FPS	.74	.54	1.16	.55
3	DISCHARGE CFS	555.	370.	99.	87.
555.	VELOCITY FPS	.74	.60	1.17	.61
4	DISCHARGE CFS	645.	437.	107.	101.
645.	VELOCITY FPS	.77	.63	1.21	.64
5	DISCHARGE CFS	965.	677.	136.	152.
965.	VELOCITY FPS	.84	.73	1.31	.72
1	ELEV 909.6 KD	2991.	1161.	1654.	176.
2	ELEV 911.5 KD	17543.	10762.	4189.	2591.
3	ELEV 912.5 KD	33019.	21916.	5946.	5157.
4	ELEV 912.7 KD	38421.	25932.	6476.	6013.
5	ELEV 913.7 KD	59098.	41417.	8362.	9319.

KD TABLE FOR CROSS SECTION 14.7

ELEVATION	AREA	KD	KD BY SEGMENT		
905.80	0.				
906.	0.	4.	1.	2.	1.
907.	4.	71.	1.	69.	1.
908.	14.	348.	1.	345.	1.
909.	57.	1237.	144.	996.	22.
910.	191.	4674.	2219.	2088.	367.
911.	419.	12309.	7165.	3458.	1628.
912.	702.	25153.	16148.	5107.	3863.
913.	1021.	44172.	30248.	7003.	6921.
914.	1365.	67835.	47990.	9120.	10711.
915.	1728.	96313.	69691.	11461.	15147.
916.	2113.	130207.	96156.	14011.	20029.
917.	2509.	170163.	127588.	16769.	25826.
918.	2904.	217345.	165245.	19763.	32586.
919.	3300.	272305.	209698.	22993.	40368.
920.	3696.	335591.	261518.	26456.	49232.

RATING TABLE FOR SECTION 14.71 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	907.3	0.0	0.0						
BANK FULL	909.0	25.4	49.5	.00	.00	.00			
1	910.7	130.1	100.0	.00	.00	.00	100.00	908.5	.0061
2	912.4	458.4	335.0	.00	.00	.00	335.00	909.9	.0042
3	913.2	678.4	555.0	.00	.00	.00	555.00	910.4	.0039
4	913.5	756.0	645.0	.00	.00	.00	645.00	910.6	.0038
5	914.4	1018.3	965.0	.00	.00	.00	965.00	911.0	.0036

SEGMENT TABLE FOR SECTION 14.71

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	100.	13.	67.	19.
100.	VELOCITY FPS	1.05	.59	1.21	.37
2	DISCHARGE CFS	335.	44.	113.	178.
335.	VELOCITY FPS	.94	.77	1.32	.56
3	DISCHARGE CFS	555.	67.	144.	344.
555.	VELOCITY FPS	.97	.87	1.43	.69
4	DISCHARGE CFS	645.	76.	156.	413.
645.	VELOCITY FPS	.99	.91	1.48	.73
5	DISCHARGE CFS	965.	105.	193.	667.
965.	VELOCITY FPS	1.05	.99	1.59	.84
1	ELEV 910.7 KD	3984.	512.	2771.	702.
2	ELEV 912.4 KD	16329.	2201.	5688.	8440.
3	ELEV 913.2 KD	28172.	3426.	7425.	17320.
4	ELEV 913.5 KD	32858.	3890.	8045.	20923.
5	ELEV 914.4 KD	50548.	5537.	10143.	34869.

KD TABLE FOR CROSS SECTION 14.71

ELEVATION	AREA	KD	KD BY SEGMENT		
907.30	0.				
908.	9.	169.	1.	166.	1.
909.	25.	762.	2.	757.	2.
910.	64.	2047.	117.	1774.	117.
911.	165.	5165.	719.	3183.	1225.
912.	359.	12106.	1703.	4911.	5444.
913.	614.	24721.	3069.	6926.	14698.
914.	902.	42346.	4786.	9207.	28303.
915.	1214.	65503.	6863.	11743.	46859.
916.	1545.	93454.	9245.	14519.	69653.
917.	1892.	125936.	11875.	17526.	96507.
918.	2258.	162275.	14701.	20755.	126800.
919.	2650.	201512.	17622.	24199.	159678.
920.	3051.	244830.	20726.	27858.	196327.
921.	3452.	293100.	24080.	31730.	237636.
922.	3853.	346465.	27682.	35809.	283790.
923.	4254.	405060.	31532.	40093.	334971.

RATING TABLE FOR SECTION 14.72 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FR CTION S OPE
0	908.6	0.0	0.0						
BANK FULL	909.5	17.3	36.3	.00	.00	.00			
1	911.1	288.1	100.0	.00	.00	.00	100.00	909.8	.0021
2	912.7	709.4	335.0	.00	.00	.00	335.00	910.1	.0017
3	913.6	976.5	555.0	.00	.00	.00	555.00	910.3	.0019
4	913.9	1073.0	645.0	.00	.00	.00	645.00	910.4	.0020
5	914.8	1383.7	965.0	.00	.00	.00	965.00	910.6	.0021

SEGMENT TABLE FOR SECTION 14.72

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	100.	40.	28.	33.
100.	VELOCITY FPS	.41	.29	.61	.30
2	DISCHARGE CFS	335.	156.	63.	116.
335.	VELOCITY FPS	.52	.44	.80	.42
3	DISCHARGE CFS	555.	267.	92.	195.
555.	VELOCITY FPS	.62	.55	.97	.50
4	DISCHARGE CFS	645.	312.	104.	229.
645.	VELOCITY FPS	.66	.58	1.02	.53
5	DISCHARGE CFS	965.	469.	139.	357.
965.	VELOCITY FPS	.76	.69	1.17	.61
1	ELEV 911.1 KD	6910.	2717.	1951.	2242.
2	ELEV 912.7 KD	25464.	11819.	4796.	8849.
3	ELEV 913.6 KD	39892.	19195.	6679.	14019.
4	ELEV 913.9 KD	45569.	22032.	7360.	16176.
5	ELEV 914.8 KD	66509.	32327.	9646.	24537.

KD TABLE FOR CROSS SECTION 14.72

ELEVATION	AREA	KD	KD BY SEGMENT		
908.60	0.				
909.	5.	70.	1.	68.	1.
910.	67.	992.	148.	673.	80.
911.	270.	6347.	2467.	1844.	2036.
912.	514.	16063.	7006.	3434.	5613.
913.	796.	29897.	14099.	5399.	10394.
914.	1120.	48503.	23497.	7702.	17295.
915.	1471.	73222.	35582.	10322.	27317.
916.	1844.	102784.	49763.	13239.	39774.
917.	2230.	137328.	65943.	16439.	54932.
918.	2629.	176409.	83930.	19911.	72554.
919.	3040.	219715.	103422.	23644.	92637.
920.	3459.	267538.	124667.	27632.	115271.
921.	3878.	320416.	147932.	31872.	140821.
922.	4297.	378412.	173223.	36357.	169382.
923.	4715.	441584.	200546.	41083.	201044.

RATING TABLE FOR SECTION 14.73 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	909.6	0.0	0.0						
BANK FULL	911.0	32.9	61.3	.00	.00	.00			
1	911.9	241.6	100.0	.00	.00	.00	100.00	910.8	.0065
2	913.1	768.6	335.0	.00	.00	.00	335.00	911.4	.0029
3	913.9	1194.0	555.0	.00	.00	.00	555.00	911.6	.0022
4	914.1	1355.0	645.0	.00	.00	.00	645.00	911.6	.0020
5	915.0	1876.2	965.0	.00	.00	.00	965.00	911.8	.0017

SEGMENT TABLE FOR SECTION 14.73

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	100.	46.	33.	21.
100.	VELOCITY FPS	.65	.34	.97	.29
2	DISCHARGE CFS	335.	174.	47.	114.
335.	VELOCITY FPS	.51	.39	.88	.42
3	DISCHARGE CFS	555.	301.	59.	196.
555.	VELOCITY FPS	.51	.42	.90	.48
4	DISCHARGE CFS	645.	356.	63.	226.
645.	VELOCITY FPS	.52	.43	.90	.49
5	DISCHARGE CFS	965.	557.	78.	330.
965.	VELOCITY FPS	.55	.47	.93	.54
1	ELEV 911.9 KD	3869.	1767.	1325.	777.
2	ELEV 913.1 KD	19697.	10243.	2785.	6669.
3	ELEV 913.9 KD	37527.	20301.	3995.	13231.
4	ELEV 914.1 KD	45100.	24831.	4449.	15820.
5	ELEV 915.0 KD	73563.	42337.	5990.	25235.

KD TABLE FOR CROSS SECTION 14.73

ELEVATION	AREA	KD	KD BY SEGMENT		
909.60	0.				
910.	5.	67.	1.	65.	1.
911.	33.	605.	15.	543.	6.
912.	282.	4848.	2305.	1450.	1092.
913.	736.	18458.	9550.	2692.	6183.
914.	1276.	41271.	22523.	4223.	14509.
915.	1885.	74133.	42681.	6018.	25413.
916.	2537.	116165.	69275.	8059.	38832.
917.	3244.	165758.	100993.	10330.	54427.
918.	4005.	223845.	138772.	12821.	72238.
919.	4821.	290286.	182518.	15524.	92230.
920.	5674.	365926.	233031.	18432.	114499.
921.	6528.	451564.	290920.	21542.	139348.
922.	7381.	547472.	356472.	24849.	166811.
923.	8234.	653903.	429962.	28348.	196918.

RATING TABLE FOR SECTION 14.75 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FR CTION S OPE
0	909.8	0.0	0.0						
BANK FULL	910.5	11.0	31.1	.00	.00	.00			
1	912.1	304.5	100.0	.00	.00	.00	100.00	910.8	.0030
2	913.2	859.9	335.0	.00	.00	.00	335.00	911.3	.0020
3	914.0	1331.8	555.0	.00	.00	.00	555.00	911.5	.0016
4	914.2	1517.6	645.0	.00	.00	.00	645.00	911.6	.0015
5	915.1	2140.5	965.0	.00	.00	.00	965.00	911.8	.0013

SEGMENT TABLE FOR SECTION 14.75

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	100.	22.	28.	50.
100.	VELOCITY FPS	.44	.23	.67	.30
2	DISCHARGE CFS	335.	114.	48.	174.
335.	VELOCITY FPS	.45	.33	.75	.39
3	DISCHARGE CFS	555.	209.	63.	284.
555.	VELOCITY FPS	.46	.36	.79	.42
4	DISCHARGE CFS	645.	252.	67.	326.
645.	VELOCITY FPS	.46	.38	.79	.43
5	DISCHARGE CFS	965.	408.	83.	475.
965.	VELOCITY FPS	.48	.42	.81	.45
1	ELEV 912.1 KD	5683.	1173.	1640.	2870.
2	ELEV 913.2 KD	23539.	7895.	3424.	12219.
3	ELEV 914.0 KD	43395.	16310.	4900.	22185.
4	ELEV 914.2 KD	52053.	20250.	5460.	26343.
5	ELEV 915.1 KD	85272.	35860.	7378.	42034.

KD TABLE FOR CROSS SECTION 14.75

ELEVATION	AREA	KD	KD BY SEGMENT		
909.80	0.				
910.	3.	24.	1.	21.	1.
911.	38.	639.	1.	500.	138.
912.	285.	5252.	1019.	1573.	2611.
913.	752.	19585.	6296.	3084.	10173.
914.	1355.	44538.	16812.	4977.	22749.
915.	2087.	82263.	34416.	7212.	40597.
916.	2913.	127209.	57881.	9769.	59507.
917.	3893.	188749.	86160.	12627.	89962.
918.	5011.	268004.	121049.	15770.	131155.
919.	6207.	368797.	164627.	19187.	184961.
920.	7449.	487288.	216069.	22868.	248390.
921.	8690.	627276.	276458.	26812.	324490.
922.	9932.	790217.	346343.	31010.	414319.
923.	11173.	977526.	426255.	35457.	518924.

RATING TABLE FOR SECTION 14.76 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	911.2	0.0	0.0						
BANK FULL	912.0	18.8	40.3	.00	.00	.00			
1	913.2	250.9	100.0	.00	.00	.00	100.00	912.1	.0051
2	914.0	772.5	335.0	.00	.00	.00	335.00	912.8	.0038
3	914.5	1174.5	555.0	.00	.00	.00	555.00	912.9	.0033
4	914.7	1382.5	645.0	.00	.00	.00	645.00	913.0	.0027
5	915.4	2072.9	965.0	.00	.00	.00	965.00	913.2	.0017

SEGMENT TABLE FOR SECTION 14.76

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	100.	8.	48.	44.
100.	VELOCITY FPS	.60	.34	.80	.26
2	DISCHARGE CFS	335.	23.	76.	236.
335.	VELOCITY FPS	.55	.30	.86	.39
3	DISCHARGE CFS	555.	49.	94.	412.
555.	VELOCITY FPS	.56	.36	.89	.44
4	DISCHARGE CFS	645.	64.	97.	484.
645.	VELOCITY FPS	.53	.37	.86	.44
5	DISCHARGE CFS	965.	116.	111.	738.
965.	VELOCITY FPS	.50	.41	.81	.45
1	ELEV 913.2 KD	4370.	343.	2138.	1888.
2	ELEV 914.0 KD	17104.	1204.	4054.	11847.
3	ELEV 914.5 KD	30542.	2488.	5386.	22668.
4	ELEV 914.7 KD	39378.	3736.	6066.	29576.
5	ELEV 915.4 KD	73258.	8796.	8412.	56051.

KD TABLE FOR CROSS SECTION 14.76

ELEVATION	AREA	KD	KD BY SEGMENT		
911.20	0.				
912.	19.	310.	1.	307.	1.
913.	175.	2936.	215.	1769.	775.
914.	781.	17457.	1218.	4084.	12050.
915.	1697.	53817.	5845.	7111.	40801.
916.	2737.	111155.	14591.	10772.	85792.
917.	3853.	190168.	26114.	15012.	149019.
918.	5004.	287496.	40392.	19799.	227281.
919.	6183.	403451.	57118.	25103.	321216.
920.	7369.	541030.	76915.	30917.	433368.
921.	8555.	702945.	100304.	37232.	566112.
922.	9741.	890357.	127472.	44033.	720547.
923.	10927.	1104361.	158594.	51309.	897716.

RATING TABLE FOR SECTION 14.77 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	911.8	0.0	0.0						
BANK FULL	913.7	33.1	74.9	.00	.00	.00			
1	914.3	147.7	100.0	.00	.00	.00	100.00	913.0	.0112
2	915.1	336.3	335.0	.00	.00	.00	335.00	914.1	.0136
3	915.6	466.1	555.0	.00	.00	.00	555.00	914.3	.0140
4	915.8	517.3	645.0	.00	.00	.00	645.00	914.3	.0139
5	916.3	676.9	965.0	.00	.00	.00	965.00	914.5	.0139

SEGMENT TABLE FOR SECTION 14.77

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	100.	31.	54.	15.
100.	VELOCITY FPS	1.07	.44	1.24	.44
2	DISCHARGE CFS	335.	156.	102.	77.
335.	VELOCITY FPS	1.24	.83	1.75	.85
3	DISCHARGE CFS	555.	280.	137.	138.
555.	VELOCITY FPS	1.37	1.04	2.01	1.07
4	DISCHARGE CFS	645.	332.	149.	164.
645.	VELOCITY FPS	1.42	1.11	2.07	1.13
5	DISCHARGE CFS	965.	520.	191.	254.
965.	VELOCITY FPS	1.57	1.29	2.30	1.33
1	ELEV 914.3 KD	2881.	766.	1732.	383.
2	ELEV 915.1 KD	9039.	4128.	2859.	2051.
3	ELEV 915.6 KD	14809.	7430.	3706.	3673.
4	ELEV 915.8 KD	17272.	8855.	4050.	4367.
5	ELEV 916.3 KD	25844.	13882.	5160.	6802.

KD TABLE FOR CROSS SECTION 14.77

ELEVATION	AREA	KD	KD BY SEGMENT		
911.80	0.				
912.	2.	23.	1.	20.	1.
913.	17.	432.	1.	429.	1.
914.	75.	1613.	64.	1305.	32.
915.	312.	8185.	3625.	2710.	1803.
916.	581.	20760.	10900.	4498.	5362.
917.	880.	38083.	21155.	6625.	10283.
918.	1203.	60676.	34923.	9074.	16668.
919.	1544.	89294.	53037.	11821.	24436.
920.	1899.	122588.	74158.	14849.	33575.
921.	2267.	160087.	97573.	18147.	44361.
922.	2646.	202159.	123809.	21709.	56650.
923.	3026.	249771.	153635.	25537.	70706.
924.	3405.	303063.	187157.	29626.	86591.
925.	3785.	362161.	224474.	33970.	104365.

RATING TABLE FOR SECTION 14.78 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	912.3	0.0	0.0						
BANK FULL	914.0	41.0	66.0	.00	.00	.00			
1	914.9	107.2	100.0	.00	.00	.00	100.00	913.3	.0100
2	916.0	275.8	335.0	.00	.00	.00	335.00	914.4	.0144
3	916.5	391.2	555.0	.00	.00	.00	555.00	914.8	.0161
4	916.7	437.9	645.0	.00	.00	.00	645.00	914.9	.0160
5	917.4	587.1	965.0	.00	.00	.00	965.00	915.3	.0156

SEGMENT TABLE FOR SECTION 14.78

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	100.	12.	86.	2.
100.	VELOCITY FPS	1.17	.38	1.22	.38
2	DISCHARGE CFS	335.	104.	214.	17.
335.	VELOCITY FPS	1.65	.72	1.98	.71
3	DISCHARGE CFS	555.	222.	298.	35.
555.	VELOCITY FPS	1.84	.98	2.34	.92
4	DISCHARGE CFS	645.	277.	324.	44.
645.	VELOCITY FPS	1.88	1.07	2.40	.98
5	DISCHARGE CFS	965.	472.	417.	76.
965.	VELOCITY FPS	2.01	1.30	2.64	1.14
1	ELEV 914.9 KD	3104.	290.	2766.	48.
2	ELEV 916.0 KD	8793.	2679.	5671.	444.
3	ELEV 916.5 KD	13852.	5539.	7433.	880.
4	ELEV 916.7 KD	16057.	6810.	8164.	1082.
5	ELEV 917.4 KD	24373.	11815.	10654.	1904.

KD TABLE FOR CROSS SECTION 14.78

ELEVATION	AREA	KD	KD BY SEGMENT		
912.30	0.				
913.	12.	196.	1.	193.	1.
914.	41.	1099.	3.	1093.	2.
915.	123.	3613.	413.	3059.	69.
916.	286.	9182.	2860.	5811.	472.
917.	502.	19542.	8885.	9214.	1413.
918.	730.	33686.	17539.	13215.	2919.
919.	974.	51028.	28119.	17771.	5117.
920.	1231.	71817.	40947.	22854.	7996.
921.	1501.	95249.	56139.	28434.	11652.
922.	1787.	121063.	73567.	34493.	12924.
923.	2181.	148197.	93102.	41011.	14064.
924.	2620.	178723.	115129.	47998.	15724.
925.	3059.	212249.	139908.	55455.	17420.
926.	3497.	248799.	167526.	63373.	19149.
927.	3936.	288396.	198064.	71743.	20910.

RATING TABLE FOR SECTION 14.8 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FR CTION S OPE
0	912.9	0.0	0.0						
BANK FULL	914.5	28.0	54.3	.00	.00	.00			
1	915.8	89.2	100.0	.00	.00	.00	100.00	914.0	.0111
2	917.2	234.2	335.0	.00	.00	.00	335.00	915.3	.0177
3	918.0	369.2	555.0	.00	.00	.00	555.00	915.8	.0175
4	918.1	402.1	645.0	.00	.00	.00	645.00	916.0	.0192
5	918.9	571.8	965.0	.00	.00	.00	965.00	916.5	.0176

SEGMENT TABLE FOR SECTION 14.8

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	100.	13.	87.	0.
100.	VELOCITY FPS	1.36	.46	1.44	.00
2	DISCHARGE CFS	335.	104.	229.	3.
335.	VELOCITY FPS	2.07	.77	2.42	.51
3	DISCHARGE CFS	555.	242.	303.	10.
555.	VELOCITY FPS	2.15	1.01	2.69	.60
4	DISCHARGE CFS	645.	296.	337.	12.
645.	VELOCITY FPS	2.27	1.11	2.88	.63
5	DISCHARGE CFS	965.	510.	419.	35.
965.	VELOCITY FPS	2.28	1.32	3.07	.74
1	ELEV 915.8 KD	2993.	386.	2606.	1.
2	ELEV 917.2 KD	7925.	2374.	5500.	51.
3	ELEV 918.0 KD	13180.	5597.	7375.	209.
4	ELEV 918.1 KD	14626.	6539.	7827.	260.
5	ELEV 918.9 KD	22917.	12046.	10118.	752.

KD TABLE FOR CROSS SECTION 14.8

ELEVATION	AREA	KD	KD BY SEGMENT		
912.90	0.				
913.	1.	11.	1.	10.	1.
914.	17.	393.	1.	391.	1.
915.	44.	1383.	25.	1350.	1.
916.	100.	3402.	515.	2873.	1.
917.	198.	6772.	1800.	4937.	23.
918.	376.	13560.	5781.	7467.	218.
919.	593.	24136.	12782.	10403.	854.
920.	848.	38394.	22063.	13716.	2574.
921.	1139.	56623.	33481.	17384.	5721.
922.	1452.	79479.	47535.	21391.	10527.
923.	1782.	106103.	63679.	25723.	16679.
924.	2127.	136609.	81951.	30372.	24317.
925.	2473.	172091.	103194.	35350.	34319.
926.	2818.	212848.	127586.	40652.	47126.

RATING TABLE FOR SECTION 14.9 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	913.9	0.0	0.0						
1	917.5	49.3	100.0	.00	.00	.00	100.00	915.2	.0201
BANK FULL	917.5	49.7	103.4	.00	.00	.00			
2	919.7	153.1	335.0	.00	.00	.00	335.00	916.7	.0289
3	920.6	258.0	555.0	.00	.00	.00	555.00	918.0	.0318
4	920.8	283.8	645.0	.00	.00	.00	645.00	918.9	.0358
5	921.7	434.5	965.0	.00	.00	.00	965.00	919.6	.0329

SEGMENT TABLE FOR SECTION 14.9

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	100.	0.	100.	0.
100.	VELOCITY FPS	2.03	.00	2.03	.00
2	DISCHARGE CFS	335.	33.	280.	22.
335.	VELOCITY FPS	3.10	.75	3.33	.88
3	DISCHARGE CFS	555.	117.	380.	59.
555.	VELOCITY FPS	3.31	1.09	3.87	1.12
4	DISCHARGE CFS	645.	149.	422.	74.
645.	VELOCITY FPS	3.52	1.21	4.18	1.23
5	DISCHARGE CFS	965.	310.	509.	146.
965.	VELOCITY FPS	3.39	1.45	4.40	1.40
1	ELEV 917.5 KD	2228.	1.	2225.	1.
2	ELEV 919.7 KD	6172.	537.	5258.	377.
3	ELEV 920.6 KD	9759.	1955.	6805.	999.
4	ELEV 920.8 KD	10669.	2356.	7135.	1179.
5	ELEV 921.7 KD	16734.	5289.	8952.	2493.

KD TABLE FOR CROSS SECTION 14.9

ELEVATION	AREA	KD	KD BY SEGMENT		
913.95	0.				
914.	1.	5.	1.	5.	1.
915.	13.	310.	1.	307.	1.
916.	27.	912.	1.	909.	1.
917.	41.	1729.	1.	1727.	1.
918.	58.	2782.	1.	2771.	7.
919.	97.	4402.	52.	4136.	128.
920.	186.	7296.	877.	5761.	537.
921.	319.	12142.	3011.	7594.	1466.
922.	493.	19433.	6672.	9625.	3119.
923.	709.	29239.	11877.	11843.	5504.
924.	970.	42066.	18512.	14241.	9299.
925.	1276.	58504.	27148.	16813.	14532.
926.	1629.	78266.	37955.	19553.	20752.
927.	2055.	98164.	49575.	22455.	26114.
928.	2480.	121077.	63487.	25526.	32309.
929.	2906.	147199.	79932.	28762.	39392.

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
LINK
CHANGE     DISCHARGE
DISCHARGE  -1         95.        335.       545.       630.       950.
END
REACH      14.95      1.         150.       140.
REACH2     15.1       -0.4
ROAD       15.0       2.7        30.        30.
BPR        15.0       A          1.
GIRDER     924.4      924.1      0.         .8         2.7
           -13.6      926.9      -13.6      924.1      13.6       924.1
           13.6       926.9
ENDTABLE
SECTION    15.0
           -225.      931.37     -200.      930.74     -150.      929.18
           -100.      927.84     -50.       927.06     -13.6      926.9
           50.        926.7      100.       926.9      150.       927.2
           200.       927.9      250.       928.5      300.       928.5
           300.       932.0      -13.5      914.5      13.5       914.5
           13.6       926.9
ENDTABLE
---------------------DATA POINTS ON SECTION 15.0   REORDERED BY PROGRAM ACCORDING TO X VALUES
                     DUPLICATE X POINTS NOT CHANGED--------------------
REACH      15.1       1.         30.        30.
SEGMENT    15.1       1          N          -7.
NVALUE     0.10
SEGMENT    15.1       2          C          7.
NVALUE     0.06
SEGMENT    15.1       3          N          90.        931.5
NVALUE     0.10
SECTION    15.1
           -312.      931.45     -300.      928.05     -250.      926.45
           -200.      926.35     -150.      923.65     -100.      920.15
           -50.       920.05     -25.       919.85     -7.        917.85
           -6.        915.35     7.         918.35     25.        919.25
           50.        918.95     90.        922.15     90.        931.5
           6.         915.35
ENDTABLE
---------------------DATA POINTS ON SECTION 15.1   REORDERED BY PROGRAM ACCORDING TO X VALUES
                     DUPLICATE X POINTS NOT CHANGED--------------------
REACH      15.15      1.         350.       220.
SEGMENT    15.15      1          N          -8.
NVALUE     0.09
SEGMENT    15.15      2          C          8.
NVALUE     0.05
SEGMENT    15.15      3          N          135.
NVALUE     0.09
SECTION    15.15
           -130.      930.0      -110.      924.0      -100.      922.0
           -25.       920.0      -6.        916.7      20.        920.0
```

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-----------------------------80/80 LIST OF INPUT DATA-----------------------------
          40.        922.0      55.        924.0      85.        926.0
          120.       928.0      135.0      930.0      -8.        920.0
          6.         916.7      8.         920.0
ENDTABLE
---------------------DATA POINTS ON SECTION 15.15  REORDERED BY PROGRAM ACCORDING TO X VALUES
                     DUPLICATE X POINTS NOT CHANGED---------------------
ROAD      15.2       2.7        65.        65.
BPR       15.2       A          1
GIRDER    927.4      927.1      0          .8         2.7
          -13.25     929.8      -13.25     927.1      13.25      927.1
          13.25      929.8
ENDTABLE
SECTION   15.2
          110.       930.0      -13.25     929.8      13.25      929.8
          -13.2      917.1      13.2       917.1      8.         916.1
          -120.      930.
ENDTABLE
---------------------DATA POINTS ON SECTION 15.2   REORDERED BY PROGRAM ACCORDING TO X VALUES
                     DUPLICATE X POINTS NOT CHANGED---------------------
REACH     15.25      1.         35.        35.
SEGMENT   15.25      1          N          -13.25     927.1
NVALUE    0.07
SEGMENT   15.25      2          C          13.25      927.1
NVALUE    0.04
SEGMENT   15.25      3          N          730.
NVALUE    0.07
SECTION   15.25
          -450.      930.0      -13.25     927.1      -13.25     917.1
          0.         916.1      13.25      917.1      13.25      927.1
          730.       930.0
ENDTABLE
ROAD      15.3       2.7        35.        35.
BPR       15.3       A          1
GIRDER    927.4      927.1      0          .8         2.7
          -13.25     929.8      -13.25     927.1      13.25      927.1
          13.25      929.8
ENDTABLE
SECTION   15.3
          -360.      932.0      -45.       930.0      -13.25     929.8
          13.25      929.8      120.       930.0      400.       932.0
          -13.2      917.1      13.2       917.1      8.         916.1
ENDTABLE
---------------------DATA POINTS ON SECTION 15.3   REORDERED BY PROGRAM ACCORDING TO X VALUES
                     DUPLICATE X POINTS NOT CHANGED---------------------
REACH     15.32      1.         45.        45.
REACH2    15.15      0.4
REACH     15.35      1.         170.       170.
SEGMENT   15.35      1          N          -8.
NVALUE    0.08
SEGMENT   15.35      2          C          8.
NVALUE    0.04
```

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
SEGMENT   15.35     3         N         65.
NVALUE    0.08
SECTION   15.35
          -55.      930.0     -55.      928.0     -45.      926.0
          -35.      924.0     -30.      922.0     -25.      920.0
          -6.       917.2     20.       920.0     45.       930.0
          -75.      934.0     65.       934.0     -8.       920.0
          6.        917.2     8.        920.0
ENDTABLE
--------------------DATA POINTS ON SECTION 15.35  REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED---------------------
REACH     16.0      1.        150.      150.
SEGMENT   16.0      1         N         -10.
NVALUE    0.09
SEGMENT   16.0      2         C         15.
NVALUE    0.05
SEGMENT   16.0      3.        N         50.       940.0
NVALUE    0.09
SECTION   16.0
          -55.      940.0     -25.      930.0     -10.      920.0
          0         919.0     15.       920.0     40.       930.0
          50.       934.0     50.       940.0
ENDTABLE
REACH     16.1      1.        90.       65.
SEGMENT   16.1      1         N         -23.
NVALUE    0.09
SEGMENT   16.1      2         C         25.
NVALUE    0.05
SEGMENT   16.1      3         N         170.      930.
NVALUE    0.09
SECTION   16.1
          -275.     928.7     -250.     928.2     -225.     927.9
          -200.     928.0     -175.     927.6     -150.     927.5
          -125.     926.7     -100.     925.6     -75.      924.7
          -50.      924.2     -23.      923.5     -8.       919.8
          0.        919.1     8.        920.2     25.       923.2
          50.       923.6     75.       923.8     170.      928.0
          170.      930.      -276.     930.
ENDTABLE
--------------------DATA POINTS ON SECTION 16.1   REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED---------------------
REACH     16.25     1.        130.      120.
SEGMENT   16.25     1         N         -20.
NVALUE    0.09
SEGMENT   16.25     2         C         10.
NVALUE    0.06
SEGMENT   16.25     3         N         120.
NVALUE    0.09
SECTION   16.25
```

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
          -230.     930.0     -120.     928.0     -90.      926.0
          -70.      924.0     -30.      922.0     -20.      920.0
          0.        919.8     10.       920.0     20.       922.0
          75.       922.0     80.       920.0     100.      920.0
          120.      930.0     60.       924.0
ENDTABLE
--------------------DATA POINTS ON SECTION 16.25  REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
REACH     16.55     1.        220.      220.
SEGMENT   16.55     1         N         -8.
NVALUE    0.09
SEGMENT   16.55     2         C         8.
NVALUE    0.06
SEGMENT   16.55     3         N         90.
NVALUE    0.09
SECTION   16.55
          -270.     935.0     -270.     926.0     -160.     926.0
          -20.      925.0     -6.       923.0     40.       924.0
          65.       930.0     90.       935.0     -8.       925.0
          6.        923.0     8.        924.0
ENDTABLE
--------------------DATA POINTS ON SECTION 16.55  REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
REACH     16.9      1.        170.      130.
SEGMENT   16.9      1         N         -8.
NVALUE    0.09
SEGMENT   16.9      2         C         7.
NVALUE    0.06
SEGMENT   16.9      3         N         40.
NVALUE    0.09
SECTION   16.9
          -25.      939.2     -25.      934.1     -16.      933.4
          -8.       925.8     -6.       924.4     7.        925.6
          15.       928.0     25.       934.5     40.       939.2
          6.        924.4
ENDTABLE
--------------------DATA POINTS ON SECTION 16.9   REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
ROAD      17.0      2.7       100.      90.
BPR       17.0      A         1
GIRDER    938.3     938.0     46.       .8        2.7
          -50.      939.82    -12.      938.0     12.       938.0
          50.       940.32
ENDTABLE
SECTION   17.0
          -300.     944.12    -300.     938.82    -250.     938.52
          -200.     938.42    -150.     938.72    -100.     939.22
          -50.      939.82    11.9      927.0     50.       940.32
          100.      941.22    150.      942.82    200.      944.12
          -11.9     927.0
ENDTABLE
```

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
--------------------DATA POINTS ON SECTION 17.0   REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED---------------------
REACH      17.1     1.        30.       30.
REACH2     17.2     -0.3
REACH      17.2     1.        480.      360.
SEGMENT    17.2     1         N         -12.
NVALUE     0.09
SEGMENT    17.2     2         C         12.
NVALUE     0.06
SEGMENT    17.2     3         N         250.
NVALUE     0.09
SECTION    17.2
           -300.    937.9     -200.     936.9     -150.     934.8
           -125.    932.9     -100.     933.7     -80.      933.3
           -50.     930.0     -13.      929.8     -12.      929.6
           -8.      927.9     12.       929.6     15.       930.0
           50.      930.0     85.       931.3     100.      931.1
           150.     932.4     200.      937.2     250.      939.2
           8.       927.9     -301.     939.2
ENDTABLE
--------------------DATA POINTS ON SECTION 17.2   REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED---------------------
REACH      17.21    1.        280.      220.
SEGMENT    17.21    1         N         -8.
NVALUE     0.09
SEGMENT    17.21    2         C         8.
NVALUE     0.06
SEGMENT    17.21    3         N         195.
NVALUE     0.09
SECTION    17.21
           -230.    940.0     -140.     938.0     -80.      936.0
           -55.     934.0     -40.      932.0     -30.      930.0
           -6.      928.3     18.       930.0     25.       932.0
           30.      934.0     70.       936.0     100.      938.0
           195.     940.0     -8.       930.0     6.        928.3
           8.       930.0
ENDTABLE
--------------------DATA POINTS ON SECTION 17.21  REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED---------------------
REACH      17.25    1.        320.      275.
SEGMENT    17.25    1         N         -8.
NVALUE     0.09
SEGMENT    17.25    2         C         8.
NVALUE     0.06
SEGMENT    17.25    3         N         255.
NVALUE     0.09
SECTION    17.25
           -110.    940.0     -80.      934.0     -25.      932.0
           -15.     930.0     -6.       928.8     25.       930.0
           115.     932.0     180.      934.0     230.      936.0
           245.     938.0     255.      940.0     -8.       930.0
```

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
          6.        928.8     8.        930.0
ENDTABLE
--------------------DATA POINTS ON SECTION 17.25  REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
REACH     17.35     1.        690.      620.
SEGMENT   17.35     1         N         -20.
NVALUE    0.10
SEGMENT   17.35     2         C         17.
NVALUE    0.06
SEGMENT   17.35     3         N         275.
NVALUE    0.10
SECTION   17.35
          -190.     940.0     -165.     938.0     -130.     936.0
          -100.     934.0     -30.      932.0     -20.      930.0
          -6.       929.8     25.       932.0     80.       934.0
          125.      936.0     200.      938.0     275.      940.0
          17.       930.0     6.        929.8     8.        932.0
ENDTABLE
--------------------DATA POINTS ON SECTION 17.35  REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
REACH     17.45     1.        920.      690.
SEGMENT   17.45     1         N         -10.
NVALUE    0.11
SEGMENT   17.45     2         C         8.
NVALUE    0.06
SEGMENT   17.45     3         N         230.
NVALUE    0.11
SECTION   17.45
          -190.     942.0     -135.     940.0     -115.     938.0
          -70.      936.0     -25.      934.0     -10.      932.0
          -6.       931.4     15.       932.0     30.       934.0
          120.      936.0     145.      938.0     175.      940.0
          230.      942.0     6.        931.4     8.        932.0
ENDTABLE
--------------------DATA POINTS ON SECTION 17.45  REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
REACH     17.5      1.        610.      530.
SEGMENT   17.5      1         N         -10.
NVALUE    0.11
SEGMENT   17.5      2         C         7.
NVALUE    0.06
SEGMENT   17.5      3         N         400.
NVALUE    0.11
SECTION   17.5
          -295.     946.7     -250.     943.4     -200.     938.7
          -150.     937.2     -100.     935.7     -75.      935.0
          -50.      935.4     -10.      935.0     -7.       933.6
          -6.       932.4     7.        934.2     10.       934.7
          50.       935.5     150.      938.3     200.      939.5
          300.      942.5     400.      944.8     6.        932.4
ENDTABLE
```

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
--------------------DATA POINTS ON SECTION 17.5   REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
REACH     17.55     1.        860.      630.
SEGMENT   17.55     1         N         -10.
NVALUE    0.12
SEGMENT   17.55     2         C         8.
NVALUE    0.06
SEGMENT   17.55     3         N         260.
NVALUE    0.12
SECTION   17.55
          -160.     944.0     -150.     942.0     -140.     940.0
          -130.     938.0     -110.     936.0     -10.      935.0
          -6.       933.5     80.       935.0     100.      936.0
          130.      938.0     220.      940.0     240.      942.0
          260.      944.0     6.        933.5     8.        935.0
ENDTABLE
--------------------DATA POINTS ON SECTION 17.55  REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
COMPUTE   14.95     17.55     14.9
-----------------------------END OF 80/80 LIST------------------------------
```

```
COMPUTE   14.95     17.55     14.9

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

RATING TABLE FOR SECTION 14.95 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	914.9	0.0	0.0						
BANK FULL	917.4	32.5	78.6	.00	.00	.00			
1	918.0	41.0	95.0	.00	.00	.00	95.00	916.2	.0322
2	920.1	223.8	335.0	.00	.00	.00	335.00	917.9	.0251
3	921.0	385.6	545.0	.00	.00	.00	545.00	919.0	.0204
4	921.2	426.7	630.0	.00	.00	.00	630.00	919.2	.0211
5	922.1	610.5	950.0	.00	.00	.00	950.00	919.8	.0190

SEGMENT TABLE FOR SECTION 14.95

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	95.	0.	95.	0.
95.	VELOCITY FPS	2.38	.38	2.39	.00
2	DISCHARGE CFS	335.	47.	210.	78.
335.	VELOCITY FPS	2.54	.68	3.00	.93
3	DISCHARGE CFS	545.	143.	249.	153.
545.	VELOCITY FPS	2.24	.89.	3.03	1.07
4	DISCHARGE CFS	630.	178.	271.	181.
630.	VELOCITY FPS	2.27	.97	3.19	1.14
5	DISCHARGE CFS	950.	330.	322.	298.
950.	VELOCITY FPS	2.19	1.15	3.32	1.31
1	ELEV 918.0 KD	1674.	7.	1665.	1.
2	ELEV 920.1 KD	6434.	643.	4305.	1485.
3	ELEV 921.0 KD	11953.	2986.	5619.	3348.
4	ELEV 921.2 KD	13637.	3763.	5957.	3917.
5	ELEV 922.1 KD	21782.	7531.	7426.	6825.

KD TABLE FOR CROSS SECTION 14.95

ELEVATION	AREA	KD	KD BY SEGMENT		
914.95	0.				
915.	1.	5.	1.	5.	1.
916.	13.	305.	1.	303.	1.
917.	26.	887.	1.	885.	1.
918.	42.	1706.	8.	1693.	1.
919.	86.	3137.	136.	2793.	155.
920.	199.	5996.	446.	4103.	1259.
921.	384.	12016.	2962.	5608.	3330.
922.	594.	21008.	7139.	7294.	6528.
923.	823.	32994.	12837.	9154.	10995.
924.	1068.	47379.	19877.	11179.	16317.
925.	1331.	64283.	28530.	13362.	22386.
926.	1615.	83649.	38818.	15698.	29132.
927.	1967.	101855.	47156.	18182.	36500.
928.	2351.	130121.	64832.	20810.	44425.
929.	2744.	163577.	86999.	23579.	52888.
930.	3140.	200890.	112442.	26484.	61870.
931.	3538.	242466.	141670.	29524.	71492.
932.	3937.	289337.	176020.	32697.	81893.
933.	4335.	341808.	216007.	36001.	93082.

TABLE OF VALUES FOR BPR EQUATION

COEFK	AKB	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
.0000	.0000	.0000	.0000	.0000	.0000	.9946	1.0000	1.0000	96.0853	55.4690	5 .4690
DCRIT	915.21	KBCRIT=									
.8068	.8068	.0000	.0000	.0000	.0000	.5910	1.0000	1.0000	155.0048	344.9748	32 .3188
DCRIT	916.18	KBCRIT=									
1.2708	1.2708	.0000	.0000	.0000	.0000	.4621	1.0000	1.0000	177.8764	543.3942	49 .2394
DCRIT	916.82	KBCRIT=									
1.3649	1.3649	.0000	.0000	.0000	.0000	.4385	1.0000	1.0000	183.5701	602.0766	53 .8848
DCRIT	917.06	KBCRIT=									
1.7179	1.7179	.0000	.0000	.0000	.0000	.3551	1.0000	1.0000	206.6141	873.2238	72 .0841
DCRIT	917.87	KBCRIT=									

ROAD SECTION 15.0

NO.	HW	CFS	HL	TW	CSM
0	914.50	0.00	0.00	0.00	0.00
1	918.05	95.00	.00	918.05	95.00
2	920.33	335.00	.10	920.23	335.00
3	921.30	545.00	.22	921.08	545.00
4	921.57	630.00	.28	921.29	630.00
5	922.73	950.00	.60	922.13	950.00

MIN ROAD ELEVATION 926.70

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 924.10 OPENING NO.= 1

RATING TABLE FOR SECTION 15.1 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	915.3	0.0	0.0						
BANK FULL	917.8	32.5	85.1	.00	.00	.00			
1	918.1	37.1	95.0	.00	.00	.00	95.00	916.6	.0422
2	920.3	187.2	335.0	.00	.00	.00	335.00	918.3	.0353
3	921.3	366.5	545.0	.00	.00	.00	545.00	919.4	.0239
4	921.6	420.1	630.0	.00	.00	.00	630.00	919.6	.0228
5	922.8	673.5	950.0	.00	.00	.00	950.00	920.2	.0153

SEGMENT TABLE FOR SECTION 15.1

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	95.	0.	95.	0.
95.	VELOCITY FPS	2.61	.41	2.61	.00
2	DISCHARGE CFS	335.	32.	233.	70.
335.	VELOCITY FPS	3.04	.66	3.47	.98
3	DISCHARGE CFS	545.	135.	262.	149.
545.	VELOCITY FPS	2.43	.90	3.24	1.09
4	DISCHARGE CFS	630.	173.	279.	178.
630.	VELOCITY FPS	2.37	.97	3.30	1.14
5	DISCHARGE CFS	950.	341.	308.	301.
950.	VELOCITY FPS	1.99	1.06	3.05	1.20
1	ELEV 918.1 KD	1462.	4.	1458.	1.
2	ELEV 920.3 KD	5497.	361.	4010.	1125.
3	ELEV 921.3 KD	11049.	2583.	5465.	3001.
4	ELEV 921.6 KD	13097.	3504.	5902.	3691.
5	ELEV 922.8 KD	24273.	8659.	7930.	7684.

KD TABLE FOR CROSS SECTION 15.1

ELEVATION	AREA	KD	KD BY SEGMENT		
915.35	0.				
916.	8.	141.	1.	139.	1.
917.	21.	628.	1.	626.	1.
918.	35.	1342.	2.	1338.	1.
919.	60.	2429.	60.	2327.	30.
920.	140.	4481.	208.	3555.	672.
921.	305.	9143.	1793.	4984.	2343.
922.	508.	16684.	5113.	6598.	4916.
923.	731.	27158.	9985.	8390.	8737.
924.	970.	40182.	16237.	10349.	13552.
925.	1225.	55621.	23972.	12469.	19147.
926.	1500.	73567.	33377.	14745.	25418.
927.	1826.	91521.	42034.	17171.	32308.
928.	2198.	114915.	55313.	19742.	39749.
929.	2586.	145242.	74919.	22455.	47751.
930.	2981.	180236.	98612.	25306.	56261.
931.	3379.	218540.	125006.	28291.	65260.
932.	3777.	261838.	156152.	31412.	75006.
933.	4175.	310424.	192544.	34664.	85510.

RATING TABLE FOR SECTION 15.15 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	916.7	0.0	0.0						
1	919.3	34.6	95.0	.00	.00	.00	95.00	917.9	.0357
BANK FULL	920.0	51.6	179.7	.00	.00	.00			
2	921.4	154.5	335.0	.00	.00	.00	335.00	919.4	.0282
3	922.2	254.4	545.0	.00	.00	.00	545.00	920.7	.0263
4	922.4	290.0	630.0	.00	.00	.00	630.00	920.8	.0257
5	923.4	437.6	950.0	.00	.00	.00	950.00	921.3	.0200

SEGMENT TABLE FOR SECTION 15.15

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	95.	0.	95.	0.
95.	VELOCITY FPS	2.75	.00	2.75	.00
2	DISCHARGE CFS	335.	61.	245.	29.
335.	VELOCITY FPS	3.15	1.01	3.59	1.12
3	DISCHARGE CFS	545.	165.	312.	69.
545.	VELOCITY FPS	3.10	1.32	3.86	1.39
4	DISCHARGE CFS	630.	210.	335.	85.
630.	VELOCITY FPS	3.08	1.43	3.95	1.47
5	DISCHARGE CFS	950.	406.	391.	153.
950.	VELOCITY FPS	2.84	1.68	3.90	1.59
1	ELEV 919.3 KD	1591.	1.	1588.	1.
2	ELEV 921.4 KD	6250.	1081.	4638.	531.
3	ELEV 922.2 KD	10538.	3092.	6136.	1310.
4	ELEV 922.4 KD	12389.	4069.	6660.	1660.
5	ELEV 923.4 KD	21195.	8987.	8823.	3385.

KD TABLE FOR CROSS SECTION 15.15

ELEVATION	AREA	KD	KD BY SEGMENT		
916.70	0.				
917.	4.	50.	1.	47.	1.
918.	17.	531.	1.	528.	1.
919.	31.	1344.	1.	1341.	1.
920.	52.	2492.	9.	2451.	7.
921.	116.	4850.	547.	3977.	290.
922.	234.	9620.	2560.	5823.	1116.
923.	378.	17499.	6875.	7945.	2633.
924.	537.	28148.	12999.	10320.	4814.
925.	712.	41129.	20705.	12936.	7453.
926.	905.	56919.	29968.	15784.	11136.
927.	1117.	75543.	40633.	18855.	16023.
928.	1349.	97496.	52659.	22140.	22648.
929.	1598.	123389.	66003.	25633.	31695.
930.	1855.	152851.	80768.	29330.	42785.
931.	2113.	186428.	97399.	33233.	56513.
932.	2370.	224350.	115976.	37340.	73253.
933.	2628.	266837.	136579.	41645.	93405.

TABLE OF VALUES FOR BPR EQUATION

COEFK	AKB	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
.0000	.0000	.0000	.0000	.0000	.0000	1.1049	1.0000	1.0000	74.0054	74.2648	5 .7288
DCRIT	917.32	KBCRIT=									
.0000	.0000	.0000	.0000	.0000	.0000	1.2078	1.0000	1.0000	130.4731	130.8894	25 .3335
DCRIT	918.30	KBCRIT=									
.0000	.0000	.0000	.0000	.0000	.0000	1.2432	1.0000	1.0000	150.8601	151.3243	36 .5515
DCRIT	918.96	KBCRIT=									
.0000	.0000	.0000	.0000	.0000	.0000	1.2553	1.0000	1.0000	157.5043	157.9830	40 .5451
DCRIT	919.20	KBCRIT=									
.0000	.0000	.0000	.0000	.0000	.0000	1.2970	1.0000	1.0000	182.4432	182.9722	55 .6556
DCRIT	920.02	KBCRIT=									

ROAD SECTION 15.2

NO.	HW	CFS	HL	TW	CSM
0	916.10	0.00	0.00	0.00	0.00
1	919.40	95.00	.00	919.40	95.00
2	921.54	335.00	.00	921.54	335.00
3	922.31	545.00	.00	922.31	545.00
4	922.56	630.00	.00	922.56	630.00
5	923.50	950.00	.00	923.50	950.00

MIN ROAD ELEVATION 929.80

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 927.10 OPENING NO.= 1

RATING TABLE FOR SECTION 15.25 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FR CTION S OPE
0	916.1	0.0	0.0						
1	919.4	74.6	95.0	.00	.00	.00	95.00	917.3	.0037
2	921.6	131.7	335.0	.00	.00	.00	335.00	918.3	.0082
3	922.4	152.7	545.0	.00	.00	.00	545.00	919.0	.0140
4	922.6	159.6	630.0	.00	.00	.00	630.00	919.2	.0164
5	923.6	185.3	950.0	.00	.00	.00	950.00	920.0	.0243

SEGMENT TABLE FOR SECTION 15.25

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	95.	0.	95.	0.
95.	VELOCITY FPS	1.28	.00	1.27	.00
2	DISCHARGE CFS	335.	0.	335.	0.
335.	VELOCITY FPS	2.55	.00	2.54	.00
3	DISCHARGE CFS	545.	0.	545.	0.
545.	VELOCITY FPS	3.57	.00	3.57	.00
4	DISCHARGE CFS	630.	0.	630.	0.
630.	VELOCITY FPS	3.95	.00	3.95	.00
5	DISCHARGE CFS	950.	0.	950.	0.
950.	VELOCITY FPS	5.13	.00	5.13	.00
1	ELEV 919.4 KD	4950.	1.	4948.	1.
2	ELEV 921.6 KD	11718.	1.	11716.	1.
3	ELEV 922.4 KD	14567.	1.	14565.	1.
4	ELEV 922.6 KD	15536.	1.	15534.	1.
5	ELEV 923.6 KD	19277.	1.	19275.	1.

KD TABLE FOR CROSS SECTION 15.25

ELEVATION	AREA	KD	KD BY SEGMENT		
916.10	0.				
917.	11.	240.	1.	238.	1.
918.	37.	1643.	1.	1641.	1.
919.	64.	3863.	1.	3861.	1.
920.	90.	6619.	1.	6617.	1.
921.	117.	9780.	1.	9778.	1.
922.	143.	13247.	1.	13245.	1.
923.	170.	16971.	1.	16969.	1.
924.	196.	20903.	1.	20901.	1.
925.	223.	25001.	1.	24999.	1.
926.	249.	29245.	1.	29243.	1.
927.	276.	33610.	1.	33608.	1.
928.	481.	41418.	518.	39057.	811.
929.	1100.	61002.	4965.	44932.	8148.
930.	1763.	89043.	25783.	51150.	42313.
931.	2426.	126600.	119409.	57707.	195964.
932.	3089.	175930.	500594.	64595.	821531.
933.	3752.	239622.	1922890.	71810.	3155682.

TABLE OF VALUES FOR BPR EQUATION

COEFK	AKB	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
.0000	.0000	.0000	.0000	.0000	.0000	1.0030	1.0000	1.0000	74.6913	52.6108	7 .9528
DCRIT	917.32	KBCRIT=									
.5268	.5268	.0000	.0000	.0000	.0000	.6845	1.0000	1.0000	131.9988	273.3516	13 .4189
DCRIT	918.30	KBCRIT=									
.9599	.9599	.0000	.0000	.0000	.0000	.5457	1.0000	1.0000	153.4846	432.3857	15 .9546
DCRIT	918.96	KBCRIT=									
1.0750	1.0750	.0000	.0000	.0000	.0000	.5136	1.0000	1.0000	160.5919	494.1028	16 .0772
DCRIT	919.20	KBCRIT=									
1.4097	1.4097	.0000	.0000	.0000	.0000	.4275	1.0000	1.0000	187.0226	753.0039	18 .5600
DCRIT	920.02	KBCRIT=									

ROAD SECTION 15.3

NO.	HW	CFS	HL	TW	CSM
0	916.10	0.00	0.00	0.00	0.00
1	919.43	95.00	.00	919.43	95.00
2	921.68	335.00	.08	921.60	335.00
3	922.73	545.00	.32	922.41	545.00
4	923.12	630.00	.44	922.68	630.00
5	924.60	950.00	.92	923.68	950.00

MIN ROAD ELEVATION 929.80

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 927.10 OPENING NO.= 1

RATING TABLE FOR SECTION 15.32 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	917.1	0.0	0.0						
1	919.6	33.1	95.0	.00	.00	.00	95.00	918.3	.0407
BANK FULL	920.4	51.6	189.9	.00	.00	.00			
2	921.7	146.6	335.0	.00	.00	.00	335.00	919.8	.0348
3	922.7	280.9	545.0	.00	.00	.00	545.00	921.1	.0252
4	923.1	338.9	630.0	.00	.00	.00	630.00	921.2	.0218
5	924.6	573.5	950.0	.00	.00	.00	950.00	921.7	.0128

SEGMENT TABLE FOR SECTION 15.32

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	95.	0.	95.	0.
95.	VELOCITY FPS	2.87	.00	2.87	.00
2	DISCHARGE CFS	335.	48.	263.	24.
335.	VELOCITY FPS	3.55	.87	3.93	.96
3	DISCHARGE CFS	545.	155.	327.	63.
545.	VELOCITY FPS	3.12	1.09	3.90	1.14
4	DISCHARGE CFS	630.	209.	339.	81.
630.	VELOCITY FPS	2.93	1.17	3.77	1.16
5	DISCHARGE CFS	950.	413.	386.	151.
950.	VELOCITY FPS	2.38	1.27	3.40	1.12
1	ELEV 919.6 KD	1490.	1.	1488.	1.
2	ELEV 921.7 KD	5621.	749.	4499.	374.
3	ELEV 922.7 KD	10832.	3047.	6533.	1252.
4	ELEV 923.1 KD	13419.	4346.	7362.	1711.
5	ELEV 924.6 KD	26560.	11490.	10862.	4208.

KD TABLE FOR CROSS SECTION 15.32

ELEVATION	AREA	KD	KD BY SEGMENT		
917.10	0.				
918.	11.	291.	1.	289.	1.
919.	25.	984.	1.	982.	1.
920.	40.	1962.	1.	1960.	1.
921.	84.	3601.	130.	3317.	76.
922.	180.	6875.	1213.	5052.	571.
923.	318.	12518.	3844.	7064.	1536.
924.	472.	20614.	8166.	9339.	3060.
925.	639.	30703.	13851.	11862.	4975.
926.	824.	42911.	20719.	14619.	7558.
927.	1029.	57361.	28731.	17601.	11016.
928.	1253.	74241.	37833.	20802.	15593.
929.	1496.	94334.	48000.	24212.	22101.
930.	1753.	117229.	59178.	27826.	30169.
931.	2010.	143284.	71764.	31648.	40182.
932.	2267.	172704.	85868.	35673.	52462.
933.	2525.	205654.	101553.	39899.	67318.
934.	2782.	242295.	118880.	44322.	85077.

RATING TABLE FOR SECTION 15.35 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	917.2	0.0	0.0						
1	919.9	40.6	95.0	.00	.00	.00	95.00	918.4	.0175
BANK FULL	920.0	43.2	106.4	.00	.00	.00			
2	922.0	139.9	335.0	.00	.00	.00	335.00	920.3	.0164
3	923.0	196.9	545.0	.00	.00	.00	545.00	920.8	.0186
4	923.4	218.6	630.0	.00	.00	.00	630.00	921.0	.0190
5	924.7	308.6	950.0	.00	.00	.00	950.00	921.5	.0180

SEGMENT TABLE FOR SECTION 15.35

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	95.	0.	94.	0.
95.	VELOCITY FPS	2.50	.27	2.50	.28
2	DISCHARGE CFS	335.	43.	261.	31.
335.	VELOCITY FPS	3.27	1.09	3.65	1.06
3	DISCHARGE CFS	545.	92.	386.	67.
545.	VELOCITY FPS	3.83	1.47	4.43	1.42
4	DISCHARGE CFS	630.	113.	434.	83.
630.	VELOCITY FPS	3.99	1.58	4.67	1.53
5	DISCHARGE CFS	950.	197.	601.	152.
950.	VELOCITY FPS	4.32	1.80	5.24	1.79
1	ELEV 919.9 KD	2260.	5.	2251.	4.
2	ELEV 922.0 KD	8266.	1060.	6441.	765.
3	ELEV 923.0 KD	12634.	2109.	8981.	1545.
4	ELEV 923.4 KD	14442.	2569.	9982.	1892.
5	ELEV 924.7 KD	22386.	4626.	14201.	3559.

KD TABLE FOR CROSS SECTION 15.35

ELEVATION	AREA	KD	KD BY SEGMENT		
917.20	0.				
918.	10.	302.	1.	300.	1.
919.	24.	1144.	1.	1142.	1.
920.	43.	2421.	8.	2398.	7.
921.	87.	4745.	308.	4192.	220.
922.	139.	8218.	1049.	6411.	758.
923.	197.	12655.	2111.	8987.	1546.
924.	260.	18008.	3484.	11901.	2613.
925.	328.	24215.	5108.	15134.	3966.
926.	405.	31418.	7124.	18670.	5615.
927.	489.	39711.	9625.	22497.	7579.
928.	580.	49142.	12654.	26604.	9874.
929.	679.	59760.	16252.	30983.	12516.
930.	785.	71605.	20595.	35623.	15366.
931.	899.	84735.	25796.	40520.	18393.
932.	1020.	99225.	31778.	45666.	21760.
933.	1149.	115138.	38358.	51055.	25713.
934.	1284.	132509.	45541.	56683.	30284.
935.	1420.	151265.	53535.	62552.	35333.
936.	1555.	171431.	62378.	68657.	40878.
937.	1691.	193030.	72108.	74995.	46936.

RATING TABLE FOR SECTION 16.0 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	919.0	0.0	0.0						
BANK FULL	920.0	12.8	50.1	.00	.00	.00			
1	920.9	36.6	95.0	.00	.00	.00	95.00	920.3	.0531
2	922.6	90.1	335.0	.00	.00	.00	335.00	921.3	.0439
3	923.5	126.4	545.0	.00	.00	.00	545.00	921.9	.0445
4	923.9	140.1	630.0	.00	.00	.00	630.00	922.1	.0444
5	925.1	193.5	950.0	.00	.00	.00	950.00	922.9	.0418

SEGMENT TABLE FOR SECTION 16.0

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	95.	0.	94.	1.
95.	VELOCITY FPS	2.69	.68	2.69	.69
2	DISCHARGE CFS	335.	6.	319.	10.
335.	VELOCITY FPS	4.07	1.15	4.15	1.23
3	DISCHARGE CFS	545.	14.	507.	24.
545.	VELOCITY FPS	4.87	1.43	5.02	1.54
4	DISCHARGE CFS	630.	17.	582.	31.
630.	VELOCITY FPS	5.12	1.52	5.30	1.64
5	DISCHARGE CFS	950.	35.	852.	63.
950.	VELOCITY FPS	5.78	1.77	6.06	1.91
1	ELEV 920.9 KD	1304.	6.	1289.	9.
2	ELEV 922.6 KD	5056.	86.	4817.	154.
3	ELEV 923.5 KD	8170.	201.	7609.	360.
4	ELEV 923.9 KD	9448.	258.	8727.	463.
5	ELEV 925.1 KD	14697.	538.	13194.	965.

KD TABLE FOR CROSS SECTION 16.0

ELEVATION	AREA	KD	KD BY SEGMENT		
919.00	0.				
920.	13.	246.	1.	243.	1.
921.	40.	1477.	7.	1457.	12.
922.	71.	3537.	44.	3415.	79.
923.	106.	6342.	129.	5980.	231.
924.	145.	9873.	278.	9093.	498.
925.	188.	14120.	504.	12707.	904.
926.	235.	19086.	820.	16791.	1470.
927.	286.	24776.	1238.	21318.	2220.
928.	341.	31201.	1767.	26264.	3169.
929.	400.	38373.	2420.	31615.	4339.
930.	463.	46306.	3205.	37355.	5746.
931.	530.	54890.	4008.	43472.	7410.
932.	604.	64354.	5049.	49952.	9344.
933.	683.	74703.	6330.	56790.	11567.
934.	767.	86073.	7874.	63974.	14200.
935.	855.	98495.	9703.	71498.	17270.
936.	947.	111891.	11840.	79353.	20682.
937.	1041.	126104.	14305.	87531.	24250.
938.	1139.	141128.	17115.	96026.	27956.
939.	1240.	156979.	20290.	104835.	31830.
940.	1342.	173654.	23851.	113952.	35851.
941.	1445.	191200.	27827.	123382.	40158.
942.	1548.	209619.	32244.	133121.	44755.
943.	1651.	228915.	37129.	143165.	49649.

RATING TABLE FOR SECTION 16.1 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	919.1	0.0	0.0						
1	921.4	37.7	95.0	.00	.00	.00	95.00	920.6	.0520
2	923.1	101.8	335.0	.00	.00	.00	335.00	921.7	.0431
BANK FULL	923.2	107.8	363.9	.00	.00	.00			
3	924.0	179.4	545.0	.00	.00	.00	545.00	922.3	.0334
4	924.4	229.3	630.0	.00	.00	.00	630.00	922.5	.0285
5	925.7	463.6	950.0	.00	.00	.00	950.00	923.4	.0153

SEGMENT TABLE FOR SECTION 16.1

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	95.	0.	95.	0.
95.	VELOCITY FPS	2.53	.00	2.52	.00
2	DISCHARGE CFS	335.	0.	335.	0.
335.	VELOCITY FPS	3.31	.00	3.30	.00
3	DISCHARGE CFS	545.	4.	521.	19.
545.	VELOCITY FPS	3.52	.62	3.55	.76
4	DISCHARGE CFS	630.	13.	575.	43.
630.	VELOCITY FPS	3.42	.67	3.51	.91
5	DISCHARGE CFS	950.	80.	720.	150.
950.	VELOCITY FPS	2.85	.86	3.20	1.03
1	ELEV 921.4 KD	1318.	1.	1315.	1.
2	ELEV 923.1 KD	5103.	1.	5100.	2.
3	ELEV 924.0 KD	9340.	34.	9073.	233.
4	ELEV 924.4 KD	11560.	125.	10860.	575.
5	ELEV 925.7 KD	24218.	1942.	18527.	3749.

KD TABLE FOR CROSS SECTION 16.1

ELEVATION	AREA	KD	KD BY SEGMENT		
919.10	0.				
920.	8.	137.	1.	134.	1.
921.	28.	879.	1.	877.	1.
922.	58.	2401.	1.	2398.	1.
923.	99.	4891.	1.	4888.	2.
924.	176.	9264.	30.	8945.	217.
925.	332.	17051.	677.	14382.	1820.
926.	542.	28781.	2825.	20827.	4982.
927.	797.	44714.	6571.	28202.	9887.
928.	1126.	63547.	10268.	36421.	16821.
929.	1551.	93370.	20624.	45463.	27122.
930.	1987.	133242.	40085.	55516.	41798.
931.	2423.	184292.	73491.	66612.	62014.
932.	2859.	248315.	128302.	78760.	89125.
933.	3295.	327208.	214861.	91964.	124663.

RATING TABLE FOR SECTION 16.25 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	919.8	0.0	0.0						
BANK FULL	920.0	3.0	10.5	.00	.00	.00			
1	921.6	102.0	95.0	.00	.00	.00	95.00	920.4	.0118
2	923.4	285.6	335.0	.00	.00	.00	335.00	921.0	.0110
3	924.3	446.3	545.0	.00	.00	.00	545.00	921.4	.0096
4	924.6	506.7	630.0	.00	.00	.00	630.00	921.5	.0090
5	925.8	737.9	950.0	.00	.00	.00	950.00	922.0	.0071

SEGMENT TABLE FOR SECTION 16.25

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	95.	3.	62.	30.
95.	VELOCITY FPS	1.06	.51	1.21	.68
2	DISCHARGE CFS	335.	26.	195.	114.
335.	VELOCITY FPS	1.52	.62	1.87	.82
3	DISCHARGE CFS	545.	64.	272.	209.
545.	VELOCITY FPS	1.59	.74	2.06	.92
4	DISCHARGE CFS	630.	81.	298.	251.
630.	VELOCITY FPS	1.59	.77	2.09	.97
5	DISCHARGE CFS	950.	155.	383.	412.
950.	VELOCITY FPS	1.59	.86	2.15	1.08
1	ELEV 921.6 KD	2765.	94.	1801.	870.
2	ELEV 923.4 KD	10112.	782.	5879.	3451.
3	ELEV 924.3 KD	17533.	2021.	8833.	6679.
4	ELEV 924.6 KD	21012.	2689.	9963.	8360.
5	ELEV 925.8 KD	35703.	5772.	14483.	15449.

KD TABLE FOR CROSS SECTION 16.25

ELEVATION	AREA	KD	KD BY SEGMENT		
919.80	0.				
920.	3.	18.	1.	16.	1.
921.	60.	1271.	27.	871.	374.
922.	133.	3997.	159.	2558.	1279.
923.	238.	8105.	515.	4897.	2683.
924.	389.	14594.	1501.	7807.	5287.
925.	574.	24971.	3465.	11231.	10237.
926.	770.	37981.	6277.	15139.	16545.
927.	980.	53382.	9847.	19499.	24036.
928.	1211.	70996.	14139.	24288.	32563.
929.	1476.	89806.	18125.	29490.	42173.
930.	1786.	112594.	24683.	35089.	52852.
931.	2096.	138208.	32656.	41078.	64851.
932.	2406.	166699.	42182.	47444.	78193.
933.	2716.	198115.	53397.	54178.	92899.

RATING TABLE FOR SECTION 16.55 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	923.0	0.0	0.0						
BANK FULL	924.0	16.8	62.7	.00	.00	.00			
1	924.5	38.5	95.0	.00	.00	.00	95.00	924.2	.1377
2	925.7	143.8	335.0	.00	.00	.00	335.00	924.9	.0987
3	926.1	238.1	545.0	.00	.00	.00	545.00	925.4	.0968
4	926.4	316.7	630.0	.00	.00	.00	630.00	925.5	.0736
5	927.0	512.6	950.0	.00	.00	.00	950.00	925.8	.0496

SEGMENT TABLE FOR SECTION 16.55

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	95.	0.	73.	22.
95.	VELOCITY FPS	3.12	.00	3.43	1.26
2	DISCHARGE CFS	335.	43.	166.	125.
335.	VELOCITY FPS	3.37	.96	4.20	2.12
3	DISCHARGE CFS	545.	140.	218.	187.
545.	VELOCITY FPS	3.46	1.23	4.65	2.41
4	DISCHARGE CFS	630.	217.	217.	196.
630.	VELOCITY FPS	3.02	1.22	4.27	2.24
5	DISCHARGE CFS	950.	467.	241.	242.
950.	VELOCITY FPS	2.54	1.38	3.98	2.13
1	ELEV 924.5 KD	795.	1.	632.	162.
2	ELEV 925.7 KD	3269.	280.	1720.	1269.
3	ELEV 926.1 KD	5442.	1221.	2282.	1938.
4	ELEV 926.4 KD	7156.	2206.	2610.	2340.
5	ELEV 927.0 KD	13379.	6389.	3497.	3492.

KD TABLE FOR CROSS SECTION 16.55

ELEVATION	AREA	KD	KD BY SEGMENT		
923.00	0.				
924.	17.	322.	1.	306.	7.
925.	63.	1564.	1.	1023.	540.
926.	199.	4781.	897.	2128.	1756.
927.	520.	13767.	6592.	3533.	3539.
928.	845.	28385.	17259.	5209.	5882.
929.	1173.	47390.	31447.	7136.	8779.
930.	1506.	70392.	48852.	9299.	12228.
931.	1844.	97012.	69141.	11685.	16186.
932.	2186.	126974.	91940.	14283.	20751.
933.	2534.	160245.	117187.	17085.	25973.
934.	2886.	196708.	144742.	20086.	31880.
935.	3243.	236267.	174486.	23277.	38504.
936.	3601.	279646.	207217.	26658.	45806.
937.	3958.	326880.	242971.	30226.	53795.
938.	4316.	377997.	281782.	33975.	62481.

RATING TABLE FOR SECTION 16.9 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FR CTION S OPE
0	924.4	0.0	0.0						
BANK FULL	925.6	16.0	62.3	.00	.00	.00			
1	926.2	26.3	95.0	.00	.00	.00	95.00	925.6	.1199
2	927.8	60.1	335.0	.00	.00	.00	335.00	927.0	.1434
3	928.6	79.0	545.0	.00	.00	.00	545.00	927.9	.1787
4	928.8	85.6	630.0	.00	.00	.00	630.00	928.2	.1918
5	929.5	105.9	950.0	.00	.00	.00	950.00	929.0	.2435

SEGMENT TABLE FOR SECTION 16.9

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	95.	0.	94.	1.
95.	VELOCITY FPS	3.69	.00	3.70	1.02
2	DISCHARGE CFS	335.	4.	311.	20.
335.	VELOCITY FPS	6.10	1.87	6.28	2.39
3	DISCHARGE CFS	545.	10.	486.	48.
545.	VELOCITY FPS	7.67	2.53	8.04	3.36
4	DISCHARGE CFS	630.	13.	555.	62.
630.	VELOCITY FPS	8.23	2.79	8.65	3.72
5	DISCHARGE CFS	950.	27.	808.	115.
950.	VELOCITY FPS	10.15	3.63	10.79	4.88
1	ELEV 926.2 KD	866.	3.	858.	5.
2	ELEV 927.8 KD	2794.	33.	2599.	162.
3	ELEV 928.6 KD	4076.	76.	3640.	360.
4	ELEV 928.8 KD	4546.	95.	4010.	441.
5	ELEV 929.5 KD	6083.	168.	5186.	729.

KD TABLE FOR CROSS SECTION 16.9

ELEVATION	AREA	KD	KD BY SEGMENT		
924.40	0.				
925.	8.	129.	1.	126.	1.
926.	22.	678.	2.	674.	2.
927.	41.	1659.	8.	1602.	46.
928.	64.	3067.	41.	2826.	199.
929.	91.	4939.	112.	4312.	511.
930.	120.	7238.	232.	6039.	967.
931.	152.	9967.	410.	7991.	1563.
932.	186.	13131.	655.	10155.	2316.
933.	223.	16739.	976.	12522.	3234.
934.	266.	20705.	1289.	15084.	4328.
935.	315.	25278.	1915.	17833.	5505.
936.	369.	30557.	2940.	20762.	6837.
937.	425.	36440.	4078.	23868.	8475.
938.	485.	42926.	5329.	27144.	10438.
939.	546.	50013.	6697.	30587.	12742.
940.	608.	57684.	8290.	34196.	15350.
941.	670.	65944.	10127.	37966.	18280.
942.	732.	74798.	12226.	41895.	21547.

TABLE OF VALUES FOR BPR EQUATION

COEFK	AKB	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
.0000	.0000	.0000	.0000	.0000	.0000	1.0000	1.0000	1.0000	44.9789	31.2367	2 .0198
DCRIT	927.74	KBCRIT=									
.3455	.4855	.0000	.0000	.0000	-.1400	.6599	1.0000	1.0000	97.0947	254.7683	4 .4621
DCRIT	928.69	KBCRIT=									
.6309	.8844	.0000	.0000	.0000	-.2535	.5676	1.0000	1.0000	132.5426	552.6704	6 .3622
DCRIT	929.29	KBCRIT=									
.6543	.9175	.0000	.0000	.0000	-.2632	.5579	1.0000	1.0000	149.7958	682.5267	7 .9343
DCRIT	929.51	KBCRIT=									
.8416	1.1844	.0000	.0000	.0000	-.3428	.4844	1.0000	1.0000	194.3093	1220.4957	10 .6191
DCRIT	930.19	KBCRIT=									

ROAD SECTION 17.0

NO.	HW	CFS	HL	TW	CSM
0	927.00	0.00	0.00	0.00	0.00
1	928.58	95.00	.00	928.58	95.00
2	930.63	335.00	.64	929.99	335.00
3	932.02	545.00	1.22	930.80	545.00
4	932.55	630.00	1.38	931.17	630.00
5	934.27	950.00	2.22	932.05	950.00

MIN ROAD ELEVATION 938.42

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 938.00 OPENING NO.= 1

RATING TABLE FOR SECTION 17.1 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FR CTION S OPE
0	927.6	0.0	0.0						
1	929.0	26.7	95.0	.00	.00	.00	95.00	928.6	.1703
BANK FULL	929.3	34.4	139.2	.00	.00	.00			
2	930.7	169.6	335.0	.00	.00	.00	335.00	929.9	.0475
3	932.0	415.2	545.0	.00	.00	.00	545.00	930.2	.0156
4	932.6	534.1	630.0	.00	.00	.00	630.00	930.3	.0110
5	934.3	1020.2	950.0	.00	.00	.00	950.00	930.6	.0048

SEGMENT TABLE FOR SECTION 17.1

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	95.	0.	95.	0.
95.	VELOCITY FPS	3.56	.00	3.56	.00
2	DISCHARGE CFS	335.	56.	225.	54.
335.	VELOCITY FPS	2.83	1.19	3.31	1.00
3	DISCHARGE CFS	545.	126.	245.	174.
545.	VELOCITY FPS	1.82	1.07	2.46	.88
4	DISCHARGE CFS	630.	143.	252.	235.
630.	VELOCITY FPS	1.59	.94	2.24	.87
5	DISCHARGE CFS	950.	233.	279.	438.
950.	VELOCITY FPS	1.20	.69	1.82	.83
1	ELEV 929.0 KD	728.	1.	726.	1.
2	ELEV 930.7 KD	4839.	789.	3292.	758.
3	ELEV 932.0 KD	13776.	3189.	6277.	4310.
4	ELEV 932.6 KD	18951.	4344.	7642.	6964.
5	ELEV 934.3 KD	43341.	10525.	12836.	19980.

KD TABLE FOR CROSS SECTION 17.1

ELEVATION	AREA	KD	KD BY SEGMENT		
927.60	0.				
928.	7.	89.	1.	87.	1.
929.	27.	744.	1.	742.	1.
930.	80.	2279.	144.	2036.	99.
931.	215.	6263.	1175.	3878.	1169.
932.	406.	13420.	3089.	6169.	4125.
933.	641.	23651.	5026.	8864.	9703.
934.	932.	38494.	8968.	11939.	17587.
935.	1261.	58141.	15473.	15366.	27278.
936.	1622.	81709.	23629.	19131.	38906.
937.	2032.	107230.	32114.	23220.	51887.
938.	2517.	136606.	43218.	27619.	65560.
939.	3048.	178693.	66005.	32324.	80961.
940.	3578.	228524.	97278.	37333.	98222.
941.	4109.	286725.	139118.	42638.	117388.
942.	4639.	353920.	193894.	48234.	138506.

RATING TABLE FOR SECTION 17.2 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	927.9	0.0	0.0						
BANK FULL	929.6	34.4	68.4	.00	.00	.00			
1	930.3	76.1	95.0	.00	.00	.00	95.00	928.9	.0185
2	931.6	272.1	335.0	.00	.00	.00	335.00	930.2	.0151
3	932.6	461.8	545.0	.00	.00	.00	545.00	930.5	.0104
4	933.0	566.0	630.0	.00	.00	.00	630.00	930.6	.0085
5	934.5	996.2	950.0	.00	.00	.00	950.00	930.9	.0044

SEGMENT TABLE FOR SECTION 17.2

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	95.	6.	85.	4.
95.	VELOCITY FPS	1.62	.43	1.70	.35
2	DISCHARGE CFS	335.	75.	177.	83.
335.	VELOCITY FPS	1.68	.96	2.13	.75
3	DISCHARGE CFS	545.	133.	219.	193.
545.	VELOCITY FPS	1.52	1.02	2.09	.85
4	DISCHARGE CFS	630.	145.	231.	254.
630.	VELOCITY FPS	1.42	.89	2.00	.88
5	DISCHARGE CFS	950.	237.	263.	450.
950.	VELOCITY FPS	1.16	.72	1.73	.87
1	ELEV 930.3 KD	2156.	111.	1970.	75.
2	ELEV 931.6 KD	8586.	1924.	4601.	2060.
3	ELEV 932.6 KD	16831.	4116.	6820.	5896.
4	ELEV 933.0 KD	21587.	5039.	7997.	8551.
5	ELEV 934.5 KD	45196.	11186.	12589.	21421.

KD TABLE FOR CROSS SECTION 17.2

ELEVATION	AREA	KD	KD BY SEGMENT		
927.90	0.				
928.	2.	14.	1.	13.	1.
929.	21.	491.	1.	488.	1.
930.	52.	1634.	9.	1576.	5.
931.	168.	4994.	865.	3276.	830.
932.	342.	11459.	2699.	5438.	3289.
933.	568.	21727.	5050.	8014.	8592.
934.	842.	35883.	8264.	10977.	16589.
935.	1158.	55961.	14825.	14301.	26810.
936.	1508.	80376.	23279.	17968.	39113.
937.	1895.	108874.	33525.	21961.	53385.
938.	2358.	136239.	41890.	26268.	68000.
939.	2889.	179989.	64750.	30880.	84479.
940.	3419.	232140.	96392.	35799.	103003.
941.	3950.	293410.	139032.	41016.	123627.
942.	4480.	364513.	195199.	46525.	146400.

RATING TABLE FOR SECTION 17.21 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FR CTION S OPE
0	928.3	0.0	0.0						
BANK FULL	930.0	26.3	62.7	.00	.00	.00			
1	930.9	69.5	95.0	.00	.00	.00	95.00	929.5	.0210
2	932.4	160.7	335.0	.00	.00	.00	335.00	930.7	.0279
3	933.3	227.7	545.0	.00	.00	.00	545.00	931.1	.0289
4	933.7	258.9	630.0	.00	.00	.00	630.00	931.2	.0273
5	935.1	399.3	950.0	.00	.00	.00	950.00	931.7	.0234

SEGMENT TABLE FOR SECTION 17.21

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	95.	16.	71.	8.
95.	VELOCITY FPS	1.71	.76	1.89	.73
2	DISCHARGE CFS	335.	99.	187.	49.
335.	VELOCITY FPS	2.49	1.50	3.04	1.47
3	DISCHARGE CFS	545.	182.	271.	92.
545.	VELOCITY FPS	2.84	1.80	3.57	1.82
4	DISCHARGE CFS	630.	218.	301.	111.
630.	VELOCITY FPS	2.88	1.85	3.66	1.89
5	DISCHARGE CFS	950.	370.	418.	162.
950.	VELOCITY FPS	2.99	1.93	3.98	1.57
1	ELEV 930.9 KD	2057.	325.	1580.	151.
2	ELEV 932.4 KD	6332.	1864.	3551.	916.
3	ELEV 933.3 KD	10134.	3362.	5069.	1704.
4	ELEV 933.7 KD	12042.	4152.	5780.	2109.
5	ELEV 935.1 KD	19629.	7628.	8670.	3331.

KD TABLE FOR CROSS SECTION 17.21

ELEVATION	AREA	KD	KD BY SEGMENT		
928.30	0.				
929.	9.	166.	1.	164.	1.
930.	26.	754.	3.	737.	3.
931.	76.	2339.	406.	1720.	189.
932.	137.	5114.	1411.	3023.	676.
933.	207.	8933.	2875.	4603.	1451.
934.	288.	13799.	4913.	6437.	2446.
935.	390.	19160.	7412.	8509.	3232.
936.	525.	26418.	10527.	10807.	5067.
937.	699.	35691.	14177.	13318.	8158.
938.	918.	47259.	19208.	16036.	11991.
939.	1208.	61538.	26096.	18952.	16462.
940.	1522.	78513.	34753.	22063.	21877.
941.	1836.	98189.	45205.	25367.	28403.
942.	2150.	120730.	57641.	28859.	36152.
943.	2464.	146300.	72249.	32534.	45240.

RATING TABLE FOR SECTION 17.25 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	928.8	0.0	0.0						
BANK FULL	930.0	16.8	45.9	.00	.00	.00			
1	931.3	110.7	95.0	.00	.00	.00	95.00	930.0	.0123
2	932.8	326.6	335.0	.00	.00	.00	335.00	930.8	.0114
3	933.7	520.7	545.0	.00	.00	.00	545.00	931.2	.0094
4	934.1	613.3	630.0	.00	.00	.00	630.00	931.3	.0083
5	935.4	980.4	950.0	.00	.00	.00	950.00	931.6	.0052

SEGMENT TABLE FOR SECTION 17.25

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	95.	8.	55.	32.
95.	VELOCITY FPS	1.19	.61	1.47	.54
2	DISCHARGE CFS	335.	32.	121.	183.
335.	VELOCITY FPS	1.37	.67	1.97	.83
3	DISCHARGE CFS	545.	66.	157.	322.
545.	VELOCITY FPS	1.35	.71	2.07	.91
4	DISCHARGE CFS	630.	86.	166.	378.
630.	VELOCITY FPS	1.31	.73	2.03	.91
5	DISCHARGE CFS	950.	172.	194.	584.
950.	VELOCITY FPS	1.16	.79	1.89	.88
1	ELEV 931.3 KD	2703.	227.	1586.	890.
2	ELEV 932.8 KD	9897.	925.	3615.	5357.
3	ELEV 933.7 KD	17750.	2107.	5160.	10482.
4	ELEV 934.1 KD	21815.	2912.	5830.	13073.
5	ELEV 935.4 KD	41558.	7465.	8540.	25553.

KD TABLE FOR CROSS SECTION 17.25

ELEVATION	AREA	KD	KD BY SEGMENT		
928.80	0.				
929.	2.	23.	1.	20.	1.
930.	17.	420.	1.	418.	1.
931.	83.	1943.	142.	1275.	511.
932.	199.	5432.	502.	2474.	2437.
933.	367.	11536.	1116.	3970.	6450.
934.	600.	21258.	2787.	5735.	12687.
935.	874.	35400.	5975.	7751.	21640.
936.	1177.	53705.	10415.	10003.	33287.
937.	1504.	77514.	15789.	12478.	49231.
938.	1843.	105364.	22211.	15168.	67973.
939.	2193.	137297.	29636.	18063.	89588.
940.	2551.	173241.	38131.	21159.	113968.
941.	2909.	214289.	48015.	24451.	142027.
942.	3267.	260657.	59372.	27936.	173950.
943.	3625.	312552.	72285.	31608.	209916.

RATING TABLE FOR SECTION 17.35 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FR CTION S OPE
0	929.8	0.0	0.0						
BANK FULL	930.0	3.8	8.5	.00	.00	.00			
1	932.0	88.0	95.0	.00	.00	.00	95.00	930.6	.0117
2	933.6	259.8	335.0	.00	.00	.00	335.00	931.4	.0133
3	934.5	415.4	545.0	.00	.00	.00	545.00	931.9	.0121
4	934.8	480.9	630.0	.00	.00	.00	630.00	932.1	.0115
5	936.0	746.1	950.0	.00	.00	.00	950.00	932.7	.0090

SEGMENT TABLE FOR SECTION 17.35

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	95.	5.	86.	4.
95.	VELOCITY FPS	1.21	.45	1.26	.45
2	DISCHARGE CFS	335.	45.	254.	36.
335.	VELOCITY FPS	1.78	.61	2.00	.61
3	DISCHARGE CFS	545.	107.	356.	82.
545.	VELOCITY FPS	1.86	.75	2.23	.72
4	DISCHARGE CFS	630.	137.	388.	105.
630.	VELOCITY FPS	1.86	.80	2.27	.76
5	DISCHARGE CFS	950.	254.	497.	199.
950.	VELOCITY FPS	1.80	.89	2.33	.81
1	ELEV 932.0 KD	2777.	143.	2519.	114.
2	ELEV 933.6 KD	9159.	1192.	7023.	944.
3	ELEV 934.5 KD	15620.	3039.	10243.	2338.
4	ELEV 934.8 KD	18511.	3960.	11511.	3039.
5	ELEV 936.0 KD	31605.	8398.	16634.	6572.

KD TABLE FOR CROSS SECTION 17.35

ELEVATION	AREA	KD	KD BY SEGMENT		
929.80	0.				
930.	4.	28.	1.	26.	1.
931.	37.	862.	24.	818.	19.
932.	86.	2687.	139.	2438.	111.
933.	174.	5975.	519.	5019.	412.
934.	320.	11597.	1816.	8345.	1436.
935.	522.	20445.	4567.	12301.	3513.
936.	758.	32256.	8615.	16856.	6748.
937.	1038.	47006.	13914.	21969.	11123.
938.	1379.	65774.	20670.	27603.	17457.
939.	1769.	89259.	29331.	33743.	26141.
940.	2199.	117555.	39741.	40372.	37522.
941.	2629.	150881.	52337.	47499.	52067.
942.	3059.	189563.	67321.	55113.	70253.
943.	3489.	233915.	84892.	63202.	92579.

RATING TABLE FOR SECTION 17.45 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FR CTION S OPE
0	931.4	0.0	0.0						
BANK FULL	932.0	9.0	23.9	.00	.00	.00			
1	933.8	77.3	95.0	.00	.00	.00	95.00	932.4	.0163
2	935.4	232.6	335.0	.00	.00	.00	335.00	933.3	.0220
3	936.3	393.2	545.0	.00	.00	.00	545.00	933.8	.0182
4	936.5	431.4	630.0	.00	.00	.00	630.00	934.0	.0196
5	937.5	650.1	950.0	.00	.00	.00	950.00	934.6	.0158

SEGMENT TABLE FOR SECTION 17.45

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	95.	7.	71.	17.
95.	VELOCITY FPS	1.53	.58	1.73	.71
2	DISCHARGE CFS	335.	49.	198.	87.
335.	VELOCITY FPS	2.27	.85	2.84	.84
3	DISCHARGE CFS	545.	101.	257.	187.
545.	VELOCITY FPS	2.17	.92	2.97	.95
4	DISCHARGE CFS	630.	121.	281.	228.
630.	VELOCITY FPS	2.27	.99	3.14	1.04
5	DISCHARGE CFS	950.	210.	342.	398.
950.	VELOCITY FPS	2.14	1.04	3.19	1.17
1	ELEV 933.8 KD	2350.	170.	1753.	426.
2	ELEV 935.4 KD	7117.	1031.	4259.	1827.
3	ELEV 936.3 KD	12739.	2345.	6056.	4338.
4	ELEV 936.5 KD	14179.	2697.	6442.	5040.
5	ELEV 937.5 KD	23859.	5236.	8683.	9940.

KD TABLE FOR CROSS SECTION 17.45

ELEVATION	AREA	KD	KD BY SEGMENT		
931.40	0.				
932.	9.	142.	1.	140.	1.
933.	42.	1046.	37.	872.	137.
934.	91.	2773.	223.	2043.	506.
935.	178.	5482.	684.	3581.	1218.
936.	336.	10637.	1833.	5444.	3329.
937.	542.	19081.	3927.	7607.	7547.
938.	786.	30628.	7229.	10049.	13321.
939.	1059.	45588.	12229.	12756.	20570.
940.	1358.	63094.	18243.	15716.	29108.
941.	1698.	82668.	24939.	18918.	38794.
942.	2058.	104893.	32675.	22355.	49942.
943.	2417.	130264.	41779.	26021.	62846.
944.	2777.	158899.	52345.	29911.	77594.
945.	3136.	190907.	64463.	34019.	94272.

RATING TABLE FOR SECTION 17.5 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	932.4	0.0	0.0						
BANK FULL	934.2	24.2	59.4	.00	.00	.00			
1	935.3	66.7	95.0	.00	.00	.00	95.00	933.6	.0249
2	936.7	312.0	335.0	.00	.00	.00	335.00	935.4	.0191
3	937.4	484.4	545.0	.00	.00	.00	545.00	935.6	.0181
4	937.6	533.9	630.0	.00	.00	.00	630.00	935.7	.0193
5	938.4	803.2	950.0	.00	.00	.00	950.00	936.0	.0159

SEGMENT TABLE FOR SECTION 17.5

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	95.	3.	87.	5.
95.	VELOCITY FPS	2.02	.25	2.09	.38
2	DISCHARGE CFS	335.	106.	162.	67.
335.	VELOCITY FPS	1.81	.71	2.46	.68
3	DISCHARGE CFS	545.	207.	206.	132.
545.	VELOCITY FPS	1.80	.86	2.66	.80
4	DISCHARGE CFS	630.	246.	225.	159.
630.	VELOCITY FPS	1.87	.92	2.80	.86
5	DISCHARGE CFS	950.	407.	271.	272.
950.	VELOCITY FPS	1.76	.99	2.86	.91
1	ELEV 935.3 KD	1857.	35.	1755.	67.
2	ELEV 936.7 KD	7647.	2397.	3750.	1500.
3	ELEV 937.4 KD	12757.	4793.	4911.	3053.
4	ELEV 937.6 KD	14283.	5516.	5223.	3544.
5	ELEV 938.4 KD	23785.	10146.	6890.	6749.

KD TABLE FOR CROSS SECTION 17.5

ELEVATION	AREA	KD	KD BY SEGMENT		
932.40	0.				
933.	7.	126.	1.	124.	1.
934.	21.	621.	1.	619.	1.
935.	48.	1504.	5.	1447.	17.
936.	169.	4021.	795.	2691.	535.
937.	384.	9721.	3335.	4245.	2098.
938.	663.	18971.	7788.	6073.	5110.
939.	1017.	32360.	14440.	8151.	9737.
940.	1425.	51056.	23951.	10468.	16599.
941.	1879.	74570.	35486.	13011.	26026.
942.	2375.	102920.	49059.	15772.	38050.
943.	2918.	135784.	64601.	18740.	52414.
944.	3514.	173245.	81794.	21910.	69510.
945.	4162.	218370.	100727.	25274.	92256.
946.	4831.	272173.	121903.	28833.	121667.
947.	5500.	333969.	145547.	32587.	157334.
948.	6169.	404277.	171746.	36533.	200018.

RATING TABLE FOR SECTION 17.55 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FR CTION S OPE
0	933.5	0.0	0.0						
BANK FULL	935.0	28.4	55.3	.00	.00	.00			
1	936.1	190.0	95.0	.00	.00	.00	95.00	934.7	.0070
2	937.3	475.6	335.0	.00	.00	.00	335.00	935.5	.0072
3	938.1	659.5	545.0	.00	.00	.00	545.00	935.7	.0076
4	938.3	715.2	630.0	.00	.00	.00	630.00	935.8	.0081
5	939.1	970.2	950.0	.00	.00	.00	950.00	936.0	.0082

SEGMENT TABLE FOR SECTION 17.55

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	95.	17.	45.	33.
95.	VELOCITY FPS	.83	.29	1.08	.37
2	DISCHARGE CFS	335.	106.	97.	132.
335.	VELOCITY FPS	.96	.55	1.50	.60
3	DISCHARGE CFS	545.	194.	136.	215.
545.	VELOCITY FPS	1.07	.70	1.75	.71
4	DISCHARGE CFS	630.	229.	153.	248.
630.	VELOCITY FPS	1.13	.76	1.87	.75
5	DISCHARGE CFS	950.	373.	206.	371.
950.	VELOCITY FPS	1.25	.91	2.12	.80
1	ELEV 936.1 KD	3530.	541.	1770.	1219.
2	ELEV 937.3 KD	12437.	3911.	3636.	4890.
3	ELEV 938.1 KD	19720.	6973.	4947.	7800.
4	ELEV 938.3 KD	22125.	8048.	5361.	8715.
5	ELEV 939.1 KD	33101.	12995.	7174.	12932.

KD TABLE FOR CROSS SECTION 17.55

ELEVATION	AREA	KD	KD BY SEGMENT		
933.50	0.				
934.	7.	98.	1.	95.	1.
935.	28.	654.	2.	636.	12.
936.	174.	3233.	446.	1674.	1079.
937.	396.	9608.	2782.	3091.	3715.
938.	644.	19101.	6696.	4835.	7558.
939.	929.	31223.	12141.	6878.	12197.
940.	1263.	47116.	18921.	9198.	18985.
941.	1631.	68554.	26919.	11779.	29835.
942.	2014.	93795.	36122.	14611.	43038.
943.	2412.	122623.	46524.	17681.	58399.
944.	2817.	155388.	58227.	20986.	76239.
945.	3222.	192708.	71399.	24523.	97142.
946.	3627.	234737.	86075.	28286.	121299.
947.	4032.	281621.	102284.	32270.	148895.

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
CHANGE    DISCHARGE
DISCHARGE -1        90.       330.      540.      625.      935.
END
REACH     17.65     1.        1020.     630.
SEGMENT   17.65     1         N         -8.
NVALUE    0.13
SEGMENT   17.65     2         C         8.
NVALUE    0.07
SEGMENT   17.65     3         N         480.
NVALUE    0.13
SECTION   17.65
          -125.     946.0     -105.     940.0     -40.      938.0
          -20.      936.0     -6.       934.6     30.       936.0
          50.       938.0     400.      940.0     440.      942.0
          470.      944.0     480.      946.0     6.        934.6
          -8.       936.0     8.        936.0
ENDTABLE
--------------------DATA POINTS ON SECTION 17.65  REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
REACH     17.75     1.        1030.     640.
SEGMENT   17.75     1         N         -20.
NVALUE    0.14
SEGMENT   17.75     2         C         25.
NVALUE    0.07
SEGMENT   17.75     3         N         530.
NVALUE    0.14
SECTION   17.75
          -210.     948.0     -190.     946.0     -175.     944.0
          -160.     942.0     -150.     940.0     -75.      938.0
          -20.      936.0     0.        935.7     25.       936.0
          40.       938.0     125.      940.0     190.      940.0
          300.      942.0     420.      941.5     470.      942.0
          495.      944.0     530.      948.0
ENDTABLE
REACH     17.85     1.        640.      520.
SEGMENT   17.85     1         N         -40.
NVALUE    0.15
SEGMENT   17.85     2         C         15.
NVALUE    0.08
SEGMENT   17.85     3         N         460.
NVALUE    0.15
SECTION   17.85
          -240.     947.5     -220.     944.0     -205.     942.0
          -170.     940.0     -40.      938.0     0.        937.4
          15.       938.0     95.       940.0     195.      942.0
          250.      943.5     440.      944.0     460.      947.5
ENDTABLE
```

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
REACH      17.9       1.         1020.      600.
SEGMENT    17.9       1          N          -8.
NVALUE     0.15
SEGMENT    17.9       2          C          8.
NVALUE     0.08
SEGMENT    17.9       3          N          600.       947.4
NVALUE     0.15
SECTION    17.9
           -600.      947.4      -600.      944.3      -500.      941.7
           -400.      939.0      -300.      938.5      -200.      938.9
           -100.      938.6      -50.       939.0      -8.        939.4
           -6.        937.4      8.         939.4      50.        939.5
           100.       939.8      200.       941.2      300.       942.1
           400.       942.9      500.       942.9      600.       946.4
           600.       947.4      6.         937.4
ENDTABLE
--------------------DATA POINTS ON SECTION 17.9   REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
ROAD       18.0       2.7        35.        35.
BPR        18.0       A          1
GIRDER     940.56     940.26     18.        .8         2.7
           -8.        942.09     -8.        940.26     8.         940.26
           8.         942.09
ENDTABLE
SECTION    18.0
           -800.      946.49     -700.      945.19     -600.      942.99
           -500.      941.39     -400.      940.79     -300.      940.69
           -200.      940.99     -100.      941.39     -8.        942.09
           8.         942.09     100.       941.99     200.       942.49
           300.       943.19     400.       943.79     500.       944.89
           600.       945.99     650.       946.6      -7.9       937.4
           7.9        937.4
ENDTABLE
--------------------DATA POINTS ON SECTION 18.0   REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
REACH      18.1       1.         30.        30.
REACH2     17.9       0.2
REACH      18.15      1.         525.       390.
SEGMENT    18.15      1          N          -8.
NVALUE     0.15
SEGMENT    18.15      2          C          8.
NVALUE     0.08
SEGMENT    18.15      3          N          515.
NVALUE     0.15
SECTION    18.15
           -370.      948.0      -355.      946.0      -335.      944.0
           -305.      942.0      -130.      940.0      -20.       939.9
           -6.        937.8      20.        939.9      90.        940.0
           345.       942.0      370.       944.0      495.       946.0
```

```
----------------------------80/80 LIST OF INPUT DATA-----------------------------
          515.      948.0     6.        937.8     -8.       939.9
          8.        939.9
ENDTABLE
--------------------DATA POINTS ON SECTION 18.15  REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
REACH     18.2      1.        1190.     830.
SEGMENT   18.2      1         N         -9.
NVALUE    0.15
SEGMENT   18.2      2         C         9.
NVALUE    0.08
SEGMENT   18.2      3         N         400.      949.0
NVALUE    0.15
SECTION   18.2
          -400.     949.0     -300.     944.0     -200.     942.6
          -100.     941.2     -50.      941.2     -10.      941.3
          -9.       940.3     -6.       938.6     9.        940.3
          11.       940.9     50.       943.4     100.      947.3
          200.      947.9     300.      946.7     400.      947.6
          400.      949.0     6.        938.6
ENDTABLE
--------------------DATA POINTS ON SECTION 18.2   REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
REACH     18.45     1.        1520.     1020.
SEGMENT   18.45     1         N         -8.
NVALUE    0.15
SEGMENT   18.45     2         C         8.
NVALUE    0.08
SEGMENT   18.45     3         N         670.      952.4
NVALUE    0.15
SECTION   18.45
          -330.     952.4     -315.     952.0     -260.     950.0
          -210.     948.0     -85.      946.0     -55.      944.0
          -20.      943.8     -6.       940.4     20.       943.1
          80.       944.0     105.      950.0     165.      950.0
          430.      948.0     125.      950.9     670.      948.0
          670.      952.4     -8.       943.8     6.        940.4
          8.        943.1
ENDTABLE
--------------------DATA POINTS ON SECTION 18.45  REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
REACH     18.55     1.        990.      730.
SEGMENT   18.55     1         N         -8.
NVALUE    0.15
SEGMENT   18.55     2         C         8.
NVALUE    0.08
SEGMENT   18.55     3         N         540.
NVALUE    0.15
SECTION   18.55
          -880.     954.0     -820.     952.0     -400.     950.5
          -250.     950.0     -160.     948.0     -30.      946.0
          -20.      944.0     -6.       941.6     20.       944.0
```

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
          380.      946.0     415.      948.0     435       950.0
          455.      952.0     540.      954.0     -8.       944.0
          6.        941.6     8.        944.0
ENDTABLE
--------------------DATA POINTS ON SECTION 18.55  REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
COMPUTE   17.65     18.55     17.55
-----------------------------END OF 80/80 LIST-----------------------------
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```
                    COMPUTE   17.65     18.55     17.55

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

RATING TABLE FOR SECTION 17.65 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	934.6	0.0	0.0						
BANK FULL	936.0	23.2	46.9	.00	.00	.00			
1	937.3	101.4	90.0	.00	.00	.00	90.00	935.7	.0141
2	938.9	345.2	330.0	.00	.00	.00	330.00	936.7	.0185
3	939.6	585.3	540.0	.00	.00	.00	540.00	937.1	.0172
4	939.8	666.4	625.0	.00	.00	.00	625.00	937.2	.0173
5	940.5	986.0	935.0	.00	.00	.00	935.00	937.7	.0141

SEGMENT TABLE FOR SECTION 17.65

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	90.	13.	56.	21.
90.	VELOCITY FPS	1.18	.53	1.40	.57
2	DISCHARGE CFS	330.	71.	150.	109.
330.	VELOCITY FPS	1.63	.78	2.25	.58
3	DISCHARGE CFS	540.	116.	182.	242.
540.	VELOCITY FPS	1.55	.83	2.35	.66
4	DISCHARGE CFS	625.	134.	193.	298.
625.	VELOCITY FPS	1.55	.86	2.41	.69
5	DISCHARGE CFS	935.	197.	216.	521.
935.	VELOCITY FPS	1.40	.91	2.38	.77
1	ELEV 937.3 KD	2383.	327.	1520.	537.
2	ELEV 938.9 KD	7625.	1636.	3546.	2442.
3	ELEV 939.6 KD	12932.	2801.	4532.	5599.
4	ELEV 939.8 KD	14901.	3223.	4812.	6866.
5	ELEV 940.5 KD	24820.	5274.	5920.	13625.

KD TABLE FOR CROSS SECTION 17.65

ELEVATION	AREA	KD	KD BY SEGMENT		
934.60	0.				
935.	5.	58.	1.	56.	1.
936.	23.	482.	4.	466.	6.
937.	80.	1801.	208.	1243.	350.
938.	163.	4057.	749.	2307.	996.
939.	362.	7999.	1709.	3620.	2617.
940.	764.	17778.	3794.	5158.	8703.
941.	1271.	36611.	7664.	6907.	22039.
942.	1812.	61984.	12710.	8854.	40389.
943.	2374.	93433.	18802.	10990.	63598.
944.	2953.	130943.	25917.	13307.	91687.
945.	3545.	174508.	33983.	15797.	124703.
946.	4142.	224695.	43131.	18458.	163172.
947.	4740.	283227.	53654.	21285.	208732.
948.	5337.	350650.	65624.	24276.	261959.
949.	5935.	427499.	79108.	27427.	323425.

RATING TABLE FOR SECTION 17.75 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	935.7	0.0	0.0						
BANK FULL	936.0	7.2	12.7	.00	.00	.00			
1	937.8	148.5	90.0	.00	.00	.00	90.00	936.3	.0059
2	939.6	452.6	330.0	.00	.00	.00	330.00	936.9	.0060
3	940.3	674.1	540.0	.00	.00	.00	540.00	937.3	.0068
4	940.5	751.6	625.0	.00	.00	.00	625.00	937.4	.0071
5	941.2	1019.3	935.0	.00	.00	.00	935.00	937.8	.0077

SEGMENT TABLE FOR SECTION 17.75

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	90.	14.	72.	4.
90.	VELOCITY FPS	.74	.31	.81	.29
2	DISCHARGE CFS	330.	88.	209.	34.
330.	VELOCITY FPS	1.03	.46	1.24	.36
3	DISCHARGE CFS	540.	166.	301.	73.
540.	VELOCITY FPS	1.18	.59	1.50	.38
4	DISCHARGE CFS	625.	198.	335.	92.
625.	VELOCITY FPS	1.23	.64	1.59	.40
5	DISCHARGE CFS	935.	309.	434.	192.
935.	VELOCITY FPS	1.33	.77	1.80	.51
1	ELEV 937.8 KD	3718.	582.	2984.	152.
2	ELEV 939.6 KD	13467.	3557.	8582.	1327.
3	ELEV 940.3 KD	20686.	6310.	11606.	2770.
4	ELEV 940.5 KD	23349.	7390.	12576.	3383.
5	ELEV 941.2 KD	33736.	11147.	15755.	6835.

KD TABLE FOR CROSS SECTION 17.75

ELEVATION	AREA	KD	KD BY SEGMENT		
935.70	0.				
936.	7.	47.	2.	42.	2.
937.	70.	1353.	116.	1204.	31.
938.	167.	4341.	734.	3421.	184.
939.	325.	9295.	2162.	6466.	640.
940.	564.	17240.	4909.	10241.	2069.
941.	931.	30095.	9795.	14677.	5478.
942.	1411.	46821.	16204.	19731.	10867.
943.	2040.	74157.	23716.	25364.	24994.
944.	2701.	108955.	32439.	31549.	44801.
945.	3379.	150459.	42439.	38263.	69647.
946.	4074.	198004.	53599.	45486.	98841.
947.	4786.	251093.	65729.	53199.	132107.
948.	5511.	310308.	79071.	61392.	169966.
949.	6236.	377190.	93755.	70056.	214408.
950.	6961.	452042.	109802.	79182.	265951.
951.	7686.	535157.	127229.	88758.	325114.

RATING TABLE FOR SECTION 17.85 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	937.4	0.0	0.0						
BANK FULL	938.0	16.5	31.7	.00	.00	.00			
1	939.1	142.6	90.0	.00	.00	.00	90.00	938.1	.0158
2	940.4	440.2	330.0	.00	.00	.00	330.00	938.6	.0135
3	941.1	664.4	540.0	.00	.00	.00	540.00	938.9	.0125
4	941.3	747.6	625.0	.00	.00	.00	625.00	939.0	.0124
5	942.0	1011.6	935.0	.00	.00	.00	935.00	939.3	.0125

SEGMENT TABLE FOR SECTION 17.85

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	90.	12.	71.	7.
90.	VELOCITY FPS	.83	.30	.91	.30
2	DISCHARGE CFS	330.	87.	193.	50.
330.	VELOCITY FPS	1.05	.49	1.31	.44
3	DISCHARGE CFS	540.	167.	274.	99.
540.	VELOCITY FPS	1.13	.59	1.48	.50
4	DISCHARGE CFS	625.	199.	305.	121.
625.	VELOCITY FPS	1.16	.63	1.53	.52
5	DISCHARGE CFS	935.	316.	412.	207.
935.	VELOCITY FPS	1.27	.74	1.74	.60
1	ELEV 939.1 KD	2259.	289.	1792.	178.
2	ELEV 940.4 KD	8980.	2364.	5254.	1363.
3	ELEV 941.1 KD	15261.	4703.	7787.	2770.
4	ELEV 941.3 KD	17728.	5623.	8711.	3394.
5	ELEV 942.0 KD	26428.	8904.	11706.	5819.

KD TABLE FOR CROSS SECTION 17.85

ELEVATION	AREA	KD	KD BY SEGMENT		
937.40	0.				
938.	17.	139.	1.	137.	1.
939.	124.	1945.	225.	1582.	138.
940.	340.	6430.	1447.	4089.	869.
941.	635.	14453.	4406.	7474.	2572.
942.	1004.	26175.	8802.	11617.	5738.
943.	1424.	42195.	14874.	16465.	10855.
944.	1939.	59517.	22290.	21961.	15195.
945.	2599.	86799.	31106.	28075.	27474.
946.	3277.	121023.	41181.	34775.	44923.
947.	3966.	160442.	52482.	42037.	65827.
948.	4659.	205827.	65136.	49856.	91281.
949.	5352.	258181.	79282.	58226.	122900.
950.	6045.	317837.	94943.	67133.	161448.
951.	6738.	385110.	112142.	76566.	207712.

RATING TABLE FOR SECTION 17.9 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	937.4	0.0	0.0						
BANK FULL	939.4	269.4	84.5	.00	.00	.00			
1	939.5	332.6	90.0	.00	.00	.00	90.00	938.6	.0056
2	940.7	978.5	330.0	.00	.00	.00	330.00	939.0	.0033
3	941.4	1458.2	540.0	.00	.00	.00	540.00	939.1	.0028
4	941.6	1624.3	625.0	.00	.00	.00	625.00	939.1	.0028
5	942.3	2197.2	935.0	.00	.00	.00	935.00	939.3	.0028

SEGMENT TABLE FOR SECTION 17.9

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	90.	71.	18.	1.
90.	VELOCITY FPS	.36	.24	.60	.12
2	DISCHARGE CFS	330.	269.	32.	29.
330.	VELOCITY FPS	.38	.34	.65	.21
3	DISCHARGE CFS	540.	432.	42.	66.
540.	VELOCITY FPS	.41	.38	.70	.25
4	DISCHARGE CFS	625.	497.	46.	82.
625.	VELOCITY FPS	.42	.40	.73	.26
5	DISCHARGE CFS	935.	727.	60.	148.
935.	VELOCITY FPS	.47	.45	.81	.28
1	ELEV 939.5 KD	3752.	2950.	796.	6.
2	ELEV 940.7 KD	17983.	14750.	1768.	1465.
3	ELEV 941.4 KD	32081.	25726.	2522.	3833.
4	ELEV 941.6 KD	37561.	29894.	2790.	4877.
5	ELEV 942.3 KD	56342.	43828.	3662.	8852.

KD TABLE FOR CROSS SECTION 17.9

ELEVATION	AREA	KD	KD BY SEGMENT		
937.40	0.				
938.	8.	97.	1.	94.	1.
939.	112.	957.	470.	486.	1.
940.	576.	8275.	6814.	1155.	235.
941.	1177.	23895.	19374.	2088.	2433.
942.	1910.	46795.	36739.	3227.	6798.
943.	2794.	76690.	59014.	4557.	13119.
944.	3884.	121805.	86207.	6063.	29429.
945.	5027.	179535.	120432.	7737.	51283.
946.	6203.	248827.	161011.	9570.	78154.
947.	7397.	329481.	206200.	11556.	111615.
948.	8597.	423518.	256702.	13693.	153633.
949.	9797.	532202.	313318.	15979.	205459.
950.	10997.	656256.	376167.	18409.	268239.
951.	12197.	796372.	445357.	20980.	343138.

TABLE OF VALUES FOR BPR EQUATION

COEFK	AKB	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
2.5694	2.8455	.0000	.0000	.0000	-.2762	.1238	1.0000	1.0000	34.0664	502.9229	34 .1550
DCRIT	938.40	KBCRIT=									
.0000	.0000	.0000	.0000	.0000	.0000	.0000	1.0000	1.0000	45.2910	502.9229	34 .1550
DCRIT	-1.00	KBCRIT=									
.0000	.0000	.0000	.0000	.0000	.0000	.0000	1.0000	1.0000	45.2910	502.9229	34 .1550
DCRIT	-1.00	KBCRIT=									
.0000	.0000	.0000	.0000	.0000	.0000	.0000	1.0000	1.0000	45.2910	502.9229	34 .1550
DCRIT	-1.00	KBCRIT=									
.0000	.0000	.0000	.0000	.0000	.0000	.0000	1.0000	1.0000	45.2910	502.9229	34 .1550
DCRIT	-1.00	KBCRIT=									

ROAD SECTION 18.0

NO.	HW	CFS	HL	TW	CSM
0	937.40	0.00	0.00	0.00	0.00
1	939.85	90.00	.30	939.55	90.00
2	941.11	330.00	.42	940.69	330.00
3	941.53	540.00	.12	941.41	540.00
4	941.75	625.00	.10	941.65	625.00
5	942.43	935.00	.08	942.35	935.00

MIN ROAD ELEVATION 940.69

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 940.26 OPENING NO.= 1

RATING TABLE FOR SECTION 18.1 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	937.6	0.0	0.0						
BANK FULL	939.6	269.4	79.5	.00	.00	.00			
1	939.9	398.2	90.0	.00	.00	.00	90.00	938.8	.0051
2	941.1	1130.3	330.0	.00	.00	.00	330.00	939.2	.0035
3	941.5	1419.4	540.0	.00	.00	.00	540.00	939.3	.0050
4	941.8	1568.2	625.0	.00	.00	.00	625.00	939.3	.0050
5	942.4	2110.0	935.0	.00	.00	.00	935.00	939.5	.0050

SEGMENT TABLE FOR SECTION 18.1

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	90.	69.	20.	1.
90.	VELOCITY FPS	.35	.20	.61	.08
2	DISCHARGE CFS	330.	261.	37.	32.
330.	VELOCITY FPS	.36	.29	.71	.18
3	DISCHARGE CFS	540.	423.	54.	63.
540.	VELOCITY FPS	.46	.38	.92	.25
4	DISCHARGE CFS	625.	487.	60.	78.
625.	VELOCITY FPS	.47	.40	.96	.26
5	DISCHARGE CFS	935.	714.	79.	142.
935.	VELOCITY FPS	.52	.46	1.07	.29
1	ELEV 939.9 KD	3926.	3011.	894.	21.
2	ELEV 941.1 KD	17634.	13962.	2010.	1662.
3	ELEV 941.5 KD	24236.	19007.	2460.	2769.
4	ELEV 941.8 KD	28051.	21880.	2702.	3470.
5	ELEV 942.4 KD	42002.	32081.	3539.	6382.

KD TABLE FOR CROSS SECTION 18.1

ELEVATION	AREA	KD	KD BY SEGMENT		
937.60	0.				
938.	5.	50.	1.	48.	1.
939.	65.	526.	39.	388.	1.
940.	464.	5021.	3939.	997.	85.
941.	1052.	15832.	12547.	1883.	1362.
942.	1753.	32577.	25212.	2983.	4359.
943.	2613.	54765.	41503.	4276.	8972.
944.	3658.	87143.	61521.	5749.	19874.
945.	4795.	129761.	86607.	7389.	35717.
946.	5965.	181751.	116976.	9191.	55513.
947.	7157.	242173.	150956.	11147.	79987.
948.	8357.	312601.	188763.	13254.	110812.
949.	9557.	394157.	231240.	15510.	148987.
950.	10757.	487391.	278480.	17911.	195385.
951.	11957.	592829.	330567.	20455.	250899.

RATING TABLE FOR SECTION 18.15 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FR CTION S OPE
0	937.8	0.0	0.0						
BANK FULL	939.9	43.5	67.7	.00	.00	.00			
1	940.6	219.0	90.0	.00	.00	.00	90.00	939.0	.0126
2	941.6	700.1	330.0	.00	.00	.00	330.00	940.2	.0104
3	942.1	991.5	540.0	.00	.00	.00	540.00	940.3	.0108
4	942.3	1112.3	625.0	.00	.00	.00	625.00	940.4	.0103
5	942.9	1515.1	935.0	.00	.00	.00	935.00	940.5	.0089

SEGMENT TABLE FOR SECTION 18.15

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	90.	27.	43.	21.
90.	VELOCITY FPS	.85	.27	1.05	.25
2	DISCHARGE CFS	330.	137.	72.	121.
330.	VELOCITY FPS	.72	.42	1.27	.38
3	DISCHARGE CFS	540.	232.	92.	216.
540.	VELOCITY FPS	.75	.50	1.42	.46
4	DISCHARGE CFS	625.	270.	97.	258.
625.	VELOCITY FPS	.75	.52	1.42	.49
5	DISCHARGE CFS	935.	411.	112.	412.
935.	VELOCITY FPS	.75	.58	1.45	.56
1	ELEV 940.6 KD	2346.	601.	1299.	446.
2	ELEV 941.6 KD	10179.	4198.	2314.	3667.
3	ELEV 942.1 KD	16373.	7017.	2858.	6497.
4	ELEV 942.3 KD	19395.	8383.	3077.	7935.
5	ELEV 942.9 KD	31244.	13719.	3840.	13685.

KD TABLE FOR CROSS SECTION 18.15

ELEVATION	AREA	KD	KD BY SEGMENT		
937.80	0.				
938.	2.	18.	1.	15.	1.
939.	16.	301.	1.	299.	1.
940.	59.	941.	14.	837.	12.
941.	379.	4747.	1681.	1667.	1338.
942.	912.	14613.	6221.	2719.	5673.
943.	1578.	33314.	14633.	3964.	14676.
944.	2270.	58581.	26198.	5391.	26975.
945.	3009.	88402.	40692.	6990.	40721.
946.	3825.	124525.	57649.	8748.	58111.
947.	4683.	170241.	77364.	10662.	82199.
948.	5555.	223362.	99702.	12725.	110963.
949.	6428.	285702.	125475.	14938.	145643.
950.	7301.	357824.	154834.	17297.	186764.
951.	8174.	440271.	187921.	19798.	234846.

RATING TABLE FOR SECTION 18.2 DA= 1.0

ND.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	938.6	0.0	0.0						
BANK FULL	940.3	25.6	46.2	.00	.00	.00			
1	941.9	149.7	90.0	.00	.00	.00	90.00	939.7	.0103
2	943.2	464.0	330.0	.00	.00	.00	330.00	941.2	.0123
3	943.9	676.9	540.0	.00	.00	.00	540.00	941.7	.0132
4	944.0	703.7	625.0	.00	.00	.00	625.00	941.8	.0160
5	944.7	984.2	935.0	.00	.00	.00	935.00	942.0	.0143

SEGMENT TABLE FOR SECTION 18.2

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	90.	23.	64.	3.
90.	VELOCITY FPS	1.04	.28	1.17	.28
2	DISCHARGE CFS	330.	176.	131.	23.
330.	VELOCITY FPS	1.14	.52	1.67	.48
3	DISCHARGE CFS	540.	325.	170.	46.
540.	VELOCITY FPS	1.21	.64	1.88	.59
4	DISCHARGE CFS	625.	379.	192.	53.
625.	VELOCITY FPS	1.33	.71	2.10	.66
5	DISCHARGE CFS	935.	616.	230.	88.
935.	VELOCITY FPS	1.31	.81	2.18	.72
1	ELEV 941.9 KD	2704.	573.	2047.	84.
2	ELEV 943.2 KD	9366.	4937.	3772.	657.
3	ELEV 943.9 KD	14799.	8810.	4760.	1229.
4	ELEV 944.0 KD	15589.	9388.	4886.	1316.
5	ELEV 944.7 KD	24694.	16203.	6170.	2321.

KD TABLE FOR CROSS SECTION 18.2

ELEVATION	AREA	KD	KD BY SEGMENT		
938.60	0.				
939.	5.	51.	1.	49.	1.
940.	20.	415.	1.	412.	1.
941.	39.	1137.	3.	1130.	4.
942.	166.	3095.	736.	2152.	103.
943.	395.	7767.	3811.	3423.	498.
944.	711.	15855.	9546.	4919.	1340.
945.	1081.	28460.	19091.	6626.	2744.
946.	1490.	44711.	31429.	8528.	4737.
947.	1966.	63479.	46499.	10617.	6271.
948.	2601.	86722.	64327.	12887.	9093.
949.	3372.	120691.	85218.	15331.	21561.
950.	4142.	162941.	110013.	17951.	47227.
951.	4913.	214495.	139004.	20742.	96840.
952.	5684.	276401.	172475.	23699.	187811.

RATING TABLE FOR SECTION 18.45 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	940.4	0.0	0.0						
BANK FULL	943.1	40.6	67.1	.00	.00	.00			
1	944.0	98.4	90.0	.00	.00	.00	90.00	941.6	.0166
2	945.6	330.9	330.0	.00	.00	.00	330.00	943.6	.0173
3	946.4	490.9	540.0	.00	.00	.00	540.00	944.1	.0174
4	946.7	539.4	625.0	.00	.00	.00	625.00	944.2	.0186
5	947.5	745.9	935.0	.00	.00	.00	935.00	944.4	.0194

SEGMENT TABLE FOR SECTION 18.45

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	90.	1.	76.	13.
90.	VELOCITY FPS	1.35	.17	1.46	.33
2	DISCHARGE CFS	330.	62.	145.	123.
330.	VELOCITY FPS	1.41	.63	1.90	.79
3	DISCHARGE CFS	540.	123.	195.	223.
540.	VELOCITY FPS	1.49	.70	2.15	.99
4	DISCHARGE CFS	625.	145.	217.	263.
625.	VELOCITY FPS	1.57	.73	2.30	1.07
5	DISCHARGE CFS	935.	258.	277.	399.
935.	VELOCITY FPS	1.68	.81	2.57	1.26
1	ELEV 944.0 KD	2195.	20.	1862.	313.
2	ELEV 945.6 KD	7886.	1424.	3558.	2905.
3	ELEV 946.4 KD	12921.	2913.	4709.	5299.
4	ELEV 946.7 KD	14486.	3355.	5051.	6080.
5	ELEV 947.5 KD	21207.	5835.	6307.	9064.

KD TABLE FOR CROSS SECTION 18.45

ELEVATION	AREA	KD	KD BY SEGMENT		
940.40	0.				
941.	7.	96.	1.	93.	1.
942.	21.	469.	1.	467.	1.
943.	38.	1051.	1.	1042.	4.
944.	95.	2156.	18.	1841.	297.
945.	241.	5334.	685.	2889.	1710.
946.	404.	10421.	2225.	4119.	4077.
947.	614.	16828.	4133.	5517.	7154.
948.	941.	24669.	8054.	7074.	9387.
949.	1530.	37151.	14628.	8782.	13627.
950.	2316.	60344.	23549.	10635.	25932.
951.	3224.	94552.	34520.	12627.	47185.
952.	4192.	138971.	47486.	14753.	76574.
953.	5175.	195462.	62989.	17014.	116257.
954.	6158.	267844.	81769.	19409.	170963.
955.	7141.	358913.	104200.	21935.	244624.
956.	8124.	471707.	130667.	24589.	341807.

RATING TABLE FOR SECTION 18.55 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	941.6	0.0	0.0						
BANK FULL	944.0	33.6	61.8	.00	.00	.00			
1	945.1	193.4	90.0	.00	.00	.00	90.00	942.8	.0086
2	946.3	632.8	330.0	.00	.00	.00	330.00	944.3	.0088
3	947.1	995.6	540.0	.00	.00	.00	540.00	944.7	.0069
4	947.4	1119.6	625.0	.00	.00	.00	625.00	944.8	.0067
5	948.1	1552.0	935.0	.00	.00	.00	935.00	945.1	.0060

SEGMENT TABLE FOR SECTION 18.55

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	90.	5.	55.	30.
90.	VELOCITY FPS	.87	.32	1.07	.24
2	DISCHARGE CFS	330.	16.	97.	217.
330.	VELOCITY FPS	.82	.34	1.36	.42
3	DISCHARGE CFS	540.	32.	111.	397.
540.	VELOCITY FPS	.75	.31	1.33	.49
4	DISCHARGE CFS	625.	41.	118.	466.
625.	VELOCITY FPS	.75	.32	1.35	.51
5	DISCHARGE CFS	935.	84.	140.	711.
935.	VELOCITY FPS	.76	.36	1.40	.58
1	ELEV 945.1 KD	2987.	170.	1888.	928.
2	ELEV 946.3 KD	11075.	541.	3277.	7257.
3	ELEV 947.1 KD	20534.	1192.	4275.	15068.
4	ELEV 947.4 KD	24120.	1533.	4606.	17981.
5	ELEV 948.1 KD	38210.	3358.	5761.	29091.

KD TABLE FOR CROSS SECTION 18.55

ELEVATION	AREA	KD	KD BY SEGMENT		
941.60	0.				
942.	5.	50.	1.	48.	1.
943.	18.	384.	1.	382.	1.
944.	34.	940.	1.	938.	1.
945.	173.	2751.	142.	1794.	712.
946.	488.	7970.	469.	2860.	4571.
947.	940.	18841.	1058.	4115.	13599.
948.	1469.	35528.	2955.	5548.	27025.
949.	2074.	57969.	6821.	7145.	43961.
950.	2754.	84822.	11661.	8899.	64245.
951.	3601.	116521.	17783.	10806.	87783.
952.	4715.	158642.	32007.	12857.	113159.
953.	6016.	212763.	58378.	15049.	138716.
954.	7371.	278699.	97197.	17378.	165955.
955.	8726.	357501.	155553.	19845.	195798.
956.	10080.	450435.	240657.	22447.	228274.
957.	11435.	558788.	361567.	25181.	263408.

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
LINK
REACH      18.6       1.         1340.      730.
SEGMENT    18.6       1          N          -10.
NVALUE     0.15
SEGMENT    18.6       2          C          10.
NVALUE     0.08
SEGMENT    18.6       3          N          400.
NVALUE     0.15
SECTION    18.6
           -600.      953.5      -500.      951.5      -400.      949.3
           -300.      945.9      -200.      945.8      -100.      945.7
           -50.       945.6      -12.       945.8      -10.       944.7
           -6.        943.3      10.        944.7      13.        946.1
           25.        946.7      100.       947.9      150.       950.1
           200.       953.7      300.       954.0      400.       954.5
           6.         943.3
ENDTABLE
--------------------DATA POINTS ON SECTION 18.6   REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
REACH      18.63      1.         850.       460.
SEGMENT    18.63      1          N          -8.
NVALUE     0.14
SEGMENT    18.63      2          C          8.
NVALUE     0.08
SEGMENT    18.63      3          N          90.
NVALUE     0.14
SECTION    18.63
           -820.      960.0      -785.      958.0      -760.      956.0
           -740.      954.0      -700.      954.0      -540.      956.0
           -270.      956.0      -245.      954.0      -130.      954.0
           -120.      952.0      -40.       950.0      -20.       948.0
           -6.        943.8      25.        948.0      30.        950.0
           35.        952.0      45.        954.0      50.        956.0
           70.        958.0      90.        960.0      -8.        948.0
           6.         943.8      8.         948.0
ENDTABLE
--------------------DATA POINTS ON SECTION 18.63  REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
REACH      18.65      1.         1130.      640.
SEGMENT    18.65      1          N          -8.
NVALUE     0.14
SEGMENT    18.65      2          C          8.
NVALUE     0.08
SEGMENT    18.65      3          N          840.
NVALUE     0.14
SECTION    18.65
           -340.      960.0      -315.      952.0      -265.      950.0
           -235.      948.0      -200.      947.8      -6.        944.2
           80.        947.8      280.       948.0      590.       950.0
```

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
          635.      952.0     740.      954.0     770.      956.0
          800.      958.0     840.      960.0     -8.       947.8
          8.        947.8     6.        944.2
ENDTABLE
--------------------DATA POINTS ON SECTION 18.65  REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
COMPUTE   18.6      18.65     18.55
-----------------------------END OF 80/80 LIST-----------------------------
```

```
                    COMPUTE   18.6      18.65     18.55

----------------------------STARTING DATA FROM PREVIOUS COMPUTATIONS-----------------------------
*****SECT.18.6  KD VALUES REVERSED ON SEGMENT 3  AT ELEVATION    954.30  VALUE CHANGED TO EQUAL PREVIOUS VALUE*** *
```

RATING TABLE FOR SECTION 18.6 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FR CTION S OPE
0	943.3	0.0	0.0						
BANK FULL	944.7	22.5	43.7	.00	.00	.00			
1	946.2	183.9	90.0	.00	.00	.00	90.00	944.4	.0101
2	947.3	584.0	330.0	.00	.00	.00	330.00	945.8	.0081
3	948.0	878.9	540.0	.00	.00	.00	540.00	946.0	.0070
4	948.3	1010.0	625.0	.00	.00	.00	625.00	946.0	.0064
5	949.0	1349.8	935.0	.00	.00	.00	935.00	946.3	.0062

SEGMENT TABLE FOR SECTION 18.6

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	90.	34.	55.	1.
90.	VELOCITY FPS	.89	.27	1.06	.23
2	DISCHARGE CFS	330.	231.	91.	8.
330.	VELOCITY FPS	.78	.48	1.22	.26
3	DISCHARGE CFS	540.	401.	113.	26.
540.	VELOCITY FPS	.77	.56	1.29	.33
4	DISCHARGE CFS	625.	468.	119.	38.
625.	VELOCITY FPS	.76	.58	1.27	.36
5	DISCHARGE CFS	935.	705.	150.	80.
935.	VELOCITY FPS	.81	.66	1.39	.45
1	ELEV 946.2 KD	2384.	566.	1799.	20.
2	ELEV 947.3 KD	11548.	8032.	3274.	242.
3	ELEV 948.0 KD	20427.	15157.	4332.	938.
4	ELEV 948.3 KD	24742.	18531.	4796.	1415.
5	ELEV 949.0 KD	37523.	28304.	6029.	3190.

KD TABLE FOR CROSS SECTION 18.6

ELEVATION	AREA	KD	KD BY SEGMENT		
943.30	0.				
944.	10.	133.	1.	130.	1.
945.	29.	660.	3.	655.	3.
946.	133.	2145.	130.	1594.	15.
947.	464.	8549.	5562.	2840.	115.
948.	885.	20684.	15327.	4355.	961.
949.	1375.	38469.	29004.	6119.	3324.
950.	1924.	61151.	45887.	8114.	7107.
951.	2534.	89358.	66414.	10329.	12578.
952.	3206.	123264.	90867.	12753.	19606.
953.	3940.	163191.	119618.	15377.	28169.
954.	4762.	206537.	157031.	18193.	31097.
955.	5614.	254251.	203258.	21202.	31098.
956.	6465.	307695.	257581.	24399.	31099.
957.	7317.	367025.	320611.	27781.	31100.

RATING TABLE FOR SECTION 18.63 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	943.8	0.0	0.0						
1	947.9	57.0	90.0	.00	.00	.00	90.00	945.0	.0191
BANK FULL	948.0	58.8	103.0	.00	.00	.00			
2	950.0	175.7	330.0	.00	.00	.00	330.00	946.5	.0302
3	950.9	254.9	540.0	.00	.00	.00	540.00	947.6	.0380
4	951.3	308.1	625.0	.00	.00	.00	625.00	947.9	.0350
5	952.1	415.4	935.0	.00	.00	.00	935.00	949.1	.0410

SEGMENT TABLE FOR SECTION 18.63

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	90.	0.	90.	0.
90.	VELOCITY FPS	1.58	.00	1.58	.00
2	DISCHARGE CFS	330.	41.	243.	46.
330.	VELOCITY FPS	2.37	.91	2.67	1.16
3	DISCHARGE CFS	540.	96.	348.	96.
540.	VELOCITY FPS	2.79	1.07	3.31	1.60
4	DISCHARGE CFS	625.	137.	378.	117.
625.	VELOCITY FPS	2.72	1.10	3.30	1.66
5	DISCHARGE CFS	935.	281.	474.	180.
935.	VELOCITY FPS	3.00	1.41	3.81	1.98
1	ELEV 947.9 KD	2058.	1.	2055.	1.
2	ELEV 950.0 KD	5980.	725.	4448.	807.
3	ELEV 950.9 KD	8741.	1543.	5660.	1539.
4	ELEV 951.3 KD	10510.	2236.	6304.	1970.
5	ELEV 952.1 KD	14506.	4192.	7492.	2822.

KD TABLE FOR CROSS SECTION 18.63

ELEVATION	AREA	KD	KD BY SEGMENT		
943.80	0.				
944.	2.	18.	1.	15.	1.
945.	15.	288.	1.	286.	1.
946.	29.	763.	1.	760.	1.
947.	43.	1390.	1.	1388.	1.
948.	59.	2153.	1.	2150.	1.
949.	111.	3681.	184.	3209.	223.
950.	175.	5981.	718.	4435.	799.
951.	265.	9138.	1676.	5814.	1647.
952.	400.	13997.	3873.	7336.	2714.
953.	560.	21140.	8126.	8999.	3966.
954.	760.	29462.	13099.	10794.	5559.
955.	1120.	37458.	16928.	12717.	7672.
956.	1647.	55917.	30935.	14764.	10028.
957.	2420.	81021.	52033.	16933.	12055.
958.	3266.	123097.	88823.	19217.	14703.
959.	4137.	174128.	134188.	21616.	18059.
960.	5014.	238435.	193403.	24132.	22001.
961.	5891.	320401.	272712.	26762.	26488.
962.	6768.	423413.	377145.	29507.	31558.
963.	7645.	551260.	512600.	32363.	37247.

RATING TABLE FOR SECTION 18.65 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	944.2	0.0	0.0						
BANK FULL	947.8	50.4	77.0	.00	.00	.00			
1	948.4	353.9	90.0	.00	.00	.00	90.00	945.4	.0033
2	950.2	1669.1	330.0	.00	.00	.00	330.00	946.9	.0008
3	951.1	2462.9	540.0	.00	.00	.00	540.00	947.8	.0006
4	951.5	2846.6	625.0	.00	.00	.00	625.00	947.9	.0005
5	952.3	3599.6	935.0	.00	.00	.00	935.00	948.0	.0006

SEGMENT TABLE FOR SECTION 18.65

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	90.	24.	41.	24.
90.	VELOCITY FPS	.49	.18	.69	.15
2	DISCHARGE CFS	330.	117.	37.	176.
330.	VELOCITY FPS	.23	.20	.42	.18
3	DISCHARGE CFS	540.	182.	44.	314.
540.	VELOCITY FPS	.24	.22	.42	.20
4	DISCHARGE CFS	625.	208.	45.	371.
625.	VELOCITY FPS	.23	.22	.41	.21
5	DISCHARGE CFS	935.	309.	57.	569.
935.	VELOCITY FPS	.27	.26	.46	.25
1	ELEV 948.4 KD	4973.	1324.	2308.	1340.
2	ELEV 950.2 KD	37812.	13516.	4410.	19887.
3	ELEV 951.1 KD	68789.	23342.	5665.	39781.
4	ELEV 951.5 KD	86472.	28837.	6296.	51339.
5	ELEV 952.3 KD	123713.	40871.	7559.	75283.

KD TABLE FOR CROSS SECTION 18.65

ELEVATION	AREA	KD	KD BY SEGMENT		
944.20	0.				
945.	10.	151.	1.	149.	1.
946.	23.	560.	1.	557.	1.
947.	38.	1145.	1.	1143.	1.
948.	150.	2491.	15.	1905.	15.
949.	730.	12250.	4259.	2947.	5043.
950.	1505.	32671.	11787.	4160.	16645.
951.	2382.	65392.	22265.	5535.	37524.
952.	3308.	108618.	35933.	7064.	65594.
953.	4287.	160772.	53654.	8738.	98359.
954.	5320.	222982.	74613.	10552.	137802.
955.	6388.	297547.	98272.	12499.	186756.
956.	7476.	382032.	124510.	14577.	242931.
957.	8584.	474899.	153136.	16780.	304962.
958.	9710.	576095.	184246.	19105.	372728.
959.	10855.	685035.	217721.	21551.	445753.
960.	12017.	802275.	253690.	24114.	524481.
961.	13178.	930513.	292841.	26796.	610983.
962.	14340.	1070032.	335239.	29595.	705495.
963.	15501.	1221107.	380949.	32510.	808245.

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
CHANGE    DISCHARGE
DISCHARGE -1        105.      275.      435.      495.      710.
END
REACH     18.7      1.        1650.     1000.
SEGMENT   18.7      1         N         -8.
NVALUE    0.13
SEGMENT   18.7      2         C         8.
NVALUE    0.08
SEGMENT   18.7      3         N         421.
NVALUE    0.13
SECTION   18.7
          -1350.    960.0     -1300.    954.0     -800.     952.0
          -700.     950.0     -650.     948.0     -600.     948.0
          -307.     949.8     -257.     950.5     -207.     949.5
          -157.     948.7     -107.     948.6     -57.      948.1
          -8.       948.1     -6.       947.2     0.        945.0
          6.        947.3     8.        948.2     18.       948.3
          68.       949.7     118.      951.5     168.      953.3
          218.      954.1     318.      956.7     421.      959.9
ENDTABLE
REACH     18.75     1.        1040.     550.
SEGMENT   18.75     1         N         -8.
NVALUE    0.13
SEGMENT   18.75     2         C         8.
NVALUE    0.08
SEGMENT   18.75     3         N         365.
NVALUE    0.13
SECTION   18.75
          -1090.    960.0     -1075.    956.0     -1035.    956.0
          -790.     956.0     -620.     954.0     -480.     954.0
          -235.     954.0     -135.0    952.0     -60.      950.0
          -6.       947.6     50.       950.0     85.       952.0
          305.      954.0     325.      956.0     350.      958.0
          365.      960.0     -8.       950.0     6.        947.6
          8.        950.0
ENDTABLE
--------------------DATA POINTS ON SECTION 18.75  REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
REACH     18.85     1.0       1310.     690.
SEGMENT   18.85     1         N         -15.
NVALUE    0.12
SEGMENT   18.85     2         C         20.
NVALUE    0.08
SEGMENT   18.85     3         N         310.
NVALUE    0.12
SECTION   18.85
          -410.     960.0     -390.     958.0     -330.     956.0
```

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
          -120.     954.0     -50.      952.0     -15.      951.0
          -6.       950.3     20.       951.0     80.       952.0
          115.      954.0     200.      954.0     230.      956.0
          250.      958.0     310.      960.0     6.        950.3
ENDTABLE
--------------------DATA POINTS ON SECTION 18.85  REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
COMPUTE   18.7      18.85     18.65
-----------------------------END OF 80/80 LIST-----------------------------
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```
                    COMPUTE   18.7      18.85     18.65

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

RATING TABLE FOR SECTION 18.7 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	945.0	0.0	0.0						
BANK FULL	948.1	43.0	77.7	.00	.00	.00			
1	949.2	389.4	105.0	.00	.00	.00	105.00	947.5	.0037
2	950.4	1216.6	275.0	.00	.00	.00	275.00	948.2	.0013
3	951.2	1900.2	435.0	.00	.00	.00	435.00	948.4	.0008
4	951.6	2246.0	495.0	.00	.00	.00	495.00	948.5	.0007
5	952.4	3007.3	710.0	.00	.00	.00	710.00	948.7	.0006

SEGMENT TABLE FOR SECTION 18.7

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	105.	73.	28.	5.
105.	VELOCITY FPS	.39	.22	.65	.19
2	DISCHARGE CFS	275.	226.	30.	19.
275.	VELOCITY FPS	.27	.21	.48	.19
3	DISCHARGE CFS	435.	368.	34.	33.
435.	VELOCITY FPS	.25	.22	.45	.19
4	DISCHARGE CFS	495.	421.	34.	40.
495.	VELOCITY FPS	.24	.22	.42	.18
5	DISCHARGE CFS	710.	604.	42.	64.
710.	VELOCITY FPS	.25	.23	.45	.20
1	ELEV 949.2 KD	5440.	3750.	1456.	233.
2	ELEV 950.4 KD	24111.	19734.	2727.	1651.
3	ELEV 951.2 KD	47613.	40242.	3755.	3616.
4	ELEV 951.6 KD	60997.	51860.	4283.	4853.
5	ELEV 952.4 KD	90670.	77173.	5441.	8057.

KD TABLE FOR CROSS SECTION 18.7

ELEVATION	AREA	KD	KD BY SEGMENT		
945.00	0.				
946.	3.	33.	1.	30.	1.
947.	11.	192.	1.	190.	1.
948.	24.	566.	1.	563.	1.
949.	309.	3870.	2325.	1282.	124.
950.	904.	15812.	12517.	2260.	983.
951.	1699.	39857.	33408.	3445.	2954.
952.	2593.	74901.	63789.	4824.	6266.
953.	3656.	114466.	96929.	6384.	11153.
954.	5013.	166798.	141935.	8109.	16754.
955.	6552.	254491.	218715.	9995.	25780.
956.	8139.	358064.	308377.	12036.	37651.
957.	9774.	477052.	410129.	14226.	52697.
958.	11457.	610452.	522620.	16557.	71239.
959.	13180.	758834.	646600.	19030.	93150.
960.	14914.	926824.	786128.	21656.	119251.
961.	16647.	1117481.	943785.	24439.	150250.

RATING TABLE FOR SECTION 18.75 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FR CTION S OPE
0	947.6	0.0	0.0						
BANK FULL	950.0	33.6	80.3	.00	.00	.00			
1	950.7	131.8	105.0	.00	.00	.00	105.00	948.9	.0174
2	951.9	335.3	275.0	.00	.00	.00	275.00	950.0	.0121
3	952.5	495.1	435.0	.00	.00	.00	435.00	950.4	.0130
4	952.8	613.6	495.0	.00	.00	.00	495.00	950.5	.0107
5	953.5	868.8	710.0	.00	.00	.00	710.00	950.7	.0098

SEGMENT TABLE FOR SECTION 18.75

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	105.	24.	63.	18.
105.	VELOCITY FPS	1.16	.48	1.38	.50
2	DISCHARGE CFS	275.	107.	94.	74.
275.	VELOCITY FPS	1.02	.66	1.48	.68
3	DISCHARGE CFS	435.	195.	123.	117.
435.	VELOCITY FPS	1.11	.78	1.68	.68
4	DISCHARGE CFS	495.	229.	124.	141.
495.	VELOCITY FPS	1.02	.75	1.58	.62
5	DISCHARGE CFS	710.	336.	146.	227.
710.	VELOCITY FPS	1.01	.80	1.64	.64
1	ELEV 950.7 KD	2470.	520.	1550.	400.
2	ELEV 951.9 KD	7897.	3054.	2700.	2142.
3	ELEV 952.5 KD	12043.	5371.	3450.	3222.
4	ELEV 952.8 KD	15117.	6959.	3887.	4270.
5	ELEV 953.5 KD	22613.	10737.	4759.	7117.

KD TABLE FOR CROSS SECTION 18.75

ELEVATION	AREA	KD	KD BY SEGMENT		
947.60	0.				
948.	5.	51.	1.	48.	1.
949.	18.	385.	1.	382.	1.
950.	34.	941.	1.	938.	1.
951.	173.	3442.	899.	1794.	678.
952.	369.	8711.	3490.	2860.	2343.
953.	673.	16913.	7877.	4115.	4887.
954.	1124.	31214.	14803.	5548.	10864.
955.	2102.	56835.	26176.	7145.	23383.
956.	3238.	101826.	53123.	8899.	39703.
957.	4574.	162661.	91934.	10806.	59583.
958.	5998.	250020.	154084.	12857.	82899.
959.	7436.	353207.	228146.	15049.	109903.
960.	8880.	475324.	317222.	17378.	141031.
961.	10325.	625092.	429938.	19845.	177508.
962.	11770.	805994.	570086.	22447.	219748.
963.	13215.	1021658.	741728.	25181.	268168.

RATING TABLE FOR SECTION 18.85 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	950.3	0.0	0.0						
BANK FULL	951.0	16.8	36.6	.00	.00	.00			
1	952.3	141.6	105.0	.00	.00	.00	105.00	951.2	.0143
2	953.4	333.0	275.0	.00	.00	.00	275.00	951.6	.0100
3	953.9	448.1	435.0	.00	.00	.00	435.00	951.9	.0114
4	954.2	540.9	495.0	.00	.00	.00	495.00	952.0	.0109
5	954.9	792.0	710.0	.00	.00	.00	710.00	952.2	.0099

SEGMENT TABLE FOR SECTION 18.85

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	105.	15.	64.	26.
105.	VELOCITY FPS	.87	.49	1.03	.53
2	DISCHARGE CFS	275.	62.	118.	95.
275.	VELOCITY FPS	.94	.61	1.18	.72
3	DISCHARGE CFS	435.	111.	168.	156.
435.	VELOCITY FPS	1.09	.74	1.42	.87
4	DISCHARGE CFS	495.	132.	187.	176.
495.	VELOCITY FPS	1.08	.71	1.46	.78
5	DISCHARGE CFS	710.	202.	233.	275.
710.	VELOCITY FPS	1.09	.69	1.53	.79
1	ELEV 952.3 KD	2777.	385.	1696.	696.
2	ELEV 953.4 KD	8669.	1930.	3758.	2981.
3	ELEV 953.9 KD	12867.	3269.	4977.	4622.
4	ELEV 954.2 KD	14977.	3969.	5681.	5327.
5	ELEV 954.9 KD	22562.	6416.	7497.	8649.

KD TABLE FOR CROSS SECTION 18.85

ELEVATION	AREA	KD	KD BY SEGMENT		
950.30	0.				
951.	17.	193.	2.	190.	2.
952.	100.	1754.	185.	1233.	322.
953.	258.	6092.	1185.	2930.	1955.
954.	474.	13436.	3454.	5167.	4812.
955.	847.	24713.	7078.	7882.	9723.
956.	1346.	45111.	14875.	11036.	19155.
957.	1930.	75203.	29311.	14600.	31220.
958.	2557.	113204.	48840.	18553.	45749.
959.	3225.	158946.	73797.	22876.	62198.
960.	3903.	214226.	105870.	27564.	81309.
961.	4581.	280390.	146595.	32611.	103532.
962.	5259.	358264.	197165.	38006.	129013.
963.	5937.	448651.	258806.	43740.	157887.

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
TITLE     SPECIAL RUN @ BULLARD LAKE OUTLET (IN CHANNEL)
CHANGE    DISCHARGE
DISCHARGE -1        90.       210.      285.      340.      440.
END
REACH     18.87     1.        590.      370.
SEGMENT   18.87     1         N         -10.
NVALUE    0.11
SEGMENT   18.87     2         C         20.
NVALUE    0.08
SEGMENT   18.87     3         N         200.
NVALUE    0.11
SECTION   18.87
          -50.      961.7     -50.      958.2     -20.      956.0
          -10.      952.0     -6.       951.7     20.       952.0
          30.       954.0     50.       956.0     180.      958.0
          200.      960.0     200.      961.7     6.        951.7
ENDTABLE
--------------------DATA POINTS ON SECTION 18.87  REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
ROAD      18.89     2.7       39.5      39.5
CULV1     18.89     1         33122
CULV2     7.2       11.6      61.       951.86    951.76
SECTION   18.89
          -50.      964.0     -50.      960.36    0.        960.46
          100.      959.46    200.      959.96    300.      960.86
          400.      962.26    400.      964.0
ENDTABLE
REACH     18.9      1.        49.5      49.5
SEGMENT   18.9      1         N         -8.
NVALUE    0.07
SEGMENT   18.9      2         C         8.
NVALUE    0.05
SEGMENT   18.9      3         N         400.
NVALUE    0.07
SECTION   18.9
          -43.      962.0     -25.      961.8     -16.      960.3
          -12.      955.9     -8.       953.7     -6.       952.8
          8.        953.6     15.       956.0     50.       957.7
          100.      958.2     150.      958.1     200.      958.5
          250.      959.1     300.      960.0     350.      961.5
          400.      962.9     -45.      962.9     6.        952.8
ENDTABLE
--------------------DATA POINTS ON SECTION 18.9   REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
REACH     18.95     1.        145.      125.
SEGMENT   18.95     1         N         -20.
NVALUE    0.07
SEGMENT   18.95     2         C         15.
NVALUE    0.05
```

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
SEGMENT   18.95     3         N         135.
NVALUE    0.07
SECTION   18.95
          -215.     966.0     -215.     960.4     -20.      960.0
          -5.       956.2     5.        956.2     15.       960.0
          75.       964.0     135.      966.0
ENDTABLE
ROAD      19.0      2.7       25.       25.
BPR       19.0      A         1
GIRDER    966.      964.3     0.        .8        2.7
          -5.       965.3     -5.       964.3     5.        964.3
          5.        965.3
ENDTABLE
SECTION   19.0
          -900.     960.0     -750.     955.9     -700.     955.6
          -650.     955.8     -600.     956.8     -550.     957.9
          -500.     958.4     -450.     958.2     -400.     957.7
          -350.     957.6     -300.     958.2     -250.     959.7
          -200.     960.8     -150.     961.7     -100.     962.7
          -50.      964.2     -5.       965.3     5.        965.3
          50.       966.1     100.      967.4     150.      968.9
          -4.9      956.25    4.9       956.25
ENDTABLE
--------------------DATA POINTS ON SECTION 19.0   REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
REACH     19.03     1.        15.       15.
SEGMENT   19.03     1         N         -5.       958.95
NVALUE    0.05
SEGMENT   19.03     2         C         5.        958.95
NVALUE    0.04
SEGMENT   19.03     3         N         170.
NVALUE    0.05
SECTION   19.03
          -705.     970.0     -700.     963.45    -100.     963.65
          -50.      963.65    -24.      963.25    -5.       958.95
          -5.       956.25    5.        956.25    5.        958.95
          21.       962.55    50.       963.35    100.      965.05
          150.      967.65    170.      969.45
ENDTABLE
REACH     19.05     1.        5.        5.
SEGMENT   19.05     1         N         -24.
NVALUE    0.05
SEGMENT   19.05     2         C         21.
NVALUE    0.04
SEGMENT   19.05     3         N         170.
NVALUE    0.05
SECTION   19.05
```

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
          -700.      963.45     -100.      963.65     -705.      970.0
          -50.       963.65     -24.       963.25     -14.       958.95
          14.        959.95     21.        962.55     50.        963.35
          100.       965.05     150.       967.65     170.       969.45
ENDTABLE
--------------------DATA POINTS ON SECTION 19.05  REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED---------------------
REACH     19.1      1.         10.        10.
SEGMENT   19.1      1          N          -24.
NVALUE    0.05
SEGMENT   19.1      2          C          21.
NVALUE    0.03
SEGMENT   19.1      3          N          170.
NVALUE    0.05
SECTION   19.1
          -700.      963.45     -100.      963.65     -50.       963.65
          -24.       963.25     -14.       962.05     0.         961.75
          14.        961.95     21.        962.55     50.        963.35
          100.       965.05     150.       967.65     170.       969.45
          -905.      970.       -900.      965.00     -800.      963.3
          -650.      962.50     -600.      963.10     -500.      963.10
          -400.      963.00     -300.      962.60     -200.      963.60
ENDTABLE
--------------------DATA POINTS ON SECTION 19.1   REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED---------------------
COMPUTE   18.87     19.1       18.85
-----------------------------END OF 80/80 LIST------------------------------
```

```
COMPUTE   18.87     19.1      18.85

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

RATING TABLE FOR SECTION 18.87 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FR CTION S OPE
0	951.7	0.0	0.0						
BANK FULL	952.0	6.5	13.1	.00	.00	.00			
1	953.8	70.7	90.0	.00	.00	.00	90.00	952.4	.0225
2	954.9	125.9	210.0	.00	.00	.00	210.00	952.9	.0239
3	955.4	158.4	285.0	.00	.00	.00	285.00	953.1	.0236
4	955.7	177.5	340.0	.00	.00	.00	340.00	953.3	.0248
5	956.3	226.7	440.0	.00	.00	.00	440.00	953.6	.0249

SEGMENT TABLE FOR SECTION 18.87

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	90.	3.	82.	6.
90.	VELOCITY FPS	1.34	.71	1.38	.73
2	DISCHARGE CFS	210.	11.	178.	22.
210.	VELOCITY FPS	1.81	1.02	1.92	.94
3	DISCHARGE CFS	285.	17.	232.	36.
285.	VELOCITY FPS	1.98	1.13	2.13	1.04
4	DISCHARGE CFS	340.	21.	271.	48.
340.	VELOCITY FPS	2.12	1.22	2.30	1.13
5	DISCHARGE CFS	440.	28.	347.	65.
440.	VELOCITY FPS	2.31	1.15	2.54	.99
1	ELEV 953.8 KD	1897.	57.	1721.	119.
2	ELEV 954.9 KD	4290.	213.	3643.	434.
3	ELEV 955.4 KD	5861.	340.	4786.	735.
4	ELEV 955.7 KD	6822.	424.	5449.	949.
5	ELEV 956.3 KD	8813.	567.	6946.	1300.

KD TABLE FOR CROSS SECTION 18.87

ELEVATION	AREA	KD	KD BY SEGMENT		
951.70	0.				
952.	6.	47.	2.	44.	2.
953.	40.	804.	13.	765.	26.
954.	81.	2336.	81.	2089.	165.
955.	133.	4629.	239.	3892.	492.
956.	198.	7764.	501.	6117.	1146.
957.	312.	11820.	845.	8727.	2202.
958.	496.	18875.	1679.	11695.	5452.
959.	729.	30697.	3409.	15000.	12251.
960.	974.	45919.	5685.	18626.	21524.
961.	1223.	64539.	8386.	22559.	33537.
962.	1473.	86422.	11524.	26790.	48234.
963.	1723.	112634.	15376.	31311.	67073.
964.	1973.	143534.	20021.	36114.	90696.
965.	2223.	179475.	25536.	41191.	119780.

ROAD SECTION 18.89

NO.	HW	CFS	HL	TW	CSM
0	951.86	0.00	0.00	0.00	0.00
1	954.65	90.00	.80	953.85	90.00
2	956.33	210.00	1.36	954.97	210.00
3	957.28	285.00	1.76	955.52	285.00
4	957.98	340.00	2.16	955.82	340.00
5	959.15	440.00	2.72	956.43	440.00

MIN ROAD ELEVATION 959.46

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	33122.	7.24	11.40	61.00	951.86	951.76	.032

RATING TABLE FOR SECTION 18.9 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FR CTION S OPE
0	952.8	0.0	0.0						
BANK FULL	953.6	11.1	36.0	.00	.00	.00			
1	954.8	33.5	90.0	.00	.00	.00	90.00	953.9	.0412
2	956.4	74.7	210.0	.00	.00	.00	210.00	954.7	.0258
3	957.3	117.1	285.0	.00	.00	.00	285.00	955.0	.0185
4	958.0	175.0	340.0	.00	.00	.00	340.00	955.3	.0146
5	959.1	402.7	440.0	.00	.00	.00	440.00	955.6	.0065

SEGMENT TABLE FOR SECTION 18.9

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	90.	1.	87.	2.
90.	VELOCITY FPS	2.84	.84	2.88	.93
2	DISCHARGE CFS	210.	8.	190.	12.
210.	VELOCITY FPS	3.27	1.24	3.42	.95
3	DISCHARGE CFS	285.	14.	237.	34.
285.	VELOCITY FPS	3.12	1.29	3.37	.94
4	DISCHARGE CFS	340.	19.	266.	55.
340.	VELOCITY FPS	2.95	1.28	3.29	.70
5	DISCHARGE CFS	440.	22.	251.	167.
440.	VELOCITY FPS	1.96	.99	2.52	.60
1	ELEV 954.8 KD	1402.	14.	1357.	30.
2	ELEV 956.4 KD	4130.	157.	3738.	236.
3	ELEV 957.3 KD	6605.	327.	5529.	750.
4	ELEV 958.0 KD	8885.	487.	6984.	1414.
5	ELEV 959.1 KD	17153.	860.	9909.	6384.

KD TABLE FOR CROSS SECTION 18.9

ELEVATION	AREA	KD	KD BY SEGMENT		
952.80	0.				
953.	2.	27.	1.	25.	1.
954.	18.	548.	2.	544.	2.
955.	38.	1676.	22.	1606.	46.
956.	63.	3364.	103.	3080.	180.
957.	101.	5693.	265.	4913.	515.
958.	179.	9043.	497.	7072.	1455.
959.	369.	15804.	809.	9535.	5143.
960.	651.	29133.	1204.	12285.	15645.
961.	988.	48746.	1531.	15305.	31807.
962.	1365.	74284.	2121.	18585.	53510.
963.	1785.	106169.	3142.	22116.	81056.
964.	2206.	146803.	4488.	25894.	118100.
965.	2626.	197404.	6216.	29910.	166620.
966.	3047.	259322.	8393.	34158.	228782.

RATING TABLE FOR SECTION 18.95 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FR CTION S OPE
0	956.2	0.0	0.0						
1	957.7	22.2	90.0	.00	.00	.00	90.00	957.4	.1657
2	958.5	40.4	210.0	.00	.00	.00	210.00	958.1	.1686
3	959.1	55.7	285.0	.00	.00	.00	285.00	958.5	.1292
4	959.4	66.5	340.0	.00	.00	.00	340.00	958.7	.1133
BANK FULL	960.0	99.0	428.1	.00	.00	.00			
5	960.1	107.0	440.0	.00	.00	.00	440.00	959.1	.0796

SEGMENT TABLE FOR SECTION 18.95

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	90.	0.	90.	0.
90.	VELOCITY FPS	4.06	.00	4.06	.00
2	DISCHARGE CFS	210.	0.	210.	0.
210.	VELOCITY FPS	5.20	.00	5.19	.00
3	DISCHARGE CFS	285.	0.	285.	0.
285.	VELOCITY FPS	5.13	.00	5.12	.00
4	DISCHARGE CFS	340.	0.	340.	0.
340.	VELOCITY FPS	5.13	.00	5.11	.00
5	DISCHARGE CFS	440.	12.	427.	0.
440.	VELOCITY FPS	4.81	.69	4.84	.78
1	ELEV 957.7 KD	699.	1.	697.	1.
2	ELEV 958.5 KD	1617.	1.	1615.	1.
3	ELEV 959.1 KD	2507.	1.	2505.	1.
4	ELEV 959.4 KD	3194.	1.	3192.	1.
5	ELEV 960.1 KD	4825.	16.	4806.	3.

KD TABLE FOR CROSS SECTION 18.95

ELEVATION	AREA	KD	KD BY SEGMENT		
956.20	0.				
957.	10.	228.	1.	226.	1.
958.	29.	1008.	1.	1005.	1.
959.	54.	2404.	1.	2402.	1.
960.	99.	4665.	8.	4578.	2.
961.	284.	11166.	3067.	7991.	108.
962.	537.	24576.	11593.	12211.	669.
963.	805.	43560.	24341.	17132.	1993.
964.	1088.	67609.	40615.	22705.	4239.
965.	1394.	96239.	59810.	28880.	7495.
966.	1705.	131269.	83767.	35758.	12335.
967.	2016.	173727.	113539.	43363.	19340.
968.	2327.	224277.	149800.	51695.	29138.
969.	2638.	283580.	193232.	60752.	42459.

TABLE OF VALUES FOR BPR EQUATION

COEFK	AKB	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
.0000	.0000	.0000	.0000	.0000	.0000	1.2696	1.0000	1.0000	16.6147	23.4214	4 .5313
DCRIT	957.62	KBCRIT=									
.3059	.3059	.0000	.0000	.0000	.0000	.7746	1.0000	1.0000	25.7451	34.8304	6 .1452
DCRIT	957.11	KBCRIT=									
1.1609	1.1609	.0000	.0000	.0000	.0000	.4906	1.0000	1.0000	30.9271	44.0194	9 .4452
DCRIT	957.51	KBCRIT=									
1.1415	1.1415	.0000	.0000	.0000	.0000	.4957	1.0000	1.0000	34.3598	51.1937	13 .8267
DCRIT	957.81	KBCRIT=									
1.1448	1.1448	.0000	.0000	.0000	.0000	.4949	1.0000	1.0000	40.7904	67.9589	28 .2995
DCRIT	958.28	KBCRIT=									

ROAD SECTION 19.0

NO.	HW	CFS	HL	TW	CSM
0	955.60	0.00	0.00	0.00	0.00
1	957.94	90.00	.00	957.94	90.00
2	958.87	210.00	.00	958.87	210.00
3	959.39	285.00	.00	959.39	285.00
4	959.74	340.00	.00	959.74	340.00
5	960.39	440.00	.00	960.39	440.00

MIN ROAD ELEVATION 955.60

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 964.30 OPENING NO.= 1

RATING TABLE FOR SECTION 19.03 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM		CRIT ELEV	FRICTION SLOPE
0	956.2	0.0	0.0							
1	958.0	17.1	90.0	.00	.00	.00	90.00		957.6	.1453
2	958.8	25.8	210.0	.00	.00	.00	210.00		958.6	.2338
BANK FULL	958.9	27.2	226.2	.00	.00	.00				
3	959.4	32.9	285.0	.00	.00	.00	285.00	C	959.4	.2219
4	959.9	40.4	340.0	.00	.00	.00	340.00	C	959.9	.1898
5	960.4	51.9	440.0	.00	.00	.00	440.00	C	960.4	.1796

SEGMENT TABLE FOR SECTION 19.03

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	90.	0.	90.	0.
90.	VELOCITY FPS	5.26	.00	5.27	.00
2	DISCHARGE CFS	210.	0.	210.	0.
210.	VELOCITY FPS	8.15	.00	8.16	.00
3	DISCHARGE CFS	285.	1.	282.	1.
285.	VELOCITY FPS	8.91	2.24	8.93	2.24
4	DISCHARGE CFS	340.	5.	330.	5.
340.	VELOCITY FPS	8.96	2.51	9.07	2.51
5	DISCHARGE CFS	440.	16.	408.	16.
440.	VELOCITY FPS	9.40	3.23	9.72	3.23
1	ELEV 958.0 KD	747.	1.	745.	1.
2	ELEV 958.8 KD	1373.	1.	1371.	1.
3	ELEV 959.4 KD	1904.	4.	1897.	4.
4	ELEV 959.9 KD	2464.	34.	2397.	34.
5	ELEV 960.4 KD	3283.	119.	3043.	120.

KD TABLE FOR CROSS SECTION 19.03

ELEVATION	AREA	KD	KD BY SEGMENT		
956.25	0.				
957.	8.	211.	1.	209.	1.
958.	18.	774.	1.	772.	1.
959.	28.	1522.	1.	1520.	1.
960.	43.	2623.	44.	2522.	44.
961.	66.	4297.	274.	3741.	276.
962.	99.	6729.	791.	5143.	780.
963.	147.	9721.	1496.	6719.	1494.
964.	548.	20217.	7132.	8460.	3247.
965.	1310.	56990.	38056.	10356.	7329.
966.	2120.	120824.	93822.	12404.	14241.
967.	2950.	204754.	165954.	14596.	24040.
968.	3799.	307275.	252994.	16929.	37253.
969.	4663.	426400.	352960.	19399.	53923.
970.	5531.	571625.	474757.	22001.	75271.
971.	6398.	750698.	625425.	24732.	102638.
972.	7266.	968394.	809140.	27590.	137136.

RATING TABLE FOR SECTION 19.05 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM		CRIT ELEV	FRICTION SLOPE
0	958.9	0.0	0.0							
1	960.1	19.6	90.0	.00	.00	.00	90.00	C	960.1	.2898
2	960.6	35.7	210.0	.00	.00	.00	210.00	C	960.6	.2355
3	960.8	44.3	285.0	.00	.00	.00	285.00	C	960.8	.2245
4	961.0	50.3	340.0	.00	.00	.00	340.00	C	961.0	.2149
5	961.3	60.6	440.0	.00	.00	.00	440.00	C	961.3	.2046

SEGMENT TABLE FOR SECTION 19.05

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	90.	0.	90.	0.
90.	VELOCITY FPS	4.67	.00	4.60	.00
2	DISCHARGE CFS	210.	0.	210.	0.
210.	VELOCITY FPS	5.89	.00	5.88	.00
3	DISCHARGE CFS	285.	0.	285.	0.
285.	VELOCITY FPS	6.47	.00	6.43	.00
4	DISCHARGE CFS	340.	0.	340.	0.
340.	VELOCITY FPS	6.77	.00	6.76	.00
5	DISCHARGE CFS	440.	0.	440.	0.
440.	VELOCITY FPS	7.28	.00	7.26	.00
1	ELEV 960.1 KD	529.	1.	527.	1.
2	ELEV 960.6 KD	1368.	1.	1366.	1.
3	ELEV 960.8 KD	1902.	1.	1900.	1.
4	ELEV 961.0 KD	2319.	1.	2317.	1.
5	ELEV 961.3 KD	3076.	1.	3074.	1.

KD TABLE FOR CROSS SECTION 19.05

ELEVATION	AREA	KD	KD BY SEGMENT		
958.95	0.				
959.	0.	3.	1.	2.	1.
960.	17.	421.	1.	418.	1.
961.	50.	2285.	1.	2283.	1.
962.	88.	5374.	1.	5372.	1.
963.	136.	9836.	1.	9773.	30.
964.	516.	22042.	3251.	15838.	858.
965.	1301.	62763.	35257.	23178.	3454.
966.	2110.	128665.	88271.	31603.	8527.
967.	2940.	214900.	157646.	41034.	16182.
968.	3789.	319406.	241160.	51416.	26801.
969.	4653.	441870.	338213.	62714.	40919.
970.	5526.	582180.	448289.	74898.	59024.
971.	6399.	748924.	579852.	88084.	82479.
972.	7272.	944263.	734786.	102259.	112218.

RATING TABLE FOR SECTION 19.1 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM		CRIT ELEV	FRICTION SLOPE
0	961.7	0.0	0.0							
BANK FULL	962.5	22.2	89.3	.00	.00	.00				
1	962.6	23.0	90.0	.00	.00	.00	90.00	C	962.6	.1398
2	962.9	64.5	210.0	.00	.00	.00	210.00	C	962.9	.1421
3	963.0	86.7	285.0	.00	.00	.00	285.00	C	963.0	.1527
4	963.0	100.6	340.0	.00	.00	.00	340.00	C	963.0	.1804
5	963.1	125.8	440.0	.00	.00	.00	440.00	C	963.1	.2177

SEGMENT TABLE FOR SECTION 19.1

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	90.	1.	89.	0.
90.	VELOCITY FPS	4.00	1.21	4.00	.00
2	DISCHARGE CFS	210.	31.	176.	3.
210.	VELOCITY FPS	4.82	1.13	5.07	1.17
3	DISCHARGE CFS	285.	59.	222.	5.
285.	VELOCITY FPS	5.22	1.33	5.63	1.35
4	DISCHARGE CFS	340.	86.	248.	6.
340.	VELOCITY FPS	5.67	1.54	6.08	1.57
5	DISCHARGE CFS	440.	139.	291.	10.
440.	VELOCITY FPS	6.24	1.80	6.73	1.85
1	ELEV 962.6 KD	759.	2.	755.	1.
2	ELEV 962.9 KD	1653.	132.	1506.	16.
3	ELEV 963.0 KD	2276.	399.	1844.	33.
4	ELEV 963.0 KD	2462.	480.	1943.	39.
5	ELEV 963.1 KD	2844.	663.	2129.	52.

KD TABLE FOR CROSS SECTION 19.1

ELEVATION	AREA	KD	KD BY SEGMENT		
961.75	0.				
962.	4.	48.	1.	45.	1.
963.	99.	2499.	468.	1929.	38.
964.	776.	23638.	16142.	6447.	900.
965.	1731.	80144.	63497.	13076.	3503.
966.	2738.	167117.	137053.	21462.	8593.
967.	3769.	278382.	230778.	31407.	16155.
968.	4817.	413748.	344048.	42827.	26844.
969.	5880.	571041.	474486.	55619.	40927.
970.	6952.	750082.	621578.	69721.	58861.
971.	8025.	954954.	789468.	85166.	81203.
972.	9097.	1185988.	978370.	101916.	108380.
973.	10170.	1443482.	1188481.	119936.	140816.

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
TITLE     SPECIAL RUN @ BULLARD LAKE OUTLET (OUT OF CHANNEL)
CHANGE    DISCHARGE
DISCHARGE -1        5.        65.       150.      155.      270.
END
REACH     18.91     1.        250.      250.
SEGMENT   18.91     1         N         -20.
NVALUE    0.11
SEGMENT   18.91     2         C         10.
NVALUE    0.08
SEGMENT   18.91     3         N         115.
NVALUE    0.11
SECTION   18.91
          -370.     970.      -360.     954.      -310.     952.
          -300.     952.      -220.     954.      -130.     956.
          -40.      956.      -20.      954.      -5.       951.2
          5.        951.2     10.       954.      40.       956.
          110.      958.      115.      970.
ENDTABLE
ROAD      19.0      2.7       25.       25.
CULV1     19.0      1         12311
CULV2     1.                  50.       951.2     951.2
CULV1     19.0      1         12311
CULV2     1.                  50.       952.      952.
SECTION   19.0
          -900.     960.0     -750.     955.9     -700.     955.6
          -650.     955.8     -600.     956.8     -550.     957.9
          -500.     958.4     -450.     958.2     -400.     957.7
          -350.     957.6     -300.     958.2     -250.     959.7
          -200.     960.8     -150.     961.7     -100.     962.7
          -50.      964.2     -55.      970.
ENDTABLE
--------------------DATA POINTS ON SECTION 19.0   REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
REACH     19.04     1.        25.       25.
SEGMENT   19.04     1         N         -270.
NVALUE    0.06
SEGMENT   19.04     2         C         100.
NVALUE    0.05
SEGMENT   19.04     3         N         305.
NVALUE    0.06
SECTION   19.04
          -300.     970.0     -270.     954.      -235.     952.
          -210.     954.      -185.     956.      -100.     957.8
          -80.      956.      -60.      954.      0.        951.2
          60.       954.      100.      956.      165.      958.
          240.      960.      300.      962.      305.      970.
ENDTABLE
```

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
REACH      19.06      1.         25.        25.
SEGMENT    19.06      1          N          -24.       970.
NVALUE     0.05
SECTION    19.06
           -705.      970.       -700.      957.       -50.       957.
           -24.       957.       -24.       970.
ENDTABLE
REACH      19.11      1.         10.        10.
SEGMENT    19.11      1          N          -24.       970.
NVALUE     0.05
SECTION    19.11
           -700.      963.45     -100.      963.65     -50.       963.65
           -24.       963.25     -24.       970.       -905.      970.
           -900.      965.       -800.      963.3      -650.      962.5
           -600.      963.1      -500.      963.1      -400.      963.
           -300.      962.6      -200.      963.6
ENDTABLE
---------------------DATA POINTS ON SECTION 19.11  REORDERED BY PROGRAM ACCORDING TO X VALUES
                     DUPLICATE X POINTS NOT CHANGED--------------------
COMPUTE    18.91      19.11      18.85
-----------------------------END OF 80/80 LIST------------------------------
```

```
                    COMPUTE   18.91     19.11     18.85

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

RATING TABLE FOR SECTION 18.91 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FR CTION S OPE
0	951.2	0.0	0.0						
1	952.4	26.0	5.0	.00	.00	.00	5.00	951.4	.0021
2	953.6	143.9	65.0	.00	.00	.00	65.00	952.1	.0076
BANK FULL	954.0	208.9	121.9	.00	.00	.00			
3	954.2	241.0	150.0	.00	.00	.00	150.00	952.5	.0110
4	954.4	286.5	155.0	.00	.00	.00	155.00	952.5	.0077
5	955.1	435.3	270.0	.00	.00	.00	270.00	952.8	.0077

SEGMENT TABLE FOR SECTION 18.91

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	5.	1.	4.	0.
5.	VELOCITY FPS	.24	.08	.25	.00
2	DISCHARGE CFS	65.	34.	31.	0.
65.	VELOCITY FPS	.54	.34	.70	.00
3	DISCHARGE CFS	150.	90.	60.	0.
150.	VELOCITY FPS	.73	.50	.98	.00
4	DISCHARGE CFS	155.	96.	59.	0.
155.	VELOCITY FPS	.65	.44	.86	.20
5	DISCHARGE CFS	270.	176.	91.	3.
270.	VELOCITY FPS	.74	.52	1.03	.27
1	ELEV 952.4 KD	341.	47.	294.	1.
2	ELEV 953.6 KD	2353.	1222.	1130.	1.
3	ELEV 954.2 KD	4527.	2699.	1825.	2.
4	ELEV 954.4 KD	5591.	3429.	2156.	6.
5	ELEV 955.1 KD	9714.	6334.	3307.	74.

KD TABLE FOR CROSS SECTION 18.91

ELEVATION	AREA	KD	KD BY SEGMENT		
951.20	0.				
952.	10.	144.	1.	142.	1.
953.	74.	1037.	386.	641.	1.
954.	209.	3704.	2117.	1576.	2.
955.	414.	9129.	5906.	3150.	59.
956.	687.	17759.	12157.	5197.	405.
957.	1108.	31040.	22206.	7621.	1172.
958.	1562.	51856.	38349.	10407.	3030.
959.	2034.	78003.	57894.	13533.	6527.
960.	2508.	108634.	80393.	16976.	11224.
961.	2983.	143392.	105766.	20725.	16875.
962.	3459.	181962.	133809.	24767.	23368.
963.	3937.	224141.	164394.	29092.	30642.
964.	4415.	269653.	197337.	33689.	38609.
965.	4894.	318559.	232689.	38554.	47301.
966.	5375.	370680.	270329.	43680.	56662.
967.	5856.	425894.	310175.	49058.	66656.
968.	6338.	484094.	352157.	54684.	77254.
969.	6822.	544907.	396019.	60545.	88336.
970.	7305.	609404.	442495.	66662.	100271.
971.	7789.	677595.	491589.	73033.	113073.
972.	8273.	749487.	543306.	79653.	126756.

TABLE OF VALUES FOR BPR EQUATION

COEFK	AKB	DGTAK	SIGMA	DKE	DKS	M	ALPHA	ALPHA2	BRIDA	APPAR	AEXIT
.0000	.0000	.0000	.0000	.0000	.0000	.0000	1.0000	1.0000	.0000	67.9589	28 .2995
DCRIT	-1.00	KBCRIT=									
.0000	.0000	.0000	.0000	.0000	.0000	.0000	1.0000	1.0000	.0000	67.9589	28 .2995
DCRIT	-1.00	KBCRIT=									
.0000	.0000	.0000	.0000	.0000	.0000	.0000	1.0000	1.0000	.0000	67.9589	28 .2995
DCRIT	-1.00	KBCRIT=									
.0000	.0000	.0000	.0000	.0000	.0000	.0000	1.0000	1.0000	.0000	67.9589	28 .2995
DCRIT	-1.00	KBCRIT=									
.0000	.0000	.0000	.0000	.0000	.0000	.0000	1.0000	1.0000	.0000	67.9589	28 .2995
DCRIT	-1.00	KBCRIT=									

ROAD SECTION 19.0

NO.	HW	CFS	HL	TW	CSM
0	951.20	0.00	0.00	0.00	0.00
1	952.48	5.00	.08	952.40	5.00
2	956.02	65.00	2.40	953.62	65.00
3	956.26	150.00	2.04	954.22	150.00
4	956.28	155.00	1.84	954.44	155.00
5	956.52	270.00	1.42	955.10	270.00

MIN ROAD ELEVATION 955.60

BRIDGE TYPE 2 GIRDER BOTTOM ELEVATION = 964.30 OPENING NO.= 1

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
2	1	12311.	1.00		50.00	951.20	951.20	.024
3	1	12311.	1.00		50.00	952.00	952.00	.024

RATING TABLE FOR SECTION 19.04 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FR CTION S OPE
0	951.2	0.0	0.0						
1	952.5	39.3	5.0	.00	.00	.00	5.00	951.5	.0004
BANK FULL	954.0	230.5	30.8	.00	.00	.00			
2	956.0	682.8	65.0	.00	.00	.00	65.00	952.1	.0000
3	956.3	757.8	150.0	.00	.00	.00	150.00	952.4	.0001
4	956.3	762.1	155.0	.00	.00	.00	155.00	952.4	.0001
5	956.5	837.4	270.0	.00	.00	.00	270.00	952.7	.0003

SEGMENT TABLE FOR SECTION 19.04

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	5.	0.	5.	0.
5.	VELOCITY FPS	.13	.00	.13	.00
2	DISCHARGE CFS	65.	0.	65.	0.
65.	VELOCITY FPS	.10	.04	.10	.00
3	DISCHARGE CFS	150.	0.	149.	0.
150.	VELOCITY FPS	.20	.09	.20	.05
4	DISCHARGE CFS	155.	0.	154.	0.
155.	VELOCITY FPS	.21	.09	.20	.05
5	DISCHARGE CFS	270.	1.	269.	1.
270.	VELOCITY FPS	.33	.15	.33	.07
1	ELEV 952.5 KD	776.	1.	774.	1.
2	ELEV 956.0 KD	37670.	88.	37581.	1.
3	ELEV 956.3 KD	42637.	117.	42514.	6.
4	ELEV 956.3 KD	42930.	119.	42805.	6.
5	ELEV 956.5 KD	48336.	156.	48151.	28.

KD TABLE FOR CROSS SECTION 19.04

ELEVATION	AREA	KD	KD BY SEGMENT		
951.20	0.				
952.	14.	223.	1.	221.	1.
953.	86.	2140.	1.	2138.	1.
954.	231.	8016.	2.	8013.	1.
955.	432.	19719.	13.	19704.	1.
956.	677.	37283.	85.	37196.	1.
957.	997.	60211.	250.	59665.	227.
958.	1402.	94104.	540.	91924.	1541.
959.	1863.	143428.	981.	137691.	4671.
960.	2365.	203714.	1597.	191658.	10326.
961.	2902.	274436.	2410.	252622.	19261.
962.	3471.	355808.	3443.	320104.	32109.
963.	4055.	449232.	4715.	393808.	50510.
964.	4644.	552550.	6243.	473305.	72732.
965.	5235.	665286.	8051.	558724.	98300.
966.	5829.	786942.	10156.	649785.	126864.
967.	6425.	917178.	12577.	746298.	158237.
968.	7024.	1055704.	15329.	848102.	192273.
969.	7625.	1201425.	18419.	954596.	228299.
970.	8227.	1357628.	21910.	1067536.	268542.
971.	8829.	1524451.	25830.	1186939.	313231.
972.	9430.	1702024.	30205.	1312819.	362596.

RATING TABLE FOR SECTION 19.06 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FR CTION S OPE
0	957.0	0.0	0.0						
1	957.1	69.6	5.0	.00	.00	.00	5.00	957.0	.0033
2	957.1	93.2	65.0	.00	.00	.00	65.00	957.0	.1347
3	957.2	126.7	150.0	.00	.00	.00	150.00	957.1	.1632
4	957.2	128.7	155.0	.00	.00	.00	155.00	957.1	.1618
5	957.3	174.0	270.0	.00	.00	.00	270.00	957.2	.1668

SEGMENT TABLE FOR SECTION 19.06

CSM		TOTAL	SEG NO 1 N
1	DISCHARGE CFS	5.	5.
5.	VELOCITY FPS	.13	.07
2	DISCHARGE CFS	65.	65.
65.	VELOCITY FPS	.98	.70
3	DISCHARGE CFS	150.	150.
150.	VELOCITY FPS	1.26	1.18
4	DISCHARGE CFS	155.	155.
155.	VELOCITY FPS	1.26	1.20
5	DISCHARGE CFS	270.	270.
270.	VELOCITY FPS	1.57	1.55
1	ELEV 957.1 KD	277.	277.
2	ELEV 957.1 KD	560.	560.
3	ELEV 957.2 KD	1174.	1174.
4	ELEV 957.2 KD	1219.	1219.
5	ELEV 957.3 KD	2090.	2090.

KD TABLE FOR CROSS SECTION 19.06

ELEVATION	AREA	KD	KD BY SEGMENT
957.00	0.		
958.	676.	20059.	20059.
959.	1353.	63600.	63600.
960.	2030.	124831.	124831.
961.	2707.	201334.	201334.
962.	3385.	291605.	291605.
963.	4063.	394568.	394568.
964.	4741.	509402.	509402.
965.	5420.	635443.	635443.
966.	6100.	772126.	772126.
967.	6779.	918986.	918986.
968.	7459.	1075613.	1075613.
969.	8140.	1241645.	1241645.
970.	8820.	1416922.	1416922.
971.	9501.	1601188.	1601188.
972.	10181.	1794213.	1794213.

RATING TABLE FOR SECTION 19.11 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM		CRIT ELEV	FRICTION SLOPE
0	962.5	0.0	0.0							
1	962.6	3.3	5.0	.00	.00	.00	5.00	C	962.6	.9035
2	962.9	27.8	65.0	.00	.00	.00	65.00	C	962.9	.6830
3	963.0	57.8	150.0	.00	.00	.00	150.00	C	963.0	.7130
4	963.0	59.5	155.0	.00	.00	.00	155.00	C	963.0	.7007
5	963.1	92.4	270.0	.00	.00	.00	270.00	C	963.1	.6906

SEGMENT TABLE FOR SECTION 19.11

CSM		TOTAL	SEG NO 1 N
1	DISCHARGE CFS	5.	5.
5.	VELOCITY FPS	1.32	1.52
2	DISCHARGE CFS	65.	65.
65.	VELOCITY FPS	2.37	2.34
3	DISCHARGE CFS	150.	150.
150.	VELOCITY FPS	2.73	2.60
4	DISCHARGE CFS	155.	155.
155.	VELOCITY FPS	2.72	2.60
5	DISCHARGE CFS	270.	270.
270.	VELOCITY FPS	3.09	2.92
1	ELEV 962.6 KD	17.	17.
2	ELEV 962.9 KD	249.	249.
3	ELEV 963.0 KD	562.	562.
4	ELEV 963.0 KD	586.	586.
5	ELEV 963.1 KD	1027.	1027.

KD TABLE FOR CROSS SECTION 19.11

ELEVATION	AREA	KD	KD BY SEGMENT
962.50	0.		
963.	49.	456.	456.
964.	653.	16328.	16328.
965.	1499.	63666.	63666.
966.	2376.	136703.	136703.
967.	3253.	230563.	230563.
968.	4132.	343008.	343008.
969.	5011.	472424.	472424.
970.	5891.	618255.	618255.
971.	6772.	782271.	782271.
972.	7652.	964202.	964202.
973.	8532.	1163809.	1163809.

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
TITLE      MAIN CHANNEL CONTINUATION
CHANGE     DISCHARGE
DISCHARGE  -1         105.       275.       435.       495.       710.
END
REACH      19.5       1.         3710.      3710.
SEGMENT    19.5       1          N          -250.
NVALUE     0.06
SEGMENT    19.5       2          C          255.
NVALUE     0.04
SEGMENT    19.5       3          N          365.
NVALUE     0.06
SECTION    19.5
           -790.      972.       -750.      970.       -665.      968.
           -600.      966.       -580.      964.       -520.      964.
           -505.      966.       -350.      967.5      -270.      966.0
           -250.      962.1      -200.      957.1      205.       957.1
           255.       962.1      310.       970.       365.       972.0
ENDTABLE
REACH      19.7       1.         1710.      1710.
SEGMENT    19.7       1          N          -110.
NVALUE     0.06
SEGMENT    19.7       2          C          120.
NVALUE     0.04
SEGMENT    19.7       3          N          655.
NVALUE     0.06
SECTION    19.7
           -350.      983.5      -275.      964.0      -200.      963.5
           -110.      962.1      -60.       957.1      70.        957.1
           120.       962.1      200.       963.5      335.       964.0
           440.       966.0      530.       967.1      655.       970.0
ENDTABLE
REACH      19.9       1.         1385.      1150.
REACH2     20.1       -0.1
ROAD       20.0       2.7        15.        15.
CULV1      20.0       1          12311
CULV2      4.                    46.        959.99     960.29
SECTION    20.0
           -400.      970.09     -300.      968.79     -200.      968.29
           -100.      967.19     0.         966.69     100.       966.89
           200.       967.89     300.       968.79     400.       970.59
ENDTABLE
REACH      20.1       1.         15.        15.
SEGMENT    20.1       1          N          -5.
NVALUE     0.12
SEGMENT    20.1       2          C          5.
```

587+60
17+10
560 50

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
NVALUE    0.07
SEGMENT   20.1      3         N         500.      970.0
NVALUE    0.12
SECTION   20.1
          -300.     970.0     -300.     967.49    -250.     966.99
          -200.     966.99    -150.     966.19    -100.     965.19
          -50.      963.09    -5.       962.39    -4.       961.19
          -3.       959.79    4.        960.79    5.        962.79
          50.       962.09    100.      963.09    150.      965.09
          200.      967.09    250.      965.99    300.      965.69
          350.      964.79    400.      964.69    450.      965.69
          500.      968.59    500.      970.0     3.        959.79
ENDTABLE
--------------------DATA POINTS ON SECTION 20.1   REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
REACH     20.9      1.        6000.     5500.
SEGMENT   20.9      1         N         -5.
NVALUE    0.12
SEGMENT   20.9      2         C         5.
NVALUE    0.08
SEGMENT   20.9      3         N         142.      997.1
NVALUE    0.12
SECTION   20.9
          -86.      997.1     -86.      995.4     -70.      994.9
          -54.      993.6     -38.      989.4     -32.      988.6
          -16.      988.5     -5.       988.3     -3.       987.5
          0.        987.1     3.        987.4     5.        988.4
          16.       988.2     32.       987.6     48.       987.2
          64.       989.0     80.       990.3     96.       991.4
          112.      993.2     128.      994.3     142.      995.4
          142.      997.1
ENDTABLE
ROAD      21.0      2.7       21.       21.
CULV1     21.0      1         12311
CULV2     2.5                 70.       987.68    987.48
SECTION   21.0
          -300.     1000.08   -200.     997.68    -100.     995.98
          0.        995.68    100.      996.18    200.      996.68
          300.      997.48    400.      998.58    500.      999.18
          600.      999.68    675.      1000.08
ENDTABLE
REACH     21.1      1.        21.       21.
REACH2    20.9      0.1
REACH     21.9      1.        980.      830.
SEGMENT   21.9      1         N         -10.
NVALUE    0.13
SEGMENT   21.9      2         C         25.
```

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
NVALUE     0.08
SEGMENT    21.9      3         N         237.      1004.8
NVALUE     0.13
SECTION    21.9
           -292.     1004.8    -292.     1003.2    -250.     1001.9
           -200.     1000.5    -150.     999.8     -100.     999.4
           -50.      999.2     -25.      997.7     -10.      996.3
           -3.       995.4     0.        994.8     3.        995.4
           25.       997.3     50.       997.9     75.       998.6
           125.      999.8     150.      1000.0    175.      1000.0
           200.      1000.1    225.      1000.3    237.      1001.1
           237.      1004.8
ENDTABLE
ROAD       22.0      2.7       36.4      36.4
CULV1      22.0      1.        12311
CULV2      3.0                 67.2      995.78    995.18
SECTION    22.0
           -150.     1006.4    -100.     1004.2    0.        1001.9
           100.      1001.1    200.      1000.9    300.      1000.4
           400.      1000.5    500.      1002.1    500.      1006.4
ENDTABLE
REACH      22.1      1.        36.4      36.4
REACH2     21.9      0.1
REACH      22.9      1.        614.      564.
SEGMENT    22.9      1         N         -5.
NVALUE     0.13
SEGMENT    22.9      2         C         6.
NVALUE     0.08
SEGMENT    22.9      3         N         275.
NVALUE     0.13
SECTION    22.9
           -64.      1008.1    -64.      1001.1    -52.      1000.4
           -40.      1000.3    -28.      1000.3    -12.      1000.1
           -5.       999.5     -4.       998.1     5.        999.0
           6.        999.1     12.       999.7     25.       1000.1
           50.       1000.7    75.       1000.9    120.      1000.9
           130.      1001.0    195.      1001.2    275.      1008.1
           4.        998.1
ENDTABLE
--------------------DATA POINTS ON SECTION 22.9   REORDERED BY PROGRAM ACCORDING TO X VALUES
                     DUPLICATE X POINTS NOT CHANGED--------------------
ROAD       23.0      2.7       18.       18.
CULV1      23.0      1         32111
CULV2      1.        2.        64.       998.7     997.7     .014
SECTION    23.0
           -150.     1007.7    -100.     1005.8    -50.      1004.3
           0.        1003.2    50.       1002.6    100.      1002.5
```

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
          150.      1002.2    200.      1002.4    250.      1003.2
          300.      1004.0    350.      1004.4    350.      1007.7
ENDTABLE
REACH     23.1      1.        18.       18.
REACH2    22.9      0.1
REACH     23.4      1.        432.      432.
SEGMENT   23.4      1         N         -3.2      1001.4
NVALUE    0.13
SEGMENT   23.4      2         C         3.2       1001.4
NVALUE    0.08
SEGMENT   23.4      3         N         250.      1010.2
NVALUE    0.13
SECTION   23.4
          -225.     1010.2    -225.     1006.05   -200.     1004.15
          -150.     1003.25   -100.     1002.25   -50.      1001.15
          -3.2      1001.40   -3.2      1000.54   -1.1      1000.54
          0.        1000.20   1.1       1000.54   3.2       1000.54
          3.2       1001.40   25.       1001.15   50.       1000.95
          100.      1001.45   150.      1001.25   200.      1001.75
          250.      1001.85   250.      1010.2
ENDTABLE
COMPUTE   19.5      23.4      19.1
-----------------------------END OF 80/80 LIST-----------------------------
```

COMPUTE 19.5 23.4 19.1

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

RATING TABLE FOR SECTION 19.5 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	957.1	0.0	0.0						
BANK FULL	962.1	2275.8	92.0	.00	.00	.00			
1	962.8	2634.6	105.0	.00	.00	.00	105.00	957.2	.0000
2	963.2	2852.0	275.0	.00	.00	.00	275.00	957.3	.0000
3	963.4	2942.7	435.0	.00	.00	.00	435.00	957.4	.0000
4	963.5	2999.8	495.0	.00	.00	.00	495.00	957.5	.0000
5	963.7	3092.1	710.0	.00	.00	.00	710.00	957.6	.0000

EGL 191 divided flow OK.

SEGMENT TABLE FOR SECTION 19.5

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	105.	0.	105.	0.
105.	VELOCITY FPS	.04	.01	.04	.01
2	DISCHARGE CFS	275.	0.	275.	0.
275.	VELOCITY FPS	.10	.02	.10	.02
3	DISCHARGE CFS	435.	0.	435.	0.
435.	VELOCITY FPS	.15	.02	.15	.02
4	DISCHARGE CFS	495.	0.	495.	0.
495.	VELOCITY FPS	.17	.03	.17	.03
5	DISCHARGE CFS	710.	0.	709.	0.
710.	VELOCITY FPS	.23	.03	.23	.04
1	ELEV 962.8 KD	293720.	14.	293687.	19.
2	ELEV 963.2 KD	334304.	46.	334195.	63.
3	ELEV 963.4 KD	351973.	74.	351797.	102.
4	ELEV 963.5 KD	363225.	99.	362991.	135.
5	ELEV 963.7 KD	380559.	137.	380247.	175.

KD TABLE FOR CROSS SECTION 19.5

ELEVATION	AREA	KD	KD BY SEGMENT		
957.10	0.				
958.	373.	12721.	1.	12719.	1.
959.	806.	44590.	1.	44588.	1.
960.	1259.	91075.	1.	91073.	1.
961.	1733.	150691.	1.	150689.	1.
962.	2225.	223060.	1.	223056.	1.
963.	2735.	312253.	24.	312159.	33.
964.	3269.	414920.	249.	414313.	286.
965.	3860.	530933.	2057.	527748.	915.
966.	4494.	660208.	6198.	651833.	2023.
967.	5245.	802369.	12321.	786194.	3727.
968.	6161.	966532.	29399.	930441.	6122.
969.	7146.	1151681.	57588.	1084246.	9301.
970.	8186.	1355860.	94576.	1247274.	12726.
971.	9272.	1579286.	142004.	1419351.	16506.
972.	10374.	1821139.	203769.	1600515.	20829.
973.	11477.	2080674.	285617.	1790768.	25890.
974.	12580.	2357952.	392178.	1989953.	31756.
975.	13683.	2653025.	528766.	2197922.	38497.

RATING TABLE FOR SECTION 19.7 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	957.1	0.0	0.0						
BANK FULL	962.1	905.8	92.0	.00	.00	.00			
1	962.8	1097.4	105.0	.00	.00	.00	105.00	957.4	.0000
2	963.2	1247.1	275.0	.00	.00	.00	275.00	957.6	.0000
3	963.4	1311.8	435.0	.00	.00	.00	435.00	957.8	.0001
4	963.5	1357.4	495.0	.00	.00	.00	495.00	957.8	.0001
5	963.7	1457.8	710.0	.00	.00	.00	710.00	958.0	.0002

SEGMENT TABLE FOR SECTION 19.7

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	105.	0.	105.	0.
105.	VELOCITY FPS	.10	.01	.10	.01
2	DISCHARGE CFS	275.	2.	272.	2.
275.	VELOCITY FPS	.23	.04	.23	.04
3	DISCHARGE CFS	435.	4.	428.	3.
435.	VELOCITY FPS	.35	.06	.36	.06
4	DISCHARGE CFS	495.	5.	486.	4.
495.	VELOCITY FPS	.39	.07	.40	.07
5	DISCHARGE CFS	710.	10.	691.	9.
710.	VELOCITY FPS	.54	.11	.54	.10
1	ELEV 962.8 KD	109669.	177.	109335.	157.
2	ELEV 963.2 KD	127743.	598.	126614.	531.
3	ELEV 963.4 KD	136344.	986.	134482.	877.
4	ELEV 963.5 KD	141836.	1295.	139387.	1155.
5	ELEV 963.7 KD	150771.	1770.	147393.	1608.

KD TABLE FOR CROSS SECTION 19.7

ELEVATION	AREA	KD	KD BY SEGMENT		
957.10	0.				
958.	125.	4157.	1.	4155.	1.
959.	283.	14891.	1.	14889.	1.
960.	462.	31143.	1.	31141.	1.
961.	660.	52803.	1.	52801.	1.
962.	880.	80269.	2.	80242.	2.
963.	1165.	117943.	310.	117013.	276.
964.	1615.	166537.	2835.	160346.	2651.
965.	2234.	231045.	10314.	209006.	11170.
966.	2929.	311551.	22040.	262615.	26425.
967.	3696.	405818.	37131.	321022.	47355.
968.	4529.	518104.	55254.	384025.	78494.
969.	5412.	645981.	76238.	451464.	118023.
970.	6344.	790750.	99796.	523148.	167125.
971.	7295.	955353.	126127.	599038.	229281.
972.	8254.	1137170.	155093.	679006.	302420.
973.	9217.	1333335.	186619.	762946.	383396.
974.	10183.	1543246.	220638.	850759.	471713.
975.	11154.	1765571.	256909.	942291.	565997.
976.	12128.	2000878.	295662.	1037546.	667253.
977.	13106.	2249271.	336956.	1136487.	775610.
978.	14087.	2509805.	380626.	1238997.	890091.
979.	15074.	2781329.	426493.	1344948.	1009639.
980.	16064.	3064942.	474830.	1454386.	1135485.
981.	17056.	3360700.	525668.	1567277.	1267687.
982.	18055.	3666348.	578628.	1683418.	1404071.
983.	19053.	3985544.	634414.	1803042.	1548305.
984.	20052.	4318848.	693156.	1926152.	1701041.

RATING TABLE FOR SECTION 19.9 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	959.7	0.0	0.0						
BANK FULL	962.3	32.3	68.4	.00	.00	.00			
1	963.7	214.9	105.0	.00	.00	.00	105.00	961.6	.0074
2	964.6	399.5	275.0	.00	.00	.00	275.00	962.7	.0103
3	965.2	600.7	435.0	.00	.00	.00	435.00	962.9	.0120
4	965.4	673.9	495.0	.00	.00	.00	495.00	963.0	.0124
5	965.8	870.1	710.0	.00	.00	.00	710.00	963.2	.0146

SEGMENT TABLE FOR SECTION 19.9

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	105.	18.	37.	50.
105.	VELOCITY FPS	.74	.33	1.08	.39
2	DISCHARGE CFS	275.	63.	66.	145.
275.	VELOCITY FPS	.91	.54	1.52	.61
3	DISCHARGE CFS	435.	117.	90.	227.
435.	VELOCITY FPS	1.00	.67	1.80	.61
4	DISCHARGE CFS	495.	135.	96.	264.
495.	VELOCITY FPS	1.02	.69	1.86	.62
5	DISCHARGE CFS	710.	193.	118.	399.
710.	VELOCITY FPS	1.12	.78	2.12	.70
1	ELEV 963.7 KD	3822.	611.	1422.	1789.
2	ELEV 964.6 KD	8568.	1957.	2073.	4538.
3	ELEV 965.2 KD	12534.	3362.	2611.	6560.
4	ELEV 965.4 KD	14067.	3845.	2774.	7447.
5	ELEV 965.8 KD	18550.	5051.	3159.	10341.

KD TABLE FOR CROSS SECTION 19.9

ELEVATION	AREA	KD	KD BY SEGMENT		
959.69	0.				
960.	2.	20.	1.	18.	1.
961.	9.	199.	1.	197.	1.
962.	19.	512.	1.	510.	2.
963.	103.	1641.	91.	988.	463.
964.	276.	5374.	1025.	1648.	2688.
965.	537.	11171.	2851.	2434.	5863.
966.	959.	20948.	5680.	3340.	11910.
967.	1569.	38968.	10086.	4356.	24504.
968.	2342.	67745.	17945.	5477.	44241.
969.	3138.	108275.	31765.	6699.	69768.
970.	3938.	159042.	49300.	8019.	101828.
971.	4738.	225437.	73461.	9442.	143503.
972.	5538.	310236.	105824.	10964.	196437.
973.	6338.	416412.	148157.	12583.	262379.

ROAD SECTION 20.0

NO.	HW	CFS	HL	TW	CSM
0	960.29	0.00	0.00	0.00	0.00
1	966.74	105.00	3.04	963.70	105.00
2	967.22	275.00	2.64	964.58	275.00
3	967.47	435.00	2.24	965.23	435.00
4	967.49	495.00	2.08	965.41	495.00
5	967.68	710.00	1.84	965.84	710.00

MIN ROAD ELEVATION 966.69

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	12311.	4.00		46.00	959.99	960.29	.024

RATING TABLE FOR SECTION 20.1 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FR CTION S OPE
0	959.8	0.0	0.0						
BANK FULL	962.4	32.3	39.3	.00	.00	.00			
1	966.7	1332.5	105.0	.00	.00	.00	105.00	961.7	.0001
2	967.2	1663.0	275.0	.00	.00	.00	275.00	962.8	.0005
3	967.5	1850.3	435.0	.00	.00	.00	435.00	963.0	.0010
4	967.5	1869.9	495.0	.00	.00	.00	495.00	963.1	.0012
5	967.7	2011.4	710.0	.00	.00	.00	710.00	963.3	.0020

SEGMENT TABLE FOR SECTION 20.1

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	105.	27.	14.	64.
105.	VELOCITY FPS	.11	.07	.22	.07
2	DISCHARGE CFS	275.	70.	32.	173.
275.	VELOCITY FPS	.21	.14	.46	.16
3	DISCHARGE CFS	435.	110.	46.	279.
435.	VELOCITY FPS	.30	.20	.64	.23
4	DISCHARGE CFS	495.	125.	52.	318.
495.	VELOCITY FPS	.34	.22	.72	.26
5	DISCHARGE CFS	710.	179.	71.	460.
710.	VELOCITY FPS	.44	.29	.96	.35
1	ELEV 966.7 KD	28889.	7516.	3975.	17398.
2	ELEV 967.2 KD	38527.	9848.	4488.	24192.
3	ELEV 967.5 KD	44302.	11265.	4757.	28280.
4	ELEV 967.5 KD	44944.	11422.	4785.	28737.
5	ELEV 967.7 KD	49815.	12604.	4993.	32217.

KD TABLE FOR CROSS SECTION 20.1

ELEVATION	AREA	KD	KD BY SEGMENT		
959.79	0.				
960.	1.	11.	1.	9.	1.
961.	9.	174.	1.	172.	1.
962.	17.	475.	1.	473.	1.
963.	88.	1376.	55.	929.	319.
964.	255.	4606.	822.	1576.	2206.
965.	506.	9814.	2392.	2350.	5050.
966.	912.	18224.	4868.	3244.	10081.
967.	1493.	33832.	8681.	4250.	20898.
968.	2263.	59094.	15330.	5360.	38344.
969.	3058.	95314.	27629.	6572.	61080.
970.	3858.	140392.	43076.	7883.	89496.
971.	4658.	199435.	64427.	9295.	126529.
972.	5458.	274931.	93099.	10807.	173668.
973.	6258.	369544.	130688.	12417.	232496.

RATING TABLE FOR SECTION 20.9 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FR CTION S OPE
0	987.1	0.0	0.0						
BANK FULL	988.3	34.2	59.8	.00	.00	.00			
1	989.2	115.7	105.0	.00	.00	.00	105.00	988.1	.0340
2	990.1	215.9	275.0	.00	.00	.00	275.00	988.6	.0377
3	990.8	297.9	435.0	.00	.00	.00	435.00	988.9	.0375
4	990.9	313.7	495.0	.00	.00	.00	495.00	989.0	.0421
5	991.6	414.9	710.0	.00	.00	.00	710.00	989.2	.0387

SEGMENT TABLE FOR SECTION 20.9

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	105.	12.	25.	68.
105.	VELOCITY FPS	1.03	.58	1.47	.87
2	DISCHARGE CFS	275.	52.	54.	169.
275.	VELOCITY FPS	1.40	1.01	2.09	1.22
3	DISCHARGE CFS	435.	95.	79.	262.
435.	VELOCITY FPS	1.60	1.25	2.42	1.38
4	DISCHARGE CFS	495.	109.	88.	297.
495.	VELOCITY FPS	1.73	1.36	2.62	1.49
5	DISCHARGE CFS	710.	168.	117.	425.
710.	VELOCITY FPS	1.87	1.53	2.86	1.61
1	ELEV 989.2 KD	1798.	198.	429.	1171.
2	ELEV 990.1 KD	4477.	846.	881.	2750.
3	ELEV 990.8 KD	7101.	1539.	1285.	4277.
4	ELEV 990.9 KD	7627.	1678.	1363.	4586.
5	ELEV 991.6 KD	11417.	2690.	1892.	6835.

KD TABLE FOR CROSS SECTION 20.9

ELEVATION	AREA	KD	KD BY SEGMENT		
987.10	0.				
988.	20.	171.	1.	64.	106.
989.	95.	1352.	102.	344.	894.
990.	203.	4076.	738.	817.	2517.
991.	329.	8150.	1818.	1439.	4891.
992.	471.	13756.	3305.	2195.	8254.
993.	627.	20824.	5185.	3072.	12566.
994.	799.	28826.	7208.	4064.	17554.
995.	993.	37843.	9130.	5164.	23548.
996.	1217.	50437.	12449.	6366.	31619.
997.	1445.	66122.	17214.	7667.	41236.
998.	1673.	84537.	23159.	9069.	52414.
999.	1901.	105773.	30355.	10570.	65233.
1000.	2129.	129970.	38929.	12169.	79766.
1001.	2357.	157263.	49004.	13862.	96081.

ROAD SECTION 21.0

NO.	HW	CFS	HL	TW	CSM
0	987.68	0.00	0.00	0.00	0.00
1	995.98	105.00	6.64	989.34	105.00
2	996.31	275.00	6.08	990.23	275.00
3	996.48	435.00	5.60	990.88	435.00
4	996.52	495.00	5.52	991.00	495.00
5	996.76	710.00	5.04	991.72	710.00

MIN ROAD ELEVATION 995.68

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	12311.	2.50		70.00	987.68	987.48	.024

RATING TABLE FOR SECTION 21.1 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FR CTION S OPE
0	987.2	0.0	0.0						
BANK FULL	988.4	34.2	14.3	.00	.00	.00			
1	996.0	1190.9	105.0	.00	.00	.00	105.00	988.2	.0000
2	996.3	1265.1	275.0	.00	.00	.00	275.00	988.7	.0003
3	996.5	1302.9	435.0	.00	.00	.00	435.00	989.0	.0007
4	996.5	1313.8	495.0	.00	.00	.00	495.00	989.1	.0008
5	996.8	1367.7	710.0	.00	.00	.00	710.00	989.3	.0015

SEGMENT TABLE FOR SECTION 21.1

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	105.	26.	14.	65.
105.	VELOCITY FPS	.10	.07	.17	.09
2	DISCHARGE CFS	275.	68.	35.	171.
275.	VELOCITY FPS	.24	.18	.41	.21
3	DISCHARGE CFS	435.	109.	55.	271.
435.	VELOCITY FPS	.37	.28	.62	.33
4	DISCHARGE CFS	495.	125.	62.	308.
495.	VELOCITY FPS	.42	.32	.70	.37
5	DISCHARGE CFS	710.	181.	88.	441.
710.	VELOCITY FPS	.57	.44	.96	.51
1	ELEV 996.0 KD	47027.	11505.	6222.	29300.
2	ELEV 996.3 KD	51506.	12763.	6634.	32109.
3	ELEV 996.5 KD	53922.	13492.	6846.	33584.
4	ELEV 996.5 KD	54633.	13708.	6908.	34017.
5	ELEV 996.8 KD	58228.	14807.	7216.	36205.

KD TABLE FOR CROSS SECTION 21.1

ELEVATION	AREA	KD	KD BY SEGMENT		
987.20	0.				
988.	16.	124.	1.	50.	73.
989.	85.	1119.	64.	306.	738.
990.	192.	3608.	621.	762.	2220.
991.	315.	7415.	1621.	1371.	4421.
992.	455.	12661.	3009.	2114.	7537.
993.	611.	19340.	4768.	2979.	11591.
994.	781.	26981.	6719.	3960.	16302.
995.	973.	35524.	8553.	5049.	21920.
996.	1194.	47234.	11560.	6241.	29429.
997.	1422.	62008.	15973.	7532.	38494.
998.	1650.	79434.	21552.	8924.	49043.
999.	1878.	99547.	28317.	10416.	61156.
1000.	2106.	122483.	36388.	12005.	74903.
1001.	2334.	148369.	45885.	13689.	90350.

RATING TABLE FOR SECTION 21.9 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FR CTION S OPE
0	994.8	0.0	0.0						
BANK FULL	996.3	15.3	47.7	.00	.00	.00			
1	998.1	106.0	105.0	.00	.00	.00	105.00	996.5	.0182
2	999.1	215.9	275.0	.00	.00	.00	275.00	997.2	.0256
3	999.6	327.1	435.0	.00	.00	.00	435.00	997.7	.0305
4	999.8	375.1	495.0	.00	.00	.00	495.00	997.8	.0320
5	1000.3	534.7	710.0	.00	.00	.00	710.00	998.2	.0343

SEGMENT TABLE FOR SECTION 21.9

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	105.	9.	91.	5.
105.	VELOCITY FPS	1.21	.47	1.26	.33
2	DISCHARGE CFS	275.	32.	207.	36.
275.	VELOCITY FPS	1.73	.67	1.95	.58
3	DISCHARGE CFS	435.	53.	301.	82.
435.	VELOCITY FPS	2.03	.58	2.39	.74
4	DISCHARGE CFS	495.	72.	325.	97.
495.	VELOCITY FPS	2.10	.64	2.48	.74
5	DISCHARGE CFS	710.	143.	414.	153.
710.	VELOCITY FPS	2.23	.77	2.80	.76
1	ELEV 998.1 KD	2431.	195.	2158.	78.
2	ELEV 999.1 KD	5427.	641.	4091.	696.
3	ELEV 999.6 KD	7866.	920.	5476.	1470.
4	ELEV 999.8 KD	8676.	1151.	5840.	1685.
5	ELEV 1000.3 KD	12049.	2321.	7144.	2583.

KD TABLE FOR CROSS SECTION 21.9

ELEVATION	AREA	KD	KD BY SEGMENT		
994.80	0.				
995.	0.	4.	1.	2.	1.
996.	9.	106.	1.	104.	1.
997.	37.	685.	15.	667.	1.
998.	97.	2223.	166.	1581.	54.
999.	205.	5216.	618.	3959.	639.
1000.	448.	10185.	1595.	6414.	2056.
1001.	846.	20621.	5347.	9343.	5767.
1002.	1316.	37598.	11818.	12698.	13083.
1003.	1824.	59468.	20740.	16435.	22239.
1004.	2351.	87202.	33238.	20557.	33366.
1005.	2880.	120517.	49133.	25053.	46405.
1006.	3409.	161591.	70019.	29972.	62579.
1007.	3938.	211294.	96804.	35311.	82257.
1008.	4467.	270505.	130461.	41067.	105817.

ROAD SECTION 22.0

NO.	HW	CFS	HL	TW	CSM
0	995.78	0.00	0.00	0.00	0.00
1	1000.69	105.00	2.48	998.21	105.00
2	1001.03	275.00	1.84	999.19	275.00
3	1001.14	435.00	1.36	999.78	435.00
4	1001.21	495.00	1.28	999.93	495.00
5	1001.37	710.00	.96	1000.41	710.00

MIN ROAD ELEVATION 1000.40

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	12311.	3.00		67.20	995.78	995.18	.024

RATING TABLE FOR SECTION 22.1 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FR CTION S OPE
0	994.9	0.0	0.0						
BANK FULL	996.4	15.3	27.2	.00	.00	.00			
1	1000.7	668.0	105.0	.00	.00	.00	105.00	996.6	.0005
2	1001.0	822.0	275.0	.00	.00	.00	275.00	997.3	.0021
3	1001.2	880.4	435.0	.00	.00	.00	435.00	997.8	.0044
4	1001.3	915.2	495.0	.00	.00	.00	495.00	997.9	.0051
5	1001.5	1009.2	710.0	.00	.00	.00	710.00	998.3	.0082

SEGMENT TABLE FOR SECTION 22.1

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	105.	24.	56.	25.
105.	VELOCITY FPS	.27	.10	.35	.10
2	DISCHARGE CFS	275.	70.	130.	75.
275.	VELOCITY FPS	.56	.22	.76	.23
3	DISCHARGE CFS	435.	113.	198.	123.
435.	VELOCITY FPS	.81	.33	1.12	.34
4	DISCHARGE CFS	495.	131.	221.	143.
495.	VELOCITY FPS	.88	.36	1.23	.38
5	DISCHARGE CFS	710.	197.	297.	216.
710.	VELOCITY FPS	1.12	.49	1.60	.52
1	ELEV 1000.7 KD	14705.	3217.	8115.	3373.
2	ELEV 1001.0 KD	18822.	4652.	9171.	4999.
3	ELEV 1001.2 KD	20684.	5323.	9590.	5771.
4	ELEV 1001.3 KD	21879.	5759.	9843.	6276.
5	ELEV 1001.5 KD	24729.	6794.	10491.	7444.

KD TABLE FOR CROSS SECTION 22.1

ELEVATION	AREA	KD	KD BY SEGMENT		
994.90	0.				
995.	0.	3.	1.	2.	1.
996.	8.	82.	1.	80.	1.
997.	33.	596.	9.	585.	1.
998.	88.	1996.	131.	1820.	34.
999.	193.	4750.	508.	3732.	494.
1000.	414.	9242.	1266.	6147.	1729.
1001.	802.	18410.	4439.	9029.	4755.
1002.	1268.	33738.	10138.	12341.	11206.
1003.	1771.	53791.	18135.	16046.	19581.
1004.	2298.	79153.	29349.	20131.	29652.
1005.	2827.	109494.	43560.	24584.	41382.
1006.	3356.	146893.	62286.	29461.	55963.
1007.	3885.	192129.	86354.	34759.	73734.
1008.	4414.	245993.	116654.	40473.	95044.

RATING TABLE FOR SECTION 22.9 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FR CTION S OPE
0	998.1	0.0	0.0						
BANK FULL	999.1	9.1	32.3	.00	.00	.00			
1	1001.4	205.5	105.0	.00	.00	.00	105.00	999.8	.0134
2	1002.0	376.9	275.0	.00	.00	.00	275.00	1000.5	.0182
3	1002.5	506.0	435.0	.00	.00	.00	435.00	1000.8	.0189
4	1002.5	516.0	495.0	.00	.00	.00	495.00	1000.9	.0231
5	1002.9	629.4	710.0	.00	.00	.00	710.00	1001.1	.0258

SEGMENT TABLE FOR SECTION 22.9

CSM		TOTAL	SEG NO 1 N	2 C	3 N
1	DISCHARGE CFS	105.	26.	42.	36.
105.	VELOCITY FPS	.94	.43	1.26	.33
2	DISCHARGE CFS	275.	70.	71.	134.
275.	VELOCITY FPS	1.07	.70	1.73	.57
3	DISCHARGE CFS	435.	108.	90.	237.
435.	VELOCITY FPS	1.13	.85	1.94	.71
4	DISCHARGE CFS	495.	123.	100.	272.
495.	VELOCITY FPS	1.26	.95	2.16	.80
5	DISCHARGE CFS	710.	173.	125.	411.
710.	VELOCITY FPS	1.39	1.12	2.46	.97
1	ELEV 1001.4 KD	2771.	712.	1240.	820.
2	ELEV 1002.0 KD	6401.	1642.	1710.	3049.
3	ELEV 1002.5 KD	9992.	2494.	2092.	5407.
4	ELEV 1002.5 KD	10282.	2562.	2122.	5598.
5	ELEV 1002.9 KD	13982.	3413.	2478.	8091.

KD TABLE FOR CROSS SECTION 22.9

ELEVATION	AREA	KD	KD BY SEGMENT		
998.10	0.				
999.	8.	125.	1.	123.	1.
1000.	26.	509.	8.	469.	29.
1001.	126.	1743.	354.	1011.	344.
1002.	376.	6420.	1636.	1707.	3033.
1003.	650.	14635.	3561.	2542.	8523.
1004.	936.	25493.	5970.	3504.	16007.
1005.	1233.	38901.	8826.	4586.	25480.
1006.	1542.	54708.	12075.	5781.	36848.
1007.	1862.	72753.	15658.	7085.	50007.
1008.	2194.	93045.	19558.	8492.	64992.
1009.	2527.	116116.	23889.	10003.	82281.
1010.	2861.	142117.	28670.	11614.	102034.
1011.	3194.	171125.	33906.	13323.	124350.
1012.	3527.	203215.	39599.	15127.	149323.

ROAD SECTION 23.0

NO.	HW	CFS	HL	TW	CSM
0	998.70	0.00	0.00	0.00	0.00
1	1002.65	105.00	1.28	1001.37	105.00
2	1002.99	275.00	.96	1002.03	275.00
3	1003.15	435.00	.64	1002.51	435.00
4	1003.27	495.00	.72	1002.55	495.00
5	1003.45	710.00	.48	1002.97	710.00

MIN ROAD ELEVATION 1002.20

OPENING NO.	NO. CULVERTS	CULV. CODE	HEIGHT OR DIAM	WIDTH	LENGTH	U/S INVERT	D/S INVERT	(N) COEFF
1	1	32111.	1.11	1.81	64.00	998.70	997.70	.014

KD TABLE FOR CROSS SECTION 23.1

ELEVATION	AREA	KD	KD BY SEGMENT		
998.20	0.				
999.	7.	103.	1.	101.	1.
1000.	23.	452.	5.	424.	20.
1001.	112.	1525.	253.	949.	277.
1002.	349.	5610.	1418.	1631.	2524.
1003.	621.	13268.	3217.	2453.	7598.
1004.	907.	23438.	5474.	3402.	14552.
1005.	1203.	36078.	8168.	4473.	23429.
1006.	1510.	51038.	11242.	5657.	34133.
1007.	1830.	68166.	14644.	6950.	46567.
1008.	2161.	87463.	18353.	8347.	60758.
1009.	2494.	109360.	22461.	9847.	77098.
1010.	2827.	134059.	27000.	11448.	95789.
1011.	3160.	161635.	31975.	13148.	116927.
1012.	3494.	192158.	37387.	14943.	140604.

RATING TABLE FOR SECTION 23.4 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	CSM	CRIT ELEV	FRICTION SLOPE
0	1000.2	0.0	0.0						
BANK FULL	1001.4	38.7	49.0	.00	.00	.00			
1	1002.8	484.1	105.0	.00	.00	.00	105.00	1001.4	.0025
2	1003.3	674.3	275.0	.00	.00	.00	275.00	1001.6	.0061
3	1003.6	800.4	435.0	.00	.00	.00	435.00	1001.7	.0091
4	1003.7	858.8	495.0	.00	.00	.00	495.00	1001.8	.0095
5	1004.0	998.3	710.0	.00	.00	.00	710.00	1001.9	.0124

SEGMENT TABLE FOR SECTION 23.4

CSM		TOTAL	SEG NO 1 N	SEG NO 2 C	SEG NO 3 N
1	DISCHARGE CFS	105.	25.	6.	74.
105.	VELOCITY FPS	.23	.19	.42	.22
2	DISCHARGE CFS	275.	67.	14.	194.
275.	VELOCITY FPS	.43	.34	.76	.42
3	DISCHARGE CFS	435.	110.	20.	305.
435.	VELOCITY FPS	.58	.45	1.00	.57
4	DISCHARGE CFS	495.	127.	22.	346.
495.	VELOCITY FPS	.61	.47	1.05	.61
5	DISCHARGE CFS	710.	191.	29.	490.
710.	VELOCITY FPS	.75	.58	1.27	.76
1	ELEV 1002.8 KD	6609.	1538.	400.	4672.
2	ELEV 1003.3 KD	11151.	2721.	553.	7876.
3	ELEV 1003.6 KD	14393.	3630.	658.	10105.
4	ELEV 1003.7 KD	16075.	4111.	709.	11255.
5	ELEV 1004.0 KD	20193.	5399.	830.	13964.

KD TABLE FOR CROSS SECTION 23.4

ELEVATION	AREA	KD	KD BY SEGMENT		
1000.20	0.				
1001.	4.	39.	1.	36.	2.
1002.	208.	1756.	390.	201.	1156.
1003.	572.	8562.	2037.	468.	6052.
1004.	986.	19814.	5273.	819.	13715.
1005.	1438.	35868.	11006.	1243.	23619.
1006.	1906.	55972.	18801.	1734.	35427.
1007.	2381.	80253.	28885.	2289.	49066.
1008.	2856.	108115.	40811.	2904.	64393.
1009.	3331.	139084.	54236.	3576.	81265.
1010.	3806.	173035.	69106.	4303.	99621.
1011.	4281.	210506.	85826.	5085.	119640.
1012.	4756.	251681.	104563.	5920.	141370.
1013.	5231.	296567.	125359.	6808.	164793.
1014.	5706.	345168.	148254.	7747.	189893.

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
TITLE      NEFF LAKE OUTLET
REACH      39.9       1.         1100.      910.
REACH2     40.1       -0.2
ROAD       40.0       2.7        50.        50.
BPR        40.0       A          1
GIRDER     908.43     908.13     0          .8         2.7
           -5.        909.93     -4.9       908.13     4.9        908.13
           5.         909.93
ENDTABLE
SECTION    40.0
           -300.      916.33     -250.      914.53     -200.      913.03
           -150.      911.93     -100.      911.03     -50.       910.23
           -5.        909.93     50.        910.03     100.       910.43
           150.       911.13     200.       911.93     250.       912.93
           300.       913.73     400.       915.13     5.         909.93
           -4.9       903.1      4.9        903.1
ENDTABLE
--------------------DATA POINTS ON SECTION 40.0   REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
REACH      40.1       1.         50.        50.
SEGMENT    40.1       1          N          -6.
NVALUE     0.10
SEGMENT    40.1       2          C          6.
NVALUE     0.06
SEGMENT    40.1       3          N          240.       914.1
NVALUE     0.10
SECTION    40.1
           -300.      914.1      -250.      909.77     -200.      909.27
           -150.      908.77     -100.      907.47     -50.       907.07
           -6.        906.27     -5.        904.07     6.         906.37
           25.        906.07     50.        906.57     100.       907.67
           150.       911.57     200.       912.67     225.       912.07
           240.       912.37     240.       914.1      -295.      912.77
           5.         904.07
ENDTABLE
--------------------DATA POINTS ON SECTION 40.1   REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
TITLE      BROPHY LAKE OUTLET
REACH      40.9       1.         534.       506.
SEGMENT    40.9       1          N          -15.
NVALUE     0.10
SEGMENT    40.9       2          C          15.
NVALUE     0.06
SEGMENT    40.9       3          N          120.
NVALUE     0.10
SECTION    40.9
           -238.      936.0      -220.      934.0      -170.      932.0
           -130.      930.0      -125.      928.0      -70.       926.0
           -15.       924.0      -5.        923.6      5.         923.6
```

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
          15.        924.0      25.        926.0      50.        928.0
          95.        930.0      120.       934.
ENDTABLE
ROAD      41.0       2.7        14.        14.
CULV1     41.0       1          12333
CULV2     2.                    63.5       925.5      925.5
SECTION   41.0
          -230.      935.66     -200.      934.36     -150.      932.26
          -100.      930.86     -50.       930.06     0.         930.16
          50.        931.26     100.       934.16     125.       935.36
ENDTABLE
REACH     41.1       1.         68.        68.
SEGMENT   41.1       1          N          -5.
NVALUE    0.10
SEGMENT   41.1       2          C          5.
NVALUE    0.06
SEGMENT   41.1       3          N          205.
NVALUE    0.10
SECTION   41.1
          -250.      935.5      -200.      932.16     -150.      931.26
          -100.      929.36     -75.       927.36     -25.       926.56
          -5.        926.76     -4.        925.56     5.         926.56
          25.        927.26     50.        927.46     100.       929.26
          150.       929.76     200.       933.06     205.       935.5
          4.         925.56
ENDTABLE
--------------------DATA POINTS ON SECTION 41.1   REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
ENDJOB


******************************NORMAL END OF JOB-----------------------------
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00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: FLOOD PLAIN MANAGEMENT STUDY

3) WATERCOURSE: NORTH ORE CREEK

4) DOCUMENT TYPE: REPORT

00BREAK00

FLOOD PLAIN MANAGEMENT STUDY

NORTH ORE CREEK

Livingston County, Michigan

MARCH 1984

TECHNICAL REPORT

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2. TABLE 2 - FLOOD ELEVATIONS - PRELIMINARY
3. INVESTIGATIONS AND ANALYSES - PRELIMINARY
4. BENCH MARK DESCRIPTIONS
5. GLOSSARY

PREPARED BY

U.S. Department of Agriculture
Soil Conservation Service
East Lansing, Michigan

[redacted]

[redacted]

[redacted]

TABLE 1 - NORTH ORE CREEK FLOOD DISCHARGES

Location	TR-20 Sec.	From Sec.	To Sec.	Drainage Area Sq. Miles	Estimated Peak Discharges 10 Yr.	50 Yr.	100 Yr.	500 Yr.
					-cubic feet per second-			
From Parshallville Dam to downstream of Cullen Road	098	12.00	12.75	36.82	975	1520	1720	2470
To upstream of Clyde Road	060	12.80	14.35	22.60	370	605	700	1070
To downstream of Old US-23	048	14.55	14.90	18.92	335	555	645	965
To upstream of Hartland Road	044	15.00	17.55	18.28	335	545	630	950
To downstream of Bullard Road	039	17.65	18.65	17.52	330	540	625	935
Through Bullard Lake structure-divided flow	103	18.85	19.10	9.71	210	285	340	440
Flow over Bullard Lake Dike-divided flow	102	18.85	19.10	4.72	65	150	155	270
To Fenton Road	020	18.70	20.00	11.61	275	435	495	710

2

TABLE 2 - FLOOD ELEVATIONS AT SURVEYED SECTIONS

Location	Section	Station	10-Year	50-Year	100-Year	500-Year
Parshallville Dam	12.00	100+00	908.2	908.8	908.9	909.5
	12.55	151+90	909.0	909.8	910.1	910.9
	12.65	158+00	909.0	909.9	910.1	911.0
	12.75	160+90	909.3	910.2	910.5	911.4
	12.80	163+50	909.4	910.4	910.6	911.6
Cullen Road	13.00 D 1/	164+80	909.4	910.4	910.6	911.6
	13.00 U	165+40	909.9	910.9	911.0	911.7
	13.55	167+10	909.9	910.9	911.1	911.8
	13.75	172+60	910.0	911.0	911.2	911.9
	13.90	176+60	910.1	911.1	911.4	912.2
Clyde Road	14.00 D	177+56	910.1	911.2	911.4	912.2
	14.00 U	177+74	910.2	911.3	911.5	912.3
	14.25	178+70	910.3	911.3	911.6	912.5
	14.35	181+10	910.4	911.4	911.7	912.6
	14.55	200+80	910.5	911.5	911.8	912.7
	14.59	227+60	911.4	912.4	912.7	913.6
Townley Road	14.60	228+20	911.4	912.4	912.6	913.5
	14.70	228+90	911.5	912.5	912.7	913.7
	14.71	249+20	912.4	913.2	913.5	914.4
	14.72	265+30	912.7	913.6	913.9	914.8
	14.73	277+70	913.1	913.9	914.1	915.0
	14.75	283+60	913.2	914.0	914.2	915.1
	14.76	301+00	914.0	914.5	914.7	915.4
	14.77	308+50	915.1	915.6	915.8	916.3
	14.78	315+00	916.0	916.5	916.7	917.4
	14.80	323+00	917.2	918.0	918.1	918.9
	14.90	331+20	919.7	920.6	920.8	921.7
Old US-23	15.00 D	332+72	920.2	921.1	921.3	922.1
	15.00 U	333+18	920.3	921.3	921.6	922.7
	15.10	333+30	920.3	921.3	921.6	922.8
	15.15	336+80	921.4	922.2	922.4	923.4
New US-23 South Bound	15.20 D	337+15	921.5	922.3	922.6	923.5
	15.20 U	337+75	921.5	922.3	922.6	923.5
	15.25	337+80	921.6	922.4	922.6	923.6
New US-23 North Bound	15.30 D	337+85	921.6	922.4	922.7	923.7
	15.30 U	338+45	921.7	922.7	923.1	924.6
	15.35	340+30	922.0	923.0	923.4	924.7

1/ D and U represent downstream and upstream faces of bridge and indicates bridge head losses for the tabulated floods.

TABLE 2 - FLOOD ELEVATIONS AT SURVEYED SECTIONS - CON'T

Location	Section	Station	10-Year	50-Year	100-Year	500-Year
Crouse Road	16.00	341+80	922.6	923.5	923.9	925.1
	16.10	342+70	923.1	924.0	924.4	925.7
	16.25	344+00	923.4	924.3	924.6	925.8
	16.55	346+20	925.7	926.1	926.4	927.0
	16.90	347+90	927.8	928.6	928.8	929.5
Hartland Road	17.00 D	348+71	930.0	930.8	931.2	932.1
	17.00 U	349+09	930.6	932.0	932.6	934.3
	17.20	354+00	931.6	932.6	933.0	934.5
	17.21	356+80	932.4	933.3	933.7	935.1
	17.25	360+00	932.8	933.7	934.1	935.4
	17.35	366+90	933.6	934.5	934.8	936.0
	17.45	376+10	935.4	936.3	936.5	937.5
	17.50	382+20	936.7	937.4	937.6	938.4
	17.55	390+80	937.3	938.1	938.3	939.1
	17.65	401+00	938.9	939.6	939.8	940.5
	17.75	411+30	939.6	940.3	940.5	941.2
	17.85	417+70	940.4	941.1	941.3	942.0
	17.90	427+90	940.7	941.4	941.6	942.3
Dunham Road	18.00 D	428+10	940.7	941.4	941.7	942.4
	18.00 U	428+40	941.1	941.5	941.8	942.4
	18.15	433+80	941.6	942.1	942.3	942.9
	18.20	445+70	943.2	943.9	944.0	944.7
	18.45	460+90	945.6	946.4	946.7	947.5
	18.55	470+80	946.3	947.1	947.4	948.1
	18.60	484+20	947.3	948.0	948.3	949.0
	18.63	492+70	950.0	950.9	951.3	952.1
	18.65	504+00	950.2	951.1	951.5	952.3
	18.70	520+50	950.4	951.2	951.6	952.4
	18.75	530+90	951.9	952.5	952.8	953.5
	18.85	544+00	953.4	953.9	954.2	954.9
	18.87	549+90	954.9	955.4	955.7	956.3
Countryside Drive	18.89 D	550+30	955.0	955.5	955.8	956.4
	18.89 U	550+90	956.3	957.3	958.0	959.2
	18.90	551+40	956.4	957.3	958.0	959.2
Bullard Road	19.00 D	552+93	958.9	959.4	959.7	960.4
	19.00 U	553+27	958.9	959.4	959.7	960.4
	19.10	553+40	962.9	963.0	963.0	963.1
	19.70	587+60	963.2	963.4	963.5	963.7
Fenton Road	20.00 D	601+37	964.6	965.2	965.4	965.8
	20.00 U	601+83	967.2	967.5	967.5	967.7

3

PROCEDURES AND METHODOLOGY

Survey Procedures

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A schematic for the WSP-2 model is in Section 10. Section 11 lists WSP-2 input data. WSP-2 output data are bound in a separate book.

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The eastern (upstream) limit of the flood plain management study area was set at Fenton Road.

Floodplain delineations were made on the contour maps and photomap sheets. At surveyed sections and bridges, computed water surface elevations were used to identify floodplain limits. Between sections, topographic map interpretations and field inspections were used to delineate the flood boundary lines. Limits of flooding shown on the photomaps may vary from actual location on the ground and the photographic image may vary from true ground location due to inherent aerial photographic displacement. High water profile elevations and detailed field surveys should be used to determine the extent or depth of flooding at any specific site.

Where the limits of the 500-year and the 100-year floods were too close to delineate, the limits of the two floodplains are shown as the same line on the photomap sheets.

Precipitation amounts totaling between four and five inches fell on the North Ore Creek Watershed on April 17-20, 1975. Three dams washed out as a result of that precipitation and flow over Parshallville Road was observed to be approximately one foot. This storm has been estimated to be approximately a 100-year storm by the Michigan Department of Agriculture Weather Service.

4

BENCH MARK DESCRIPTIONS *

NORTH ORE CREEK

LIVINGSTON COUNTY, MICHIGAN

7RGW 1967

Section 23, T3N, R6E - On headwall, approximately 800 feet east of intersection of Bullard Road and M-59.

Standard tablet in center of the headwall, 34 feet south of centerline of M-59.

Elev. 983.75

TBM #1

Section 24, T3N, R6E - At North Ore Creek crossing along Fenton Road.

Chiseled "x" painted on top of east end of 48" CMP, 24 feet east of centerline of Fenton Road.

Elev. 963.99

TBM #2

Section 24, T3N, R6E - 36 feet east and 56 feet south of intersection of Fenton and Hyde Roads.

SCS disk and nail in north side of 18" oak tree.

Elev. 993.46

TBM #3

Section 24, T3N, R6E - Along Hyde Road, 0.5 mile east of Fenton Road, 35 feet south of centerline of Hyde Road and 30 feet northeast of corner of small house.

Lag bolt in north side of power pole.

Elev. 1,022.62

* Elevations based on USC&GS mean sea level datum of 1929.

TBM #4

Section 24, T3N, R6E - At North Ore Creek crossing along Tipsico Lake Road.

Chiseled and painted "x" on top of south end of 30" CMP.

Elev. 990.08

TBM #5

Section 24, T3N, R6E - 100 feet north and 25 feet east of intersection of Murray Hill Road and Tipsico Lake Road.

SCS disk and nail in west side of power guy pole.

Elev. 1,023.06

TBM #6

Section 30, T3N, R7E - 50 feet south and 36 feet east of intersection of Tipsico Lake Road and M-59.

Top of northwest corner of concrete right-of-way post.

Elev. 1,012.82

TBM #7

Section 25, T3N, R6E - 46 feet south of centerline of M-59, approximately half way between Fenton Road and Tipsico Lake Road, 132 feet east of driveway to south.

Lag bolt in north side of power pole.

Elev. 1,015.72

TBM #8

Section 23, T3N, R6E - 57 feet south and 31 feet west of intersection of M-59 and Bullard Road.

Top of bolt set vertically in northeast side of 36" oak tree.

Elev. 974.49

TBM #9

Section 23, T3N, R6E - At bridge on Bullard Road at Bullard Lake outlet.

Chiseled and painted square on southeast wingwall, 5 feet south and 16 feet east of centerline of bridge.

Elev. 963.25

TBM #10

Section 23, T3N, R6E - At a 90° bend in Bullard Road, 25 feet north and 56 feet west of intersection of Bullard Road and Michell Lane.

Chiseled and painted "x" on north end of 12" CMP.

Elev. 1,021.34

TBM #11

Section 14, T3N, R6E - 85 feet north and 15 feet east of intersection of Dunham Road and Bullard Road.

Chiseled and pained "x" on east end of 12" CMP.

Elev. 1,034.01

TBM #12

Section 14, T3N, R6E - At stream crossing on Dunham Road, appoximately half way between Bullard Road and Fenton Road, 142 feet east of T Road to north.

Chiseled and painted "x" on north end of 72" CMP, 22 feet north of centerline of Dunham Road

Elev. 965.44

TBM #13

Section 22, T3N, R6E - Along M-59, approximately 0.3 mile west of Bullard Road, near west edge of a small lake at a drive to the south with a brick fence, 35 feet south of M-59 and 13 feet west of the driveway.

Chiseled and painted square on top of a concrete culvert.

Elev. 962.68

TBM #14

Section 22, T3N, R6E - 59 feet south and 36 feet west of intersection of M-59 and Melody Place.

Lag bolt in north side of power pole.

Elev. 980.59

TBM #15

Section 21, T3N, R6E - 50 feet north and 25 feet west of intersection of Clark Road and M-59.

Chiseled and painted square on top of west end of 12" concrete culvert.

Elev. 968.64

TBM #16

Section 22, T3N, R6E - 20 feet east of Clark Road, approximately 0.5 mile north of M-59, 45 feet south of drive to the west to an underground house.

Chiseled and painted "x" on east end of 12" CMP.

Elev. 959.05

TBM #17

Section 22, T3N, R6E - At a bridge over North Ore Creek along Dunham Road between Clark Road and Fenton Road.

Chiseled and painted square on southeast concrete wingwall 16 feet south and 10 feet east of center of bridge.

Elev. 941.96

TBM #18

Section 22, T3N, R6E - 155 feet south and 29 feet west of intersection of Dunham Road and a blacktop street to south, approximately 0.3 mile west of Bullard Road.

Lag bolt in north side of power pole.

Elev. 972.25

TBM #19

Section 16, T3N, R6E - 25 feet north of Dunham Road, approximately 0.4 mile west of Clark Road, 15 feet west of a field entrance.

SCS disk and nail in south side of 20" oak tree.

Elev. 964.53

TBM #20

Section 16, T3N, R6E - 29 feet north and 42 feet east of intersection of Dunham Road and Hartland Road.

Rail spike in south side of 24" oak.

Elev. 963.34

TBM #21

Section 16, T3N, R6E - 20 feet south and 14 feet west of centerline of bridge over North Ore Creek on Hartland Road near south edge of Hartland.

Chiseled and painted square on southwest concrete wingwall

Elev. 940.07

TBM #22

Section 17, T3N, R6E - 28 feet north and 164 feet west of intersection of Crouse Road and Old US-23.

Painted "+" mark on top center of concrete headwall

Elev. 926.59

TBM #23

Section 17, T3N, R6E - Approximately 0.5 mile west of US-23 on Crouse Road, 24 feet south and 17 feet west of intersection of Crouse Road and driveway to south.

SCS disk and nail in north side of tree stump.

Elev. 953.57

TBM #24

Section 17, T3N, R6E - 28 feet south and 25 feet east of intersection of Crouse Road and extension of Cullen Road at 90° bend.

Lag bolt in north side of 48" oak tree.

Elev. 985.07

TBM #25

Sections 8 and 17, T3N, R6E - 13 feet east of centerline of Cullen Road opposite end of Dwyer Road.

Lag bolt in west side of 25" cottonwood tree.

Elev. 942.62

TBM #26

Section 7, T3N, R6E - 28 feet east and 33 feet north of intersection of Cullen Road and Townley Road.

Chiseled and painted "x" on north end of 12" CMP.

Elev. 932.40

TBM #27

Section 5, T3N, R6E - 35 feet north and 57 feet east of intersection of Clyde Road and Cullen Road.

Lag bolt in west side of telephone pole.

Elev. 917.93

TBM #28

Section 5, T3N, R6E - Approximately 0.5 mile west of US-23 on Clyde Road, 28 feet north and 40 feet east of intersection of Clyde Road and Pleasant Hill Drive.

Chiseled and painted square on east end of 18" concrete culvert.

Elev. 920.41

TBM #29

Section 8, T3N, R6E - 64 feet east and 16 feet south of intersection of Clyde Road and Old US-23.

Chiseled and painted "x" on curb at a post with a reflector.

Elev. 995.13

TBM #30

Section 8, T3N, R6E - 20 feet east of centerline of Old US-23 in line with centerline of Townley Road.

Painted mark on top of steel center post of guard rail

Elev. 974.54

TBM #31

Section 8, T3N, R6E - 38 feet west of centerline of west US-23 service road at the bottom of a hill between Clyde Road and Crouse Road.

Painted "+" of 535+00 on west concrete headwall

Elev. 921.71

TBM #32

Section 7, T3N, R6E - 23 feet south and 85 feet east of intersection of Clyde Road and Parshallville Road.

Nail in north side of power pole.

Elev. 939.37

TBM #33

Section 6, T3N, R6E - 60 feet north and 23 feet east of centerline of road at 90° turn to the east on Parshallville Road.

Chiseled and painted "+" on top of large rock.

Elev. 941.63

TBM #34

Section 6, T3N, R6E - 24 feet south of centerline of Parshallville Road at Parshallville Dam.

Chiseled and painted square on southwest corner of dam.

Elev. 907.50

TBM #35

Section 5, T3N, R6E - Approximately 0.4 mile south of Parshallville along Cullen Road, 24 feet west of centerline of Cullen Road.

Chiseled and painted "x" on west end of south 26" CMP.

Elev. 906.47

6944B

5

GLOSSARY

BACKWATER--The resulting highwater surface upstream from a dam, bridge or other obstruction in a river channel or high stages in a receiving stream.

BRIDGE DECK--Elevation of road surface at the bridge.

BRIDGE LOW CLEARANCE--The lowest point of a bridge or other structure over or across a river, stream, or water course that limits the opening through which water flows. This is referred to as "low steel" or "low chord". It often is higher than the low point of the roadway.

CHANNEL OR WATER COURSE--An elongated depression either natural or man-made having a bed and well-defined banks varying in depth, width and length which gives direction to a current of water and is normally described as a creek, stream or riverbed.

CHANNEL BOTTOM--The lowest part of the stream channel (either in a constructed cross section or a natural channel). Bottom elevations at a series of points along the length of a stream may be plotted and connected to provide a stream bottom profile.

CONFLUENCE--A flowing together or place of junction of two or more streams.

CROSS SECTION OR VALLEY SECTION--A graph showing the shape of the streambed, banks and adjacent land on either side made by plotting elevations at measured distances along a line perpendicular to the flow of the stream.

DATUM--An assumed reference plane from which elevations and depths are measured such as from sea level.

HIGH WATER OR FLOOD PROFILE--A graph showing the relationship of water surface elevation location along the stream. While it is drawn to show surface elevations for the crest of a specific flood, it may be prepared for conditions at any other given time or stage.

ELEVATION-DISCHARGE RELATIONSHIP--The relationship between water surface elevation and rate of flow at a specified location for a range of flow rates.

FLOOD--A temporary overflow by a river, stream, ocean lake or other body of lands not normally covered by water. It does not include the ponding of surface water due to inadequate drainage such as within a development. It is characterized by damaging inundation, backwater effects of surcharging sewers and local drainage channels, and by unsanitary conditions within adjoining flooded habitated area attributable to pollutants, debris and water table.

FLOOD CREST--The maximum stage or elevation reached by flood waters at a given location.

FLOOD FREQUENCY--A means of expressing the probability of flood occurrences as determined from a statistical analysis of representative stream flow or rainfall and runoff records. It is customary to estimate the frequency with which specific flood stages or discharges may be equalled or exceeded, rather than the frequency of an exact stage or discharge. Such estimates by strict definition are designated "exceedence frequence," but in practice the term "frequency" is used. The frequency of a particular stage or discharge is usually expressed as occurring once in a specified number of years.

10-year Flood--A flood having an average frequency of occurrance in the order of once in 10 years. It has a 10 percent chance of being equalled or exceeded in any given year.

100-year Flood--A flood having an average frequency of occurrance in the order of once in 100 years. It has a one percent chance of being equalled or exceeded in any given year. This flood is comparable to the "Intermediate Regional Flood" used by the U.S. Army Corps of Engineers.

FLOOD PEAK--The maximum instantaneous discharge or volume of flow in cubic feet per second passing a given location. It usually occurs at or near the time of the flood crest.

FLOOD PLAIN--The relatively flat area or low lands covered by flood waters originating with either the adjoining channel of a water course such as a river or stream, or a body of standing water such as an ocean or lake.

FLOOD ROUTING--The process of determining progressively the timing and shape of a flood wave at successive points along a stream. This procedure is used to derive a downstream hydrograph from an upstream hydrograph. Local inflow and tributary hydrographs are considered.

FLOOD STAGE--The elevation at which overflow of the natural stream banks or body of water occurs.

FLOODWAY--The portion of the flood plain including the channel of the stream that is required for the conveyance of flood flow.

FLOODWAY FRINGE--The area of the flood plain lying outside of the floodway which may be covered by flood waters originating from an adjoining river or stream.

HEAD LOSS--The effect of obstructions, such as narrow bridge openings, dams or buildings that limit the area through which water must flow, raising the surface water upstream from the obstruction.

HEADWATER--The tributaries and upper reaches which are the sources of the stream.

HYDRAULICS--The science of the laws governing the motion of water and their practical applications.

HYDROGRAPH--A graph denoting the discharge or stage of flow over a period of time.

HYDROLOGY--The science dealing with the occurrence and movement of water upon and beneath the land areas of the earth.

INUNDATION--The flooding or overflow of an area with water.

LEFT BANK--The bank of the left side of a river, stream or water course, looking downstream.

LOW GROUND--The highest elevation at a specific stream channel cross section at which the flow in the stream can be contained in the channel without overflowing into adjacent overbank areas.

MANNING'S "n"--A coefficient of channel and overbank roughness used in Manning's open channel flow formula, commonly called a retardance factor.

REACH LENGTH--A longitudinal length of stream channel selected for use in hydraulic or other computations.

RIGHT BANK--The bank on the right side of the river, stream or water course, looking downstream.

ROAD OVERFLOW--The lowest elevation on a road profile in the vicinity of where the road and stream cross. It is the first point on the roadway inundated if overtopping of the road occurs during a storm.

RUNOFF--That part of precipitation, as well as any other flow contributions, which appears in surface streams of either perennial or intermittent form.

TIME OF CONCENTRATION--Time required for water to flow from the most remote point of a watershed to the outlet or other point of reference.

WATERSHED--A drainage basin or area which collects runoff and transmits it usually by means of streams and tributaries to the outlet of the basin.

WATERSHED BOUNDARY--The divide separating one drainage basin from another.

00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: FLOOD PLAIN MANAGEMENT STUDY

3) WATERCOURSE: NORTH ORE CREEK

4) DOCUMENT TYPE: TECHNICAL SUPPORT DOC.

00BREAK00

FLOOD PLAIN MANAGEMENT STUDY

NORTH ORE CREEK

Livingston County, Michigan

MARCH 1984

CONTENTS

TECHNICAL SUPPORT DOCUMENTATION

PREPARED BY

U.S. Department of Agriculture
Soil Conservation Service
East Lansing, Michigan

Basin 373

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Starting lake level elevations at the Parshallville Dam were hand calculated for various configurations of the gates. A check of flows from the Parshallville Dam to the Shannon Lake Dam showed that tailwater below Parshallville Dam would not affect these starting elevations.

The eastern (upstream) limit of the flood plain management study area was set at Fenton Road.

Floodplain delineations were made on the contour maps and photomap sheets. At surveyed sections and bridges, computed water surface elevations were used to identify floodplain limits. Between sections, topographic map interpretations and field inspections were used to delineate the flood boundary lines. Limits of flooding shown on the photomaps may vary from actual location on the ground and the photographic image may vary from true ground location due to inherent aerial photographic displacement. High water profile elevations and detailed field surveys should be used to determine the extent or depth of flooding at any specific site.

Where the limits of the 500-year and the 100-year floods were too close to delineate, the limits of the two floodplains are shown as the same line on the photomap sheets.

Precipitation amounts totaling between four and five inches fell on the North Ore Creek Watershed on April 17-20, 1975. Three dams washed out as a result of that precipitation and flow over Parshallville Road was observed to be approximately one foot. This storm has been estimated to be approximately a 100-year storm by the Michigan Department of Agriculture Weather Service.

yes but gates were closed/parcial closed and locked / John Dexter

2

TABLE 1 - NORTH ORE CREEK FLOOD DISCHARGES

Location	TR-20 Sec.	From Sec.	To Sec.	Drainage Area Sq. Miles	Estimated Peak Discharges 10 Yr.	50 Yr.	100 Yr.	500 Yr.
					-cubic feet per second-			
From Parshallville Dam to downstream of Cullen Road	098	12.00	12.75	36.82 37.37	975	1520	1720	2470
To upstream of Clyde Road	060	12.80	14.35	22.60	370	605	700	1070
To downstream of Old US-23	048	14.55	14.90	18.92	335	555	645	965
To upstream of Hartland Road	044	15.00	17.55	18.28	335	545	630	950
To downstream of Bullard Road	039	17.65	18.65	17.52	330	540	625	935
Through Bullard Lake structure-divided flow	103	18.85	19.10	9.71	210	285	340	440
Flow over Bullard Lake Dike-divided flow	102	18.85	19.10	4.72	65	150	155	270
To Fenton Road	020	18.70	20.00	11.61	275	435	495	710

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TABLE 2 - FLOOD ELEVATIONS AT SURVEYED SECTIONS

Location	Section	Station	10-Year	50-Year	100-Year	500-Year
Parshallville Dam	12.00	100+00	908.2	908.8	908.9	909.5
	12.55	151+90	909.0	909.8	910.1	910.9
	12.65	158+00	909.0	909.9	910.1	911.0
	12.75	160+90	909.3	910.2	910.5	911.4
	12.80	163+50	909.4	910.4	910.6	911.6
Cullen Road	13.00 D 1/	164+80	909.4	910.4	910.6	911.6
	13.00 U	165+40	909.9	910.9	911.0	911.7
	13.55	167+10	909.9	910.9	911.1	911.8
	13.75	172+60	910.0	911.0	911.2	911.9
	13.90	176+60	910.1	911.1	911.4	912.2
Clyde Road	14.00 D	177+56	910.1	911.2	911.4	912.2
	14.00 U	177+74	910.2	911.3	911.5	912.3
	14.25	178+70	910.3	911.3	911.6	912.5
	14.35	181+10	910.4	911.4	911.7	912.6
	14.55	200+80	910.5	911.5	911.8	912.7
	14.59	227+60	911.4	912.4	912.7	913.6
Townley Road	14.60	228+20	911.4	912.4	912.6	913.5
	14.70	228+90	911.5	912.5	912.7	913.7
	14.71	249+20	912.4	913.2	913.5	914.4
	14.72	265+30	912.7	913.6	913.9	914.8
	14.73	277+70	913.1	913.9	914.1	915.0
	14.75	283+60	913.2	914.0	914.2	915.1
	14.76	301+00	914.0	914.5	914.7	915.4
	14.77	308+50	915.1	915.6	915.8	916.3
	14.78	315+00	916.0	916.5	916.7	917.4
	14.80	323+00	917.2	918.0	918.1	918.9
	14.90	331+20	919.7	920.6	920.8	921.7
Old US-23	15.00 D	332+72	920.2	921.1	921.3	922.1
	15.00 U	333+18	920.3	921.3	921.6	922.7
	15.10	333+30	920.3	921.3	921.6	922.8
	15.15	336+80	921.4	922.2	922.4	923.4
New US-23 South Bound	15.20 D	337+15	921.5	922.3	922.6	923.5
	15.20 U	337+75	921.5	922.3	922.6	923.5
	15.25	337+80	921.6	922.4	922.6	923.6
New US-23 North Bound	15.30 D	337+85	921.6	922.4	922.7	923.7
	15.30 U	338+45	921.7	922.7	923.1	924.6
	15.35	340+30	922.0	923.0	923.4	924.7

1/ D and U represent downstream and upstream faces of bridge and indicates bridge head losses for the tabulated floods.

TABLE 2 - FLOOD ELEVATIONS AT SURVEYED SECTIONS - CON'T

Location	Section	Station	10-Year	50-Year	100-Year	500-Year
Crouse Road	16.00	341+80	922.6	923.5	923.9	925.1
	16.10	342+70	923.1	924.0	924.4	925.7
	16.25	344+00	923.4	924.3	924.6	925.8
	16.55	346+20	925.7	926.1	926.4	927.0
	16.90	347+90	927.8	928.6	928.8	929.5
Hartland Road	17.00 D	348+71	930.0	930.8	931.2	932.1
	17.00 U	349+09	930.6	932.0	932.6	934.3
	17.20	354+00	931.6	932.6	933.0	934.5
	17.21	356+80	932.4	933.3	933.7	935.1
	17.25	360+00	932.8	933.7	934.1	935.4
	17.35	366+90	933.6	934.5	934.8	936.0
	17.45	376+10	935.4	936.3	936.5	937.5
	17.50	382+20	936.7	937.4	937.6	938.4
	17.55	390+80	937.3	938.1	938.3	939.1
	17.65	401+00	938.9	939.6	939.8	940.5
	17.75	411+30	939.6	940.3	940.5	941.2
	17.85	417+70	940.4	941.1	941.3	942.0
	17.90	427+90	940.7	941.4	941.6	942.3
Dunham Road	18.00 D	428+10	940.7	941.4	941.7	942.4
	18.00 U	428+40	941.1	941.5	941.8	942.4
	18.15	433+80	941.6	942.1	942.3	942.9
	18.20	445+70	943.2	943.9	944.0	944.7
	18.45	460+90	945.6	946.4	946.7	947.5
	18.55	470+80	946.3	947.1	947.4	948.1
	18.60	484+20	947.3	948.0	948.3	949.0
	18.63	492+70	950.0	950.9	951.3	952.1
	18.65	504+00	950.2	951.1	951.5	952.3
	18.70	520+50	950.4	951.2	951.6	952.4
	18.75	530+90	951.9	952.5	952.8	953.5
	18.85	544+00	953.4	953.9	954.2	954.9
	18.87	549+90	954.9	955.4	955.7	956.3
Countryside Drive	18.89 D	550+30	955.0	955.5	955.8	956.4
	18.89 U	550+90	956.3	957.3	958.0	959.2
	18.90	551+40	956.4	957.3	958.0	959.2
Bullard Road	19.00 D	552+93	958.9	959.4	959.7	960.4
	19.00 U	553+27	958.9	959.4	959.7	960.4
	19.10	553+40	962.9	963.0	963.0	963.1
	19.70	587+60	963.2	963.4	963.5	963.7
Fenton Road	20.00 D	601+37	964.6	965.2	965.4	965.8
	20.00 U	601+83	967.2	967.5	967.5	967.7

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Michigan N. Ore Creek F.H. Study
N. McDonald 7/82 3-83
Watershed Lengths-

1 2

Sub-Watershed Area #	Flow Length Lake	Channel	Overland
1	2500	—	7500
2	—	7100	3900
3	—	4790	5200
4	—	4000'	12,100'
5	1800	2,400'	5,100'
6	—	9,700'	3,500'
7	—	3500	2,900'
8	2400	2700	8,600
9	4000	3000	1500
10	—	1700'	5400
11	—	2400	4500
12	—	2300	2200
13	—	4600	2600
14	—	2900	8600
15	—	7400'	2700'
16	—	1000	7700
17	—	1400	1000
18	—	1700	5900
19	—	1000	6000
20	—	800	1800
21	—	3600	1300
22	—	7200'	7700
23	—	8400'	7700'
24	—	5200	2300
25	—	1300	2900
26		5100	7900
27		1000	6500
28	—	12,500' WW	2500'

Michigan N. Ore Creek F.H. Study
N. McDonald 7/82 ~~OATS~~ 3/83
Watershed Lengths 2. 2

Sub Watershed Area #	LAKE	Flow Length CHANNEL	OVERLAND
29	—	1,800	2400
30	—	4000	4200
31	—	1700	2300
32	—	2400	2200
33	—	9500	3700
34	—	2300	2600
35	—	5100	2900
36	—	500'	1,800'
37	—	3700	4200
38	—	1800	2300
39	—	4,700'	3,200'
40	—	10,050'	1,250'
41	3000	—	4400

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F = Forest

Michigan North Oak Creek Fish Study

Nine Dwight 8/82 TARP 3/83

Time of Concentration t_c 1

Sub Watershed Area #	Description of flow	Slope %	Length ft.	Velocity fps	Travel time hr
1.	S.G. Overland fields	1.6	7,500	1.13	1.84 hr
	LAKE		2500	16.0	0.04
					1.88
2.	Channel	0.5	7100	0.62	3.18
	OVERLAND	0.5	3900	0.64	1.69
					4.87
3.	S.G. Overland	2.9	5200'	1.50	0.96
	CHANNEL		4790	16.0	0.08
					1.04
4.	Overland	1.07	12,100	0.75	4.48
	Channel	.14	4,000	0.24	4.63
					9.11
5.	Overland	2.3	5,100'	1.07	1.32
	Channel	0.2	2400	0.28	2.38
	LAKE		1800	16.0	0.03
					3.73
6.	Overland	0.14	3,500	0.09	10.80
	Channel	~~0.13~~ 0.16	9,700	~~0.23~~ 0.80	~~11.71~~ 3.37
					~~22.51~~ 14.5
7.	Overland	3.5	4,700	1.70	0.47
	Channel	0.23	3500	0.30	3.24
					3.71
8.	OVERLAND	3.5	1000	1.40	0.20
	Overland	0.8	7600	0.60	3.52
	Channel	0.8	2700	1.8	0.42
	LAKE		2400	16.0	0.04
					4.18
9.	OVERLAND	1.6	1500	0.9	0.46
	Channel	1.0	3000	2.0	0.42
	LAKE		4000	16.0	0.07
					0.95

Michigan N. Ore Creek Feb. Study
McDonald 8/82 CMC 3/87
Time of Concentration t_c 2

Sub Watershed Area #	Description of flow	Slope %	Length ft.	Velocity	Travel time
	OVERLAND	0.6	2500'	0.55	1.26
10	Overland	3.7	2900'	1.35	0.60
	Channel		1700'	1.0	0.47
					2.33
11	Overland	1.2	4500'	0.75	1.67
	Channel	0.4	2400'	1.1	0.61
					2.28
	OVERLAND	4.4	900	1.9	0.13
12	Overland	0.8	1300	0.8	0.45
	Channel	0.4	2300	1.1	0.58
					1.16
13.	Overland	0.4	2600	0.18	4.01
	Channel	1.0	4600	1.5	0.35
					4.36
14	Overland	0.6	8600	0.55	4.34
	Channel		2900	1.0	0.31
					5.15
15	Overland	1.4	2700	0.35	0.65
	Channel	0.65	7400	1.2	1.71
					2.36
16	Overland	0.5	7700	0.5	4.28
	Channel		1000	1.0	0.28
					4.56
	OVERLAND	1.5	1000	0.85	0.33
17	Channel		1400	1.0	0.39
					0.72

Michigan N. Ore Creek F.H. Study
McDonald 5/92 CNR3 3-03
Time of Concentration Tc 3

Sub Watershed Area #		Description of flow	Slope %	Length ft.	Velocity	$\frac{LV}{3600}$ Travel time hrs.
		OVERLAND	2.7	2900	1.2	0.67
13	F	Overland	0.8	3000	0.65	1.28
		Channel		1700	1.0	0.47
						2.42
19		Overland	0.65	6000	0.55	3.03
		Channel		1000	0.6	0.46
						3.49
20		Overland	5.9	1800'	1.1	0.45
		Channel		300'	2.6	0.37
						0.82
21		Overland	3.5	1300	1.4	0.26
		Channel	1.4	3600	1.8	2.56
						2.82
		OVERLAND	2.7	3700	1.2	0.86
22		Overland	0.2	4000	0.35	3.17
		Channel	0.6	7200	1.6	1.25
						5.28
23		Overland	1.1	7700	0.75	2.85
		Channel	1.0	8400	1.5	1.56
						4.41
24		Channel		5200	1.0	1.44
		OVERLAND	1.5	2300	0.85	0.76
						2.20
25		Overland	3.2	2900	1.3	0.62
		Channel		1300	1.0	0.36
						0.98

Michigan N. Oak Creek F.H. Study
N. McDonald 5/92 TMS 3-93
Time of Concentration t_c #

Sub Watershed Area #		Description of Flow	Slope %	Length ft.	Velocity	travel time hr
26		overland	0.25	7900	0.35	6.27
		Channel	0.15	5100	0.78	1.82
						8.09
27		overland	0.9	6500	0.7	2.58
		Channel	0.4	1000	1.3	0.21
						2.79
28		overland	3.5	2,500	1.7	0.41
		Waterway	0.25	12,500	0.75	4.63
						5.04
29	G.W.	overland	0.4	2400	0.45	1.48
		Channel	0.1	1800	0.6	0.83
						2.31
30		overland	1.7	4200	0.9	1.30
		Channel	0.3	4000	1.1	1.01
						2.31
31		overland	1.1	2300	0.95	0.67
		Channel	0.3	1700	1.1	0.43
						1.10
32		overland	2.0	2200	1.2	0.51
		channel	0.9	2400	1.5	0.44
						0.95
33		OVERLANDS	1.9	1300	1.2	0.30
		overland	0.4	2400	0.5	1.33
		Waterway	0.3	9500	0.8	3.30
						4.93

Michigan N. Cre Creek F.H. Study
N. McDonald 5/82 TARB 3-37
time of Concentration t_c 5

Sub Watershed Area #	Description of Flow	Slope %	Length ft.	velocity	travel time
34	F overland	0.8	2600	0.6	1.20
	G. Waterway	0.6	2300	1.2	0.53
					1.73
	OVERLAND	5.0	500	1.6	0.09
35	overland	1.0	2400	0.7	0.95
	G. waterway	0.8	5100	1.3	1.09
					2.13
36	overland	2.2	1500	1.3	0.38
	channel	0.6	500	1.5	0.09
					0.47
37	overland	1.0	4200	0.9	1.30
	G. Waterway	0.4	3700	0.95	1.03
					2.33
38	overland	1.7	2300	1.1	0.58
	channel	0.3	1800	1.1	0.45
					1.03
39	overland	0.5	3200	0.5	1.78
	channel	0.2	4700	0.9	1.45
					3.23
40	overland	1.7	1200	1.2	0.28
	channel	1.35	10,000	1.7	1.63
					1.91
41	overland	2.0	4400	1.2	1.02
	LAKE		3000	16	0.05
					1.07

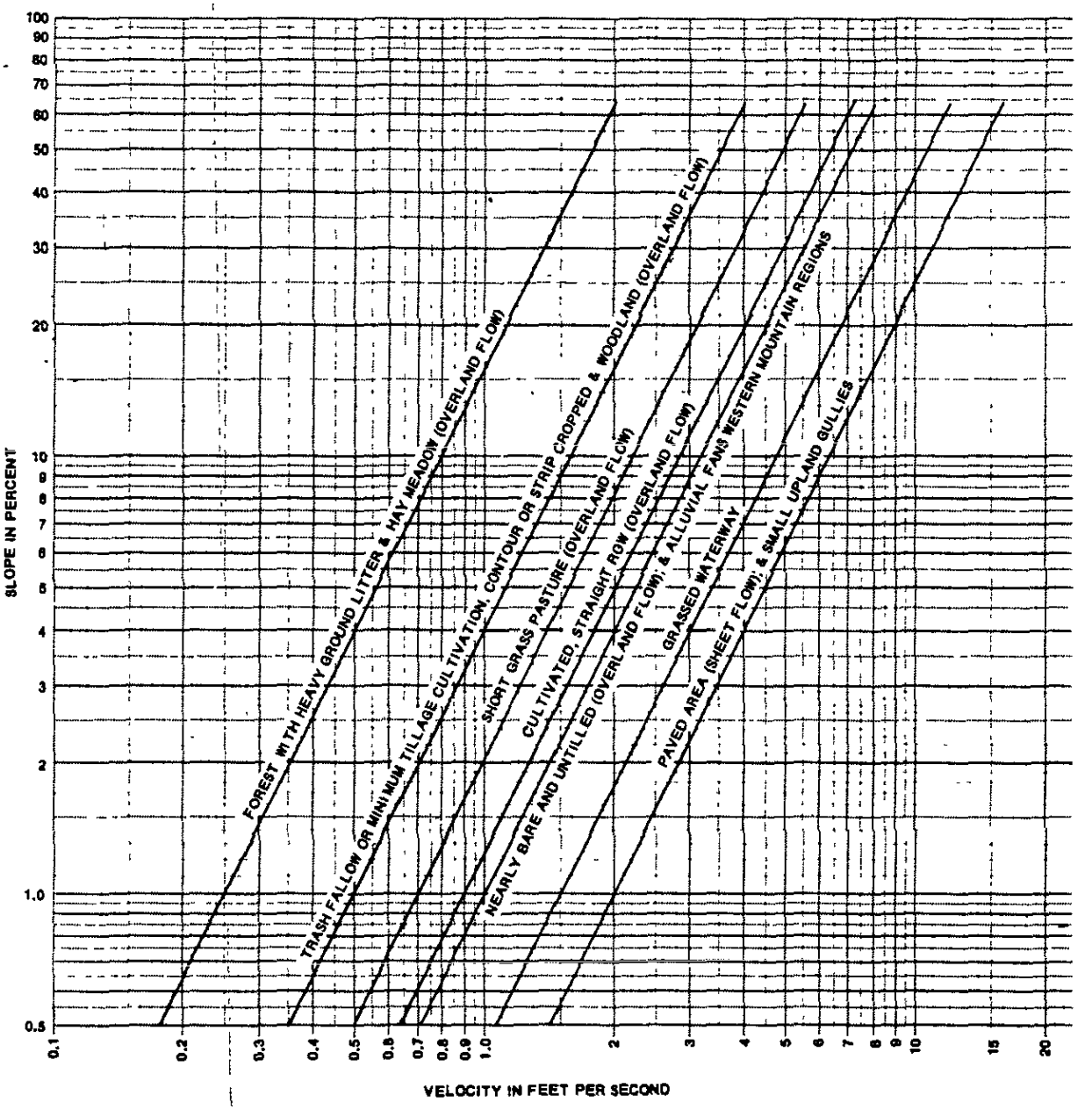

Figure 15.2.—Velocities for upland method of estimating T_c

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Michigan N. Cre Cr. - Livingston Co.

N.M.L.D. 7/82 Inc. 3-83

Land use in (%) of sub w.s. 1 2

70 acres	Sub W.S.	Acres	Cult. Land	Pasture	Meadow	Woods	Open Space	Comm. Bk.	Ind.	Resi.	Mining Extr.	Streets Roads
8	1	1267	30	20	20	12	3			5		2
	2	730	20	16	20	30				10	1	4
	3	579	30	15	15	30	4			3		3
	4	304	40	18	15	20				2		2
7	5	790	20	10	45	15				1		2
	6	1322	10	10	20	50	6			2		2
	7	165				48				50		2
8	8	826	10	18	30	20		2		10		2
16	9	404				37	5			40		2
	10	569	10	10	28	40				10		2
	11	330	50	8	10	50						2
	12	92	10	10	29	50						1
	13	422	10	10	37	40			1	1		1
	14	598			15	70			1	10	2	2
1	15	574	20	10	37	30				1	1	1
12	16	1203	10	10	25	40					1	2
	17	75			80	20						
	18	413	5		20	70				3		2
	19	295	10	10	39	40						1
	20	119			48	48						2+2
	21	64			48	50				1		1
	22	937	20	10	26	40				2		2
	23	982	20	10	18	50						2
	24	230	9		40	50						1
	25	147			48	50				1		1
	26	2158	50	26	10	10				2		2
	27	926	16	10	30	40				2		2
7	28	1855	30	15	10	40				1		2

Michigan N.R.D. 7/32 N. ORE CR. Livingston Co.

TRB 3-33

Land use in (%) of Subws.

% water	Sub wts.	Acres	Cult Land	Pasture	Meadow	Woods	Open Space	Comm. Bus.	Ind.	Res.	Property Tax	Streets Roads
	29	138	30		49	20						1
2	30	698	20		27	50						1
	31	46	50		3	20						
	32	119	35		35	30						
	33	854	50		18	30				1		1
	34	185	50		10	40						
	35	349	9		20	70						1
	36	46	80		10	10						
	37	312	39			10						1
	38	230	60			40						
	39	248	69		20	10						1
	40	413	39		20	50						2
7	41	515	20		49	20				2		2

∞

Michigan — N. Ore Creek - Livingston Co.

7/82 — 3-83

Hydrologic Soil Grouping

Sub W.S.	Acres	sq. mi.	Hyd. Soil Grp. % A	B	C	D	1 2 weighted Runoff Curve #
1	1267	1.98	20	79	0	1	71.85
2	780	1.21	5	75	0	20	70.46
3	578	0.90	1	89	0	10	70.72
4	1304	2.04	1	94	0	15	72.47
5	790	1.23	1	84	0	15	70.10
6	1322	2.07	5	80	0	15	67.32
7	165	0.26	2	43	0	55	76.86
8	826	1.29	5	85	0	10	72.26
9	404	0.63	0	70	0	30	77.43
10	569	0.89	20	60	0	20	66.96
11	330	0.52	10	70	0	20	71.21
12	92	0.14	30	15	0	55	69.52
13	422	0.66	5	75	0	20	68.62
14	588	0.92	15	65	0	20	66.94
15	574	0.90	2	88	0	10	70.27
16	1203	1.88	20	60	0	20	71.10
17	73	0.11	30	40	0	30	57.49
18	413	0.65	20	60	0	20	65.01
19	285	0.45	5	75	0	20	68.35
20	119	0.19	10	50	0	40	67.96
21	64	0.10	5	80	0	15	64.14
22	937	1.46	0	80	0	20	71.75
23	982	1.53	1	94	0	5	70.45
24	230	0.36	50	30	0	20	56.67
25	147	0.23	10	70	0	20	63.62
26	2158	3.37	1	89	0	10	77.83
27	926	1.45	0	60	0	20	71.19
28	1855	2.90	1	79	0	20	75.54

1883.264

Michigan N. Oil Creek – Livingston Co.
N. McD. 7/82 TRB 3-83

Hydrologic Soil Grouping 2 2

Sub W.S.	Acres	Sq. mi.	Hyd. Soil Grp % A	B	C	D	Weighted Runoff Curve #
29	139	0.22	5	50	0	45	73.03
30	698	1.09	1	84	0	15	70.04
31	46	0.07	0	80	0	20	75.30
32	119	0.19	0	95	0	5	69.25
33	554	1.33	1	89	0	10	73.66
34	185	0.29	0	90	0	10	74.10
35	349	0.55	0	80	0	20	69.32
36	46	0.07	0	70	0	30	80.42
37	312	0.49	0	80	0	20	71.79
38	230	0.36	0	90	0	10	76.28
39	248	0.39	30	55	0	15	72.69
40	413	0.65	1	94	0	5	69.80
41	515	0.80	10	80	0	10	67.58

$$\frac{\Sigma\ CN \times DA}{\Sigma\ DA} = \frac{2349.736}{32.92} = 71.32$$

9

COMPUTATION SHEET
SCS-ENG-522 REV. 3-69

U.S. DEPARTMENT OF AGRICULTURE
L CONSERVATION SERVICE
GPO 1968-O-337-998

STATE	PROJECT		
MI	NORTH ORE CREEK		
BY T. BAKER	DATE	CHECKED BY	DATE	JOB NO.
SUBJECT STAGE-DISCHARGE SUMMARY			SHEET ____ OF ____

STR. NO.	SUB-WATERSHED	TYPE STR.	CALCULATION METHOD
02	Dunham Lake (1)	WEIR	WSP2
03	Bullard Lake (3)	WEIR-BRIDGE	WSP2
04	Round Lake (8)	PIPE	HAND
05	Handy Lake (9)	PIPE	HAND
06	Brophy Lake (16)	WEIR	HAND
07	Parshallville (41)	WEIR-ORIFICE	HAND
SHANNON LAKE STR.		WEIR-ORIFICE-PIPE	HAND-WSP2

```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
SEGMENT   22.9      3         N         275.                                  1248
NVALUE    0.13                                                                1249
SECTION   22.9                                                                1250
          -54.      1008.1    -64.      1001.1    -52.      1000.4            1251
          -40.      1000.3    -28.      1000.3    -12.      1000.1            1252
          -5.       999.5     -4.       998.1     5.        999.0             1253
          6.        999.1     12.       999.7     25.       1000.1            1254
          50.       1000.7    75.       1000.9    120.      1000.9            1255
          130.      1001.0    195.      1001.2    275.      1008.1            1256
          4.        998.1                                                     1257
ENDTABLE                                                                      1258
--------------------DATA POINTS ON SECTION 22.9   REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
ROAD      23.0      2.7       18.       18.                                   1259
CULV1     23.0      1         32111                                           1260
CULV2     1.        2.        64.       998.7     997.7     .014            1262
SECTION   23.0                                                                1263
          -150.     1007.7    -100.     1005.8    -50.      1004.3            1264
          0.        1003.2    50.       1002.6    100.      1002.5            1265
          150.      1002.2    200.      1002.4    250.      1003.2            1266
          300.      1004.0    350.      1004.4    350.      1007.7            1267
ENDTABLE                                                                      1268
REACH     23.1      1.        18.       18.                                   1269
REACH2    22.9      0.1                                                       1270
REACH     23.4      1.        432.      432.                                  1271
SEGMENT   23.4      1         N         -3.2      1001.4                      1272
NVALUE    0.13                                                                1273
SEGMENT   23.4      2         C         3.2       1001.4                      1274
NVALUE    0.08                                                                1275
SEGMENT   23.4      3         N         250.      1010.2                      1276
NVALUE    0.13                                                                1277
SECTION   23.4                                                                1278
          -225.     1010.2    -225.     1006.05   -200.     1004.15           1279
          -150.     1003.25   -100.     1002.25   -50.      1001.15           1280
          -3.2      1001.40   -3.2      1000.54   -1.1      1000.54           1281
          0.        1000.20   1.1       1000.54   3.2       1000.54           1282
          3.2       1001.40   25.       1001.15   50.       1000.95           1283
          100.      1001.45   150.      1001.25   200.      1001.75           1284
          250.      1001.85   250.      1010.2                                1285
ENDTABLE                                                                      1286
COMPUTE   19.6      23.4      18.55                                           1287
-----------------------------END OF 80/80 LIST-----------------------------
```

1

(1)

RATING TABLE FOR SECTION 23.4 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	STARTING CSM	CRIT ELEV	FRICTION SLOPE
0	1000.2	0.0	0.0						
1	1001.2	24.5	5.0	0.0	0.0	0.0	5.00	1000.7	0.00200
BANK FULL	1001.4	38.7	6.4	0.0	0.0	0.0			
2	1001.8	149.2	10.0	0.0	0.0	0.0	10.00	1001.0	0.00008
3	1002.3	328.2	20.0	0.0	0.0	0.0	20.00	1001.1	0.00003
4	1002.4	358.8	30.0	0.0	0.0	0.0	30.00	1001.1	0.00005
5	1002.5	376.0	40.0	0.0	0.0	0.0	40.00	1001.1	0.00008
6	1002.6	415.0	60.0	0.0	0.0	0.0	60.00	1001.2	0.00013
7	1002.7	451.5	80.0	0.0	0.0	0.0	80.00	1001.3	0.00018
8	1002.7	475.5	100.0	0.0	0.0	0.0	100.00	1001.4	0.00024
9	1003.0	553.8	150.0	0.0	0.0	0.0	150.00	1001.4	0.00034
10	1003.1	592.5	200.0	0.0	0.0	0.0	200.00	1001.5	0.00049
11	1003.5	769.3	400.0	0.0	0.0	0.0	400.00	1001.7	0.00087
12	1003.9	922.2	600.0	0.0	0.0	0.0	600.00	1001.8	0.00112
13	1004.3	1128.7	900.0	0.0	0.0	0.0	900.00	1002.0	0.00136
14	1004.9	1381.5	1300.0	0.0	0.0	0.0	1300.00	1002.2	0.00150
15	1005.7	1776.4	2000.0	0.0	0.0	0.0	2000.00	1002.4	0.00160

STORAGE
96 AC. @ EL. 1000
124 AC. @ EL. 1010

```
REACH      19.03     1.        10.       10.                                   1121
SEGMENT    19.03     1         N         -5.       956.95                      1122
NVALUE     0.05                                                                1123
SEGMENT    19.03     2         C         5.        956.95                      1124
NVALUE     0.04                                                                1125
SEGMENT    19.03     3         N         170.                                  1126
NVALUE     0.05                                                                1127
SECTION    19.03                                                               1128
           -705.     970.0     -700.     963.45    -100.     963.65            1129
           -50.      963.65    -24.      963.25    -5.       958.55            1130
           -5.       956.25    5.        956.25    5.        958.85            1131
           21.       962.55    50.       963.35    100.      965.05            1132
           150.      967.65    170.      969.45                                1133
ENDTABLE                                                                       1134
REACH      19.05     1.        5.        5.                                    1135
SEGMENT    19.05     1         N         -24.                                  1136
NVALUE     0.05                                                                1137
SEGMENT    19.05     2         C         21.                                   1138
NVALUE     0.04                                                                1139
SEGMENT    19.05     3         N         170.                                  1140
```



```
-----------------------------80/80 LIST OF INPUT DATA-----------------------------
NVALUE     0.05                                                                1141
SECTION    19.05                                                               1142
 (3)       -700.     963.45    -100.     963.65    -705.     970.0             1143
           -50.      963.65    -24.      963.25    -14.      958.95            1144
           14.       959.95    21.       962.55    50.       963.35            1145
           100.      965.05    150.      967.55    170.      969.45            1146
ENDTABLE                                                                       1147
--------------------DATA POINTS ON SECTION 19.05  REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
REACH      19.1      1.        10.       10.                                   1148
SEGMENT    19.1      1         N         -24.                                  1149
NVALUE     0.05                                                                1150
SEGMENT    19.1      2         C         21.                                   1151
NVALUE     0.03                                                                1152
SEGMENT    19.1      3         N         170.                                  1153
NVALUE     0.05                                                                1154
SECTION    19.1                                                                1155
           -700.     963.45    -100.     963.65    -50.      963.65            1156
           -24.      963.25    -14.      962.05    0.        961.75            1157
           14.       961.95    21.       962.55    50.       963.35            1158
           100.      965.05    150.      967.65    170.      969.45            1159
           -705.     970.                                                      1160
ENDTABLE                                                                       1161
--------------------DATA POINTS ON SECTION 19.1  REORDERED BY PROGRAM ACCORDING TO X VALUES
                    DUPLICATE X POINTS NOT CHANGED--------------------
REACH      19.5      1.        [illegible]
```

3

RATING TABLE FOR SECTION 19.05 DA= 1.0

NO.	ELEV	AREA	CFS	ACRES FLOODED DAMAGE	ACRES FLOODED CHANNEL	ACRES FLOODED NON-DAM	STARTING CSM		CRIT ELEV	FRICTION SLOPE
0	958.9	0.0	0.0							
1	959.3	2.0	5.0	0.0	0.0	0.0	5.00	C	959.3	0.04058
2	959.4	3.5	10.0	0.0	0.0	0.0	10.00	C	959.4	0.04031
3	959.6	6.2	20.0	0.0	0.0	0.0	20.00	C	959.6	0.03514
4	959.7	8.6	30.0	0.0	0.0	0.0	30.00	C	959.7	0.03342
5	959.8	10.6	40.0	0.0	0.0	0.0	40.00	C	959.8	0.03331
6	959.9	14.2	60.0	0.0	0.0	0.0	60.00	C	959.9	0.03464
7	960.0	17.8	80.0	0.0	0.0	0.0	80.00	C	960.0	0.03122
8	960.2	21.3	100.0	0.0	0.0	0.0	100.00	C	960.2	0.02672
9	960.4	28.0	150.0	0.0	0.0	0.0	150.00	C	960.4	0.02651
10	960.6	34.6	200.0	0.0	0.0	0.0	200.00	C	960.6	0.02350
11	961.2	56.5	400.0	0.0	0.0	0.0	400.00	C	961.2	0.02102
12	961.8	78.5	600.0	0.0	0.0	0.0	600.00		961.7	0.01757
BANK FULL	962.5	111.0	770.0	0.0	0.0	0.0				
13	963.2	145.0	900.0	0.0	0.0	0.0	900.00		962.3	0.00709
14	965.0	1297.3	1300.0	0.0	0.0	0.0	1300.00		963.8	0.00043
15	965.9	2022.9	2000.0	0.0	0.0	0.0	2000.00		963.9	0.00028

STORAGE

51 AC. @ 962

126 AC. @ 970

STATE [illegible] SUBJECT [illegible]

BY T. [illegible] | DATE 3-21-83 | CHECKED BY | DATE | JOB NO

SUBJECT ELEV - AREA - DISCHARGE | SHEET ___ OF ___

(16) Brophy Lake

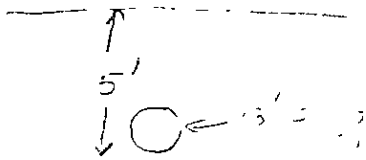
BROPHY LAKE OUTLET

13" x 3' WOOD WEIR 35' HIGH

$Q = CLh^{3/2}$ C = 3.1 FOR SQUARE CRESTED WEIR

h	L	ELEV	DISCH.	AREA
0	3	949.0	0	0
0.5	3	949.5	3	1.5
1.0	3	950.0	9	3.0
1.5	3	950.5	17	4.5
2.0-2.5	3-32	951.0	61	22.0
2.5-3.0	3-32	951.5	136	49.5
3.0-3.5	3-32	952.0	193	57.0
3.5-4.0	3-32	952.5	341	74.5
4.0-4.5	3-32	953.0	467	92.0
4.5-5.0	3-32	953.5	634	107.5
5.0-5.5	3-32	954.0	754	127.0

(8) BROPHY LAKE OUTLET



h	ELEV	INLET DISCH.	OUTLET DISCH.
0	957.0	0	0
1.5	958.5	6	12
3.0	960.0	12	19
4.0	961.0	15	21
5.0	962.0	17	23
0.5	962.5	106	
1.0	963.0	300	
1.5	963.5	551	
2.0	964.0	849	

DATE [illegible]	PROJECT [illegible]		
BY T. [illegible]	DATE 3-21-83	CHECKED BY	DATE
SUBJECT ELEV - DISCH.			SHEET ___ OF ___

(9) HANDY LAKE OUTLET (ROAD 35' [illegible] ELEV)
12" CMP PLUGGED (ASSUME ELEVATED OUT)
PROJECTING

h	ELEV	DISCH.
0	951.0	0
1.0	952.0	2
2.0	953.0	5
3.0	954.0	7
3.5	954.5	8
0.5	955.0	212
1.0	955.5	600
1.5	956.0	1102

$Q = 3.4 h^{3/2}$

[illegible] AREAS

[illegible] LAKE

979 - [illegible] IN^2 = 146 AC.

950 - 1.32 IN^2 = 183 AC.

EXTRAPOLATE OUT TO GET [illegible] ELEV.

ROUND LAKE

957 - 0.76 IN^2 = 70 AC.

960 - 1.35 IN^2 = 124 AC.

EXTRAPOLATE OUT TO GET [illegible]

[illegible] LAKE

951 - 0.71 IN^2 = 65 AC.

960 - 1.26 IN^2 = 116 AC (IF [illegible])

960 - 1.72 IN^2 158 AC. (IF [illegible])

CHECK HANDY LAKE OUTLET UNDER M-59

FROM USGS TOPO ASSUME ROAD = 968' [illegible]

h	ELEV	DISCH
0	953.0	0
5	958.0	160
10	963.0	320
15	968.0	430
2	955.0	40

PI N OAE L 2.

BARON C. 2-8-83 T. BAKER 2-15-83

(41) WEIR FLOW THRU PARSHALLVILLE DAM 1 6

GATES DOWN

$Q = 3.1\ L\ H^{3/2}$ $L = 20$ FT.

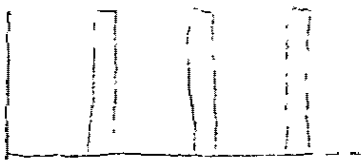


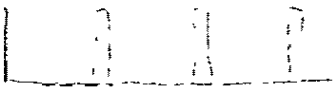
TABLE 1A

ELEV.	H	Q
904.7	0.0	0.00
904.8	0.1	1.96
905.0	0.3	10.18
905.2	0.5	21.92
905.7	1.0	62.00
906.2	1.5	113.90
906.7	2.0	175.36
907.2	2.5	245.07
907.7	3.0	322.16

GATES UP 1.5'

TABLE 1B

ELEV.	H.	Q
906.2	0	0
906.3	0.1	1.96
906.5	0.3	10.18
906.7	0.5	21.92
907.2	1.0	62.00
907.7	1.5	113.90

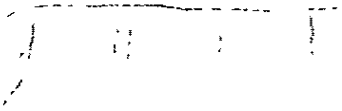


GATES UP 3.0'

L = 25'

TABLE 1C

ELEV	H	Q
907.7	0	0
907.8	0.1	2.45
908.0	0.3	12.73
908.2	0.5	27.40
908.7	1.0	77.5
909.2	1.5	142.37
909.7	2.0	219.20
910.2	2.5	306.34
910.7	3.0	402.70



NJ [illegible]

BARON C. 2-8-83 T. BAKER 2-15-83

ORIFICE FLOW THRU [illegible] DAM 2 6

ORIFICE BETWEEN TOP OF GATE (DOWN) AND GRATING

$Q = 0.6 A\sqrt{2gH}$ $L = 20$ FT, $W = \sqrt{3^2+0.5^2} = 3.04$ FT $A = 60.8$ [illegible]

CENTER OF ORIFICE @ 906.2

TABLE 2A

ELEV.	H	Q
907.7	1.5	356.72
908.2	2.0	414.21
906.7	2.5	463.10
909.7	3.5	547.15
910.7	4.5	621.22
911.7	5.5	686.89
912.7	6.5	746.73
913.7	7.5	802.12
914.7	8.5	853.92
915.7	9.5	902.76
916.7	10.5	949.09
917.0	10.8	962.55

ORIFICE BETWEEN TOP OF GATES (UP 1.5') AND GRATING

$L = 20'$ $W = \sqrt{1.5^2+0.5^2} = 1.58'$ $A = 31.62$ FT^2

CENTER OF ORIFICE @ 907.0

TABLE 2B

ELEV.	H.	Q.
907.7	0.7	127
908.0	1.0	152
908.2	1.2	167
908.7	1.7	198
909.2	2.2	226
909.7	2.7	250
910.7	3.7	293
911.7	4.7	330
912.7	5.7	363
913.7	6.7	394
914.7	7.7	422
915.7	8.7	449
916.7	9.7	474

[illegible] II N. ORE C.P.

ELRON C 2-3-83 T BAKER 2-15-83

ORIFICE FLOW THRU PARSHALL FLUME CAM 3 6

SATES UP 1.5 FT

SUBMERGED ORIFICES 1.5' x 5' 4EA. A = 30 FT² g = 32.2

$Q = 0.6A\sqrt{2gH}$ CENTER OF ORIFICE @ 902.2

TABLE 3

ELEV.	H	Q
907.7	5.5	338.76
907.8	5.6	341.82
908.0	5.8	347.97
908.2	6.0	353.82
908.7	6.5	368.27
909.2	7.0	382.17
909.7	7.5	395.59
910.2	8.0	408.56
910.7	8.5	421.13
911.2	9.0	433.34
911.7	9.5	445.22
912.7	10.5	468.06
913.7	11.5	489.85
914.7	12.5	510.70
915.7	13.5	530.74
916.7	14.5	550.04
917.0	14.8	555.70
904.7	2.5	228
905.2	3.0	250
905.7	3.5	270
906.2	4.0	289
906.7	4.5	306
907.2	5.0	323

MJ

BARON C 2-8-83 T BAKER 2-15-83

ORIFICE FLOW THRU FARMINGTON DAM 4 6

GATES UP 3.0 FT

SUBMERGED ORIFICES 3'x5' 4 EA A = 60.00 FT

$Q = 0.6 A \sqrt{2gH}$ CENTER OF ORIFICE @ 902.9

TABLE 4

ELEV.	H.	Q
907.7	4.8	632.94
907.8	4.9	657.50
908.0	5.1	657.42
908.2	5.3	66E.09
908.7	5.8	695.75
909.2	6.3	725.12
909.7	6.3	753.35
910.2	7.3	780.56
910.7	7.8	806.84
911.2	8.3	832.30
911.7	8.8	856.01
912.7	9.8	904.53
913.7	10.8	949.41
914.7	11.8	992.39
915.7	12.8	1033.59
916.7	13.8	1073.21
917.0	14.1	1084.81
904.7	1.8	338
905.2	2.3	438
905.7	2.8	483
906.2	3.3	525
906.7	3.8	563
907.2	4.3	599

MI N OFE CR

BARON C 2-8 83 T. BAKER 2-15-83

ORIFICE FLOW THRU MARSHALLVILLE DAM 5 6

STRAIGHT DOWN BETWEEN GATES & GRATING

$Q = 0.6A\sqrt{2gH}$ L = 20 FT. W = 0.5 FT A = 10 SQ FT

TABLE 5

ELEV.	H	Q
907.7	0	0
907.8	0.1	15.22
908.0	0.3	26.37
908.2	0.5	34.04
908.7	1.0	46.14
909.2	1.5	58.97
909.7	2.0	65.09
910.2	2.5	76.13
910.7	3.0	83.39
911.2	3.5	90.07
911.7	4.0	96.79
912.7	5.0	107.66
913.7	6.0	117.94
914.7	7.0	127.39
915.7	8.0	136.18
916.7	9.0	144.44
917.0	9.3	146.33

SCS-ENG-22 REV 3-69 SOIL CONSERVATION SERVICE

STATE	PROJECT		
MI	N. ORE CR.		
BY T. BAKER	DATE 2-15-83	CHECKED BY	DATE	JOB NO
SUBJECT STR. RATING EVAL. FOR PARSHALLVILLE DAM			SHEET 6 OF 6

GATES DOWN ⊙

USE SMALLER OF TABLE 1A & 2A
USE 1A UP TO 907.7 & 2A ABOVE THAT

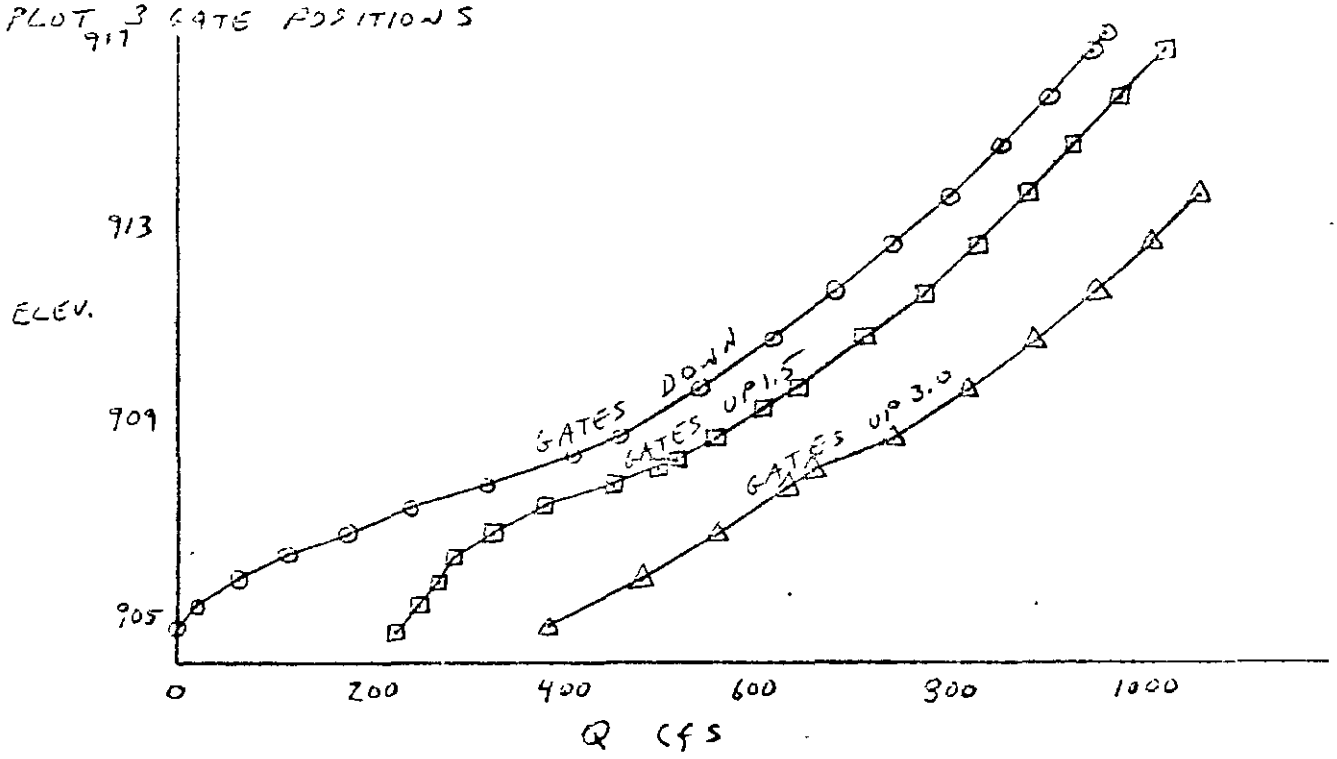
GATES UP 1.5' □

USE SMALLER OF TABLE 1B & 2B
USE 1B UP TO 907.7 & 2B ABOVE THAT
ADD TABLE 3

GATES UP 3.0' △

USE SMALLER OF 1C & 5
USE 1C UP TO 908.2 AND 5 ABOVE THAT
ADD TABLE 4

PLOT 3 GATE POSITIONS



USE GATES DOWN

STORAGE FROM 2' CONTOUR MAP

LAKE ELEV.	
	41.6 AC.
906	63.4 AC.
908	75.5 AC.
910	90.9 AC.

M1 N. DALE CREEK FPMS

T CARKER 1-3-93

STAGE-DISCHARGE RATING - SHANNON LAKE STR. 1 3

SUBMERGED INLET (AND WEIR OVER IT)

① 8' INLET PIPE $Q = Ca\sqrt{2gh}$, $C = 0.76$, $d = 3'$, $L = 30'$

② 1/10" ORIFICE BETWEEN STOPLOGS $Q = Ca\sqrt{2gh}$, $C = 0.79$, $d = 0.33'$, $a = .3'$

③ WEIR FLOW OVER STOPLOGS $Q = 3.1\,Lh^{3/2}$, $L = 10'$

④ WEIR FLOW OVER CREST " "

TAKE STAGE FROM ③ DISCHARGE + HIGHER OF ① OR ② FOR ④ DISCHARGE AND ADD TO BASE ELEV. OF 886.6 = 0 STAGE.

STAGE	①
0.05	69
0.1	97
1.1	322

AT 890.9 ADD Q OVER 10' CREST TO ② Q TO GET STAGE

STAGE	②
0.05	26
0.1	37
0.25	58
0.6	90
1.1	122
1.5	142
1.6	147
1.7	152
1.8	156 = 161
2.0	164 = 175
2.3	176 = 198
2.5	184 = 215
2.6	187 = 223
2.8	195 = 241
3.3	211 = 286
3.8	227 = 335
4.4	244 = 397
4.9	257 = 451
5.4	270 = 509
5.9	282 = 568

STAGE	③	ELEV. FROM ③ Q
0.1	1	886.7
0.3	5	886.9
0.6	14	887.2
0.9	26	887.6
1.2	41	887.9
1.5	57	889.3
2.0	98	[illegible]
2.5	123	[illegible]
2.8	145	[illegible]
3.0	161	[illegible]
3.2	177	[illegible]
3.4	194	892.3
3.6	212	892.7
3.8	230	[illegible]
4.0	248	[illegible]
4.5	296	[illegible]
5.0	347	[illegible]
5.5	400	[illegible]
6.0	456	[illegible]
6.5	514	[illegible]
7.0	574	899.5

STAGE	④
0.1	1
0.2	3
0.3	5
0.5	11
0.8	22
1.0	31
1.1	36
1.3	46
1.8	75
2.3	108
2.9	153
3.4	194
3.9	239
4.4	286

+

N. [illegible] CREEK [illegible]

[illegible] 1-2-[illegible]

STAGE-DISCHARGE RATING — SHANNON LAKE DAM 2 3

SIDE NOTES (Z EACH, BELOW CALCULATIONS FOR 1 EA)

① WEIR FLOW ON 3' [illegible] OF BOX $Q = 3.1 L h^{3/2}$, $L = 30'$

② ORIFICE FLOW THRU 4'10" x 3' ORIFICE $Q = C_d \sqrt{2gh}$, $C = 0.76$, $A = 14.5$

POOL ELEV.	WEIR STAGE	WEIR Q	ORIFICE STAGE	ORIFICE Q	[illegible]
891.2	0.3	15	0.03	13	[illegible]
891.8	0.9	79	0.5	77	[illegible]
892.3	1.4	154	2.0	153	[illegible]

@ ELEV. 890.9 ELEV. @ ORIFICE TOPPED WALL & REST [illegible]
ORIFICE FLOW + 10' WEIR FLOW (5' ABOVE ORIFICE & 5' [illegible]

POOL ELEV	WEIR STAGE	WEIR Q	ORIFICE STAGE	ORIFICE Q	TOTAL Q_T
892.7	1.3	75	3.4	163	238
893.0	2.1	94	3.7	170	264
893.2	2.3	108	3.9	175	283
894.4	3.5	203	5.1	200	403
895.4	4.5	296	6.1	218	514
896.5	5.6	411	7.2	237	648
897.5	7.6	650	8.2	253	903
898.5	8.6	782	9.2	268	1050
899.5	9.6	922	10.2	282	1204

10

11

SCS-ENG-16
REV. DEC. 1974

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

WATER SURFACE PROFILE INPUT DATA

_____ BY _____ CHECKED _____ DATE _____
(JOB OR PROJECT)

Control Word	Data Fields 1	2	3	4	5	6	Card Ident.
	DELTA ELEV.						
WSP2							
	ANY ALPHAMERIC TITLE WILL BE PRINTED AT TOP OF EACH PAGE MAY NOT BE CHANGED IN JOB						
TITLE							
	ANY ALPHAMERIC TITLE WILL BE PRINTED AT TOP OF EACH PAGE MAY BE CHANGED AT ANY TIME						
TITLE							
	TOTAL D. A.	CSM	CSM	CSM	CSM	CSM	
DISCHARGE							
DISCHARGE							
DISCHARGE							
	XSEC NAME	SLOPE	SLOPE	SLOPE	SLOPE	SLOPE	
STARTS							
STARTS							
STARTS							
	XSEC NAME	ELEVATION	ELEVATION	ELEVATION	ELEVATION	ELEVATION	
STARTE							
STARTE							
STARTE							
	XSEC NAME	XSEC NAME	XSEC NAME	XSEC NAME	XSEC NAME	XSEC NAME	
TRIB							
TRIB							
TRIB							
TRIB							
	OUTPUT OPTIONS						
OUTPUT							
	ANY ALPHAMERIC MESSAGE						
COMMENT							
	SAME AS COMMENT						
*							

PAGE _____ OF _____

SCS-ENG-19
JAN. 1973

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

CROSS SECTION DATA

_____ BY _____ CHECKED _____ DATE _____
(JOB OR PROJECT)

Control Word	Data Fields 1	2	3	4	5	6	Card Ident.
	XSEC NAME	HI					
SECTION							
	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	
ENDTABLE							
NOTE:	IF ROD READINGS ARE GIVEN TURN CARDS MAY BE NEEDED.						

U. S. [redacted]RTM[redacted]F A[redacted]LTU[redacted]NG-[redacted]
SOIL CONSERVATION SERVICE

2-82

WATER SURFACE PROFILE INPUT DATA

_____ BY _____ CHECKED _____ DATE _____
(JOB OR PROJECT)

Control Word	Data Fields 1	2	3	4	5	6	Card Ident.
	REACH NAME	DRAINAGE AREA	CHANNEL LENGTH	FLOOD LENGTH	DAMAGE LENGTH	CHANNEL LENGTH	
REACH							
	XSEC NAME	DISPLACEMENT	VELOCITY				
REACH 2							
	XSEC NAME	SEGMENT No.	SEGMENT TYPE	LAST STATION	LAST ELEV	CODE LETTER	
SEGMENT							
	'n'	'E' or 'r'	'n'	'E' or 'r'	'n'	'E' or 'r'	
NVALUE							
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
SEGMENT							
NVALUE							
	ROAD NAME	COEF OF CONTR					
CONTR							
	ELEV FULL	ELEV GRDR BOT	SKEW ANGLE	ORIF COEF	WEIR COEF		
GIRDER							
	STATION	ELEV.	STATION	ELEV.	STATION	ELEV.	
ENDTABLE							

NOTE: 2 N VALUE CARDS CAN BE USED PER SEGMENT WITH A MAXIMUM OF 4 SETS OF 'n' and 'r' OR 'n' AND 'E' VALUES

PAGE _____ OF _____

SCS-ENG-17
JAN. 1973

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

WATER SURFACE PROFILE INPUT DATA

_____ BY _____ CHECKED _____ DATE _____
(JOB OR PROJECT)

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80

Control Word	Data Fields						Card Ident.
	1	2	3	4	5	6	
	ROAD NAME	WEIR COEF	CHANNEL LENGTH	FLOOD LENGTH			
ROAD							
	ROAD NAME	SKEW TYPE	BASE CURVE	PIER CURVE			
BPR							
	BOTTOM ELEV	AVG WIDTH	BOTTOM ELEV	AVG WIDTH	BOTTOM ELEV	AVG WIDTH	
PIER							
	ELEV FULL	ELEV GRDR BOT	SKEW ANGLE	ORIF COEF	WEIR COEF		
GIRDER							
ENDTABLE							
	ROAD NAME	NO. OF PIPES	CULV CODE				
CULV 1							
	DIA OR HEIGHT	WIDTH	LENGTH	ELEV US INVERT	ELEV DS INVERT	CULV 'n'	
CULV 2							
CULV 1							
CULV 2							
CULV 1							
CULV 2							
CULV 1							
CULV 2							
CULV 1							
CULV 2							

SCS-ENG-20
JAN. 1973

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

WATER SURFACE PROFILE INPUT DATA

_____ BY _____ CHECKED _____ DATE _____
(JOB OR PROJECT)

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80

Control Word	Data Fields						Card Ident.
	1	2	3	4	5	6	
	FROM XSEC	TO XSEC	STARTING XSEC				
COMPUTE							
COMPUTE							
COMPUTE							
COMPUTE							
COMPUTE							
COMPUTE							
LINK							
	FILE NAME	FROM (XSEC)	TO (XSEC)				
CHANGE							
END							
ENDJOB							
ENDRUN							

10M SCS HYATTSVILLE MD 1973

PAGE _____ OF _____

```
RECORD              1         2         3         4         5         6         7
NUMBER   12345678901234567890123456789012345678901234567890123456789012345678901
    1    WSP2       20.
    2    TITLE      NORTH ORE CREEK - FPMS - LIVINGSTON CO., MI
    3    TITLE      FLOOD PLAIN MANAGEMENT STUDY - PRESENT CONDITIONS
    4    DISCHARGE  -1.       385.      975.      1520.     1720.     2470.
    5    STARTE     12.2      907.6     908.2     908.8     908.9     909.5

    6    TRIB       12.75     14.35     14.9      17.55     18.55     18.65
    7    TRIB       18.85     19.1
    8    OUTPUT     PSK
    9    REACH      12.2      1.        1.        1.
   10    SEGMENT    12.2      1         N         -55.

   11    NVALUE     0.04
   12    SEGMENT    12.2      2         C         40.
   13    NVALUE     0.03
   14    SEGMENT    12.2      3         N         150.      917.0
   15    NVALUE     0.04

   16    SECTION    12.2
   17               -190.     917.0     -186.     913.76    -160.     912.0
   18               -145.     910.0     -60.      908.0     -55.      906.0
   19               -12.5     904.7     12.5      904.7     40.       906.0
   20               65.0      908.0     150.      908.0     150.      917.0

   21    ENDTABLE
   22    REACH      12.55     1.        5168.     5168.
   23    SEGMENT    12.55     1         N         -30.
   24    NVALUE     0.10
   25    SEGMENT    12.55     2         C         42.

   26    NVALUE     0.05
   27    SEGMENT    12.55     3         N         154.
   28    NVALUE     0.10
   29    SECTION    12.55
   30               -408.     914.      -380.     906.      -30.      904.6

   31               -15.      902.      18.       902.      42.       906.
   32               57.       910.      154.      914.
   33    ENDTABLE
   34    REACH      12.65     1.        610.      410.
   35    SEGMENT    12.65     1         N         -50.

   36    NVALUE     0.10
   37    SEGMENT    12.65     2         C         175.
   38    NVALUE     0.05
   39    SEGMENT    12.65     3         N         227.
   40    NVALUE     0.10

   41    SECTION    12.65
   42               -290.     916.      -225.     912.      -210.     908.
   43               -155.     908.      -50.      906.      -55.      902.1
   44               55.       902.1     175.      906.      227.      910.
   45               225.      916.
```

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RECORD                1         2         3         4         5         6
NUMBER     12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789

   46      ENDTABLE
   47      REACH      12.75     1.        290.      220.
   48      SEGMENT    12.75     1         N         -10.
   49      NVALUE     0.10
   50      SEGMENT    12.75     2         C         10.

   51      NVALUE     0.05
   52      SEGMENT    12.75     3         N         155.
   53      NVALUE     0.10
   54      SECTION    12.75
   55                 -150.     916.0     -135.     914.0     -130.     912.0

   56                 -110.     910.0     -100.     908.0     -55.      906.0
   57                 -25.      906.0     -10.      905.9     -9.       902.2
   58                 10.       905.9     60.       906.0     70.       908.0
   59                 80.       910.0     90.       912.0     100.      914.0
   60                 130.      915.      155.      916.0     9.        902.2

   61      ENDTABLE
   62      COMPUTE    12.2      12.75     12.2
   63      CHANGE     DISCHARGE
   64      DISCHARGE  -1        125.      370.      605.      700.      1070.
   65      END

   66      REACH      12.8      1.        260.      200.
   67      SEGMENT    12.8      1         N         -10.
   68      NVALUE     0.10
   69      SEGMENT    12.8      2         C         10.
   70      NVALUE     0.05

   71      SEGMENT    12.8      3         N         200.
   72      NVALUE     0.10
   73      SECTION    12.8
   74                 -150.     913.0     -100.     909.8     -50.      909.1
   75                 -25.      906.0     -10.      905.9     -9.       902.3

   76                 10.       905.9     25.       905.5     50.       905.2
   77                 125.      905.1     150.      905.1     200.      913.0
   78                 9.        902.3
   79      ENDTABLE
   80      REACH      12.9      1.        150.      150.

   81      SEGMENT    12.9      1         N         -20.
   82      NVALUE     0.10
   83      SEGMENT    12.9      2         C         20.
   84      NVALUE     0.05
   85      SEGMENT    12.9      3         N         230.

   86      NVALUE     0.10
   87      SECTION    12.9
   88                 -200.     914.0     -165.     910.0     -20.      906.0
   89                 -15.      901.4     15.       901.4     20.       906.
   90                 50.       910.0     200.      912.0     230.      914.0
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RECORD              1         2         3         4         5         6         7
NUMBER   12345678901234567890123456789012345678901234567890123456789012345678901234567890

  91     ENDTABLE
  92     ROAD       13.0      2.7       10.       10.
  93     CULV1      13.0      1.        32111
  94     CULV2      6.5       11.0      66.6      901.48    901.48
  95     CULV1      13.0      1.        32111

  96     CULV2      6.5       11.0      66.6      901.64    901.64
  97     SECTION    13.0
  98                -300.     914.1     -250.     913.2     -200.     912.1
  99                -150.     911.3     -100.     910.6     -50.      910.2
 100                0.        910.2     50.       910.6     100.      911.0

 101                150.      911.1     200.      911.2     250.      911.2
 102                300.      910.8     300.      914.1
 103     ENDTABLE
 104     REACH      13.1      1.        10.       10.
 105     REACH2     12.9      0.15

 106     REACH      13.55     1.        190.      160.
 107     SEGMENT    13.55     1         N         -15.
 108     NVALUE     0.10
 109     SEGMENT    13.55     2         C         15.
 110     NVALUE     0.05

 111     SEGMENT    13.55     3         N         50.
 112     NVALUE     0.10
 113     SECTION    13.55
 114                -350.     916.0     -280.     914.0     -260.     912.
 115                -250.     910.0     -240.     908.0     -150.     906.2

 116                -15.      906.0     -9.       902.4     15.       906.0
 117                20.       906.0     30.       910.0     35.       912.0
 118                40.       914.0     50.       916.0     9.        902.4
 119     ENDTABLE
 120     REACH      13.75     1.        550.      400.

 121     SEGMENT    13.75     1         N         -10.
 122     NVALUE     0.10
 123     SEGMENT    13.75     2         C         15.
 124     NVALUE     0.05
 125     SEGMENT    13.75     3         N         245.

 126     NVALUE     0.10
 127     SECTION    13.75
 128                -35.      916.0     -30.      914.0     -25.      912.0
 129                -18.      910.0     -12.      908.0     -10.      906.0
 130                -9.       902.6     15.       906.0     80.       906.2

 131                155.      908.0     220.      910.0     230.      912.0
 132                240.      914.0     245.      916.0     9.        902.6
 133     ENDTABLE
 134     REACH      13.9      1.        450.      350.
 135     SEGMENT    13.9      1         N         -10.
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RECORD          1         2         3         4         5         6
NUMBER   123456789012345678901234567890123456789012345678901234567890123456789

  136    NVALUE    0.10
  137    SEGMENT   13.9      2         C         10.
  138    NVALUE    0.05
  139    SEGMENT   13.9      3         N         30.       916.0
  140    NVALUE    0.10

  141    SECTION   13.9
  142              -100.     916.0     -100.     911.5     -75.      908.8
  143              -50.      907.3     -25.      907.4     -10.      906.4
  144              -9.       902.8     10.       906.6     20.       909.2
  145              25.       911.0     30.       913.8     30.       916.0

  146              9.        902.8
  147    ENDTABLE
  148    ROAD      14.0      2.7       60.       50.
  149    BPR       14.0      A         1.
  150    GIRDER    912.12    911.82    0.        .8        2.7

  151              -10.      914.23    -10.      911.82    10.       911.82
  152              10.       914.23
  153    ENDTABLE
  154    SECTION   14.0
  155              -400.     920.0     -400.     911.43    -350.     910.33

  156              -300.     909.83    -250.     909.83    -100.     911.73
  157              -50.      912.83    -10.      914.23    10.       914.23
  158              50.       916.73    100.      919.73    -9.9      903.67
  159              9.9       903.67
  160    ENDTABLE

  161    REACH     14.25     1.        100.      90.
  162    SEGMENT   14.25     1         N         -8.
  163    NVALUE    0.09
  164    SEGMENT   14.25     2         C         8.
  165    NVALUE    0.05

  166    SEGMENT   14.25     3         N         115.
  167    NVALUE    0.09
  168    SECTION   14.25
  169              -130.     918.0     -120.     916.0     -80.      916.0
  170              -75.      914.0     -60.      912.0     -50.      910.0

  171              -40.      908.0     -6.       903.7     50.       908.0
  172              65.       910.0     80.       912.0     100.      914.0
  173              110.      916.0     115.      918.0     6.        903.7
  174              -8.       908.0     8.        908.0
  175    ENDTABLE

  176    REACH     14.35     1.        240.      230.
  177    SEGMENT   14.35     1         N         -10.
  178    NVALUE    0.09
  179    SEGMENT   14.35     2         C         10.
  180    NVALUE    0.05
```

```
RECORD              1         2         3         4         5         6
NUMBER   123456789012345678901234567890123456789012345678901234567890123456789

  181    SEGMENT   14.35     3         N         70.
  182    NVALUE    0.09
  183    SECTION   14.35
  184              -300.     916.0     -285.     910.0     -275.     907.5
  185              -10.      907.5     -6.       903.8     10.       907.5

  186              40.       908.0     50.       910.0     70.       916.0
  187              6.        903.8
  188    ENDTABLE
  189    COMPUTE   12.8      14.35     12.75
  190    CHANGE    DISCHARGE

  191    DISCHARGE -1        100.      335.      655.      645.      965.
  192    END
  193    REACH     14.55     1.        1970.     1130.
  194    SEGMENT   14.55     1         N         -15.
  195    NVALUE    0.10

  196    SEGMENT   14.55     2         C         10.
  197    NVALUE    0.06
  198    SEGMENT   14.55     3         N         430.
  199    NVALUE    0.10
  200    SECTION   14.55

  201              -310.     916.0     -290.     912.0     -170.     911.5
  202              -135.     910.0     -120.     908.0     -15.      907.5
  203              -6.       904.8     10.       907.5     155.      908.0
  204              335.      910.0     390.      912.0     420.      914.0
  205              430.      916.0     .6.       904.8

  206    ENDTABLE
  207    REACH     14.59     1.        2690.     1480.
  208    SEGMENT   14.59     1         N         -9.
  209    NVALUE    0.09
  210    SEGMENT   14.59     2         C         10.

  211    NVALUE    0.06
  212    SEGMENT   14.59     3         N         250.
  213    NVALUE    0.09
  214    SECTION   14.59
  215              -240.     916.0     -230.     914.0     -180.     912.0

  216              -100.     910.0     -20.      908.0     -6.       905.6
  217              10.       908.0     30.       910.0     65.       912.0
  218              75.       914.0     80.       916.0     150.      916.0
  219              250.      918.0     -9.       908.0     6.        905.6
  220    ENDTABLE

  221    REACH     14.6      1.        60.       60.
  222    SEGMENT   14.6      1         N         -18.6     911.7
  223    NVALUE    0.07
  224    SEGMENT   14.6      2         C         18.6      911.7
  225    NVALUE    0.05
```

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RECORD                1         2         3         4         5         6         7
NUMBER    12345678901234567890123456789012345678901234567890123456789012345678901

  226     SEGMENT     14.6      3         N         300.      922.0
  227     NVALUE      0.07
  228     SECTION     14.6
  229                 -300.     922.      -300.     917.4     -250.     915.9
  230                 -200.     915.0     -150.     913.6     -100.     912.5

  231                 -50.      911.4     0.        905.7     50.       913.6
  232                 100.      914.7     150.      915.1     200.      916.0
  233                 250.      915.9     300.      917.4     300.      922.0
  234                 -18.6     911.7     -18.5     905.7     18.5      905.7
  235                 18.6      911.7

  236     ENDTABLE
  237     REACH       14.7      1.        70.       50.
  238     SEGMENT     14.7      1         N         -8.
  239     NVALUE      0.09
  240     SEGMENT     14.7      2         C         8.

  241     NVALUE      0.06
  242     SEGMENT     14.7      3         N         125.
  243     NVALUE      0.09
  244     SECTION     14.7
  245                 -300.     915.3     -250.     911.9     -200.     911.0

  246                 -150.     910.1     -100.     909.4     -50.      908.6
  247                 -8.       908.6     5.        905.8     8.        908.4
  248                 25.       909.4     50.       910.2     75.       914.6
  249                 100.      916.7     125.      917.0     -301.     917.6
  250     ENDTABLE

  251     REACH       14.71     1.        2030.     980.
  252     SEGMENT     14.71     1         N         -8.
  253     NVALUE      0.10
  254     SEGMENT     14.71     2         C         10.
  255     NVALUE      0.06

  256     SEGMENT     14.71     3         N         380.
  257     NVALUE      0.10
  258     SECTION     14.71
  259                 -60.      920.0     -45.      918.0     -38.      916.0
  260                 -30.      912.0     -25.      910.0     -20.      909.0

  261                 -6.       907.3     10.       909.0     30.       910.0
  262                 210.      912.0     270.      914.0     300.      916.0
  263                 330.      918.0     380.      920.0     -8.       909.9
  264                 6.        907.3
  265     ENDTABLE

  266     REACH       14.72     1.        1610.     1020.
  267     SEGMENT     14.72     1         N         -10.
  268     NVALUE      0.10
  269     SEGMENT     14.72     2         C         10.
  270     NVALUE      0.06
```

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RECORD              1         2         3         4         5         6         7
NUMBER   12345678901234567890123456789012345678901234567890123456789012345678901

  271    SEGMENT   14.72     3         N         220.
  272    NVALUE    0.10
  273    SECTION   14.72
  274              -210.     920.0     -195.     918.0     -175.     914.0
  275              -150.     912.0     -100.     910.0     -10.      909.5

  276              -6.       908.6     10.       909.6     90.       910.0
  277              110.      912.0     170.      914.0     195.      916.0
  278              210.      918.0     220.      920.0     6.        908.6
  279    ENDTABLE
  280    REACH     14.73     1.        1240.     800.

  281    SEGMENT   14.73     1         N         -8.
  282    NVALUE    0.10
  283    SEGMENT   14.73     2         C         8.
  284    NVALUE    0.06
  285    SEGMENT   14.73     3         N         220.

  286    NVALUE    0.10
  287    SECTION   14.73
  288              -690.     920.0     -575.     918.0     -480.     916.0
  289              -400.     914.0     -230.     912.0     -100.     911.0
  290              -20.      911.0     -6.       909.6     20.       911.0

  291              175.      912.0     220.      920.0     -8.       911.0
  292              6.        909.6     8.        911.0
  293    ENDTABLE
  294    REACH     14.75     1.        590.      330.
  295    SEGMENT   14.75     1         N         -10.

  296    NVALUE    0.10
  297    SEGMENT   14.75     2         C         10.
  298    NVALUE    0.06
  299    SEGMENT   14.75     3         N         640.
  300    NVALUE    0.10

  301    SECTION   14.75
  302              -640.     920.0     -550.     918.0     -430.     916.0
  303              -350.     914.0     -175.     912.0     -10.      911.0
  304              -6.       909.8     10.       910.5     220.      912.0
  305              330.      914.0     430.      916.0     510.      916.0

  306              620.      918.0     640.      920.0     6.        909.8
  307    ENDTABLE
  308    REACH     14.76     1.        1740.     830.
  309    SEGMENT   14.76     1         N         -15.
  310    NVALUE    0.10

  311    SEGMENT   14.76     2         C         20.
  312    NVALUE    0.06
  313    SEGMENT   14.76     3         N         990.
  314    NVALUE    0.10
  315    SECTION   14.76
```

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RECORD                1         2         3         4         5         6
NUMBER     1234567890123456789012345678901234567890123456789012345678901234567890
  316                -220.     920.0     -200.     918.0     -185.     916.0
  317                -170.     914.0     -80.      914.0     -15.      912.0
  318                -6.       911.2     20.       912.0     115.      913.0
  319                350.      912.7     550.      913.7     720.      914.0
  320                910.      916.0     970.      918.0     990.      920.0

  321                6.        911.2
  322     ENDTABLE
  323     REACH      14.77     1.        750.      380.
  324     SEGMENT    14.77     1         N         -10.
  325     NVALUE     0.10

  326     SEGMENT    14.77     2         C         10.
  327     NVALUE     0.06
  328     SEGMENT    14.77     3         N         130.
  329     NVALUE     0.10
  330     SECTION    14.77

  331                -260.     922.0     -240.     920.0     -230.     918.0
  332                -190.     916.0     -150.     914.0     -10.      913.7
  333                -6.       911.8     10.       913.7     80.       914.0
  334                120.      920.0     130.      922.0     6.        911.8
  335     ENDTABLE

  336     REACH      14.78     1.        650.      400.
  337     SEGMENT    14.78     1         N         -20.
  338     NVALUE     0.10
  339     SEGMENT    14.78     2         C         15.
  340     NVALUE     0.06

  341     SEGMENT    14.78     3         N         295.
  342     NVALUE     0.10
  343     SECTION    14.78
  344                -230.     924.0     -200.     920.0     -180.     918.0
  345                -170.     916.0     -20.      914.0     -6.       912.3

  346                15.       914.0     40.       916.0     55.       918.0
  347                65.       920.0     70.       922.0     290.      922.0
  348                170.      923.2     295.      924.0     6.        912.3
  349     ENDTABLE
  350     REACH      14.8      1.        800.      570.

  351     SEGMENT    14.8      1         N         -15.
  352     NVALUE     0.10
  353     SEGMENT    14.8      2         C         10.
  354     NVALUE     0.06
  355     SEGMENT    14.8      3         N         140.

  356     NVALUE     0.10
  357     SECTION    14.8
  358                -225.     924.5     -200.     920.9     -150.     916.6
  359                -100.     917.3     -50.      915.6     -15.      914.5
  360                -6.       912.9     10.       916.2     25.       917.9
```

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RECORD          1         2         3         4         5         6
NUMBER  12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789

  361                50.       918.6     100.      920.6     125.      923.1
  362                140.      924.7     6.        912.9
  363   ENDTABLE
  364   REACH        14.9      1.0       820.      570.
  365   SEGMENT      14.9      1         N         -8.

  366   NVALUE       0.11
  367   SEGMENT      14.9      2         C         8.
  368   NVALUE       0.06
  369   SEGMENT      14.9      3         N         200.
  370   NVALUE       0.11

  371   SECTION      14.9
  372                -300.     926.85    -250.     926.45    -200.     924.85
  373                -150.     923.15    -100.     920.85    -50.      919.15
  374                -25.      918.75    -8.       918.35    -6.       913.95
  375                8.        917.55    25.       919.25    75.       922.35

  376                100.      923.35    125.      925.15    150.      926.55
  377                200.      927.25    6.        913.95
  378   ENDTABLE
  379   COMPUTE      14.55     14.9      14.35
  380   LINK

  381   CHANGE       DISCHARGE
  382   DISCHARGE    -1        95.       335.      545.      630.      950.
  383   END
  384   REACH        14.95     1.        150.      140.
  385   REACH2       15.1      -0.4

  386   ROAD         15.0      2.7       30.       30.
  387   SPR          15.0      A         1.
  388   GIRDER       924.4     924.1     0.        .8        2.7
  389                -13.6     926.9     -13.6     924.1     13.6      924.1
  390                13.6      926.9

  391   ENDTABLE
  392   SECTION      15.0
  393                -225.     931.37    -200.     930.74    -150.     929.18
  394                -100.     927.84    -50.      927.06    -13.6     926.9
  395                50.       926.7     100.      926.9     150.      927.2

  396                200.      927.9     250.      928.5     300.      928.5
  397                300.      932.0     -13.5     914.5     13.5      914.5
  398                13.6      926.9
  399   ENDTABLE
  400   REACH        15.1      1.        30.       30.

  401   SEGMENT      15.1      1         N         -7.
  402   NVALUE       0.10
  403   SEGMENT      15.1      2         C         7.
  404   NVALUE       0.06
  405   SEGMENT      15.1      3         N         90.       931.5
```

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RECORD                1         2         3         4         5         6
NUMBER   1234567890123456789012345678901234567890123456789012345678901234567890123456789

  406    NVALUE     0.10
  407    SECTION    15.1
  408               -312.     931.45    -300.     928.05    -250.     926.45
  409               -200.     926.35    -150.     923.65    -100.     920.15
  410               -50.      920.05    -25.      919.85    -7.       917.85

  411               -6.       915.35    7.        918.35    25.       919.25
  412               50.       918.55    90.       922.15    90.       931.5
  413               6.        915.35
  414    ENDTABLE
  415    REACH      15.15     1.        350.      220.

  416    SEGMENT    15.15     1         N         -8.
  417    NVALUE     0.09
  418    SEGMENT    15.15     2         C         8.
  419    NVALUE     0.05
  420    SEGMENT    15.15     3         N         135.

  421    NVALUE     0.09
  422    SECTION    15.15
  423               -130.     930.0     -110.     924.0     -100.     922.0
  424               -25.      920.0     -6.       916.7     20.       920.0
  425               40.       922.0     55.       924.0     85.       926.0

  426               120.      928.0     135.0     930.0     -8.       920.0
  427               6.        916.7     8.        920.0
  428    ENDTABLE
  429    ROAD       15.2      2.7       65.       65.
  430    BPR        15.2      A         1

  431    GIRDER     927.4     927.1     0         .8        2.7
  432               -13.25    929.8     -13.25    927.1     13.25     927.1
  433               13.25     929.8
  434    ENDTABLE
  435    SECTION    15.2

  436               110.      930.0     -13.25    929.8     13.25     929.8
  437               -13.2     917.1     13.2      917.1     8.        916.1
  438               -120.     930.
  439    ENDTABLE
  440    REACH      15.25     1.        35.       35.

  441    SEGMENT    15.25     1         N         -13.25    927.1
  442    NVALUE     0.07
  443    SEGMENT    15.25     2         C         13.25     927.1
  444    NVALUE     0.04
  445    SEGMENT    15.25     3         N         730.

  446    NVALUE     0.07
  447    SECTION    15.25
  448               -450.     930.0     -13.25    927.1     -13.25    917.1
  449               0.        916.1     13.25     917.1     13.25     927.1
  450               730.      930.0
```

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RECORD                1         2         3         4         5         6
NUMBER   1234567890123456789012345678901234567890123456789012345678901234567890123456789

  451    ENDTABLE
  452    ROAD        15.3      2.7       35.       35.
  453    BPR         15.3      A         1
  454    GIRDER      927.4     927.1     0         .8        2.7
  455                -13.25    929.8     -13.25    927.1     13.25     927.1

  456                13.25     929.8
  457    ENDTABLE
  458    SECTION     15.3
  459                -360.     932.0     -45.      930.0     -13.25    929.8
  460                13.25     929.8     120.      930.0     400.      932.0

  461                -13.2     917.1     13.2      917.1     8.        916.1
  462    ENDTABLE
  463    REACH       15.32     1.        45.       45.
  464    REACH2      15.15     0.4
  465    REACH       15.35     1.        170.      170.

  466    SEGMENT     15.35     1         N         -8.
  467    NVALUE      0.08
  468    SEGMENT     15.35     2         C         8.
  469    NVALUE      0.04
  470    SEGMENT     15.35     3         N         55.

  471    NVALUE      0.08
  472    SECTION     15.35
  473                -65.      930.0     -55.      928.0     -45.      926.0
  474                -35.      924.0     -30.      922.0     -25.      920.0
  475                -6.       917.2     20.       920.0     45.       930.0

  476                -75.      934.0     65.       934.0     -8.       920.0
  477                6.        917.2     8.        920.0
  478    ENDTABLE
  479    REACH       16.0      1.        150.      150.
  480    SEGMENT     16.0      1         N         -10.

  481    NVALUE      0.09
  482    SEGMENT     16.0      2         C         15.
  483    NVALUE      0.05
  484    SEGMENT     16.0      3.        N         50.       940.0
  485    NVALUE      0.09

  486    SECTION     16.0
  487                -55.      940.0     -25.      930.0     -10.      920.0
  488                0         919.0     15.       920.0     40.       930.0
  489                50.       934.0     50.       940.0
  490    ENDTABLE

  491    REACH       16.1      1.        90.       65.
  492    SEGMENT     16.1      1         N         -23.
  493    NVALUE      0.09
  494    SEGMENT     16.1      2         C         25.
  495    NVALUE      0.05
```

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RECORD                1         2         3         4         5         6
NUMBER     123456789012345678901234567890123456789012345678901234567890123456789

  496      SEGMENT    16.1      3         N         170.      930.
  497      NVALUE     0.09
  498      SECTION    16.1
  499                 -275.     928.7     -250.     928.2     -225.     927.9
  500                 -200.     928.0     -175.     927.6     -150.     927.5

  501                 -125.     926.7     -100.     925.6     -75.      924.7
  502                 -50.      924.2     -23.      923.5     -8.       919.8
  503                 0.        919.1     8.        920.2     25.       923.2
  504                 50.       923.6     75.       923.8     170.      928.0
  505                 170.      930.      -276.     930.

  506      ENDTABLE
  507      REACH      16.25     1.        130.      120.
  508      SEGMENT    16.25     1         N         -20.
  509      NVALUE     0.09
  510      SEGMENT    16.25     2         C         10.

  511      NVALUE     0.06
  512      SEGMENT    16.25     3         N         120.
  513      NVALUE     0.09
  514      SECTION    16.25
  515                 -230.     930.0     -120.     928.0     -90.      926.0

  516                 -70.      924.0     -30.      922.0     -20.      920.0
  517                 0.        919.6     10.       920.0     20.       922.0
  518                 75.       922.0     80.       920.0     100.      920.0
  519                 120.      930.0     60.       924.0
  520      ENDTABLE

  521      REACH      16.55     1.        220.      220.
  522      SEGMENT    16.55     1         N         -8.
  523      NVALUE     0.09
  524      SEGMENT    16.55     2         C         8.
  525      NVALUE     0.06

  526      SEGMENT    16.55     3         N         90.
  527      NVALUE     0.09
  528      SECTION    16.55
  529                 -270.     935.0     -270.     926.0     -160.     926.0
  530                 -20.      925.0     -6.       923.0     40.       924.0

  531                 65.       930.0     90.       935.0     -8.       925.0
  532                 6.        923.0     8.        924.0
  533      ENDTABLE
  534      REACH      16.9      1.        170.      130.
  535      SEGMENT    16.9      1         N         -8.

  536      NVALUE     0.09
  537      SEGMENT    16.9      2         C         7.
  538      NVALUE     0.06
  539      SEGMENT    16.9      3         N         40.
  540      NVALUE     0.09
```

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RECORD              1         2         3         4         5         6
NUMBER   12345678901234567890123456789012345678901234567890123456789012345678901234567890
  541    SECTION   16.9
  542              -25.      939.2     -25.      934.1     -15.      933.4
  543              -8.       925.8     -6.       924.4     7.        925.6
  544              15.       928.0     25.       934.5     40.       939.2
  545              6.        924.4

  546    ENDTABLE
  547    ROAD      17.0      2.7       100.      90.
  548    BPR       17.0      A         1
  549    GIRDER    936.3     938.0     46.       .8        2.7
  550              -50.      939.82    -12.      938.0     12.       938.0

  551              50.       940.32
  552    ENDTABLE
  553    SECTION   17.0
  554              -300.     944.12    -300.     938.82    -250.     938.52
  555              -200.     938.42    -150.     938.72    -100.     939.22

  556              -50.      939.82    11.9      927.0     50.       940.32
  557              100.      941.22    150.      942.82    200.      944.12
  558              -11.9     927.0
  559    ENDTABLE
  560    REACH     17.1      1.        30.       30.

  561    REACH2    17.2      -0.3
  562    REACH     17.2      1.        460.      360.
  563    SEGMENT   17.2      1         N         -12.
  564    NVALUE    0.09
  565    SEGMENT   17.2      2         C         12.

  566    NVALUE    0.06
  567    SEGMENT   17.2      3         N         250.
  568    NVALUE    0.09
  569    SECTION   17.2
  570              -300.     937.9     -200.     936.9     -150.     934.8

  571              -125.     932.9     -100.     933.7     -80.      933.3
  572              -50.      930.0     -13.      929.8     -12.      929.6
  573              -8.       927.9     12.       929.6     15.       930.0
  574              50.       930.0     85.       931.3     100.      931.1
  575              150.      932.4     200.      937.2     250.      939.2

  576              8.        927.9     -301.     939.2
  577    ENDTABLE
  578    REACH     17.21     1.        280.      220.
  579    SEGMENT   17.21     1         N         -8.
  580    NVALUE    0.09

  581    SEGMENT   17.21     2         C         8.
  582    NVALUE    0.06
  583    SEGMENT   17.21     3         N         195.
  584    NVALUE    0.09
  585    SECTION   17.21
```

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RECORD                1         2         3         4         5         6
NUMBER     12345678901234567890123456789012345678901234567890123456789012345678901234567890

  586                 -230.     940.0     -140.     938.0     -80.      936.0
  587                 -55.      934.0     -40.      932.0     -30.      930.0
  588                 -6.       928.3     18.       930.0     25.       932.0
  589                 30.       934.0     70.       936.0     100.      938.0
  590                 195.      940.0     -8.       930.0     6.        928.3

  591                 8.        930.0
  592     ENDTABLE
  593     REACH       17.25     1.        320.      275.
  594     SEGMENT     17.25     1         N         -8.
  595     NVALUE      0.09

  596     SEGMENT     17.25     2         C         9.
  597     NVALUE      0.06
  598     SEGMENT     17.25     3         N         255.
  599     NVALUE      0.09
  600     SECTION     17.25

  601                 -110.     940.0     -80.      934.0     -25.      932.0
  602                 -15.      930.0     -6.       928.8     25.       930.0
  603                 115.      932.0     180.      934.0     230.      936.0
  604                 245.      938.0     255.      940.0     -8.       930.0
  605                 6.        928.8     8.        930.0

  606     ENDTABLE
  607     REACH       17.35     1.        690.      620.
  608     SEGMENT     17.35     1         N         -20.
  609     NVALUE      0.10
  610     SEGMENT     17.35     2         C         17.

  611     NVALUE      0.06
  612     SEGMENT     17.35     3         N         275.
  613     NVALUE      0.10
  614     SECTION     17.35
  615                 -190.     940.0     -165.     938.0     -130.     936.0

  616                 -100.     934.0     -30.      932.0     -20.      930.0
  617                 -6.       929.8     25.       932.0     80.       934.0
  618                 125.      936.0     200.      938.0     275.      940.0
  619                 17.       930.0     6.        929.8     8.        932.0
  620     ENDTABLE

  621     REACH       17.45     1.        920.      590.
  622     SEGMENT     17.45     1         N         -10.
  623     NVALUE      0.11
  624     SEGMENT     17.45     2         C         8.
  625     NVALUE      0.06

  626     SEGMENT     17.45     3         N         230.
  627     NVALUE      0.11
  628     SECTION     17.45
  629                 -190.     942.0     -135.     940.0     -115.     938.0
  630                 -70.      936.0     -25.      934.0     -10.      932.0
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RECORD                1         2         3         4         5         6
NUMBER     12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789

  631                -6.       931.4      15.       932.0      30.       934.0
  632                120.      936.0      145.      938.0      175.      940.0
  633                230.      942.0      6.        931.4      8.        932.0
  634      ENDTABLE
  635      REACH     17.5      1.         610.      530.

  636      SEGMENT   17.5      1          N         -10.
  637      NVALUE    0.11
  638      SEGMENT   17.5      2          C         7.
  639      NVALUE    0.06
  640      SEGMENT   17.5      3          N         400.

  641      NVALUE    0.11
  642      SECTION   17.5
  643                -295.     946.7      -250.     943.4      -200.     938.7
  644                -150.     937.2      -100.     935.7      -75.      935.0
  645                -50.      935.4      -10.      935.0      -7.       933.6

  646                -6.       932.4      7.        934.2      10.       934.7
  647                 50.      935.5      150.      938.3      200.      939.5
  648                300.      942.5      400.      944.8      6.        932.4
  649      ENDTABLE
  650      REACH     17.55     1.         860.      630.

  651      SEGMENT   17.55     1          N         -10.
  652      NVALUE    0.12
  653      SEGMENT   17.55     2          C         8.
  654      NVALUE    0.06
  655      SEGMENT   17.55     3          N         260.

  656      NVALUE    0.12
  657      SECTION   17.55
  658                -160.     944.0      -150.     942.0      -140.     940.0
  659                -130.     938.0      -110.     936.0      -10.      935.0
  660                -6.       933.5      80.       935.0      100.      936.0

  661                130.      938.0      220.      940.0      240.      942.0
  662                280.      944.0      6.        933.5      8.        935.0
  663      ENDTABLE
  664      COMPUTE   14.95     17.55      14.9
  665      CHANGE    DISCHARGE

  666      DISCHARGE -1        90.        330.      540.       625.      935.
  667      END
  668      REACH     17.65     1.         1020.     630.
  669      SEGMENT   17.65     1          N         -8.
  670      NVALUE    0.13

  671      SEGMENT   17.65     2          C         8.
  672      NVALUE    0.07
  673      SEGMENT   17.65     3          N         480.
  674      NVALUE    0.13
  675      SECTION   17.65
```

```
RECORD              1         2         3         4         5         6
NUMBER   123456789012345678901234567890123456789012345678901234567890123456789

  676                -125.     946.0     -105.     940.0     -40.      938.0
  677                -20.      936.0     -6.       934.6     30.       936.0
  678                50.       938.0     400.      940.0     440.      942.0
  679                470.      944.0     480.      946.0     6.        934.6
  680                -8.       936.0     8.        936.0

  681     ENDTABLE
  682     REACH      17.75     1.        1030.     640.
  683     SEGMENT    17.75     1         N         -20.
  684     NVALUE     0.14
  685     SEGMENT    17.75     2         C         25.

  686     NVALUE     0.07
  687     SEGMENT    17.75     3         N         530.
  688     NVALUE     0.14
  689     SECTION    17.75
  690                -210.     948.0     -190.     946.0     -175.     944.0

  691                -160.     942.0     -150.     940.0     -75.      938.0
  692                -20.      936.0     0.        935.7     25.       936.0
  693                40.       938.0     125.      940.0     190.      940.0
  694                300.      942.0     420.      941.5     470.      942.0
  695                495.      944.0     530.      948.0

  696     ENDTABLE
  697     REACH      17.85     1.        640.      520.
  698     SEGMENT    17.85     1         N         -40.
  699     NVALUE     0.15
  700     SEGMENT    17.85     2         C         15.

  701     NVALUE     0.08
  702     SEGMENT    17.85     3         N         460.
  703     NVALUE     0.15
  704     SECTION    17.85
  705                -240.     947.5     -220.     944.0     -205.     942.0

  706                -170.     940.0     -40.      938.0     0.        937.4
  707                15.       938.0     95.       940.0     195.      942.0
  708                250.      943.5     440.      944.0     460.      947.5
  709     ENDTABLE
  710     REACH      17.9      1.        1020.     600.

  711     SEGMENT    17.9      1         N         -8.
  712     NVALUE     0.15
  713     SEGMENT    17.9      2         C         8.
  714     NVALUE     0.08
  715     SEGMENT    17.9      3         N         600.      947.4

  716     NVALUE     0.15
  717     SECTION    17.9
  718                -600.     947.4     -600.     944.3     -500.     941.7
  719                -400.     939.0     -300.     938.5     -200.     938.9
  720                -100.     938.6     -50.      939.0     -8.       939.4
```

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RECORD                1         2         3         4         5         6
NUMBER     12345678901234567890123456789012345678901234567890123456789012345678901

  721                -6.       937.4      8.        939.4     50.       939.5
  722                100.      939.8      200.      941.2     300.      942.1
  723                400.      942.9      500.      942.9     600.      946.4
  724                600.      947.4      6.        937.4
  725      ENDTABLE

  726      ROAD      18.0      2.7        35.       35.
  727      SPR       18.0      A          1
  728      GIRDER    940.56    940.26     18.       .8        2.7
  729                -6.       942.09     -8.       940.26    8.        940.26
  730                8.        942.09

  731      ENDTABLE
  732      SECTION   18.0
  733                -600.     946.49     -700.     945.19    -800.     942.99
  734                -500.     941.39     -400.     940.79    -300.     940.69
  735                -200.     940.99     -100.     941.39    -8.       942.09

  736                8.        942.09     100.      941.99    200.      942.49
  737                300.      943.19     400.      943.79    500.      944.89
  738                600.      945.99     650.      946.6     -7.9      937.4
  739                7.9       937.4
  740      ENDTABLE

  741      REACH     18.1      1.         30.       30.
  742      REACH2    17.9      0.2
  743      REACH     18.15     1.         525.      390.
  744      SEGMENT   18.15     1          N         -8.
  745      NVALUE    0.15

  746      SEGMENT   18.15     2          C         8.
  747      NVALUE    0.08
  748      SEGMENT   18.15     3          N         515.
  749      NVALUE    0.15
  750      SECTION   18.15

  751                -370.     948.0      -355.     946.0     -335.     944.0
  752                -305.     942.0      -130.     940.0     -20.      939.9
  753                -6.       937.8      20.       939.9     90.       940.0
  754                345.      942.0      370.      944.0     495.      946.0
  755                515.      948.0      6.        937.8     -8.       939.9

  756                8.        939.9
  757      ENDTABLE
  758      REACH     18.2      1.         1190.     830.
  759      SEGMENT   18.2      1          N         -9.
  760      NVALUE    0.15

  761      SEGMENT   18.2      2          C         9.
  762      NVALUE    0.08
  763      SEGMENT   18.2      3          N         400.      949.0
  764      NVALUE    0.15
  765      SECTION   18.2
```

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RECORD              1         2         3         4         5         6
NUMBER   12345678901234567890123456789012345678901234567890123456789012345678901234567890

  766                -400.     949.0     -300.     944.0     -200.     942.6
  767                -100.     941.2     -50.      941.2     -10.      941.3
  768                -9.       940.3     -6.       938.6     9.        940.3
  769                11.       940.9     50.       943.4     100.      947.3
  770                200.      947.9     300.      946.7     400.      947.6

  771                400.      949.0     6.        938.6
  772     ENDTABLE
  773     REACH      18.45     1.        1520.     1020.
  774     SEGMENT    18.45     1         N         -8.
  775     NVALUE     0.15

  776     SEGMENT    18.45     2         C         8.
  777     NVALUE     0.08
  778     SEGMENT    18.45     3         N         670.      952.4
  779     NVALUE     0.15
  780     SECTION    18.45

  781                -330.     952.4     -315.     952.0     -260.     950.0
  782                -210.     948.0     -65.      946.0     -55.      944.0
  783                -20.      943.8     -5.       940.4     20.       943.1
  784                80.       944.0     105.      950.0     165.      950.0
  785                430.      948.0     125.      950.9     670.      948.0

  786                670.      952.4     -8.       943.8     6.        940.4
  787                8.        943.1
  788     ENDTABLE
  789     REACH      18.55     1.        990.      730.
  790     SEGMENT    18.55     1         N         -8.

  791     NVALUE     0.15
  792     SEGMENT    18.55     2         C         8.
  793     NVALUE     0.08
  794     SEGMENT    18.55     3         N         540.
  795     NVALUE     0.15

  796     SECTION    18.55
  797                -880.     954.0     -820.     952.0     -400.     950.5
  798                -250.     950.0     -160.     948.3     -30.      946.0
  799                -20.      944.0     -6.       941.6     20.       944.0
  800                380.      946.0     415.      948.0     435       950.0

  801                455.      952.0     540.      954.0     -8.       944.0
  802                6.        941.6     8.        944.0
  803     ENDTABLE
  804     COMPUTE    17.65     18.55     17.55
  805     LINK

  806     REACH      18.6      1.        1340.     730.
  807     SEGMENT    18.6      1         N         -10.
  808     NVALUE     0.15
  809     SEGMENT    18.6      2         C         10.
  810     NVALUE     0.08
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RECORD                1         2         3         4         5         6
NUMBER   12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789

  811    SEGMENT   18.6      3         N         400.
  812    NVALUE    0.15
  813    SECTION   18.6
  814              -600.     953.5     -500.     951.5     -400.     949.3
  815              -300.     945.9     -200.     945.8     -100.     945.7

  816              -50.      945.6     -12.      945.8     -10.      944.7
  817              -6.       943.3     10.       944.7     13.       946.1
  818              25.       946.7     100.      947.9     150.      950.1
  819              200.      953.7     300.      954.0     400.      954.5
  820              6.        943.3

  821    ENDTABLE
  822    REACH     18.63     1.        850.      460.
  823    SEGMENT   18.63     1         N         -8.
  824    NVALUE    0.14
  825    SEGMENT   18.63     2         C         8.

  826    NVALUE    0.08
  827    SEGMENT   18.63     3         N         90.
  828    NVALUE    0.14
  829    SECTION   18.63
  830              -820.     960.0     -785.     958.0     -760.     956.0

  831              -740.     954.0     -700.     954.0     -540.     956.0
  832              -270.     956.0     -245.     954.0     -130.     954.0
  833              -120.     952.0     -40.      950.0     -20.      948.0
  834              -6.       943.8     25.       948.0     30.       950.0
  835              35.       952.0     45.       954.0     50.       956.0

  836              70.       958.0     90.       960.0     -8.       943.0
  837              6.        943.8     8.        948.0
  838    ENDTABLE
  839    REACH     18.65     1.        1130.     640.
  840    SEGMENT   18.65     1         N         -8.

  841    NVALUE    0.14
  842    SEGMENT   18.65     2         C         8.
  843    NVALUE    0.08
  844    SEGMENT   18.65     3         N         840.
  845    NVALUE    0.14

  846    SECTION   18.65
  847              -340.     960.0     -315.     952.0     -265.     950.0
  848              -235.     948.0     -200.     947.8     -6.       944.2
  849              80.       947.8     280.      948.0     590.      950.0
  850              635.      952.0     740.      954.0     770.      956.0

  851              800.      958.0     840.      960.0     -8.       947.8
  852              8.        947.8     6.        944.2
  853    ENDTABLE
  854    COMPUTE   18.6      18.65     18.55
  855    CHANGE    DISCHARGE
```

```
RECORD              1         2         3         4         5         6         7
NUMBER   12345678901234567890123456789012345678901234567890123456789012345678901

  856    DISCHARGE -1         105.      275.      435.      495.      710.
  857    END
  858    REACH     18.7       1.        1650.     1000.
  859    SEGMENT   18.7       1         N         -8.
  860    NVALUE    0.13

  861    SEGMENT   18.7       2         C         8.
  862    NVALUE    0.08
  863    SEGMENT   18.7       3         N         421.
  864    NVALUE    0.13
  865    SECTION   18.7

  866              -1360.     960.0     -1300.    954.0     -800.     952.0
  867              -700.      950.0     -650.     948.0     -600.     948.0
  868              -307.      949.8     -257.     950.5     -207.     949.5
  869              -157.      948.7     -107.     948.6     -57.      948.1
  870              -8.        948.1     -6.       947.2     0.        945.0

  871              6.         947.3     8.        948.2     18.       948.3
  872              68.        949.7     118.      951.5     168.      953.3
  873              218.       954.1     318.      956.7     421.      959.9
  874    ENDTABLE
  875    REACH     18.75      1.        1040.     550.

  876    SEGMENT   18.75      1         N         -8.
  877    NVALUE    0.13
  878    SEGMENT   18.75      2         C         8.
  879    NVALUE    0.08
  880    SEGMENT   18.75      3         N         365.

  881    NVALUE    0.13
  882    SECTION   18.75
  883              -1090.     960.0     -1075.    956.0     -1035.    956.0
  884              -790.      956.0     -620.     954.0     -480.     954.0
  885              -235.      954.0     -135.0    952.0     -60.      950.0

  886              -6.        947.6     50.       950.0     85.       952.0
  887              305.       954.0     325.      956.0     350.      958.0
  888              365.       960.0     -8.       950.0     6.        947.6
  889              8.         950.0
  890    ENDTABLE

  891    REACH     18.85      1.0       1310.     690.
  892    SEGMENT   18.85      1         N         -15.
  893    NVALUE    0.12
  894    SEGMENT   18.85      2         C         20.
  895    NVALUE    0.08

  896    SEGMENT   18.85      3         N         310.
  897    NVALUE    0.12
  898    SECTION   18.85
  899              -410.      960.0     -390.     958.0     -330.     956.0
  900              -130.      954.0     -50.      952.0     -15.      951.0
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RECORD                1         2         3         4         5         6
NUMBER   12345678901234567890123456789012345678901234567890123456789012345678901

  901                -6.       950.3     20.       951.0     30.       952.0
  902                115.      954.0     200.      954.0     230.      956.0
  903                260.      958.0     310.      960.0     6.        950.3
  904    ENDTABLE
  905    COMPUTE     18.7      18.85     18.65

  906    TITLE       SPECIAL RUN @ BULLARD LAKE OUTLET (IN CHANNEL)
  907    CHANGE      DISCHARGE
  908    DISCHARGE   -1        90.       210.      285.      340.      440.
  909    END
  910    REACH       18.87     1.        590.      370.

  911    SEGMENT     18.87     1         N         -10.
  912    NVALUE      0.11
  913    SEGMENT     18.87     2         C         20.
  914    NVALUE      0.08
  915    SEGMENT     18.87     3         N         200.

  916    NVALUE      0.11
  917    SECTION     18.87
  918                -50.      961.7     -50.      958.2     -20.      956.0
  919                -10.      952.0     -6.       951.7     20.       952.0
  920                30.       954.0     50.       956.0     180.      958.0

  921                200.      960.0     200.      961.7     6.        951.7
  922    ENDTABLE
  923    ROAD        18.89     2.7       39.5      39.5
  924    CULV1       18.89     1         33122
  925    CULV2       7.2       11.6      61.       951.86    951.76

  926    SECTION     18.89
  927                -50.      964.0     -50.      960.36    0.        960.46
  928                100.      959.46    200.      959.96    300.      960.86
  929                400.      962.26    400.      964.0
  930    ENDTABLE

  931    REACH       18.9      1.        49.5      49.5
  932    SEGMENT     18.9      1         N         -8.
  933    NVALUE      0.07
  934    SEGMENT     18.9      2         C         8.
  935    NVALUE      0.05

  936    SEGMENT     18.9      3         N         400.
  937    NVALUE      0.07
  938    SECTION     18.9
  939                -43.      962.0     -25.      961.8     -16.      960.3
  940                -12.      955.9     -8.       953.7     -6.       952.8

  941                8.        953.5     15.       956.0     50.       957.7
  942                100.      958.2     150.      958.1     200.      958.5
  943                250.      959.1     300.      960.0     350.      961.5
  944                400.      962.9     -45.      962.9     6.        952.8
  945    ENDTABLE
```

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RECORD              1         2         3         4         5         6
NUMBER   123456789012345678901234567890123456789012345678901234567890123456789

  946    REACH      18.95     1.        145.      125.
  947    SEGMENT    18.95     1         N         -20.
  948    NVALUE     0.07
  949    SEGMENT    18.95     2         C         15.
  950    NVALUE     0.05

  951    SEGMENT    18.95     3         N         135.
  952    NVALUE     0.07
  953    SECTION    18.95
  954               -215.     966.0     -215.     960.4     -20.      960.0
  955               -5.       956.2     5.        956.2     15.       960.0

  956               75.       964.0     135.      966.0
  957    ENDTABLE
  958    ROAD       19.0      2.7       25.       25.
  959    BPR        19.0      A         1
  960    GIRDER     966.      964.3     0.        .8        2.7

  961               -5.       965.3     -5.       964.3     5.        964.3
  962               5.        965.3
  963    ENDTABLE
  964    SECTION    19.0
  965               -900.     960.0     -750.     955.9     -700.     955.6

  966               -650.     955.8     -600.     956.9     -550.     957.9
  967               -500.     958.4     -450.     958.2     -400.     957.7
  968               -350.     957.6     -300.     958.2     -250.     959.7
  969               -200.     960.8     -150.     961.7     -100.     962.7
  970               -50.      964.2     -5.       965.3     5.        965.3

  971               50.       966.1     100.      967.4     150.      968.9
  972               -4.9      956.25    4.9       956.25
  973    ENDTABLE
  974    REACH      19.03     1.        15.       15.
  975    SEGMENT    19.03     1         N         -5.       958.95

  976    NVALUE     0.05
  977    SEGMENT    19.03     2         C         5.        958.95
  978    NVALUE     0.04
  979    SEGMENT    19.03     3         N         170.
  980    NVALUE     0.05

  981    SECTION    19.03
  982               -705.     970.0     -700.     963.45    -100.     963.65
  983               -50.      963.65    -24.      963.25    -5.       958.95
  984               -5.       956.25    5.        956.25    5.        958.95
  985               21.       962.55    50.       963.35    100.      965.05

  986               150.      967.65    170.      969.45
  987    ENDTABLE
  988    REACH      19.05     1.        5.        5.
  989    SEGMENT    19.05     1         N         -24.
  990    NVALUE     0.05
```

```
RECORD                1         2         3         4         5         6
NUMBER   123456789012345678901234567890123456789012345678901234567890123456789

  991    SEGMENT   19.05     2         C         21.
  992    NVALUE    0.04
  993    SEGMENT   19.05     3         N         170.
  994    NVALUE    0.05
  995    SECTION   19.05

  996              -700.     963.45    -100.     963.65    -705.     970.0
  997              -50.      963.65    -24.      963.25    -14.      958.95
  998              14.       959.95    21.       962.55    50.       963.35
  999              100.      965.05    150.      967.65    170.      969.45
 1000    ENDTABLE

 1001    REACH     19.1      1.        10.       10.
 1002    SEGMENT   19.1      1         N         -24.
 1003    NVALUE    0.05
 1004    SEGMENT   19.1      2         C         21.
 1005    NVALUE    0.03

 1006    SEGMENT   19.1      3         N         170.
 1007    NVALUE    0.05
 1008    SECTION   19.1
 1009              -700.     963.45    -100.     963.65    -50.      963.65
 1010              -24.      963.25    -14.      962.05    0.        961.75

 1011              14.       961.95    21.       962.55    50.       963.35
 1012              100.      965.05    150.      967.65    170.      969.45
 1013              -905.     970.      -900.     965.00    -800.     963.3
 1014              -650.     962.50    -600.     963.10    -500.     963.10
 1015              -400.     963.00    -300.     962.60    -200.     963.60

 1016    ENDTABLE
 1017    COMPUTE   18.87     19.1      18.85
 1018    TITLE     SPECIAL RUN @ BULLARD LAKE OUTLET (OUT OF CHANNEL)
 1019    CHANGE    DISCHARGE
 1020    DISCHARGE -1        5.        65.       150.      155.      270.

 1021    END
 1022    REACH     18.91     1.        250.      250.
 1023    SEGMENT   18.91     1         N         -20.
 1024    NVALUE    0.11
 1025    SEGMENT   18.91     2         C         10.

 1026    NVALUE    0.08
 1027    SEGMENT   18.91     3         N         115.
 1028    NVALUE    0.11
 1029    SECTION   18.91
 1030              -370.     970.      -360.     954.      -310.     952.

 1031              -300.     952.      -220.     954.      -130.     956.
 1032              -40.      956.      -20.      954.      -5.       951.2
 1033              5.        951.2     10.       954.      40.       956.
 1034              110.      958.      115.      970.
 1035    ENDTABLE
```

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RECORD                1         2         3         4         5         6
NUMBER   12345678901234567890123456789012345678901234567890123456789012345678901234567890

 1036    ROAD         19.0      2.7       25.       25.
 1037    CULV1        19.0      1         12311
 1038    CULV2        1.                  50.       951.2     951.2
 1039    CULV1        19.0      1         12311
 1040    CULV2        1.                  50.       952.      952.

 1041    SECTION      19.0
 1042                 -900.     960.0     -750.     955.9     -700.     955.6
 1043                 -650.     955.8     -600.     956.8     -550.     957.9
 1044                 -500.     958.4     -450.     958.2     -400.     957.7
 1045                 -350.     957.6     -300.     958.2     -250.     959.7

 1046                 -200.     960.8     -150.     961.7     -100.     962.7
 1047                 -50.      964.2     -55.      970.
 1048    ENDTABLE
 1049    REACH        19.04     1.        25.       25.
 1050    SEGMENT      19.04     1         N         -270.

 1051    NVALUE       0.06
 1052    SEGMENT      19.04     2         C         100.
 1053    NVALUE       0.05
 1054    SEGMENT      19.04     3         N         305.
 1055    NVALUE       0.06

 1056    SECTION      19.04
 1057                 -300.     970.0     -270.     954.      -235.     952.
 1058                 -210.     954.      -185.     956.      -100.     957.8
 1059                 -80.      956.      -60.      954.      0.        951.2
 1060                 60.       954.      100.      956.      165.      958.

 1061                 240.      960.      300.      962.      305.      970.
 1062    ENDTABLE
 1063    REACH        19.06     1.        25.       25.
 1064    SEGMENT      19.06     1         N         -24.      970.
 1065    NVALUE       0.05

 1066    SECTION      19.06
 1067                 -705.     970.      -700.     957.      -50.      957.
 1068                 -24.      957.      -24.      970.
 1069    ENDTABLE
 1070    REACH        19.11     1.        10.       10.

 1071    SEGMENT      19.11     1         N         -24.      970.
 1072    NVALUE       0.05
 1073    SECTION      19.11
 1074                 -700.     963.45    -100.     963.65    -50.      963.65
 1075                 -24.      963.25    -24.      970.      -905.     970.

 1076                 -900.     965.      -800.     963.3     -650.     962.5
 1077                 -600.     963.1     -500.     963.1     -400.     963.
 1078                 -300.     962.6     -200.     963.6
 1079    ENDTABLE
 1080    COMPUTE      18.91     19.11     18.85
```

```
RECORD              1         2         3         4         5         6         7
NUMBER   1234567890123456789012345678901234567890123456789012345678901234567890

 1081    TITLE     MAIN CHANNEL CONTINUATION
 1082    CHANGE    DISCHARGE
 1083    DISCHARGE -1        105.      275.      435.      495.      710.
 1084    END
 1085    REACH     19.5      1.        3710.     3710.

 1086    SEGMENT   19.5      1         N         -250.
 1087    NVALUE    0.06
 1088    SEGMENT   19.5      2         C         255.
 1089    NVALUE    0.04
 1090    SEGMENT   19.5      3         N         365.

 1091    NVALUE    0.06
 1092    SECTION   19.5
 1093              -790.     972.      -750.     970.      -665.     968.
 1094              -600.     966.      -580.     964.      -520.     964.
 1095              -505.     966.      -350.     967.5     -270.     966.0

 1096              -250.     962.1     -200.     957.1     205.      957.1
 1097              255.      962.1     310.      970.      365.      972.0
 1098    ENDTABLE
 1099    REACH     19.7      1.        1710.     1710.
 1100    SEGMENT   19.7      1         N         -110.

 1101    NVALUE    0.06
 1102    SEGMENT   19.7      2         C         120.
 1103    NVALUE    0.04
 1104    SEGMENT   19.7      3         N         655.
 1105    NVALUE    0.06

 1106    SECTION   19.7
 1107              -350.     983.5     -275.     964.0     -200.     963.5
 1108              -110.     962.1     -60.      957.1     70.       957.1
 1109              120.      962.1     200.      963.5     335.      964.0
 1110              440.      966.0     530.      967.1     655.      970.0

 1111    ENDTABLE
 1112    REACH     19.9      1.        1385.     1150.
 1113    REACH2    20.1      -0.1
 1114    ROAD      20.0      2.7       15.       15.
 1115    CULV1     20.0      1         12311

 1116    CULV2     4.                  46.       959.99    960.29
 1117    SECTION   20.0
 1118              -400.     970.09    -300.     968.79    -200.     968.29
 1119              -100.     967.19    0.        966.69    100.      966.89
 1120              200.      967.89    300.      968.79    400.      970.59

 1121    ENDTABLE
 1122    REACH     20.1      1.        15.       15.
 1123    SEGMENT   20.1      1         N         -5.
 1124    NVALUE    0.12
 1125    SEGMENT   20.1      2         C         5.
```

```
RECORD                1         2         3         4         5         6         7
NUMBER     1234567890123456789012345678901234567890123456789012345678901234567890

 1126      NVALUE    0.07
 1127      SEGMENT   20.1      3         N         500.      970.0
 1128      NVALUE    0.12
 1129      SECTION   20.1
 1130                -300.     970.0     -300.     967.49    -250.     966.99

 1131                -200.     966.99    -150.     966.19    -100.     965.19
 1132                -50.      963.09    -5.       962.39    -4.       961.19
 1133                -3.       959.79    4.        960.79    5.        962.79
 1134                50.       962.09    100.      963.09    150.      965.09
 1135                200.      967.09    250.      965.99    300.      965.69

 1136                350.      964.79    400.      964.69    450.      965.69
 1137                500.      968.59    500.      970.0     3.        959.79
 1138      ENDTABLE
 1139      REACH     20.9      1.        6000.     5500.
 1140      SEGMENT   20.9      1         N         -5.

 1141      NVALUE    0.12
 1142      SEGMENT   20.9      2         C         5.
 1143      NVALUE    0.08
 1144      SEGMENT   20.9      3         N         142.      997.1
 1145      NVALUE    0.12

 1146      SECTION   20.9
 1147                -86.      997.1     -86.      995.4     -70.      994.9
 1148                -54.      993.6     -38.      989.4     -32.      988.6
 1149                -16.      988.5     -5.       988.3     -3.       987.5
 1150                0.        987.1     3.        987.4     5.        988.4

 1151                16.       988.2     32.       987.6     48.       987.2
 1152                64.       989.0     80.       990.3     96.       991.4
 1153                112.      993.2     128.      994.3     142.      995.4
 1154                142.      997.1
 1155      ENDTABLE

 1156      ROAD      21.0      2.7       21.       21.
 1157      CULV1     21.0      1         12311
 1158      CULV2     2.5                 70.       987.68    987.48
 1159      SECTION   21.0
 1160                -300.     1000.08   -200.     997.68    -100.     995.98

 1161                0.        995.68    100.      996.18    200.      996.68
 1162                300.      997.48    400.      998.58    500.      999.18
 1163                600.      999.68    675.      1000.08
 1164      ENDTABLE
 1165      REACH     21.1      1.        21.       21.

 1166      REACH2    20.9      0.1
 1167      REACH     21.9      1.        980.      830.
 1168      SEGMENT   21.9      1         N         -10.
 1169      NVALUE    0.13
 1170      SEGMENT   21.9      2         C         25.
```

```
RECORD                1         2         3         4         5         6
NUMBER     12345678901234567890123456789012345678901234567890123456789012345678
 1171      NVALUE    0.08
 1172      SEGMENT   21.9      3         N         237.      1004.8
 1173      NVALUE    0.13
 1174      SECTION   21.9
 1175                -292.     1004.8    -292.     1003.2    -250.     1001.9

 1176                -200.     1000.5    -150.     999.8     -100.     999.4
 1177                -50.      999.2     -25.      997.7     -10.      996.3
 1178                -3.       995.4     0.        994.8     3.        995.4
 1179                25.       997.3     50.       997.9     75.       998.6
 1180                125.      999.8     150.      1000.0    175.      1000.0

 1181                200.      1000.1    225.      1000.3    237.      1001.1
 1182                237.      1004.8
 1183      ENDTABLE
 1184      ROAD      22.0      2.7       36.4      36.4
 1185      CULV1     22.0      1.        12311

 1186      CULV2     3.0                 67.2      995.78    995.18
 1187      SECTION   22.0
 1188                -150.     1006.4    -100.     1004.2    0.        1001.9
 1189                100.      1001.1    200.      1000.9    300.      1000.4
 1190                400.      1000.5    500.      1002.1    500.      1006.4

 1191      ENDTABLE
 1192      REACH     22.1      1.        36.4      36.4
 1193      REACH2    21.9      0.1
 1194      REACH     22.9      1.        614.      564.
 1195      SEGMENT   22.9      1         N         -5.

 1196      NVALUE    0.13
 1197      SEGMENT   22.9      2         C         6.
 1198      NVALUE    0.08
 1199      SEGMENT   22.9      3         N         275.
 1200      NVALUE    0.13

 1201      SECTION   22.9
 1202                -64.      1008.1    -64.      1001.1    -52.      1000.4
 1203                -40.      1000.3    -28.      1000.3    -12.      1000.1
 1204                -5.       999.5     -4.       999.1     5.        999.0
 1205                6.        999.1     12.       999.7     25.       1000.1

 1206                50.       1000.7    75.       1000.9    120.      1000.9
 1207                130.      1001.0    195.      1001.2    275.      1008.1
 1208                4.        998.1
 1209      ENDTABLE
 1210      ROAD      23.0      2.7       18.       18.

 1211      CULV1     23.0      1         32111
 1212      CULV2     1.        2.        64.       998.7     997.7     .014
 1213      SECTION   23.0
 1214                -150.     1007.7    -100.     1005.8    -50.      1004.3
 1215                0.        1003.2    50.       1002.6    100.      1002.5
```

```
RECORD                1         2         3         4         5         6
NUMBER   123456789012345678901234567890123456789012345678901234567890123456789

 1216                150.      1002.2    200.      1002.4    250.      1003.2
 1217                300.      1004.0    350.      1004.4    350.      1007.7
 1218    ENDTABLE
 1219    REACH       23.1      1.        18.       18.
 1220    REACH2      22.9      0.1

 1221    REACH       23.4      1.        432.      432.
 1222    SEGMENT     23.4      1         N         -3.2      1001.4
 1223    NVALUE      0.13
 1224    SEGMENT     23.4      2         C         3.2       1001.4
 1225    NVALUE      0.08

 1226    SEGMENT     23.4      3         N         250.      1010.2
 1227    NVALUE      0.13
 1228    SECTION     23.4
 1229                -225.     1010.2    -225.     1006.05   -200.     1004.15
 1230                -150.     1003.25   -100.     1002.25   -50.      1001.15

 1231                -3.2      1001.40   -3.2      1000.54   -1.1      1000.54
 1232                0.        1000.20   1.1       1000.54   3.2       1000.54
 1233                3.2       1001.40   25.       1001.15   50.       1000.95
 1234                100.      1001.45   150.      1001.25   200.      1001.75
 1235                250.      1001.85   250.      1010.2

 1236    ENDTABLE
 1237    COMPUTE     19.5      23.4      19.1
 1238    TITLE       NEFF LAKE OUTLET
 1239    REACH       39.9      1.        1100.     910.
 1240    REACH2      40.1      -0.2

 1241    ROAD        40.0      2.7       50.       50.
 1242    BPR         40.0      A         1
 1243    GIRDER      908.43    908.13    0         .8        2.7
 1244                -5.       909.93    -4.9      908.13    4.9       908.13
 1245                5.        909.93

 1246    ENDTABLE
 1247    SECTION     40.0
 1248                -300.     916.33    -250.     914.53    -200.     913.03
 1249                -150.     911.93    -100.     911.03    -50.      910.23
 1250                -5.       909.93    50.       910.03    100.      910.43

 1251                150.      911.13    200.      911.93    250.      912.93
 1252                300.      913.73    400.      915.13    5.        909.93
 1253                -4.9      903.1     4.9       903.1
 1254    ENDTABLE
 1255    REACH       40.1      1.        50.       50.

 1256    SEGMENT     40.1      1         N         -6.
 1257    NVALUE      0.10
 1258    SEGMENT     40.1      2         C         6.
 1259    NVALUE      0.06
 1260    SEGMENT     40.1      3         N         240.      914.1
```

```
RECORD              1         2         3         4         5         6
NUMBER   123456789012345678901234567890123456789012345678901234567890123456789

 1261    NVALUE    0.10
 1262    SECTION   40.1
 1263              -300.     914.1     -250.     909.77    -200.     909.27
 1264              -150.     908.77    -100.     907.47    -50.      907.07
 1265              -6.       906.27    -5.       904.07    6.        906.37

 1266              25.       906.07    50.       906.57    100.      907.67
 1267              150.      911.57    200.      912.67    225.      912.07
 1268              240.      912.37    240.      914.1     -295.     912.77
 1269              5.        904.07
 1270    ENDTABLE

 1271    TITLE     BROPHY LAKE OUTLET
 1272    REACH     40.9      1.        534.      506.
 1273    SEGMENT   40.9      1         N         -15.
 1274    NVALUE    0.10
 1275    SEGMENT   40.9      2         C         15.

 1276    NVALUE    0.06
 1277    SEGMENT   40.9      3         N         120.
 1278    NVALUE    0.10
 1279    SECTION   40.9
 1280              -238.     936.0     -220.     934.0     -170.     932.0

 1281              -130.     930.0     -125.     928.0     -70.      926.0
 1282              -15.      924.0     -5.       923.6     5.        923.6
 1283              15.       924.0     25.       926.0     50.       928.0
 1284              95.       930.0     120.      934.
 1285    ENDTABLE

 1286    ROAD      41.0      2.7       14.       14.
 1287    CULV1     41.0      1         12333
 1288    CULV2     2.                  63.5      925.5     925.5
 1289    SECTION   41.0
 1290              -230.     935.66    -200.     934.36    -150.     932.26

 1291              -100.     930.86    -50.      930.06    0.        930.16
 1292              50.       931.26    100.      934.16    125.      935.36
 1293    ENDTABLE
 1294    REACH     41.1      1.        68.       68.
 1295    SEGMENT   41.1      1         N         -5.

 1296    NVALUE    0.10
 1297    SEGMENT   41.1      2         C         5.
 1298    NVALUE    0.06
 1299    SEGMENT   41.1      3         N         205.
 1300    NVALUE    0.10

 1301    SECTION   41.1
 1302              -250.     935.5     -200.     932.16    -150.     931.26
 1303              -100.     929.36    -75.      927.36    -25.      926.56
 1304              -5.       926.76    -4.       925.56    5.        926.56
 1305              25.       927.26    50.       927.46    100.      929.26
```

```
RECORD                1         2         3         4         5         6         7
NUMBER     12345678901234567890123456789012345678901234567890123456789012345678901234567890

 1306                150.      929.76    200.      933.06    205.      935.5
 1307                4.        925.56
 1308      ENDTABLE
 1309      ENDJOB
 1310      ENDRUN
```

12

13

SCS-ENG.-264 DRAFT
REV May 1982

TR-20
JOB & TITLE

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Watershed _____ Hydrologist _____ Date _____ SHEET _____ OF _____

1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80
1 2 3 4 5 6 7 8 9 0	1 2 3 4 5 6 7 8 9 0	1 2 3 4 5 6 7 8 9 0	1 2 3 4 5 6 7 8 9 0	1 2 3 4 5 6 7 8 9 0	1 2 3 4 5 6 7 8 9 0	1 2 3 4 5 6 7 8 9 0	1 2 3 4 5 6 7 8 9 0
JOB TR-20							
TITLE							
TITLE							

JOB Record (required)

Columns 1-3	JOB
Columns 5-9	TR-20
Columns 11-17	HOLDOUT Use only if a holdout hydrograph is desired.
Columns 21-24	ECON Use only if peak discharge output for ECON2/URB1 is desired. Locations for this output must be selected for inclusion in Summary Tables 1 and 3 also. Such designation can be made using summary option explained below (columns 51-57) or on Standard Control (column 71).
Columns 31-39	FULLPRINT Use only if FULLPRINT option is desired.
Columns 41-48	PASS=XXX Use only if PASS number, XXX, is greater than 1. XXX is an integer, right justified.
Columns 51-57	SUMMARY Use only if Summary Tables 1 and 3 are to include all Standard Control operations (except SAVMOV).
Columns 61-67	NOPLOTS Use if no cross section rating plots are desired. ENDPLOT Use if only cross section rating plots are desired with no routings.
Columns 73-80	Optional user information, printed at top of input listing.

TITLE Records (one required, second is optional)

Columns 1-5	TITLE
Columns 7-9	XXX (first TITLE record only). An optional user file number, XXX, is an integer, right justified.
Columns 11-80	Both titles may be any characters desired.

SCS - ENG. - 269 DRAFT
REV. May 1982

TR - 20
STRUCTURE DATA

STRUCTURE NO._____

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Watershed _____ Hydrologist _____ Date _____ SHEET _____ OF _____

1-10		11-20	21-30	31-40	41-50	51-60	61-70	71-80
DATA CODE	TABLE NAME		DATA FIELD NO. 1	DATA FIELD NO. 2	DATA FIELD NO. 3			RECORD IDENT.
		STRUCTURE ID. (01-99)	IMPORTANT: Line out unused lines. Data fields require decimal points.					
3	STRUCT							
		NOTE: Maximum of 20 data records allowed.						
			Elevation, Ft.	Discharge, CFS	Storage, Acre, Ft.			
8								
8								
8								
8								
8								
8								
8								
8								
8								
8								
8								
8								
8								
8								
8								
9	ENDTBL		NOTE: This record must be the last record of this table.					

SCS-ENG.-270 DRAFT
REV. May 1982

TR-20
STREAM CROSS SECTION DATA

CROSS SECTION NO. _____

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Watershed _____ Hydrologist _____ Date _____ SHEET _____ OF _____

1-10		11-20	21-30	31-40	41-50	51-60	61-70	71-80
DATA CODE	TABLE NAME		DATA FIELD NO. 1	DATA FIELD NO. 2	DATA FIELD NO. 3			RECORD IDENT.
		X SECTION ID. (001-200)	IMPORTANT: Line out unused lines. Data fields require decimal points. Drainage Area, Sq.Mi.	Bankfull Elevation, Ft.				
2	X SECTN							
			(Use 1.0 unless discharge in CSM.)					
			NOTE: Maximum of 20 data records allowed.					
				Elevation, Ft.	Discharge, CFS	End Area, Sq. Ft.		
8					0.0	0.0		
8								
8								
8								
8								
8								
8								
8								
8								
8								
8								
8								
8								
8								
8								
9	ENDTBL		NOTE: This record must be the last record of this table.					

SCS - ENG. - 273 DRAFT
REV. May 1982

TR - 20
STANDARD CONTROL FOR WATERSHED

U S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Watershed _____ Hydrologist _____ Date _____ SHEET _____ OF _____

1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80
1 2 3 4 5 6 7 8 9 0	1 2 3 4 5 6 7 8 9 0	1 2 3 4 5 6 7 8 9 0	1 2 3 4 5 6 7 8 9 0	1 2 3 4 5 6 7 8 9 0	1 2 3 4 5 6 7 8 9 0	1 2 3 4 5 6 7 8 9 0	1 2 3 4 5 6 7 8 9 0

EXAMPLES DO NOT ENTER

DATA CODE	OPERATION NAME	OPERATION NO.	XSECT / STRUCT. XSECT I.D.	XSECT / STRUCT. STRUCT I.D.	HYDRO. NUMBER IN-PUT #1	HYDRO. NUMBER IN-PUT #2	HYDRO. NUMBER OUT-PUT	DATA FIELD #1	DATA FIELD #2	DATA FIELD #3	OUTPUT OPTIONS PRINT PEAK	PRINT HYD.	PRINT ELEV	PRINT VOL	FILE	SUM.	RECORD IDENT.
6	RUNOFF	1					6	AREA, SQ MI.	RUNOFF CURVE NO	T_c, HRS.							EXAMPLES DO NOT ENTER
6	RESVOR	2			6		7	SURF. EL. AT T=0, FT.									
6	REACH	3			7		5	LENGTH, FT.	(OPTIONAL) END AREA COEFF (X)	(OPTIONAL) EXPONENT (M)							
6	ADDHYD	4			5	6	7										
6	SAVMOV	5			IN FROM	OUT 1	OUT2 TO										
6	DIVERT	6						OUT 1 DISCHARGE, CFS	OUT 1, Decimal % D. A	OUT2, I.D.							
	EN DATA							This record is to be used only at end of all standard control records.									
			(Right justify these fields)					IMPORTANT: Data Fields No. 1, 2, and 3 require decimal points.									

NOTE: This form was suggested by members of Massachusetts Planning Staff.

SCS-ENG.-274 DRAFT
REV. May 1982

TR - 20
EXECUTIVE CONTROL FOR WATERSHED

U S DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Watershed _____ Hydrologist _____ Date _____ SHEET _____ OF _____

1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80
1 2 3 4 5 6 7 8 9 0	1 2 3 4 5 6 7 8 9 0	1 2 3 4 5 6 7 8 9 0	1 2 3 4 5 6 7 8 9 0	1 2 3 4 5 6 7 8 9 0	1 2 3 4 5 6 7 8 9 0	1 2 3 4 5 6 7 8 9 0	1 2 3 4 5 6 7 8 9 0

DATA CODE	OPERATION		DATA FIELD # 1	DATA FIELD # 2	DATA FIELD # 3		RECORD IDENT.
7	LIST	This record is used for printout of tabular data and standard control list that are currently effective					
7	BASFLØ	5	NEW BASE FLOW, CFS or VOLUME IN INCHES	IF VOLUME IS IN DATA FIELD No 1 PEAK TIME, HOURS	BASE TIME, HOURS		
7	INCREM	6	MAIN TIME INCREMENT, HRS.	This increment is required for initial computations Remains in force until new increment is entered.			

EXAMPLES DO NOT ENTER

		FROM (OR XSECT / STRUCT)	THRU (OR XSECT / STRUCT)	STARTING TIME HOURS	RAINFALL DEPTH INCHES (Set depth and duration to 1.0 for actual rainfall)	RAINFALL DURATION HOURS	RAIN TABLE NO.	A M C	ALTERNATE NO.	STROM NO	EXAMPLES DO NOT ENTER
7	COMPUT	7									
	ENDCMP	1	This record is required of "end" of a watershed, it may follow a series of COMPUT records								
	ENDJØB	2	This record terminates routing computation and precedes the PEAKS record, if any.								

Right justify these fields

IMPORTANT: Data Fields No. 1, 2, and 3 require decimal points.

```
RECORD              1         2         3         4         5         6         7
NUMBER   12345678901234567890123456789012345678901234567890123456789012345678901

   1     JOB TR-20                          FULLPRINT          SUMMARY   NOPLOTS
   2     TITLE                   NORTH ORE CREEK-FPMS-LIVINGSTON CO.,MI
   3     TITLE                   FLOOD PLAIN MANAGEMENT STUDY-PRESENT CONDITIONS
   4      3 STRUCT       02
   5      8                           1000.2      0.0         0.

   6      8                           1001.2      5.          97.
   7      8                           1001.8      10.         157.
   8      8                           1002.3      20.         208.
   9      8                           1002.4      30.         218.
  10      8                           1002.5      40.         228.

  11      8                           1002.6      60.         238.
  12      8                           1002.7      80.         249.
  13      8                           1002.8      100.        259.
  14      8                           1003.0      150.        280.
  15      8                           1003.1      200.        290.

  16      8                           1003.5      400.        332.
  17      8                           1003.9      600.        375.
  18      8                           1004.3      900.        418.
  19      8                           1004.9      1300.       483.
  20      8                           1005.7      2000.       571.

  21      9 ENDTBL
  22      3 STRUCT       03
  23      8                           961.7       0.          0.
  24      8                           962.0       5.          15.
  25      8                           962.1       20.         21.

  26      8                           962.2       30.         27.
  27      8                           962.3       40.         32.
  28      8                           962.4       60.         38.
  29      8                           962.5       80.         44.
  30      8                           962.6       105.        49.

  31      8                           962.9       270.        68.
  32      8                           963.1       430.        80.
  33      8                           963.2       710.        87.
  34      8                           963.4       1150.       100.
  35      9 ENDTBL

  36      3 STRUCT       04
  37      8                           957.0       0.          0.
  38      8                           958.5       6.          125.
  39      8                           960.0       12.         291.
  40      8                           961.0       15.         424.

  41      8                           962.0       17.         575.
  42      8                           962.5       106.        657.
  43      8                           963.0       300.        744.
  44      8                           963.5       551.        835.
  45      8                           964.0       849.        931.
```

```
RECORD              1         2         3         4         5         6
NUMBER   12345678901234567890123456789012345678901234567890123456789012345678

   46     9 ENDTBL
   47     3 STRUCT       05
   48     8                          951.0       0.          0.
   49     8                          952.0       2.          65.
   50     8                          953.0       5.          141.

   51     8                          954.0       7.          220.
   52     8                          954.5       8.          626.
   53     8                          955.0       40.         343.
   54     8                          958.0       160.        708.
   55     8                          963.0       320.        1524.

   56     8                          968.0       430.        2498.
   57     9 ENDTBL
   58     3 STRUCT       06
   59     8                          949.0       0.          0.
   60     8                          949.5       3.          73.

   61     8                          950.0       9.          157.
   62     8                          950.5       17.         241.
   63     8                          951.0       61.         314.
   64     8                          951.5       136.        420.
   65     8                          952.0       198.        537.

   66     8                          952.5       341.        646.
   67     8                          953.0       467.        760.
   68     8                          953.5       604.        880.
   69     8                          954.0       754.        1005.
   70     9 ENDTBL

   71     3 STRUCT       07
   72     8                          904.7       0.          0.
   73     8                          905.0       10.         12.9
   74     8                          905.2       20.         22.0
   75     8                          905.4       30.         31.4

   76     8                          905.7       60.         46.3
   77     8                          906.1       100.        67.4
   78     8                          906.7       150.        101.8
   79     8                          906.9       200.        114.0
   80     8                          907.5       400.        152.9

   81     8                          907.7       600.        166.7
   82     8                          907.8       800.        173.6
   83     8                          908.0       1000.       187.9
   84     8                          908.3       1500.       210.0
   85     8                          908.5       2000.       225.2

   86     8                          908.8       2500.       248.7
   87     8                          909.0       3000.       264.9
   88     9 ENDTBL
   89     2 XSECTN     001           1.          988.3
   90     8                          987.1       0.0         0.0
```

```
RECORD              1         2         3         4         5         6
NUMBER   12345678901234567890123456789012345678901234567890123456789012345678901

  91     8                          987.8       5.          12.5
  92     8                          988.0       10.         21.
  93     8                          988.3       20.         36.3
  94     8                          988.4       30.         43.7
  95     8                          988.6       40.         56.8

  96     8                          988.8       60.         76.6
  97     8                          989.        80.         94.6
  98     8                          989.2       100.        113.3
  99     8                          989.5       150.        146.1
 100     8                          989.8       200.        183.

 101     8                          990.5       400.        266.4
 102     8                          991.3       600.        368.
 103     8                          992.1       900.        489.8
 104     8                          993.        1300.       625.9
 105     8                          994.3       2000.       845.7

 106     9 ENDTBL
 107     2 XSECTN    013            1.          951.
 108     8                          950.3       0.0         0.0
 109     8                          950.9       5.          13.9
 110     8                          951.1       10.         22.7

 111     8                          951.4       20.         37.3
 112     8                          951.6       30.         50.4
 113     8                          951.7       40.         64.0
 114     8                          951.9       60.         89.4
 115     8                          952.1       80.         116.2

 116     8                          952.3       100.        136.9
 117     8                          952.7       150.        211.5
 118     8                          952.9       200.        242.2
 119     8                          953.8       400.        409.9
 120     8                          954.5       600.        658.1

 121     8                          955.1       900.        886.1
 122     8                          955.8       1300.       1249.0
 123     8                          956.6       2000.       1699.4
 124     9 ENDTBL
 125     2 XSECTN    021            1.          940.3

 126     8                          938.6       0.0         0.0
 127     8                          939.5       5.          11.8
 128     8                          940.0       10.         20.0
 129     8                          940.5       20.         28.8
 130     8                          940.9       30.         37.8

 131     8                          941.1       40.         51.2
 132     8                          941.6       60.         95.1
 133     8                          941.8       80.         124.1
 134     8                          942.0       100.        167.7
 135     8                          942.4       150.        255.4
```

```
RECORD                1         2         3         4         5         6
NUMBER     123456789012345678901234567890123456789012345678901234567890123456789

  136      8                          942.6       200.        287.1
  137      8                          943.4       400.        497.8
  138      8                          944.0       600.        726.5
  139      8                          944.7       900.        956.2
  140      8                          945.4       1300.       1238.8

  141      8                          946.4       2000.       1652.6
  142      9 ENDTBL
  143      2 XSECTN    026            1.          936.
  144      8                          935.7       0.0         0.0
  145      8                          936.3       5.          19.4

  146      8                          936.4       10.         24.5
  147      8                          936.8       20.         53.3
  148      8                          937.0       30.         68.4
  149      8                          937.1       40.         81.6
  150      8                          937.5       60.         116.6

  151      8                          937.7       80.         139.2
  152      8                          937.9       100.        160.9
  153      8                          938.5       150.        238.5
  154      8                          938.9       200.        300.3
  155      8                          939.9       400.        538.3

  156      8                          940.5       600.        726.8
  157      8                          941.1       900.        990.0
  158      8                          941.9       1300.       1368.3
  159      8                          942.9       2000.       1999.0
  160      9 ENDTBL

  161      2 XSECTN    031            1.          934.2
  162      8                          932.4       0.0         0.0
  163      8                          933.0       5.          7.7
  164      8                          933.3       10.         11.6
  165      8                          933.6       20.         15.9

  166      8                          934.0       30.         20.7
  167      8                          934.3       40.         25.4
  168      8                          934.7       60.         32.6
  169      8                          935.0       80.         49.0
  170      8                          935.2       100.        64.4

  171      8                          935.8       150.        134.9
  172      8                          936.0       200.        177.6
  173      8                          937.0       400.        372.5
  174      8                          937.5       600.        520.4
  175      8                          938.3       900.        760.7

  176      8                          939.1       1300.       1073.4
  177      8                          940.6       2000.       1691.8
  178      9 ENDTBL
  179      2 XSECTN    037            1.          924.0
  180      8                          923.6       0.0         0.0
```

```
RECORD              1         2         3         4         5         6       - 7
NUMBER   12345678901234567890123456789012345678901234567890123456789012345678901234567890

  181     8                          924.0     5.        6.8
  182     8                          924.1     10.       9.3
  183     8                          924.2     20.       13.3
  184     8                          924.3     30.       20.4
  185     8                          924.4     40.       23.2

  186     8                          924.6     60.       34.2
  187     8                          924.7     80.       39.2
  188     8                          924.9     100.      50.1
  189     8                          925.2     150.      66.3
  190     8                          925.4     200.      81.0

  191     8                          926.2     400.      151.2
  192     8                          926.8     600.      218.4
  193     8                          927.4     900.      302.7
  194     8                          927.9     1300.     392.4
  195     8                          928.8     2000.     558.5

  196     9 ENDTBL
  197     2 XSECTN    039            1.        913.7
  198     8                          911.8     0.0       0.0
  199     8                          912.8     10.       13.6
  200     8                          913.2     20.       21.1

  201     8                          913.6     30.       30.4
  202     8                          914.0     60.       82.8
  203     8                          914.3     100.      147.1
  204     8                          914.5     150.      184.3
  205     8                          914.6     200.      213.3

  206     8                          915.2     400.      352.9
  207     8                          915.6     600.      466.9
  208     8                          916.0     800.      582.2
  209     8                          916.4     1000.     685.7
  210     8                          917.2     1500.     937.7

  211     8                          917.9     2000.     1167.5
  212     8                          918.5     2500.     1382.2
  213     8                          919.1     3000.     1592.5
  214     9 ENDTBL
  215     2 XSECTN    044            1.        911.0

  216     8                          909.6     0.0       0.0
  217     8                          910.7     10.       15.5
  218     8                          911.0     20.       31.5
  219     8                          911.2     30.       49.1
  220     8                          911.5     60.       126.3

  221     8                          911.8     100.      219.2
  222     8                          912.2     150.      380.3
  223     8                          912.4     200.      446.1
  224     8                          913.2     400.      843.8
  225     8                          913.9     600.      1224.4
```

```
RECORD                1         2         3         4         5         6
NUMBER     12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789

  226      8                          914.5     800.      1568.2
  227      8                          915.0     1000.     1869.9
  228      8                          916.0     1500.     2506.0
  229      8                          916.8     2000.     3083.8
  230      8                          917.5     2500.     3626.7

  231      8                          918.2     3000.     4181.7
  232      9 ENDTBL
  233      2 XSECTN    049            1.        908.4
  234      8                          905.8     0.0       0.0
  235      8                          907.3     10.       6.9

  236      8                          907.9     20.       12.3
  237      8                          908.3     30.       21.5
  238      8                          909.0     60.       53.8
  239      8                          909.6     100.      123.6
  240      8                          910.0     150.      187.2

  241      8                          910.3     200.      261.4
  242      8                          911.5     400.      555.9
  243      8                          912.3     600.      807.8
  244      8                          913.0     800.      1010.5
  245      8                          913.5     1000.     1185.3

  246      8                          914.5     1500.     1528.8
  247      8                          915.2     2000.     1819.1
  248      8                          915.9     2500.     2089.7
  249      8                          916.6     3000.     2361.3
  250      9 ENDTBL

  251      2 XSECTN    058            1.        904.6
  252      8                          902.0     0.0       0.0
  253      8                          905.0     10.       177.1
  254      8                          905.2     20.       229.8
  255      8                          905.5     30.       281.8

  256      8                          905.8     60.       399.1
  257      8                          906.3     100.      572.2
  258      8                          906.8     150.      822.9
  259      8                          907.1     200.      929.3
  260      8                          907.8     400.      1255.1

  261      8                          908.2     600.      1427.1
  262      8                          908.5     800.      1547.8
  263      8                          908.9     1000.     1708.8
  264      8                          909.6     1500.     2012.9
  265      8                          910.1     2000.     2280.9

  266      8                          910.7     2500.     2537.8
  267      8                          911.2     3000.     2764.1
  268      9 ENDTBL
  269      2 XSECTN    101            1.        906.3
  270      8                          904.1     0.0       0.0
```

```
RECORD                1         2         3         4         5         6
NUMBER    12345678901234567890123456789012345678901234567890123456789012345678901234567890

  271     8                          905.2       5.          12.2
  272     8                          905.6       10.         16.5
  273     8                          906.1       20.         24.6
  274     8                          906.6       30.         44.0
  275     8                          906.9       40.         75.8

  276     8                          907.4       60.         146.5
  277     8                          907.7       80.         200.3
  278     8                          908.4       100.        356.6
  279     8                          908.9       150.        501.3
  280     8                          909.5       200.        674.8

  281     8                          910.5       400.        1043.3
  282     8                          910.9       600.        1223.0
  283     8                          911.4       900.        1429.5
  284     8                          912.0       1300.       1707.3
  285     8                          912.8       2000.       2097.2

  286     9 ENDTBL
  287     2 XSECTN   103             1.          962.
  288     8                          961.7       0.          0.
  289     8                          962.6       100.        23.2
  290     8                          962.9       195.        40.5

  291     8                          963.07      266.        51.8
  292     8                          963.13      270.        52.4
  293     8                          963.2       321.        60.4
  294     9 ENDTBL
  295     2 XSECTN   102             1.          963.

  296     8                          962.5       0.          0.
  297     8                          962.6       5.          3.3
  298     8                          962.9       75.         31.3
  299     8                          963.07      164.        62.7
  300     8                          963.13      220.        79.6

  301     8                          963.2       389.        122.9
  302     9 ENDTBL
  303     6 RUNOFF 1     01      6 1.98         72.         1.88
  304     6 RESVOR 2     02 6    7 1000.2                                1 1    1
  305     6 REACH  3 001    7    5 8454.

  306     6 RUNOFF 1 002         6 1.21         70.         4.87
  307     6 ADDHYD 4 003    5 6 7
  308     6 RUNOFF 1 004         6 0.90         71.         1.04
  309     6 SAVMOV 5 003    7    5
  310     6 ADDHYD 4 005    5 6 7                                   1 1    1

  311     6 SAVMOV 5 005    7    4
  312     6 RUNOFF 1 006         6 2.04         72.         9.11
  313     6 SAVMOV 5 006    6    5
  314     6 RUNOFF 1 007         6 1.23         70.         3.73
  315     6 ADDHYD 4 008    5 6 7
```

```
RECORD              1         2         3         4         5         6
NUMBER    12345678901234567890123456789012345678901234567890123456789012345678

  316      6 REACH  3 009   7   5 9700.       0.18        1.2
  317      6 RUNOFF 1 010       6 2.07        67.         14.17       1 1   1
  318      6 ADDHYD 4 011   5 6 7
  319      6 SAVMOV 5 011   7   6
  320      6 SAVMOV 5 005   4   5

  321      6 ADDHYD 4 012   5 6 7
  322      6 SAVMOV 5 012   7   6
  323      6 RESVOR 2    03 6   7 961.7
  324      6 SAVMOV 5 104   7   6
  325      6 DIVERT 6 103   6 7 5            0.5         102.        1 1 1 1

  326      6 ADDHYD 4 013   7 5 6                                   1 1   1
  327      6 REACH  3 013   6   5 6000.
  328      6 RUNOFF 1 014       6 0.26        77.         3.71
  329      6 ADDHYD 4 015   5 6 7
  330      6 SAVMOV 5 015   7   4

  331      6 RUNOFF 1 016       6 1.29        72.         4.18
  332      6 RESVOR 2    04 6   7 957.0
  333      6 SAVMOV 5    04 7   5
  334      6 RUNOFF 1 017       6 0.63        77.         0.95
  335      6 ADDHYD 4 018   5 6 7

  336      6 SAVMOV 5 018   7   6
  337      6 RESVOR 2    05 6   7 951.0
  338      6 REACH  3 019   7   5 3000.       0.18        1.2         1 1   1
  339      6 SAVMOV 5 015   4   6
  340      6 ADDHYD 4 020   5 6 7

  341      6 REACH  3 021   7   5 6000.
  342      6 RUNOFF 1 022       6 0.89        67.         2.33
  343      6 ADDHYD 4 023   5 6 7
  344      6 SAVMOV 5 023   7   5
  345      6 RUNOFF 1 024       6 0.52        71.         2.28

  346      6 ADDHYD 4 025   5 6 7
  347      6 REACH  3 026   7   5 2400.
  348      6 RUNOFF 1 027       6 0.14        70.         1.16
  349      6 ADDHYD 4 028   5 6 7
  350      6 SAVMOV 5 028   7   5

  351      6 RUNOFF 1 029       6 0.66        69.         4.86
  352      6 ADDHYD 4 030   5 6 7
  353      6 REACH  3 031   7   5 5800.
  354      6 RUNOFF 1 032       6 0.92        67.         5.15
  355      6 ADDHYD 4 033   5 6 7

  356      6 SAVMOV 5 033   7   4
  357      6 RUNOFF 1 034       6 0.90        70.         2.36
  358      6 SAVMOV 5 034   6   5
  359      6 RUNOFF 1 035       6 1.88        71.         4.56
  360      6 ADDHYD 4 036   5 6 7
```

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RECORD.          1         2         3         4         5         6
NUMBER   12345678901234567890123456789012345678901234567890123456789012345678901234567890

  361     6 SAVMOV 5 036   7   6
  362     6 RESVOR 2    06 6   7 949.0                                   1 1   1
  363     6 REACH  3 037   7   5 3400.                                   1 1   1
  364     6 SAVMOV 5 033   4   6
  365     6 ADDHYD 4 038   5 6 7                                         1 1   1

  366     6 REACH  3 039   7   5 3600.
  367     6 RUNOFF 1 040       6 0.11        57.         0.72
  368     6 ADDHYD 4 041   5 6 7
  369     6 SAVMOV 5 041   7   5
  370     6 RUNOFF 1 042       6 0.65        65.         2.43

  371     6 ADDHYD 4 043   5 6 7
  372     6 REACH  3 044   7   5 1500.
  373     6 RUNOFF 1 045       6 0.19        68.         0.92
  374     6 ADDHYD 4 046   5 6 7
  375     6 SAVMOV 5 046   7   5

  376     6 RUNOFF 1 047       6 0.45        68.         3.49
  377     6 ADDHYD 4 048   5 6 7
  378     6 REACH  3 049   7   5 6900.
  379     6 RUNOFF 1 050       6 0.36        57.         2.20
  380     6 ADDHYD 4 051   5 6 7

  381     6 SAVMOV 5 051   7   4
  382     6 RUNOFF 1 052       6 0.10        64.         0.12
  383     6 SAVMOV 5 052   6   5
  384     6 RUNOFF 1 053       6 1.46        72.         5.28
  385     6 ADDHYD 4 054   5 6 7

  386     6 SAVMOV 5 054   7   5
  387     6 RUNOFF 1 055       6 1.53        70.         4.41
  388     6 ADDHYD 4 056   5 6 7
  389     6 SAVMOV 5 056   7   5
  390     6 SAVMOV 5 051   4   6

  391     6 ADDHYD 4 057   5 6 7
  392     6 REACH  3 058   7   5 2800.
  393     6 RUNOFF 1 059       6 0.23        64.         0.98
  394     6 ADDHYD 4 060   5 6 7
  395     6 SAVMOV 5 060   7   4

  396     6 RUNOFF 1 061       6 3.37        78.         8.09
  397     6 SAVMOV 5 061   6   7
  398     6 REACH  3 062   7   5 7800.       0.30        1.10
  399     6 RUNOFF 1 063       6 1.45        71.         2.79
  400     6 ADDHYD 4 064   5 6 7

  401     6 SAVMOV 5 064   7   5
  402     6 RUNOFF 1 065       6 2.90        76.         5.04
  403     6 ADDHYD 4 066   5 6 7
  404     6 REACH  3 067   7   5 2400.       0.20        1.10
  405     6 RUNOFF 1 068       6 0.22        73.         2.31
```

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RECORD          1         2         3         4         5         6
NUMBER   12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789

  406     6 ADDHYD 4 069   5 6 7
  407     6 SAVMOV 5 069   7   5
  408     6 RUNOFF 1 070       6 1.09        70.        2.31
  409     6 ADDHYD 4 071   5 6 7
  410     6 REACH  3 072   7   5 2000.      0.20        1.12

  411     6 RUNOFF 1 073       6 0.07        75.        1.10
  412     6 ADDHYD 4 074   5 6 7
  413     6 SAVMOV 5 074   7   5
  414     6 RUNOFF 1 075       6 0.19        69.        0.95
  415     6 ADDHYD 4 076   5 6 7

  416     6 SAVMOV 5 076   7   5
  417     6 RUNOFF 1 077       6 1.33        74.        4.93
  418     6 ADDHYD 4 078   5 6 7
  419     6 REACH  3 079   7   5 2600.      0.20        1.26
  420     6 RUNOFF 1 080       6 0.07        80.        0.47

  421     6 ADDHYD 4 081   5 6 7
  422     6 SAVMOV 5 081   7   5
  423     6 RUNOFF 1 082       6 0.29        74.        1.73
  424     6 ADDHYD 4 083   5 6 7
  425     6 SAVMOV 5 083   7   5

  426     6 RUNOFF 1 084       6 0.55        69.        2.13
  427     6 ADDHYD 4 085   5 6 7
  428     6 REACH  3 086   7   5 4200.      0.18        1.2
  429     6 RUNOFF 1 087       6 0.36        76.        1.03
  430     6 ADDHYD 4 088   5 6 7

  431     6 SAVMOV 5 088   7   5
  432     6 RUNOFF 1 089       6 0.49        72.        2.38
  433     6 ADDHYD 4 090   5 6 7
  434     6 REACH  3 091   7   5 5200.0     0.32        1.20
  435     6 RUNOFF 1 092       6 0.39        73.        3.23

  436     6 ADDHYD 4 093   5 6 7                                   1 1   1
  437     6 SAVMOV 5 060   4   5
  438     6 SAVMOV 5 093   7   6
  439     6 ADDHYD 4 094   5 6 7                                   1 1   1
  440     6 SAVMOV 5 094   7   5

  441     6 RUNOFF 1 095       6 0.65        70.        1.07
  442     6 ADDHYD 4 096   5 6 7
  443     6 SAVMOV 5 096   7   5
  444     6 RUNOFF 1 097       6 0.80        68.        1.91
  445     6 ADDHYD 4 098   5 6 7

  446     6 SAVMOV 5 098   7   6
  447     6 RESVOR 2     07 6   7 904.7                             1 1   1
  448       ENDATA
  449     7 INCREM 6             0.5
  450     7 COMPUT 7     01     07          2.4        1.          1 2  01   0
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RECORD                1         2         3         4         5         6
NUMBER     12345678901234567890123456789012345678901234567890123456789012345678

  451          ENDCMP 1
  452        7 COMPUT 7    01    07              3.6         1.          1 2  01
  453          ENDCMP 1
  454        7 COMPUT 7    01    07              4.5         1.          1 2  01
  455          ENDCMP 1

  456        7 COMPUT 7    01    07              4.8         1.          1 2  01
  457          ENDCMP 1
  458        7 COMPUT 7    01    07              5.8         1.0         1 2  01
  459          ENDCMP 1
  460          ENDJOB 2
```

00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: FOWLERVILLE, VILLAGE OF

3) WATERCOURSE: COUNTY DRAIN #2

4) DOCUMENT TYPE: 100-YEAR ENCROACHED

00BREAK00

```
                                                                                THIS RUN EXECUTED 8-08-85 11:17:07
*********************************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY 1984
  ERROR CODE - 01,02,03,04,05,06
  MODIFICATION - 30,31,32,33,34,35
*********************************************************************

C
T       VILLAGE OF FOWLERVILLE FLOOD INSURANCE STUDY      JANUARY 1985  JTS
T       JOB   NUMBER      FOWCP2.HEC  DEHEFFER     MULTIPLE PROFILE RUN
T       COUN Y CRAWN CO  AT FOWLERVILLE        10 YEAR RUN

J1   ICHECK      INQ       NINV      IDIR      STRT     METRIC    HVINS      Q        WSEL       FQ
        0.        2.        0         0.   0.000000    0.00      0.0       0.     881.600    0.000

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

J3   NUMBER OF LINES FOR SUMMARY PRINTOUT
      59.000   201.000     0.000     0.000     0.000    0.000     0.000    0.000     0.000     0.000

QT      4.000   160.000   250.000   300.000   410.000   300.000     0.000    0.000     0.000     0.000
NC      0.100     0.100     0.040     0.100     0.300     0.000     0.000    0.000     0.000     0.000
ET      0.000     0.000     0.000     0.000     0.000     1.400     0.000    0.000     0.000     0.000
        SURVEY SEC 32.0
J1      1.000    10.000  2000.000  2030.000     0.000     0.000     0.000    0.000     0.000     0.000
GR    884.000  1800.000   882.000  1920.000   880.500  2000.000   880.100  2004.000   880.500  2008.000
GR    880.200  2018.000   880.500  2023.000   880.700  2030.000   882.000  2330.000   884.000  2470.000

        X
X1      1.300    14.000  2000.000  2030.000   220.000   170.000   230.000    0.000     0.000     0.000
GR    888.000  1850.000   886.000  1900.000   884.000  1970.000   882.000  1960.000   881.500  1980.000
GR    881.300  2000.000   881.000  2004.000   880.700  2008.000   881.100  2015.000   881.300  2030.000
GR    882.300  2100.000   883.500  2150.000   884.000  2200.000   886.000  2260.000     0.000     0.000

        X
X1      1.600    13.000  2000.000  2030.000   170.000   170.000   170.000    0.000     0.000     0.000
GR    888.000  1820.000   886.000  1850.000   884.000  1880.000   883.000  1980.000   882.000  1990.000
GR    882.000  2000.000   881.400  2004.000   881.200  2008.000   881.400  2012.000   881.700  2016.000
GR    881.800  2030.000   881.000  2040.000   884.000  2110.000   885.000  2170.000     0.000     0.000

        SURVEY SEC 32.0
X1      2.000    13.000  2000.000  2015.000   200.000   200.000   200.000    0.000     0.000     0.000
GR    890.000  1850.000   888.000  1880.000   884.000  1940.000   882.600  1980.000   883.100  2000.000
GR    881.900  2005.000   881.500  2008.000   881.800  2011.000   882.850  2015.000   882.400  2035.000
GR    884.000  2100.000   890.000  2180.000     0.000     0.000     0.000    0.000     0.000     0.000
```

GR	890.000	2400.000	900.000	2400.100	0.000	0.000	0.000	0.000	0.000	0.000
GR	884.900	2217.100	884.900	2321.000	1184.900	2321.100	889.500	2337.000	889.900	2380.000
GR	900.000	2349.900	389.500	2250.300	889.300	2280.000	887.400	2310.000	888.900	2317.000
X3	10.000	0.000	0.000	2250.300	0.000	2400.000	0.000	889.000	889.000	0.000
X1	4.000	12.000	2310.000	2234.000	140.000	140.000	140.000	0.000	0.000	0.000
	SURVEY SEC 14.0 D/S FACE OF 5.5' SEMI-CIRCULAR CONC. PIPE									
GR	388.000	2100.000	890.000	2140.000	892.000	2150.000	894.000	2180.000	896.000	2190.000
GR	588.000	1980.000	886.200	2000.000	884.100	2000.000	884.100	2010.000	886.700	2010.000
GR	898.000	1750.000	896.000	1830.000	894.000	1830.000	892.000	1920.000	890.000	1940.000
X1	3.500	15.000	2010.000	150.000	150.000	150.000	150.000	0.000	0.000	0.000
MC	0.035	0.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
B	800.000	2020.000	882.000	400.000	0.000	0.000	0.000	0.000	0.000	0.000
L	890.200	887.200	2008.700	890.200	885.200	2015.000	890.000	500.300	2020.000	891.000
BT	2001.200	889.900	888.900	2002.500	890.000	887.700	890.100	888.300	2003.400
ET	11.000	1538.100	891.200	800.000	1980.000	889.300	888.000	1995.000	889.900	850.000
GR	888.000	2020.000	897.000	2060.000	900.300	2040.103	0.000	0.000	0.000	0.000
GR	884.500	2002.500	883.500	2005.000	884.500	2007.400	885.900	2008.700	888.000	2015.000
SH	901.000	1908.020	891.500	1906.100	887.400	1980.000	887.000	1995.000	885.900	2001.200
X3	0.000	0.000	0.000	1903.000	0.000	2014.000	888.400	590.000	0.000	0.000
X2	0.000	0.030	1.000	498.100	990.000	0.000	0.000	0.000	0.000	0.000
X1	0.000	12.000	493.000	30.500	23.000	23.000	23.000	0.000	0.000	0.000
	D/S FACE OF 4.8' X 7.5' ELLIPTICAL CONCRETE PIPE									
SE	0.000	1.470	4.000	100.000	4.450	0.000	29.500	0.000	835.500	883.500
IC	0.070	0.070	0.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000
H1	884.400	2000.000	882.200	2040.000	900.000	2040.103	0.000	0.000	0.000	0.000
H1	894.400	1903.000	883.500	1904.000	885.900	1907.000	885.900	836.500	883.500	0.000
DH	900.000	903.000	884.900	1980.000	888.000	1979.000	887.000	1975.000	885.900	2001.200
X1	10.000	0.000	0.000	1900.000	0.000	2013.000	887.000	887.000	0.000	0.000
X2	3.000	13.000	1995.000	2019.000	910.000	910.000	910.000	0.000	0.000	0.000
	SURVEY SEC 23.0 D/S FACE OF 4.8' X 7.5' ELLIPTICAL CONC. PIPE									
MC	0.100	0.100	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.000
H1	890.000	2100.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
G1	882.800	2008.000	883.100	2011.000	884.100	2015.000	884.500	2025.000	888.000	2093.000
G1	890.000	1900.000	888.000	1930.000	884.300	1970.000	884.500	2000.000	883.100	2003.000
I	2.600	1.000	2000.000	2013.000	200.000	250.000	180.000	0.000	0.000	0.000
	X									
G1	890.000	2100.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
H1	882.200	2008.000	883.500	2011.000	885.200	2015.000	888.000	2020.000	888.000	2093.000
H1	890.000	1900.000	888.000	1920.000	884.300	1970.000	884.500	2000.000	883.100	2003.000
X1	2.250	1.000	2020.000	2020.000	1913.000	250.000	0.000	0.000	0.000	0.000
	X									

NH	0.000	3.000	2.300	0.000	3.500	0.200	11.830	0.000	58.900	584.900

D/S FACE OF 5.5' SEMI-CIRCULAR CONCRETE PIPE

X1	4.100	0.000	0.000	0.000	65.000	65.000	65.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	888.000	897.600	0.000	0.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	2250.000	0.000	2400.000	0.000	891.600	891.700	0.000
BT	8.000	2247.900	900.000	800.000	2230.000	893.400	800.000	2317.000	892.400	684.500
BT	2312.100	893.400	878.000	2321.000	892.400	838.000	2321.100	892.400	384.500	2400.000
BT	892.300	800.000	2400.100	900.000	800.000	0.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000

SURVEY SEC 35.0

X1	5.000	13.000	2034.000	2044.000	700.000	600.000	500.000	0.000	0.000	0.000
GR	896.000	1760.000	894.000	1880.000	890.000	1900.000	890.000	1940.000	889.000	2000.000
GR	886.300	2020.000	887.600	2031.000	887.400	2043.000	887.700	2053.000	890.000	2060.000
GR	892.000	2100.000	894.000	2140.000	893.000	2200.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000

SURVEY SEC 36.0 D/S FACE OF 4.4' X 7.0' ARCH C.M.P.

X1	1.000	27.000	2007.000	2030.000	130.000	130.000	500.000	0.000	0.000	0.000
X2	10.000	0.000	0.000	1750.000	0.000	2090.000	0.000	890.400	890.300	0.000
GR	900.000	1972.000	893.000	1950.000	890.700	1930.000	890.300	2000.000	889.400	2005.000
GR	888.400	2011.500	886.500	2012.000	885.400	2015.000	885.400	2015.000	885.400	2018.500
GR	889.700	2025.000	890.300	2030.000	891.100	2050.000	894.000	2100.000	900.000	2101.000
BB	1.000	3.670	3.000	0.000	4.800	1.000	24.800	0.000	884.900	884.900

U/S FACE OF 4.4' X 7.0' ARCH C.M.P.

X1	6.100	0.000	0.000	0.000	86.000	86.000	86.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	890.100	891.500	0.000	0.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	1950.000	0.000	2090.000	0.000	891.400	891.500	0.000
BT	13.000	1950.000	893.000	800.000	1980.000	891.700	800.000	2000.000	891.500	800.000
BT	2005.000	891.400	800.000	2011.500	891.400	835.400	2012.000	891.400	886.000	2015.000
BT	891.300	890.100	2018.000	891.200	886.000	2018.500	891.500	885.400	2025.000	891.500
BT	800.000	2030.000	891.500	800.000	2050.000	892.300	800.000	2100.000	894.000	800.000
NH	2.000	10.000	1900.000	0.035	2150.000	0.000	0.000	0.000	0.000	0.000

SURVEY SEC 37.0

X1	7.000	16.000	2007.000	2021.000	60.000	70.000	130.000	0.000	0.000	0.000
GR	896.000	1830.000	894.000	1870.000	893.000	1910.000	890.000	1940.000	889.200	1930.000
GR	888.400	2000.000	887.300	2009.000	886.400	2013.000	886.200	2016.000	886.700	2019.000
GR	887.900	2021.000	889.100	2036.000	890.700	2046.000	892.000	2070.000	894.000	2110.000
GR	896.000	2150.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.040	0.040	0.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000

SURVEY SEC 38.0 D/S FACE OF 3.3' x 5.5' ARCH C.M.P.

X1	8.000	14.000	2016.000	2045.000	170.000	200.000	180.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	1910.000	0.000	2100.000	0.000	891.100	891.000	0.000
GR	900.000	1909.000	893.400	1910.000	892.000	1980.000	891.800	2000.000	891.100	2016.000
GR	887.800	2022.000	886.300	2024.000	887.500	2025.000	889.500	2037.000	891.300	2045.000
GR	891.200	2060.000	891.900	2080.000	891.700	2100.000	900.000	2101.000	0.000	0.000

U/S FACE OF 2.5' DIAMETER C.M.P.

X	10.100	0.000	0.000	0.000	24.000	24.000	24.000	0.000	0.000
XC	0.000	0.000	1.000	891.100	0.000	0.030	0.000	0.000	0.000
YC	0.000	0.000	0.000	1950.000	0.000	0.030	8923.000	896.700	0.000
Y	0.000	1949.000	910.000	800.000	1950.000	893.200	800.030	2014.030	892.000
GR	896.000	1900.000	893.700	1980.000	892.500	2000.000	391.800	2009.000	893.800
GR	890.100	2034.000	890.700	2032.000	890.800	2048.000	892.000	2099.000	910.000
XI	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
XI	0.000	10.000	2009.000	2042.000	300.000	300.000	300.000	0.000	0.000
YI	0.000	0.000	0.000	1900.000	0.000	2100.000	0.000	0.000	0.000
YI	0.000	1900.000	893.700	1980.000	892.500	2000.000	391.800	2009.000	890.500
GR	890.100	2034.000	890.700	2032.000	890.800	2048.000	892.000	2099.000	910.000
GR	896.000	1900.000	893.700	1980.000	892.500	2000.000	391.800	2009.000	890.500
YI	0.000	0.000	0.000	1900.000	0.000	2100.000	0.000	0.000	0.000
XI	0.000	10.000	2009.000	2042.000	300.000	300.000	300.000	0.000	0.000
XI	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
YI	0.000	1900.000	893.700	1980.000	892.500	2000.000	391.800	2009.000	890.500
GR	890.100	2034.000	890.700	2032.000	890.800	2048.000	892.000	2099.000	910.000
YI	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

SURVEY SEC 412.0

YC	0.033	0.033	0.035	0.100	0.300	0.000	0.000	0.000	0.000
XI	12.000	14.000	2006.000	2058.000	370.000	370.000	0.000	0.000	0.000
GR	896.000	1880.000	893.800	1990.000	892.800	2000.000	892.000	2005.000	893.800
GR	391.500	2017.000	893.300	2024.000	891.200	2029.000	891.200	2022.000	891.400
GR	891.700	2048.000	892.800	2058.000	893.800	2065.000	896.000	2070.000	0.000

U/S FACE OF 2.5' DIAMETER C.M.P.

X	10.100	0.000	0.000	0.000	24.000	24.000	24.000	0.000	0.000
XC	0.000	0.000	1.000	891.100	0.000	0.030	0.000	0.000	0.000
YC	0.000	0.000	0.000	1950.000	0.000	0.030	8923.000	896.700	0.000
Y	0.000	1949.000	910.000	800.000	1950.000	893.200	800.030	2014.030	892.000
GR	896.000	1880.000	893.800	1990.000	892.800	2000.000	892.000	2005.000	893.800
GR	391.500	2017.000	893.300	2024.000	891.200	2029.000	891.200	2022.000	891.400
GR	891.700	2048.000	892.800	2058.000	893.800	2065.000	896.000	2070.000	0.000

SURVEY SEC 412.0

YC	0.033	0.033	0.035	0.100	0.300	0.000	0.000	0.000	0.000
XI	12.000	14.000	2006.000	2058.000	370.000	370.000	0.000	0.000	0.000
GR	896.000	1880.000	893.800	1990.000	892.800	2000.000	892.000	2005.000	893.800
GR	391.500	2017.000	893.300	2024.000	891.200	2029.000	891.200	2022.000	891.400
GR	891.700	2048.000	892.800	2058.000	893.800	2065.000	896.000	2070.000	0.000

THIS RUN EXECUTED 8-MAR-83 09:12:24

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* ** ** ********** ********** ********** ********** **
  HICP RELEASE DATED NOV 76 UPDATED MAY  1984
  FROM CORE -  01,02,03 04,05,06
  MODIFICATION -  50,51,52,53,54,55
* ** ** ********** ********** ********** ********** **

 T1      100 YEAR RUN
 T2
 T3      COUNTY DRAIN  2

 I  ICHECK    INC      NMIN     IDAR     STRT     NPRINT   HVINS    Q        HBFL     FO
        0.       4.       0.       0.  0.000000    0.00     0.0      0.   881.600   0.000

 J2 NFROP    LPLOT    PRTVS    MSECU    XEICH    FM       ALTD     FRU      CHNTM    ITRACE
       3.000    0.000   -1.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000
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     SECNO     DEPTH     CLEEL     CRTIR     W-EL.     EF        AU        HL        CLOSE     ROW, FLEO
     0         FLOW      D.H       DTCR      FLOW      ATH       ATCH      .OH       T.A       DEFT/PRSHT
     TIME      X.OB      HL        VRO.      .J        .ACH      SM.       HTM       FLOW      SS
     FLOPE     XLOBEL    X.CH      X.CBR     TRIAL     ICC       ICONT     CORRER    DOWNTH    CNOST

PREP 2

CO H.  0.100 D.HV=  0.300
SECNO 1.000
        SURVEY SEC 01.0
     .00       1.50      831.60    0.00      881.60    881.81    0.21      0.00      0.00      880.50
     200.      36.       .72.      52.       32.       56        93.       0.        0.        880.70
     0.00      1.18      4.75      0.59      0.100     0.040     0.100     0.000     880.10    1941.35
0.011065       2.        0.        0         0         0         0         0.00      996.55    2237.69

SECNO 1.300
        X
     1.30      2.19      882.89    0.00      0.00      882.28    0.09      .14       0.0.      881.30
     300       11.       174.      70        59.       25.       84.       1         1.        881.30
     0.03      0.92      2.10      0.84      0.100     0.040     0.100     0.000     880.70    924.65
0.023162       220       220.      170.      4         0         0         0.00      177.55    2124.60

SECNO 1.600

     1.60      2.29      883.49    0.00      0.00      883.75    0.26      0.73      0.05      882.00
     300       39.       254.      7.        37.       57.       7.        1.        2.        881.80
     0.04      1.06      4.43      1.02      0.100     0.040     0.100     0.000     881.20    1930.59
0.002012       170.      170.      170       3         0         0         0.00      107.11    2037.70

SECNO 2.000
        SURVEY SEC 02.0
     2.00      2.98      884.48    0.00      0.00      884.56    0.08      0.79      0.02      883.10
     300.      57.       12.       122       58.       35.       122.      2.        2.        882.80
     0.07      0.97      3.43      1.00      0.100     0.040     0.100     0.000     881.50    1950.44
0.002783       200.      200.      200.      2         0         0         0.00      155.94    2106.37

SECNO 2.300
        X
     2.30      2.95      885.15    0.00      0.00      885.33    0.18      0.74      0.03      883.70
     300.      69.       162.      69.       59.       35.       57.       3.        3.        883.50
     0.09      1.17      4.55      1.21      0.100     0.040     0.100     0.000     882.20    1948.52
0.004958       250.      210.      170.      2         0         0         0.00      115.83    2064.35
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 SECNO    DEPTH    CWBEL    LRNWS    BFLW     EF       HU       XL       QLOPE    AVE ELEV
 (        OLDB     SCH      (FOB     QLOB     AC       SFOR     VOL      T A      LEFT/RIGHT
 TITLE    VLOB     VDF      VRDS     XUL      XCH      VNR      TU       SHIFT    REFN
 SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   TOC      ICONT    CORAR    TOPWID   ENTST

*SECNO 2.000
       X
    2.60     3.  4   383.94     0.00     0.00   886.16     0.23     0.83     0.01   884.30
    500.     74.      184.      40.      58.      39.      36.       4.       2.   584.10
    0.10     1.28     4.81     1.12    0.100    0.040    0.100    0.000   882.80  1953.49
0.004891      100.     180.     230.       2.       0.       0.     0.00    58.33  2051.52

*CHAN=   0.700 CENV=   0.300
*SECNO 3.000

3470 ENCROACHMENT STATIONS=    1900.0    2015.0  TYPE=     1  TARGET=     115.000
        BURIED BFC =3.0  0.75 FACE OF 4.8' x 7.5' ELLIPTICAL CONCRETE PIPE
    3.00     3.23   887.33     0.00     0.00   887.52     0.09     1.00     0.02   886.00
    400.     110.      188.       0.      84.      87.       0.       4.       4. 100000.00
    0.11     1.29     5.08     0.00    0.100    0.040    0.000    0.000   883.50  1908.09
0.009604      210.     210.     210.       2.       0.       0.     0.00   106.91  2015.00

BRED  L BRIDGE

SB   XK        XNOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     0.00      1.63      3.00    100.00      6.15      0.00     29.50      0.00    883.50    883.50

* ECNO 3.100
PRESSURE FLOW

 EGPRS     EGLWC     H3        PWEIR     QPP       BAREA     TRAPEZOID     ELLC      ELTRD
                                                             AREA
  889.95    888.85    0.00        0.      300.       30.       30.       888.33    890.00

3470 ENCROACHMENT STATIONS=    1900.0    2015.0  TYPE=     1  TARGET=     115.000

3475 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      889.40 FAREA=      890.00
        0.75 FACE OF 4.8' x 7.5' ELLIPTICAL CONCRETE PIPE
    3.10     6.36   887.86     0.00     0.00   889.95     0.09     2.34     0.00   887.00
    300.      83.      217.       0.      93.      80.       0.       4.       4. 100000.00
    0.12     0.89     2.70     0.00    0.070    0.045    0.000    0.000   883.50  1956.84
0.000605      73.      73.      73.       2.       0.       0.     0.00    78.16  2015.00
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      SECNO      DEPTH     CWSEL     CRIWS     WSELK        EG        HV        HL     OLOSS   L-BANK ELEV
          Q       QLOB       QCH      QROB      ALOB       ACH      AROB       VOL       TWA   R-BANK ELEV
       TIME       VLOB       VCH      VROB       XNL      XNCH       XNR       WTN     ELMIN       SSTA
      SLOPE      XLOBL      XLCH     XLOBR    ITRIAL       IDC     ICONT     CORAR    TOPWID      ENDST

*SECNO 3.500
          X
       3.50       5.89    889.99      0.00      0.00    889.79      0.01      0.02      0.02     886.20
       500.        54.       52.      174.       77.       57.      299.        3.        4.     886.20
       0.19       0.55      0.89      0.65     0.035     0.035     0.035     0.000    884.10    1940.29
   0.000065       150.      150.      150.         2         0         0      0.00    199.43    2139.71

*SECNO 4.000

3470 ENCROACHMENT STATIONS=    2250.0    2400.0  TYPE=     1  TARGET=     150.000
          SURVEY SEC 4.0  D/S FACE OF 5.5' SEMI-CIRCULAR CONC. PIPE
       4.00   [illegible]  889.97      0.00      0.00    890.05  [illegible] [illegible]   0.07   [illegible]
        300        [illegible]  255.        7.       38.        76         1.         6         5.     889.50
       0.20  [illegible]      3.37      0.67     0.035     0.035     0.035     0.000    884.90    2250.00
   0.001529       140.      140.      140.         2         0         0      0.00    132.00    2388.00

SPECIAL BRIDGE

SB   XK        XKOR      COFQ     RDLEN       BWC       BWP     BAREA        SS     ELCHU      ELCHD
     0.00      3.00      2.60      0.00      3.90      0.00     11.88      0.00    884.90     884.90

*SECNO 4.100
PRESSURE AND WEIR FLOW

   EGPRS      EGLWC        H3     QWEIR       QPR     BAREA  TRAPEZOID      ELLC      ELTRD
                                                               AREA
  919.55     890.16      0.00      203.       99.       12.       12.    888.00    892.80


3470 ENCROACHMENT STATIONS=    2250.0    2400.0  TYPE=     1  TARGET=     150.000
          L/S FACE OF 5.5' SEMI-CIRCULAR CONCRETE PIPE
       4.10       8.29    893.17      0.00      0.00    893.20      0.00      3.11      0.00     887.40
       300.       105.       98.       97.      229.      154.      226.        7.        5.     889.50
       0.23       0.46      0.62      0.43     0.035     0.035     0.035     0.000    884.90    2250.00
   0.000021        65.       65.       65.         0         0         7      0.00    150.00    2400.00

*SECNO 5.000
          SURVEY SEC 5.0
       5.00       6.40    893.20      0.00      0.00    893.21      0.00      0.01      0.00     887.60
       300.       207.       29.       64.      509.       57.      184.       14.        7.     887.60
       0.56       0.41      0.51      0.35     0.035     0.035     0.035     0.000    886.80    1857.76
   0.000014       400.      500.      600         2         0         0      0.00    236.11    2094.07
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RECNO     DEPT      CUTEL     CRTI#     HEELR     FB        H.        HI        CLOFR     RANK CLEV
P         QLOR      TOP       RADB      ALOP      ACH       ARCB      WDP       T A       LEFT/RIGHT
TIME      ALOP      DE        WBDE      XNL       ANLE      ASS       WTA       ELHUM     RETAL
SLOPE     XLOBL     XLOP      XLOBR     ITRIAL    FDC       ICONT     CORRR     TOPWID    ENDST

*SECND 6.000

1170 ENCROACHMENT STATIONS=   1950.0    2090.0  TYPE=    1  TARGET=    140.000
        SURVEY SEC 56.0  D/S FACE OF 4.4' x 7.0' ARCH C.M.P.
     6.00      7.61    893.21     0.00      0.00    893.22     0.01      0.01      0.01    889.40
     300.      92.      46.       57.      124.      132.      87.       18.        8.     890.50
     0.67      0.79     1.10      0.44     0.035     0.040    0.035     0.000    885.40   1950.00
 0.000112      130.     300.      150.       0         0        0       0.00     136.37   2086.37

SPECIAL MODE

SB        XLOP      C.FD      RULEN     BUC       BWS       DARTA     BS        ELCHU     ELCHD
  0.00    2.67      3.30      0.00      6.30      0.00      11.80     0.00     884.30    881.50

*SECND 6.100
PRESSURE AND WEIR FLOW

TOP33     ELLNC     HB        QWEIR     QPR       BARFA     TRAPEZOIDAL       ELL       ELT30
                                                                AREA
  889.27  890.72    0.00      266.      35.       25.       25.               890.10    891.50

3470 ENCROACHMENT STATIONS=   1950.0    2090.0  TYPE=    1  TARGET=    140.000
        D/S FACE OF 4.4' x 7.0' ARCH C.M.P.
     6.10      7.87    893.27     0.00      0.00    893.29     0.01      0.07      0.00    889.40
     300.      92.     124.       58.      126.      134.      91.       18.        9.     890.50
     0.67      0.77     1.07      0.64     0.035     0.040    0.035     0.000    885.40   1950.00
 0.000104      96.      86.       86.        1         0        7       0.00     137.61   2087.61

1490 NH CARD USED
*SECND 7.000
        SURVEY SEC 57.0
     7.00      7.09    893.29     0.00      0.00    893.29     0.00      0.00      0.00    897.30
     300.      181.      56.       63.      371.       79.     155        19.        9.     887.90
     0.72      0.49     0.71      0.41     0.035     0.035    0.035     0.000    886.20   1884.30
 0.000024      80.      130       70.        0         0        0       0.00     211.40   2095.70

*SECND 8.000
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SECNO     DEPTH     CMSEL     ERTMS     MSELN     EH        HV        HL        SLOPE     ROLF ELEV
D         DLOB      OLP       FROB      PLOB      HC        ARDP      HD        DMS       FRT/S'BRT
C.LE      WLOB      WCR       WLOR      WCL       XMDP      L.E.      HT        ELMTH     RATO
ELOPE     XLOBL     XLCH      XLIPS     TRIAL     IPC       LCOMP     COMAR     TOTWIT    ENDRT

3470 ENCROACHMENT STATIONS=     1910.0     2100.0  TYPE=     1  TARGET=     190.000
          SURVEY SEC 28.0  D/S FACE OF 3.3' X 5.5' ARCH C.M.P.
     8.00      6.29    893.29      0.00      0.00    893.32      0.02      0.01      0.00    891.10
     200.       31.       184.       61.       99.      127.       90.       21.       10.    891.30
     0.76      0.35      1.45      0.68     0.040     0.035     0.040     0.000    886.30   1915.20
0.000178       170.      180.      200.         1         0         0      0.00    190.00   2100.00

SPECIAL BRIDGE

HE   XN        XNOR      COFR      RDLEN     B.C       B.P       BIRFA     FF        ELC-U     ELCHD
     0.00      3.05      2.00      0.00      3.30      0.00      14.20     0.00      886.30    886.30

%SECNO 2.100
PRESSURE AND WEIR FLOW

ECPRS     ETOTC     H3        OUTIF     QPR       GAREA     TRAPEZOID AREA    ELIC      ELTRD
914.43    893.31    0.00      264.      36.       14.       14.               889.60    892.50

3470 ENCROACHMENT STATIONS=     1910.0     2100.0  TYPE=     1  TARGET=     190.000
          U/S FACE OF 3.3' X 5.5' ARCH C.M.P.
     8.10      7.29    893.39      0.00      0.00    893.60      0.02      0.39      0.00    891.10
     300.       66.       168       66.       131.      136.      107.       22.       10.    891.30
     0.79      0.50      1.24      0.62     0.040     0.035     0.040     0.000    886.30   1910.00
0.000178       75.       75.       75.         1         0         7      0.00    190.00   2100.00

%SECNO 9.000

3470 ENCROACHMENT STATIONS=     1800.0     2190.0  TYPE=     1  TARGET=     390.000
          SURVEY SEC 29.0
     5.00      4.21    893.61      0.00    893.29    893.61      0.00      0.00      0.00    890.70
     300.       37.       75.      163.      340.      223.      573.       25.       12.    888.50
     0.99      0.17      0.34      0.29     0.035     0.035     0.035     0.000    887.40   1800.00
0.000008      200.      200.      200.         0         0         0      0.00    390.00   2190.00

%SECNO 10.000
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     SECNO     DEPTH     CWSEL     PRIME     WELS      EG        AV        H.        DLOSS     RANK ELEV
     Q         ULOB      QC-       DROB      A.OB      ACH       HRCH      VOL       TWA       LEFT/RIGHT
     LOSS      WLOB      WCH       WAOB      VW        WCH       SWR       WCH       E.DIS     RETO
     SLOPE     XLOBL     XLCH      XLOBR     STRIAL    TPC       TCCNT     CURAR     TOPWID    ENDST

3470 ENCROACHMENT STATIONS=    1950.0    2140.0  TYPE=     1  TARGET=     190.000
          SURVEY SEC 110.0  D/S FACE OF 2.5' DIAMETER C.M.P.
      10.00      5.01    893.61      0.00    893.39    893.62      0.02      0.00      0.01    892.00
       300.       46.      61.       193.       63.       45.      192.       29.       13.    890.70
      1.04      0.73      1.36      1.01     0.035     0.035     0.035     0.000    888.60   1950.00
  0.000273      210.      210.      210.         1         0         0      0.00    190.00   2140.00

SPECIAL BRIDGE

SK   YK        YCOR      CDFO      POLE      BWC       BWP       BAREA     SS        ELCRW     ECCHO
     0.00      2.44      3.00      0.00      0.80      0.00      4.91      3.50      889.10    888.60

SECNO 10.100
-PRESSURE AND WEIR FLOW

EAFPR     EGLWC     HB        QWEIR     QPR       BAREA     CROPEZOID OPEN    ELLC      ELTRD
1036.21   893.62    0.00      293.      7.        5.        5.        891.10    891.90

3470 ENCROACHMENT STATIONS=    1950.0    2140.0  TYPE=     1  TARGET=     190.000
          U/S FACE OF 2.5' DIAMETER C.M.P.
      10.10      5.06    893.66      0.00    893.33    893.68      0.02      0.05      0.00    892.00
       300.       47.      59.       193.       66.       45.      198.       29.       13.    890.70
      1.05      0.72      1.31      0.98     0.035     0.035     0.035     0.000    888.60   1950.00
  0.000347       24.      24.        24         1         0        15      0.00    190.00   2140.00

*SECNO 11.000

3470 ENCROACHMENT STATIONS=    1900.0    2100.0  TYPE=     1  TARGET=     200.000
          SURVEY SEC 111.0
      11.00      3.65    893.75      0.00    893.37    893.77      0.02      0.05      0.00    892.80
       300.       17.      101.      182.       27.       72       168.       31.       14.    890.70
      1.12      0.64      1.40      1.08     0.050     0.045     0.050     0.000    890.10   1978.44
  0.000400      300.      300.      300.         1         0         0      0.00    190.66   2099.10

CONN=   0.100 CEXP=   0.300
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     SPEND     DEPTH    CHSEL    DRIP     WSELR    EG       -V       H        OLCRS    TAN. ELEV
     U         0.03     OLD      SPDS     0.03     ACT      SPEED    OL       DIA      PERCENTAGE
     LL        WSEL     VOS      VPROP    KN       SLNCH    SHP      WIN      FL DM    SEC.
     SLOPE     XLOBL    XLCH     XLOBR    FORLAI   TIC      LCONT    FORSER   FORW D   EMBST

SECNO 12.000
        SURVEY SEC 012.0
    12.00     3.73    893.53     0.00    893.47   894.01     0.06     0.22     0.02    892.80
     300.       6.      290.       4.       7.      130       4.       32.      15.     892.80
     1.17     0.91     2.24     0.95     0.035    0.033    0.032    0.000   891.20   1983.44
 0.000927     370.     370.     270.       2        0        0     0.00    81.86   2045.30

SECNO 12.500
        X
    12.50     3.19    896.09     0.00    893.57   894.13     0.04     0.12     0.00    892.00
     300.     148.     130.      23.      .06       63       22.      35.       .5     892.00
     1.40     1.39     2.39      .05     0.035    0.035    0.079    0.000   890.90   1983.1
 0.000552     170.     170.     170.       2        0        0     0.00    11.24   2040.13

SECNO. 12.700
        X
    2.70     3.42    894.12     0.00    893.00   894.20     0.08     0.04     0.01    892.00
     300.     41.      346.      13.      34.      100.     41.      34.      14.     892.00
     1.21     1.20     3.46     1.19     0.035    0.035    0.035    0.000   890.70   1963.78
 0.000695     100.     100.     100.       2        0        0     0.00    71.84   2040.61

CCFV=    0.300 CEHC=    0.300
SECNO 13.000

3470 ENCROACHMENT STATIONS=     1960.0     2050.0  TYPE=      1  TARGE =      90.000
        SURVEY SEC 013.0  D/S FACE OF 3.3' X 5.5' ARCH C.M.P.
    13.00     3.70    894.20     0.00    893.59   894.26     0.06     0.05     0.01    892.70
     400       95.      155.      50.      58.      72.      30.      34.      16.     892.50
     1.22     1.63     2.15     1.69     0.035    0.035    0.035    0.000   890.50   1960.00
 0.000912      60.      60.      60.       2        0        0     0.00    90.00   2050.00


SPECIAL BRIDGE

 SP   XK        XKOR      COFC      FDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
      0.00      2.96      3.00     90.00      4.30      0.00     14.30      0.00    890.50    890.50

SBECNO 13.100
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SECND	DEPTH	CHSEL	LRTOB	MSEL	FO	-V	HL	SLOPS	SANF FLEU
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
LOAD	WLOB	WCH	WROB	NVT	JUCH	JMP	MTA	ELIM	FRTS
F OPE	XLOBL	XLCH	XLOBR	TTRIAL	IDP	ICONT	CCRAR	TOFITD	ENDST

PRESSURE AND WEIR FLOW

FGPRS	EGLOC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
914.43	894.75	0.00	153.	14.	14.	14.	993.80	898.50

3750 ENCROACHMENT STATIONS= 1960.0 2050.0 TYPE= 1 TARGET= 90.000
U/S FACE OF 3.5' X 5.5' ARCH C M F.

13.10	8.67	899.7	0.00	898.61	899.18	0.01	1.95	0.00	893.70
360	81.	19	24	126.	316.	17	34.	16	894.30
1.24	0.66	0.42	0.50	0.035	0.035	0.035	0.000	890.50	1931.61
0.000041	70.	70	70.	1	0	1	0.00	88.35	3050.00

SECTN. 13.000
SURVEY SEC 1314.0--HIGH WATER INFL AT 899 +/- ON HOUSE AT 752 STANDARD

1.00	7.55	899.19	0.00	898.42	899.19	0.00	0.00	0.00	895.10
100	58.	110.	152	213.	325.	496	38.	17.	893.20
1.44	0.18	0.38	0.27	0.035	0.035	0.035	0.000	891.60	1832.18
0.000007	210.	210.	210.	2	0	0	0.00	351.93	2194.11

00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: FOWLERVILLE, VILLAGE OF

3) WATERCOURSE: COUNTY DRAIN #2

4) DOCUMENT TYPE: 100-YEAR NATURAL

00BREAK00

RECEIVED
MAY 08 1985
WATER MANAGEMENT

[illegible] DATE RUN EXECUTED [illegible]-MAY-85 [illegible]

[illegible]
HEC-1 [illegible]-85 [illegible] UPDATED MAY 198
[illegible]
[illegible]

VILLAGE OF FONDERVILLE FLOOD INSURANCE STUDY -- JANUARY 1985 -- ZIP
T2 [illegible] FONDERVILLE [illegible] 100 YR FLOOD [illegible]
T3 [illegible] AT FONDERVILLE 100 YR.

RECEIVED
MAY 08 1985
WATER MANAGEMENT

IO	CHK	INQ	NSTL	NE	NR	STRT	DTAP	LROUT	KSPEC	JP	JR
	0	4.	1.	0	0	0.062000	0.00	0.0	0	881.600	0.000

NRTIOR	ITIOUT	NT	NX	KSECU	KRCHI	LT	LTD	NU	CHK M	ITRACE
.000	0.000	-.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000

IT VARIABLE CODES FOR SUMMARY TRIP OUT

	10.000	150	110.000	0.000	0.200	0.000	0.000	0.000	0.000	0.000

QT	0.000	160.000	250.000	300.000	410.000	500.000	0.000	0.000	0.000	0.000
HT	0.100	0.100	0.040	0.100	0.300	0.000	0.000	0.000	0.000	0.000
FT	0.000	0.000	0.000	0.000	0.000	[illegible]	0.000	0.000	1982.000	2197.000
	SURVEY SEC 31.0									
XI	1.000	10.000	2000.000	2030.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	884.000	1800.000	882.000	1900.000	880.500	2000.000	880.100	2004.000	880.500	2008.000
GR	880.700	2018.000	830.300	2025.000	880.700	2030.000	882.000	2370.000	884.000	2470.000
YT	0.000	0.000	0.000	0.000	0.000	1.400	0.000	0.000	0.000	0.000
XI	1.300	14.000	2000.000	2030.000	220.000	170.000	220.000	0.000	0.000	0.000
GR	888.000	1850.000	886.000	1900.000	884.000	1930.000	882.000	1960.000	881.500	1980.000
GR	882.300	2000.000	881.000	2004.000	830.700	2008.000	881.100	2018.000	881.300	2030.000
GR	882.300	2100.000	883.500	2130.000	884.000	2300.000	882.000	2260.000	0.000	0.000
XI	[illegible].800	15.000	2000.000	2030.000	170.000	[illegible]	170.000	0.000	0.000	0.000
GR	886.000	1850.000	886.000	1950.000	884.000	[illegible]	883.000	1960.000	882.000	1990.000
GR	882.300	2000.000	881.400	2004.000	881.200	[illegible]	881.400	2012.000	831.700	2018.000
GR	881.800	2030.000	884.000	2040.000	886.000	2110.000	888.000	2170.000	0.000	0.000
	SURVEY SEC 33.0									
XI	2.000	12.000	2000.000	2030.000	200.000	[illegible]	200.000	0.000	0.000	0.000
GR	890.000	1850.000	888.000	1881.000	889.000	[illegible]	882.600	1990.000	883.100	2000.000
GR	881.700	2000.000	881.500	2003.000	881.800	[illegible]	882.800	2015.000	882.400	2035.000
GR	884.000	2100.000	890.000	2180.000	0.000	0.000	0.000	0.000	0.000	0.000

	X									
[illegible]	2.500	1.000	2000.000	2012.000	250.000	270.000	210.000	0.000	0.000	0.000
GR	890.000	1900.000	886.000	1920.000	884.000	1960.000	883.700	2000.000	882.500	2005.000
GR	882.200	2008.000	882.300	2011.000	883.500	2015.000	881.000	2050.000	888.000	2100.000
GR	890.000	2100.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	X									
[illegible]	2.600	11.000	2000.000	2015.000	210.000	210.000	210.000	0.000	0.000	0.000
GR	890.000	1900.000	888.000	1970.000	884.500	1970.000	884.300	2000.000	883.100	2005.000
GR	882.800	2008.000	883.100	2011.000	884.100	2015.000	881.200	2075.000	888.000	2090.000
GR	890.000	2100.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.100	[illegible]	0.040	0.300	0.500	0.000	0.000	0.000	0.000	0.000
	SURVEY SE[illegible] U/S FACE OF [illegible] X 7.3' ELLIPTICAL CONC PIPE									
X1	3.000	13.000	1995.000	2015.000	100.000	230.000	130.000	0.000	0.000	0.000
[illegible]	10.000	0.000	0.000	1500.000	0.000	2015.000	0.000	887.000	827.000	0.000
GR	[illegible]	[illegible]	885.200	[illegible]	886.400	[illegible]	886.000	1995.000	883.700	2001.300
GR	[illegible]	[illegible]	882.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2008.[illegible]	886.200	2015.000
GR	[illegible]	[illegible]	[illegible]	2060.000	900.000	2060.100	0.000	0.000	0.000	0.000
NC	0.070	0.070	0.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SB	0.000	.620	3.000	100.000	6.150	0.000	29.500	0.000	883.500	883.500
	U/S FACE OF [illegible] X 7.3' ELLIPTICAL CONCRETE PIPE									
X1	3.100	3.000	1995.000	2015.000	73.000	73.000	73.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	882.500	890.000	0.000	0.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	1900.000	0.000	2015.000	0.000	[illegible]	890.000	0.000
GR	900.000	1908.000	891.500	1908.100	887.400	1960.000	887.000	1995.000	885.900	2001.200
GR	884.300	2002.300	883.500	2005.000	884.500	2007.400	883.900	2008.700	888.000	2015.000
GR	889.000	2030.000	892.000	2060.000	900.000	2060.100	0.000	0.000	0.000	0.000
BT	11.000	1908.100	891.500	800.000	1980.000	889.400	800.000	1995.000	889.900	800.000
BT	2001.200	885.900	885.900	2002.500	890.000	887.700	2005.000	890.100	888.300	2007.400
BT	890.200	887.700	2008.700	890.300	885.900	2015.000	890.000	800.000	2030.000	891.000
BT	300.000	2060.000	892.000	900.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.035	0.025	0.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ET	0.000	0.000	0.000	0.000	0.000	[illegible] 400	0.000	0.000	0.000	0.000
X1	3.500	15.000	2000.000	2010.000	150.000	150.000	150.000	0.000	0.000	0.000
GR	898.000	1750.000	896.000	1830.000	894.000	1880.000	892.000	1920.000	890.000	1940.000
GR	888.000	1980.000	886.200	2000.000	884.100	2000.000	884.100	2010.000	886.200	2010.000
GR	888.000	2100.000	890.000	2140.000	892.000	2150.000	894.000	2180.000	896.000	2190.000
	SURVEY SEC 04.0 D/S FACE OF 5.5' SEMI-CIRCULAR CONC. PIPE									
X1	4.000	12.000	2310.000	2334.000	140.000	140.000	140.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	2250.000	0.000	2400.000	0.000	889.000	889.000	0.000
GR	900.000	2249.900	889.500	2250.000	889.300	2280.000	889.400	2310.000	884.900	2317.000
GR	884.900	2317.100	884.900	2321.000	884.900	2321.100	889.500	2334.000	889.900	2380.000
GR	890.000	2400.000	900.000	2400.100	0.000	0.000	0.000	0.000	0.000	0.000

[illegible]	0.000	2.000	[illegible]	[illegible]	3.500	0.000	11.380	0.000	[illegible]	[illegible]
	U/S FACE OF [illegible] SEMI-CIRCULAR CONDUIT- P.E.C.									
X1	[illegible]	0.000	0.000	0.000	65.000	65.000	65.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	883.000	892.600	0.000	0.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	2350.000	0.000	2400.000	0.000	891.300	891.700	0.000
BT	[illegible]	[illegible]	900.000	800.000	2350.000	893.400	800.000	2317.000	892.400	884.900
BT	[illegible]	892.500	883.000	2321.000	[illegible]	808.000	2321.[illegible]	897.400	884.900	2400.000
BT	[illegible]	[illegible]	2400.100	900.000	800.000	0.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ET	0.000	0.000	0.000	0.000	0.000	1.400	0.000	0.000	0.000	0.000
	SURVEY SEC 03.0									
X1	5.000	[illegible]	2034.000	2044.000	430.000	400.000	200.000	0.000	0.000	0.000
GR	[illegible]	[illegible]	894.000	1880.000	892.000	1500.000	890.000	1940.000	882.000	2000.000
GR	886.300	2030.000	837.600	2034.000	887.400	2074.000	587.700	2050.000	890.000	2060.000
GR	672.000	2100.000	894.000	2140.000	856.000	2250.000	0.000	0.000	0.000	0.000
[illegible]	0.000	[illegible]	[illegible]	[illegible]	0.000	0.000	0.300	0.000	0.000	0.000
	SURVEY SEC [illegible] D/S FACE OF [illegible] X 7.0 ARCH C.M.P.									
X1	[illegible]	[illegible]	2005.000	2030.000	80.000	[illegible]	300.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	1950.000	0.000	2090.000	0.000	890.400	890.500	0.000
GR	900.000	1949.000	892.000	1950.000	890.700	1980.000	890.500	2000.000	889.400	2005.000
GR	888.400	201[illegible].500	884.300	2012.000	885.400	[illegible]	885.400	2018.000	885.400	2018.500
GR	889.700	[illegible]	890.500	2020.000	891.100	2050.000	893.000	2100.000	[illegible]	2101.000
SB	0.000	[illegible]	3.000	0.000	[illegible]	0.000	27.300	0.000	[illegible]	887.900
	U/S FACE OF 4.4' X 7.0' ARCH C.M.P.									
X1	6.100	0.000	0.000	0.000	86.000	86.000	86.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	890.100	891.500	0.000	0.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	1950.000	0.000	2090.000	0.000	891.000	891.500	0.000
BT	15.000	1950.000	892.000	800.000	1980.000	891.700	800.000	2000.000	891.500	800.000
BT	2005.000	891.400	800.000	2011.500	891.400	885.400	2012.000	891.400	886.000	2015.000
BT	891.500	890.100	2018.000	891.500	886.000	2018.500	891.500	885.400	2025.000	891.500
BT	800.000	2030.000	891.500	800.000	2050.000	892.100	800.000	2100.000	894.000	800.000
NR	2.000	15.000	1900.000	0.025	2150.000	0.000	0.500	0.000	0.000	0.000
ET	0.000	0.000	0.000	0.000	0.000	1.400	0.000	0.000	0.000	0.000
	SURVEY SEC 07.0									
X1	7.000	16.000	2009.000	2021.000	80.000	70.000	130.000	0.000	0.000	0.000
GR	896.000	1830.000	894.000	1870.000	892.000	1710.000	890.000	1940.000	889.200	1980.000
GR	888.400	2000.000	837.300	2009.000	886.400	2013.000	886.200	2016.000	836.700	20[illegible]9.000
GR	887.200	2021.000	887.100	2024.000	890.700	2046.000	892.000	2070.000	894.000	2110.000
GR	896.000	2130.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.040	0.070	0.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	SURVEY SEC 08.0 D/S FACE OF 3.3' X 5.5' ARCH C.M.P.									
X1	8.000	14.000	2016.000	2045.000	170.000	200.000	180.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	1910.000	0.000	2100.000	0.000	891.000	891.000	0.000
GR	900.000	1909.000	893.400	1910.000	892.000	1980.000	891.800	2000.000	891.100	2014.000
GR	887.300	2022.000	886.300	2024.000	887.300	2028.000	889.300	2047.000	891.300	2045.000
GR	891.500	2060.000	891.900	2080.000	891.700	2100.000	900.000	2101.000	0.000	0.000

CL	0.000	2.000	3.000	0.000	1.000	0.000	14.300	0.000	836.300	836.300
U/S FACE OF 3.2' x 5.7' ARCH C.M.P.										
X1	3.100	0.000	0.000	0.000	74.500	74.500	74.500	0.000	0.000	0.000
X2	0.000	0.000	1.000	889.600	892.500	0.000	0.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	1910.000	0.000	2100.000	0.000	892.800	892.700	0.000
ET	12.000	1913.000	857.700	800.000	1940.000	893.000	800.000	2000.000	892.800	800.000
BT	2013.000	892.700	800.000	2032.000	892.800	857.800	2028.000	893.600	884.600	2028.000
RT	892.800	887.500	2037.000	892.900	800.000	2045.000	892.900	800.000	2060.000	892.500
BT	800.000	2050.000	892.900	800.000	2100.000	894.700	800.000	0.000	0.000	0.000
ET	0.000	5.100	8.100	9.100	9.100	7.100	2000.000	2170.000	1800.000	2190.000
RT	0.035	0.035	0.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SURVEY SEC 09.0										
XC	2.000	1.000	2000.000	2040.000	200.000	200.000	200.000	0.000	0.000	0.000
GR	896.000	1880.000	894.000	1820.000	892.000	1820.000	893.900	1980.000	890.700	2000.000
GR	889.200	2014.000	887.900	2024.000	887.400	2030.000	858.300	2045.000	888.600	2065.000
GR	890.000	2100.000	890.000	2130.000	892.000	2170.000	894.000	2200.000	0.000	0.000
SURVEY SEC 010.0 D/S FACE OF 2.5' DIAMETER C.M.P.										
XC	10.000	1.000	801.000	2037.000	210.000	210.000	210.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	1910.000	0.000	2100.000	0.000	892.000	890.700	0.000
GR	910.000	1949.000	893.200	1950.000	892.700	1980.000	892.300	2000.000	892.000	2000.000
GR	891.100	2016.000	888.600	2016.600	888.600	2017.400	891.100	2019.000	889.800	2021.000
GR	890.700	2037.000	892.900	2047.000	892.000	2100.000	510.000	2141.000	0.000	0.000
SR	0.000	2.440	3.000	0.000	0.800	0.000	4.510	0.500	883.000	808.200
U/S FACE OF 2.5' DIAMETER C.M.P.										
X1	10.100	0.000	0.000	0.000	24.000	24.000	24.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	891.100	891.900	0.000	0.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	1950.000	0.000	2100.000	0.000	892.000	890.700	0.000
ET	8.000	1949.000	910.000	800.000	1950.000	893.200	800.000	2014.000	892.000	800.000
BT	2013.000	892.000	891.100	2019.000	892.200	891.100	2021.000	892.300	800.000	2140.000
LT	893.200	900.000	2141.000	910.000	800.000	0.000	0.000	0.000	0.000	0.000
XC	0.050	0.030	0.045	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ET	0.000	0.000	0.000	0.000	0.000	1.400	0.000	0.000	0.000	0.000
SURVEY SEC 011.0										
X1	11.000	10.000	2009.000	2032.000	300.000	300.000	300.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	1900.000	0.000	2100.000	0.000	0.000	0.000	0.000
GR	896.000	1900.000	893.700	1980.000	892.500	2000.000	891.300	2009.000	890.500	2017.000
GR	890.100	2026.000	890.700	2032.000	890.800	2048.000	892.000	2099.000	910.000	2100.000
XC	0.033	0.032	0.033	0.100	0.300	0.000	0.000	0.000	0.000	0.000
SURVEY SEC 012.0										
X1	12.000	14.000	2000.000	2038.000	370.000	370.000	370.000	0.000	0.000	0.000
GR	896.000	1880.000	893.800	1990.000	892.800	2000.000	892.000	2005.000	891.800	2012.000
GR	891.500	2017.000	891.300	2024.000	891.200	2029.000	891.200	2032.000	891.400	2040.000
GR	892.700	2048.000	892.300	2058.000	893.800	2065.000	896.000	2070.000	0.000	0.000

SURVEY SEC 014.0--HIGH WATER MARK AT 299.47- ON HOUSE AT 252 PINEWOOD

EJ	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
BR	905.030	2230.030	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GN	891.400	2021.000	881.900	2027.000	892.100	2031.000	893.200	2043.000	893.000	2063.000
BK	900.000	1820.230	878.300	1980.000	894.400	1980.000	895.100	2000.000	892.100	2012.000
XI	14.000	11.000	2000.000	2043.000	210.000	210.000	210.000	0.300	0.000	0.000
YI	0.000	0.000	0.000	0.000	9.100	0.000	0.000	0.000	1905.000	2045.300
BT	898.300	500.000	2250.000	898.800	500.000	0.000	0.000	0.000	0.000	0.000
JT	2016.100	870.000	853.000	2019.900	892.800	2020.000	898.500	821.000	2032.000	
BI	8.000	1950.000	901.000	800.000	2000.000	898.900	800.000	2016.130	896.500	890.900
GR	891.000	2020.000	892.000	2022.000	894.400	2032.000	898.800	2050.000	920.000	2050.100
GN	891.600	2015.000	890.900	2016.000	890.500	2016.100	890.500	2018.000	890.500	2019.900
BR	900.000	1949.000	901.300	1750.000	895.500	1980.000	893.200	2000.000	892.500	2002.000
XI	0.000	0.000	1960.000	0.000	0.000	2000.000	0.000	0.000	396.500	0.000
YI	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
BT	900.000	1950.000	901.300	1750.000	895.500	1980.000	893.200	2000.000	892.500	2002.000
JT	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
BI	8.000	1950.000	901.000	800.000	2000.000	898.900	800.000	2016.130	896.500	890.900
GR	891.000	2020.000	892.000	2022.000	894.400	2032.000	898.800	2050.000	920.000	2050.100
GN	891.600	2015.000	890.900	2016.000	890.500	2016.100	890.500	2018.000	890.500	2019.900
BR	900.000	1949.000	901.300	1750.000	895.500	1980.000	893.200	2000.000	892.500	2002.000
XI	0.000	0.000	1960.000	0.000	0.000	2000.000	0.000	0.000	396.500	0.000
YI	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
BT	900.000	1950.000	901.300	1750.000	895.500	1980.000	893.200	2000.000	892.500	2002.000
JT	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
BI	8.000	1950.000	901.000	800.000	2000.000	898.900	800.000	2016.130	896.500	890.900
GR	891.000	2020.000	892.000	2022.000	894.400	2032.000	898.800	2050.000	920.000	2050.100
GN	891.600	2015.000	890.900	2016.000	890.500	2016.100	890.500	2018.000	890.500	2019.900
BR	900.000	1949.000	901.300	1750.000	895.500	1980.000	893.200	2000.000	892.500	2002.000
XI	0.000	0.000	1960.000	0.000	0.000	2000.000	0.000	0.000	396.500	0.000
YI	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
BT	900.000	1950.000	901.300	1750.000	895.500	1980.000	893.200	2000.000	892.500	2002.000
JT	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
BI	8.000	1950.000	901.000	800.000	2000.000	898.900	800.000	2016.130	896.500	890.900
GR	891.000	2020.000	892.000	2022.000	894.400	2032.000	898.800	2050.000	920.000	2050.100
GN	891.600	2015.000	890.900	2016.000	890.500	2016.100	890.500	2018.000	890.500	2019.900
BR	900.000	1949.000	901.300	1750.000	895.500	1980.000	893.200	2000.000	892.500	2002.000
XI	0.000	0.000	1960.000	0.000	0.000	2000.000	0.000	0.000	396.500	0.000
YI	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
BT	900.000	1950.000	901.300	1750.000	895.500	1980.000	893.200	2000.000	892.500	2002.000
JT	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

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 SS NO     DEPTH     CHSEL     PRINC     MSELR     EG        -V        HL        OLDES     BANK ELEV
           DLOP      QCH       QRCS      -LDE      ACH       APIN      VOL       TIA       LEFT/RIGHT
 EMS       PLOP      VCH       VRDE      PSL       XSCHL     KN        WCL       ELSIN     39.0
 SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IIC       ICONT     IORAR     IOPWTD    EXDST

*PROF 1

*EMM = 0.000 CENV= 0.300
*SECNO 1.000
        SURVEY SEC 01.0
   1.00      1.50    881.40     0.00    881.60    881.31     0.21      0.00      0.00    880.50
   300.       52.     172.      93.       37.       56.      53.        0.        0      880.70
   0.00      1.15      4.75     0.99      0.00     0.040     0.100     0.000    870.70   1941.35
0.012759       0.        0        0.        0         0         0      0.00    296.72   2237.69

*SECNO 1.300

   1.30      1.19    882.39     0.00      0.00    882.98     0.07      1.10      0.11    881.30
   300.       37.     174.      70.       51.       52.       8.        1.        .       882.30
   0.03      0.96      3.15     0.84     0.100     0.040     0.100     0.000    880.70   1946.63
0.003162    220.      220.      170.       2         0         0      0.00    177.95   2124.60

*SECNO 1.600

   1.60      2.29    883.49     0.00      0.00    882.75     0.26      0.72      0.03    882.00
   300.       39.     254.       7.       37.       57.       7.        1.        2.      881.80
   0.04      1.06      4.43     1.02     0.100     0.040     0.100     0.000    881.20   1930.59
0.000805    170.      170.      170.       2         0         0      0.00    107.11   2037.70

*SECNO 2.000
        SURVEY SEC 02.0
   2.00      2.98    884.48     0.00      0.00    884.56     0.08      0.79      0.02    883.10
   300.       57.     121.     122.       58.       35.     122.        2.        2.     882.80
   0.07      0.97      3.43     1.00     0.100     0.040     0.100     0.000    881.50   1950.44
0.002783    200.      200.      200.       2         0         0      0.00    155.94   2106.37

*SECNO 2.300

   2.30      2.95    885.15     0.00      0.00    885.33     0.18      0.74      0.03    883.70
   300.       69.     142.      69.       59.       36.       57.        3.        3.     883.50
   0.09      1.17      4.53     1.21     0.100     0.040     0.100     0.000    882.20   1948.52
0.004858    250.      210.      170.       2         0         0      0.00    115.83   2064.35
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 RECND     DEPTH     CHSEL     PRIMS     %SELK     BS        HV        HL        DLOSS     TOPO ELEV
           ELDC      DSN       TRDE      ALCB      RCH       ASOB      VOL       TRA       LEFT/RIGHT
 INE       VLOC      VCA       MOR       SNO       XNC       XAR       LTH       E.HIA     SETA
 SLOPE     XLOCL     XLCH      ELDER     ITRIAL    IDC       ICONT     COXAR     TOP.TO    ENDST

 RECND 2.600

      3.30      3.36    888.06      0.20      0.00    886.26      0.30      0.92      0.00    884.30
       300.        77.       181.        42.        64.        40.        40.        4.        2.    884.10
      0.10       .20       1.48      1.05     0.100     0.040     0.100     0.000    882.30   1952.14
  0.002996        0.       210.       210.         2         0         0      0.00    101.89   2057.05

 HVF   0.300 DIMP=   0.500
 SECND 3.000
 3470 ENCROACHMENT STATIONS=     1900.0     2015.0  TYPE=     1  TARGET=     115.000
          SURVEY SEC 2.0'  D/S FACE OF 4.0' X 7.5' ELLIPTICAL CONC. PIPE
      3.00      3.41    887.11    887.07      0.00    882.74      0.83      1.17      0.12    882.00
       300.        96       204.        0.        0.        33.        0.        4.        4. 100000.00
      0.11      1.36      6.29      0.00     0.100     0.040     0.000     0.000    883.50   1908.10
  0.007212       100       180       230.         6        19         0      0.00    103.90   2015.00

 SPECIAL FOR BS

 BS   XI        XKOR      CDFQ      RDLEN     BWC       BWP       BAREA     SS        ELCRU     ELCRD
      2.00      1.63      3.00    100.00      6.15      0.00     29.50      0.00    883.50    883.50

 SECNO 3.100
 PRESSURE FLOW

 EBPRS     EELNC     H3        QNEXR     QPR       BAREA     TRAPEZOID AREA     ELLC      ELTRD
 887.73    889.09    0.00      0.        300.      30.       30.       888.30    890.00

 3470 ENCROACHMENT STATIONS=     1900.0     2015.0  TYPE=     1  TARGET=     115.000
 3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=     889.40 ELREA=     890.00
          D/S FACE D= 4.0' X 7.5' ELLIPTICAL CONCRETE PIPE
      3.10      6.13    889.63      0.00      0.00    889.73      0.10      2.19      0.00    887.00
       300.        77.       223.        0.        80.        76.        0.        4.        4. 100000.00
      0.12      0.96      2.95      0.00     0.070     0.045     0.000     0.000    883.30   1940.92
  0.001927       73.       73.       73.         2         0         0      0.00     74.08   2015.00
```

```
   RECNO    DEPTH    CHNEL    CRTWP    WSELK    EG       HV       AL       CLOSS    MARK SLOP
   0        ELDT     ICH      QPCB     ELCD     CCH      ARCH     VOL      TWA      LEFT/RIGHT
   TIME     ELDT     DC       QLOB     WSL      XNCH     XNL      WTOL     ELLH     SSTA
   S OPE    XLOBL    XLCR     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID   ENDST

PSECNO 3.000
   X
      0     5.63     889.78   0.00     0.00     889.79   0.00     0.03     0.05     816.20
    300     52.      52.      193.     35.      37.      273.     5.       4.       886.20
   0.13     0.61     0.98     0.71     0.033    0.033    0.035    0.000    984.10   1944.42
0.000084    150.     150.     150.     2        0        0        0.00     91.16    2135.38

PSECNO 4.000

3470 ENCROACHMENT STATIONS=    2250.0    2400.0  TYPE=     1  TARGET=     150.000
        SURVEY SEC 95.0  U/S FACE 0- 5.5' SEMI-CIRCULAR CONC. PIPE
   4.00     3.81     889.79   0.00     0.00     889.79   0.33     0.03     0.11     889.70
   300.     20.      170      .        20.      70       3.       6.       5.       859.70
   0.19     0.99     3.99     0.16     0.035    0.035    0.035    0.000    884.90   2953.04
0.000375    140.     140.     140.     2        0        0        0.00     107.79   2357.79

SPECIAL BRIDGE

SB   XR       XKOR     COPO     RDLEN    B C      BWP      BAREA    SS       ELCHU    ELCHD
     0.00     3.00     2.60     0.00     3.90     0.00     11.88    0.00     884.90   884.90

PSECNO 5.100
PRESSURE AND WEIR FLOW

 EGPRS     EGLWC     H3       QWEIR    DPR      BAREA    TRAPEZOID AREA    ELLC     ELTRD
 919.41    887.95    0.00     199.     103.     12.      12.               888.00   892.60

3470 ENCROACHMENT STATIONS=    2250.0    2400.0  TYPE=     1  TARGET=     150.000
        U/S FACE OF 5.5' SEMI-CIRCULAR CONCRETE PIPE
   4.10     3.29     893.19   0.00     0.00     893.19   0.00     3.25     0.00     889.40
   300.     105.     93.      97.      229.     154.     225      7.       5.       899.50
   0.22     0.46     0.64     0.43     0.033    0.035    0.033    0.000    884.90   2250.00
0.000021    65.      65.      65.      0        0        7        0.00     150.00   2400.00

PSECNO 5.000
        SURVEY SEC 95.0
   5.00     6.40     893.20   0.00     0.00     893.20   0.00     0.01     0.00     887.60
   300.     207.     29.      52.      507.     57.      193.     14.      7.       887.40
   0.55     0.41     0.51     0.35     0.035    0.035    0.035    0.000    386.80   1858.05
0.000014    400.     500.     600.     2        0        0        0.00     235.66   2123.91
```

```
    ESCRI    CEPTI    CWEEL    CRIT3    WSEL.    CE       HV       VL       CLOSE    BANK ELEV
    '        ALOC     (CH      OW 3     'LOC     ECH      AVG3     VOL      TWA      LEFT/RIGHT
    INE      ALOC     UCE      UCD3     BN       L.CH     XMA      TH       ELHI     SECO
    SLOPE    XLCBL    XLCH     YLOBP    ITAIAL   TIC      ICONT    CORAR    YOPETD   EADST

*SECNO 6.000

*6470 ENCROACHMENT STATIONS= 1930.0    2090.0  TYPE=     1  TARGET=     140.000
          SURVEY SEC 16.0  D/S FACE OF 4.4' x 7.0' ARCH C.M.P.
     6.00     7.80   893.20     0.00     0.00   893.21     0.01     0.0.     0.01   889.40
     300.      97.      146.      57.     128.     132.      86.      17.       8.   890.50
     0.68     0.75     1.11     0.65    0.035    0.040    0.035    0.000   885.0  1950.00
 0.000113      160.     200.     150        0        0        0     0.00   136.22  2086.22

SPECIAL BRIDGE

 NO   BR       SKOR     COFF     JULFH    BWI      BWP      SAREA    BS       ELCHD    E_CHD
      0.00     2.47     3.00     0.00     0.00     0.00    24.60     0.00    891.90   884.90

*SEC 0 6.100
PRESSURE AND WEIR FLOW

ROPES    ELWT     ..G      WEIR     OPR      BAREA    TRAPEZOID     ELLC     ELTRD
                                                       AREA
  893.27   892.71     0.00      266.      35.      25.      23.    890.10   891.50

*470 ENCROACHMENT STATIONS=    1930.0    2090.0  TYPE=     1  TARGET=     140.000
          U/S FACE OF 4.4' x 7.0' ARCH C.M.P.
     6.10     7.87   893.27     0.00     0.00   893.28     0.01     0.07     0.00   889.40
     300.      98.      144.      56.     128.     134.      90.      18.       9   890.50
     0.66     0.77     1.05     0.64    0.035    0.040    0.035    0.000   885.40  1950.00
 0.000104      86.      86.      86.        1        0        7     0.00   137.47  2087.47

1490 NH CARD USED
*SECNO 7.000
          SURVEY SEC 97.0
     7.00     7.08   893.28     0.00     0.00   893.29     0.00     0.00     0.00   887.30
     300.     181.      26.      63.      370      79.     154.      19.       9.   887.60
     0.71     0.49     0.71     0.41    0.035    0.035    0.035    0.000   886.20  1884.46
 0.000024      80.     130.      70.        0        0        0     0.00   211.08  2095.54

*SECNO 8.000
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SE'NO     DEPTH     CHEEL     DRI.R     WBELK     EC        RV        -I        DLOSE     BANK ILE-
B         PLOE      D'H       DRCB      BLCB      PCH       ARCR      VD.       MA        .EF'/RIGHT
TIE       VLOE      VCH       VRCB      XIL       LCH       XMT       TW        ELHIV     SSTA
5'OPE     XLOBL     XLCH      XLOBP     ITRIAL    IDC       TCONT     COBAR     IOPMID    ENDPD

'/A3 ENCROACHMENT STATIONS=  1910.0    2100.0  TYPE=     1  TARGET=     190.000
        SURVEY SEC 03.0  D/S FACE OF 3.3' x 5.5' ARCH C.M.P.
    8.00      6.93    893.28      0.00      0.00    893.30      0.02      0.01      0.01    891.10
    300.       54.      185.       61.       99.      127.       90.       21.       10.    891.30
    0.73      0.55      1.45      0.68     0.040     0.035     0.040     0.000    886.30   1935.60
0.000177      170.      130.      200.         1         0         0      0.00    190.00   2100.00

SPECIAL BRIDGE

SK      WK      WLEN      DIFW      RLEN      DIS       DIS       AREA      BE        ELEV      ELBRD
    0.00      3.20      3.00      0.00      7.30      0.00     14.20      0.00    886.23    886.30

SECNO 8.100
PRESSURE AND WEIR FLOW

SIPOL     EBLWC     HJ        QWEIR     QPR       QPRES     TRAPEZOID AREA    ELLC      ELYID
914.42    893.30    0.00      264.      37.       14.       14.       889.60    892.50

3470 ENCROACHMENT STATIONS=  1910.0    2100.0  TYPE=     1  TARGET=     190.000
        U/S FACE OF 3.3' x 5.5' ARCH C.M.P.
    8.10      7.28    893.58      0.00      0.00    893.60      0.03      0.30      0.00    891.10
    300.       64.      168.       66       131.      136.      107.       22.       10.    891.30
    0.77      0.50      1.24      0.62     0.040     0.035     0.040     0.000    386.30   1910.00
0.000113       75.       75.       75.         1         0         7      0.00    190.00   2100.00

SECNO 9.000

3470 ENCROACHMENT STATIONS=  1300.0    2190.0  TYPE=     1  TARGET=     390.000
        SURVEY SEC 09.0
    9.00      6.21    893.61      0.00      0.00    893.61      0.00      0.00      0.00    890.70
    300.       57.       75.      168.      340.      223.      578.       25.       11.    888.50
    0.97      0.17      0.34      0.29     0.035     0.035     0.035     0.000    887.40   1800.00
0.000008      200.      200.      200.         0         0         0      0.00    390.00   2190.00

SECNO 10.000
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 -ECNO     DEPTH     CUBEL     CACHS     HSELK     IO        HW        HL        CLOSS     BANK ELEV
 0         QLOB      QCH       CROB      ALOB      ACH       CROB      QCL       TUS       LEFT/RIGHT
 11.00     VLOB      VCH       VLOB      XNL       XNCH      XNR       WT        FLOW      SATA
 SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    SNDSQ

3470 ENCROACHMENT STATIONS=     1900.0     2140.0  TYPE=     1  TARGET=     190.000
        SURVEY SEC 210.0  U/S FACE OF 2.5' DIAMETER C.I.P.
     10.00      5.00    893.60      0.00      0.00    893.62      0.02      0.00      0.01    892.00
     300.       46.      61.       193.       63.      45.       192.       29.       13.     890.70
      1.03      0.73      1.36      1.01     0.035     0.035     0.035     0.000    888.60   1950.00
 0.000275       210       210.      210.        1         0         0       0.00    190.00   2110.00

SPECIAL BRIDGE

 ...PR       ...ROA      DOFI      ...LEN      DUC       DUP       BAREA     ...S      ELCHD     ELCHD
     0.00      3.73      3.02      0.02      0.50      0.00      4.51      0.30    888.30    885.62

 SECNO 10.000
PRESSURE AND WEIR FLOW

 ...BRIDGE   ELCHD      ...3      CUBEA     DPS       BAREA     TRAPEZOID AREA    ELLC      ELTRD
 1036.21     893.62     0.00      293.      7.        5.        5.        891.10    891.90

3470 ENCROACHMENT STATIONS=     1900.0     2140.0  TYPE=     1  TARGET=     190.000
        U/S FACE OF 2.5' DIAMETER C.I.P.
     10.10      5.02    893.66      0.00      0.00    893.62      0.02      0.05      0.00    892.00
     300.       47.      59.       193.       66.      45.       193.       29.       13.     890.70
      1.04      0.72      1.31      0.98     0.035     0.035     0.035     0.000    888.60   1950.00
 0.000275        24.       24.       24.        1         0        13       0.00    190.00   2110.00

SECNO 11.000

3470 ENCROACHMENT STATIONS=     1900.0     2100.0  TYPE=     1  TARGET=     200.000
        SURVEY SEC 211.0
     11.00      3.65    893.78      0.00      0.00    893.77      0.02      0.09      0.00    891.80
     300.       17.      101.      182.       27.      72.       168.       31.       14.     890.70
      1.11      0.64      1.41      1.09     0.050     0.045     0.050     0.000    890.10   1978.48
 0.000100       300.      300.      300.        1         0         0       0.00    120.62   2099.10

CONV=  0.100 CEHV=  0.300
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```
 STEND      DEPTH     CUBEL     GRIMB     USFLK     EL        HV        AL        DLOSS     BAR ELEV
 0          0.03      TCH       GROF      ALO3      ACS       AROU      VOL       TUS       LEFT/RIGHT
 TIME       VLO3      WCH       VSOB      KM        ANCH      JNL       WTL       ELWCH     SSIA
 SLOPE      XLOBL     XLCH      XLOBR     TTRIAL    IRC       TCOMT     CORAR     TOFWTE    ENDST

SECOND 12.000
        SURVEY SEC 013.0
   12.00      3.73    895.55      0.00      0.00    894.01      0.03      0.32      0.02    892.80
     300.       6.       390.       4.       7.      129.       7.       33.       15.    892.80
    1.15      0.91      2.24      0.96     0.033     0.035     0.033     0.000    891.20   1983.79
0.000955      370.      370.      370.         2         0         0      0.00     81.81   2045.50

SECOND 12.500
        X
   12.50      7.19    894.09      0.00      0.00    894.13      0.04      0.12      0.00    892.00
     300.       48.       130.       23.       06.       63.       22.       33.       15.    892.00
    1.13       [illegible]      2.07      1.96     0.035     0.035     0.035     0.000    890.90    [illegible]
0.000953      170.      170.      170.         2         0         0      0.00     [illegible]   2040.[illegible]

SECOND 12.700
        X
   12.70      3.42    [illegible]      0.00      0.00    894.20      0.08      0.24      0.01    892.00
     300.       41.       [illegible]       3.       34.      100.       11.       33.       15.    892.00
     .20      1.20      2.76      1.19     0.035     0.035     0.035     0.000    890.70   1948.38
0.000698      100.      100.      100.         2         0         0      0.00     71.83   2040.61

CCPVE= 0.300 CEEVE= 0.500
SECOND 13.000

S-70 ENCROACHMENT STATIONS=    1950.0    2020.0  TYPE=    1  TARGET=    90.000
        SURVEY SEC 013.0  D/S FACE OF 3.3' x 5.5' ARC- C.M.P.
   13.00      3.70    894.20      0.00      0.00    894.25      0.06      0.05      0.01    892.70
     300.       95.       155.       50.       58.       72.       30.       52.       16.    892.70
    1.20      1.60      2.15      1.89     0.035     0.035     0.035     0.000    890.50   1960.00
0.000916       60.       60.       60.         2         0         0      0.00     90.00   2050.00

SPECIAL BRIDGE

 SB   XS        XCR       COFQ      RDLEN     BWC       BWP       BARFA     BS        ELCHU     ELCHD
      0.00      2.95      3.00      90.00     4.30      0.00     14.30      0.00    890.50    890.50

SECOND 13.100
```

SECNO	DEPTH	DMBFL	CRCMB	MSELR	ZU	HL	VL	DLOPE	RANK FLEV
K	PLOB	QDA	DROP	WLOO	XC	ATOP	UDL	TWA	CFTVRTGH
ZMB	VLOB	VCH	VAOP	VWL	ZWC	ZLR	WT	SLOPE	ESTA
SLOPE	XLOBL	XLCH	XLOSR	CTRIAL	IDC	XCONT	CCRAR	TOPWIC	ZNDST

PRESSURE AND MEAN FLOW

ESPRE	EGLWC	HL	DMEAN	DPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
917.43	894.70	0.00	153.	149.	14.	14.	893.80	898.30

3470 ENCROACHMENT STATIONS= 1960.0 2050.0 TYPE= 1 TARGET= 50.000
U/S FACE OF 3.3' X 5.5' ARCH C.P.

43.10	1.67	899.17	0.00	0.00	899.18	0.00	4.93	0.00	895.70
300.	23.	195.	31.	35.	210.	17.	14.	16.	[illegible]
1.25	0.16	0.72	0.30	0.035	0.035	0.035	0.000	390.50	1931.41
0.000041	70.	70.	70.	0	0	0	0.00	38.19	3030.00

SECNO 14.000
SURVEY 880 1.4.0--HIGH WATER ARK AT 899.4/- OF HOUSE AT 350 PINEWOOD

[illegible]	[illegible]	129.19	0.00	0.00	899.[illegible]	0.00	0.00	0.00	895.10
324	[illegible]	110.	123.	523.	285.	496.	38.	17.	853.30
1.73	0.18	0.38	0.27	0.035	0.035	0.035	0.000	891.60	1832.18
0.000007	210.	210.	210.	2	0	0	0.00	351.93	2184.11

00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: FOWLERVILLE, VILLAGE OF

3) WATERCOURSE: COUNTY DRAIN #2

4) DOCUMENT TYPE: SUMMARY

00BREAK00

HCE JOB EXECUTED 9-MAR-85 10.05.08

* **** **** **** **** **** **** **** **** **** ****
HCP RELEASE DATED NOV 75 UPDATED AY 1984
ERROR CORR - 01,02,03,04,05,06
VERSION - 80.5.52-93.51.55
* **** **** **** **** **** **** **** **** **** ****

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

COUNTY DRAIN 12 AT FOWL

SUMMARY PRINTOUT TABLE 150

SECNO	ELTN	ELEVO	CLOP	ELEVN	D	CNSEL	CRT-R	EC	TOKEP	JCP	AREA	QIK
1.000	0.00	0.00	0.00	880.10	160.00	881.60	0.00	88[illegible]	36.29	2.55	61.53	26.06
1.000	0.00	0.00	0.00	880.10	250.00	881.60	0.00	881.74	93.60	3.55	15.86	26.53
1.000	0.00	0.00	0.00	880.10	300.00	881.60	0.00	881.51	127.59	4.73	161.84	26.36
1.000	0.00	0.00	0.00	880.10	410.00	881.66	381.66	881.98	158.86	5.96	180.01	29.83
1.300	220.00	0.00	0.00	880.70	160.00	882.30	0.00	882.44	58.38	2.76	111.75	27.84
1.300	220.00	0.00	0.00	880.70	250.00	882.72	0.00	882.81	33.32	3.02	167.85	33.31
1.300	220.00	0.00	0.00	880.70	300.00	882.89	0.00	882.98	31.62	3.14	197.45	33.35
1.300	220.00	0.00	0.00	880.70	410.00	883.19	0.00	883.30	31.35	3.45	252.51	73.23
1.600	170.00	0.00	0.00	881.20	160.00	882.06	0.00	882.19	47.44	3.28	62.89	23.23
1.600	170.00	0.00	0.00	881.20	250.00	883.35	0.00	883.58	76.53	4.08	86.28	33.16
1.600	170.00	0.00	0.00	881.20	300.00	883.49	0.00	883.75	60.15	4.43	100.93	32.68
1.600	170.00	0.00	0.00	881.20	410.00	883.78	0.00	884.10	64.49	5.03	135.58	31.05
2.000	200.00	0.00	0.00	881.50	160.00	882.88	0.00	883.96	31.28	3.00	129.41	28.61
2.000	200.00	0.00	0.00	881.50	250.00	884.29	0.00	884.37	38.21	3.79	187.21	46.73
2.000	200.00	0.00	0.00	881.50	300.00	884.48	0.00	884.56	27.83	3.43	215.99	36.87
2.000	200.00	0.00	0.00	881.50	410.00	884.83	0.00	884.92	27.23	3.72	273.30	78.53
2.300	210.00	0.00	0.00	882.20	160.00	884.61	0.00	884.76	47.06	3.78	92.51	23.32
2.300	210.00	0.00	0.00	882.20	250.00	884.98	0.00	885.15	47.26	4.30	131.97	36.14
2.300	210.00	0.00	0.00	882.20	300.00	885.15	0.00	875.33	48.58	4.53	151.31	43.04
2.300	210.00	0.00	0.00	882.20	410.00	885.49	0.00	885.69	48.94	4.99	191.75	38.61
2.600	180.00	0.00	0.00	882.80	160.00	885.38	0.00	885.54	42.88	3.81	81.50	24.45
2.600	180.00	0.00	0.00	882.80	250.00	885.76	0.00	885.97	47.24	4.50	115.28	36.37
2.600	180.00	0.00	0.00	882.80	300.00	885.94	0.00	886.18	48.94	4.81	132.64	42.88
2.600	180.00	0.00	0.00	882.80	410.00	886.29	0.00	886.56	51.71	5.39	168.63	57.02
3.000	210.00	0.00	0.00	887.50	160.00	886.34	0.00	887.39	190.39	5.51	27.07	11.58
3.000	210.00	0.00	0.00	883.30	250.00	887.18	0.00	887.43	105.64	5.01	98.74	24.32
3.000	210.00	0.00	0.00	887.50	300.00	887.33	0.00	487.59	56.09	5.08	117.53	30.61
3.000	210.00	0.00	0.00	883.30	410.00	887.67	0.00	887.91	85.42	5.31	154.37	44.36

SECTNO	XCOM	E TOT	ELLC	ELLU	E-SEC	CRIT 3	E2	ICHRG	ICH	CREA	OUT
1.100	73.00	0.00	888.30	410.00	842.50	0.00	590.28	3.13	3.08	215.20	135.72
2.100	73.00	0.00	888.30	300.00	883.50	0.00	889.84	3.05	2.10	175.37	105.71
3.100	73.00	0.00	888.30	250.00	883.50	0.00	888.48	3.48	1.41	56.70	1.98
4.100	73.00	0.00	888.30	160.00	884.90	0.00	892.48	0.09	0.40	551.65	328.99
5.100	63.00	0.00	888.30	410.00	884.90	0.00	890.51	9.39	2.95	200.57	133.80
6.100	63.00	0.00	888.30	300.00	884.90	0.00	889.97	5.79	2.37	170.44	76.73
7.100	63.00	0.00	888.30	250.00	884.90	0.00	889.01	40.51	1.80	63.75	29.03
8.100	63.00	0.00	888.30	160.00	884.90	0.00	888.19	45.24	1.31	37.05	14.79
1.200	73.00	0.00	888.30	410.00	884.90	0.00	890.53	0.75	0.94	545.75	507.77
2.200	73.00	0.00	888.30	300.00	884.90	0.00	889.99	0.59	0.39	455.12	570.77
3.200	73.00	0.00	888.30	250.00	884.90	0.00	889.31	0.46	0.50	395.34	205.34
4.200	73.00	0.00	888.30	160.00	884.90	0.00	888.91	0.37	0.41	160.24	91.52
1.300	73.00	0.00	888.30	410.00	884.90	0.00	890.28	3.13	3.08	215.20	135.72
2.300	73.00	0.00	888.30	300.00	883.50	0.00	889.84	3.05	2.10	175.37	105.71
3.300	73.00	0.00	888.30	250.00	883.50	0.00	888.48	3.48	1.41	56.70	1.98
4.300	73.00	0.00	888.30	160.00	884.90	0.00	892.48	0.09	0.40	551.65	328.99
5.300	63.00	0.00	888.30	410.00	884.90	0.00	890.51	9.39	2.95	200.57	133.80
6.300	63.00	0.00	888.30	300.00	884.90	0.00	889.97	5.79	2.37	170.44	76.73
7.300	63.00	0.00	888.30	250.00	884.90	0.00	889.01	40.51	1.80	63.75	29.03
8.300	63.00	0.00	888.30	160.00	884.90	0.00	888.19	45.24	1.31	37.05	14.79
1.400	73.00	0.00	888.30	410.00	884.90	0.00	890.51	9.39	2.95	200.57	133.80
2.400	73.00	0.00	888.30	300.00	884.90	0.00	889.97	5.79	2.37	170.44	76.73
3.400	73.00	0.00	888.30	250.00	884.90	0.00	889.01	40.51	1.80	63.75	29.03
4.400	73.00	0.00	888.30	160.00	884.90	0.00	888.19	45.24	1.31	37.05	14.79
1.500	73.00	0.00	888.30	410.00	884.90	0.00	890.53	0.75	0.94	545.75	507.77
2.500	73.00	0.00	888.30	300.00	884.90	0.00	889.99	0.59	0.39	455.12	570.77
3.500	73.00	0.00	888.30	250.00	884.90	0.00	889.31	0.46	0.50	395.34	205.34
4.500	73.00	0.00	888.30	160.00	884.90	0.00	888.91	0.37	0.41	160.24	91.52
1.600	73.00	0.00	888.30	410.00	884.90	0.00	890.28	3.13	3.08	215.20	135.72
2.600	73.00	0.00	888.30	300.00	883.50	0.00	889.84	3.05	2.10	175.37	105.71
3.600	73.00	0.00	888.30	250.00	883.50	0.00	888.48	3.48	1.41	56.70	1.98
4.600	73.00	0.00	888.30	160.00	884.90	0.00	892.48	0.09	0.40	551.65	328.99
5.600	63.00	0.00	888.30	410.00	884.90	0.00	890.51	9.39	2.95	200.57	133.80
6.600	63.00	0.00	888.30	300.00	884.90	0.00	889.97	5.79	2.37	170.44	76.73
7.600	63.00	0.00	888.30	250.00	884.90	0.00	889.01	40.51	1.80	63.75	29.03
8.600	63.00	0.00	888.30	160.00	884.90	0.00	888.19	45.24	1.31	37.05	14.79
1.700	73.00	0.00	888.30	410.00	884.90	0.00	890.53	0.75	0.94	545.75	507.77
2.700	73.00	0.00	888.30	300.00	884.90	0.00	889.99	0.59	0.39	455.12	570.77
3.700	73.00	0.00	888.30	250.00	884.90	0.00	889.31	0.46	0.50	395.34	205.34
4.700	73.00	0.00	888.30	160.00	884.90	0.00	888.91	0.37	0.41	160.24	91.52
1.800	73.00	0.00	888.30	410.00	884.90	0.00	890.28	3.13	3.08	215.20	135.72
2.800	73.00	0.00	888.30	300.00	883.50	0.00	889.84	3.05	2.10	175.37	105.71
3.800	73.00	0.00	888.30	250.00	883.50	0.00	888.48	3.48	1.41	56.70	1.98
4.800	73.00	0.00	888.30	160.00	884.90	0.00	892.48	0.09	0.40	551.65	328.99
5.800	63.00	0.00	888.30	410.00	884.90	0.00	890.51	9.39	2.95	200.57	133.80
6.800	63.00	0.00	888.30	300.00	884.90	0.00	889.97	5.79	2.37	170.44	76.73
7.800	63.00	0.00	888.30	250.00	884.90	0.00	889.01	40.51	1.80	63.75	29.03
8.800	63.00	0.00	888.30	160.00	884.90	0.00	888.19	45.24	1.31	37.05	14.79
1.900	73.00	0.00	888.30	410.00	884.90	0.00	890.53	0.75	0.94	545.75	507.77
2.900	73.00	0.00	888.30	300.00	884.90	0.00	889.99	0.59	0.39	455.12	570.77
3.900	73.00	0.00	888.30	250.00	884.90	0.00	889.31	0.46	0.50	395.34	205.34
4.900	73.00	0.00	888.30	160.00	884.90	0.00	888.91	0.37	0.41	160.24	91.52
1.000	73.00	0.00	888.30	410.00	884.90	0.00	890.28	3.13	3.08	215.20	135.72
2.000	73.00	0.00	888.30	300.00	883.50	0.00	889.84	3.05	2.10	175.37	105.71
3.000	73.00	0.00	888.30	250.00	883.50	0.00	888.48	3.48	1.41	56.70	1.98
4.000	73.00	0.00	888.30	160.00	884.90	0.00	892.48	0.09	0.40	551.65	328.99
5.000	63.00	0.00	888.30	410.00	884.90	0.00	890.51	9.39	2.95	200.57	133.80
6.000	63.00	0.00	888.30	300.00	884.90	0.00	889.97	5.79	2.37	170.44	76.73
7.000	63.00	0.00	888.30	250.00	884.90	0.00	889.01	40.51	1.80	63.75	29.03
8.000	63.00	0.00	888.30	160.00	884.90	0.00	888.19	45.24	1.31	37.05	14.79
1.100	74.50	392.50	889.60	886.30	160.00	892.28	893.29	0.51	0.77	315.41	224.95
2.100	74.50	392.50	889.60	886.30	250.00	892.49	893.50	0.94	1.09	288.41	[illegible]
3.100	74.50	392.50	889.60	886.30	300.00	892.59	893.60	0.00	1.24	373.53	274.47
4.100	74.50	392.50	889.60	886.30	410.00	892.78	893.8	0.00	1.34	409.79	312.05
5.100	74.50	392.50	889.60	886.30	160.00	892.28	893.29	0.51	0.77	315.41	224.95
6.100	74.50	392.50	889.60	886.30	250.00	892.49	893.50	0.94	1.09	288.41	[illegible]
7.100	74.50	392.50	889.60	886.30	300.00	892.59	893.60	0.00	1.24	373.53	274.47
8.100	74.50	392.50	889.60	886.30	410.00	892.78	893.8	0.00	1.34	409.79	312.05

9,000	200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9,000	200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9,000	200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9,000	200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10,000	210.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10,000	210.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10,000	210.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10,000	210.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10,100	210.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10,100	210.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10,100	210.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10,100	210.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11,000	200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000	200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000	200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000	200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000	370.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000	370.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000	370.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500	170.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500	170.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500	170.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500	170.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12,700	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12,700	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12,700	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12,700	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13,000	60.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13,000	60.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13,000	60.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13,000	60.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13,100	70.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13,100	70.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13,100	70.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13,100	70.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14,000	210.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14,000	210.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14,000	210.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14,000	210.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14,000	210.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14,000	210.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14,000	210.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14,000	210.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

OUT DIAM OF 6 FT

SUMMER EXTINCTION TIME 30

BRGNI	D	CUBE	DFMFF	DFCUBE	DFFR3	TOFMIC	XLC-
.000	160.00	881.60	0.00	0.00	0.00	336.35	0.00
1.000	250.00	881.60	0.00	0.00	0.00	336.35	0.00
.000	300.00	881.60	0.00	0.00	0.00	396.35	0.00
1.000	410.00	881.66	0.06	0.00	0.06	313.26	0.00
1.200	160.00	882.36	0.00	0.76	0.00	148.17	720.00
1.300	250.00	882.72	0.36	1.13	0.00	68.26	720.00
1.200	300.00	882.99	0.27	1.29	0.00	177.55	720.00
1.300	410.00	883.19	0.30	1.53	0.00	192.76	720.00
1.400	160.00	883.04	0.00	0.68	0.00	59.31	170.00
1.400	250.00	883.36	0.31	0.69	0.00	92.70	170.00
1.400	300.00	883.49	0.13	0.82	0.00	107.11	170.00
1.400	410.00	883.79	0.29	0.82	0.00	134.83	170.00
2.000	160.00	883.88	0.00	0.85	0.00	133.64	200.00
2.000	250.00	884.29	0.41	0.94	0.00	149.66	200.00
2.000	300.00	884.48	0.19	0.91	0.00	158.92	200.00
2.000	410.00	884.83	0.35	1.05	0.00	167.74	200.00
2.300	160.00	884.61	0.00	0.73	0.00	103.79	210.00
2.300	250.00	884.98	0.37	0.68	0.00	112.01	210.00
2.300	300.00	885.15	0.17	0.67	0.00	115.83	210.00
2.300	410.00	885.49	0.34	0.65	0.00	123.49	210.00
2.500	160.00	885.38	0.00	0.76	0.00	81.26	180.00
2.500	250.00	885.76	0.39	0.78	0.00	92.89	180.00
2.600	300.00	885.94	0.18	0.80	0.00	98.33	180.00
2.600	410.00	886.29	0.35	0.80	0.00	108.76	180.00
3.000	160.00	886.84	0.00	1.47	0.00	20.00	210.00
3.000	250.00	887.16	0.31	1.40	0.00	106.90	210.00
3.000	300.00	887.33	0.17	1.38	0.00	106.91	210.00
3.000	410.00	887.67	0.34	1.38	0.00	106.91	210.00
3.100	160.00	887.78	0.00	0.94	0.00	19.34	73.00
3.100	250.00	888.68	0.89	1.52	0.00	20.00	73.00
3.100	300.00	889.86	1.19	2.53	0.00	78.16	73.00
3.100	410.00	890.38	0.52	2.71	0.00	97.24	73.00
3.500	160.00	888.21	0.00	0.43	0.00	128.61	150.00
3.500	250.00	889.11	0.90	0.44	0.00	154.29	150.00
3.500	300.00	889.99	0.88	0.13	0.00	199.43	150.00
3.500	410.00	890.53	0.54	0.15	0.00	207.93	150.00

SF/D		OUTFL	DIF/SP	DIF/BY	DIF/WS	TOF/D	ACH
1.000	160.00	892.74	0.00	0.00	0.00	0.00	140.00
2.000	250.00	893.11	0.37	0.01	0.00	204.35	130.00
2.000	300.00	893.29	0.18	0.02	0.00	211.40	130.00
2.000	410.00	892.54	0.27	0.02	0.00	222.22	120.00
3.000	160.00	892.74	0.00	0.00	0.00	157.47	180.00
3.000	250.00	893.11	0.37	0.00	0.00	179.87	180.00
3.000	300.00	893.29	0.18	0.00	0.00	184.80	180.00
3.000	410.00	892.56	0.27	0.00	0.00	190.00	180.00
3.100	160.00	892.38	0.00	0.54	0.00	184.31	74.50
3.100	250.00	892.49	0.21	0.37	0.00	190.00	74.50
3.100	300.00	892.59	0.10	0.30	0.00	190.00	74.50
3.100	410.00	892.78	0.20	0.22	0.00	190.00	74.50
4.000	160.00	892.29	0.00	0.01	0.00	190.00	200.00
4.000	250.00	892.50	0.21	0.02	0.21	190.00	200.00
4.000	300.00	892.61	0.11	0.02	0.37	190.00	200.00
4.000	410.00	892.82	0.21	0.03	0.03	190.00	200.00
10.000	160.00	892.29	0.00	0.00	0.00	190.00	210.00
10.000	250.00	892.50	0.21	0.20	0.21	190.00	210.00
10.000	300.00	892.61	0.10	0.00	0.32	190.00	210.00
10.000	410.00	892.81	0.21	0.20	0.23	190.00	210.00
5.000	160.00	892.69	0.00	0.00	0.00	190.00	200.00
5.000	250.00	892.84	0.15	0.00	0.00	190.00	200.00
5.000	300.00	892.94	0.09	0.00	0.00	190.00	200.00
5.000	410.00	893.16	0.22	0.00	0.00	190.00	200.00
6.000	160.00	892.69	0.00	0.00	0.00	190.00	200.00
6.000	250.00	892.84	0.15	0.00	0.00	143.46	200.00
6.000	300.00	892.94	0.10	0.00	0.00	146.37	200.00
6.000	410.00	893.16	0.22	0.00	0.00	150.00	200.00
7.000	160.00	892.74	0.00	0.01	0.00	189.65	140.00
7.000	250.00	893.11	0.37	0.01	0.00	204.35	130.00
7.000	300.00	893.29	0.18	0.02	0.00	211.40	130.00
7.000	410.00	892.54	0.27	0.02	0.00	222.22	120.00
8.000	160.00	892.74	0.00	0.00	0.00	157.47	180.00
8.000	250.00	893.11	0.37	0.00	0.00	179.87	180.00
8.000	300.00	893.29	0.18	0.00	0.00	184.80	180.00
8.000	410.00	892.56	0.27	0.00	0.00	190.00	180.00
8.100	160.00	892.38	0.00	0.54	0.00	184.31	74.50
8.100	250.00	892.49	0.21	0.37	0.00	190.00	74.50
8.100	300.00	892.59	0.10	0.30	0.00	190.00	74.50
8.100	410.00	892.78	0.20	0.22	0.00	190.00	74.50
9.000	160.00	892.29	0.00	0.01	0.00	190.00	200.00
9.000	250.00	892.50	0.21	0.02	0.21	190.00	200.00
9.000	300.00	892.61	0.11	0.02	0.37	190.00	200.00
9.000	410.00	892.82	0.21	0.03	0.03	190.00	200.00
10.000	160.00	892.29	0.00	0.00	0.00	190.00	210.00
10.000	250.00	892.50	0.21	0.20	0.21	190.00	210.00
10.000	300.00	892.61	0.10	0.00	0.32	190.00	210.00
10.000	410.00	892.81	0.21	0.20	0.23	190.00	210.00

SECND	X	CUSEL	DIFSP	DIFMSX	DIFMB	TOPWID	KLCH
10.100	160.00	893.75	0.00	0.04	0.00	190.00	24.00
10.100	250.00	893.55	0.21	0.05	0.22	190.00	24.00
10.100	300.00	893.66	0.11	0.06	0.33	190.00	24.00
10.100	410.00	893.88	0.22	0.07	0.55	190.00	24.00
11.000	160.00	893.37	0.00	0.05	0.00	113.57	300.00
11.000	250.00	893.63	0.25	0.08	0.25	117.72	300.00
11.000	300.00	893.75	0.12	0.09	0.38	120.66	300.00
11.000	410.00	894.00	0.25	0.12	0.62	129.17	300.00
12.000	160.00	893.47	0.00	0.10	0.00	69.43	370.00
12.000	250.00	893.78	0.31	0.15	0.31	74.68	370.00
12.000	300.00	893.93	0.15	0.18	0.46	81.86	370.00
12.000	410.00	894.23	0.30	0.23	0.76	97.41	370.00
12.500	160.00	893.57	0.00	0.09	0.00	96.97	170.00
12.500	250.00	893.93	0.35	0.14	0.35	107.50	170.00
12.500	300.00	894.09	0.17	0.18	0.52	111.29	170.00
12.500	410.00	894.42	0.33	0.19	0.85	114.20	170.00
12.700	160.00	893.60	0.00	0.03	0.00	62.12	100.00
12.700	250.00	893.95	0.36	0.04	0.36	69.05	100.00
12.700	300.00	894.12	0.17	0.04	0.53	71.84	100.00
12.700	410.00	894.45	0.33	0.03	0.85	76.77	100.00
13.000	160.00	893.59	0.00	0.00	0.00	32.00	60.00
13.000	250.00	894.02	0.42	0.07	0.42	90.00	60.00
13.000	300.00	894.20	0.18	0.08	0.61	90.00	60.00
13.000	410.00	894.55	0.35	0.10	0.96	90.00	60.00
13.100	160.00	898.61	0.00	5.03	0.00	84.85	70.00
13.100	250.00	899.01	0.40	4.99	0.40	87.60	70.00
13.100	300.00	899.17	0.16	4.97	0.56	88.39	70.00
13.100	410.00	899.46	0.29	4.91	0.85	89.86	70.00
14.000	160.00	898.62	0.00	0.01	0.00	333.22	210.00
14.000	250.00	899.02	0.41	0.01	0.41	346.23	210.00
14.000	300.00	899.19	0.16	0.01	0.57	351.93	210.00
14.000	410.00	899.49	0.30	0.02	0.87	362.29	210.00

00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: FOWLERVILLE, ~~CITY~~ VILLAGE OF

3) WATERCOURSE: RED CEDAR RIVER

4) DOCUMENT TYPE: 100-YEAR ENCROACHED

00BREAK00

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                                                          1.15 PM  [illegible]  [illegible]

HEC2 RELEASE DATED  NOV 76 UPDATED MAY  1984
ERROR CORR -  01,02,03,04,05,06
MODIFICATION -  50,51,52,53,54,55
[illegible]

C
T1      VILLAGE OF FOWLERVILLE FLOOD INSURANCE STUDY    JANUARY 1985 .TP
T2      [illegible]  [illegible]  100 YR  FLOOD PROFILE RUN
T3      RED CEDAR RIVER AT FOWLERVILLE

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS     Q       WSEL      FQ
      0.       2.       0         0   0.000520    0.00     0.0      0.   882.000    0.000

J2  NPROF    IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW     CHNIM    ITRACE
     1.000    0.500   -1.000    0.000    0.000   0.000    0.000   0.000    0.000    0.000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

   [illegible]  201.000   0.000    0.000    0.000    0.000    0.000    0.000    0.000    0.000

QT     5.000   940.000  1470.000  17 0.000  2120.000  1740.000     0.000     0.000     0.000     0.000
NC     0.000     0.200     0.000     0.100     0.300     0.000     0.000     0.000     0.000     0.000
ET     0.000     0.000     0.000     0.000     0.000     1.400     0.000     0.000     0.000     0.000
NH     5.000     0.060   704.000     0.030  1184.000     0.040  1272.000     0.030  1732.000     0.045
NH  1912.000     0.035  2045.000     0.045  2120.000     0.030  2944.000     0.040  3805.000     0.000
       170' D/S OF FOWLERVILLE VILLAGE LIMIT
X1     4.000    78.000  2000.000  2033.000     0.000     0.000     0.000     0.000     0.000     0.000
X3     0.000     0.000     0.000  1816.000     0.000  2120.000     0.000     0.000     0.000     0.000
GR   885.700   360.000   883.600   416.000   885.300   472.000   895.300   520.000   854.700   552.000
GR   883.300   600.000   884.500   616.000   885.100   632.000   893.800   640.000   882.800   628.000
GR   883.300   656.000   886.900   664.000   839.900   680.000   881.700   704.000   881.700   784.000
GR   884.100  1172.000   884.900  1200.000   883.500  1216.000   883.500  1224.000   882.700  1240.000
GR   881.700  1248.000   882.500  1256.000   879.900  1272.000   879.900  1732.000   882.300  1752.000
GR   881.100  1772.000   884.700  1784.000   886.200  1500.000   867.500  1808.000   887.500  1316.000
GR   880.700  1824.000   880.300  1848.000   879.700  1872.000   879.700  1912.000   880.100  1964.000
GR   810.900  1976.000   880.800  1980.000   880.900  1992.000   880.100  2020.000   872.400  2002.000
GR   876.700  2002.000   874.600  2008.000   874.600  2013.000   874.600  2017.000   874.700  2022.000
GR   874.300  2047.000   874.700  2051.000   873.500  2042.000   871.500  2045.000   881.100  2045.000
GR   882.300  2048.000   881.700  2072.000   883.300  2096.000   889.700  2104.000   890.300  2120.000
GR   838.500  2121.000   881.400  2744.000   849.500  2952.000   891.500  2960.000   885.500  2968.000
GR   884.300  2976.000   884.300  3005.000   884.300  4078.000   885.500  3096.000   884.300  3160.000
GR   887.300  2208.000   888.300  3264.000   887.300  3280.000   888.300  3370.000   890.600  3352.000
GR    89 .500  3 00.000   887.200  3368.000   892.300  3504.000   893.300  3376.000   894.500  3404.000
GR   893.700  3672.000   [illegible]  3712.000  837.700  4000.000     0.000     0.000     0.000     0.000
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[illegible]	9.000	0.060	67.000	0.02[illegible]	10[illegible].000	0.0[illegible]	1357.000	0.050	1[illegible].000	0.[illegible]
[illegible]	[illegible].000	0.[illegible]	[illegible].000	0.[illegible]	[illegible].000	0.0[illegible]	[illegible].000	0.[illegible]	[illegible].000	0.000
[illegible]	0.000	0.000	0.000	0.000	0.000	9.100	0.000	0.000	[illegible].000	[illegible].000
SURVEY SECTION [illegible]										
X1	3.000	53.000	1982.000	2061.000	1030.000	070.000	1040.000	0.000	0.000	0.000
[illegible]	0.000	0.000	0.000	1740.000	0.000	[illegible].000	0.000	0.000	0.000	0.000
GR	386.200	3[illegible].000	384.700	165.000	8[illegible]	[illegible].000	384.[illegible]	[illegible].000	8[illegible]	[illegible].000
[illegible]	387.200	[illegible].000	382.500	[illegible].000	8[illegible].000	[illegible].000	[illegible].200	1021.000	[illegible]	[illegible]
GR	387.700	[illegible].000	887.300	[illegible].000	839.[illegible]00	1077.000	88[illegible]	[illegible].000	588.[illegible]	1[illegible]
GR	891.900	1301.000	89[illegible].500	1[illegible]05.000	8[illegible]2.700	[illegible].000	882.900	1357.000	8[illegible]	1655.000
GR	885.900	1665.000	884.300	1682.000	889.300	170[illegible].000	883.700	1753.000	588.700	1793.000
GR	881.700	1731.000	880.700	1810.000	[illegible]	1815.000	880.[illegible]	19[illegible].000	8[illegible]	19[illegible]
GR	882.200	1982.000	88[illegible].500	2000.000	881.000	20[illegible].000	87[illegible]	2011.000	87[illegible]	[illegible]
GR	876.400	2025.000	87[illegible].800	2026.000	876.400	2062.000	878.400	2064.000	8[illegible].000	20[illegible].000
GR	88[illegible].200	2061.000	88[illegible].600	2117.000	886.300	2133.000	883.600	2[illegible].000	88[illegible].300	[illegible].000
GR	886.400	2331.000	884.300	2877.000	898.400	2885.000	889.700	2901.000	882.900	29[illegible].000
GR	88[illegible].500	[illegible].000	88[illegible].000	3133.000	88[illegible].900	3173.000	88[illegible].200	3[illegible].000	887.700	3239.000
GR	[illegible]	[illegible].000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.080	0.080	0.035	0.000	0.000	0.000	0.050	0.000	0.000	0.000
ET	0.000	9.100	9.100	9.100	9.100	[illegible].400	0.000	0.000	2770.000	3270.000
SURVEY SECTION [illegible]										
X1	6.000	47.000	3000.000	3044.000	1060.000	1030.000	1040.000	0.000	0.000	0.000
GR	[illegible]	[illegible].000	877.500	[illegible].000	883.900	[illegible].000	887.700	[illegible].000	88[illegible]	[illegible]
GR	[illegible].200	1180.000	887.300	1204.000	887.900	1296.000	887.000	[illegible].000	88[illegible]	[illegible]
GR	8[illegible].300	1[illegible].000	8[illegible].400	1643.000	887.600	1360.000	888.000	1676.000	887.500	1[illegible].000
GR	88[illegible].700	[illegible].000	885.500	1716.000	886.700	1724.000	887.000	1732.000	886.500	1740.000
GR	883.000	1913.000	882.600	2108.000	881.200	2756.000	880.800	2772.000	880.600	2820.000
GR	881.600	2876.000	881.200	2940.000	880.400	2980.000	880.800	2996.000	880.000	3000.000
GR	878.800	3004.000	877.300	3007.000	876.500	3014.000	879.360	3019.000	876.400	3024.000
GR	875.600	3039.000	877.400	3035.000	878.100	3037.000	879.400	3039.000	880.200	3041.000
GR	880.800	3084.000	880.700	3457.000	881.400	3503.000	892.100	3796.000	896.200	[illegible].000
GR	89[illegible].400	4176.000	899.600	4714.000	0.000	0.000	0.000	0.000	0.000	0.000
E.	0.000	9.100	9.100	9.100	9.100	0.000	0.000	0.000	2525.000	3120.000
200' U/S FROM BRIDGE @ GRAND RIVER AVENUE										
X1	7.100	18.000	3000.000	3044.000	580.000	650.000	620.000	0.000	0.000	0.000
GR	888.200	210.000	887.500	1230.000	885.300	2160.000	884.000	2250.000	882.000	2400.000
GR	881.900	3000.000	877.400	3004.000	875.800	3009.000	875.400	3019.000	875.300	3028.000
GR	877.500	3036.000	878.500	3041.000	881.900	3044.000	882.000	3230.000	884.000	3250.000
GR	886.000	3520.000	888.000	3610.000	890.000	3700.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.300	0.500	0.000	0.000	0.000	0.000	0.000
ET	0.000	0.000	0.000	0.000	0.000	1.410	0.000	0.000	0.000	0.000
D/S FACE OF GRAND RIVER AVENUE BRIDGE										
X1	7.200	24.000	3000.000	3044.000	300.000	300.000	300.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	887.000	887.000	0.000
GR	889.400	963.000	882.600	1719.000	838.400	1807.000	887.500	1975.000	886.600	2047.000
GR	885.600	2959.000	885.500	2998.000	885.800	2999.900	855.500	3000.000	876.600	3003.000
GR	876.400	3003.100	874.900	3010.000	875.300	3019.000	875.200	3022.000	877.500	3036.000
GR	878.000	3042.100	878.900	3044.000	88[illegible]	3044.000	88[illegible].500	3044.100	885.500	3046.000
GR	885.600	3037.000	887.700	3751.000	89[illegible]	4[illegible].000	902.200	4751.000	0.000	0.000

[illegible]	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
[illegible]	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	[illegible]	[illegible]
	U/S FACE OF [illegible]									
[illegible]	7.400	0.000	0.000	0.000	56.000	56.000	56.000	0.000	0.000	0.000
[illegible]	0.000	0.000	1.000	831.700	981.700	0.000	0.000	0.000	0.000	0.000
[illegible]	0.000	0.000	0.000	0.000	0.000	0.000	0.000	[illegible]	[illegible]	0.000
[illegible]	8.000	[illegible]	[illegible]	800.000	719.000	[illegible]	800.000	[illegible]	[illegible]	800.000
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	800.000	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	88.500	3042.900	939.100	881.500	3043.000	869.100	878.000	3044.000	889.100	800.000
[illegible]	3044.100	836.700	300.000	3046.000	886.700	800.000	3040.000	836.700	800.000	3780.000
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.000	0.000	0.000	0.000	0.000
[illegible]	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
[illegible]	0.000	[illegible]	9.100	[illegible]	9.100	0.000	0.000	0.000	[illegible]	[illegible]
	400' U/S OF GRAND RIVER AVENUE BRIDGE									
XI	7.200	19.000	3000.000	3057.000	400.000	400.000	400.000	0.000	0.000	0.000
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	877.500	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	3046.000	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.000	0.000
NC	0.080	0.080	0.000	0.100	0.300	0.000	0.000	0.000	0.000	0.000
ET	0.000	[illegible]	9.100	[illegible]	9.100	0.000	0.000	0.000	[illegible]	[illegible]
	HUBVEY BRIDGE									
XI	3.000	23.000	3000.000	[illegible]	400.000	400.000	400.000	0.000	0.000	0.000
GR	871.400	862.000	887.800	[illegible]	888.000	[illegible]	884.600	[illegible]	[illegible]	[illegible]
GR	883.300	2678.000	883.900	2686.000	882.800	2702.000	881.100	2980.000	881.200	3000.000
GR	879.100	3006.000	877.900	3009.000	876.500	3015.000	876.500	3020.000	876.200	3025.000
GR	877.000	3030.000	879.[illegible]00	3037.000	880.300	3042.000	881.100	3062.000	882.700	3071.000
GR	882.300	3102.000	882.200	3126.000	882.400	3152.000	886.000	3166.000	887.000	3206.000
BI	890.000	3300.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.300	0.300	0.000	0.000	0.000	0.000	0.000
ET	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000
	D&G FACE OF C & O R.R. BRIDGE									
XI	9.200	25.000	3000.000	3094.000	370.000	600.000	600.000	0.000	0.000	0.000
XI	0.000	0.000	0.000	0.000	0.000	0.000	0.000	890.700	870.700	0.000
BR	875.600	755.000	871.800	[illegible]	891.400	1923.000	890.500	[illegible]	891.700	[illegible]
GR	890.800	2997.000	890.700	3000.000	889.600	3008.000	884.500	3011.000	880.400	3011.000
GR	879.300	3020.000	878.600	3027.000	878.500	3032.000	878.500	3040.000	878.500	3049.000
GR	878.700	3054.000	879.400	3060.000	881.300	3071.000	884.500	3071.100	888.600	3074.000
BR	890.700	3094.000	893.400	3770.000	895.000	4309.000	895.600	4754.000	896.700	4780.000
NC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SB	0.900	1.500	3.000	0.000	50.200	10.000	265.000	0.000	878.300	878.500
	U/S FACE OF C & O R.R. BRIDGE									
XI	9.400	0.000	0.000	0.000	10.500	10.500	10.500	0.000	0.000	0.000
XI	0.000	0.000	1.000	804.500	890.700	0.000	0.000	0.000	0.000	0.000
[illegible]	10.000	0.000	0.000	0.000	0.000	0.000	0.000	890.700	870.700	0.000
[illegible]	[illegible]	[illegible]	[illegible]	0.000	[illegible]	890.700	0.000	[illegible]	[illegible]	0.000
BR	3770.000	873.400	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

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  C     [illegible]    0.200      0.052      0.000    [illegible]   0.000      0.000      0.000    [illegible]    0.200
  T     [illegible]    9.100    [illegible]  9.100      7.200      0.000      0.000      0.000   1700.000   [illegible]
           100 [illegible]
  X1      7.500     21.000    900.000   2060.000    500.000    700.000    300.000      0.000      0.000      0.000
  GR    885.000    700.000    888.500    750.000    884.000   1030.000    891.000   1040.000    884.000    270.000
  GR  [illegible] [illegible]  880.900   2000.000    877.[illegible] 2026.000 878.[illegible] 2018.000 878.[illegible] 2025.000
  GR    876.200   [illegible]  877.700   2038.000    827.200   1045.000    879.000   2050.000    879.[illegible] 2040.000
  GR    88[illegible] 2040.000 [illegible] 2040.000   883.000   [illegible]  876.000   2110.000    883.050   2070.000
  GR    870.000   2270.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000

  ET      0.000      9.100      9.100      9.100      9.100      0.000      0.000      0.000   1350.000   3012.000
           SURVEY SECTION 10
  X1     10.700     30.000   3000.000   2036.000    500.000    500.000    300.000      0.000      0.000      0.000
  GR    8[illegible]  [illegible]  887.000  [illegible]  865.700   [illegible]  885.400   1500.000    882.100   1524.000
  GR    881.000   1624.000    880.800   1712.000    851.300   1760.000    881.400   1980.000    882.100   1931.000
  GR    883.300   1994.000    88[illegible].600 2000.000 879.500  2006.000    877.700   2011.000    877.400   2020.000
  GR    877.300   2023.000    87[illegible]  2030.000   878.000   2036.000    878.600   2039.000    879.300   2030.000
  GR    8[illegible]  2037.000  882.[illegible]  [illegible]  882.200  1072.000  882.000  2080.000  882.200   2094.000
  GR    881.100   2172.000    890.900   2512.000    884.100   [illegible]  896.100   5608.000    883.200   [illegible]

           SURVEY SECTION 11
  X1     11.000     27.000   2000.000   2104.000    340.000    830.000    710.000      0.000      0.000      0.000
  GR    8[illegible].000  620.000  885.400  760.000  886.400   1400.000    386.000   1704.000    83[illegible].400 1770.000
  GR    [illegible]12.800  1800.000  8[illegible]  [illegible]  881.300  1980.000  882.700  1990.000  882.300  [illegible]
  GR    [illegible]0.800  3000.000  87[illegible]  2007.000  878.500  2008.000  877.840  2010.000  877.[illegible] 2015.000
  GR    877.400   2020.000    87[illegible]  2028.000  878.[illegible]  2043.000  881.500  2057.000  883.000   2070.000
  GR    881.400   2047.000    880.400   2057.000    882.200   2080.000    883.000   2104.000    882.100   2284.000
  GR    887.600   2704.000    887.800   2760.000    892.100   3288.000    893.400   3472.000      0.000      0.000

           SURVEY SECTION 12
  X1     12.000     31.000   2000.000   2035.000    580.000    370.000    410.000      0.000      0.000      0.000
  GR    839.700   1160.000    887.200   1480.000    853.400   1584.000    881.800   1504.000    852.600   1926.000
  GR    882.000   1960.000    880.400   1975.000    8[illegible].100 1990.000  883.000  1999.000    882.800   1995.000
  GR    881.400   2000.000    879.700   2001.000    878.600   2001.500    877.000   2005.000    877.200   2012.000
  GR    877.700   2017.000    875.600   2021.000    877.500   2027.000    878.400   2031.000    879.700   2033.000
  GR    880.700   2035.000    885.000   2047.000    881.700   2057.000    883.000   2064.000    883.700   2224.000
  GR    881.400   2712.000    881.800   2736.000    833.200   2760.000    889.300   3200.000    899.000   3752.000
  GR    904.600   3992.000      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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                                                                  THIS RUN EXECUTED 27-FEB-85  12:[illegible]
 [illegible]
   HEC2 RELEASE DATED NOV 76 UPDATED MAY 1984
   ERROR CORR - 01,02,03,04,05,06
   MODIFICATION - 50,51,52,53,54,55,56
 [illegible]

 T1   100 YR. FLOOD PROFILE
 T2
 T3   [illegible]

 J1   ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ
        0.      [illegible]  0.     0.   0.000520    0.00      0.0       0.   880.000     0.000

 J2   NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE
      1.000     0.000    -1.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
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SECNO     DEPTH     CSEL      CRCW      CHECK     EF        HO        HL        OLCAR     RAMP STEP
E         DLOR      DCX       TROT      ALOR      ACX       PROP      UDL       TWA       EF 7.5C0.
TYPE      VLOR      VCH       UCW       SWL       VCH       JNT       UTH       ELMTR     3870
SLOPE     XLOBL     XCCH      XCOER     TRIBE     TDC       ICONT     CCRAR     TOPOIL    ENDST


*TOP 3.

EDPU=    0.100 SEW=    0.000
*90 MH CARD USED
*SECNO 4.000

3470 ENCROACHMENT STATIONS=    2310.0    2120.0  TYPE=    1  TARGET=    394.000
          1701 9/8 MF TOW.BRUTLLE VILLAGE .IHIT
     4.00      3.72    885.02     0.00    882.00    885.13     0.11      0.00      0.00    880.10
     730       001.      004.      43.      421.      255.      44.       0.        0.      875.00
     0.00      1.74      3.12      1.03     0.039     0.035     0.045     0.000   874.30   1843.17
 0.000529       0.        0.        0        0         0         0      0.00    251.39   2084.76


*90 MH CARD USED
*SECNO 5.000

3470 ENCROACHMENT STATIONS=    174.0     2133.0  TYPE=    1  TARGET=    392.000
          SURVEY SECTION 55
     5.00      7.79    882.00     0.00     0.00    883.65     0.06      0.30      0.01    882.90
    1720      846       8[illegible].      53.      595       322.      49.       21.       7.     862.20
     0.15      1.42      2.50      0.99     0.045     0.035     0.045     0.000   875.80   1768.69
 0.000469     1020      1040.     1070.       1         0         0      0.00    352.04   2120.73


*SECNO 6.000

3470 ENCROACHMENT STATIONS=    2775.0    3270.0  TYPE=    1  TARGET=    495.000
          SURVEY SECTION 56
     6.00      8.70    884.00     0.00    882.72    884.04     0.05      0.39      0.00    880.00
    1730.     472.      704.      623.      677.      693.      724.      53.       47.     880.30
     0.34      0.67      2.57      0.71     0.080     0.035     0.080     0.000   875.30   2775.00
 0.000308     1060.     1040.     1030.       2         0         0      0.00    495.00   3270.00


*SECNO 7.100

3470 ENCROACHMENT STATIONS=    2925.0    3120.0  TYPE=    1  TARGET=    195.000
          300' D/S FROM BRIDGE I GRAND RIVER AVENUE
     7.10      8.35    884.15     0.00    882.56    884.40     0.25      0.30      0.04    881.30
    1730.     153.      1434.     153.      148.      325.      170.      70.       22.     881.90
     0.39      0.71      4.39      0.90     0.080     0.035     0.080     0.000   875.30   2925.00
 0.000841      580.      630.      440.       2         0         0      0.00    195.00   3120.00
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      STCP     DEPTH    CHSEL    CSLMP    CSEL R    SO       HV       VOL      TLOSS    SAVE FLOW
                TIDE     QLO      TIDE     ALCH      AC       ARDR     VOL      TWA      EXTRAPOLT
       HP      FLOOD    VOL      FLOW     KNL       VHC      CA       HT       FLOW     PERM
      ELOPE    ELOCL    ALCF     ELOUT    TTRIA     VHC      ICONT    CONAR    TOP ID   EXOST

COMP  0.000 CLTYE  TRLOT
BETWD 7.200

*** OVERBANK AREA ASSUMED NON-EFFECTIVE:FLLEA=      887.00 ELRSA=      887.00

          D/S FACE OF GRAND RIVER AVENUE BRIDGE
     7.20     9.48    884.50     0.00    883.37    884.77     0.39     0.50     0.07    885.50
     1730.      0.     1730.      0.        0.      397.       0.       7.       25.    885.50
     0.40     0.00     0.55     0.30     0.000     0.032    0.000    0.000   874.90   3000.00
0.001170      300.     300.     300.        2         0        0     0.00    43.47   3000.00

PRT FAL BRIDGE

HT. YK      XNOR      CDTO      HOLCH      DTC       DJF      SARTH      SS       ELCHK     ELCHK
  0.00      1.50      3.00      0.00      42.90     0.00    217.00     0.00    877.90    874.90

SECTNO 7.100
*** SURC # DM

EGPRS      ELWC       H3       CWEIR      QPR       BARFA    TRAPEZOID AREA    ELLC      ELTRD
835.82    884.77     0.00                1730.      217.       217.            881.50    886.76

*** OVERBANK AREA ASSUMED NON-EFFECTIVE:FLLEA=      887.00 ELRSA=      887.00

          U/S FACE GRAND R. AVE BRIDGE - 975 FLOOD REACHES APPROX. ELEV. 843.8'
     7.40    10.47    885.37     0.00    883.38    885.26     0.29     1.09     0.00    885.30
     1730      0.     1730.      0.        0.      399.       0.      74.       23.    885.50
     0.42     0.00     4.54     0.00     0.000     0.072    0.000    0.000   874.90   3060.00
0.000312       56.      56.      56.        2         0        0     0.00    44.00   3064.00

SECNO 7.600

*** ENCROACHMENT STATIONS=     2745.0    3305.0  TYPE=      1  TARGET=     560.000
          400' U/S OF GRAND RIVER AVENUE BRIDGE
     7.60    10.48    885.93     0.00    883.56    886.01     0.02     0.06     0.08    881.20
     1730.     354.     799.     530.      909.      466.    1198.      87.      26.    881.20
     0.52     0.02     1.21     0.49     0.080     0.035    0.080    0.000   875.30   2745.00
0.000275      400.     400.     400.        3         0        0     0.00   560.00   3305.00
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SECND   DEPTH   COREL   CRITS   WEELS   EC      SV      HL      OLDWS   ENNR ELEV
D       ELOC    DCH     DZZP    ELOC    ATH     ARES    HCL     TWS     LEFT RIGHT
FACE    WLOD    HC      WRDU    F.L.    WPCH    ANG     HCI     EL CH   EST.
SLOPS   XLOCL   XCCH    XLCOR   ITR AL  JTC     ICOUT   CONAR   TUPWIT  ENDST

CD U=   0.100 CD U=   0.300
CDCD.0 2.000

SECTION ENCROACHMENT STATION= 2350.0   3210.0  TYPE=   X-TRB=   360.000
        SURVEY SECTION 12
   8.00    9.82   886.02    0.00   883.65   886.07    0.05    0.06    0.01   891.20
   1530.   400.   1015.    215.    693.    496.    370.    106.     30.    891.10
   0.33    0.73    2.57    0.62    0.380   0.075   0.080   0.050   826.50  3820.00
0.001.1.   150.    400.    600.      2       0       0     0.00    31.65   3136.53

CD U=   0.300 CEHV=   0.500
ARCH= 0.00

2.0 TH OVERBANK AREA ASS NOT NON-EFFECTIVE ELTOP=   890.70 ELTOP=   890.70

        D/S FACE OF C & O R.R. BRIDGE
   9.00    7.64   886.11    0.00   883.93   886.40    0.06    0.23    0.11   890.70
   1730.     0.    1730.     0.      0.     421.      0.    119.     32.    890.70
   0.12    0.00    1.11    0.00    0.000   0.055   0.000   0.000   578.50  3010.02
0.000382   570.    1.0.    600.      2       0       0     0.00    62.00  3072.03

SPECIAL BRIDGE

SC   SK    XMOR    DOFO    RDLEN   BUC     BUF     BAREA   SS      ELCRW   ELCRD
     0.90    1.30    3.00    0.60   54.20   10.00  265.00    0.00  878.50  878.50

BSECNO 9.400
BPRESSURE 7.00

ESPRS   EOLNS   HS      GWEIR   QFR     BAREA   TRAPEZOID AREA  ELLS    ELTRD
887.13  886.46  0.06    0.      1730.   265.    265.            884.50  890.70

2.0 OVERBANK AREA ASSUMED NON-EFFECTIVE ELTOP=   890.70 ELTOP=   890.70

        U/S FACE OF C & O R.R. BRIDGE
   9.40    8.42   886.92    0.00   883.95   887.13    0.21    0.23    0.00   890.70
   1730.     0.    1730.     0.      0.     449.      0.    119.     33.    890.70
   0.65    0.00    3.69    0.00    0.000   0.071   0.000   0.000   578.50  3009.58
0.000243   15.     17.     15.      2       0       0     0.00    62.00  3072.48
```

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 9.600									
3470 ENCROACHMENT STATIONS=		700.0		2180.0	TYPE=	1	TARGET=	480.000	
	500' U/S OF C L O R.R. BRIDGE								
9.60	9.9	887.21	0.00	884.20	887.32	0.01	0.03	0.06	880.90
1730.	893	719.	117.	1322.	511.	307.	130.	24	881.70
0.72	0.25	1.41	0.23	0.080	0.035	0.070	0.000	877.30	1700.00
0.00006	300.	200.	300.	2	0	0	0.00	480.00	2180.00
*SECNO 10.000									
3470 ENCROACHMENT STATIONS=		1790.0		2282.0	TYPE=		TARGET=	492.000	
	SURVEY SECTION 010								
10.00	10.92	887.38	0.00	884.26	887.38	0.0	0.02	0.00	881.60
1730.	1203.	420.	107.	3400.	417.	401.	169.	41	887.20
0.99	0.35	1.03	0.23	0.080	0.035	0.050	0.000	876.40	1790.00
0.000036	300	500.	500.	2	0	0	0.00	339.67	2225.67
*SECNO 11.000									
	SURVEY SECTION 011								
11.00	9.37	887.27	0.00	884.34	887.27	0.00	0.37	0.00	880.80
1730.	432.	581.	717	1739.	591	2530.	239.	59.	883.00
1.50	0.25	0.04	0.28	0.080	0.035	0.080	0.000	877.40	1120.11
0.000032	340.	710.	330.	1	0	0	0.00	1576.66	2695.77
*SECNO 12.000									
	SURVEY SECTION 012								
12.00	9.29	887.20	0.00	884.59	887.29	0.00	0.01	0.20	881.40
1730.	425.	273.	932.	2179.	322.	3987.	257.	76.	880.90
3.76	0.24	0.85	0.25	0.080	0.035	0.080	0.000	877.30	1459.98
0.000025	380.	310.	370.	0	0	0	0.00	1564.64	3054.62

00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: FOWLERVILLE, ~~CITY~~ VILLAGE OF

3) WATERCOURSE: RED CEDAR RIVER

4) DOCUMENT TYPE: 100-YEAR NATURAL

00BREAK00

THIS RUN EXECUTED 27-FEB-95 12:03:51

HECP RELEASE DATED NOV 76 UPDATED MAY 1984
ERROR CORR - 01,02,03,04,05,06
MODIFICATION - 01,02,03,04,31
* [illegible]

C
T1 VILLAGE OF FOWLERVILLE FLOOD INSURANCE STUDY JANUARY 1982 JTF
T2 JOB NO.[illegible] FOWLERVILLE,MICHIGAN 100 YR FLOOD PROFILE RUN
T3 RED CENTER RIVER AT FOWLERVILLE 100 YR.

NDECK	INQ	NINQ	IDIV	SIN	METRIC	HVINS	O	PSFL	FQ
0.	0	0.	0.	0.000320	0.00	0.0	0.	383.000	0.000

NPROF	IPLD	PROFN	JBEGN	JBEGN	FN	ALTIC	IB	CHSTK	ITRACE
1.000	0.000	-1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

JR VARIABLE CODES FOR SUMMARY PRINTOUT

	0.00	200.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000
QT	5.000	930.000	1470.000	1730.000	2120.000	1730.000	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
QT	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000
NH	9.000	0.060	704.000	0.030	1184.000	0.040	1272.000	0.030	1732.000	0.045
NH	1912.000	0.035	2035.000	0.045	2121.000	0.030	2944.000	0.060	3808.000	0.000
	170	D/S OF FOWLERVILLE VILLAGE LIMIT								
X1	4.000	73.000	2000.000	2035.000	0.000	0.000	0.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	1816.000	0.000	2120.000	0.000	0.000	0.000	0.000
GR	835.700	368.000	885.600	416.000	885.500	472.000	885.500	520.000	886.700	552.000
GR	885.300	600.000	884.300	616.000	885.100	632.000	888.800	640.000	883.800	648.000
GR	884.300	656.000	884.900	664.000	889.900	680.000	881.700	704.000	881.700	1184.000
GR	884.100	1192.000	884.900	1208.000	883.500	1216.000	883.500	1224.000	884.700	1240.000
GR	886.700	1248.000	882.500	1256.000	879.900	1272.000	879.900	1732.000	882.300	1752.000
GR	883.100	1752.000	883.700	1784.000	886.200	1800.000	887.500	1808.000	887.500	1816.000
GR	884.700	1920.000	880.300	1848.000	879.700	1872.000	879.700	1912.000	880.100	1944.000
GR	884.900	1976.000	880.800	1980.000	880.900	1992.000	880.100	2000.000	879.400	2002.000
GR	875.700	2003.000	874.600	2006.000	874.600	2012.000	876.800	2017.000	874.700	2022.000
GR	874.300	2027.000	876.700	2031.000	878.300	2032.000	879.900	2035.000	881.100	2045.000
GR	882.300	2048.000	882.700	2072.000	883.300	2096.000	889.600	2104.000	890.300	2120.000
GR	888.500	2121.000	888.400	2944.000	889.500	2952.000	891.500	2960.000	889.500	2968.000
GR	884.300	2976.000	884.300	3008.000	884.000	3048.000	885.100	3096.000	886.300	3160.000
GR	887.300	3208.000	888.000	3344.000	887.500	3384.000	888.900	3320.000	890.600	3352.000
GR	891.800	3408.000	892.300	3440.000	892.000	3504.000	893.800	3576.000	894.500	3624.000
GR	895.700	3672.000	894.600	3744.000	897.900	3808.000	0.000	0.000	0.000	0.000

[illegible]	9.000	0.050	357.000	0.070	1017.000	0.035	1357.000	0.030	1455.000	0.070
[illegible]	1539.000	0.030	3061.000	0.035	3150.000	0.030	3361.000	0.040	3429.000	0.000
[illegible]	0.000	0.000	0.000	0.000	0.000	9.100	0.000	0.000	[illegible]	3429.000
	SURVEY SECTION [illegible]									
X1	5.000	53.000	1987.000	3061.000	1070.000	1070.000	1040.000	0.000	0.000	0.000
[illegible]	0.200	0.000	[illegible]	1741.000	0.000	2134.000	0.000	0.000	0.000	0.000
GR	886.500	275.000	884.700	469.000	835.500	501.000	884.700	577.000	887.600	605.000
GR	887.000	613.000	882.500	737.000	88[illegible].500	1015.000	884.900	1021.000	882.500	1029.000
GR	882.700	1033.000	887.300	1305.000	839.500	1077.000	878.100	1093.000	880.600	1305.000
[illegible]	891.500	1301.000	891.500	1309.000	887.700	1335.000	882.900	1357.000	883.900	1653.000
[illegible]	885.900	1669.000	885.300	1683.000	889.300	1701.000	888.700	1733.000	888.700	1741.000
[illegible]	881.500	1781.000	880.700	1810.000	880.900	1813.000	880.300	1945.000	882.200	1981.000
[illegible]	[illegible].900	1989.000	881.300	2000.000	831.000	2005.000	878.400	2011.000	877.000	2014.000
GR	8[illegible].400	2011.000	87[illegible].800	2028.000	873.600	2057.000	873.[illegible]00	2043.000	880.000	2056.000
GR	832.200	2001.000	812.000	2117.000	886.500	2183.000	888.500	2149.000	853.400	2165.000
GR	883.400	2661.000	824.300	2677.000	838.400	2885.000	859.700	2901.000	882.500	2917.000
GR	881.500	2949.000	881.000	3103.000	384.900	3173.000	885.200	3203.000	887.700	3229.000
GR	894.300	3439.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.050	0.200	0.050	0.200	0.000	0.000	0.000	0.000	0.000	0.000
ET	0.000	9.160	9.[illegible]00	9.100	9.100	[illegible].400	0.000	0.000	2775.000	3270.000
	SURVEY SECTION 36									
X1	5.000	47.000	3000.000	3044.000	1060.000	1030.000	1070.000	0.000	0.000	0.000
[illegible]	887.600	[illegible]	887.800	620.000	885.900	996.000	887.700	1170.000	885.800	1181.000
GR	8[illegible].200	1[illegible]	887.300	[illegible].000	887.700	1556.000	[illegible].37.000	1611.000	885.700	1620.000
GR	[illegible].300	16[illegible]	886.400	[illegible].000	887.600	1660.000	885.700	1673.000	887.300	1692.000
GR	885.[illegible]00	1701.000	885.500	1715.000	886.700	1774.000	887.000	1732.000	885.400	1740.000
GR	883.000	1916.000	882.600	2108.000	881.200	2756.000	880.800	2777.000	880.600	2820.000
GR	8[illegible].300	2876.000	881.200	2940.000	880.400	2950.000	880.800	2996.000	880.000	3000.000
GR	8[illegible].800	3004.000	877.500	3007.000	876.500	3011.000	873.300	3017.000	874.300	3024.000
GR	873.600	3029.000	877.400	3035.000	878.100	3047.000	879.400	3039.000	880.300	3034.000
GR	880.900	3084.000	880.700	3492.000	88[illegible].00	3508.000	892.100	3796.000	896.200	4074.000
GR	891.400	4276.000	890.600	4774.000	0.000	0.000	0.000	0.000	0.000	0.000
ET	0.000	9.100	9.100	9.100	9.100	0.000	0.000	0.000	2923.000	3320.000
	300' D/S FROM BRIDGE @ GRAND RIVER AVENUE									
X1	7.100	19.000	3000.000	3044.000	530.000	660.000	620.000	0.000	0.000	0.000
GR	888.200	910.000	887.500	1720.000	885.300	2160.000	884.000	2250.000	882.000	2400.000
GR	881.900	3000.000	877.400	3000.000	875.800	3009.000	873.400	3019.000	873.300	3028.000
GR	877.600	3036.000	878.500	3041.000	881.900	3044.000	883.000	3330.000	884.000	3250.000
GR	886.000	3520.000	888.000	3610.000	890.000	3700.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.300	0.500	0.000	0.000	0.000	0.000	0.000
ET	0.000	0.000	0.000	0.000	0.000	1.410	0.000	0.000	0.000	0.000
	D/S FACE OF GRAND RIVER AVENUE BRIDGE									
X1	7.200	24.000	3000.000	3044.000	300.000	300.000	300.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	887.000	887.000	0.000
GR	889.400	843.000	828.400	1719.000	888.400	1807.000	887.500	1935.000	886.600	2047.000
GR	884.800	2949.000	885.500	2998.000	885.500	2999.900	883.500	3000.000	876.600	3003.000
GR	876.800	3008.000	874.700	3010.000	875.500	3019.000	875.200	3027.000	877.500	3036.000
GR	873.000	3041.000	878.500	3044.000	885.500	3044.000	883.500	3044.100	885.500	3046.000
GR	885.600	3087.000	887.200	3751.000	891.400	4167.000	902.200	4751.000	0.000	0.000

BT	3773.000	893.400	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
BI	0.000	3953.000	0.000	0.000	3000.000	0.000	0.000	2094.000	390.700	0.000
CI	10.000	0.000	3.000	0.000	0.000	0.000	0.000	890.700	890.703	0.000
CC	0.000	0.000	0.000	0.000	0.000	8123.700	484.500	0.000	0.000	0.000
CK	8.000	0.000	0.000	0.000	14.500	16.500	44.500	0.000	0.000	0.000

U/S FACE OF D.C.L.R. BRIDGE

SB	3.900	1.500	3.000	0.000	34.200	10.000	265.000	0.000	878.500	878.500
MC	0.000	0.000	0.021	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	890.700	3094.000	893.400	7770.000	695.000	4108.000	895.600	4754.300	8941.200	4780.000
GR	678.700	3084.000	879.400	3060.000	881.300	4071.000	884.500	3071.100	889.600	2074.000
GR	379.300	3020.000	878.600	3027.000	678.500	3037.000	678.500	3040.000	878.500	3049.000
GR	870.800	2997.000	890.700	3000.000	889.600	3008.000	884.500	3011.300	860.400	3011.000
GR	095.800	923.000	891.800	2321.000	891.400	2973.000	890.300	2453.000	891.100	2957.000
XI	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	890.700	0.000
XI	0.300	28.000	3000.000	3094.000	370.000	600.000	600.000	0.000	0.000	0.000

D/S FACE OF E.B.D.R. BRIDGE

ET	0.000	0.000	0.000	0.000	0.000	1.400	0.000	0.000	0.000	0.000
IC	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000
GR	890.000	3300.330	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	3030.000	3037.030	3042.000	3062.000	3082.000	3082.100	3082.700	3082.700	3074.000	
GR	3102.000	813.300	3123.000	3132.000	3142.000	3146.000	587.000	3234.000		
GR	8.000	3006.000	877.900	3009.000	876.500	3015.000	876.200	3025.000		
GR	883.300	2678.030	883.900	2686.030	882.800	2702.000	881.100	2980.000	881.200	3030.000
GC	891.900	883.000	887.800	889.000	889.000	1713.000	889.200	2222.000	884.000	2452.000
XI	0.000	36.000	3062.000	100.000	400.000	400.000	0.000	0.000		

FURNEY ELEV. 1.68

EI	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	320.000
MC	0.080	0.080	0.000	0.000	0.300	0.000	0.000	0.000	0.000	0.000
GR	829.000	850.000	888.700	888.000	888.000	888.000	888.000	888.000	888.000	888.000
HI	877.000	3043.000	883.500	3044.000	885.100	3047.000	878.000	3049.000	889.100	3050.000
HI	831.500	3000.000	889.700	3000.000	889.600	3008.000	884.500	3011.000	860.000	3013.100
GR	836.000	3000.000	838.638	3000.000	3000.000	3000.000	3000.000	3000.000	889.100	3000.000
EI	3047.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
EI	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
EI	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
EI	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
EI	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

U/S FACE OF D.C.L.R. BRIDGE

EI	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
EI	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
EI	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

U/S OF GRAND RIVER AVENUE BRIDGE

EI	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
EI	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
EI	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
EI	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
EI	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
EI	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
EI	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
EI	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

SURVEY SECTION 43

0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3732.000	899.000	3200.000	389.300	2740.000	683.300	2764.000	841.300	3232.000	3992.000	904.600
2224.000	833.400	2064.000	383.000	2047.000	681.300	2047.000	832.000	2025.000	880.900	882.600
2033.000	879.700	2331.000	378.400	2027.000	677.900	2021.000	578.500	20.7.000	877.700	881.600
2012.000	877.200	2005.000	377.000	2003.000	678.400	2001.000	579.700	2000.000	881.600	882.600
1993.000	882.500	1992.000	382.000	1990.000	683.400	1973.000	380.400	1968.000	882.600	884.000
1936.000	852.800	1907.000	381.900	1880.000	843.400	1880.000	857.200	1450.030	889.900	891.000
0.000	0.000	0.000	416.000	370.000	580.000	2035.000	2000.000	31.000	42.000	44.000

SURVEY SECTION 44

0.000	0.000	3472.000	893.400	3798.030	892.100	2760.030	587.800	2704.000	887.600	3R
238.000	882.200	2104.000	883.000	2040.000	882.200	2037.000	880.400	2047.000	884.000	4N
2010.000	883.000	2027.000	884.310	2030.000	877.900	1025.030	2030.100	2030.100	877.600	4R
2015.000	872.500	2016.000	877.800	2006.000	878.100	2005.030	879.700	30.0.000	880.800	5N
1992.000	882.400	1990.000	882.200	1990.000	881.900	1994.000	885.700	1990.000	882.500	5R
1790.000	884.400	1706.000	886.000	1700.000	884.400	760.000	888.400	2000.000	0.000	6N
0.000	0.000	0.000	720.000	730.000	0.000	2000.000	29.000	11.000	0.000	6R

SURVEY SECTION 45

2140.000	700.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	0.000	7N
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	7R

SURVEY SECTION 46

0.000	0.000	0.000	300.000	300.000	300.000	2060.000	2030.000	21.000	9.000	8N
1230.000	884.000	1090.000	884.000	1040.000	886.000	740.000	883.500	303.000	888.000	8R
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	9N
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	9R

SURVEY SECTION 40

0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4N
2323.000	882.000	2150.030	856.000	2110.000	884.000	2080.000	832.000	3070.030	8[illegible].000	4R
2054.000	3[illegible].700	2030.000	876.000	2045.000	877.400	2038.000	877.700	2032.000	878.000	5N
2022.000	878.100	2010.000	878.300	2000.000	878.000	1990.000	878.300	1990.000	882.100	5R
1230.000	884.000	1090.000	884.000	1040.000	886.000	740.000	883.500	303.000	888.000	6N
0.000	0.000	0.000	300.000	300.000	300.000	2060.000	2030.000	21.000	9.000	6R

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     FEDSC    DEPTH    CHNEL    BRIDG    HR-R    AR      HV      HL      CLOSS   BANK ELEV
     A        LOB      OCH      BRID     ALOB    ACH     PROB    VEL     TWP     (EFF/FRIGHT)
     CHS      ELOB     VC-1     ARID     VPL     ANC     VAC     HT      ELMIN   SELD
     SLOPE    ELOBL    VC/R     ELEVR    TITLA   TDC     ICONT   CORAR   TOPTD   ENTER

TITLE X

TITLE  0.00 CLEAR=  0.300
NO NH CARD USED
SF 10 4.000

2970 ENCROACHMENT STATIONS=  2810.0   2930.0  TYPE=   1  TARGET=   300.000
        300  D/S OF FOTLERVILLE WILDLIE LIMIT
     0.0      8.72    287.02    0.00    880.00    881.14    0.11    0.00    0.00    880.10
     730.     802.     283.     45.     461.      279.      44.     0.      0.      879.90
     0.00     1.74     3.41     1.03    0.039     0.035     0.045   0.000   874.30  1282.15
  0.000522    0.       0.       0.      0         0         3       0.00    351.77  2007.92

                                                                                  from COE

2490 NH CARD USED
SECNO 5.000

2770 ENCROACHMENT STATIONS=  [illegible].0   3130.0  TYPE=   1  TARGET=   392.000
        CURVEY SECTION ON CO
     5.30     7.74     883.55   0.00     0.00     883.65    0.06    0.5     0.00    883.90
     [illegible]  [illegible]  830.     [illegible]  [illegible]  [illegible]  68      31      7.      883.20
     0.7[illegible]  1.[illegible]  2.50     0.79     0.0[illegible]  0.030     0.040   0.000   8[illegible].80  1762.67
  0.000466   1020.    1040.    1070.    1        0         0       0.00    352.06  2120.73

SECNO 6.000

3270 ENCROACHMENT STATIONS=  2775.0   3270.0  TYPE=   1  TARGET=   495.000
        SURVEY SECTION #6
     6.00     8.70     884.00   0.00     0.00     884.03    0.03    0.39    0.00    880.00
     1730.    403.     [illegible]  423      [illegible]  297.     [illegible]  [illegible]  17.      [illegible]
     0.54     0.67     3.57     0.71     0.039     0.035     0.080   0.000   875.20  2775.00
  0.000307    1060.    1040.    1030     2         0         0       0.00    495.00  3270.00

SECNO 7.100

3470 ENCROACHMENT STATIONS=  2925.0   3120.0  TYPE=   1  TARGET=   195.000
        300' D/S FROM BRIDGE @ GRAND RIVER AVENUE
     7.10     8.85     884.15   0.00     0.00     884.40    0.25    0.30    0.06    881.90
     1730.    153.     1424.    153.     169.      325.      170.    70.     22.     881.90
     0.39     0.91     4.39     0.90     0.080     0.035     0.080   0.000   875.30  2925.00
  0.000840    580.     620.     640.     2         0         0       0.00    195.00  3120.00
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    SECNO     LEFTH     ELREL     CHNL      VELCH     EG        FV        HL        OLDWS     BANK ELEV
    Q         OLOB      SCH       QROB      VLOB      ACH       AROB      WSI       TWA       LEFT/RIGHT
    F  NF     VLOB      VCH       AROB      X 1       XWCH      XNP       HT.       FLOW      SETW
    SLOPE     XLOBL     XLCH      XLOBR     STATIAL   IMP       ICONV     BONUS     TOPWID    ENDST

RCNV=   0.500 RCHV=   0.500
SPRD.0 7.200

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      387.00 ELREA=      887.00

            D/S FACE OF GRAND RIVER AVENUE BRIDGE
      7.20      9.08    881.23      0.00      0.00    882.22      0.59      0.30      0.07    882.30
     1730.        0.     1730.        0.        0.     399.        0.       74.       23.    885.30
      0.41      0.00      4.34      0.00     0.000     0.022     0.000     0.000    874.90   3000.00
  0.000190       200.      300.      200.         2         0         0      0.00     43.47   3043.05

SPECIAL EXPOSED

SS   XK        XCOR      COND      RDCEN     SHP       SH        BAREA     SS        ELCHH     ELCHO
     0.00      1.50      3.00      0.00     32.90      0.00    217.00      0.00    874.90    874.90

FLOW= 7.000
MAXIMUM FLOW

  EGPRS     EGLWC     H3        QWEIR     QPR       BAREA     TRAPEZOID AREA    ELLC      ELTRD
   885.56    881.77     0.00        0.      1730.     217.      217.      881.50    886.70

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      387.00 ELREA=      887.00

            U/S FACE GRAND R. AVE BRIDGE  1973 FLOOD REACHED APPROX. ELEV. 885.84
      7.60     10.87    885.57      0.00      0.00    883.61      0.29      1.09      0.00    885.50
     1730.        0.     1730.        0.        0.     399.        0.       74.       23.    885.50
      0.41      0.00      4.34      0.00     0.000     0.022     0.000     0.000    874.90   3000.00
  0.000312        56.       56.       56.         2         0         0      0.00     44.00   3044.00

SECND 7.600

3470 ENCROACHMENT STATIONS=    2745.0    3305.0  TYPE=      1  TARGET=     560.000
            400' U/S OF GRAND RIVER AVENUE BRIDGE
      7.60     10.48    885.93      0.00      0.00    886.01      0.02      0.06      0.08    881.20
     1730.       384.      799.      550.      909.      466.     1128.       87.       26.    881.20
      0.3.      0.42      1.71      0.49     0.030     0.035     0.080     0.000    873.50   2745.00
  0.000097       400.      400.      400.         2         0         0      0.00    560.00   3305.00
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    SECNO     DEPTH     LOBEL     CRIWS     XSELK     ET        WV        HL        OLTOB     FRNS ELEV
    Q         BLOB      BCH       DBCB      BLOB      BCH       ABCB      WOR       TIB       LEFT/RIGHT
    TOC       VLOB      VCH       VBCB      XLI       VCH       XNP       HIN       ELTOP     PSTP
    SLOPE     XLOBL     XLCH      XLOBR     STATIC    TRC       IDENT     FORMT     TOPWTH    SNIST

RCHV=   0.100 DEHV=   0.300
TBSCNO 8.000

3.70 ENCROACHMENT STATIONS=     7500.0     8010.0  TYPE=     TARGET=     365.000
          SURVEY SECTION 2E
     8.00      9.82    836.02      0.00      0.00    836.07      0.03      0.36      0.01    881.20
    1750.       60.      1015.      200.      380.      140.      350.      100.       50.     801.10
     0.89      0.73      3.37      3.62     0.080     0.035     0.080     0.000    876.30   2870.00
 0.000210      100.      400.      400.         2         0         0      0.00    876.37   3136.37

JCPV=   0.300 DEHV=   0.500
TBSCNO 9.200

3.30 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=     890.70 ELRLA=     890.70

          D/S FACE OF C & O R.R. BRIDGE
     9.20      7.64    836.9      0.00      0.00    887.20      0.24      0.23      0.11    890.70
     1750.       0.      1750.      0.        0.      462.      0.        119.      33.     890.70
     0.53      0.00      3.68      0.00     0.000     0.031     0.000     0.000    878.50   3009.03
 0.000323       10.       15.       15.         2         0         0      0.00     62.50   3072.03

SPECIAL BRIDGE

SB   XK        XKOR      CDFB      RDLEN     BLC       BUF       BAREA     SB        ELCHL     ELCHD
     0.90      1.50      5.00      0.00      40.20     10.00     265.00    0.00      870.50    875.50

TSECNO 9.400
PRESSURE FLOW

EGPRS     FBLWC     H3        QWEIR     QFR       BAREA     TRAPEZOID AREA    ELLC      ELTRB
687.13    586.46    0.06      0.        1730.     263.      265.              884.50    890.70

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=     890.70 ELRLA=     890.70

          U/S FACE OF C & O R.R. BRIDGE
     9.40      8.42    886.92      0.00      0.00    887.13      0.21      0.73      0.00    890.70
    1750.       0.      1750.      0.        0.      469.      0.        119.      33.     890.70
     0.53      0.00      3.68      0.00     0.000     0.021     0.000     0.000    878.50   3009.57
 0.000323       10.       15.       15.         2         0         0      0.00     62.50   3072.40
```

SECTO	DEPTH	CHEEL	CHIME	TSELK	SO	HW	PL	DLOPE	BANK ELEV
U	DLOE	OPY	TROE	WLTD	AC.	SROP	WO	TWA	(FEET/RIGHT
LINE	WLCB	LCB	WCB	SPL	SNC	SIL	DTW	ELMIN	SETO
SLOPE	SLOBE	SLCB	SLOBA	LTTTAL	TTC	ICOR	CONVAR	TOPWID	ENOF

SECOND 9,000

0.01 INCREACH END STATIONS= 700.0 810.0 TYPE= 1 TARGET= 440.000
300 0/2 0/ C 2 0 XTK SECTIONS

9.60	9.77	887.21	0.00	0.00	887.23	0.01	0.03	0.06	880.90
1700.	793	719.	717.	1820.	511.	307.	130.	39	881.70
0.72	0.49	1.01	0.33	0.000	0.035	0.090	0.000	977.40	1700.00
0.000034	300.	300.	300.	2	0	0	0.00	940.00	2430.00

SECOND 10,000

0.70 INCRO CHMENT STATIONS= 1000.0 1002.0 TYPE= 1 TARGET= 2442.000
SURVEY SECTION 010

10.00	0.35	887.23	0.00	0.00	887.27	0.01	0.03	0.00	881.60
1730	1205.	472.	403.	3005.	472.	481.	169.	13.	882.70
1.00	0.33	1.03	0.23	0.080	0.033	0.090	0.000	876.00	1390.00
0.000036	500	500	500.	2	0	0	0.00	839.70	2229.70

SECOND 11,000
SURVEY SECTION 011

11.00	9.87	887.27	0.00	0.00	887.27	0.00	0.02	0.00	880.80
700.	432.	581.	717.	1740.	691.	2530.	239.	59.	883.00
0.92	0.25	0.88	0.28	0.080	0.035	0.080	0.000	877.40	1119.86
0.000032	500.	700.	830.	3	0	0	0.00	1576.93	2696.79

SECOND 12,000
SURVEY SECTION 012

12.00	10.28	887.28	0.00	0.00	887.25	0.00	0.01	0.00	881.60
1730.	525.	273.	930.	3150.	522.	3988.	297.	36.	880.90
1.76	0.24	0.85	0.23	0.080	0.035	0.090	0.000	877.00	1469.89
0.000023	300.	410.	370.	0	0	0	0.00	1584.78	3054.68

00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: FOWLERVILLE, VILLAGE OF

3) WATERCOURSE: RED CEDAR RIVER & COUNTY DRAIN #2

4) DOCUMENT TYPE: REPORT

00BREAK00

FEDERAL EMERGENCY MANAGEMENT AGENCY
REGION V
300 SOUTH WACKER DRIVE
24TH FLOOR
CHICAGO, IL 60606

VILLAGE OF FOWLERVILLE FLOOD INSURANCE STUDY

HYDRAULIC ANALYSIS REPORT FOR THE RED CEDAR RIVER AND COUNTY DRAIN NO. 2

STS JOB NO. 1054F

FEBRUARY 18, 1985

STS Consultants Ltd.
Consulting Engineers

3340 Ranger Road
Lansing, Michigan 48906
(517) 321-4964

Rec'd March 15

February 18, 1985

Mr. Steve Miller
Michigan Department of Natural Resources
Water Management Division
P.O. Box 30028
Lansing, Michigan 48909

RE: Village of Fowlerville Flood Insurance Study
Hydraulic Analysis Report

Dear Steve:

Enclosed is the hydraulic analysis report for the Red Cedar River and County Drain No. 2 in the Village of Fowlerville, Livingston County. This report is in partial fulfillment of the Village of Fowlerville Flood Insurance Study (FIS) which is being developed by STS Consultants, Ltd. under contract with the Federal Emergency Management Agency (FEMA).

The objective of this report is to summarize the technical analyses which were performed to develop flood plain elevations and limits for the Red Cedar River and County Drain No. 2. Floods which were investigated include the 10-, 50-, 100-, and 500-year frequency events.

Your review of this report is requested. Upon receipt of approval of this report from your office, STS will proceed with finalizing the FIS for the Village of Fowlerville. In the meantime, if you have any questions regarding this report, please feel free to call at (517) 321-4964.

Sincerely,

STS CONSULTANTS, LTD.

Bernard B. Sheff, EIT
Assistant Project Engineer

William J. Weaver, P.E.
Project Manager

cc: Don Glondys, FEMA

STS Job No. 1054F

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1.0 INTRODUCTION

This hydraulic analysis report has been developed as part of the Village of Fowlerville Flood Insurance Study (FIS) which STS Consultants, Ltd. is performing under contract with the Federal Emergency Management Agency (FEMA). The objective of this study is to develop flood plain limits and elevations for both the Red Cedar River and County Drain No. 2, define floodway areas sensitive to development, and estimate the relative risk of flooding. The purpose of this report is to summarize the technical analyses which were performed in the development of flood elevations and delineations.

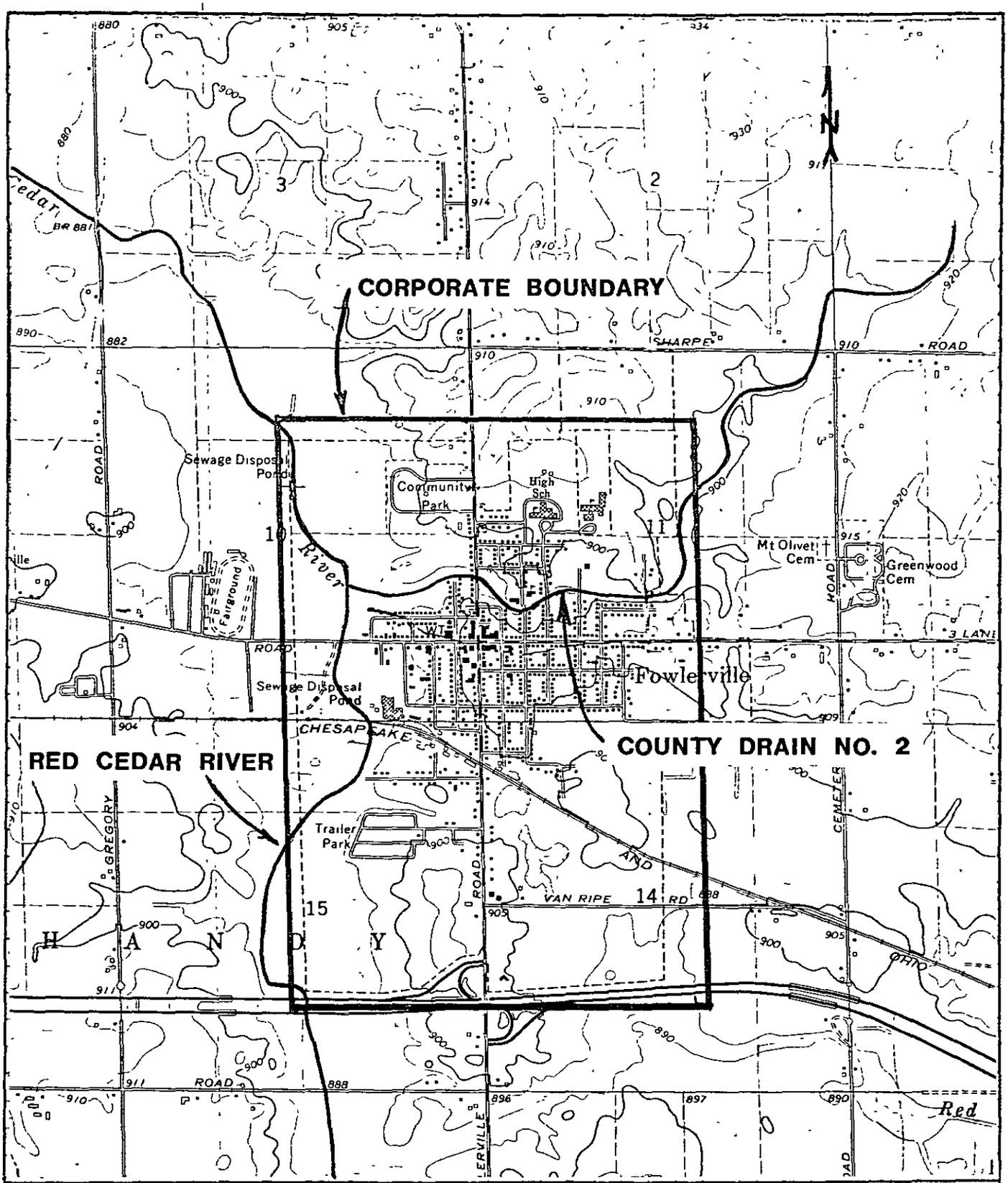
The scope of this study includes the analysis of the 10-, 50-, 100-, and 500-year frequency flooding events for the following:

a. Red Cedar River - beginning at the downstream Village boundary and ending upstream at a point near State Route I-96, a distance of approximately 1.3 miles.

b. County Drain No. 2 - beginning at the confluence of County Drain No. 2 and the Red Cedar River, and extending approximately 1.0 mile upstream to the Village boundary.

A vicinity map of the study area is presented in Figure 1. The watershed of the Red Cedar River above the Village of Fowlerville corporate limit is approximately 65 square miles in area, covering portions of Hardy, Howell, Iosco, Marion, Putnam, and Unadilla Townships. Land use in the Red Cedar River watershed is primarily agricultural with a residential concentration in Fowlerville.

County Drain No. 2 is tributary to the Red Cedar River. The confluence of these streams is located approximately 1.4 miles upstream of the Gregory Road bridge which crosses over the Red Cedar River.



STS Consultants Ltd. FIGURE SHEET	PROJECT VILLAGE OF FOWLERVILLE FLOOD INSURANCE STUDY		FIGURE NO. 1
	TITLE VICINITY MAP		JOB NO. 1054F
	DATE 2-10-1985	DRAWN BY JTP	APPROVED BY WJW	SCALE 1" = 2000'

2.0 HYDRAULIC ANALYSIS

2.1 General

Hydraulic analyses of the Red Cedar River and County Drain No. 2 were performed to develop the 10-, 50-, 100-, and 500-year flood elevations and delineations. A floodway was then developed to identify areas of the flood plain which are sensitive to development. Finally, flood hazard analyses were performed to determine the relative degree of risk at different locations along the river systems. The portion of the Red Cedar River being studied by detailed methods begins at the Village of Fowlerville corporate boundary, approximately 5,000 feet upstream of the Gregory Road bridge. Limits of detailed study of County Drain No. 2 extend from its confluence with the Red Cedar River upstream approximately 1.0 mile to the Fowlerville Village limit.

2.2 Methodology

For both the Red Cedar River and County Drain No. 2, the Army Corps of Engineers HEC-2 computer model (Reference 1) was utilized to simulate the 10-, 50-, 100-, and 500-year flood events and to estimate water surface elevations. This program simulates water-surface profiles for steady gradually varied flow in natural or manmade channels based upon the solution of

the one-dimensional energy equation. Energy losses due to friction are evaluated using Manning's equation. The program has the capability to assess the impacts of various obstructions to flow including bridges culverts, and weirs. The computational procedure utilized by the program is generally known as the standard step method. Parameters which were input to the HEC-2 computer model include stream, bridge and culvert cross section dimensions and elevations, roughness coefficients associated with stream bed and overbank areas, expansion and contraction loss coefficients, and the distance between cross sections and structures.

2.3 Red Cedar River

2.3.1 Starting Conditions

The Red Cedar River is very flat and uniform near Fowlerville. Furthermore, there are very few road crossings or other restrictions to this river near Fowlerville. Therefore, the slope-area method was utilized to provide starting conditions for the backwater analysis that was performed for this river. To improve the confidence of this methodology, the backwater analysis was started 4,900 feet downstream of the Village of Fowlerville corporate boundary. In this way, any error in the selection of the starting friction slope should be

minimized as the assumed water surface converges with the normal water surface downstream of the corporate boundary. Finally, to provide an additional measure of confidence in the starting condition, a convergence analysis was performed for the reach of river downstream of the corporate boundary. this analysis was performed as follows:

a. Backwater analyses were performed between Gregory Road and the downstream village limit for normal depth, and for water surfaces that are 0.25 feet above and 0.25 feet below normal depth. Normal depth was estimated based upon the slope area methodology which utilizes Manning's equation and the average river slope.

b. A comparison of water surface elevations at the downstream village limit was performed based upon the results of the backwater analyses for the three starting condition scenarios itemized in "a" above.

The convergence analysis provides a quantification for the sensitivity of the backwater analysis to various starting conditions. Results of the analysis indicated that the water surface at the village limit for all three starting conditions converges within 0.1 feet of the assumed normal condition.

In conclusion, the convergence analysis indicates that the slope-area method starting condition, based upon the average slope of the Red Cedar River, provides a reasonable estimate.

A graph which illustrates the convergence analysis, and HEC-2 computer printouts for this analysis, are presented in Appendix H.

2.3.2 Backwater Analysis

Stream and bridge cross section data which were utilized in the backwater analysis were obtained as follows:

1. A land survey was performed in November, 1983 by STS to obtain below water channel elevations and detailed dimensions and elevations of all river crossings.

2. An aerial survey was performed in January, 1984 to obtain elevations in overbank areas (Reference 2).

3. Results of both surveys were spliced to form composite river valley cross sections.

Plots of these cross sections are presented in Appendix C. Table 1 presents a cross reference between cross section designations for the HEC-2 model, the land survey, and mapping in the FIS. Cross section locations are illustrated on Plate 1.

Distances between cross sections and structures for both the channel and overbank areas were obtained from the work map which was generated from the aerial survey.

Manning's roughness coefficients (Reference 4) utilized in the computer model were 0.035 for the stream channel, and ranged from 0.040 to 0.08 in the stream overbank areas. Manning's roughness coefficients for bridge sections were estimated based upon a weighted average between the stream channel and the structural surfaces. Contraction and expansion coefficients (Reference 1) were established as 0.1 and 0.3 for smooth transitions and 0.3 and 0.5 for abrupt transitions, respectively. Selection of these parameters was based upon extensive field investigations. Both the Grand River Avenue and Chesapeake and Ohio Railroad bridges were modeled using the HEC-2 special bridge routine.

TABLE 1

VILLAGE OF FOWLERVILLE FLOOD INSURANCE STUDY
CROSS SECTION - CROSS REFERENCE TABLE
RED CEDAR RIVER

HEC-2 Designation	Land Survey Cross Section	FIS Map Designation	Description
4.0	4.0	A	170' U/S of Fowlerville Village Corporate Boundary
5.0	5.0	B	1,210' U/S of village limit
6.0	6.0	C	2,250' U/S of village limit
7.2	-	D	D/S Face of Grand River Avenue Bridge
7.4	7.0	E	U/S Face of Grand River Avenue Bridge
8.0	8.0	F	800' U/S of Grand River Avenue Bridge
9.2	-	G	D/S Face of C&O Railroad Bridge
9.4	9.0	H	U/S Face of C&O Railroad Bridge
10.0	10.0	I	800' U/S of C&O Railroad Bridge
11.0	11.0	J	1,510' U/S of C&O Railroad Bridge
12.0	12.0	K	1,920' U/S of C&O Railroad Bridge

2.4 County Drain No. 2

Starting conditions for the backwater analysis of County Drain No. 2 were established based upon the mean annual flood elevation of the Red Cedar River at the confluence of these two streams. This elevation was obtained from a stage-frequency curve developed for the Red Cedar River. This curve and the calculations which accompany it are presented in Appendix E.

Table 2 presents a cross reference between cross section designations for the HEC-2 model, the land survey, and mapping in the FIS for County Drain No. 2. Cross section locations are illustrated on Plate 1.

Distances between cross sections and structures for both the stream channel and overbank areas were obtained from the work map generated from the aerial survey.

All culverts were modeled using the HEC-2 Special Bridge Routine. Manning's roughness coefficients utilized in the computer ranged from 0.035 to 0.045 for the stream channel, and ranged from 0.035 to 0.10 for the overbank areas. Contraction and expansion coefficients (Reference 1) were established as 0.1 and 0.3 for smooth transitions and 0.3 and 0.5 for abrupt transitions, respectively. Selection of these parameters were based upon extensive field investigations.

TABLE 2

VILLAGE OF FOWLERVILLE FLOOD INSURANCE STUDY
CROSS SECTION - CROSS REFERENCE TABLE
COUNTY DRAIN NO. 2

HEC-2 Designation	Land Survey Cross Section	FIS Map Designation	Description
1.0	1.0	A	400' U/S of confluence with Red Cedar River
2.0	2.0	B	970' U/S of confluence with Red Cedar River
3.0	-	C	D/S face of Ann Street
3.1	3.0	D	U/S face of Ann Street
4.0	-	E	D/S face of Fowlerville Road
4.1	4.0	F	U/S face of Fowlerville Road
5.0	5.0	G	500' U/S of Fowlerville Road
6.0	-	H	D/S face of Collins Street
6.1	6.0	I	U/S face of Collins Street
7.0	7.0	J	170' U/S of Collins Street
8.0	-	K	D/S face of Hubbard Street
8.1	8.0	L	U/S face of Hubbard Street
9.0	9.0	M	250' U/S of Hubbard Street

TABLE 2 (Continued)

VILLAGE OF FOWLERVILLE FLOOD INSURANCE STUDY
CROSS SECTION - CROSS REFERENCE TABLE
COUNTY DRAIN NO. 2

HEC-2 Designation	Land Survey Cross Section	FIS Map Designation	Description
10.0	-	N	D/S face of Maple Street
10.1	10.0	O	U/S face of Maple Street
11.0	11.0	P	300' U/S of Maple Street
12.0	12.0	Q	670' U/S of Maple Street
13.0	-	R	D/S face of Pinewood Drive
13.1	13.0	S	U/S face of Pinewood Drive
14.0	14.0	T	200' U/S of Pinewood Drive

2.5 Floodway Development

The floodway for the Fowlerville Village FIS was developed using the HEC-2 computer model. For both the Red Cedar River and County Drain No. 2, stream encroachment method number four was utilized. This option utilizes the equal conveyance reduction method to compute the floodway limits. As required by the Michigan Department of Natural Resources, an allowable rise in flood stage of 0.1 feet after encroachment was utilized.

Plate 1, Appendix A, illustrates the resultant floodway limits for both the Red Cedar River and County Drain No. 2.

3.0 HYDRAULIC ANALYSIS RESULTS

3.1 General

Results of the hydraulic analysis include an estimation of 10-, 50-, 100-, and 500-year flood elevations for the Red Cedar River and County Drain No. 2. In addition, the limits of the 100- and 500-year flood plain were assessed. Finally, floodway limits were established to estimate the area of the 100-year flood plain which should be reserved as open space to maintain existing flood conveyance capacities of the river without adversely impacting flood elevations.

Table No. 3 presents a summary of 10-, 50-, 100-, and 500-year flood elevations at selected locations along the detailed study reach of the Red Cedar River. Table No. 4 presents similar information for County Drain No. 2. Flood profiles which illustrate estimated flood elevations at all locations along the study reaches are presented in Appendix B. Note that the flood profiles do not reflect the results of the HEC-2 backwater analysis near the confluence of the Red Cedar River and County Drain No. 2. In this area, the higher flood elevations of the Red Cedar River were superimposed upon the flood profile of County Drain No. 2 to reflect the impact of the larger system.

TABLE 3
VILLAGE OF FOWLERVILLE FLOOD INSURANCE STUDY
HYDROLOGIC/HYDRAULIC ANALYSIS SUMMARY
RED CEDAR RIVER

Cross Section Designation	Location	FLOOD ELEVATION (ft)* 10-Year	50-Year	100-Year	500-Year
	DISCHARGE (cfs)	930	1,470	1,730	2,120
A	170' U/S of Fowlerville Corporate Boundary	881.7	882.6	883.0	883.5
D	D/S Face of Grand River Avenue Bridge	883.1	884.0	884.4	884.9
E	U/S Face of Grand River Avenue Bridge	883.4	884.8	885.6	886.5
G	D/S Face of C&O Railroad Bridge	883.9	885.4	886.1	887.1
H	U/S Face of C&O Railroad Bridge	884.0	885.9	886.9	888.4
K	1,920' U/S of C&O Railroad Bridge	884.4	886.3	887.3	888.8

*Referenced to National Geodetic Vertical Datum

TABLE 4

VILLAGE OF FOWLERVILLE FLOOD INSURANCE STUDY
HYDROLOGIC/HYDRAULIC ANALYSIS SUMMARY
COUNTY DRAIN NO. 2

Cross Section Designation	Location	FLOOD ELEVATION (ft)*			
		10-Year	50-Year	100-Year	500-Year
	DISCHARGE (cfs)	160	250	300	410
A	400' U/S of confluence of Red Cedar River and County Drain No. 2	881.6	881.6	881.6	881.6
C	D/S face of Ann Street	886.8	887.2	887.3	887.7
D	U/S face of Ann Street	887.8	888.7	889.9	890.4
E	D/S face of Fowlerville Road	888.2	889.0	889.9	890.5
F	U/S face of Fowlerville Road	892.7	893.0	893.2	893.4
H	D/S face of Collins Street	892.7	893.0	893.2	893.5
I	U/S face of Collins Street	892.7	893.1	893.3	893.5
K	D/S face of Hubbard Street	892.7	893.1	893.3	893.6
L	U/S face of Hubbard Street	893.3	893.5	893.6	893.8
N	D/S face of Maple Street	893.3	893.5	893.6	893.8
O	U/S face of Maple Street	893.3	893.6	893.7	893.9
R	D/S face of Pinewood Drive	893.6	894.0	894.2	894.6
S	U/S face of Pinewood Drive	898.6	899.0	899.2	899.5
T	200' U/S of Pinewood Drive	898.6	899.0	899.2	899.5

*Referenced to National Geodetic Vertical Datum

Plate 1, which illustrates the location of cross sections, limits of the floodway, and 100- and 500-year flood plains, is presented in Appendix A.

3.2 High Water Marks

An historical high water mark for the Red Cedar River was recorded for a flood that occurred in the spring of 1975. This flood was estimated to have a recurrence interval of less than 50 years. The elevation was observed at the upstream face of the Grand River Avenue bridge and was estimated to be approximately 883.8' (N.G.V.D.)[1]. This agrees fairly well with the estimated water surface elevation of 885.6 for the 50-year flood event, as simulated by the HEC-2 backwater analysis.

A high water mark for County Drain No. 2 was observed at a private residence located at 252 Pinewood Drive. This elevation was estimated to be approximately 899.0 ± (N.G.V.D.). The date and frequency of the floodway event associated with this high water mark is unknown. This high water mark is between the simulated 50- and 100-year flood elevations of 899.0 and 899.2, respectively, which were estimated for the FIS.

[1]National Geodetic Vertical Datum.

4.0 SUMMARY

Hydraulic studies were performed to develop flood elevations, floodway limits and flood plain delineations for the Red Cedar River and County Drain No. 2 for the Village of Fowlerville FIS. This study included the following tasks: reconnaissance; data collection and field surveys; computer aided hydraulic analyses; and development of flood profiles, flood plain delineations, and floodway limits.

Flood discharges which were utilized in the hydraulic analysis were obtained from a hydrologic analysis report (Reference 5) which was developed for the Fowlerville FIS. Tables 3 and 4 present a hydrologic/hydraulic analysis summary including estimated flows and elevations of selected locations for the 10-, 50-, 100-, and 500-year flood events.

The flood plain delineation map was developed based upon the results of the backwater analyses and is illustrated on Plate 1 in Appendix A. This map shows the estimated boundaries of the 100- and 500-year floods, and the floodway. In the event that the 500-year and 100-year boundaries coincide, only the 100-year boundary is shown. Furthermore, only the floodway line is shown where the delineation is coincident with the 100- and 500-year boundaries.

Water surface profiles which illustrate the estimated elevations of the 10-, 50-, 100- and 500-year flood events for the Red Cedar River and County Drain No. 2 are presented in Appendix B. Plots of cross sections which were used for the backwater analysis are enclosed in Appendix C. Computation sheets for the development of parameters which were input to the backwater analyses are presented in Appendices D and E for the Red Cedar River and County Drain No. 2, respectively. Bridge survey notes are presented in Appendix F. All HEC-2 computer printouts for the backwater analyses which were performed are presented in Appendix G under separate cover. Finally, results of the convergence analysis which were performed to estimate starting conditions are presented on a graph in Appendix H. Computer output for this analysis are also included.

5.0 REFERENCES

1. U.S. Army Corps of Engineers, Hydrologic Engineering Center, Computer Program 723-X6-L202A, HEC-2 Water Surface Profiles; Davis, California, September 1982.

2. Abrams Aerial Survey Corporation, Aerial Topographic Map of Fowlerville, 2' Contour Interval, Scale 1:4800, Photography May 1983.

3. U.S. Geological Survey, Quadrangles of Fowlerville, Michigan (1973); Howell, Michigan (1968); Parkers Corners, Michigan (1973); Oak Grove, Michigan (1968).

4. Chow, Ven Te, Open Channel Hydraulics, McGraw Hill, New York, 1959.

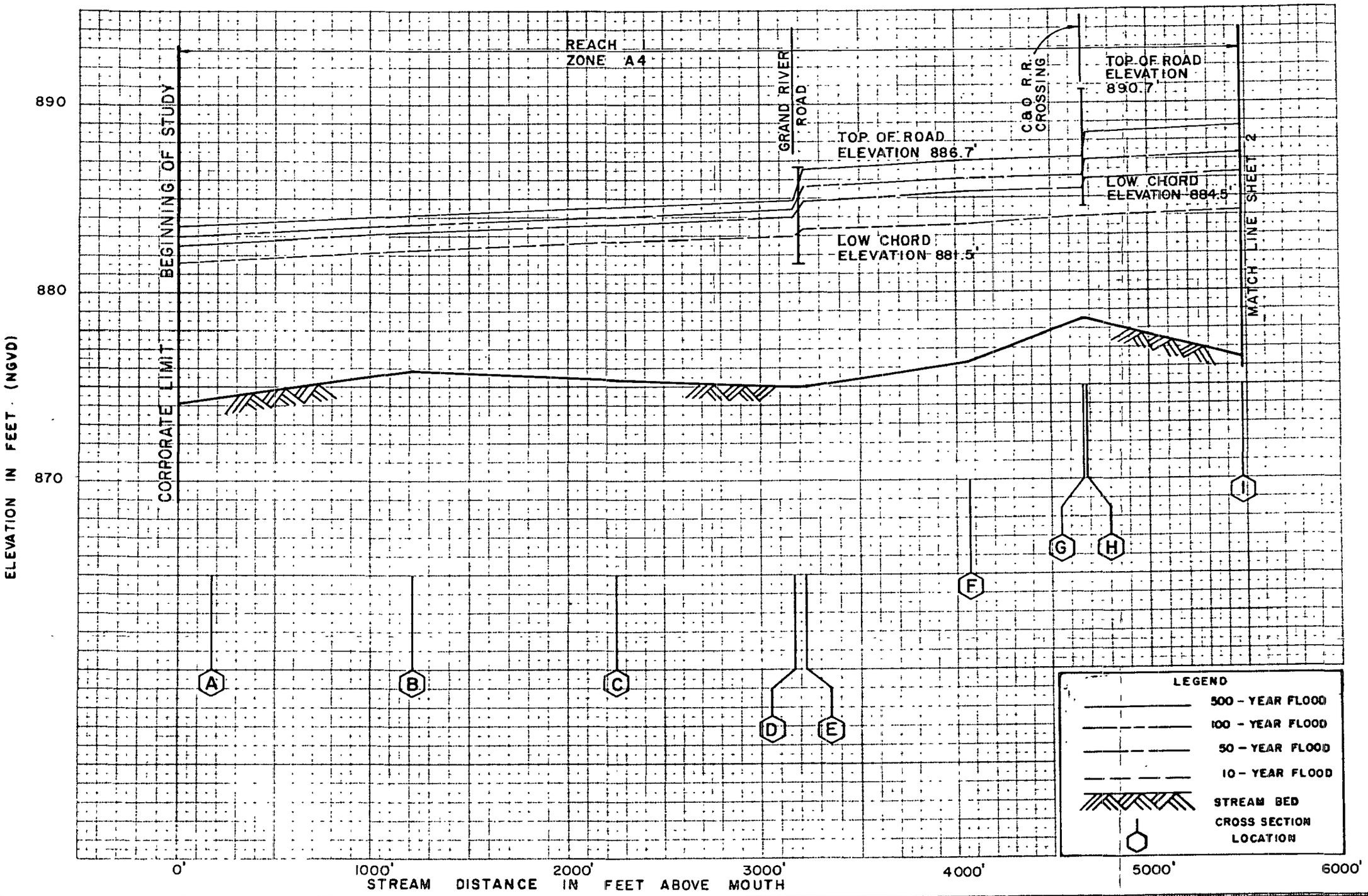
5. STS Consultants, Ltd., Village of Fowlerville Flood Insurance Study - Report on Hydrologic Analysis, Lansing, Michigan, July 1984.

APPENDIX A

VILLAGE OF FOWLERVILLE FLOOD INSURANCE STUDY
FLOOD PLAIN MAPS

APPENDIX B

VILLAGE OF FOWLERVILLE FLOOD INSURANCE STUDY
WATER SURFACE PROFILES



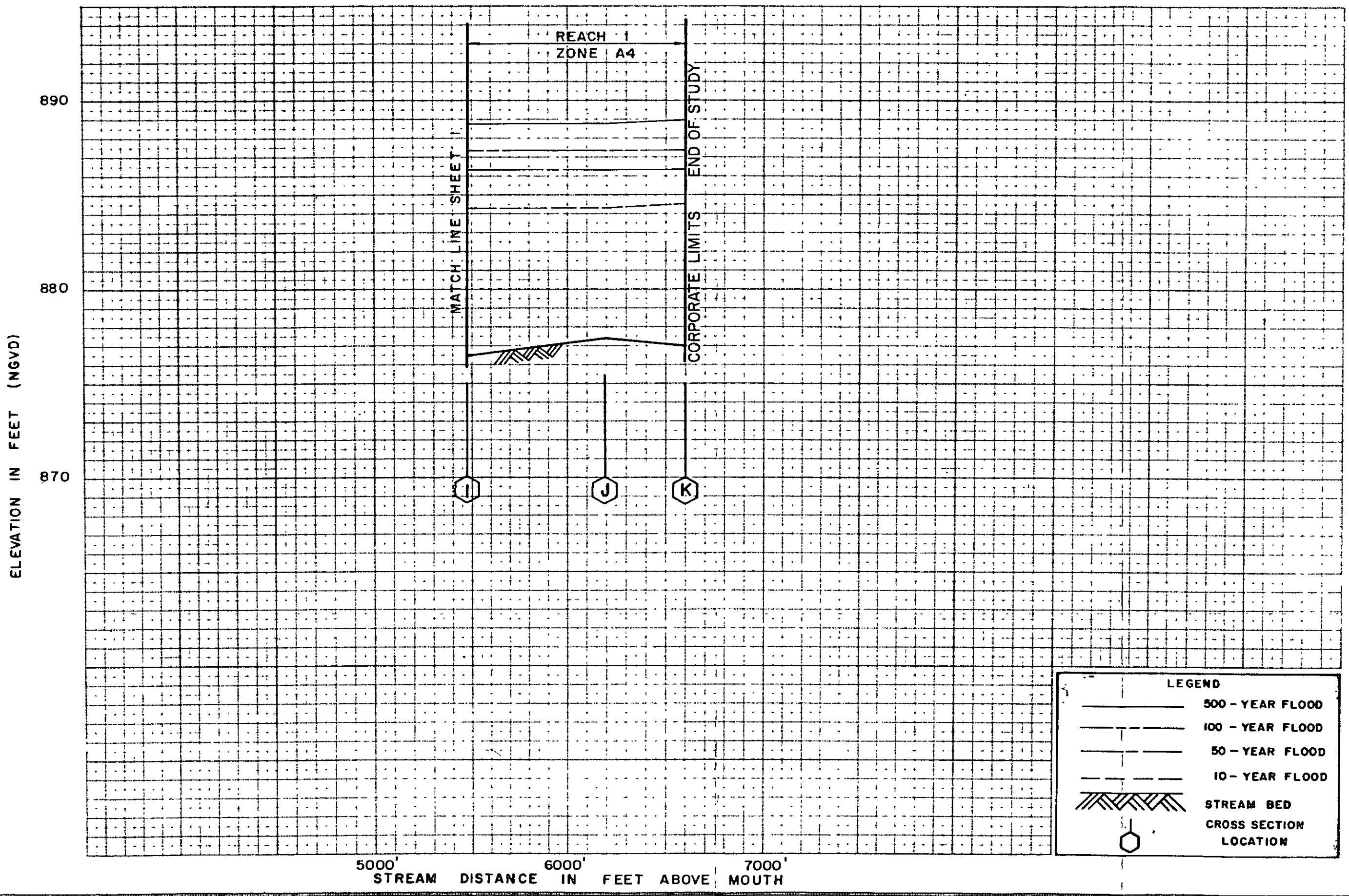
RED CEDAR RIVER

FLOOD PROFILES

FEDERAL EMERGENCY MANAGEMENT ACT
FEDERAL INSURANCE ADMINISTATION

VILLAGE OF FOWLERVILLE, LIVINGSTON CO., MICHIGAN

STS Consultants Ltd.



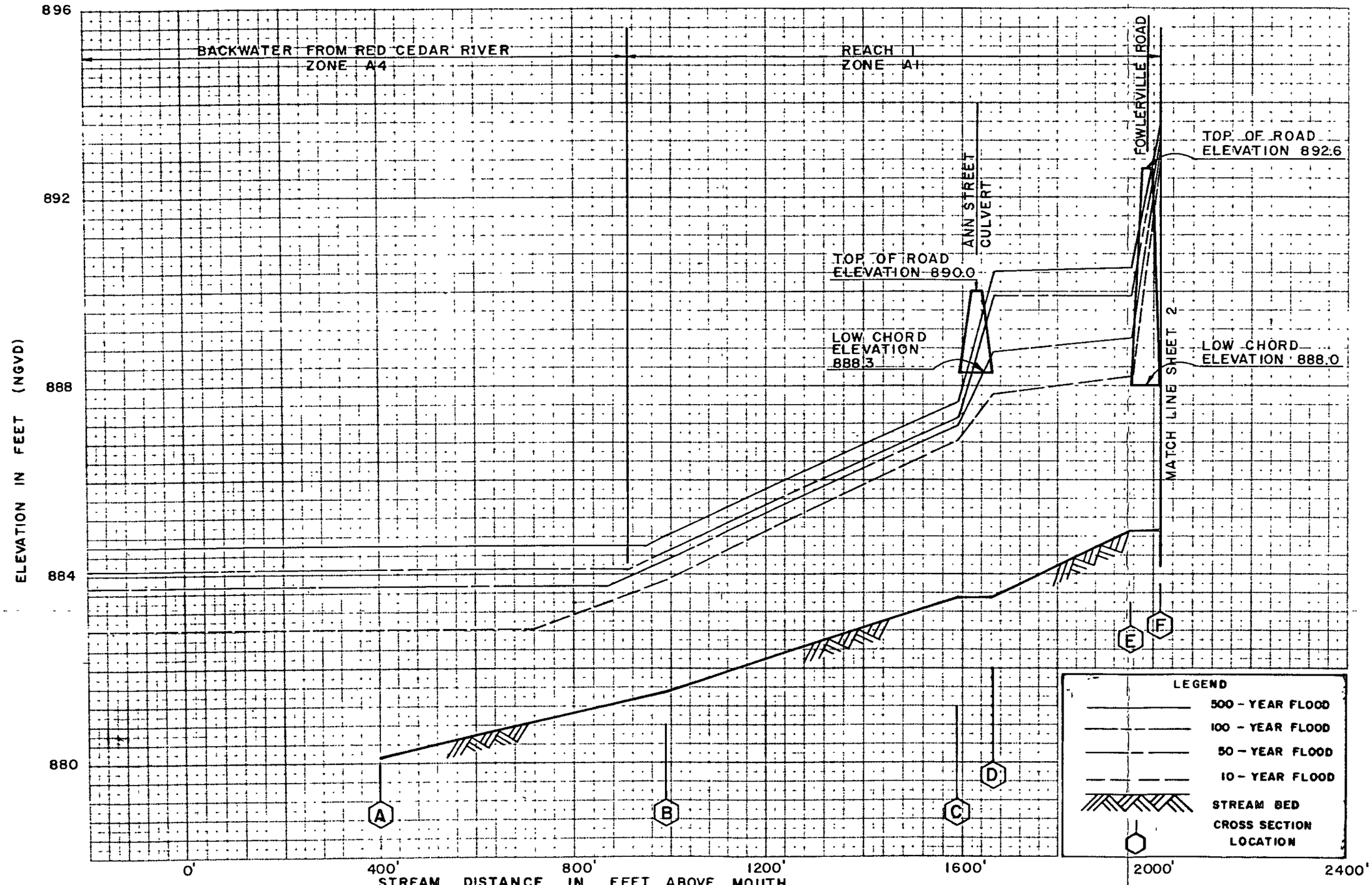
RED CEDAR RIVER

FLOOD PROFILES

FEDERAL EMERGENCY MANAGEMENT ACT
FEDERAL INSURANCE ADMINISTATION

VILLAGE OF FOWLERVILLE,
LIVINGSTON CO., MICHIGAN

STS Consultants Ltd.



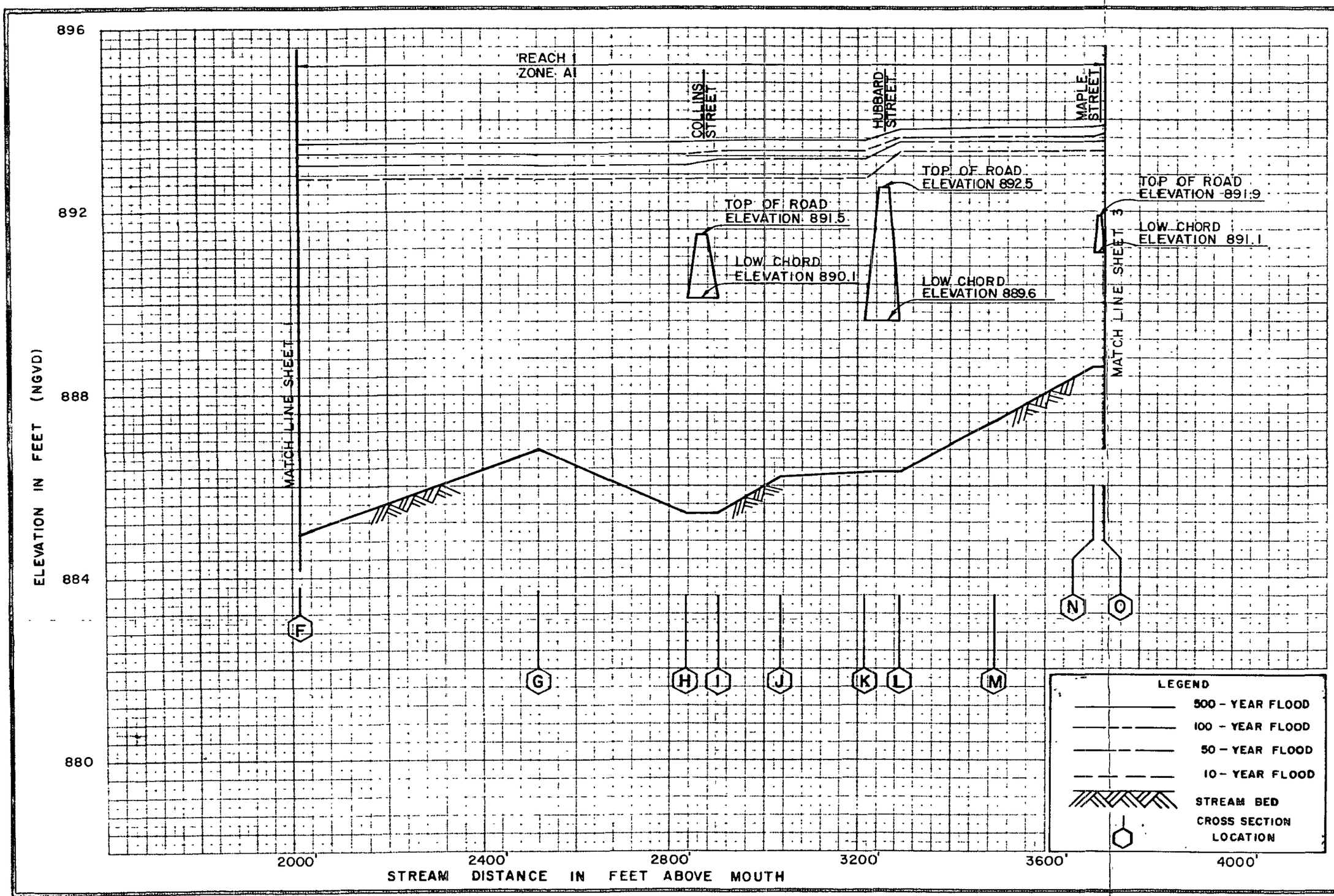
COUNTY DRAIN NO. 2

FLOOD PROFILES

FEDERAL EMERGENCY MANAGEMENT ACT
FEDERAL INSURANCE ADMINISTATION

VILLAGE OF FOWLERVILLE,
LIVINGSTON CO., MICHIGAN

STS Consultants Ltd.



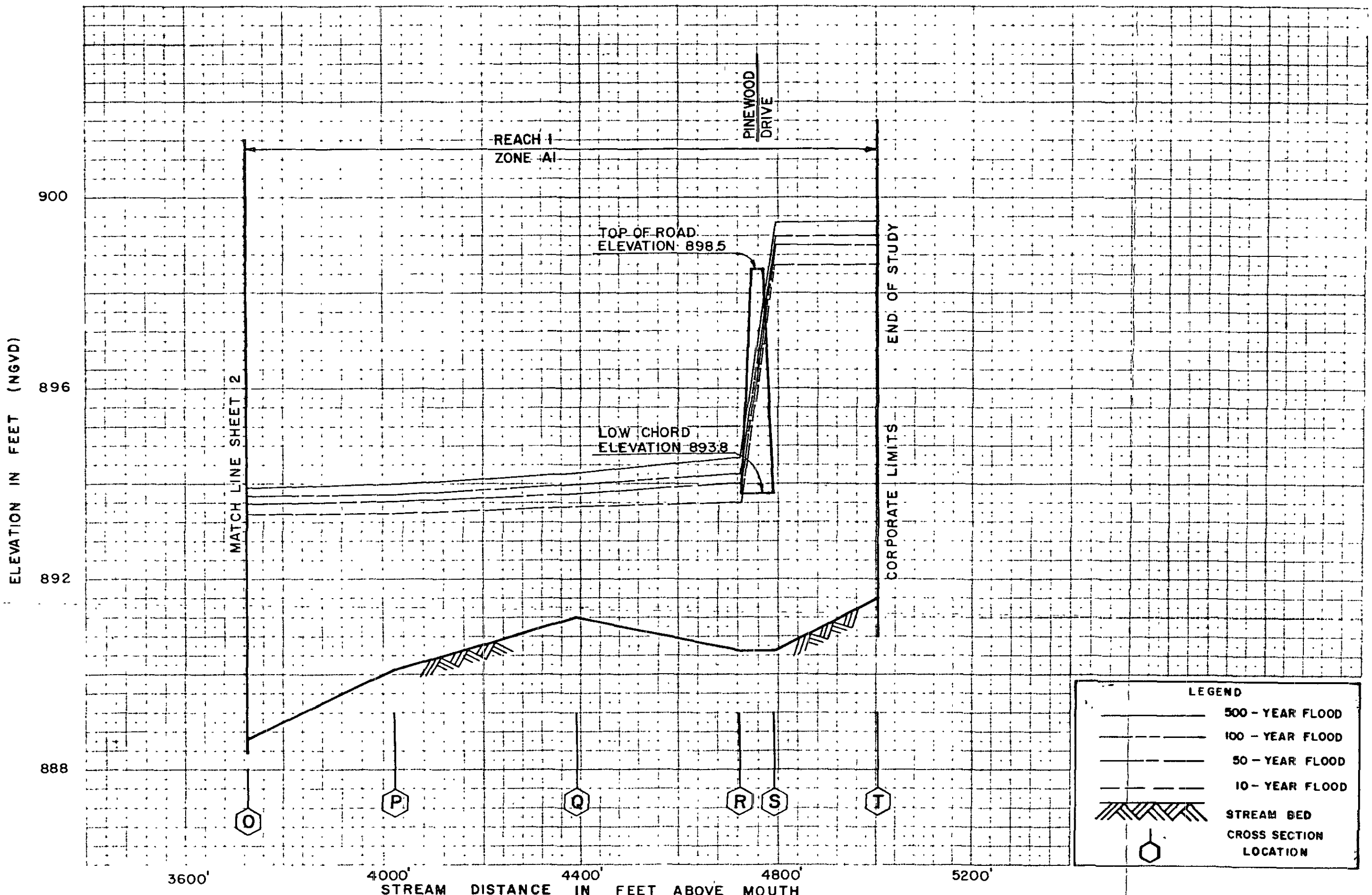
COUNTY DRAIN NO. 2

FLOOD PROFILES

FEDERAL EMERGENCY MANAGEMENT ACT
FEDERAL INSURANCE ADMINISTATION

VILLAGE OF FOWLERVILLE,
LIVINGSTON CO., MICHIGAN

STS Consultants Ltd.



COUNTY DRAIN NO. 2

FLOOD PROFILES

FEDERAL EMERGENCY MANAGEMENT ACT
FEDERAL INSURANCE ADMINISTRATION

VILLAGE OF FOWLERVILLE,
LIVINGSTON CO., MICHIGAN

STS Consultants Ltd.

APPENDIX C

VILLAGE OF FOWLERVILLE FLOOD INSURANCE STUDY
CROSS SECTION PLOTS

APPENDIX D

VILLAGE OF FOWLERVILLE FLOOD INSURANCE STUDY
RED CEDAR RIVER COMPUTATION SHEETS

CALCULATION COVER SHEET

PROJECT VILLAGE OF FOWLERVILLE F.I.S. JOB NO 1054F DIVISION H/H

SUBJECT RED CEDAR RIVER HYDRAULICS FILE NO. 1054

CALC NO

ORIGINATOR JHP DATE

CHECKER DATE 2/95 NO OF SHEETS

RECORD OF ISSUES

NO	DESCRIPTION	BY	DATE	CHKD	DATE	APPRD.		
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PRELIMINARY CALC ☐

SUPERSEDED CALC ☐ FINAL CALC ☐

BRIEF SUMMARY OF CALCULATIONS INCLUDING SCOPE AND RESULTS

ENCLOSED CALCULATIONS ESTIMATE:

1) MANNINGS COEFFICIENTS FOR SPECIAL BRIDGE ROUTINES IN THE HEC-2 MODEL OF THE RED CEDAR RIVER.

2) DEVELOP ESTIMATES OF BRIDGE LOSSES FOR SPECIAL BRIDGES MODELED IN THE RED CEDAR RIVER HEC-2 ... COMPUTER MODEL.

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1.0 COMPOSITE "n" VALUES

1.1 GENERAL

1.2 CALCULATIONS

2.0 SPECIAL BRIDGE LOSSES

2.1 GENERAL

2.2 CALCULATIONS

BBS 8251

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CALCULATION SHEET

PROJECT: FOWLERVILLE F.I.S. JOB NO.: 1054F PAGE: ____ OF: ____

SUBJECT: RED CEDAR RIVER HYDRAULICS DIVISION: H/H

ORIGINATOR: UTP DATE: 10/84 CHECKED BY: UHU DATE: 2/85

1.0 COMPOSITE "n" VALUES

1.1 GENERAL

The purpose of the following calculations is to estimate the Manning's coefficients for bridges that span the Red Cedar River; to be used as input variables for the Special Bridge Routines in the HEC-2 computer model. These calculations are necessary because bridge materials reduce flow resistance caused by friction between these materials and the flowing water.

1.2 CALCULATIONS

The composite "n" values were determined using simple mathematical averaging. Typical Mannings coefficient values were taken from Open Channel Hydraulics, Chow, McGraw Hill, 1959.

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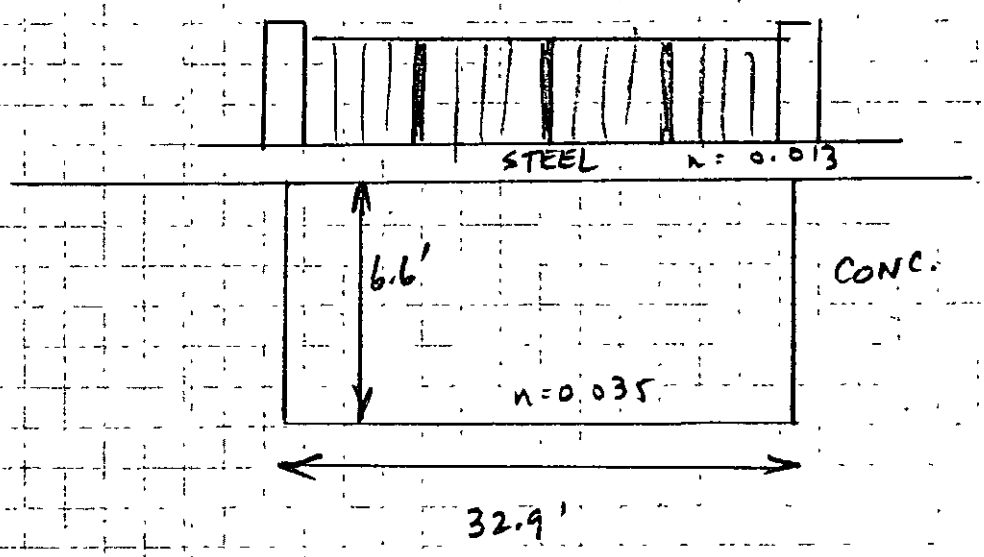
PROJECT: FOWLERVILLE F.I.S. JOB NO.: 1054F PAGE: ____ OF: ____

SUBJECT: RED CEDAR RIVER HYDRAULICS DIVISION: H/H

ORIGINATOR: JTP DATE: 10/84 CHECKED BY: WJU DATE: 2/85

COMPOSITE "n" FOR THE GRAND RIVER AVENUE BRIDGE

X-S 7.4



n = 0.035 channel
n = 0.013 wood, steel

$$n = \frac{(0.013)(32.9+6.6+6.6) + (0.035)(32.9)}{(32.9)^2 + (6.6)^2}$$

n = 0.022

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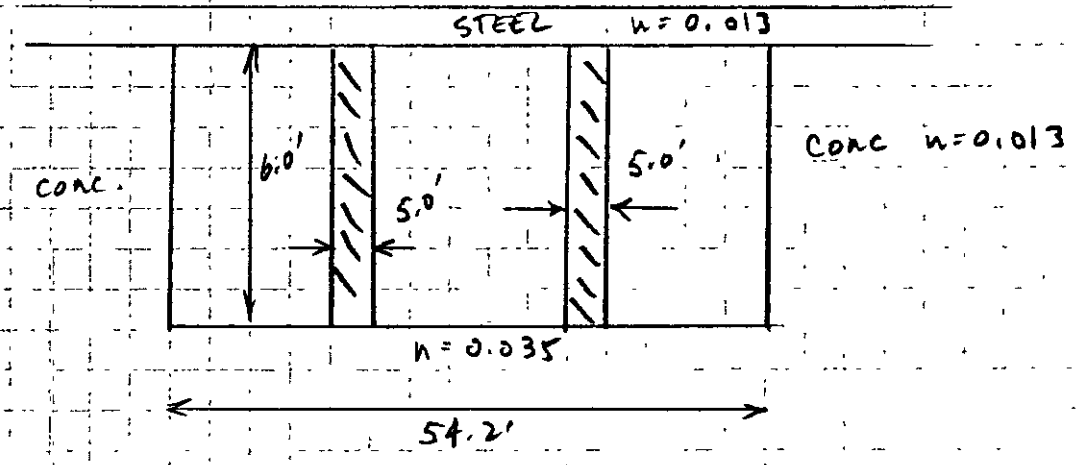
PROJECT: FOWLERVILLE F.I.S. JOB NO.: 1054F PAGE: ____ OF: ____

SUBJECT: RED CEDAR RIVER HYDRAULICS DIVISION: H/H

ORIGINATOR: JTP DATE: 10/84 CHECKED BY: WJW DATE: 2/85

COMPOSITE 'n' FOR C&O R.R. BRIDGE.



n channel = 0.035
n conc, steel = 0.013

$$n = \frac{(0.035)(44.2) + 0.013[(2)(6.0) + 44.2]}{44.2 + 36.0 + 44.2}$$

n = 0.021

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PROJECT: FOWLERVILLE F.I.S. JOB NO.: PAGE: OF:

SUBJECT: RED CEDAR RIVER HYDRAULICS DIVISION: H/H

ORIGINATOR: JTP DATE: 10/84 CHECKED BY: WW DATE: 2/85

2.0 SPECIAL BRIDGE LOSSES

2.1 GENERAL

The purpose of these calculations is to estimate coefficients to account for head losses due to piers in the channel; bridge-opening entrance conditions; to estimate discharge coefficients in the event of weir flow; to determine area available for flow. These data are used as input variables in special bridge routines in the HEC-2 computer model.

2.2 CALCULATIONS

The calculations were performed as presented on the following sheets, with the given references.

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CALCULATION SHEET

PROJECT: FOWLERVILLE FIS JOB NO.: 1054F PAGE: ____ OF: ____

SUBJECT: RED CEDAR RIVER HYDRAULICS DIVISION: H/H

ORIGINATOR: JTP DATE: 10/84 CHECKED BY: DJU DATE: 2/85

Bridge Location: KS 7.4 Red Cedar - Grand River Ave

Bridge Losses - SB Card

1. XK (Pier Shape Coefficient) 0.0 no piers — HEC-2 Manual

XKOR (Loss Coefficient) = 1.0 + k, $k = k_f + k_e + k_p$

where k_f = friction loss coefficient
k_e = entrance loss coefficient
k_p = loss from intermediate piers

Description of Bridge:

$k_f = 29.1 n^2 L/R^{4/3}$ for English units

Area = 217.0 = _____ wp = 79.0

R = A/sp 2.75 $R^{4/3}$ = 3.85 L = 56.0

n(composite) = 0.022

k_f = 29.1 x (0.022)^2 x 56.0/3.85 = 0.21

k_e = 0.2

k_p = 0 if bridge has no intermediate piers —

k_p = 0.05 if bridge has intermediate piers —

Hydraulic Charts for Selection of Highway Culverts Circular No. 5, December 1965, Page 49. HEC-2 Manual

2. XKOR = 1 + 0.21 + 0.2 + _____ = 1.41 use 1.50 minimum — HEC-2 Manual

3. COFQ = Coefficient of discharge = 3.0

4. RDLEN = Length of weir = — (0 if read off BT cards)

5. BWC = Bottom width of bridge opening (inc. piers) = 32.9

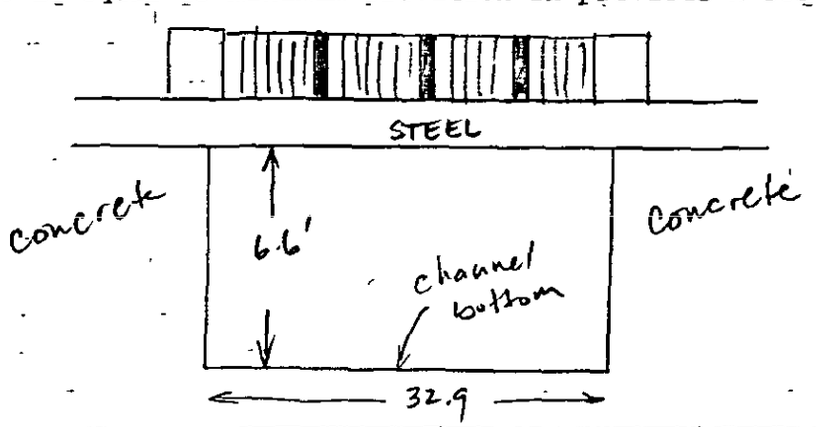
6. BWP = Total width of obstruction = — — field data

7. BAREA = Bridge opening inc. piers = 217.0

8. SS = Side slope = — (horizontal per 1 vertical unit)

9. ELCHU = Elevation of channel invert U/S side = 874.9
(0 if equal to minimum elevation in previous X-sect.)

10. ELCHD = Elevation of channel invert D/S side = 874.9
(0 if equal to minimum elevation in previous X-sect.)



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CALCULATION SHEET

PROJECT: FOWLERVILLE FIS JOB NO.: 1054F PAGE ____ OF: ____

SUBJECT: RED CEDAR RVER HYDRAULICS DIVISION: H/H

ORIGINATOR: JTP DATE: 10/84 CHECKED BY: LLL DATE: 2/85

Bridge Location: XS 9.4, Red Cedar River, C&O RR

Bridge Losses - SB Card

1. XK (Pier Shape Coefficient) 0.90 — HEC-2 Manual

XKOR (Loss Coefficient) = 1.0 + k, $k = k_f + k_e + k_p$

where k_f = friction loss coefficient
k_e = entrance loss coefficient
k_p = loss from intermediate piers

Description of Bridge:

$k_f = 29.1 n^2 L/R^{4/3}$ for English units

Area = 265 = ____ wp = 124.4

R = A/sp 2.13 $R^{4/3}$ = 2.74 L = 30.0

n(composite) = 0.021

k_f = 29.1 x (0.021)^2 x 30 / 2.74 = 0.14

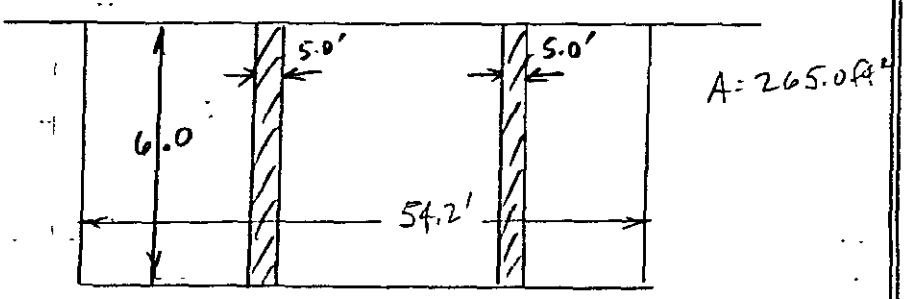
k_e = 0.2

k_p = 0 if bridge has no intermediate piers

k_p = 0.05 if bridge has intermediate piers

Hydraulic Charts for Selection of Highway Culverts Circular No. 5, December 1965, Page 49. HEC-2 Manual

2. XKOR = 1 + 0.14 + 0.2 + ____ = 1.34 → use 1.50 minimum
3. COFQ = Coefficient of discharge = 3.0 — HEC-2 Manual
4. RDLEN = Length of weir = 0.0 (0 if read off BT cards)
5. BWC = Bottom width of bridge opening (inc. piers) = 54.2
6. BWP = Total width of obstruction = 10 — field data
7. BAREA = Bridge opening inc. piers = 265.0
8. SS = Side slope = ____ (horizontal per 1 vertical unit)
9. ELCHU = Elevation of channel invert U/S side = 878.5
(0 if equal to minimum elevation in previous X-sect.)
10. ELCHD = Elevation of channel invert D/S side = 878.5
(0 if equal to minimum elevation in previous X-sect.)



APPENDIX E

VILLAGE OF FOWLERVILLE FLOOD INSURANCE STUDY
COUNTY DRAIN NO. 2 COMPUTATION SHEETS

CALCULATION COVER SHEET

PROJECT FOWLERVILLE FIS JOB NO. 1057 DIVISION

SUBJECT COUNTY DRAIN #2 HYDRAULICS FILE NO 1057F

CALC NO

ORIGINATOR JTP DATE

CHECKER DATE 2/85 NO OF SHEETS

RECORD OF ISSUES

NO	DESCRIPTION	BY	DATE	CHKD	DATE	APPRD		
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PRELIMINARY CALC ☐

SUPERSEDED CALC ☐ FINAL CALC ☐

BRIEF SUMMARY OF CALCULATIONS INCLUDING SCOPE AND RESULTS

1) STARTING CONDITION CALCULATIONS.

2) BRIDGE LOSSES FOR SPECIAL BRIDGES MODELED IN THE COUNTY DRAIN #2 HEC-2 COMPUTER MODEL.

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1.0 STARTING CONDITIONS
- 1.1 GENERAL
- 1.2 CALCULATION
- 1.3 RESULTS

2.0 SPECIAL BRIDGE LOSSES
- 2.1 GENERAL
- 2.2 CALCULATIONS

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CALCULATION SHEET

PROJECT: FOWLERVILLE FIS JOB NO.: 1054F PAGE: 1 OF: 3

SUBJECT: COUNTY DRAIN #2 HYDRAULICS DIVISION: H/H

ORIGINATOR: JTP DATE: 10/84 CHECKED BY: WJU DATE: 2/85

1.0 STARTING CONDITIONS

1.1 GENERAL

The purpose of these calculations is to determine the starting elevation which will be used for the County Drain #2 hydraulic analysis. By plotting the flood stage vs recurrence interval at the point of interest, mean annual flood stage can be determined.

1.2 CALCULATIONS

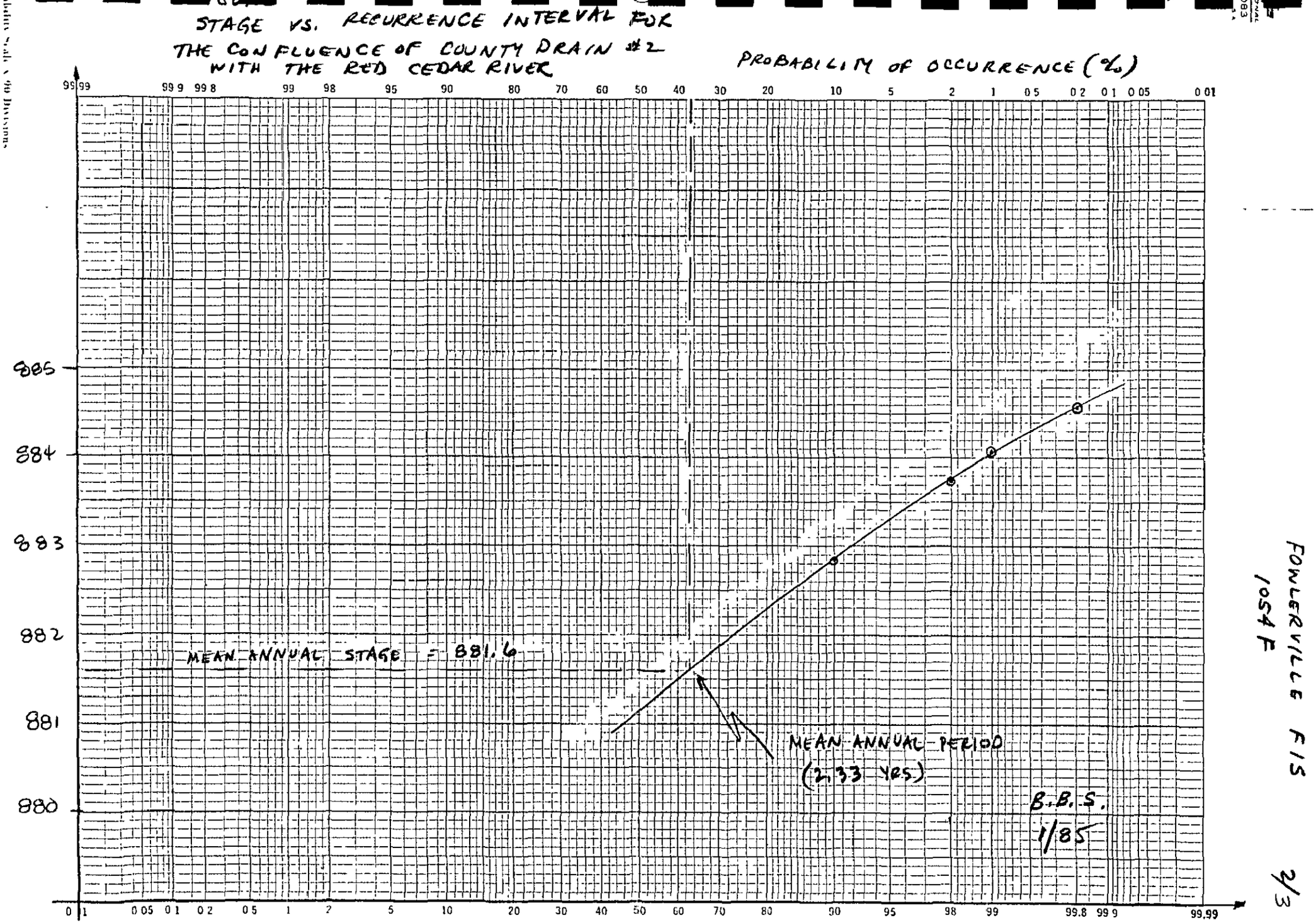
The HEC-2 Multiple profile computer run for the Red Cedar River will be used to determine the flood elevation at the mouth of County Drain #2. This confluence is located between cross sections C & D.

A plot of the data presented below is given in Figure 1, page 2

FLOOD ELEVATIONS FOR THE RED CEDAR RIVER

RECURRENCE INTERVAL (YRS)	CROSS SECTION C	CROSS SECTION D	CONFLUENCE OF COUNTY DRAIN #2 AND RED CEDAR RIVER *
10	882.72	882.90	882.83
50	883.64	883.80	883.74
100	884.0	884.15	884.09
500	884.49	884.64	884.58

* - BASED ON LINEAR INTERPOLATION BETWEEN CROSS-SECTIONS C & D
- CONFLUENCE IS APPROXIMATELY 390 FT U/S OF X-SECTION C AND 230 FT D/S FROM CROSS SECTION D.



FOWLERVILLE FIS
1054 F

2/3

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CALCULATION SHEET

PROJECT: FOWLERVILLE FIS JOB NO.: 1054 F PAGE: 3 OF: 3

SUBJECT: COUNTY DRAIN #2 HYDRAULICS DIVISION: H/H

ORIGINATOR: JPP DATE: 10/84 CHECKED BY: UW DATE: 2/85

1.3 CONCLUSIONS:

The stage in the Red Cedar River corresponding to a 2.33 year return interval is 881.6. This will be used as the starting elevation for the backwater analysis for County Drain #2

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PROJECT: FOWLERVILLE FIS JOB NO.: 1057F PAGE: ____ OF: ____

SUBJECT: COUNTY DRAIN #2 HYDRAULICS DIVISION: H/H

ORIGINATOR: JTP DATE: 11/84 CHECKED BY: WJW DATE: 2/85

2.0 SPECIAL BRIDGE LOSSES

2.1 GENERAL

The purpose of these calculations is to estimate coefficients to account for head losses due to culvert entrance conditions; estimate discharge coefficients in the event of weir flow; and to determine area available for flow. These data are used as input variables in special bridge routines in the HEC-2 computer model.

2.2 CALCULATIONS

The calculations were performed as presented in the following sheets, with the given references.

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CALCULATION SHEET

PROJECT: FOWLERVILLE F.I.S. JOB NO.: 1054F PAGE: ____ OF: ____

SUBJECT: COUNTY DRAIN #2 HYDRAULICS DIVISION: H/H

ORIGINATOR: JTP DATE: 10/84 CHECKED BY: WJU DATE: 2/85

Bridge Location: X-5 #3 COUNTY DRAIN #2

Bridge Losses - SB Card

1. XK (Pier Shape Coefficient) NO PIERS — HEC-2 Manual

XKOR (Loss Coefficient) = 1.0 + k, $k = k_f + k_e + k_p$

where k_f = friction loss coefficient
k_e = entrance loss coefficient
k_p = loss from intermediate piers

Description of Bridge:

$k_f = 29.1 n^2 L/R^{4/3}$ for English units

Area = = 29.5 wp = $2\pi\sqrt{\frac{3.75^2+2.4^2}{2}}$ = 19.8

R = A/sp 1.49 $R^{4/3}$ = 1.70 L = 73.

n(composite) = 0.010

k_f = 29.1 x (0.010)^2 x 73.0 / 1.70 = 0.13

k_e = 0.5

k_p = 0 if bridge has no intermediate piers

k_p = 0.05 if bridge has intermediate piers

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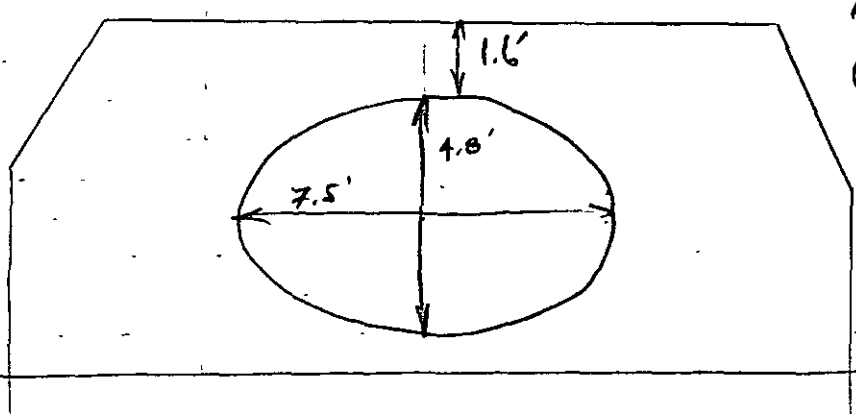
2. XKOR = 1 + 0.13 + 0.5 + 0.0 = 1.63
3. COFQ = Coefficient of discharge = 3.0 — HEC-2 Manual
4. RDLEN = Length of weir = 100.0 (0 if read off BT cards)
5. BWC = Bottom width of bridge opening (inc. piers) = 6.15
6. BWP = Total width of obstruction = — — field data
7. BAREA = Bridge opening inc. piers = 29.5
8. SS = Side slope = — (horizontal per 1 vertical unit)
9. ELCHU = Elevation of channel invert U/S side = 883.5
(0 if equal to minimum elevation in previous X-sect.)
10. ELCHD = Elevation of channel invert D/S side = 883.5
(0 if equal to minimum elevation in previous X-sect.)



A = 29.5 ft^2

Concrete Pipe Design Manual

A.C.P.A 1974

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CALCULATION SHEET

PROJECT: FOWLERVILLE FIS JOB NO.: 1054F PAGE: ____ OF: ____

SUBJECT: COUNTY DRAIN #2 HYDRAULICS DIVISION: H/H

ORIGINATOR: JTP DATE: 10/84 CHECKED BY: WW DATE: 2/85

Bridge Location: X-S #4.1 County Drain #2

Bridge Losses - SB Card

1. XK (Pier Shape Coefficient) 0.0 NO PIERS — HEC-2 Manual

XKOR (Loss Coefficient) = 1.0 + k, $k = k_f + k_e + k_p$

where k_f = friction loss coefficient
k_e = entrance loss coefficient
k_p = loss from intermediate piers

Description of Bridge:

$k_f = 29.1 n^2 L/R^{4/3}$ for English units

Area = $\pi(2.75^2)/2$ = 11.88 wp = $\pi(2.75) + 5.5 = 14.14$

R = A/sp 0.84 $R^{4/3}$ = 0.79 L = 65.0

n(composite) = 0.025

k_f = 29.1 x (0.025)^2 x 65.0 / 0.79 = 1.50

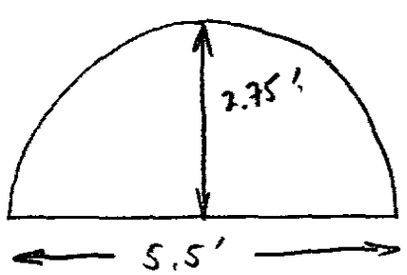
k_e = 0.5

k_p = 0 if bridge has no intermediate piers

k_p = 0.05 if bridge has intermediate piers

Hydraulic Charts for Selection of Highway Culverts Circular No. 5, December 1965, Page 49. HEC-2 Manual

2. XKOR = 1 + 1.50 + 0.5 + — = 3.0
3. COFQ = Coefficient of discharge = 2.6 — HEC-2 Manual
4. RDLEN = Length of weir = — (0 if read off BT cards)
5. BWC = Bottom width of bridge opening (inc. piers) = 3.9
6. BWP = Total width of obstruction = — — field data
7. BAREA = Bridge opening inc. piers = 11.88
8. SS = Side slope = — (horizontal per 1 vertical unit)
9. ELCHU = Elevation of channel invert U/S side = 884.9
(0 if equal to minimum elevation in previous X-sect.)
10. ELCHD = Elevation of channel invert D/S side = 884.9
(0 if equal to minimum elevation in previous X-sect.)



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CALCULATION SHEET

PROJECT: FOWLERVILLE FIS JOB NO.: 1054F PAGE: ____ OF: ____

SUBJECT: COUNTY DRAIN #2 HYDRAULICS DIVISION: H/H

ORIGINATOR: JTP DATE: 10/84 CHECKED BY: UW DATE: 2/85

Bridge Location: X-S 6.1 County Drain #2

Bridge Losses - SB Card

1. XK (Pier Shape Coefficient) no piers — HEC-2 Manual

XKOR (Loss Coefficient) = 1.0 + k, $k = k_f + k_e + k_p$

where k_f = friction loss coefficient
k_e = entrance loss coefficient
k_p = loss from intermediate piers

Description of Bridge:

$k_f = 29.1 n^2 L/R^{4/3}$ for English units

Area = 24.8 = _____ wp = 17.28

R = A/sp 1.44 $R^{4/3}$ = 1.62 L = 86.0

n(composite) = 0.027

k_f = 29.1 x $(0.027)^2$ x 86.0/1.62 = 1.17

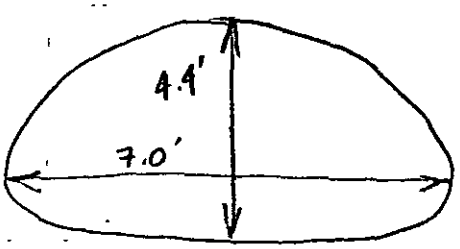
k_e = 0.5

k_p = 0 if bridge has no intermediate piers

k_p = 0.05 if bridge has intermediate piers

Hydraulic Charts for Selection of Highway Culverts Circular No. 5, December 1965, Page 49. HEC-2 Manual

2. XKOR = 1 + 1.17 + 0.5 + _____ = 2.67
3. COFQ = Coefficient of discharge = 3.0 — HEC-2 Manual
4. RDLEN = Length of weir = — (0 if read off BT cards)
5. BWC = Bottom width of bridge opening (inc. piers) = 4.8
6. BWP = Total width of obstruction = — — field data
7. BAREA = Bridge opening inc. piers = 24.8
8. SS = Side slope = ~ (horizontal per 1 vertical unit)
9. ELCHU = Elevation of channel invert U/S side = 884.9
(0 if equal to minimum elevation in previous X-sect.)
10. ELCHD = Elevation of channel invert D/S side = 884.9
(0 if equal to minimum elevation in previous X-sect.)



A = 24.8 ft²
Conc Pipe
Design Manual

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CALCULATION SHEET

PROJECT: FOWLERVILLE FIS JOB NO.: 1054F PAGE: ____ OF: ____

SUBJECT: COUNTY DRAIN #2 HYDRAULICS DIVISION: H/H

ORIGINATOR: JTP DATE: 10/84 CHECKED BY: WW DATE: 2/85

Bridge Location: X-S 8.1 County Drain #2

Bridge Losses - SB Card

1. XK (Pier Shape Coefficient) no piers — HEC-2 Manual

XKOR (Loss Coefficient) = 1.0 + k, $k = k_f + k_e + k_p$

where k_f = friction loss coefficient
k_e = entrance loss coefficient
k_p = loss from intermediate piers

Description of Bridge:

$k_f = 29.1 n^2 L/R^{4/3}$ for English units

Area = 14.3 = _____ wp = 14.14

R = A/sp 1.01 $R^{4/3}$ = 1.02 L = 74.5

n(composite) = 0.027

k_f = 29.1 x (0.027)^2 x 74.5/1.02 = 1.55

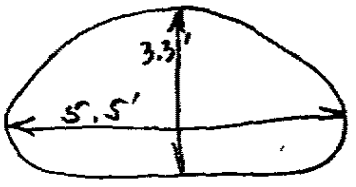
k_e = 0.5

k_p = 0 if bridge has no intermediate piers

k_p = 0.05 if bridge has intermediate piers

Hydraulic Charts for Selection of Highway Culverts, Circular No. 5, December 1965, Page 49. HEC-2 Manual

2. XKOR = 1 + 1.55 + 0.5 + _____ = 3.05
3. COFQ = Coefficient of discharge = 3.0 — HEC-2 Manual
4. RDLEN = Length of weir = – (0 if read off BT cards)
5. BWC = Bottom width of bridge opening (inc. piers) = 4.3
6. BWP = Total width of obstruction = – — field data
7. BAREA = Bridge opening inc. piers = 14.3
8. SS = Side slope = – (horizontal per 1 vertical unit)
9. ELCHU = Elevation of channel invert U/S side = 886.3
(0 if equal to minimum elevation in previous X-sect.)
10. ELCHD = Elevation of channel invert D/S side = 886.3
(0 if equal to minimum elevation in previous X-sect.)



A = 14.3 ft^2

Concrete Pipe Design Manual

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CALCULATION SHEET

PROJECT: FOWLERVILLE FIS JOB NO.: 1054F PAGE: ____ OF: ____

SUBJECT: COUNTY-DRAIN NO. 2 HYDRAULICS DIVISION: H/H

ORIGINATOR: JTP DATE: 10/84 CHECKED BY: WJU DATE: 2/85

Bridge Location: XS 10.1 County Drain #2

Bridge Losses - SB Card

1. XK (Pier Shape Coefficient) — HEC-2 Manual

XKOR (Loss Coefficient) = 1.0 + k, $k = k_f + k_e + k_p$

where k_f = friction loss coefficient
k_e = entrance loss coefficient
k_p = loss from intermediate piers

Description of Bridge:

$k_f = 29.1 n^2 L/R^{4/3}$ for English units

Area = $\pi(1.25^2)$ = 4.91 wp = $\pi(2.5)$ = 7.85

R = A/sp 0.63 $R^{4/3}$ = 0.53 L = 24.0

n(composite) = 0.027

k_f = 29.1 x $(0.027)^2$ x 24.0/0.53 = 0.96

k_e = 0.5

k_p = 0 if bridge has no intermediate piers

k_p = 0.05 if bridge has intermediate piers

Hydraulic Charts for Selection of Highway Culverts Circular No. 5, December 1965, Page 49. HEC-2 Manual

2. XKOR = 1 + 0.96 + 0.5 + ____ = 2.46

3. COFQ = Coefficient of discharge = 3.0 — HEC-2 Manual

4. RDLEN = Length of weir = — (0 if read off BT cards)

5. BWC = Bottom width of bridge opening (inc. piers) = 0.8

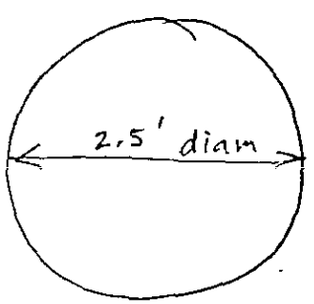
6. BWP = Total width of obstruction = — — field data

7. BAREA = Bridge opening inc. piers = 4.91

8. SS = Side slope = 0.5 (horizontal per 1 vertical unit)

9. ELCHU = Elevation of channel invert U/S side = 888.6
(0 if equal to minimum elevation in previous X-sect.)

10. ELCHD = Elevation of channel invert D/S side = 888.6
(0 if equal to minimum elevation in previous X-sect.)



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CALCULATION SHEET

PROJECT: FOWLERVILLE FIS JOB NO.: 1054F PAGE: ____ OF: ____

SUBJECT: COUNTY-DRAIN # 2 HYDRAULICS DIVISION: H/H

ORIGINATOR: JTP DATE: 10/84 CHECKED BY: WW DATE: 2/85

Bridge Location: XS 13.1 County Drain #2

Bridge Losses - SB Card

1. XK (Pier Shape Coefficient) no piers — HEC-2 Manual

XKOR (Loss Coefficient) = 1.0 + k, $k = k_f + k_e + k_p$

where k_f = friction loss coefficient
k_e = entrance loss coefficient
k_p = loss from intermediate piers

Description of Bridge:

$k_f = 29.1 n^2 L/R^{4/3}$ for English units

Area = 14.3 = _____ wp = 14.14

R = A/sp 1.01 $R^{4/3}$ = 1.02 L = 70.0

n(composite) = 0.027

k_f = 29.1 x (0.027)^2 x 70.0 / 1.02 = 1.45

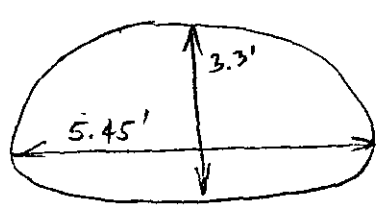
k_e = 0.5

k_p = 0 if bridge has no intermediate piers

k_p = 0.05 if bridge has intermediate piers

Hydraulic Charts for Selection of Highway Culverts Circular No. 5, December 1965, Page 49. HEC-2 Manual

2. XKOR = 1 + 1.45 + 0.5 + _____ = 2.95
3. COFQ = Coefficient of discharge = 3.0 — HEC-2 Manual
4. RDLEN = Length of weir = 90.0 (0 if read off BT cards)
5. BWC = Bottom width of bridge opening (inc. piers) = 4.3
6. BWP = Total width of obstruction = — — field data
7. BAREA = Bridge opening inc. piers = 14.3
8. SS = Side slope = _____ (horizontal per 1 vertical unit)
9. ELCHU = Elevation of channel invert U/S side = 390.5
(0 if equal to minimum elevation in previous X-sect.)
10. ELCHD = Elevation of channel invert D/S side = 390.5
(0 if equal to minimum elevation in previous X-sect.)



A = 14.3 ft^2

Concrete Pipe Design Manual

APPENDIX F

VILLAGE OF FOWLERVILLE FLOOD INSURANCE STUDY
BRIDGE SURVEY NOTES

CALCULATION COVER SHEET

PROJECT FOWLERVILLE FIS. JOB NO 1057 DIVISION

SUBJECT RED CEDAR RIVER HYDRAULICS FILE NO 1057F

CALC NO

ORIGINATOR DATE

CHECKER DATE 2/85 NO OF SHEETS

RECORD OF ISSUES

NO	DESCRIPTION	BY	DATE	CHKD	DATE	APPRD		
△								
△								
△								
△								
△								
△								

PRELIMINARY CALC ☐

SUPERSEDED CALC ☐ FINAL CALC ☐

BRIEF SUMMARY OF CALCULATIONS INCLUDING SCOPE AND RESULTS

BRIDGE SURVEY NOTES & BRIDGE CROSS SECTIONS

FOR THE RED CEDAR RIVER

CROSS SECTION 9

		DROPS		
20+00	≈ 89073	-0-	890.73	GRO
20+08		1.1	889.63	E/FACE OF W ABUT
20+11		6.2	884.53	" ALSO B/I
20+11		10.3	880.43	GRO.
20+20		11.4	879.33	EO/▽
20+27		12.1	878.63	W/FACE PIER
20+29.5		6.2	884.53	℄ PIER
20+32		12.2	878.53	E/FACE PIER
20+40		12.2	878.53	CH.
20+49		12.2	878.53	W/FACE PIER
20+57.5		6.2	884.53	℄ PIER
20+54		12.0	878.73	E/FACE PIER
20+60		11.3	879.43	EO/▽
20+71		9.4	881.33	GRO
20+71		6.2	884.53	W/FACE OF E. ABUT.
20+74		1.1	889.63	"
20+94		-0-	890.73	GRO

12-1-83 FOWLERVILLE 12-2-83 54

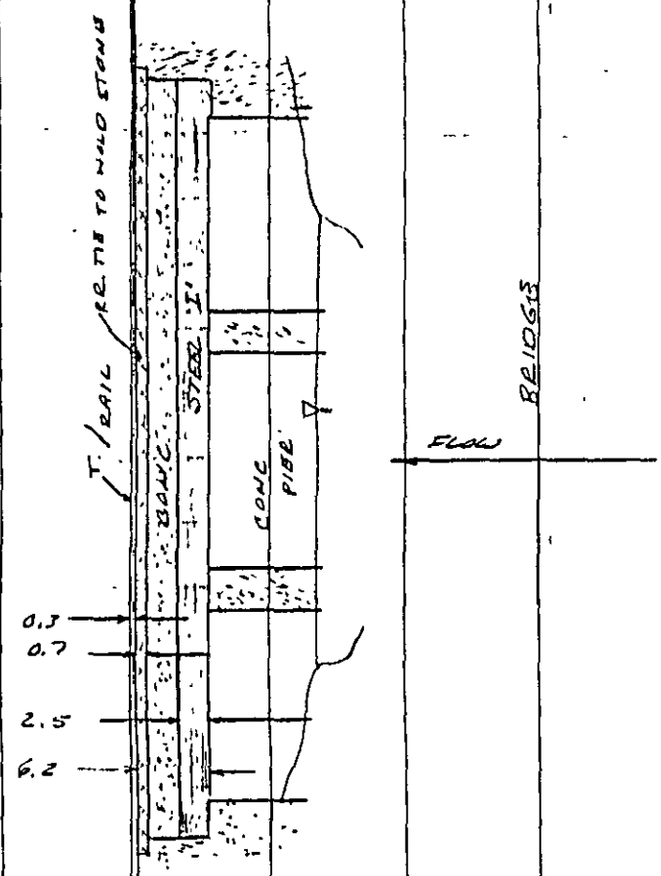
D. COLE, JACK FROST

30°F OVERCAST 5 MPH WIND

MILEAGE END

START 78833

C & O RAILROAD BRIDGE 14.5' WIDE



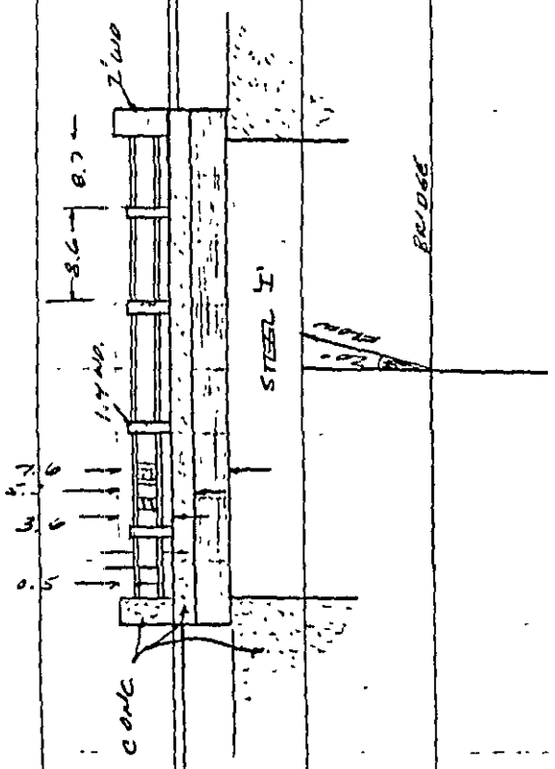
12-1-33 FULLER-LS FEMA - F/S 31

[redacted] CROSS-SECTION #7 2 C. GRAND RIVER & REED CEDAR

STA	BS	HI	FS	TP	ELEV.		
		890.06					BRIDGE.
END.	6.37	~~890.85~~			884.48	883.69	P6.37 '□' ON HEADWALL
			0.95		889.11		E/END T/PILLAR
			0.95		889.11		W/END T/PILLAR
19+82		889.11	5.0		884.11		GRD
20+00			3.6		885.51		W./FACE CONC
20+03			12.5		876.61		E/FACE W./BOT CH.
20+23			10.2		878.91		"
20+13			14.2		874.91		CIL
20+19			13.6		875.51		"
20+27			13.9		875.21		"
20+36			11.6		877.51		"
20+43			11.1		878.01		CH W./FACE E/A CUT
20+44			3.6		885.51		W/END PILLAR
20+50			"		885.51		E/FACE CONC. DECK
20+61			4.3		884.8		GRD

12-1-83 FOWLERVILLE

STA	BS	HI	FS	TP	ELEV.	
		890.06 ~~889.85~~				
			4.98		885.08	50' E. OF E. ED BRIDGE
			4.85		885.21	E. / ED.
			4.83		885.23	MID.
			4.82		885.24	W / ED.
			4.96		885.10	50' W. OF W. ED BRIDGE



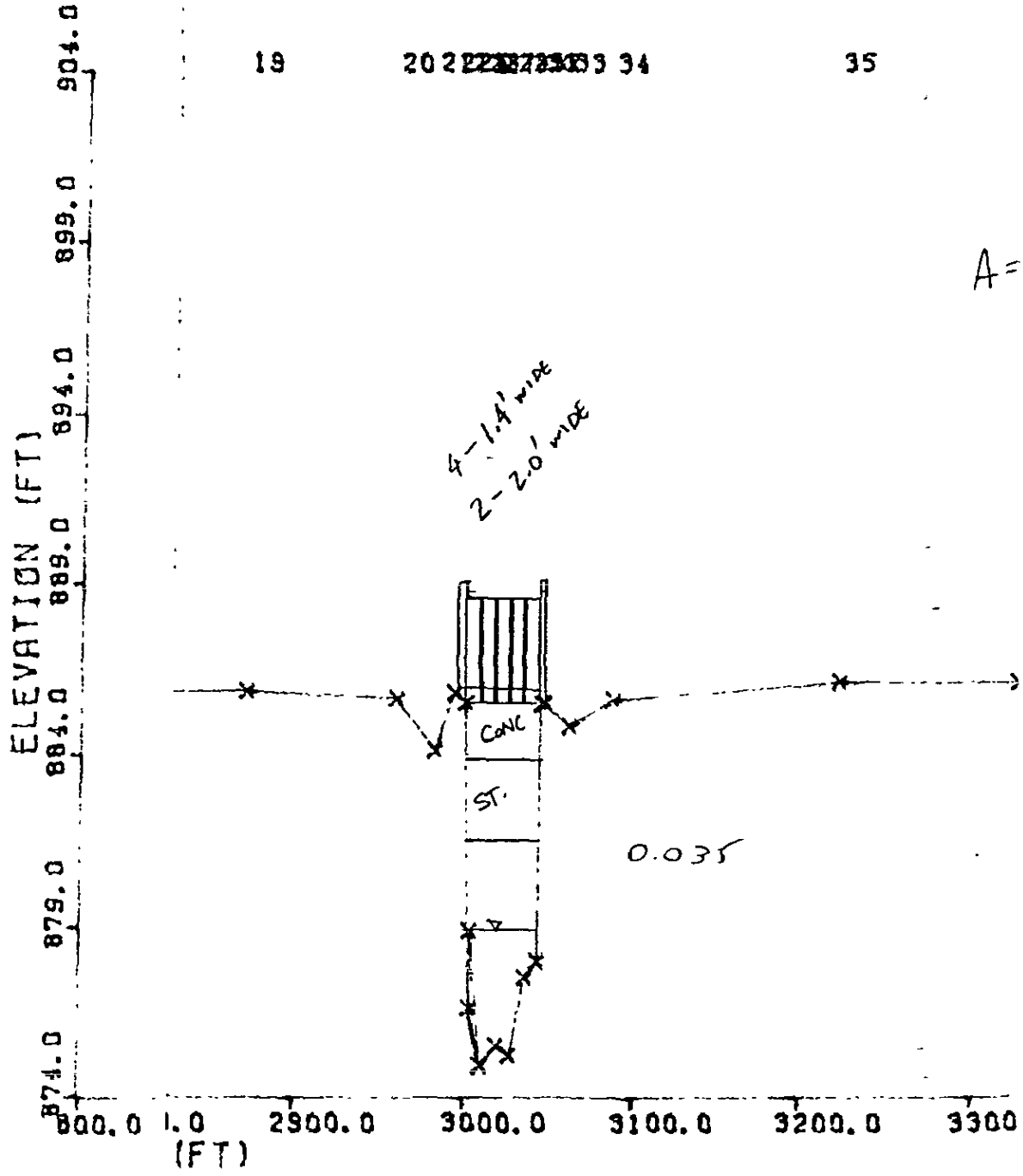
56.4' WD.

NC 0.06 0.06 0.035

X1 7.0 56.0 3600.0

X-S SECTION #7

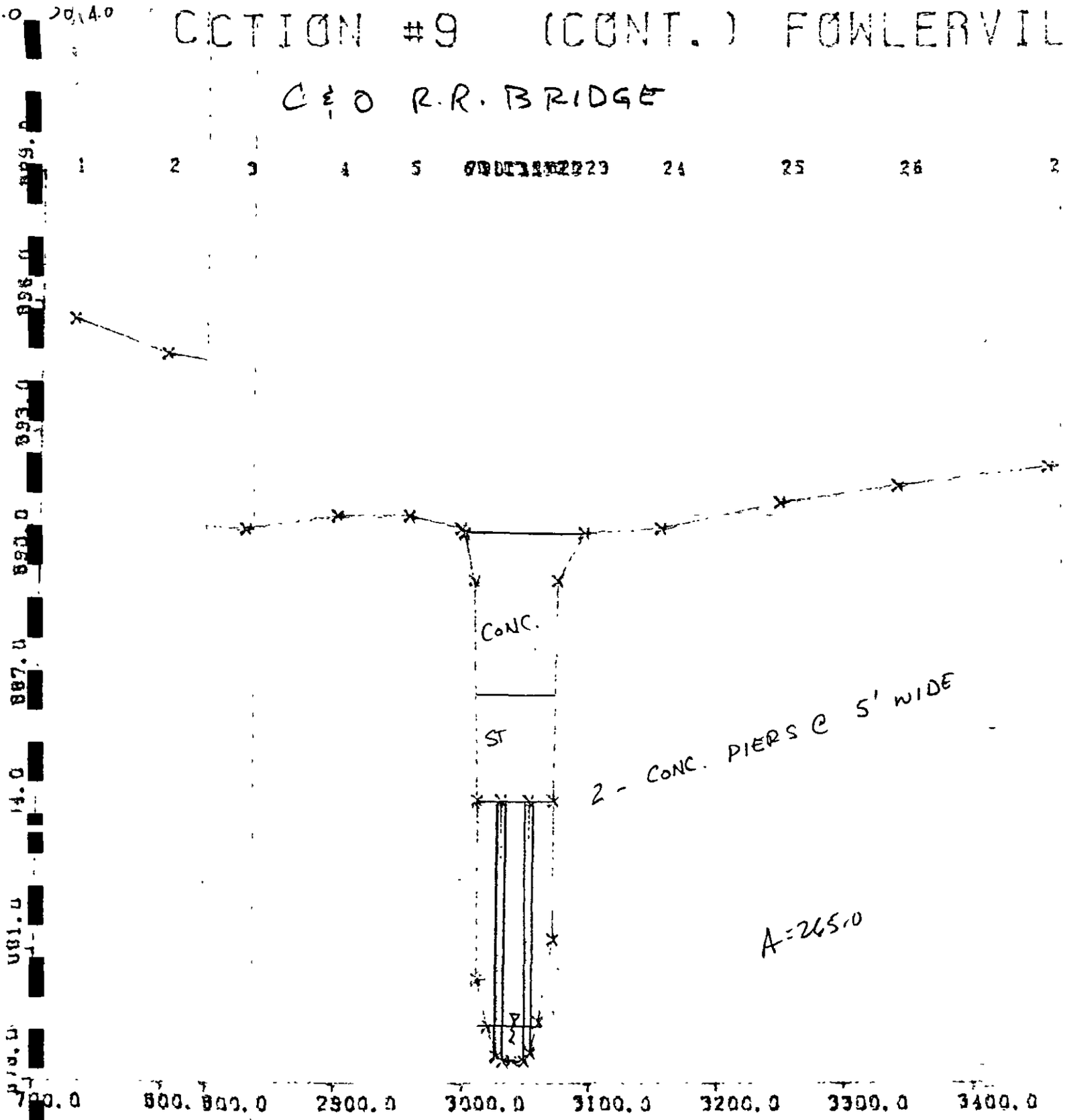
GRAND RIVER AVE.



A=

CCTION #9 (CONT.) FOWLERVIL

C & O R.R. BRIDGE



CALCULATION COVER SHEET

PROJECT FOWLERVILLE FIS JOB NO 1057 DIVISION

SUBJECT COUNTY DRAIN #2 HYDRAULICS FILE NO 1057F

CALC. NO

ORIGINATOR DATE

CHECKER DATE NO OF SHEETS

RECORD OF ISSUES

NO	DESCRIPTION	BY	DATE	CHKD	DATE	APPRD		
△								
△								
△								
△								
△								
△								

PRELIMINARY CALC ☐

SUPERSEDED CALC ☐ FINAL CALC. ☐

BRIEF SUMMARY OF CALCULATIONS INCLUDING SCOPE AND RESULTS

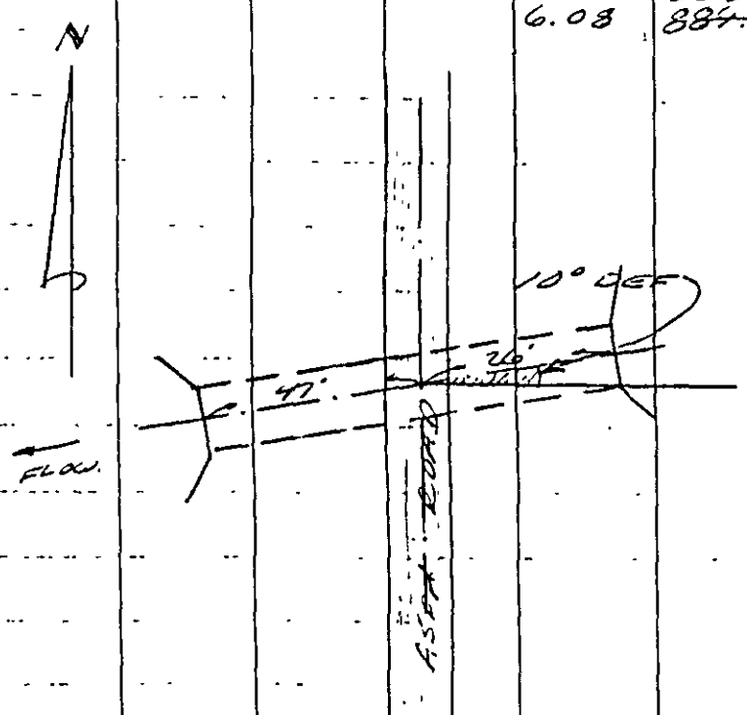
BRIDGE & CULVERT SURVEY NOTES & CROSS SECTIONS FOR COUNTY DRAIN #2

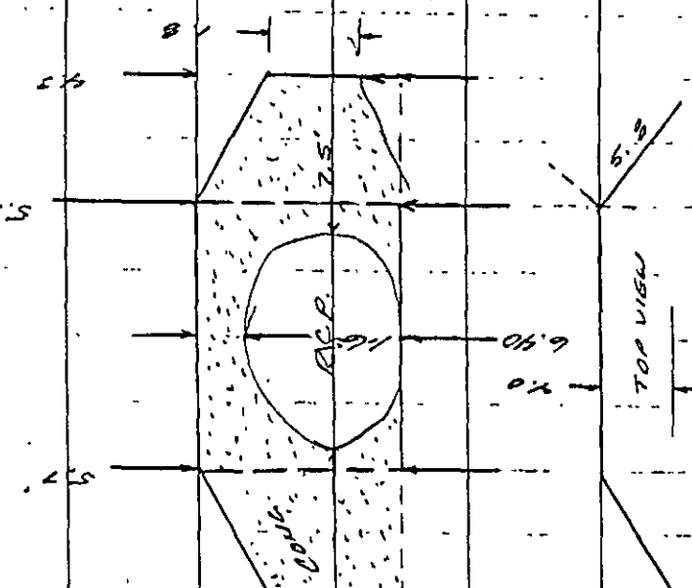
12-02-83 FONCEVILLE

STA	BS	HI	FS	TP	ELEV			
		886.63 ~~887.42~~						
	7.93	889.75 ~~890.54~~		4.81	881.82 ~~882.61~~		VEG	TALL GRASS
	CROSS SECTION #2 F.T.							
19+80			7.2		882.55			GRD.
20+00			6.7		883.05			T/B
20+05			7.9		881.85			ED/▽
20+08			8.3		881.45			CH.
20+11			8.0		881.75			ED/▽
20+15			7.0		882.75			T/B
20+35			7.4		882.35			GRD.
	14.03	901.59 ~~902.38~~		2.19	887.56 ~~888.35~~			
	4.95	894.85 ~~895.64~~		11.69	889.90 ~~890.69~~		X5 - 3	
			5.43		889.42			FROM ℄ 25' S. RD. CULVERT BREAK
			5.44		889.41			FROM ℄ CULVERT RD 47' S. BREAK
			3.40		891.45			FROM ℄ CULVERT RD 97' S.
			2.99		891.86			FROM ℄ CULVERT RD 50' N. GRD.
20+05			4.74		890.11			℄ RD.

12-02-83 FOWLER IV LLC

SA	BS	HI	FS	TP	ELEV			
		894.85 ~~895.01~~						
19+80			6.1		888.75			GRD // TO LO @ S/END HW
20+00			4.95		889.90			S/END T/H WALL
20+10			5.02		889.83			N/END T/H WALL
20+30			4.9		889.95			GRD // TO LO N/END H WALL
			4.1		885.15			10' UPSTREAM ℄ H. WALL
					888.57 ~~887.50~~	(888.81 ~~889.00~~)		PG 34 T/CULVERT





12-05-83 FOWLERVILLE

D. COLE, J. FROST

35°F OVERCAST, FOG

CONTINUATION OF CROSS SECTIONS OF TRIBUTARY.

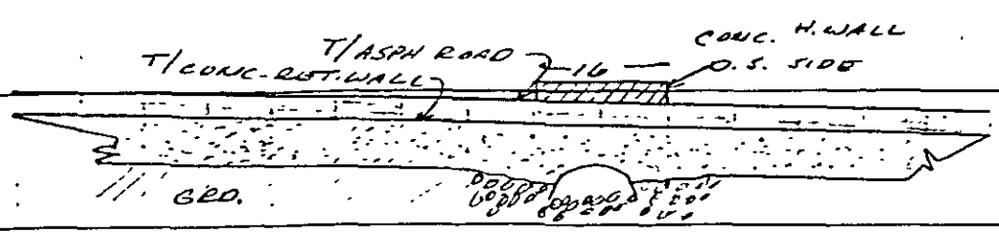
CROSS SECTION #4 FT.

STA	BS	HI	FS	TP	ELEV.		
STA	8.08	896.89 ~~897.68~~			889.60	888.81	PG. 34, T/CONC. CULVERT
5+00 ~~20+00~~			0.44		896.45		N. FACE BLDG EXTENDED W. @ S/WALK
5+30 ~~20+30~~			1.32		895.57		S./END CONC. RET. WALL
5+80 ~~20+80~~			2.18		894.71		T/WALL
5+80 ~~20+80~~			5.9		890.99		B/WALL GRD.
6+30 ~~21+30~~			2.90		893.99		T/W
"			5.9		890.99		B/W
6+80 ~~21+80~~			3.68		892.21		T/W
"			6.6		890.29		B/W
7+30 ~~22+30~~			3.89		892.00		T/W
"			7.2		889.69		B/W

CROSS SECTION - 4 CONT.

STA	BS	HI	FS	TP	ELEV.	
7+80 ~~22+80~~		896.89 ~~897.68~~	4.77		892.12	T/W
"			7.6		889.29	B/W
8+10 ~~23+10~~			5.02		891.87	T/WALL
"			8.5		888.39	C/WALL & S/GD OF STONES
8+17 ~~23+17~~			8.7		888.19	T/BANK
8+20 ~~23+20~~						℄ CULVERT T/W
"			8.85 ~~8.08~~		888.04	℄ CULVERT (INVERT)
8+23 ~~23+23~~			9.3		887.59	T/BANK
8+24 ~~23+24~~			5.15		891.74	T/WALL
"			6.7		890.19	C/WALL N. EV./STONES
8+80 ~~23+80~~			5.28		891.61	T/W
"			6.0		890.89	C/W
9+05 4+05			5.22		891.67	WALL & GRD
9+30 4+30			4.85		892.04	℄ S STEET
			3.36		893.53	T/WALL DOWNSTREAM END
			8.85		888.04	OVCLT D.S.
			12.0		884.89	INVERT U.S.

VEG - GRASS

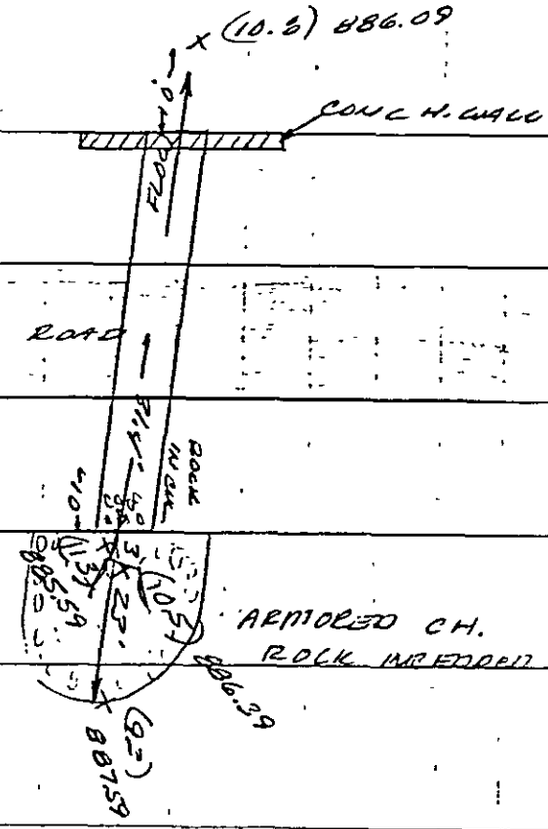


65'
WIDE

HT = 886.88

WIDTH @ BOT. CULVERT 5.5'

STONE BOTTOM CULVERT



12-05 G.

66

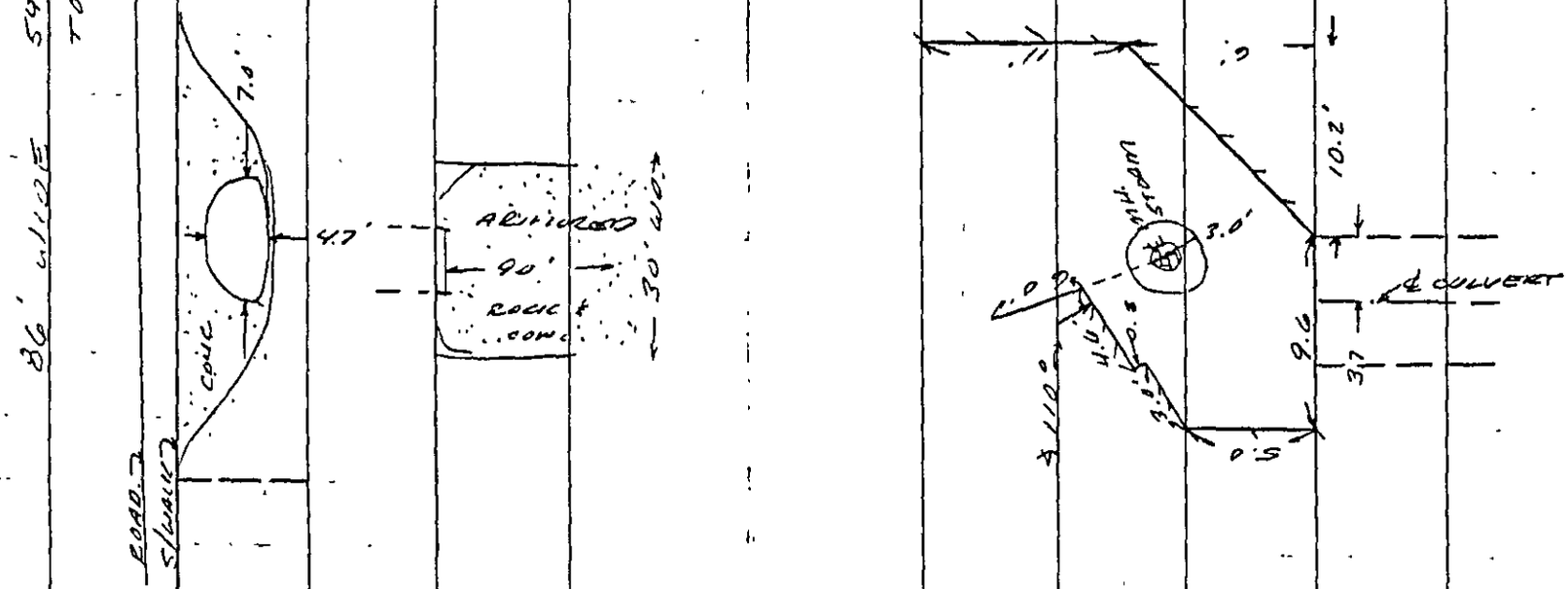
ST CROSS - SECTION - 6 F.T.

STA	BS	HI	FS	TN	ELEV.		
19+80		896.83 ~~897.02~~	6.1		890.73	GRD	
20+00			6.3		890.53	T/B	TRUE
20+05			6.40		890.43	T/B	ARTIFICIAL
20+15			11.48		885.35	℄ PIPE ARCH INVERT CMP.	
20+25			7.15		889.68	T/B	
20+30			6.3		890.53	T/B	TRUE
20+50			5.7		891.13	GRD	
20+12			10.35		886.48	CH	
20+18			10.33		886.50	CH.	

CROSS-SECTION #6

UPSTREAM SIDE

HI	FS	ELEV.	
896.83 ~~897.62~~	11.95	884.88	O.S. INVERT
	8.72	888.11	T/MU RIM
	5.65	891.18	T/CONC. RET WALL



12-05-83 FOWLERVILLE FEMA - F15 69

STA	BS	HI	FS	TP	ELEV.				
	CROSS SECTION # 8								
		897.69 ~~898.48~~							
19+80			4.7		892.99		GRD		
20+00			4.9		892.79		T/B		
20+16			4.94		892.75		S. END/H. WALL	T/W	
"			6.6		891.09		GH.		
20+22			10.0		887.69		CH.		
20+24			11.42		886.27		℄ CULVERT	~~40'~~ D.	3.3 D. 5.5 WD.
20+28			10.2		887.49		CH.		
20+37			8.2		889.49		"		
20+45			4.77		892.92		N END/H. WALL	T/W	
"			6.4		891.29		CH.		
20+60			5.2		892.49		T/B		
20+80			4.8		892.89		GRD.		
20+24			10.7		886.99		T/ACCURED CUM.		
			7.51		894.18		100'S ℄ RD FROM ℄ CULV.		
			5.06		892.63		℄ ∧ ℄		
			4.34		893.35		100'N ℄ RD		

55°
ROAD
NORTH

74.5' LONG
34' TO ℄ ROAD
POSTS 1' ABOVE BANKS
1"x6" BOARDS WOOD
5" POSTS
30
1.5
7'
7'
7'
7'
ASH
COAL WALL

12-05-83 FOWLERVILLE

STA	BS	HI	FS	TP	ELEV		
		897.69 ~~890.48~~					
						GROSS SECTION @ 9 F.T.	
19+80			5.8		891.89	GRD.	
20+00			7.0		890.69	T/B	
20+14			8.5		889.19	CH	
20+24			9.8		887.89	"	
20+30			10.3		887.39	CH.	℄
20+45			9.2		888.49	T/B	
20+65			9.1		888.59	GRD.	
	4.46	897.83 ~~898.62~~		4.32	893.37 ~~894.16~~	T/FENCE POST	
	CROSS SECTION @ 10 F.T.					MAPLE STREET	
19+80			5.1		892.73	GRD	
20+00			5.5		892.33	T/B	
20+14			5.8		892.03	S. END/H. WALL	
			7.5		890.33	GRD.	
20+16			8.5		889.33	CH.	
20+17			9.2		888.63	℄ CH.	
20+19			8.7		889.13	CH.	

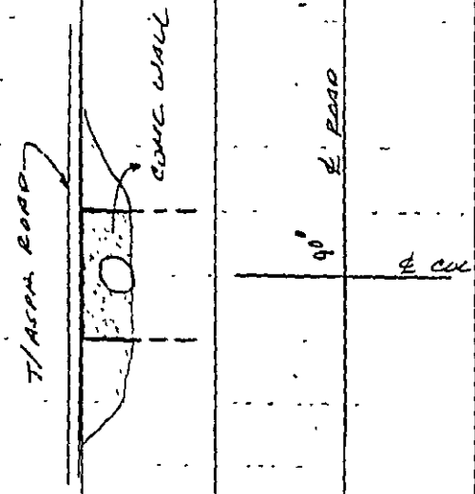
12-05-85 FULLERVILLE

STA.	BS	HI	FS	TP	ELEV.	
		892.83 ~~898.62~~				
20+21			5.9		891.93	H END/H.WALL T/W
"			8.0		889.83	GRD.
20+27			7.1		890.73	T/B
20+47			5.9		891.93	GRD.
			4.00		892.83	100' S. ℄ RD FROM ℄ CULVERT
			5.52		892.31	℄ ~ ℄
			5.10		892.73	100' N ℄ RD FROM ℄ CULVERT

24' LONG

14.5' TO ℄ RD.

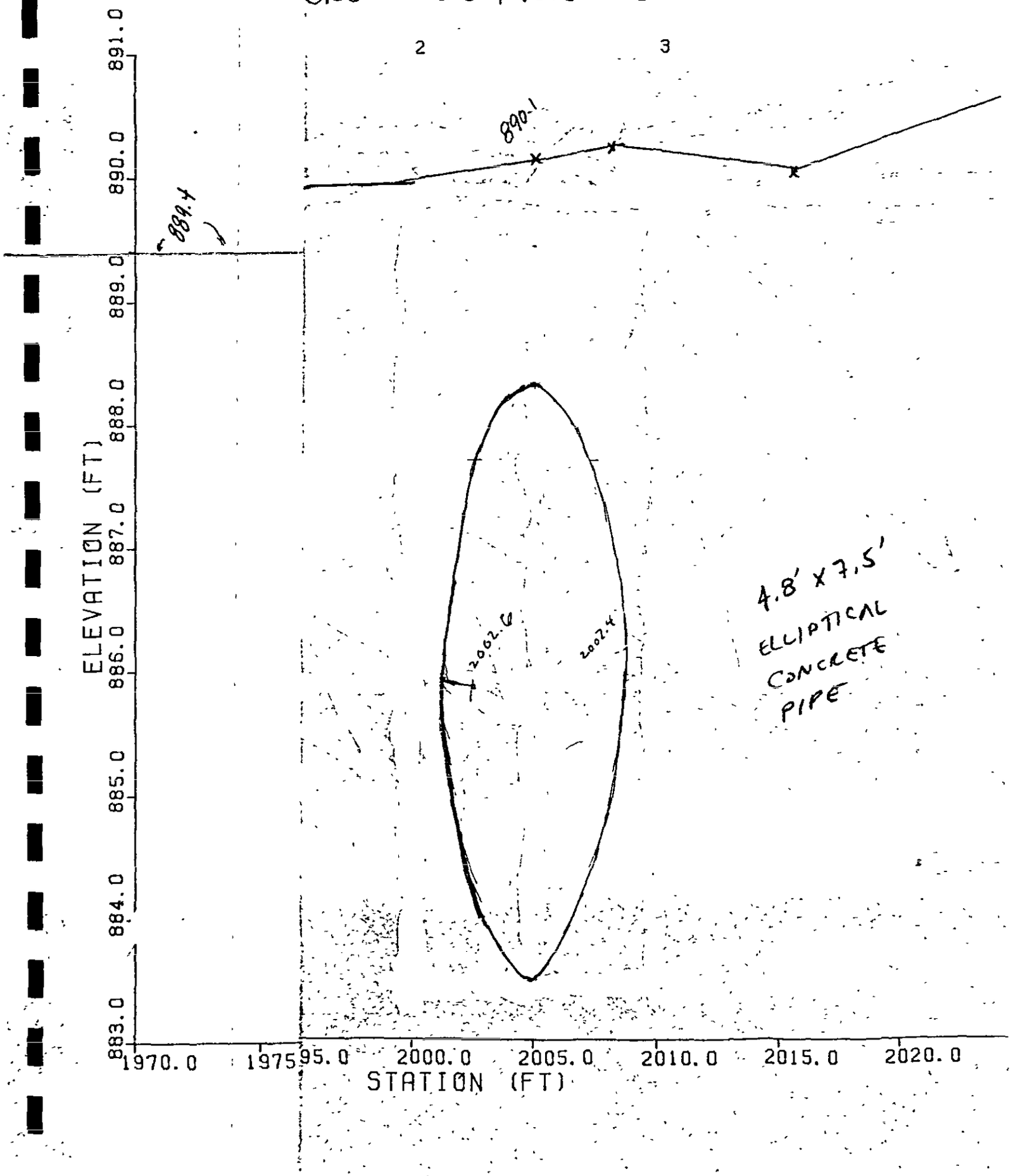
2.5' DIA. CULVERT C.M.P.

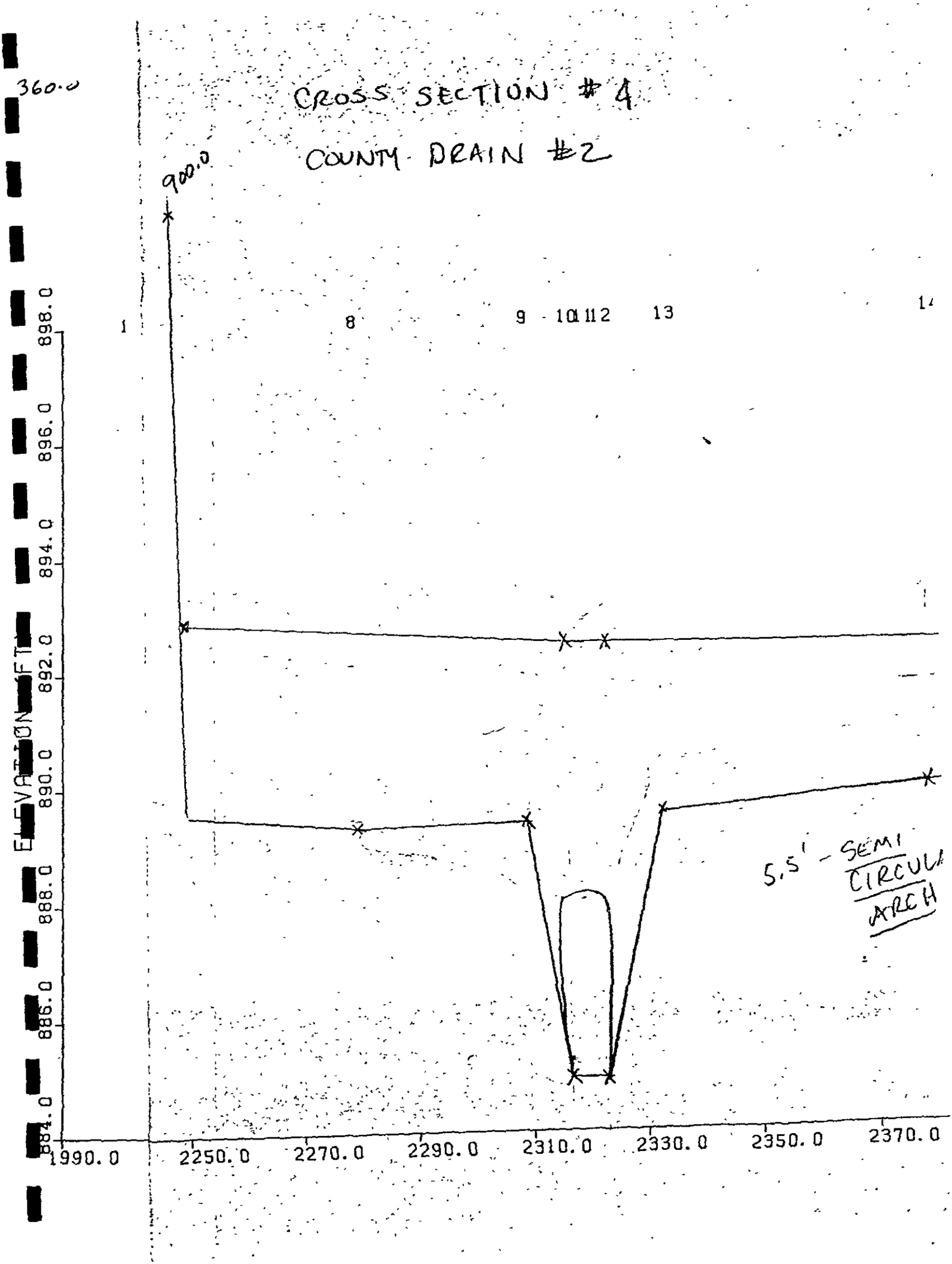


.0 720.0 660.0

CF#3 FOWLERVILLE COUNTY [

CROSS SECTION #3




CROSS SECTION # 4
COUNTY DRAIN #2
360.0
900.0
1
8
9
10
11
12
13
14
898.0
896.0
894.0
892.0
890.0
888.0
886.0
884.0
ELEVATION FT
1990.0
2250.0
2270.0
2290.0
2310.0
2330.0
2350.0
2370.0
5.5' - SEMI CIRCULAR ARCH

APPENDIX G

VILLAGE OF FOWLERVILLE FLOOD INSURANCE STUDY
HEC-2 COMPUTER PRINTOUT (SEPARATE COVER)

APPENDIX H

VILLAGE OF FOWLERVILLE FLOOD INSURANCE STUDY
CONVERGENCE ANALYSIS

CALCULATION COVER SHEET

STS Consultants Ltd.

PROJECT FOWLERVILLE FIS JOB NO. 1057 DIVISION H/H

SUBJECT RED CEDAR RIVER HYDRAULICS FILE NO 1057F

CONVERGENCE RUN STARTING CONDITIONS CALC NO

ORIGINATOR JTP DATE 10/84

CHECKER WJW DATE 2/85 NO OF SHEETS

RECORD OF ISSUES

NO	DESCRIPTION	BY	DATE	CHKD	DATE	APPRD		
△								
△								
△								
△								
△								
△								

PRELIMINARY CALC ☐

SUPERSEDED CALC ☐ FINAL CALC ☐

BRIEF SUMMARY OF CALCULATIONS INCLUDING SCOPE AND RESULTS

THESE CALCULATIONS ESTIMATE THE AVERAGE BASIN SLOPE FOR THE RED CEDAR RIVER HEC-2 COMPUTER MODEL CONVERGENCE RUN.

INDEX

1.0 STARTING CONDITIONS FOR CONVERGENCE RUN

1.1 GENERAL

1.2 CALCULATIONS

1.3 CONCLUSIONS

BBS 8251

STS Consultants Ltd.
CALCULATION SHEET

PROJECT: FOWLERVILLE FIS JOB NO.: 1054 F PAGE: ____ OF: ____

SUBJECT: RED CEDAR RIVER HYDRAULICS DIVISION: H/H

ORIGINATOR: JTP DATE: 10/84 CHECKED BY: UW DATE: 2/85

1.0 STARTING CONDITION FOR CONVERGENCE RUN.

1.1 GENERAL

The Purpose of these Calculations is to determine the starting conditions for the Red Cedar River hydraulic analysis. An average slope calculated between sections 1.5 and 4.0 will be used; normal depth will be assumed.

1.2 CALCULATIONS

X-SECTION	INVERT ELEVATION	DISTANCE	CUMULATIVE DISTANCE
1.5	872.8	–	–
1.6	872.8	200.0	200.0
2.0	874.9	1260	1460.0
3.0	873.8	1700.0	3160.0
4.0	874.3	1780.0	4940.0

$$\text{Slope} = \frac{\Delta \text{ invert}}{\Delta \text{ distance}} = \frac{874.3 - 872.8}{4940} =$$

slope = 0.000303

1.3 CONCLUSIONS

Use slope of 0.000303 for normal depth starting conditions in Red Cedar River hydraulic analysis convergence run.

THIS RUN EXECUTED 6-MAR-85 08:14:04

```
**********************************************
HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
ERRORS CORR -  01,02,03,04,05,06
MODIFICATION -  50,51,52,53,54,55
**********************************************

T1      VILLAGE OF FOWLERVILLE FLOOD INSURANCE STUDY - DECEMBER 1984 - JTP
T2      JOB #10545   FWLCONVS.HEC FSHEET1   CONVERGENCE RUN
T3      RED CEDAR RIVER AT FOWLERVILLE

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ
     0.       4.        0.        0.     0.000303     0.00      0.0       0.       0.000     0.000

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

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

   150.000    0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

NT      4.000   930.000  1470.000  1730.000  2120.000     0.000     0.000     0.000     0.000     0.000
NC      0.100     0.100     0.035     0.100     0.304     0.000     0.000     0.000     0.000     0.000
        100' D/S FROM GREGORY ROAD BRIDGE
X1      1.100    23.000  2000.000  2044.000     0.000     0.000     0.000     0.000     0.000     0.000
GR    333.000     0.000   882.800   876.000   860.200  1204.000   880.000  1372.000   879.800  1716.000
GR    880.800  1964.000   881.500  1988.000   881.600  1998.000   881.200  1999.000   879.800  2000.000
GR    873.000  2010.000   873.400  2011.000   872.800  2017.000   873.800  2023.000   874.700  2029.000
GR    876.100  2036.000   879.800  2043.900   881.200  2044.000   880.600  2068.000   880.400  2100.000
GR    881.400  2420.000   882.800  2604.000   884.000  3000.000     0.000     0.000     0.000     0.000

NC      0.000     0.000     0.000     0.300     0.500     0.000     0.000     0.000     0.000     0.000
        D/S FACE OF GREGORY ROAD BRIDGE
X1      1.200     0.000     0.000     0.000   100.000   100.000   100.000     0.000     0.000     0.000
X3     10.000     0.000     0.000     0.000     0.000     0.000     0.000   880.000   880.400     0.000

NC      0.000     0.000     0.022     0.000     0.000     0.000     0.000     0.000     0.000     0.000
        1 FT. U/S OF D/S FACE OF GREGORY RD. BRIDGE
X2      1.300     0.000     0.000     0.000     1.000     1.000     1.000     0.000     0.000     0.000
BT      4.000  1999.000   881.200   800.000  2000.000   881.200   879.800  2043.900   881.200   879.800
BT   2044.000   881.200   800.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

        1 FT. D/S OF U/S FACE OF GREGORY RD. BRIDGE
X1      1.400     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
```

NC	0.000	0.000	0.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000
U/S FACE OF GREGORY ROAD BRIDGE										
X1	-1.500	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	810.000	0.000	0.000	0.000	0.000	0.000	0.000	880.000	880.400	0.000
NC	0.000	0.000	0.000	0.100	0.300	0.000	0.000	0.000	0.000	0.000
200' U/S OF GREGORY ROAD BRIDGE										
X1	1.600	0.000	0.000	0.000	200.000	200.000	200.000	0.000	0.000	0.000
NC	0.060	0.060	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SURVEY SECTION #2										
X1	2.000	50.000	2000.000	2042.000	1130.000	1450.000	1760.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	1000.000	0.000	2402.000	0.000	0.000	0.000	0.000
GR	884.600	90.000	884.800	98.000	884.600	114.000	882.900	127.000	882.200	154.000
GR	882.200	186.000	882.800	234.000	881.200	282.000	881.800	367.000	881.900	612.000
GR	881.600	634.000	881.000	658.000	882.000	682.000	881.400	722.000	880.900	746.000
GR	881.200	770.000	879.600	946.000	880.200	1242.000	878.200	1402.000	879.200	1918.000
GR	979.100	1882.000	879.400	1930.000	879.800	1970.000	879.000	1980.000	878.400	2000.000
GR	877.000	2002.000	875.500	2004.000	875.000	2010.000	875.000	2016.000	875.100	2022.000
GR	874.900	2028.000	875.200	2033.000	874.900	2035.000	876.800	2038.000	877.000	2042.000
GR	879.400	2052.000	879.600	2057.000	878.400	2072.000	879.200	2114.000	880.000	2330.000
GR	882.200	2370.000	883.200	2407.000	879.200	2506.000	879.000	2546.000	888.600	2666.000
GR	890.000	2714.000	889.800	2762.000	893.000	3002.000	893.000	3034.000	893.300	3082.000
SURVEY SECTION #3										
X1	3.000	37.000	2000.000	2060.000	1640.000	1800.000	1900.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	1412.000	0.000	2593.000	0.000	0.000	0.000	0.000
GR	883.400	823.000	884.000	847.000	882.600	887.000	882.400	975.000	881.300	975.000
GR	880.400	1031.000	880.000	1071.000	879.600	1095.000	880.400	1127.000	880.200	1147.000
GR	879.900	1215.000	880.200	1247.000	880.000	1287.000	879.800	1327.000	879.800	1399.000
GR	880.600	1471.000	880.400	1519.000	880.400	1583.000	879.600	1623.000	878.600	1647.000
GR	878.600	1695.000	878.400	1743.000	878.700	1764.000	879.000	1839.000	879.200	1911.000
GR	878.500	1975.000	879.000	1983.000	881.600	2000.000	879.400	2006.000	877.400	2007.000
GR	876.100	2009.000	874.400	2015.000	873.800	2020.000	873.900	2025.000	874.500	2030.000
GR	874.900	2032.000	876.000	2037.000	877.300	2041.000	879.100	2044.000	881.100	2050.000
GR	882.000	2060.000	880.100	2075.000	880.600	2103.000	881.600	2143.000	882.800	2263.000
GR	883.400	2327.000	883.500	2519.000	884.400	2593.000	884.000	2679.000	882.400	2719.000
GR	881.600	2783.000	881.800	2887.000	881.400	2983.000	881.200	3071.000	881.800	3151.000
GR	882.100	3215.000	884.000	3271.000	0.000	0.000	0.000	0.000	0.000	0.000
NH	9.000	0.060	704.000	0.030	1184.000	0.040	1272.000	0.030	1732.000	0.045
NH	1912.000	0.035	2035.000	0.045	2120.000	0.030	2944.000	0.060	3808.000	0.000
SURVEY SECTION #4										
X1	4.000	78.000	2000.000	2037.000	1690.000	1880.000	1780.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	1816.000	0.000	2120.000	0.000	0.000	0.000	0.000
GR	885.700	360.000	885.600	416.000	885.300	472.000	885.300	520.000	884.700	552.000
GR	885.300	600.000	884.500	616.000	885.100	632.000	888.800	640.000	888.800	648.000
GR	886.300	656.000	886.900	664.000	889.900	680.000	881.700	704.000	881.700	1184.000
GR	884.100	1192.000	884.900	1208.000	883.500	1216.000	883.500	1224.000	884.700	1240.000
GR	884.700	1248.000	882.500	1256.000	879.900	1272.000	879.900	1232.000	882.300	1752.000
GR	883.100	1752.000	883.700	1784.000	886.700	1800.000	887.500	1808.000	887.500	1816.000
GR	884.700	1824.000	880.300	1848.000	879.700	1872.000	879.700	1912.000	880.100	1944.000
GR	880.900	1976.000	880.800	1980.000	880.900	1992.000	880.100	2000.000	878.400	2002.000

GR	876.700	2003.000	874.600	2006.000	874.600	2013.000	874.800	2017.000	874.700	2022.000
GR	874.300	2027.000	876.700	2031.000	878.300	2042.000	879.900	2045.000	881.100	2045.000
GR	882.300	2048.000	882.700	2072.000	883.300	2098.000	889.800	2104.000	890.300	2170.000
GR	888.500	2130.000	888.400	2944.000	889.500	2952.000	891.500	2960.000	889.500	2968.000
GR	884.300	2976.000	884.300	3008.000	884.000	3048.000	885.100	3096.000	886.300	3160.000
GR	887.300	3208.000	888.000	3264.000	887.300	3288.000	888.900	3320.000	890.400	3352.000
GR	891.600	3408.000	892.300	3464.000	892.000	3504.000	893.800	3576.000	894.500	3624.000
GR	895.700	3672.000	896.600	3712.000	897.900	3808.000	0.000	0.000	0.000	0.000
GR	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

THIS RUN EXECUTED 6-MAR-85 08:18:36

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RELEASE DATED NOV 76 UPDATED MAY 1984
CORR 01,02,03,04,05,06
ICATION -- 50,51,52,53,54,55
****

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

CEDAR RIVER AT FOWLE

Y PRINTOUT TABLE 150

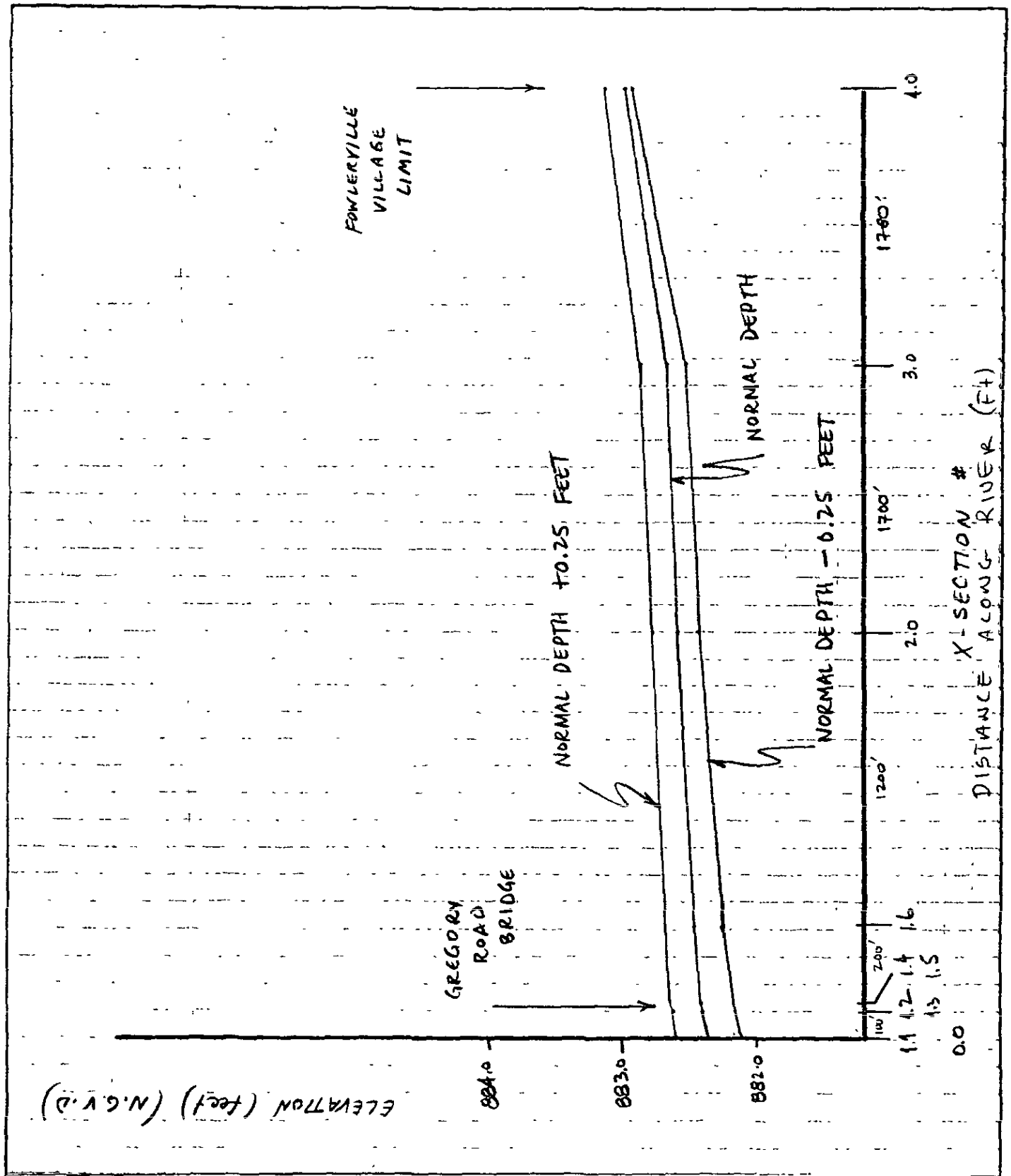
SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEI	CRIWS	EG	10K*S	VCH	AREA	.01K
1.100	0.00	0.00	0.00	872.80	1730.00	882.35	0.00	882.39	3.03	2.34	2966.29	994.57
1.100	0.00	0.00	0.00	872.80	1730.00	882.60	0.00	882.62	2.24	2.06	3371.82	1155.48
1.100	0.00	0.00	0.00	872.80	1730.00	882.10	0.00	882.15	4.22	2.69	2565.78	842.57
1.200	100.00	0.00	0.00	872.80	1730.00	882.39	0.00	882.42	2.91	2.30	3017.30	1013.67
1.200	100.00	0.00	0.00	872.80	1730.00	882.62	0.00	882.65	2.18	2.04	3409.45	1170.88
1.200	100.00	0.00	0.00	872.80	1730.00	882.14	0.00	882.15	3.98	2.67	2631.29	866.66
1.300	1.00	881.20	879.80	872.80	1730.00	882.41	0.00	882.42	4.12	1.91	2991.47	852.21
1.300	1.00	881.20	879.80	872.80	1730.00	882.64	0.00	882.65	3.03	1.68	3361.27	954.14
1.300	1.00	881.20	879.80	872.80	1730.00	882.17	0.00	882.20	5.82	2.20	2619.98	716.86
1.400	18.00	881.20	879.80	872.80	1730.00	882.42	0.00	882.43	4.08	1.90	3001.87	856.11
1.400	18.00	881.20	879.80	872.80	1730.00	882.64	0.00	882.66	2.98	1.67	3382.07	1002.33
1.400	18.00	881.20	879.80	872.80	1730.00	882.19	0.00	882.21	5.75	2.18	2633.78	721.76
1.500	1.00	0.00	0.00	872.80	1730.00	882.41	0.00	882.44	2.80	2.26	3066.89	1033.13
1.500	1.00	0.00	0.00	872.80	1730.00	882.64	0.00	882.66	2.13	2.02	3446.47	1186.11
1.500	1.00	0.00	0.00	872.80	1730.00	882.18	0.00	882.22	3.78	2.57	2692.09	889.29
1.600	200.00	0.00	0.00	872.80	1730.00	882.46	0.00	882.49	2.62	2.20	3157.32	1068.94
1.600	200.00	0.00	0.00	872.80	1730.00	882.68	0.00	882.70	2.02	1.97	3523.48	1217.98
1.600	200.00	0.00	0.00	872.80	1730.00	882.25	0.00	882.29	3.41	2.46	2819.91	937.49
2.000	1260.00	0.00	0.00	874.90	1730.00	882.60	0.00	882.61	0.46	1.04	4160.49	2558.14
2.000	1260.00	0.00	0.00	874.90	1730.00	882.79	0.00	882.80	0.38	0.96	4563.42	2799.24
2.000	1260.00	0.00	0.00	874.90	1730.00	882.43	0.00	882.44	0.55	1.11	4054.89	2440.79
3.000	1700.00	0.00	0.00	873.80	1730.00	882.71	0.00	882.73	1.19	1.37	2486.29	1581.92
3.000	1700.00	0.00	0.00	873.80	1730.00	882.85	0.00	882.90	1.02	1.29	2642.26	1712.67
3.000	1700.00	0.00	0.00	873.80	1730.00	882.56	0.00	882.57	1.39	1.44	2365.66	1469.68

CNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEI	CRIWS	EG	10K*S	VCH	AREA	.01K
4.000	1780.00	0.00	0.00	874.30	1730.00	883.02	0.00	883.14	5.18	3.30	762.89	760.21
4.000	1780.00	0.00	0.00	874.30	1730.00	883.15	0.00	883.25	4.66	3.36	795.30	801.01
4.000	1780.00	0.00	0.00	874.30	1730.00	882.91	0.00	883.04	5.67	3.63	735.34	726.31

ED CEDAR RIVER AT FOWLE

SUMMARY PRINTOUT TABLE 150

SECND	Q	CWSEL	DIFWSP	DIFWSX	DIFKVS	TOPWID	XLCH
1.100	1730.00	882.35	0.00	0.00	0.00	1613.29	0.00
1.100	1730.00	882.60	0.25	0.06	0.00	1676.46	0.00
1.100	1730.00	882.10	-0.50	0.00	0.00	1547.69	0.00
1.200	1730.00	882.39	0.00	0.03	0.00	1621.00	100.00
1.200	1730.00	882.62	0.24	0.02	0.00	1682.25	100.00
1.200	1730.00	882.14	-0.48	0.04	0.00	1558.55	100.00
1.300	1730.00	882.41	0.00	0.02	0.00	1626.87	1.00
1.300	1730.00	882.64	0.23	0.02	0.00	1684.40	1.00
1.300	1730.00	882.17	-0.46	0.03	0.00	1566.94	1.00
1.400	1730.00	882.42	0.00	0.01	0.00	1628.51	18.00
1.400	1730.00	882.64	0.23	0.01	0.00	1687.50	18.00
1.400	1730.00	882.19	-0.46	0.01	0.00	1569.21	18.00
1.500	1730.00	882.41	0.00	0.01	0.00	1628.95	1.00
1.500	1730.00	882.64	0.23	-0.01	0.00	1687.91	1.00
1.500	1730.00	882.18	-0.46	-0.01	0.00	1568.57	1.00
1.600	1730.00	882.46	0.00	0.06	0.00	1643.19	200.00
1.600	1730.00	882.68	0.22	0.04	0.00	1699.62	200.00
1.600	1730.00	882.25	-0.43	0.00	0.00	1589.42	200.00
2.000	1730.00	882.60	0.00	0.14	0.00	1382.85	1260.00
2.000	1730.00	882.79	0.19	0.11	0.00	1488.93	1260.00
2.000	1730.00	882.43	-0.37	0.17	0.00	1377.16	1260.00
3.000	1730.00	882.71	0.00	0.11	0.00	842.42	1700.00
3.000	1730.00	882.89	0.17	0.09	0.00	860.14	1700.00
3.000	1730.00	882.56	-0.33	0.13	0.00	826.76	1700.00
4.000	1730.00	883.02	0.00	0.30	0.00	251.55	1780.00
4.000	1730.00	883.15	0.13	0.26	0.00	257.38	1780.00
4.000	1730.00	882.91	-0.24	0.35	0.00	246.56	1780.00



STS Consultants Ltd. FIGURE SHEET	PROJECT VILLAGE OF FOWLERVILLE F.I.S.			FIGURE NO. 2
	TITLE RED CEDAR RIVER CONVERGENCE ANALYSIS			JOB NO. 1054F
	DATE 2-10-85	DRAWN BY JTP	APPROVED BY WJW	SCALE AS SHOWN

00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: FOWLERVILLE, ~~CITY~~ VILLAGE OF

3) WATERCOURSE: RED CEDAR RIVER

4) DOCUMENT TYPE: SUMMARY

00BREAK00

THIS JOB EXECUTED 07-FEB-85 12:10:17

[illegible]
ABCD RELEASE DATED NOV 74 UPDATED MAY 1980
VERSION CORR - 01.02.03.04.05.06
[illegible]
[illegible]

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

HIGH STORM RIVER AT POLE

SUMMARY PRINTOUT TABLE 150

SECNO	QCH	ELTRD	ELLC	ELDIF	C	CHSTM	CONTRC	SO	SAREA	VCH	FREQ	QOT
4.000	0.00	0.00	0.00	874.30	930.00	882.69	0.00	883.79	5.24	2.99	37.70	408.39
4.000	0.00	0.00	0.00	874.30	1470.00	882.87	0.00	883.75	5.21	2.29	371.97	544.00
4.000	0.00	0.00	0.00	874.30	1730.00	883.02	0.00	883.13	5.24	2.47	732.67	755.57
4.000	0.00	0.00	0.00	874.30	2120.00	883.54	0.00	883.66	5.30	2.52	898.75	929.99
5.000	1040.00	0.00	0.00	875.30	930.00	[illegible]	0.00	882.54	2.03	2.47	358.24	307.03
5.000	1040.00	0.00	0.00	875.80	1470.00	883.[illegible]	0.00	883.28	4.95	2.74	270.46	460.49
5.000	1040.00	0.00	0.00	875.80	1730.00	883.69	0.00	883.65	4.89	2.50	994.94	798.57
5.000	1040.00	0.00	0.00	875.80	2120.00	884.09	0.00	884.16	4.36	2.38	1173.14	1013.24
6.000	1040.00	0.00	0.00	875.30	930.00	882.72	0.00	882.76	3.03	2.21	1069.71	335.48
6.000	1040.00	0.00	0.00	875.30	1470.00	883.64	0.00	883.38	3.02	2.46	1521.46	846.57
6.000	1040.00	0.00	0.00	875.30	1730.00	884.00	0.00	883.[illegible]	3.08	2.57	1702.41	986.29
6.000	1040.00	0.00	0.00	875.30	2120.00	884.49	0.00	884.34	3.16	2.74	1947.15	1173.23
7.000	820.00	0.00	0.00	875.30	930.00	882.90	0.00	883.05	3.78	3.21	417.69	386.85
7.000	820.00	0.00	0.00	875.30	1470.00	883.80	0.00	884.02	7.44	4.07	593.52	531.83
7.000	820.00	0.00	0.00	875.30	1730.00	884.15	0.00	884.40	8.11	4.39	642.62	596.60
7.000	820.00	0.00	0.00	875.30	2120.00	884.64	0.00	884.93	9.40	4.84	737.02	491.33
7.200	300.00	0.00	0.00	874.90	930.00	883.07	0.00	883.23	3.84	3.21	290.01	384.93
7.200	300.00	0.00	0.00	874.90	1470.00	884.01	0.00	884.32	9.87	4.44	330.84	467.87
7.200	300.00	0.00	0.00	874.90	1730.00	884.44	0.00	884.77	11.90	4.99	346.32	501.47
7.200	300.00	0.00	0.00	874.90	2120.00	884.85	0.00	885.30	14.98	5.75	368.38	547.77
7.400	56.00	886.70	881.50	874.90	930.00	883.35	0.00	883.49	2.04	3.09	302.07	450.61
7.400	56.00	886.70	881.50	874.90	1470.00	884.83	0.00	885.08	2.89	4.01	366.47	864.87
7.400	56.00	886.70	881.50	874.90	1730.00	885.57	0.00	885.86	3.12	4.34	398.92	979.85
7.400	56.00	886.70	881.50	874.90	2120.00	886.54	0.00	886.90	3.33	4.80	441.61	1161.22
7.600	400.00	0.00	0.00	875.50	930.00	883.54	0.00	883.60	1.78	1.90	1147.35	696.14
7.600	400.00	0.00	0.00	875.50	1470.00	884.19	0.00	885.22	1.15	1.78	2039.57	1370.39
7.600	400.00	0.00	0.00	875.50	1730.00	885.95	0.00	886.01	0.95	1.71	2502.57	1779.16
7.600	400.00	0.00	0.00	875.50	2120.00	887.04	0.00	887.06	0.78	1.68	3093.18	2397.86

SECPC	FLCH	ELTRO	ELLC	ELRIN	C	CWPEL	CPTMS	SO	TORKS	VCM	AREA	TOTR
3,000	440.00	0.00	0.00	876.20	930.00	884.27	0.00	885.71	3.62	1.25	744.12	487.83
8,000	440.00	0.00	0.00	876.20	1470.00	886.25	0.00	885.20	2.49	2.29	1238.30	930.80
8,000	440.00	0.00	0.00	876.20	1730.00	886.07	0.00	886.07	2.10	2.27	1483.36	1193.92
8,000	440.00	0.00	0.00	876.20	2120.00	887.07	0.00	887.11	1.77	2.28	1836.13	1595.13
9,200	600.00	0.00	0.00	878.50	930.00	883.92	0.00	889.05	3.63	3.24	285.45	224.29
9,200	600.00	0.00	0.00	878.50	1470.00	885.40	0.00	885.67	5.02	3.92	375.31	489.51
9,200	600.00	0.00	0.00	878.50	1730.00	886.74	0.00	886.70	4.85	4.15	470.49	389.47
9,200	600.00	0.00	0.00	878.50	2120.00	887.14	0.00	887.44	5.70	4.59	483.12	718.56
9,400	14.50	590.70	204.50	878.50	930.00	883.94	0.00	884.14	2.94	3.23	387.65	340.25
9,400	14.50	590.70	834.50	878.50	1470.00	885.52	0.00	886.15	3.54	3.62	406.91	923.14
9,400	14.50	590.70	784.50	878.50	1730.00	886.32	0.00	887.12	2.23	3.69	469.[illegible]	1[illegible].50
9,400	14.50	590.70	654.50	878.50	2120.00	888.44	0.00	888.63	1.97	3.76	364.39	313.65
9,600	300.00	0.00	0.00	877.30	930.00	884.20	0.00	884.32	1.31	1.50	1331.35	512.34
9,600	300.00	0.00	0.00	877.30	1470.00	886.29	0.00	886.25	0.80	1.41	2376.65	1544.58
9,600	300.00	0.00	0.00	877.30	1730.00	887.21	0.00	887.23	0.54	1.81	2610.79	2134.23
9,600	300.00	0.00	0.00	877.30	2120.00	888.70	0.00	887.72	0.49	1.17	3298.44	2317.48
10,000	500.00	0.00	0.00	876.40	930.00	884.26	0.00	884.27	0.93	1.26	1975.13	964.0.
10,000	500.00	0.00	0.00	876.40	1470.00	886.24	0.00	886.25	0.47	1.10	3443.75	2136.88
10,000	500.00	0.00	0.00	876.40	1730.00	887.23	0.00	887.26	0.36	1.03	4266.39	3899.39
10,000	500.00	0.00	0.00	876.40	2120.00	888.73	0.00	888.74	0.25	0.96	5557.76	4341.28
1[illegible],000	710.00	0.00	0.00	877.40	930.00	884.34	0.00	884.34	1.38	1.18	1769.60	772.23
1[illegible],000	710.00	0.00	0.00	877.40	1470.00	886.28	0.00	886.28	0.50	0.94	3566.57	2088.44
11,000	710.00	0.00	0.00	877.40	1730.00	887.27	0.00	887.27	0.32	0.84	4960.18	3050.54
11,000	710.00	0.00	0.00	877.40	2120.00	888.75	0.00	888.75	0.18	0.71	7764.04	5060.36
12,000	410.00	0.00	0.00	877.00	930.00	884.39	0.00	884.40	1.11	1.44	2338.20	584.41
12,000	410.00	0.00	0.00	877.00	1470.00	886.30	0.00	886.30	0.35	0.97	4900.30	2473.91
12,000	410.00	0.00	0.00	877.00	1730.00	887.28	0.00	887.27	0.23	0.85	6488.24	3604.75
12,000	410.00	0.00	0.00	877.00	2120.00	888.76	0.00	888.76	0.14	0.72	9032.01	5715.71

RST LEDTR XLDEN 1 FEMLE

SLMMARY FRM RCLF TABLE 50

SECNO	Q	DWSEL	DIFMBP	DIFMBK	DIFKUP	IOPHID	XLCH
1.000	930.00	881.69	0.00	0.00	1.69	202.02	0.00
1.000	1470.00	882.41	0.96	0.00	2.34	213.97	0.00
1.000	1730.00	883.02	0.27	0.00	3.02	252.55	0.00
1.000	2120.00	883.34	0.32	0.00	3.34	245.97	0.00
5.000	930.00	882.93	0.00	0.12	0.00	277.11	1040.00
5.000	1470.00	883.32	0.95	0.58	0.00	248.77	1040.00
5.000	1730.00	883.29	0.36	0.37	0.00	232.01	1040.00
5.000	2120.00	887.09	0.00	0.50	0.00	356.87	1040.00
6.000	930.00	882.72	0.00	0.14	0.00	273.00	1040.00
6.000	1470.00	884.37	0.72	0.41	0.02	195.00	1040.00
6.000	1730.00	885.02	0.34	0.31	1.28	493.00	1040.00
6.000	2120.00	884.[illegible]	0.25	0.40	1.77	493.00	1040.00
7.100	930.00	882.90	0.00	0.18	0.00	195.00	620.00
7.100	1470.00	883.80	0.90	0.16	0.90	93.00	620.00
7.100	1730.00	884.12	0.32	0.16	1.32	193.00	620.00
7.100	2120.00	884.[illegible]	0.[illegible]	0.13	1.74	193.00	620.00
7.200	930.00	883.07	0.00	0.17	0.00	42.83	300.00
7.200	1470.00	884.01	0.95	0.22	0.95	43.30	300.00
7.200	1730.00	884.78	0.37	0.23	1.32	43.47	300.00
7.200	2120.00	885.89	0.40	0.24	1.81	43.71	300.00
7.400	930.00	883.30	0.00	0.26	0.00	42.99	56.00
7.400	1470.00	884.03	1.40	0.03	1.49	43.67	56.00
7.400	1730.00	883.57	0.74	1.19	2.22	44.00	56.00
7.400	2120.00	886.34	0.97	1.67	3.20	44.00	56.00
7.600	930.00	883.56	0.00	0.22	0.00	560.00	400.00
7.600	1470.00	885.19	1.63	0.34	1.63	560.00	400.00
7.600	1730.00	883.98	0.79	0.41	2.42	560.00	400.00
7.600	2120.00	887.04	1.05	0.50	3.47	560.00	400.00
8.000	930.00	883.65	0.00	0.09	0.00	306.95	440.00
8.000	1470.00	885.24	1.58	0.05	1.59	313.05	440.00
8.000	1730.00	886.02	0.78	0.04	2.37	316.33	440.00
8.000	2120.00	887.07	1.04	0.03	3.41	358.04	440.00
9.200	930.00	883.92	0.00	0.26	0.00	60.08	600.00
9.200	1470.00	885.40	1.49	0.16	1.49	61.15	600.00
9.200	1730.00	886.17	0.74	0.12	2.22	62.00	600.00
9.200	2120.00	887.14	1.00	0.07	3.22	63.15	600.00

$Q_{975} \approx 1200$ $\left(\frac{65}{163}\right)^{.886} \times 2640 = [illegible]$

$Q_{WSEL} \approx 888.49$

$+1.4 \times \frac{[illegible]}{64.4} = 884.1$ ft

```
   SECNO       Q        CWSEL    DIFWSP    DIFWSX    DIFKWS    TOPWID     XLCH

   9.400    930.00     383.75      0.00  [illegible]    0.00      0.08    14.50
   9.400   1470.00     385.92      1.97      0.51      1.97     61.74    14.50
   9.400   1730.00     386.92      1.00      0.78      2.97     62.50    14.50
   9.400   2120.00     388.41  [illegible]   1.27  [illegible]    64.65    14.50

   9.600    930.00     384.20      0.00      0.24      0.00    413.91   300.00
   9.600   1470.00     386.20      2.01      0.28      2.01    440.00   300.00
   9.600   1730.00     387.21      1.01      0.29      3.01    440.00   300.00
   9.600   2120.00     388.70      1.49      0.29      4.51    440.00   300.00

  10.000    930.00     384.28      0.00      0.07      0.00    750.81   500.00
  10.000   1470.00     386.34      1.78  [illegible]    1.78    502.95   500.00
  10.000   1730.00     387.35  [illegible]   0.04      2.98    505.67   500.00
  10.000   2120.00     388.75      1.49      0.05      4.47    500.40   500.00

  11.000    930.00     384.34      0.00      0.07      0.00    308.98   710.00
  11.000   1470.00     386.28  [illegible]   0.03  [illegible]   684.90   710.00
  11.000   1730.00     387.37      0.99  [illegible]    2.95   1374.55   710.00
  11.000   2120.00     388.75  [illegible] [illegible]  4.[illegible] [illegible] 710.00

  12.000    930.00     384.39      0.00      0.05      0.00   1285.77   810.00
  12.000   1470.00     386.50         5      0.07  [illegible]  1478.77   810.00
  12.000   1730.00     387.30  [illegible]   0.01      2.89   1580.6[illegible] 810.00
  [illegible]000  2120.00  388.76  [illegible]   0.01  [illegible]  1865.75  [illegible]
```

00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: GREEN OAK

3) WATERCOURSE: HURON RIVER

4) DOCUMENT TYPE: REPORT

00BREAK00

GREEN OAK TOWNSHIP
LIVINGSTON COUNTY
MICHIGAN

FLOOD INSURANCE STUDY

HURON RIVER

HYDRAULIC ANALYSIS
REFERENCES
SECNO TABLE
BRIDGE SKETCHES AND CALCULATIONS
SUPPLEMENTAL HAND CALCULATIONS

SEPTEMBER 1982

PROJECT MANAGER: MOW-SOUNG CHENG

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HYDRAULIC ANALYSIS

A. Introduction

The Huron River within the Township of Green Oak, Livingston County, Michigan is the subject of this report. The study begins at corporate boundary with Hamburg Township and continues upstream for approximately 11.9 miles along the Huron River to another corporate boundary with Lyon Township. The 10-, 50-, 100-, and 500-year frequency flood flows were obtained using a Log-Pierson Type III program. These discharges were approved by the Michigan Department of Natural Resources on December 22, 1981. The major floods on the Huron River occur in the late winter or early spring months. The project manager for this study is Dr. Mow-Soung Cheng.

B. Method of Analysis

The flood profiles were calculated by the HEC-2 computer program developed by the U.S. Army Corps of Engineers. All of the bridges along the Huron River have been modelled for the requirements of the normal bridge routine and special bridge routine.

C. Variables and Coefficients

The roughness factors (Manning's "n") were established by comparing the descriptions in Open-Channel Hydraulics (Reference 1) with photographs and field descriptions taken by survey crews in 1981, and field reconnaissance trips taken in 1982. Aerial photographs of Green Oak Township taken in 1978 were also used to determine the roughness coefficients and their extent. These roughness factors were determined assuming that flooding would occur during the late winter/early spring. The Manning's "n" for the channel ranges from .032 in areas with a sandy bottom to .036 in areas with a gravelly

bottom. The Manning's "n" for the overbanks ranges from .040 in areas of short grass residential areas to 0.100 in areas of heavy brush and woods. The expansion and contraction coefficients chosen for this study were 0.5 and 0.3, respectively.

D. Starting Water Surface Elevations

The starting water surface elevations for the 10-, 50-, 100-, and 500-year floods at the Huron River at the southwest corporate boundary are obtained from the Hamburg Township Flood Insurance Study for both natural floodway and encroached floodway runs.

E. Encroachments

In most cases, the encroachments for the 100-year natural floodway were based on a 1:1 convergence into bridges and a 1:4 expansion from the downstream sides of bridges or natural constrictions. However, this method was sometimes not feasible due to the severe meandering of the river in places. In these cases, the 100-year natural floodway was based on the sweep and extent of moving floodwaters. Aerial photographs were utilized extensively in the location of encroachments for the hydraulic model of the Huron River.

For the 100-year encroached floodway, areas of shallow ponding have been encroached. These encroachments resulted in a rise of 0.1 foot or less in water surface elevation compared to the 100-year natural floodway profile.

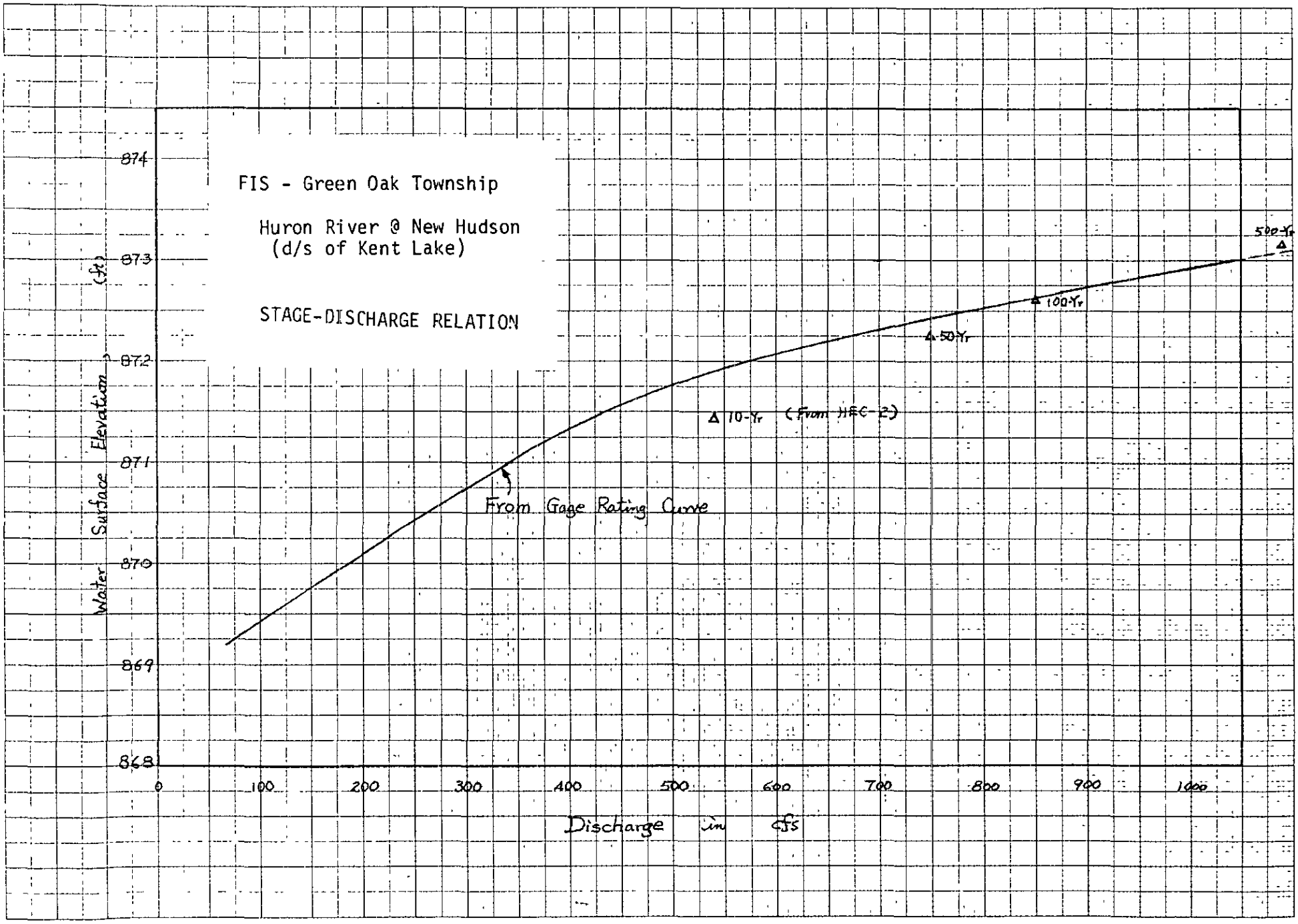
F. Gage Calibration

A U.S.G.S. water stage recorder is located at the downstream side of the Kent Lake dam in Green Oak Township. The period of record for this gage is from August 1948 to the current year. The maximum discharge observed at this gage occurred on December 29, 1950 and was estimated to be 1080 cfs.

Manning's "n" values for the channel were calibrated by computing backwater profiles for 4 flood flows and comparing the backwater profile results to the U.S.G.S. rating curve for the gage. As a result of this analysis, the original estimates for Manning's "n" have been adjusted to match the rating curve.

K+E 10 X 10 TO THE CENTIMETER 18 X 25 CM
KEUFFEL & ESSER CO. MADE IN U.S.A.

461510



References

1. Chow, Ven Te, Open-Channel Hydraulics, McGraw-Hill, 1959.

Abrams Aerial Survey Corporation, Aerial Mosaic and Topographic Map of Green Oak Township, Scale 1" = 1000 ft., Photography 1978.

U.S. Army Corps of Engineers, Detroit District, Southeastern Michigan Water Resources Study; Gazetteer of the Huron River Basin, Technical Paper No. 7, June 1972.

U.S. Army Corps of Engineers, Hydrologic Engineering Center, Application of the HEC-2 Bridge Routines, Training Document No. 6, June 1974.

U.S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-2 Water-Surface Profile Users Manual, 1973.

U.S. Department of Interior, Geological Survey, Measurement of Peak Discharge at Dams by Indirect Methods, Techniques of Water Resources Investigations of the U.S. Geological Survey, Book 3, Chapter A5, 1976.

U.S. Department of Interior, Geological Survey, Water Resources Data for Michigan, Surface Water Records for Water Years 1952-1979.

U.S. Department of Transportation, Federal Highway Administration, Hydraulics of Bridge Waterways, Hydraulic Design Series No. 1, 1973.

SECNO TABLE

Green Oak Township
Livingston County, Michigan
11259-00

HURON RIVER

CROSS SECTION	SECNO	DESCRIPTION
A	0	From Hamburg Twp. FIS Section 80,925
B	1500	J&A field section 1
C	3090	J&A field section 2
D	4280	J&A field section 2A
E	5790	J&A field section 3
F	7830	J&A field section 4
G	9040	J&A field section 5
H	9340	J&A field section 6 - Pickett Road Bridge
I	11100	J&A field section 7
J	12960	J&A field section 8
K	14200	J&A field section 9
L	14970	J&A field section 10
M	15100	J&A field section 11 - Old U.S. 23 Bridge
N	15230	J&A field section 12 - U.S. 23 Bridge
O	15440	J&A field section 13 - Fieldcrest Drive Bridge
P	16570	J&A field section 14
Q	18010	J&A field section 15
R	19210	J&A field section 16
S	20620	J&A field section 17
T	21960	J&A field section 18
U	23400	J&A field section 19
V	23650	J&A field section 20 - McCabe Road Bridge
W	24330	J&A field section 21
X	25110	J&A field section 22
Y	27960	J&A field section 23
Z	30760	J&A field section 24

Green Oak Township
Livingston County, Michigan
11259-00

HURON RIVER

CROSS SECTION	SECNO	DESCRIPTION
AA	31370	J&A field section 25
AB	32300	J&A field section 26
AC	32830	J&A field section 27
AD	33630	J&A field section 28
AE	33920	J&A field section 29 - Driveway Bridge
AF	34740	J&A field section 30
AG	37250	J&A field section 31
AH	39670	J&A field section 32
AI	42170	J&A field section 33
AJ	43250	J&A field section 34
AK	43545	J&A field section 35 - C & O Railroad Bridge
AL	43970	J&A field section 36
AM	45130	J&A field section 37 - Sutherland Road Bridge
AN	46760	J&A field section 38
AO	48160	J&A field section 39
AP	49545	J&A field section 40
AQ	50735	J&A field section 41
AR	53335	J&A field section 42
AS	55645	J&A field section 43
AT	57005	J&A field section 44
AU	57295	J&A field section 45 - Kensington Road Bridge
AV	58005	J&A field section 45A
AW	59225	J&A field section 46
AX	61035	J&A field section 47
AY	62125	J&A field section 48
AZ	62745	J&A field section 49
BA	62945	J&A field section 50 - Kent Lake Dam

BRIDGE SKETCHES
AND
CALCULATIONS

Johnson & Anderson, Inc.
Consulting Engineers
P. O. Box 1166 2300 Dixie Highway Pontiac, Michigan 48056

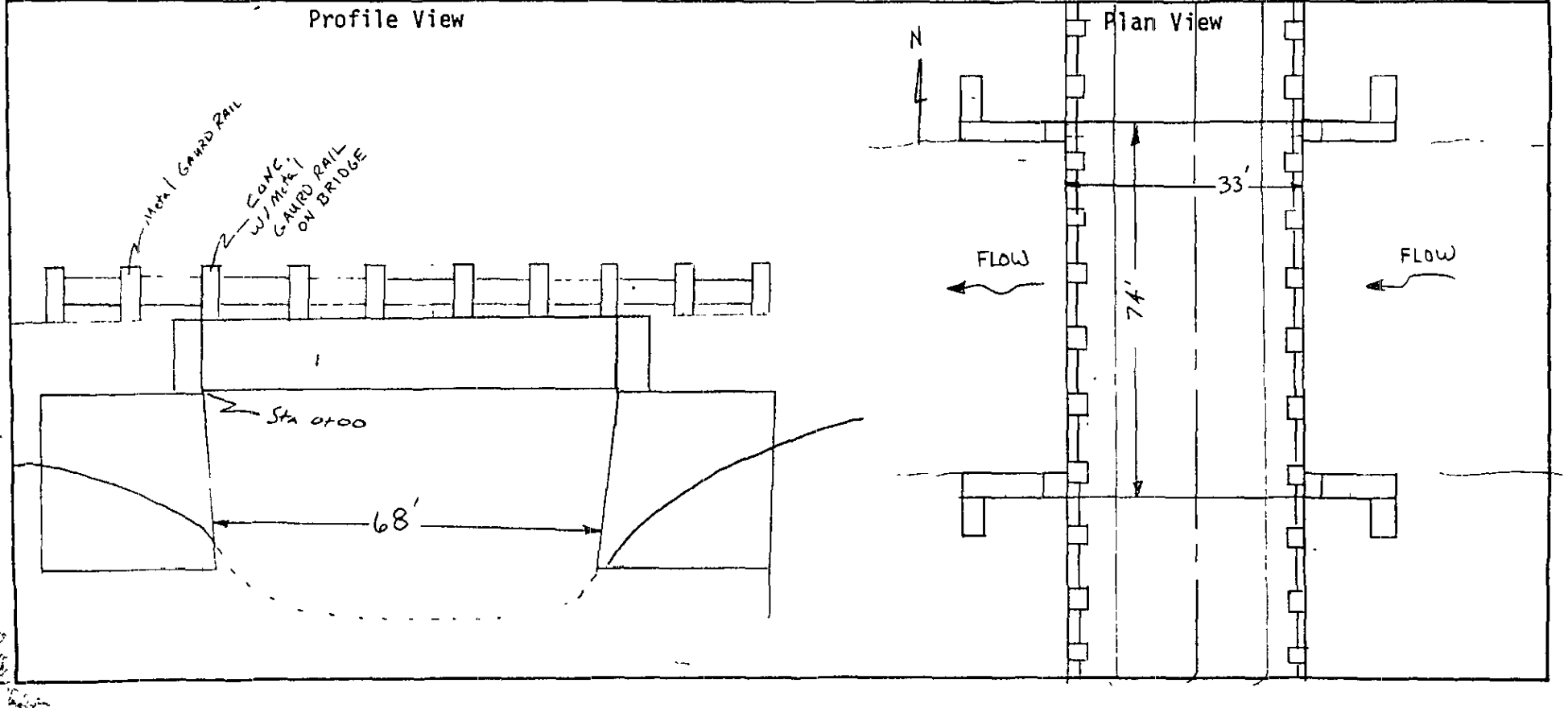
HYDRAULIC STRUCTURAL DATA

B.S. #6

Code No. 11259-00-210

Job Name: Green Oaks Twp. F.I.S.		By: L. Cumberworth	
Date: 1-22-82	Feature:	Water Course: Huron River	
Remarks: On Rickett Rd. Up Stream Heavy Brush w/woods Down Stream Brush w/wood			
Width of Piers: —	Pier Shape: —	No. of Piers: —	Area: —
Water Elevation: 857.2	Length: 74'	Width of Deck: 33'	Skew: —

FIELD SKETCH



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HYDRAULIC STRUCTURAL DATA

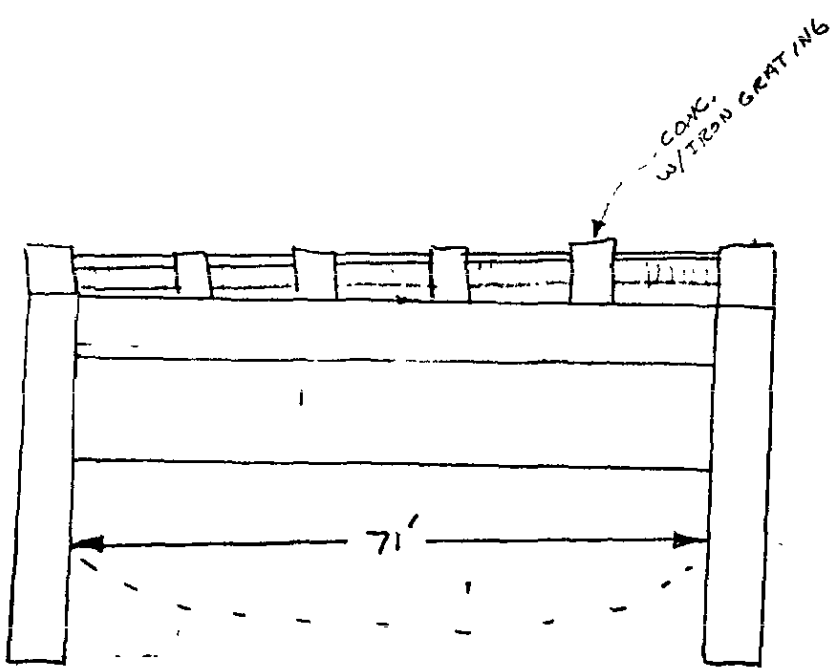
B.S. #11

Code No. 11259-00-21

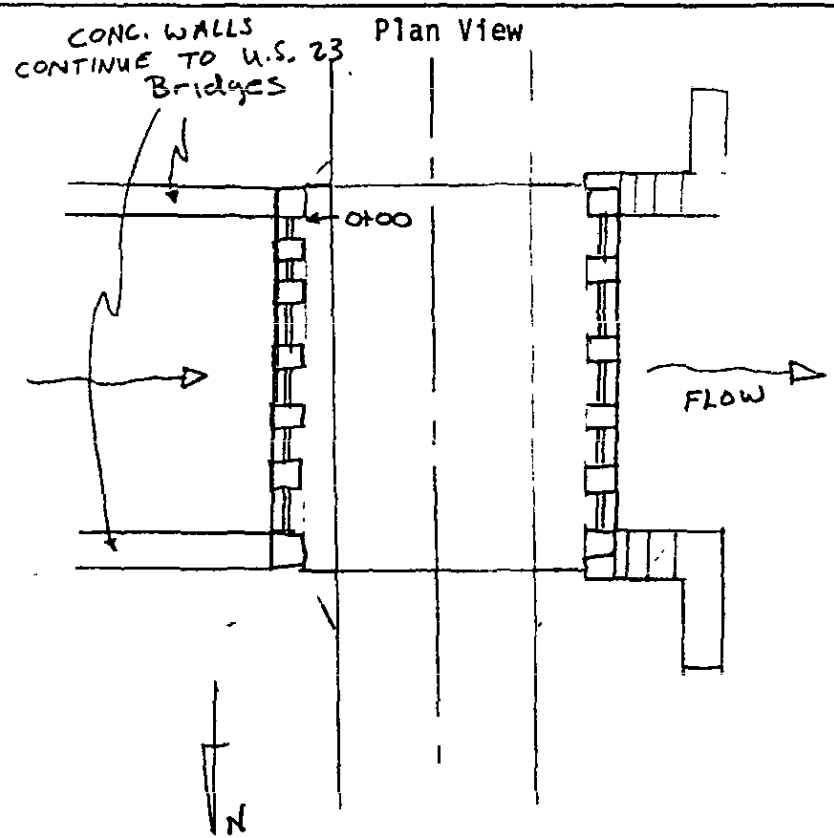
Job Name: GREEN OAKS Twp. F.I.S.		By: L. Cumberworth	
Date: 1-21-82	Feature:	Water Course: HURON RIVER	
Remarks: On Old U.S. 23 Up Stream is U.S. 23 AND A SERVICE DRIVE Down Stream is Light Brush + Heavy Woods			
Width of Piers: —	Pier Shape: —	No. of Piers: —	Area: —
Water Elevation: 858.8	Length: 75'	Width of Deck: 46'	Skew: —

FIELD SKETCH

Profile View



Plan View



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P.O. Box 1166 2300 Dixie Highway Pontiac, Michigan 48056

HYDRAULIC STRUCTURAL DATA

BS # 12 (Part I)

Code No. 11259-00-210

Job Name: Green Oaks Twp F.I.S.		By: L. Cumberworth
Date: 1-22-82	Feature: Two Bridges	Water Course: Huron River

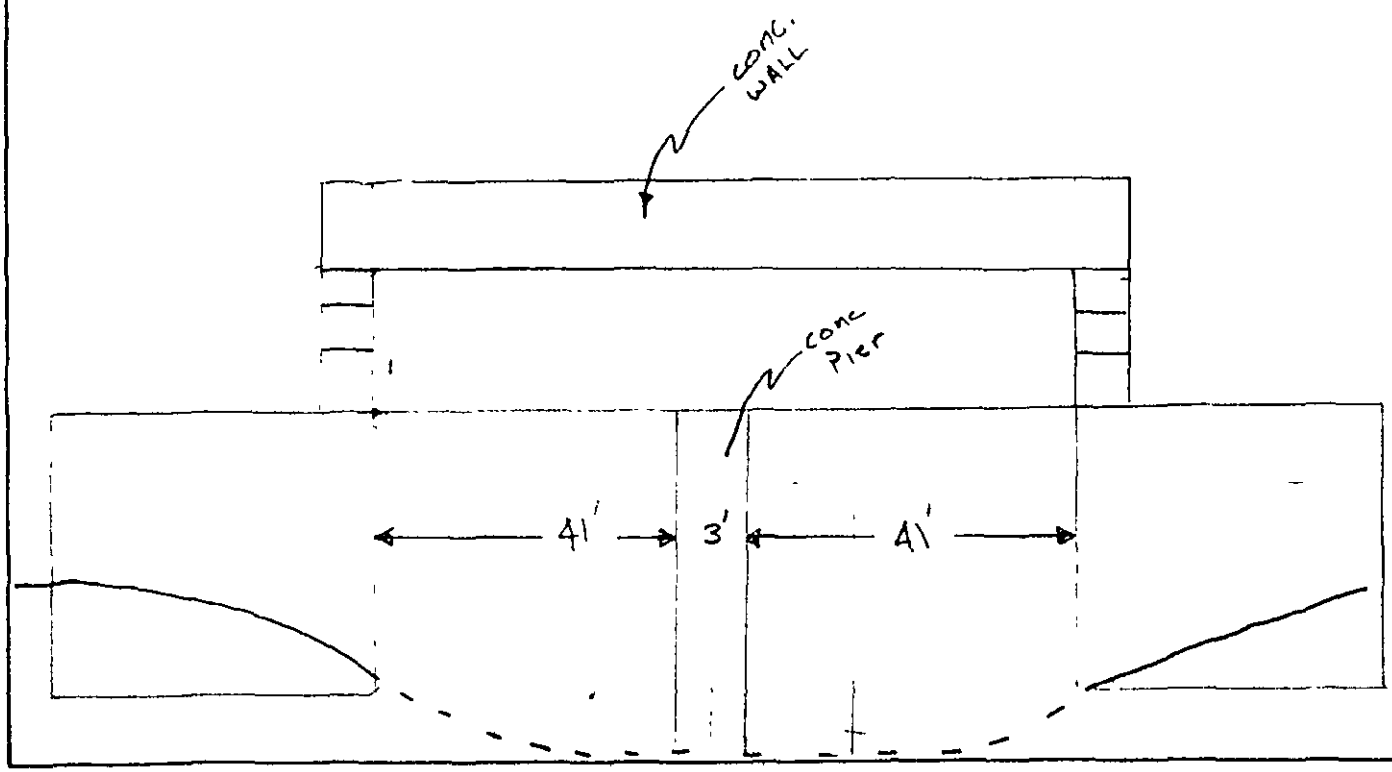
Remarks: On US 23 Both North + South Bound Bridges Up Stream there is Fieldcrest Rd Bridge and Down Stream there is Old US 23 Bridge

Width of Piers: 3'	Pier Shape: Pointed	No. of Piers: 1	Area:
Water Elevation: 858.6	Length: [illegible]	Width of Deck: [illegible]	Skew: 70° ±

FIELD SKETCH

Profile View

[redacted] – ON Different Sheet



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P.O. Box 1166 2300 Dixie Highway Pontiac, Michigan 48056

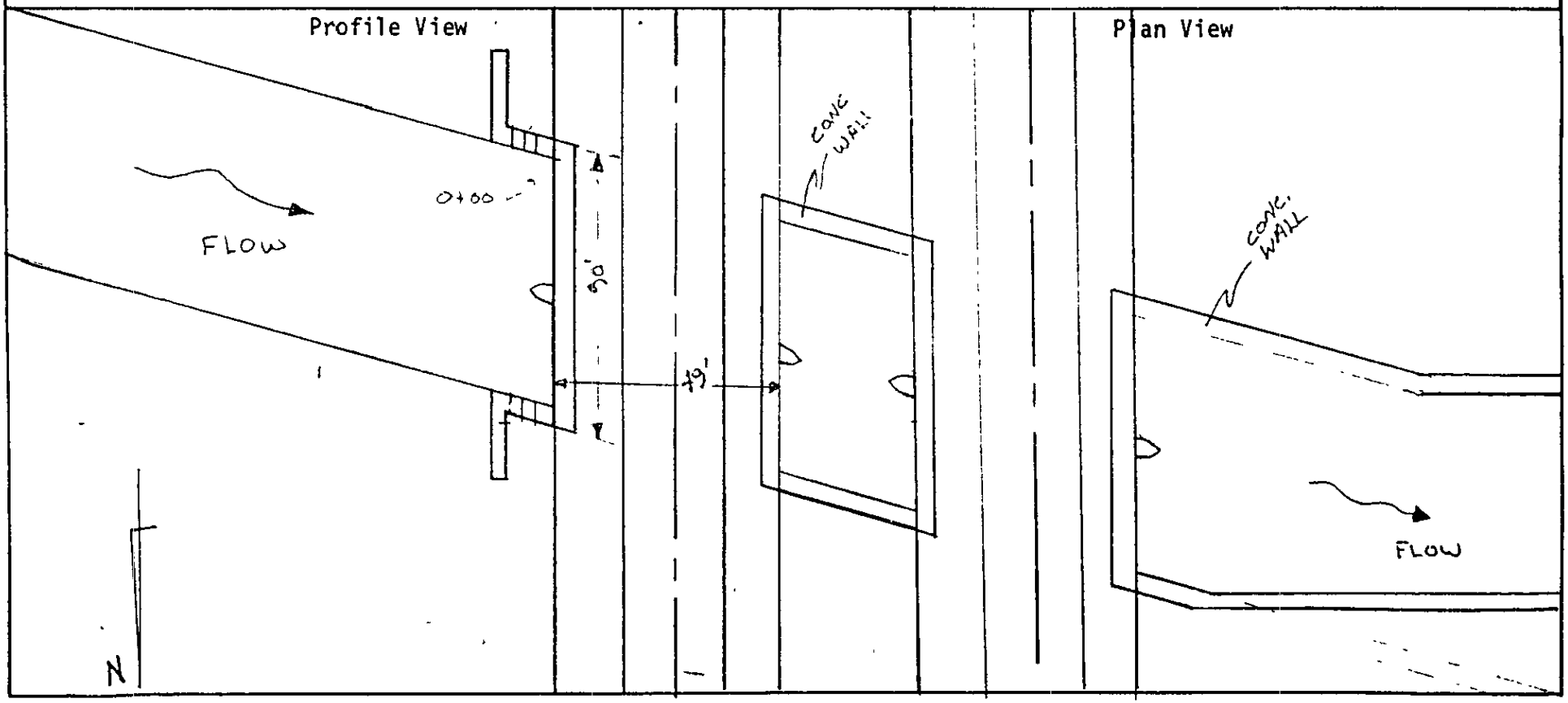
HYDRAULIC STRUCTURAL DATA

BS #12 (Part II).

Code No. 11259-00-21C

Job Name:		By: L. Cumberworth	
Date:	Feature:	Water Course:	
Remarks:			
Width of Piers:	Pier Shape:	No. of Piers:	Area:
Water Elevation:	Length:	Width of Deck:	Skew:

FIELD SKETCH



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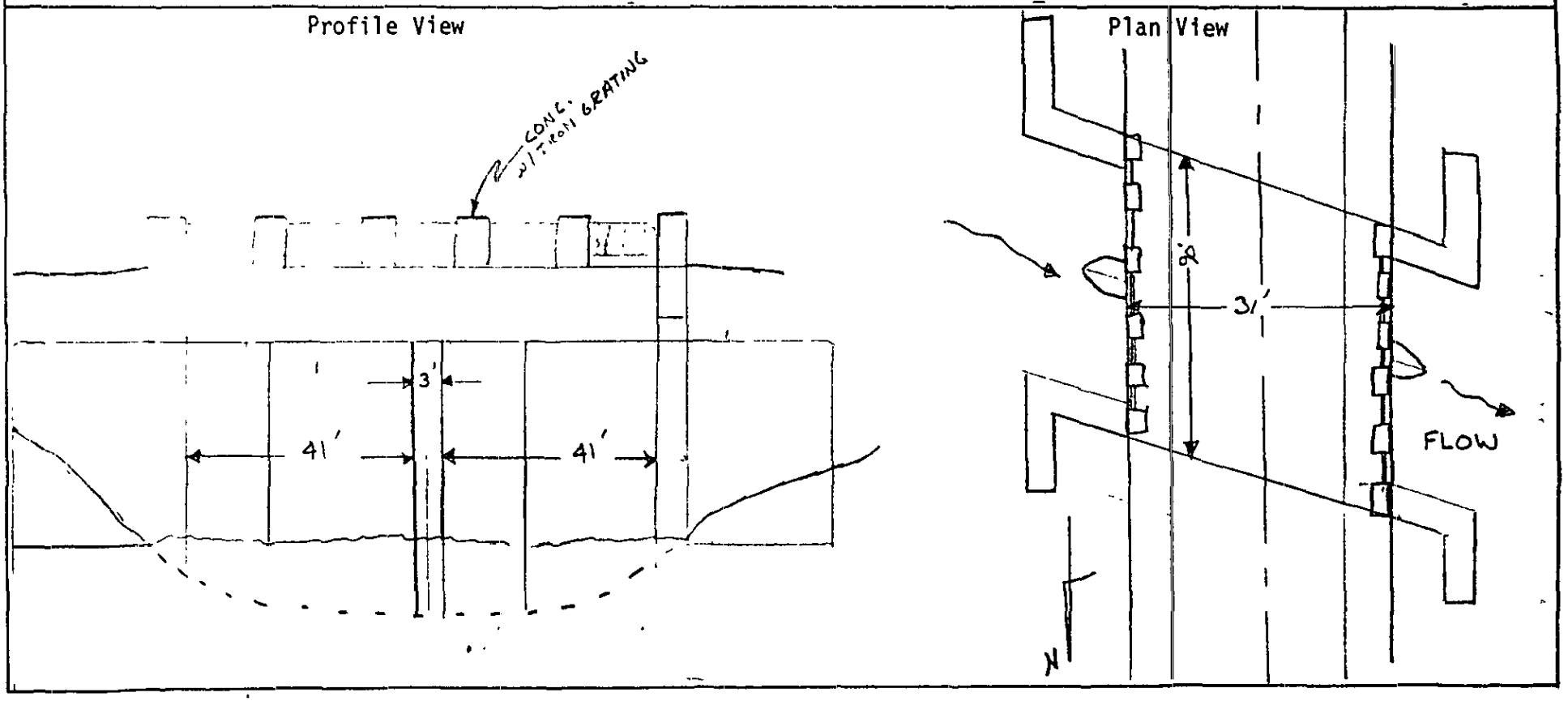
HYDRAULIC STRUCTURAL DATA
B.S. #13

Code No. 11259-00-2

Job Name: Green Oaks Twp. F.I.S.			By: L. Cumberworth
Date: 1-21-82	Feature:		Water Course: Huron River
Remarks: On Fieldcrest Dr. Up Stream there is woods and brush			
Down Stream is US 23 + old US 23			
Width of Piers: 3'	Pier Shape: Pointed	No. of Piers: 1	Area:
Water Elevation: 858.9	Length: 90'	Width of Deck: 31'	Skew: 70° ±

FIELD SKETCH



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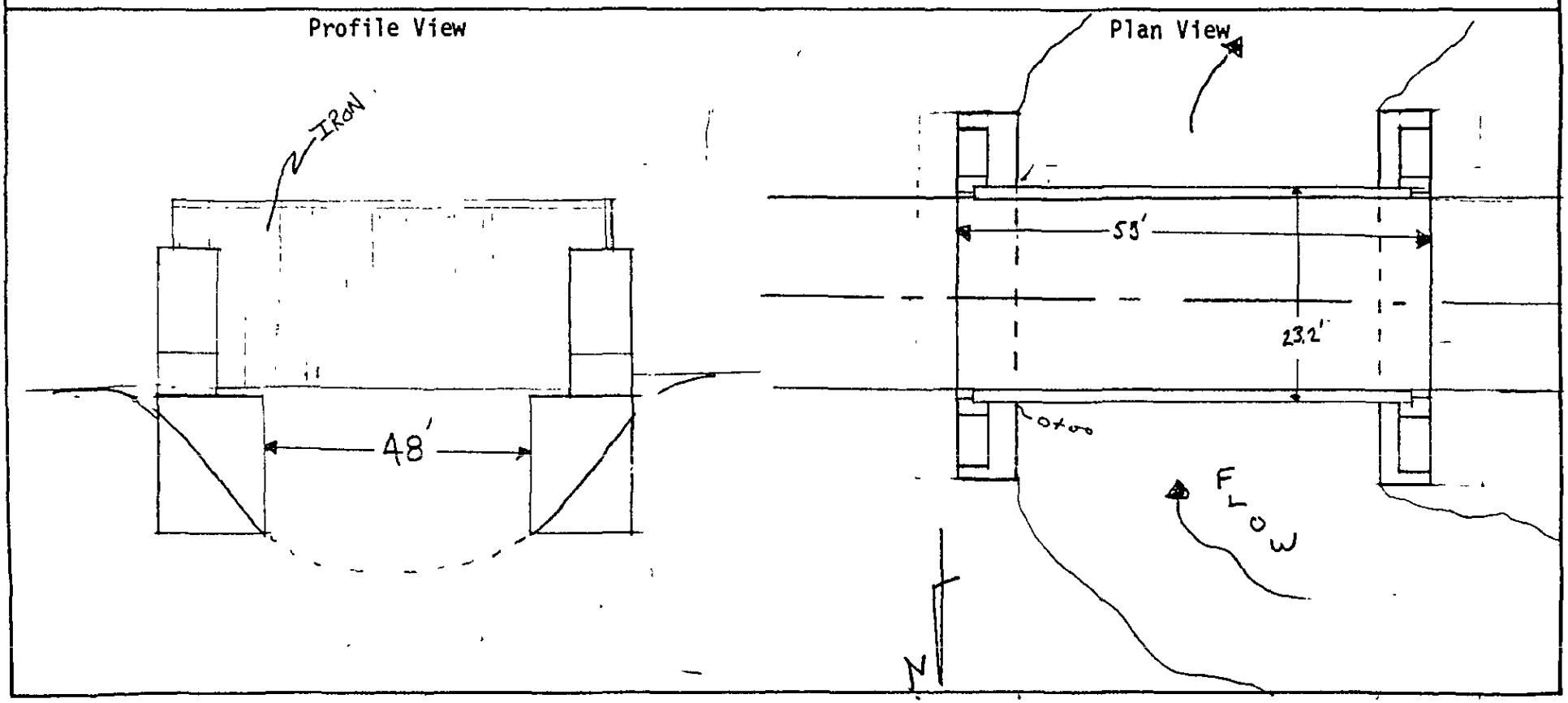
HYDRAULIC STRUCTURAL DATA
B.S. # 20

Code No. 11259-00-210

Job Name: Green Oaks Twp. FIS		By: L. Cumberworth	
Date: 1-27-82	Feature:	Water Course: Huron River	
Remarks:			
Width of Piers: —	Pier Shape: —	No. of Piers: —	Area:
Water Elevation: 860.4	Length: 55'	Width of Deck: 23.2'	Skew: —

FIELD SKETCH



Johnson & Anderson, Inc.
Consulting Engineers
P.O Box 1166 2300 Dixie Highway Pontiac, Michigan 48056

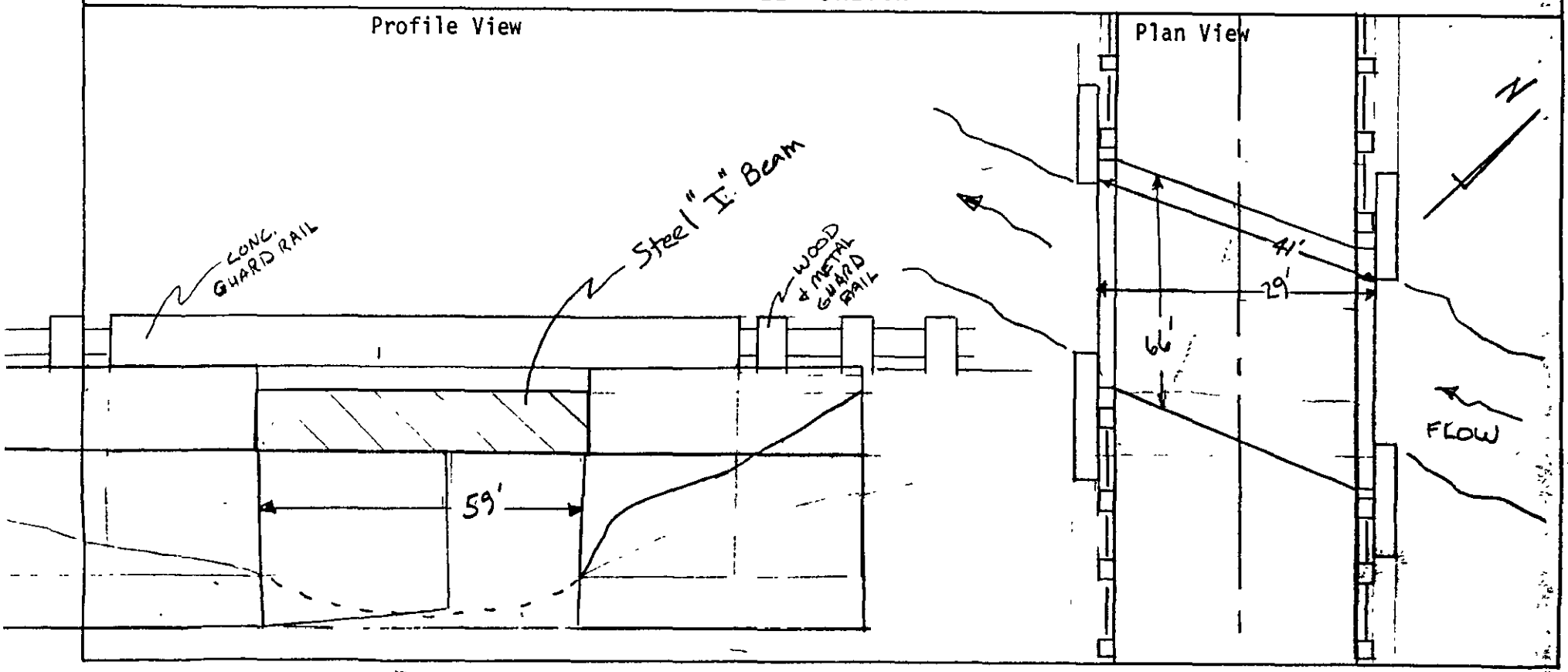
HYDRAULIC STRUCTURAL DATA

B.S. #29

Code No. 11259-00-210

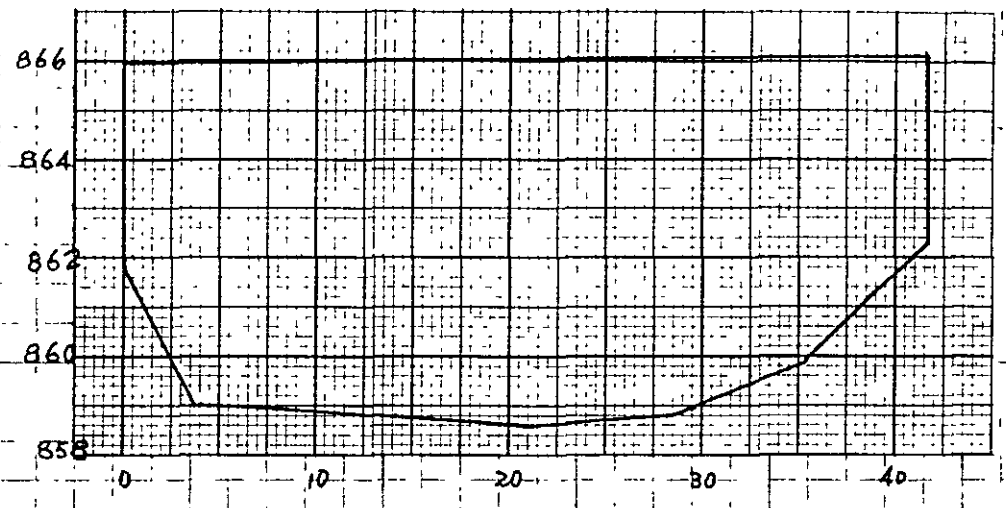
Job Name: GREEN OAKS TWP F.I.S.		By: Lee Cumberworth	
Date: 2-4-82	Feature:	Water Course: Huron River	
Remarks:			
Width of Piers: —	Pier Shape: —	No. of Piers: —	Area: —
Water Elevation: 862.8	Length: 66'	Width of Deck: 29'	Skew: 41°

FIELD SKETCH



JOHNSON & ANDERSON, INC.
CONSULTING ENGINEERS

BY MSC DATE 9/6/82 JOB DESCRIPTION FIS - Green Oak Township SHEET 1 OF 1
SUBJECT Bridge Parameter for Driveway Bridge (BS AE) JOB NO. 11359-00-1



Bridge Feature : Concrete Bridge with Sandy Bottom

Cross-Section Area : $A = 280.42 \ ft^2$

Wetted Perimeter : $P = 93.08 \ ft$

Hydraulic Radius : $R = A/P = 3.01 \ ft$

Entrance Loss : $K_e = 0.3$

Manning Coefficient : $n = 0.02$

Length : $L = 41 \ ft$

$$K_f = \frac{29.1 n^2 L}{R^{4/3}} = 0.11$$

$$\Sigma K \phi R = 1 + K_e + K_f = 1.41$$

Max Depth : $D = 7.5 \ ft$

$$BWC = A/D = 37.39 \ ft$$

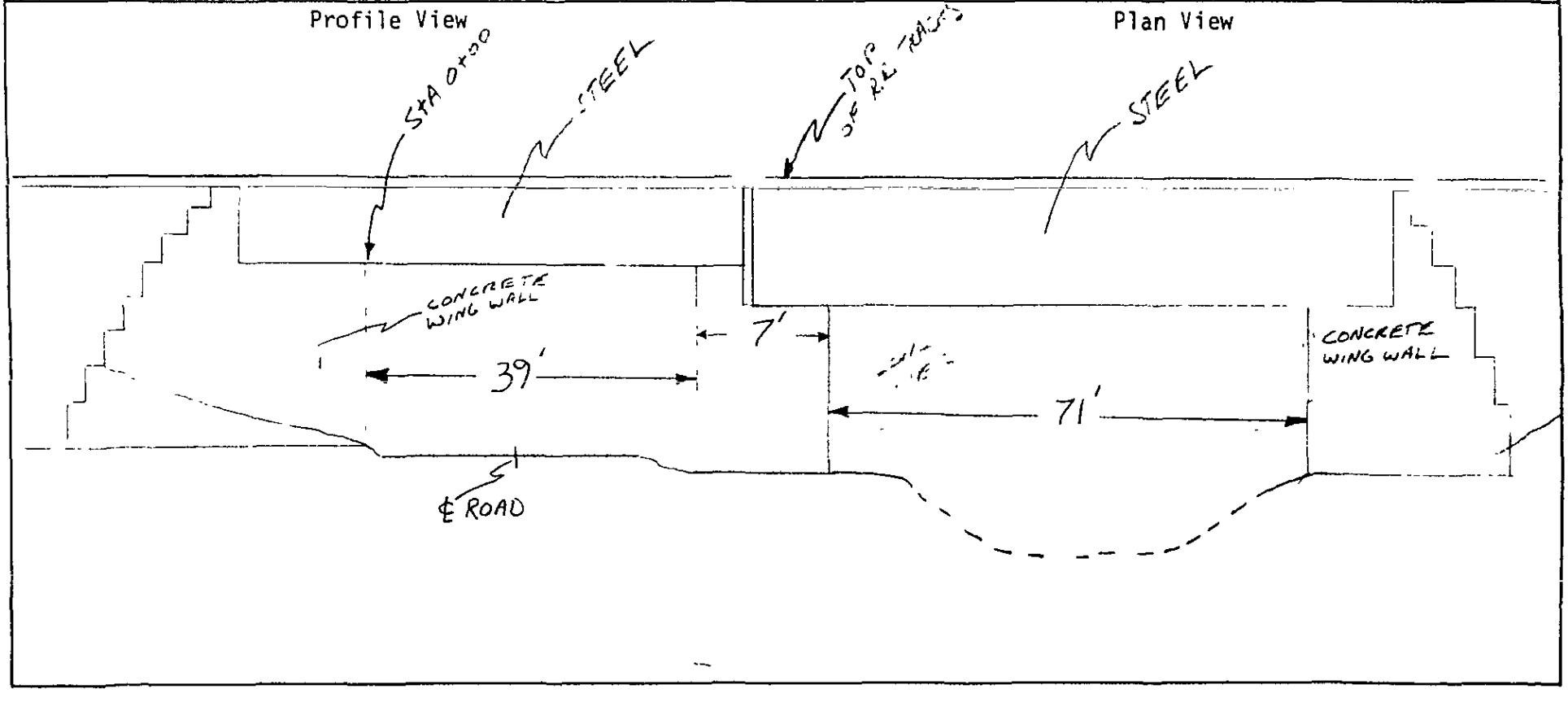
Johnson & Anderson, Inc.
Consulting Engineers
P O Box 1166 2300 Dixie Highway Pontiac, Michigan 48056

HYDRAULIC STRUCTURAL DATA
B.S. #35

Code No. 11257-00-210

Job Name: Green Oaks Twp. F.I.S.		By: L. Cumberworth	
Date: 2-8-82	Feature:	Water Course: Huron River	
Remarks:			
Width of Piers: 7'	Pier Shape: Oval	No. of Piers: 1	Area: —
Water Elevation: 865.3	Length: 127'	Width of Deck: 9'	Skew: —

FIELD SKETCH



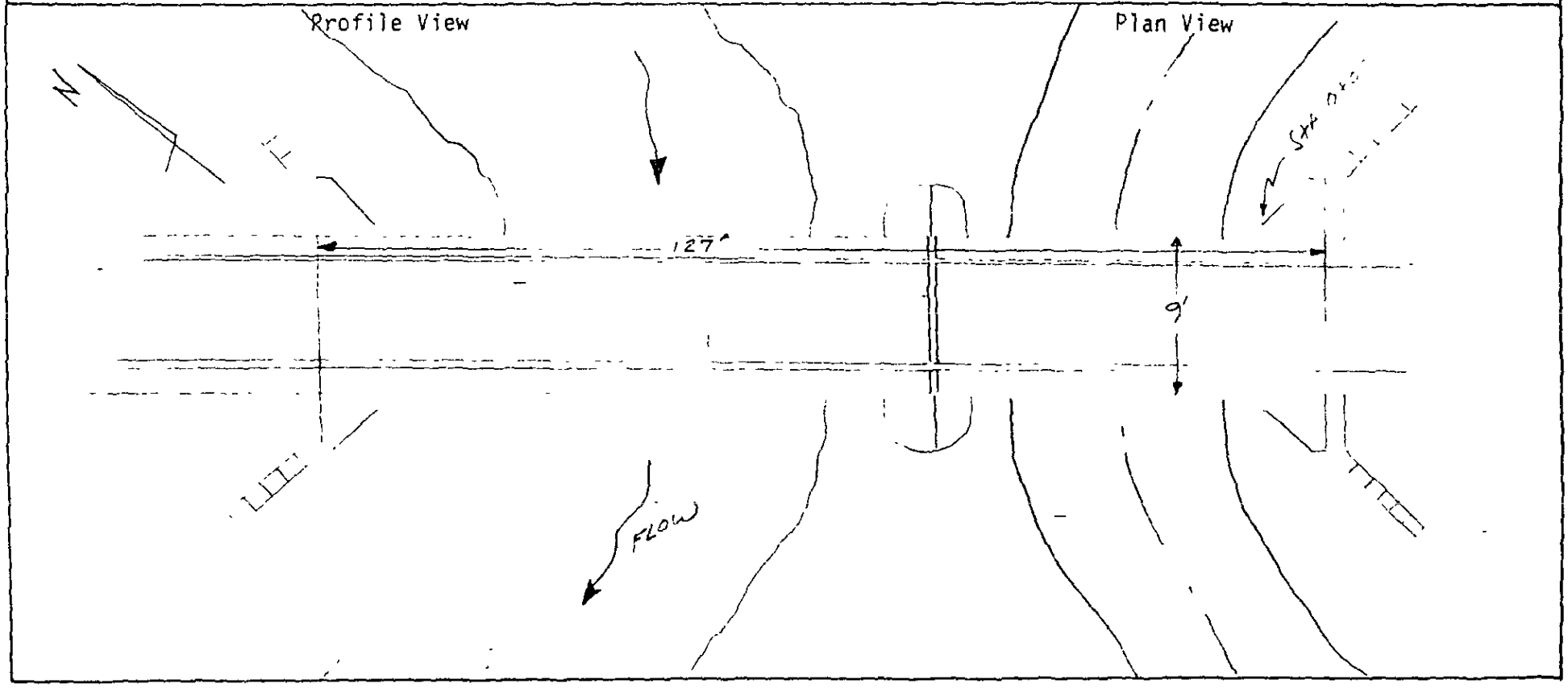
Johnson & Anderson, Inc.
Consulting Engineers
2300 Dixie Hwy., Pontiac, MI 48055

HYDRAULIC STRUCTURAL DATA
B.S. #5

Code No. 11259-00-210

Job Name: Green Oaks Twp. F.I.S.		By: L. Cumberworth	
Date: 2-8-82	Feature:	Water Course: Huron River	
Remarks:			
Width of Piers:	Pier Shape:	No. of Piers:	Area:
Water Elevation:	Length:	Width of Deck:	Skew:

FIELD SKETCH



Johnson & Anderson, Inc.
Consulting Engineers
P O Box 1166 2300 Dixie Highway Pontiac, Michigan 48056

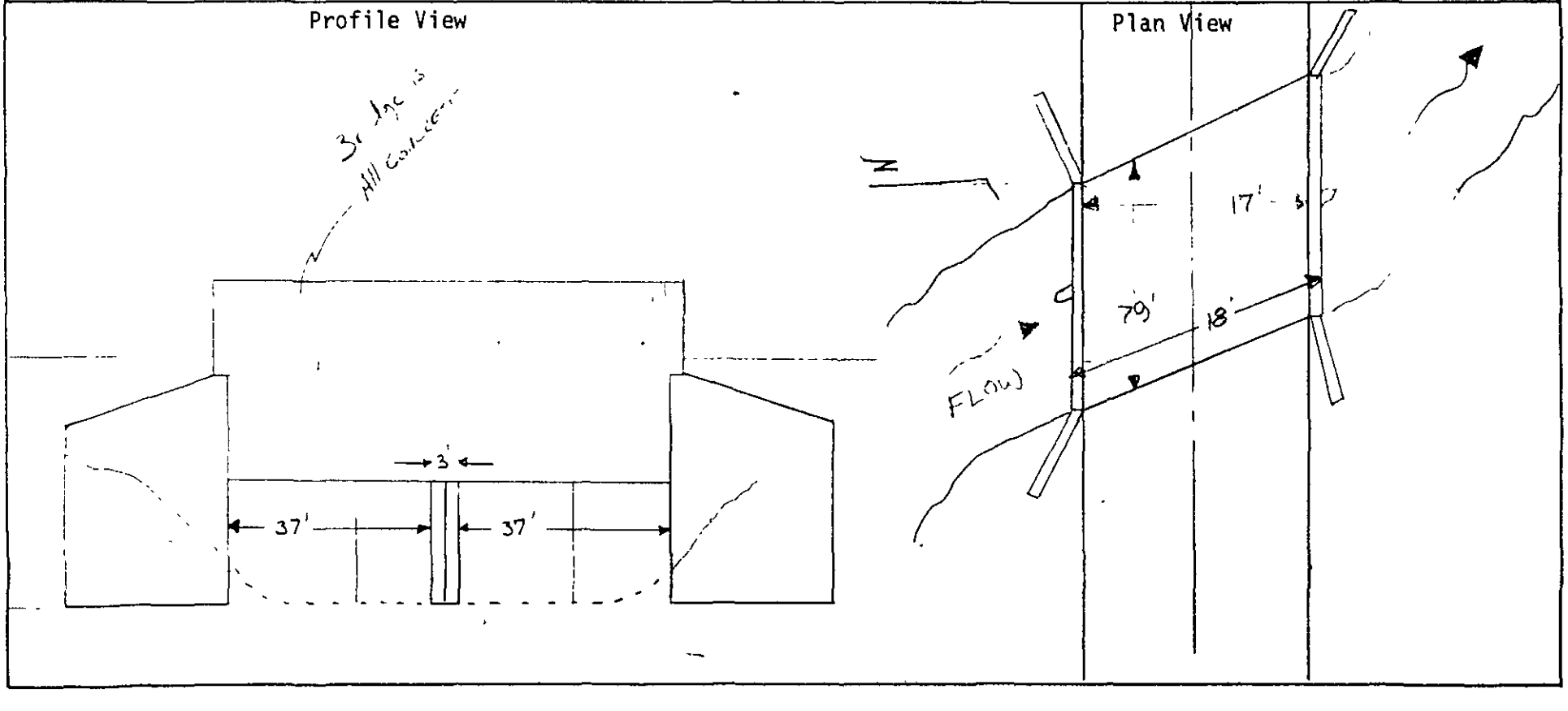
HYDRAULIC STRUCTURAL DATA

B.S. #37

Code No. 11253-00-215

Job Name: Great Dixie Tw - F.I.S.			By: L. Cumberworth
Date: 2-5-32	Feature:		Water Course: Huron River
Remarks:			
Width of Piers: 3'	Pier Shape: Pointed	No. of Piers: 1	Area: —
Water Elevation: Elev. 2	Length: 79'	Width of Deck: 17'	Skew: 18'

FIELD SKETCH



Johnson & Anderson, Inc.
Consulting Engineers
P O Box 1166 2300 Dixie Highway Pontiac, Michigan 48056

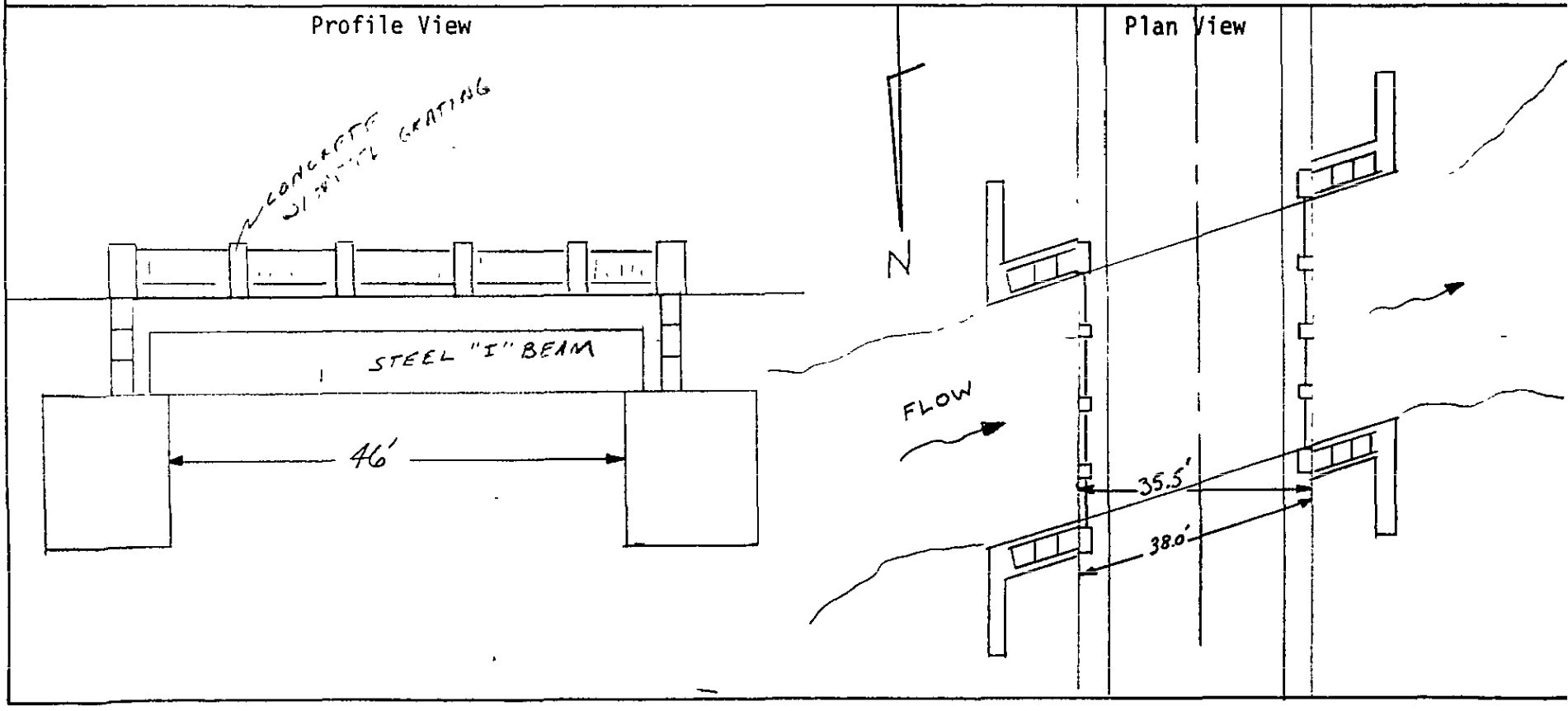
HYDRAULIC STRUCTURAL DATA
B.S. #45

Code No. 11259-00-21

Job Name: GREEN OAKS TWP. F. I. S.		By: L. Cumberworth
Date: 2-10-82	Feature:	Water Course: HURON RIVER.
Remarks:		

Width of Piers: —	Pier Shape: —	No. of Piers: —	Area: —
Water Elevation: 867.8	Length: 46'	Width of Deck: 35.5	Skew:

FIELD SKETCH



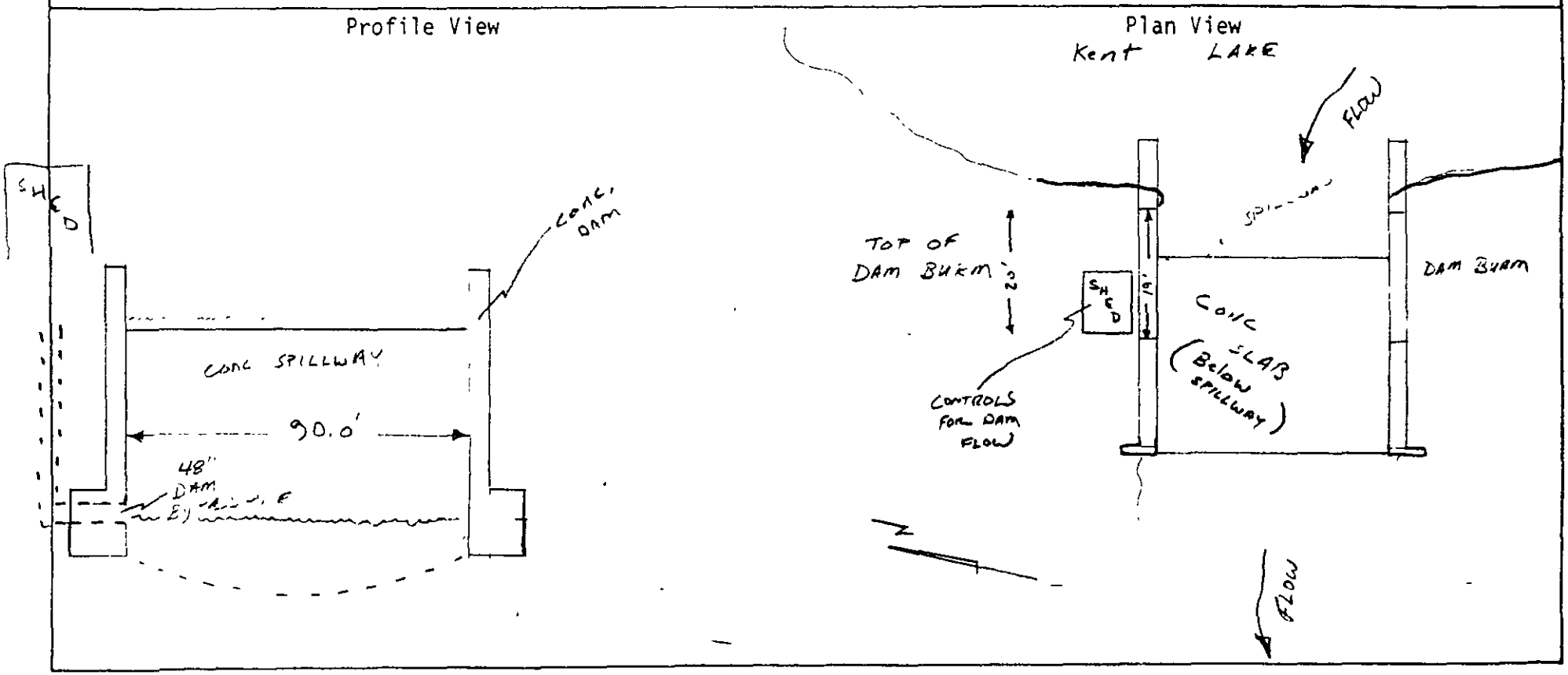
Johnson & Anderson, Inc.
Consulting Engineers
2300 Dixie Hwy., Pontiac, MI 48055

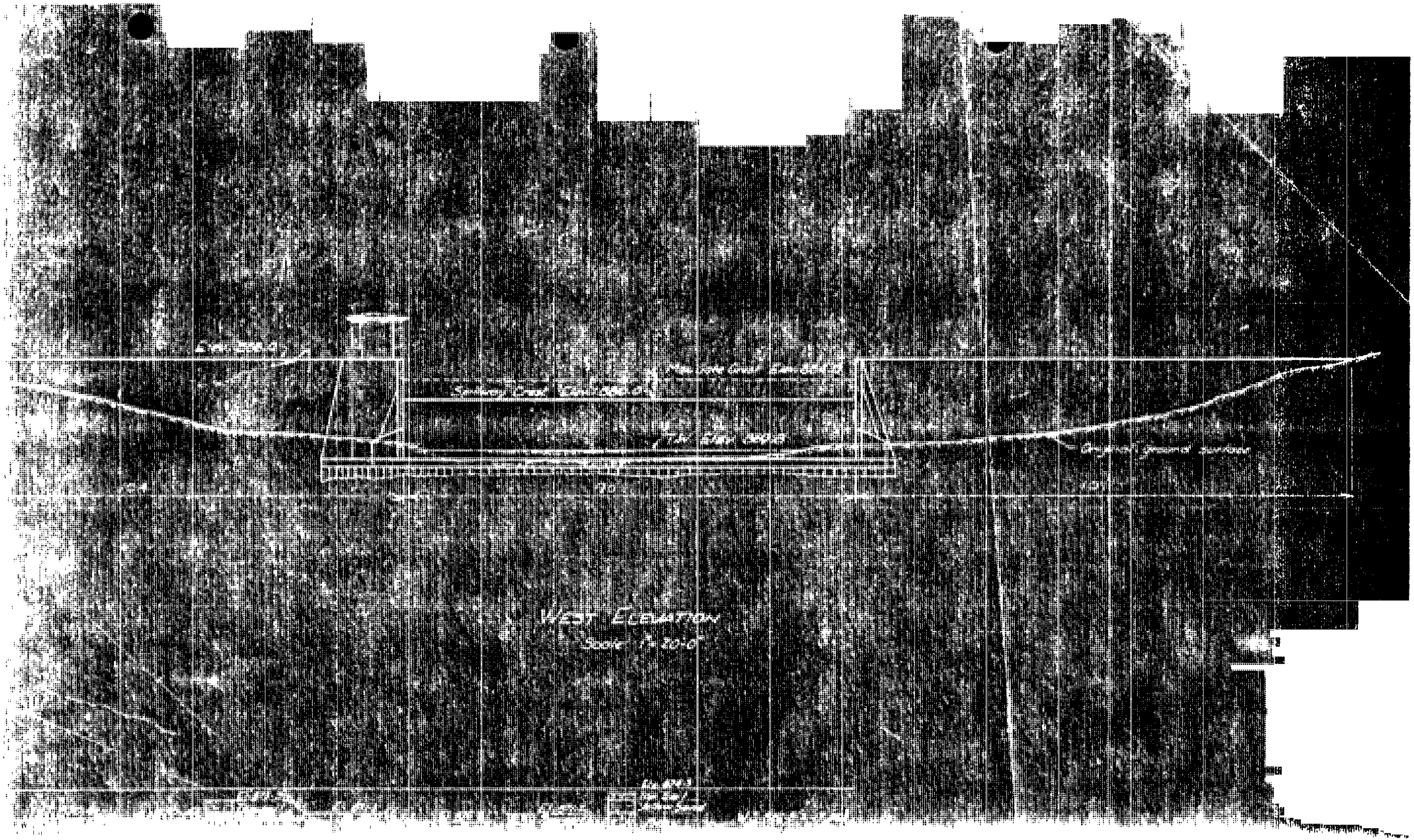
HYDRAULIC STRUCTURAL DATA
DAM # 50
SECTION

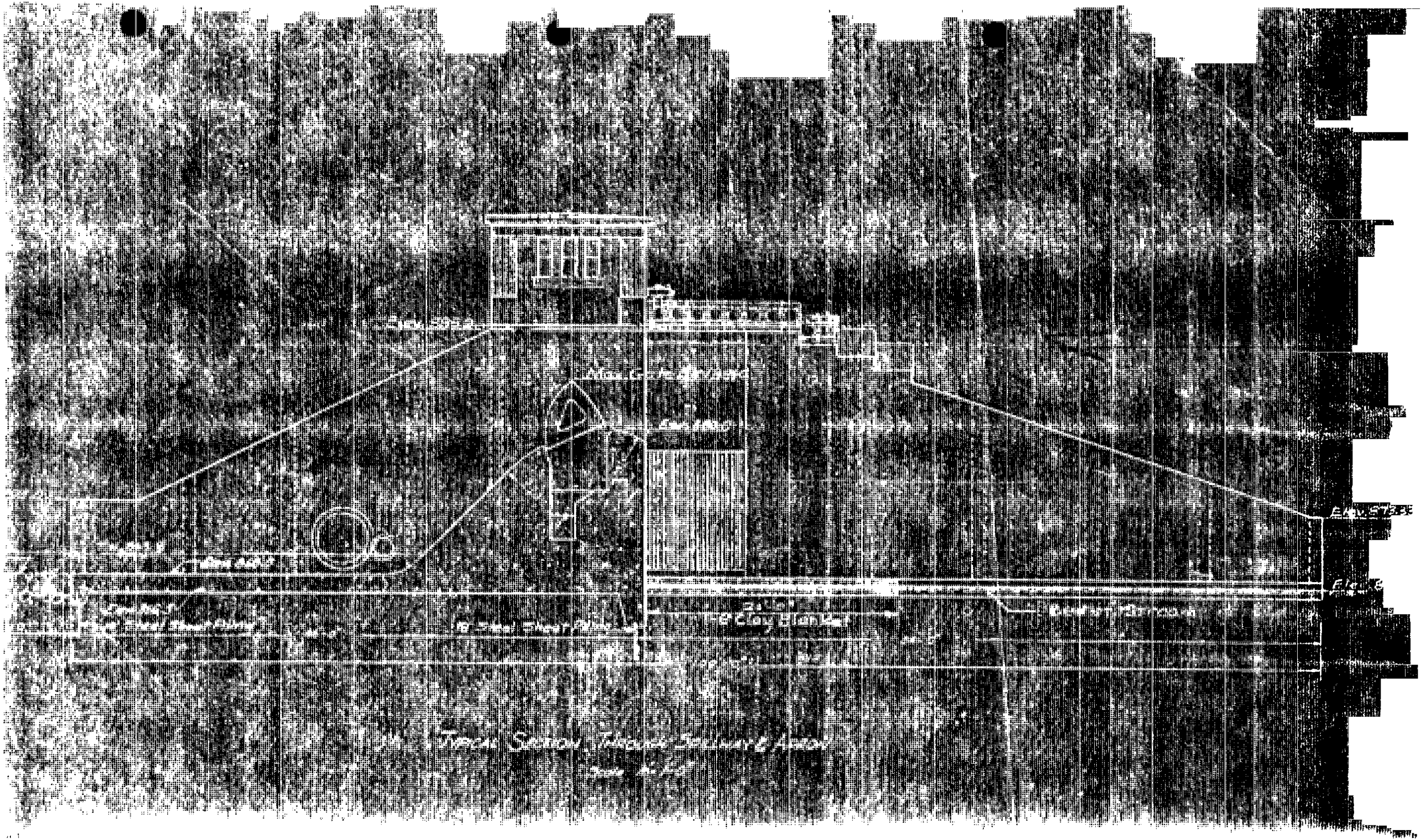
Code No. 11259-00-210

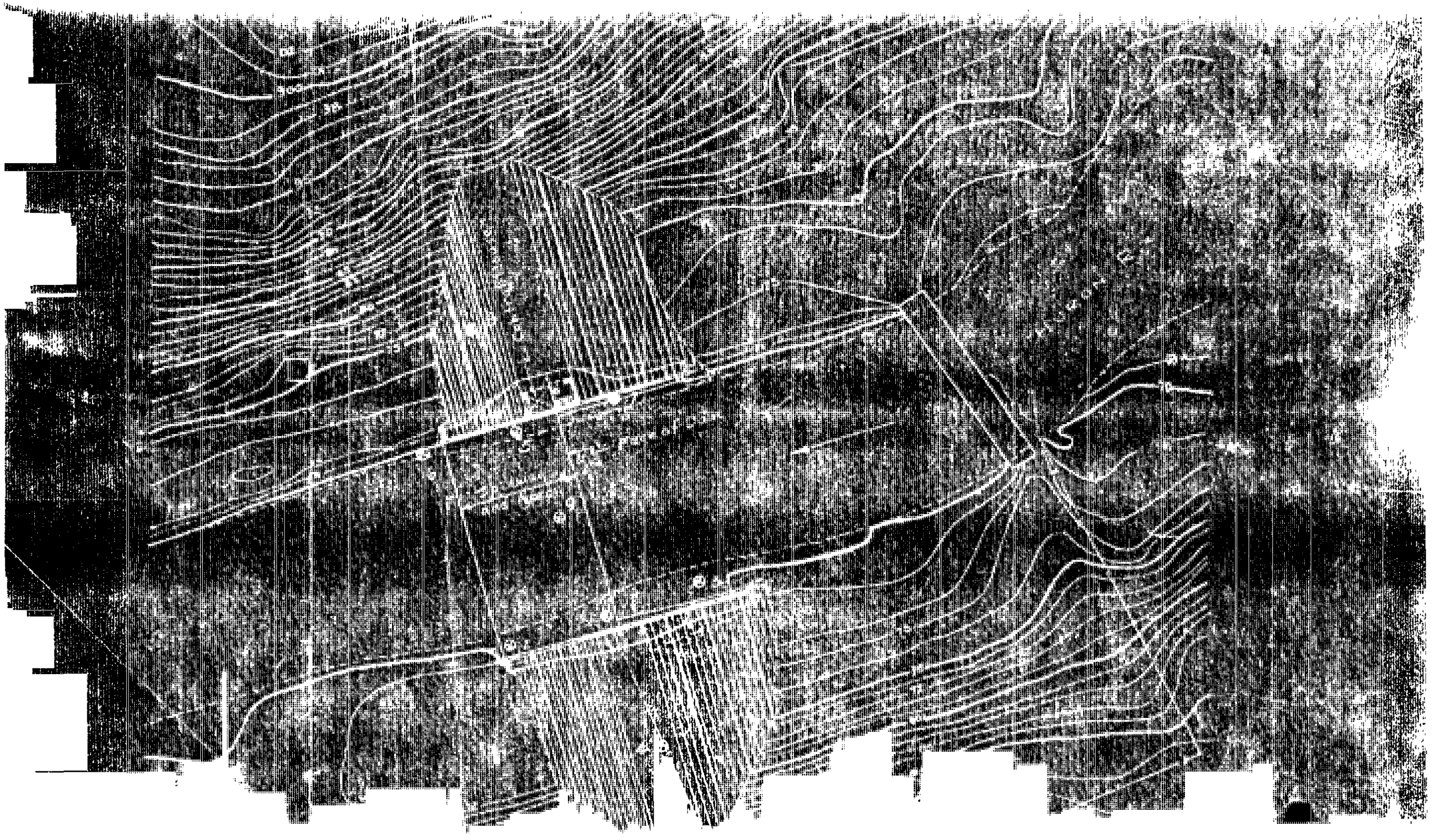
Job Name: GREEN OAKS TWP. F.I.S.			By: L Cumberworth
Date: 5-3-82	Feature: Spillway DAM		Water Course: HURON RIVER
Remarks: Kensington Park DAM (See Next Three Sheets)			
DAM SIDE PIER 48" DIA.			
Width of Piers:	Pier Shape:	No. of Piers:	Area:
Water Elevation:	Length: 90.0'	Width of Deck:	Skew:

FIELD SKETCH




West Elevation
Scale 1" = 10'-0"





00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: GREEN OAK TWP

3) WATERCOURSE: DAVIS CREEK

4) DOCUMENT TYPE: 100-YEAR ENCROACHED

00BREAK00

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*************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
*************************************************


C
T1      GREEN OAK TOWNSHIP FIS  J & A  FILE NO. 11259-00
T2      10-YEAR FLOOD:  ENCROACHED FLOODWAY;  FILE NAME: DAVISHEE
T3      DAVIS CREEK              HURON RIVER TO C & O RAILROAD   (A-AS)

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

     -1.       2.        0.        0.    .000000      .00       .0        0.    861.800    .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    1.000     .000     -1.000     .000      .000      .000      .000      .000      .000      .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

   38.000   39.000    40.000    41.000    42.000    43.000     1.000     8.000    10.000    12.000


    3.000    4.000    25.000     .000      .000      .000      .000      .000      .000      .000

QT      4.000   827.000  1178.000  1365.000  2080.000     .000      .000      .000      .000      .000
NC       .080     .080     .045      .300      .500      .000      .000      .000      .000      .000


        VS    JA 14

X1       .000    22.000   290.000   355.000     .000      .000      .000      .000      .000      .000
GR    866.800     .000   864.000    10.000   861.900    90.000   861.500   190.000   859.000   290.000
GR    857.500   295.000   856.500   300.000   855.600   310.000   855.200   320.000   854.800   330.000
GR    855.300   340.000   854.600   350.000   859.500   355.000   859.500   390.000   859.500   490.000
GR    859.600   590.000   859.700   690.000   859.800   790.000   860.200   890.000   861.800   950.000
GR    867.100   990.000   874.700  1040.000     .000      .000      .000      .000      .000      .000
QT      4.000   595.000  1040.000  1315.000  2080.000     .000      .000      .000      .000      .000
NC       .085     .070     .040      .000      .000      .000      .000      .000      .000      .000


        VS   A JA 51

X1    625.000    28.000   568.000   600.000   600.000   760.000   625.000     .000      .000      .000
X3       .000     .000     .000   400.000     .000      .000      .000      .000      .000      .000
GR    883.800     .000   869.300   100.000   864.400   142.000   862.800   200.000   860.600   300.000
GR    858.900   400.000   858.300   500.000   858.100   520.000   858.200   540.000   859.200   568.000
GR    857.600   573.000   857.300   578.000   856.800   582.000   856.700   587.000   855.900   594.000
GR    856.700   597.000   858.900   600.000   858.800   700.000   858.600   800.000   858.900   900.000
GR    859.500  1000.000   859.700  1056.000   857.700  1078.000   859.000  1100.000   859.200  1200.000
GR    859.300  1300.000   859.800  1340.000   874.300  1400.000     .000      .000      .000      .000
NC       .090     .100     .060      .000      .000      .000      .000      .000      .000      .000


        VS   B JA 52

X1   1225.000    19.000    33.000    61.000   580.000   610.000   600.000     .000      .000      .000
X3       .000     .000     .000      .000      .000   690.000      .000      .000      .000      .000
GR    875.200     .000   863.900    33.000   856.700    35.000   856.300    30.000   856.400    41.000
```

GR	860.900	200.000	860.000	300.000	860.700	400.000	860.300	500.000	860.400	600.000
GR	860.500	700.000	861.400	767.000	868.100	800.000	877.100	845.000	.000	.000
NC	.090	.080	.045	.000	.000	.000	.000	.000	.000	.000

VS C JA 53

X1	2195.000	13.000	300.000	337.000	620.000	580.000	970.000	.000	.000	.000
X3	.000	.000	.000	215.000	.000	365.000	.000	.000	.000	.000
GR	870.700	.000	874.700	35.000	863.700	100.000	862.200	200.000	862.300	300.000
GR	859.200	305.000	859.200	310.000	858.800	320.000	858.600	325.000	859.000	330.000
GR	859.200	335.000	862.300	337.000	876.500	365.000	.000	.000	.000	.000
NC	.090	.080	.040	.000	.000	.000	.000	.000	.000	.000

X1	2372.000	21.000	789.000	824.000	227.000	207.000	177.000	.000	.000	.000
X3	.000	.000	.000	788.000	.000	825.000	.000	.000	.000	.000
GR	877.000	.000	873.200	99.000	870.300	197.000	868.800	296.000	868.900	394.000
GR	868.800	493.000	868.700	592.000	869.100	690.000	870.500	765.000	859.000	789.000
GR	858.800	794.000	858.800	799.000	858.700	804.000	858.400	809.000	858.200	814.000
GR	857.900	819.000	857.900	824.000	872.000	850.000	872.700	888.000	875.200	986.000
GR	879.000	1085.000	.000	.000	.000	.000	.000	.000	.000	.000

X1	2376.000	.000	.000	.000	4.000	4.000	4.000	.000	.000	.000
X3	.000	.000	.000	789.000	.000	824.000	.000	.000	.000	.000
NC	.040	.040	.022	.000	.000	.000	.000	.000	.000	.000

BS D JA 54 SILVER LAKE ROAD

X1	2377.000	21.000	789.000	824.000	1.000	1.000	1.000	.000	.000	.000
BT	15.000	.000	877.000	.000	99.000	873.200	.000	197.000	870.300	.000
BT	296.000	868.800	.000	394.000	868.900	.000	493.000	868.800	.000	592.000
BT	868.700	.000	690.000	869.100	.000	789.000	871.000	.000	789.000	871.000
BT	867.700	824.000	871.600	868.200	824.000	871.600	.000	888.000	872.700	.000
BT	986.000	875.200	.000	1085.000	879.000	.000	.000	.000	.000	.000
GR	877.000	.000	873.200	99.000	870.300	197.000	868.800	296.000	868.900	394.000
GR	868.800	493.000	868.700	592.000	869.100	690.000	871.000	789.000	859.000	789.000
GR	858.800	794.000	858.800	799.000	858.700	804.000	858.400	809.000	858.200	814.000
GR	857.900	819.000	857.900	824.000	871.600	824.000	872.700	888.000	875.200	986.000
GR	879.000	1085.000	.000	.000	.000	.000	.000	.000	.000	.000

X1	2413.000	.000	.000	.000	36.000	36.000	36.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.087	.087	.040	.000	.000	.000	.000	.000	.000	.000

X1	2414.000	21.000	789.000	824.000	1.000	1.000	1.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	869.000	869.000	.000
GR	877.000	.000	873.200	99.000	870.300	197.000	868.800	296.000	868.900	394.000
GR	868.800	493.000	868.700	592.000	869.100	690.000	870.500	765.000	859.000	789.000
GR	858.800	794.000	858.800	799.000	858.700	804.000	858.400	809.000	858.200	814.000
GR	857.900	819.000	857.900	824.000	872.000	850.000	872.700	888.000	875.200	986.000
GR	879.000	1085.000	.000	.000	.000	.000	.000	.000	.000	.000

X1	2416.000	.000	.000	.000	2.000	2.000	2.000	.000	.000	.000
X3	.000	.000	.000	787.000	.000	826.000	.000	.000	.000	.000

X1	2420.000	.000	.000	.000	4.000	4.000	4.000	.000	.000	.000
X3	.000	.000	.000	783.000	.000	830.000	.000	.000	.000	.000

VS E JA 55

X1	3515.000	24.000	100.000	403.000	675.000	675.000	1095.000	.000	.000	.000
GR	882.800	.000	870.300	80.000	864.300	100.000	862.100	102.000	860.100	105.000
GR	860.200	112.000	860.200	117.000	860.400	125.000	861.200	127.000	864.600	133.000
GR	865.900	173.000	864.900	200.000	863.300	222.000	862.500	285.000	862.300	300.000
GR	864.400	365.000	860.200	370.000	860.100	375.000	860.400	382.000	861.600	392.000
GR	861.200	400.000	867.700	403.000	878.500	417.000	881.000	440.000	.000	.000

VS F JA 56

X1	4885.000	19.000	46.000	83.000	1150.000	1100.000	1370.000	.000	.000	.000
GR	894.900	.000	883.400	20.000	869.700	40.000	866.800	46.000	863.200	48.000
GR	861.900	51.000	861.600	58.000	861.600	65.000	861.600	73.000	861.500	80.000
GR	861.500	82.000	863.700	83.000	864.700	100.000	865.700	200.000	866.000	230.000
GR	871.000	300.000	873.300	355.000	879.300	390.000	886.600	450.000	.000	.000

VS G JA 57

X1	6695.000	21.000	263.000	287.000	1150.000	1210.000	1810.000	.000	.000	.000
GR	886.400	.000	878.500	62.000	876.200	100.000	874.300	163.000	867.600	178.000
GR	867.400	200.000	864.600	263.000	862.400	265.000	861.700	270.000	861.800	275.000
GR	861.500	278.000	861.700	281.000	863.100	285.000	864.700	287.000	865.500	300.000
GR	864.100	400.000	864.800	500.000	865.700	590.000	870.300	600.000	876.100	618.000
GR	881.200	675.000	.000	.000	.000	.000	.000	.000	.000	.000

VS H JA 58

X1	8495.000	25.000	790.000	820.000	1260.000	1200.000	1800.000	.000	.000	.000
X3	.000	.000	.000	657.000	.000	1190.000	.000	.000	.000	.000
GR	894.200	.000	888.200	10.000	882.200	60.000	878.300	100.000	877.000	200.000
GR	874.500	300.000	871.600	400.000	869.700	500.000	868.300	600.000	867.100	700.000
GR	865.400	790.000	864.400	793.000	862.800	796.000	862.700	800.000	862.500	803.000
GR	862.800	809.000	863.100	813.000	863.300	816.000	864.400	818.000	865.600	820.000
GR	865.500	900.000	865.000	1000.000	865.300	1100.000	865.400	1150.000	878.900	1190.000

X1	8955.000	.000	.000	.000	347.000	373.000	460.000	.000	.800	.000
X3	.000	.000	.000	734.000	.000	950.000	.000	.000	.000	.000
NC	.100	.100	.045	.000	.000	.000	.000	.000	.000	.000

VS I JA 59

X1	9185.000	20.000	335.000	370.000	173.000	187.000	230.000	.000	.000	.000
X3	.000	.000	.000	302.000	.000	403.000	.000	.000	.000	.000
GR	891.900	.000	885.700	35.000	876.500	135.000	874.200	235.000	873.600	255.000
GR	871.200	265.000	868.200	320.000	865.200	335.000	864.000	340.000	863.800	345.000
GR	863.800	350.000	863.700	355.000	863.900	360.000	864.000	365.000	866.500	370.000
GR	867.400	400.000	868.400	435.000	870.200	460.000	874.200	535.000	883.500	635.000

X1	9316.000	.000	.000	.000	171.000	121.000	131.000	.000	.000	.000
X3	.000	.000	.000	336.000	.000	370.000	.000	.000	.000	.000
NC	.040	.040	.022	.000	.000	.000	.000	.000	.000	.000

BS J JA 60 SPICER ROAD

X1	9317.000	18.000	400.000	434.000	1.000	1.000	1.000	.000	.000	.000
BT	18.000	.000	891.400	.000	100.000	883.300	.000	200.000	878.400	.000
BT	300.000	874.000	.000	400.00	872.000	.000	40[illegible].000	872.000	870.650	405.000

BT	870.650	425.000	871.630	870.650	430.000	871.560	870.650	434.000	871.500	870.650
BT	434.000	871.500	.000	500.000	871.600	.000	600.000	874.800	.000	700.000
BT	880.000	.000	775.000	881.800	.000	.000	.000	.000	.000	.000
GR	891.400	.000	883.300	100.000	878.400	200.000	874.800	300.000	872.000	400.000
GR	865.400	400.000	864.000	405.000	863.800	410.000	863.800	415.000	863.700	420.000
GR	863.900	425.000	864.000	430.000	864.500	434.000	871.500	434.000	871.600	500.000
GR	874.800	600.000	880.000	700.000	881.800	775.000	.000	.000	.000	.000
X1	9333.000	.000	.000	.000	16.000	16.000	16.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.070	.070	.042	.000	.000	.000	.000	.000	.000	.000
X1	9334.000	20.000	335.000	370.000	1.000	1.000	1.000	.000	.000	.000
X3	.000	.000	.000	336.000	.000	370.000	.000	.000	.000	.000
GR	891.900	.000	885.700	35.000	876.500	135.000	874.200	235.000	873.600	255.000
GR	871.200	265.000	868.200	320.000	865.200	335.000	864.000	340.000	863.800	345.000
GR	863.800	350.000	863.700	355.000	863.900	360.000	864.000	365.000	866.500	370.000
GR	867.400	400.000	868.400	435.000	870.200	460.000	874.200	535.000	883.500	635.000
X1	9336.000	.000	.000	.000	2.000	2.000	2.000	.000	.000	.000
X3	.000	.000	.000	334.000	.000	372.000	.000	.000	.000	.000
QT	4.000	620.000	1070.000	1350.000	2125.000	.000	.000	.000	.000	.000

VS K JA 61

X1	10535.000	20.000	500.000	600.000	939.000	1109.000	1199.000	.000	.000	.000
X3	.000	.000	.000	275.000	.000	.000	.000	.000	.000	.000
GR	880.000	.000	868.000	100.000	867.000	200.000	866.200	300.000	865.500	400.000
GR	865.500	500.000	865.300	510.000	865.200	520.000	864.900	530.000	864.600	540.000
GR	864.300	550.000	864.200	560.000	864.200	570.000	864.200	580.000	864.300	590.000
GR	864.600	595.000	865.500	600.000	865.200	700.000	869.000	745.000	879.100	772.000
NC	.035	.050	.042	.000	.000	.000	.000	.000	.000	.000

VS L JA 62

X1	11745.000	21.000	175.000	250.000	1220.000	1190.000	1210.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	600.000	.000	.000	.000	.000
GR	880.000	.000	870.000	70.000	868.600	125.000	865.400	175.000	864.900	180.000
GR	864.900	190.000	864.800	200.000	864.700	210.000	864.500	220.000	864.500	230.000
GR	864.500	240.000	865.000	245.000	865.600	250.000	865.700	350.000	865.700	450.000
GR	865.800	550.000	866.000	650.000	866.600	750.000	870.700	820.000	876.500	850.000
GR	880.000	862.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.070	.100	.045	.000	.000	.000	.000	.000	.000	.000

VS M JA 63

X1	14395.000	17.000	440.000	478.000	1660.000	1600.000	2650.000	.000	.000	.000
GR	886.000	.000	881.700	40.000	873.600	115.000	872.100	140.000	868.300	240.000
GR	867.600	340.000	867.500	440.000	866.500	445.000	866.100	450.000	865.700	460.000
GR	865.700	470.000	866.100	475.000	867.200	478.000	867.100	540.000	868.100	640.000
GR	868.800	690.000	884.000	720.000	.000	.000	.000	.000	.000	.000
QT	4.000	680.000	1175.000	1475.000	2355.000	.000	.000	.000	.000	.000
NC	.120	.100	.050	.000	.000	.000	.000	.000	.000	.000

VS N JA 64

X1	15265.000	16.000	190.000	255.000	810.000	870.000	870.000	.000	.000	.000
GR	889.500	.000	87[illegible].400	90.000	871.[illegible]00	10[illegible].000	868.600	160.000	[illegible]67.200	175.000

GR	885.600	437.000	889.600	450.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
GR	865.900	389.000	866.000	396.000	867.200	402.000	868.000	406.000	869.500	407.000													
GR	867.100	363.000	866.400	369.000	866.300	375.000	866.200	378.000	866.000	384.000													
GR	883.800	.000	873.700	100.000	872.100	200.000	869.700	300.000	868.800	362.000													
X1	17145.000	17.000	362.000	407.000	660.000	640.000	650.000	.000	.000	.000													

VS D JA 67

X1	16495.000	.000	.000	.000	.000	1.000	1.000	.000	.000	900.000	.000	872.100	872.100	.000									
X3	10.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000									
GR	887.700	.000	883.500	100.000	878.900	200.000	874.800	300.000	873.700	400.000													
GR	871.500	470.000	866.700	500.000	866.400	505.000	865.800	510.000	865.000	515.000													
GR	865.400	520.000	865.900	525.000	866.200	530.000	866.100	536.000	871.500	570.000													
GR	873.100	600.000	872.400	700.000	872.100	800.000	872.700	900.000	872.800	1000.000													
GR	872.400	1100.000	.000	.000	.000	.000	.000	.000	.000	.000													
NC	.100	.100	.050	.000	.000	.000	.000	.000	.000	.000													

X1	16477.000	.000	.000	.000	.000	1.000	1.000	.000	.000	1.000	.000	.000	.000	.000									
X3	10.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000									
SB	.000	1.370	3.020	.000	30.670	.000	1000.000	.000	871.400	179.100	.000	.000	865.000	.000									

BS P JA 66 MARSHALL ROAD

X1	16494.000	21.000	500.000	536.000	17.000	17.000	17.000	.000	.000	.000	.000	.000	.000	.000									
X2	.000	.000	1.000	870.800	872.100	.000	.000	.000	.000	.000	.000	.000	.000	.000									
X3	10.000	.000	.000	.000	.000	900.000	.000	872.100	872.100	.000													
BT	19.000	.000	887.700	.000	100.000	883.500	.000	200.000	878.900	.000													
BT	300.000	874.800	.000	400.000	873.700	.000	500.000	873.900	866.700	500.000													
BT	876.220	870.780	505.000	876.220	870.800	510.000	876.230	870.820	515.000	876.230													
BT	870.840	520.000	876.230	870.860	525.000	876.230	870.880	530.000	876.240	870.900													
BT	536.000	876.240	870.930	536.000	873.900	866.100	600.000	873.100	.000	700.000													
BT	872.400	.000	800.000	.000	.000	900.000	872.700	.000	.000	.000													
GR	887.700	.000	883.500	100.000	878.900	200.000	874.800	300.000	873.700	400.000													
GR	871.500	470.000	866.700	500.000	866.400	505.000	865.800	510.000	865.000	515.000													
GR	865.400	520.000	865.900	525.000	866.200	530.000	866.100	536.000	871.500	570.000													
GR	873.100	600.000	872.400	700.000	872.100	800.000	872.700	900.000	872.800	1000.000													
GR	872.400	1100.000	.000	.000	.000	.000	.000	.000	.000	.000													
NC	.100	.100	.050	.000	.000	.000	.000	.000	.000	.000													

VS D JA 65

X1	16255.000	29.000	700.000	771.000	890.000	900.000	990.000	.000	.000	.000													
X3	.000	.000	.000	550.000	.000	1000.000	.000	.000	.000	.000													
GR	887.700	.000	880.700	100.000	875.900	165.000	872.600	180.000	871.300	200.000													
GR	868.900	300.000	869.100	400.000	869.000	500.000	868.000	600.000	868.200	700.000													
GR	867.700	706.000	867.100	712.000	866.800	720.000	866.600	730.000	867.200	740.000													
GR	866.600	747.000	866.200	750.000	866.700	755.000	866.600	764.000	867.300	768.000													
GR	867.900	770.000	868.300	771.000	868.100	800.000	867.500	830.000	868.000	850.000													
GR	868.300	900.000	868.800	1000.000	868.300	1100.000	868.800	1170.000	.000	.000													
NC	.100	.100	.050	.000	.000	.000	.000	.000	.000	.000													

X1	16476.000	29.000	720.000	755.000	191.000	191.000	221.000	.000	-1.200	.000													
X3	10.000	.000	.000	550.000	.000	1000.000	.000	871.400	871.400	.000													
GR	887.700	.000	880.700	100.000	875.900	165.000	872.600	180.000	871.300	200.000													
GR	868.900	300.000	869.100	400.000	869.000	500.000	868.000	600.000	868.200	700.000													
GR	867.700	706.000	867.100	712.000	866.800	720.000	866.600	730.000	867.200	740.000													
GR	866.600	747.000	866.200	750.000	866.700	755.000	866.600	764.000	867.300	768.000													
GR	867.900	770.000	868.300	771.000	868.100	800.000	867.500	830.000	868.000	850.000													
GR	868.300	900.000	868.800	1000.000	868.300	1100.000	868.800	1170.000	.000	.000													
NC	.100	.100	.050	.000	.000	.000	.000	.000	.000	.000													

GR	865.500	230.000	865.900	240.000	866.600	250.000	868.300	255.000	869.800	285.000													
GR	884.200	320.000	.000	.000	.000	.000	.000	.000	.000	.000													

VS R JA 68

X1	17925.000	31.000	385.000	459.000	650.000	780.000	780.000	.000	.000	.000
X3	.000	.000	.000	250.000	.000	.000	.000	.000	.000	.000
GR	888.800	.000	879.000	55.000	874.700	85.000	871.900	135.000	870.000	185.000
GR	869.700	235.000	869.000	285.000	868.700	335.000	868.600	385.000	867.700	391.000
GR	866.500	395.000	865.900	405.000	865.700	415.000	865.600	425.000	865.600	433.000
GR	866.200	442.000	867.100	453.000	868.400	457.000	869.000	459.000	869.200	514.000
GR	869.400	565.000	871.100	615.000	873.300	665.000	875.600	715.000	878.400	765.000
GR	892.200	850.000	894.700	860.000	892.100	900.000	887.300	950.000	883.700	990.000
GR	890.700	1090.000	.000	.000	.000	.000	.000	.000	.000	.000

VS S JA 68A

X1	18525.000	30.000	756.000	838.000	640.000	610.000	600.000	.000	.000	.000
X3	.000	.000	.000	325.000	.000	950.000	.000	.000	.000	.000
GR	876.400	.000	884.800	40.000	880.800	90.000	879.500	140.000	876.800	190.000
GR	872.500	250.000	870.700	280.000	871.300	315.000	872.300	330.000	874.400	380.000
GR	876.200	430.000	886.200	490.000	889.500	520.000	885.100	580.000	871.300	660.000
GR	869.300	690.000	868.800	756.000	868.300	760.000	868.000	777.000	867.300	788.000
GR	866.100	798.000	865.700	808.000	865.600	819.000	865.900	826.000	866.600	833.000
GR	869.100	835.000	870.200	838.000	872.500	890.000	873.400	940.000	873.300	990.000

VS T JA 69 DOWNSTREAM SANDY BOTTOM LAKE

X1	18955.000	39.000	685.000	880.000	170.000	200.000	430.000	.000	.000	.000
X3	.000	.000	.000	450.000	.000	1150.000	.000	.000	.000	.000
GR	883.000	.000	877.100	35.000	871.300	85.000	870.200	135.000	870.200	185.000
GR	869.100	235.000	869.100	285.000	868.400	335.000	869.000	385.000	869.000	435.000
GR	869.100	485.000	869.200	535.000	869.100	585.000	868.600	635.000	868.500	685.000
GR	867.200	690.000	866.600	695.000	865.900	700.000	856.600	715.000	846.800	735.000
GR	844.700	755.000	844.200	780.000	844.100	787.000	844.800	797.000	846.500	807.000
GR	849.100	817.000	851.500	827.000	854.000	837.000	859.500	847.000	861.600	850.000
GR	864.000	860.000	866.300	871.000	867.300	875.000	868.500	860.000	871.300	882.000
GR	870.400	925.000	871.900	975.000	871.600	1075.000	873.600	1175.000	.000	.000
NC	.035	.035	.035	.300	.500	.000	.000	.000	.000	.000
OT	4.000	550.000	880.000	1065.000	1570.000	.000	.000	.000	.000	.000
NC	.110	.110	.047	.000	.000	.000	.000	.000	.000	.000

FIELD SECTION 70 SEC. U

USE ENERGY GRADE OF SEC. T (16775) AS STARTING WSEL

X1	20955.000	21.000	300.000	344.000	10.000	10.000	10.000	.000	.000	.000
GR	881.900	.000	871.900	80.000	871.200	100.000	868.800	200.000	868.600	300.000
GR	867.300	305.000	866.600	310.000	866.500	315.000	866.400	320.000	866.400	330.000
GR	866.600	332.000	866.600	336.000	866.600	340.000	868.600	344.000	868.500	400.000
GR	868.900	500.000	871.400	510.000	873.100	600.000	876.400	700.000	878.000	770.000
GR	882.800	790.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.115	.115	.045	.000	.000	.000	.000	.000	.000	.000

FIELD SECTION 71 SEC. V

X1	21755.000	24.000	325.000	400.000	500.000	1000.000	800.000	.000	.000	.000
X3	.000	.000	.000	125.000	.000	750.000	.000	.000	.000	.000
GR	875.700	.000	873.200	10.000	872.800	25.000	872.000	125.000	870.600	225.000
GR	869.100	325.000	867.900	332.000	867.200	340.000	866.600	349.000	866.200	356.000
GR	865.900	362.000	865.800	369.000	866.100	376.000	866.400	385.000	867.200	392.000
GR	867.900	398.000	868.800	400.000	869.300	425.000	869.300	525.000	869.600	625.000
GR	869.400	725.000	870.200	825.000	870.200	885.000	875.700	900.000	.000	.000

FIELD SECTION 72 SEC. W

X1	22655.000	27.000	500.000	567.000	900.000	750.000	900.000	.000	.000	.000
X3	.000	.000	.000	150.000	.000	950.000	.000	.000	.000	.000
GR	879.900	.000	873.900	60.000	871.900	100.000	868.600	200.000	869.200	300.000
GR	869.000	400.000	868.700	500.000	867.300	507.000	866.800	514.000	866.500	518.000
GR	866.000	522.000	865.800	529.000	865.800	535.000	866.200	540.000	866.200	545.000
GR	866.200	552.000	867.000	558.000	868.000	562.000	868.900	567.000	868.900	600.000
GR	870.900	700.000	869.200	800.000	869.100	900.000	869.100	1000.000	869.600	1100.000
GR	871.300	1160.000	881.300	1190.000	.000	.000	.000	.000	.000	.000
NC	.090	.060	.042	.000	.000	.000	.000	.000	.000	.000

FIELD SECTION 73 SEC. X

USE ENERGY GRADE OF SEC. W (20475) AS WSEL

X1	24555.000	27.000	875.000	909.000	10.000	10.000	10.000	.000	.000	.000
X3	.000	.000	.000	250.000	.000	.000	.000	.000	.000	.000
GR	880.400	.000	873.200	15.000	872.400	75.000	871.100	175.000	869.600	275.000
GR	869.500	375.000	867.800	475.000	868.400	575.000	868.700	675.000	868.900	775.000
GR	869.100	801.000	866.200	806.000	866.200	811.000	869.100	817.000	869.300	855.000
GR	869.000	875.000	866.400	878.000	865.900	882.000	865.400	886.000	865.400	891.000
GR	865.900	896.000	866.400	902.000	867.400	906.000	869.000	909.000	870.000	975.000
GR	875.200	1075.000	880.100	1175.000	.000	.000	.000	.000	.000	.000
NC	.100	.060	.045	.000	.000	.000	.000	.000	.000	.000

FIELD SECTION 74 SEC. Y

X1	25315.000	30.000	1130.000	1197.000	1150.000	750.000	760.000	.000	.000	.000
X3	.000	.000	.000	800.000	.000	.000	.000	.000	.000	.000
GR	881.300	.000	875.500	30.000	874.600	130.000	874.100	230.000	873.800	330.000
GR	873.300	430.000	873.100	530.000	872.400	630.000	871.600	730.000	870.800	830.000
GR	870.300	930.000	869.900	1030.000	870.400	1072.000	868.600	1080.000	870.400	1095.000
GR	872.600	1100.000	872.500	1130.000	867.600	1140.000	866.700	1147.000	866.300	1155.000
GR	866.000	1161.000	866.500	1167.000	867.300	1174.000	867.600	1181.000	867.700	1186.000
GR	868.000	1192.000	871.300	1197.000	872.500	1230.000	881.100	1310.000	883.200	1330.000
NC	.090	.080	.045	.000	.000	.000	.000	.000	.000	.000

FIELD SECTION 75 SEC. Z

X1	26315.000	29.000	600.000	683.000	1100.000	900.000	1000.000	.000	.000	.000
X3	.000	.000	.000	610.000	.000	674.000	.000	.000	.000	.000
GR	890.900	.000	888.100	30.000	876.400	80.000	875.000	100.000	874.300	200.000
GR	872.700	215.000	873.200	230.000	872.400	300.000	871.700	400.000	872.400	500.000
GR	872.400	600.000	868.700	611.000	868.400	620.000	868.000	622.000	867.800	630.000
GR	867.600	637.000	866.400	643.000	866.100	645.000	866.600	651.000	866.700	660.000
GR	867.900	670.000	872.500	683.000	872.900	700.000	873.600	800.000	876.900	900.000
GR	876.800	965.000	878.600	1000.000	884.200	1050.000	887.400	1065.000	.000	.000

X1	26404.000	17.000	531.000	550.000	89.000	89.000	89.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	875.100	875.100	.000
GR	889.800	.000	885.000	89.000	879.500	177.000	876.300	266.000	875.100	354.000
GR	875.600	443.000	876.700	510.000	867.900	531.000	868.000	536.000	867.900	540.000
GR	868.000	544.000	868.100	550.000	877.800	565.000	879.800	620.000	885.100	708.000
GR	891.000	797.000	895.000	859.000	.000	.000	.000	.000	.000	.000
NC	.040	.040	.022	.000	.000	.000	.000	.000	.000	.000

X1	26405.000	17.000	531.000	550.000	1.000	1.000	1.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	875.100	875.100	.000
BT	14.000	.000	889.800	.000	89.000	885.000	.000	177.000	879.500	.000
BT	266.000	76.300	.00	354.000	875.100	.000	443.000	875.600	.000	531.000

BT	[illegible]	.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
BT	.000	620.000	879.800	.000	708.000	885.100	.000	797.000	891.000	.000
BT	859.000	895.000	.000	.000	.000	.000	.000	.000	.000	.000
GR	889.800	.000	885.000	89.000	879.500	177.000	876.300	266.000	875.100	354.000
GR	875.600	443.000	877.000	531.000	867.900	531.000	868.000	536.000	867.900	540.000
GR	868.000	544.000	868.100	550.000	877.300	550.000	879.800	620.000	885.100	708.000
GR	891.000	797.000	895.000	859.000	.000	.000	.000	.000	.000	.000

FIELD SECTION 76 - DOANE ROAD SEC. AA

X1	26436.000	.000	.000	.000	31.000	31.000	31.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.100	.100	.047	.000	.000	.000	.000	.000	.000	.000
X1	26437.000	17.000	531.000	550.000	1.000	1.000	1.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	875.100	875.100	.000
GR	889.800	.000	885.000	89.000	879.500	177.000	876.300	266.000	875.100	354.000
GR	875.600	443.000	876.700	510.000	867.900	531.000	868.000	536.000	867.900	540.000
GR	868.000	544.000	868.100	550.000	877.800	565.000	879.800	620.000	885.100	708.000
GR	891.000	797.000	895.000	859.000	.000	.000	.000	.000	.000	.000
X1	26460.000	29.000	600.000	683.000	23.000	23.000	23.000	.000	1.800	.000
X3	.000	.000	.000	610.000	.000	675.000	.000	.000	.000	.000
GR	890.900	.000	888.100	30.000	876.400	80.000	875.000	100.000	874.300	200.000
GR	872.700	215.000	873.200	230.000	872.400	300.000	871.700	400.000	872.400	500.000
GR	872.400	600.000	868.700	611.000	868.400	620.000	868.000	622.000	867.800	630.000
GR	867.600	637.000	866.400	643.000	866.100	645.000	866.600	651.000	866.700	660.000
GR	867.900	670.000	872.500	683.000	872.900	700.000	873.600	800.000	876.900	900.000
GR	876.800	965.000	878.600	1000.000	884.200	1050.000	887.400	1065.000	.000	.000
NC	.110	.095	.047	.000	.000	.000	.000	.000	.000	.000

FIELD SECTION 77 SEC. AB

X1	27160.000	13.000	177.000	205.000	650.000	530.000	700.000	.000	.000	.000
GR	889.100	.000	875.500	40.000	872.900	80.000	871.600	130.000	871.700	177.000
GR	868.800	182.000	868.500	185.000	868.400	190.000	869.200	200.000	872.200	205.000
GR	874.600	230.000	876.100	255.000	890.400	280.000	.000	.000	.000	.000
NC	.110	.095	.043	.000	.000	.000	.000	.000	.000	.000

FIELD SECTION 78 SEC. AC

X1	28660.000	22.000	575.000	595.000	750.000	1400.000	1500.000	.000	.000	.000
X3	.000	.000	.000	200.000	.000	.000	.000	.000	.000	.000
GR	890.200	.000	887.700	20.000	876.200	80.000	873.700	180.000	873.900	280.000
GR	873.100	380.000	872.500	480.000	872.500	575.000	872.000	577.000	870.800	580.000
GR	869.300	585.000	869.200	589.000	871.600	593.000	872.500	595.000	872.500	615.000
GR	873.500	680.000	875.400	780.000	875.400	830.000	876.300	880.000	879.900	1080.000
GR	881.400	1180.000	903.500	1280.000	.000	.000	.000	.000	.000	.000
NC	.110	.095	.045	.000	.000	.000	.000	.000	.000	.000

OVERBANK=1/3 OF SEC.AC; CHANNEL=SAME AS SEC.AC; ELEV=INCREASE 1.5'

X1	30110.000	22.000	173.000	193.000	750.000	1250.000	1450.000	.000	.000	.000
GR	891.700	.000	889.200	6.000	877.700	24.000	875.200	54.000	875.400	84.000
GR	874.600	114.000	874.000	144.000	874.000	173.000	873.500	175.000	872.300	178.000
GR	870.800	183.000	870.700	187.000	873.100	191.000	874.000	193.000	874.000	199.000
GR	875.000	219.000	876.900	249.000	876.900	264.000	877.800	279.000	881.400	339.000
GR	882.900	369.000	905.000	399.000	.000	.000	.000	.000	.000	.000

FIELD SECTION 79 SEC. AD

X1	30760.000	25.000	284.000	314.000	500.000	600.000	650.000	.000	.000	.000
X3	.000	.000	.000	175.000	.000	775.000	.000	.000	.000	.000
GR	887.400	.000	883.700	.000	882.400	50.000	875.800	120.000	875.200	150.000
GR	873.700	250.000	873.400	265.000	873.800	284.000	873.100	287.000	871.900	292.000
GR	872.100	302.000	871.400	308.000	871.900	311.000	873.800	314.000	874.300	350.000
GR	875.400	450.000	876.500	550.000	876.500	650.000	874.600	715.000	875.400	750.000
GR	875.700	850.000	875.800	950.000	876.200	1050.000	878.200	1100.000	892.200	1150.000
BT	4.000	555.000	895.000	1095.000	1625.000	.000	.000	.000	.000	.000

FIELD SECTION 80 SEC. AE

X1	32960.000	27.000	356.000	375.000	2350.000	950.000	2200.000	.000	.000	.000
X3	.000	.000	.000	250.000	.000	1250.000	.000	.000	.000	.000
GR	900.800	.000	886.500	54.000	880.900	90.000	876.500	190.000	875.000	290.000
GR	875.000	356.000	874.000	358.000	873.400	362.000	873.900	366.000	873.500	373.000
GR	875.100	375.000	875.000	390.000	875.400	490.000	875.500	590.000	875.600	690.000
GR	875.200	790.000	876.000	890.000	875.200	990.000	876.300	1090.000	877.100	1190.000
GR	877.000	1290.000	877.700	1374.000	879.700	1397.000	883.700	1415.000	884.700	1427.000
GR	888.300	1527.000	894.600	1590.000	.000	.000	.000	.000	.000	.000

FIELD SECTION 81 SEC. AF

X1	34860.000	15.000	245.000	280.000	1000.000	1100.000	1900.000	.000	.000	.000
X3	.000	.000	.000	122.000	.000	.000	.000	.000	.000	.000
GR	891.200	.000	879.200	70.000	877.600	100.000	876.700	200.000	877.900	245.000
GR	876.400	258.000	875.600	264.000	875.500	268.000	876.400	272.000	877.900	280.000
GR	877.300	300.000	879.100	350.000	883.800	400.000	886.500	500.000	893.200	600.000
X1	35010.000	.000	.000	.000	100.000	100.000	150.000	.000	-1.300	.000
X3	.000	.000	.000	168.000	.000	298.000	.000	.000	.000	.000
NC	.040	.040	.022	.000	.000	.000	.000	.000	.000	.000
SB	.000	1.580	2.800	.000	16.300	.000	76.500	.000	874.200	874.200

FIELD SECTION 82 - PRIVATE DRIVE SEC. AG

X1	35022.000	14.000	350.000	371.000	12.000	12.000	12.000	.000	.000	.000
X2	.000	.000	1.000	878.900	879.800	.000	.000	.000	.000	.000
BT	11.000	.000	890.900	.000	50.000	887.500	.000	150.000	882.300	.000
BT	250.000	880.500	.000	350.000	879.900	876.100	350.000	879.900	878.900	371.000
BT	879.800	878.800	371.000	879.800	876.500	450.000	883.700	.000	550.000	888.100
BT	.000	600.000	892.200	.000	.000	.000	.000	.000	.000	.000
GR	890.900	.000	887.500	50.000	882.300	150.000	880.500	250.000	880.000	335.000
GR	876.100	350.000	875.700	355.000	874.200	360.000	874.700	365.000	876.500	371.000
GR	881.300	400.000	883.700	450.000	888.100	550.000	892.200	600.000	.000	.000
NC	.100	.100	.047	.000	.000	.000	.000	.000	.000	.000

FIELD SECTION 83 SEC. AH

X1	35622.000	15.000	210.000	232.000	550.000	450.000	600.000	.000	.000	.000
GR	893.300	.000	879.900	60.000	879.000	110.000	878.500	160.000	877.800	210.000
GR	876.700	215.000	875.200	219.000	875.000	222.000	876.000	225.000	877.700	228.000
GR	878.700	232.000	879.200	260.000	880.700	295.000	883.300	313.000	895.100	353.000
X1	35947.000	90.000	226.800	244.300	175.000	225.000	325.000	.000	.000	.000
GR	896.800	.000	895.700	7.800	894.700	15.600	893.700	23.500	892.700	31.300
GR	891.700	39.100	890.700	46.900	889.600	54.700	888.500	62.600	887.900	70.400
GR	887.500	78.200	887.100	86.000	886.700	93.800	886.300	101.600	886.000	109.500
GR	885.600	117.300	885.200	125.10	884.900	132.900	884.500	[illegible]	884.200	148.600

GR	883.900	156.400	883.500	184.200	883.200	172.000	[illegible]	[illegible]	[illegible]	[illegible]
GR	882.000	195.500	881.400	203.300	880.700	211.100	879.800	218.900	878.200	226.800
GR	877.800	227.300	877.400	227.900	877.100	228.500	876.900	229.100	876.800	229.700
GR	876.600	230.200	876.500	230.800	876.300	231.400	876.200	232.000	876.000	232.600
GR	875.800	233.200	875.700	233.700	875.600	234.300	875.500	234.900	875.500	235.500
GR	875.500	236.100	875.600	236.700	875.700	237.200	875.900	237.800	876.000	238.400
GR	876.200	239.000	876.500	239.600	876.700	240.200	877.000	240.700	877.100	241.300
GR	877.300	241.900	877.500	242.500	878.000	243.100	878.400	243.700	878.800	244.300
GR	880.500	251.500	880.800	258.700	881.000	266.000	881.200	273.200	881.500	280.500
GR	881.700	287.700	881.900	294.900	882.200	302.200	882.400	309.400	882.700	316.700
GR	882.900	323.900	883.100	331.200	883.400	338.400	883.600	345.600	884.000	352.900
GR	884.500	360.100	885.000	367.400	885.600	374.600	886.300	381.800	887.200	389.100
GR	888.400	396.300	889.600	403.600	890.800	410.800	892.100	418.100	893.300	425.300
GR	894.500	432.500	895.700	439.800	896.900	447.000	898.200	454.300	899.600	461.500
X1	36110.000	90.000	235.100	250.400	88.000	113.000	163.000	.000	.000	.000
GR	898.500	.000	897.800	8.100	897.100	16.200	896.400	24.300	895.700	32.400
GR	895.000	40.500	894.300	48.600	893.400	56.800	892.500	64.900	891.900	73.000
GR	891.400	81.100	890.900	89.200	890.400	97.300	889.900	105.400	889.400	113.500
GR	888.900	121.600	888.400	129.700	887.900	137.800	887.400	145.900	886.900	154.000
GR	886.500	162.200	886.000	170.300	885.600	178.400	885.100	186.500	884.600	194.600
GR	883.900	202.700	883.100	210.800	882.000	218.900	880.700	227.000	878.300	235.100
GR	877.900	235.600	877.400	236.100	877.000	236.600	876.700	237.200	876.600	237.700
GR	876.500	238.200	876.500	238.700	876.300	239.200	876.200	239.700	876.100	240.200
GR	876.000	240.700	875.900	241.200	875.800	241.700	875.700	242.200	875.700	242.700
GR	875.700	243.300	875.800	243.800	875.900	244.300	876.000	244.800	876.100	245.300
GR	876.300	245.800	876.400	246.300	876.600	246.800	876.700	247.300	876.800	247.800
GR	876.900	248.300	877.200	248.800	877.800	249.400	878.300	249.900	878.800	250.400
GR	881.300	259.200	881.800	268.100	882.100	276.900	882.400	285.800	882.700	294.600
GR	882.900	303.500	883.200	312.300	883.600	321.100	883.900	330.000	884.100	338.800
GR	884.400	347.700	884.700	356.500	884.900	365.400	885.200	374.200	885.700	383.100
GR	886.200	391.900	886.800	400.800	887.400	409.600	888.200	418.400	889.200	427.300
GR	890.400	436.100	891.700	445.000	892.900	453.800	894.100	462.700	895.300	471.500
GR	896.600	480.400	897.800	489.200	899.000	498.100	900.400	506.900	901.800	515.800
X1	36142.000	90.000	236.800	251.600	18.000	23.000	32.000	.000	.000	.000
GR	898.800	.000	898.200	8.200	897.600	16.300	896.900	24.500	896.300	32.700
GR	895.700	40.800	895.000	49.000	894.200	57.200	893.300	65.300	892.700	73.500
GR	892.200	81.700	891.700	89.800	891.100	98.000	890.600	106.200	890.000	114.300
GR	889.500	122.500	889.000	130.600	888.500	138.800	887.900	147.000	887.500	155.100
GR	887.000	163.300	886.500	171.500	886.100	179.600	885.600	187.800	885.000	196.000
GR	884.200	204.100	883.500	212.300	882.200	220.500	880.900	228.600	878.400	236.800
GR	877.900	237.300	877.400	237.800	876.900	238.300	876.700	238.800	876.600	239.300
GR	876.500	239.800	876.400	240.300	876.300	240.700	876.200	241.200	876.100	241.700
GR	876.000	242.200	875.900	242.700	875.800	243.200	875.800	243.700	875.700	244.200
GR	875.800	244.700	875.800	245.200	875.900	245.700	876.000	246.200	876.100	246.700
GR	876.300	247.200	876.400	247.700	876.500	248.100	876.700	248.600	876.800	249.100
GR	876.800	249.600	877.200	250.100	877.700	250.600	878.300	251.100	878.900	251.600
GR	881.500	260.800	882.000	269.900	882.300	279.100	882.600	288.300	882.900	297.400
GR	883.200	306.600	883.500	315.800	883.800	324.900	884.200	334.100	884.400	343.300
GR	884.700	352.400	885.000	361.600	885.200	370.800	885.600	379.900	886.100	389.100
GR	886.600	398.300	887.100	407.400	887.700	416.600	888.500	425.800	889.600	434.900
GR	890.800	444.100	892.100	453.300	893.300	462.400	894.500	471.600	895.700	480.800
GR	897.000	489.900	898.200	499.100	899.400	508.300	900.800	517.400	902.300	526.600
X1	36207.000	90.000	240.100	254.000	35.000	45.000	65.000	.000	.000	.000
GR	899.500	.000	899.000	8.300	898.500	16.600	898.000	24.800	897.500	33.100
GR	897.000	41.400	896.400	49.700	895.700	58.000	895.000	66.200	894.300	74.500
GR	893.800	82.800	893.200	91.100	892.600	99.400	892.000	107.700	891.400	115.900
GR	890.800	124.200	890.200	132.500	889.700	140.800	889.100	149.100	888.600	157.300
GR	888.000	165.600	887.500	173.900	887.000	182.200	886.500	190.500	885.900	198.700
GR	885.000	207.000	884.100	215.300	882.800	223.600	881.300	231.900	878.400	240.100
GR	877.900	240.600	877.400	241.100	876.900	241.500	876.[illegible]00	242.000	876.60[illegible]	242.500

GR	876.100	245.200	876.000	245.700	875.900	246.200	875.900	246.600	875.800	247.100
GR	875.900	247.600	875.900	248.000	876.000	248.500	876.100	249.000	876.200	249.400
GR	876.300	249.900	876.400	250.300	876.500	250.800	876.500	251.300	876.600	251.700
GR	876.700	252.200	877.000	252.700	877.600	253.100	878.300	253.600	878.900	254.000
GR	881.800	263.900	882.400	273.700	882.700	283.500	883.000	293.300	883.400	303.100
GR	883.700	312.900	884.100	322.700	884.400	332.500	884.700	342.300	885.000	352.100
GR	885.300	361.900	885.600	371.800	885.900	381.600	886.200	391.400	886.700	401.200
GR	887.300	411.000	887.800	420.800	888.400	430.600	889.300	440.400	890.400	450.200
GR	891.700	460.000	892.900	469.800	894.100	479.600	895.300	489.500	896.600	499.300
GR	897.800	509.100	899.000	518.900	900.300	528.700	901.700	538.500	903.200	548.300
X1	36272.000	18.000	243.500	256.500	35.000	45.000	65.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	882.500	882.500	.000
GR	900.200	.000	897.900	50.000	890.300	150.000	886.900	200.000	884.600	220.000
GR	881.300	237.000	878.500	243.500	876.600	245.000	875.900	250.000	876.600	255.000
GR	878.900	256.500	881.500	261.000	882.500	270.000	885.300	350.000	886.700	400.000
GR	889.400	450.000	901.200	550.000	904.100	570.000	.000	.000	.000	.000
NC	.040	.040	.022	.000	.000	.000	.000	.000	.000	.000
X1	36273.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	882.500	882.500	.000
SB	.000	1.590	2.800	.000	7.800	.000	53.840	.000	875.900	875.900

FIELD SECTION 84 - PRIVATE DRIVE SEC. AI

X1	36287.000	.000	243.500	256.500	14.000	14.000	14.000	.000	.000	.000
X2	.000	.000	1.000	882.800	885.100	.000	.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	885.100	885.100	.000
BT	14.000	.000	900.200	.000	50.000	897.900	.000	150.000	890.300	.000
BT	200.000	886.900	.000	243.500	885.100	.000	243.500	885.100	878.500	250.000
BT	885.100	882.900	256.500	885.100	878.900	256.500	885.100	.000	350.000	885.300
BT	.000	400.000	886.700	.000	450.000	889.400	.000	550.000	901.200	.000
BT	570.000	904.100	.000	.000	.000	.000	.000	.000	.000	.000
NC	.100	.090	.045	.000	.000	.000	.000	.000	.000	.000
X1	36288.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	885.100	885.100	.000

FIELD SECTION 85 SEC. AJ

X1	37098.000	19.000	43.000	63.000	750.000	750.000	810.000	.000	.000	.000
GR	898.000	.000	888.700	20.000	883.400	43.000	879.900	45.000	879.000	49.000
GR	878.000	52.000	879.100	56.000	879.800	60.000	881.200	63.000	881.500	80.000
GR	881.800	180.000	882.000	230.000	882.200	260.000	888.600	280.000	889.200	295.000
GR	893.500	380.000	893.800	400.000	897.300	430.000	907.600	480.000	.000	.000
X1	37858.000	17.000	130.000	165.000	660.000	700.000	760.000	.000	.200	.000
X3	.000	.000	.000	126.000	.000	168.000	.000	.000	.000	.000
GR	900.500	.000	892.500	65.000	891.900	83.000	884.100	100.000	883.600	110.000
GR	882.100	130.000	881.300	135.000	880.900	140.000	880.500	145.000	881.800	153.000
GR	881.300	155.000	881.900	162.000	883.800	165.000	884.200	235.000	887.800	265.000
GR	896.400	320.000	900.200	345.000	.000	.000	.000	.000	.000	.000
X1	37898.000	14.000	132.000	154.000	40.000	40.000	40.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	893.900	893.900	.000
GR	902.600	.000	899.400	50.000	896.300	127.000	881.600	132.000	881.500	136.000
GR	881.700	140.000	881.500	144.000	880.900	149.000	880.800	154.000	895.300	160.000
GR	893.900	215.000	894.200	297.000	897.200	300.000	901.700	462.000	.000	.000

NC	.040	.040	.022	.000	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
X1	37899.000	14.000	132.000	154.000	1.000	1.000	1.000	.000	.000	.000
BT	10.000	.000	902.600	.000	50.000	899.400	.000	132.000	896.100	.000
BT	132.000	896.500	894.300	154.000	896.100	893.800	154.000	895.500	.000	215.000
BT	893.900	.000	297.000	894.200	.000	380.000	897.200	.000	462.000	901.700
BT	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
GR	902.600	.000	899.400	50.000	896.100	132.000	881.600	132.000	881.500	136.000
GR	881.700	140.000	881.500	144.000	880.900	149.000	880.800	154.000	895.500	154.000
GR	893.900	215.000	894.200	297.000	897.200	380.000	901.700	462.000	.000	.000

FIELD SECTION 85 - RUSHTON ROAD SEC. AK

X1	37942.000	.000	.000	.000	43.000	43.000	43.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.080	.090	.040	.000	.000	.000	.000	.000	.000	.000
X1	37943.000	14.000	132.000	154.000	1.000	1.000	1.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	893.900	893.900	.000
GR	902.600	.000	899.400	50.000	896.300	127.000	881.600	132.000	881.500	136.000
GR	881.700	140.000	881.500	144.000	880.900	149.000	880.800	154.000	895.300	160.000
GR	893.900	215.000	894.200	297.000	897.200	380.000	901.700	462.000	.000	.000
X1	37953.000	17.000	130.000	165.000	10.000	10.000	10.000	.000	.300	.000
X3	.000	.000	.000	126.000	.000	168.000	.000	.000	.000	.000
GR	900.500	.000	892.500	65.000	891.900	83.000	884.100	100.000	883.600	110.000
GR	882.100	130.000	881.300	135.000	880.900	140.000	880.500	145.000	881.800	153.000
GR	881.300	155.000	881.900	162.000	883.800	165.000	884.200	235.000	887.800	265.000
GR	896.400	320.000	900.200	345.000	.000	.000	.000	.000	.000	.000
QT	4.000	565.000	905.000	1110.000	1660.000	.000	.000	.000	.000	.000

FIELD SECTION 86 SEC. AL

X1	38123.000	17.000	130.000	165.000	200.000	100.000	170.000	.000	.000	.000
GR	900.500	.000	892.500	65.000	891.900	83.000	884.100	100.000	883.600	110.000
GR	882.100	130.000	881.300	135.000	880.900	140.000	880.500	145.000	881.800	153.000
GR	881.300	155.000	881.900	162.000	883.800	165.000	884.200	235.000	887.800	265.000
GR	896.400	320.000	900.200	345.000	.000	.000	.000	.000	.000	.000
NC	.095	.100	.045	.000	.000	.000	.000	.000	.000	.000

FIELD SECTION 87 SEC. AM

X1	39313.000	15.000	158.000	179.000	900.000	900.000	1190.000	.000	.000	.000
GR	902.800	.000	898.000	83.000	890.900	129.000	886.500	141.000	885.400	158.000
GR	884.000	161.000	883.400	164.000	883.100	168.000	883.000	170.000	883.800	176.000
GR	884.300	179.000	886.200	208.000	887.900	258.000	896.000	358.000	900.800	418.000
NC	.095	.095	.047	.000	.000	.000	.000	.000	.000	.000

FIELD SECTION 88 SEC. AN

X1	40883.000	27.000	530.000	545.000	800.000	1300.000	1570.000	.000	.000	.000
GR	901.900	.000	887.900	70.000	886.700	95.000	886.700	170.000	886.800	195.000
GR	898.600	270.000	903.600	310.000	903.600	345.000	894.800	405.000	898.200	445.000
GR	889.600	490.000	888.000	530.000	886.000	532.000	885.200	537.000	884.800	540.000
GR	885.200	543.000	886.600	545.000	886.700	550.000	886.000	563.000	885.400	567.000
GR	886.000	570.000	886.700	670.000	887.300	770.000	888.500	870.000	890.300	920.000
GR	893.900	935.000	904.000	970.000	.000	.000	.000	.000	.000	.000
NC	.100	.100	.047	.000	.000	.000	.000	.000	.000	.000

FIELD SECTION 89 SEC. AO

X1	42053.000	16.000	78.000	95.000	1150.000	550.000	1170.000	.000	.000	.000
GR	902.800	.000	890.500	37.000	888.700	78.000	887.000	80.000	886.500	82.000
GR	886.400	87.000	886.400	90.000	887.400	93.000	888.700	95.000	888.800	110.000
GR	887.900	210.000	888.800	410.000	888.800	510.000	889.600	610.000	890.400	630.000
GR	903.600	710.000	.000	.000	.000	.000	.000	.000	.000	.000

FIELD SECTION 90 SEC. AP

X1	42613.000	24.000	459.000	477.000	550.000	350.000	560.000	.000	.000	.000
X3	.000	.000	.000	300.000	.000	950.000	.000	.000	.000	.000
GR	906.100	.000	897.100	25.000	890.100	125.000	888.900	225.000	889.100	325.000
GR	889.200	425.000	888.900	459.000	888.300	461.000	887.100	464.000	886.800	469.000
GR	886.400	473.000	886.900	475.000	889.200	477.000	889.800	525.000	890.400	585.000
GR	893.200	625.000	899.400	725.000	900.300	745.000	890.800	825.000	889.800	850.000
GR	890.500	925.000	890.600	1025.000	890.900	1075.000	900.000	1125.000	.000	.000

X1	43433.000	20.000	199.000	223.000	699.000	699.000	820.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	400.000	.000	.000	.000	.000
GR	909.700	.000	899.500	8.000	900.500	18.000	898.500	23.000	894.800	103.000
GR	891.100	199.000	888.400	203.000	888.300	208.000	888.400	211.000	888.300	214.000
GR	888.500	219.000	890.700	223.000	891.400	250.000	892.600	303.000	892.600	403.000
GR	893.000	468.000	894.900	503.000	898.000	538.000	899.500	603.000	902.800	703.000
NC	.040	.040	.022	.000	.000	.000	.000	.000	.000	.000

X1	43434.000	36.000	201.000	221.000	1.000	1.000	1.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	400.000	.000	892.400	892.400	.000
GR	909.700	.000	899.500	8.000	900.500	18.000	898.500	23.000	894.800	103.000
GR	891.100	199.000	889.600	201.000	888.500	202.000	888.300	203.000	888.500	204.000
GR	889.600	205.000	889.600	206.000	888.500	207.000	888.300	208.000	888.500	209.000
GR	889.600	210.000	889.600	212.000	888.500	213.000	888.300	214.000	888.500	215.000
GR	889.600	216.000	889.600	217.000	888.500	218.000	888.300	219.000	888.500	220.000
GR	889.600	221.000	889.600	221.000	890.700	224.000	892.400	250.000	892.600	303.000
GR	892.600	403.000	893.000	468.000	894.900	503.000	898.000	538.000	899.500	603.000
GR	902.800	703.000	.000	.000	.000	.000	.000	.000	.000	.000
SB	.000	1.880	2.850	.000	12.570	.000	50.270	.000	888.300	888.300

FIELD SECTION 90A - PRIVATE DRIVE SEC. AQ

X1	43461.000	.000	201.000	221.000	27.000	27.000	27.000	.000	.000	.000
X2	.000	.000	1.000	892.300	892.400	.000	.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	400.000	.000	.000	.000	.000
BT	37.000	.000	909.700	.000	8.000	899.500	.000	18.000	900.500	.000
BT	23.000	898.500	.000	103.000	894.800	.000	201.000	893.300	889.600	201.000
BT	893.300	891.000	202.000	893.300	892.100	203.000	893.300	892.300	204.000	893.300
BT	892.100	205.000	893.300	891.000	205.000	893.300	889.600	206.000	893.300	889.600
BT	206.000	893.300	891.000	207.000	893.300	892.100	208.000	893.300	892.300	209.000
BT	893.300	892.100	210.000	893.300	891.000	210.000	893.300	889.600	212.000	893.300
BT	889.600	212.000	893.300	891.000	213.000	893.300	892.100	214.000	893.300	892.300
BT	215.000	893.300	892.100	216.000	893.300	891.000	216.000	893.300	889.600	217.000
BT	893.300	889.600	217.000	893.300	891.000	218.000	893.300	892.100	219.000	893.300
BT	892.300	220.000	893.300	892.100	221.000	893.300	891.000	221.000	893.300	889.600
BT	224.000	892.800	.000	250.000	892.400	.000	303.000	892.600	.000	400.000
BT	892.600	.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.100	.100	.045	.000	.000	.000	.000	.000	.000	.000

X1	43462.000	20.000	199.000	223.000	1.000	1.000	1.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	400.000	.000	.000	.000	.000
GR	909.700	[illegible]	899.500	8.000	900.500	18.000	898.500	23.000	894.800	103.000

GR	871.100	199.000	[illegible]	203.000	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
GR	888.500	219.000	890.700	223.000	891.400	250.000	892.600	303.000	892.600	403.000
GR	893.000	468.000	894.900	503.000	898.000	538.000	899.500	603.000	902.800	703.000

FIELD SECTION 91 SEC. AR

X1	43812.000	15.000	250.000	265.000	272.000	222.000	350.000	.000	.000	.000
X3	.000	.000	.000	210.000	.000	310.000	.000	.000	.000	.000
GR	911.000	.000	898.500	50.000	893.700	73.000	891.500	150.000	891.900	200.000
GR	891.700	250.000	889.500	253.000	889.200	256.000	890.100	260.000	892.000	265.000
GR	892.000	350.000	893.000	433.000	896.700	450.000	902.000	470.000	904.200	570.000
X1	43902.000	.000	.000	.000	90.000	90.000	90.000	.000	.550	.000
X3	.000	.000	.000	230.000	.000	285.000	.000	.000	.000	.000
X1	43925.000	.000	.000	.000	23.000	23.000	23.000	.000	.140	.000
X3	.000	.000	.000	236.000	.000	279.000	.000	.000	.000	.000
X1	43947.000	.000	.000	.000	22.000	22.000	22.000	.000	.140	.000
X3	.000	.000	.000	241.000	.000	273.000	.000	.000	.000	.000
X1	43969.000	.000	.000	.000	22.000	22.000	22.000	.000	.140	.000
X3	.000	.000	.000	246.000	.000	267.000	.000	.000	.000	.000
X1	43981.000	.000	.000	.000	12.000	12.000	12.000	.000	.070	.000
X3	.000	.000	.000	250.000	.000	265.000	.000	.000	.000	.000
X1	43987.000	.000	.000	.000	6.000	6.000	6.000	.000	.030	.000
X3	.000	.000	.000	251.500	.000	263.500	.000	.000	.000	.000
X1	43992.000	.000	.000	.000	5.000	5.000	5.000	.000	.030	.000
X3	.000	.000	.000	252.500	.000	262.500	.000	.000	.000	.000
NC	.040	.040	.022	.000	.000	.000	.000	.000	.000	.000
SB	.000	1.690	2.850	.000	8.530	.000	74.170	.000	890.300	890.300

FIELD SECTION 92 - CHESAPEAKE & OHIO RAILROAD SEC. AS

X1	44032.000	21.000	500.000	510.000	40.000	40.000	40.000	.000	.000	.000
X2	.000	.000	1.000	899.000	910.900	.000	.000	.000	.000	.000
BT	17.000	.000	912.300	.000	100.000	911.800	.000	200.000	911.500	.000
BT	300.000	911.100	.000	400.000	910.900	.000	500.000	910.900	.000	500.000
BT	910.900	894.000	502.000	910.900	898.300	505.000	910.900	899.000	508.000	910.900
BT	898.300	510.000	910.900	894.000	510.000	910.900	.000	600.000	911.100	.000
BT	700.000	911.400	.000	800.000	911.800	.000	900.000	912.300	.000	1000.000
BT	913.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
GR	912.300	.000	911.800	100.000	911.500	200.000	911.100	300.000	910.900	400.000
GR	910.900	500.000	894.000	500.000	890.400	500.000	890.400	501.000	890.400	502.000
GR	890.300	505.000	890.700	508.000	890.800	509.000	890.800	510.000	894.000	510.000
GR	910.900	510.000	911.100	600.000	911.400	700.000	911.800	800.000	912.300	900.000
GR	913.000	1000.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	44033.000	17.000	500.000	510.000	1.000	1.000	1.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	911.000	911.000	.000
X5	5.000	.000	900.850	903.300	.000	.000	.000	.000	.000	.000
GR	912.300	.000	911.800	100.000	911.500	200.000	911.100	300.000	910.900	400.000
GR	890.400	500.000	890.400	501.000	890.400	502.000	890.300	505.000	890.700	508.000

EJ	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
GR	912.300	900.000	913.000	1000.000	.000	.000	.000	.000	.000	.000

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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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T1      GREEN OAK TOWNSHIP FIS  J & A  FILE NO. 11259-00
T2      100-YEAR FLOOD;  ENCROACHED FLOODWAY;  FILE NAME: DAVISHEE
T3      DAVIS CREEK              HURON RIVER TO C & O RAILROAD   (A-AS)

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

     -10.       4.        0.        0.   .000000      .00       .0        0.    863.250    .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     3.000     .000    -1.000     .000      .000      .000      .000      .000      .000      .000

*PROF 3

CCHV=    .300 CEHV=    .500
*SECNO .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

         VS    JA 14

     .00      8.65    863.25      .00     863.25    863.26      .01       .00       .00     859.00
    1365.     133.      500.     732.      490.      485.     2054.       0.        0.      859.50
     .00       .27      1.03      .36      .080      .045      .080      .000     854.60     38.57
  .000070      0.        0.       0.        0         0         0        .00     922.37    960.94

*SECNO 625.000

3470 ENCROACHMENT STATIONS=     400.0    1400.0  TYPE=     1  TARGET=     -400.000

         VS  A JA 51

   625.00     7.39    863.29      .00       .00     863.29      .00       .03       .00     859.20
    1315.     214.      132.     969.      803.      198.     3185.      60.       15.      858.90
     .59       .27       .67      .30      .085      .040      .070      .035     855.90    400.00
  .000030     600.      625.     760.        0         0         0        .00     954.47   1354.47

*SECNO 1225.000

3470 ENCROACHMENT STATIONS=        .0     690.0  TYPE=     1  TARGET=     689.999

         VS  B JA 52

  1225.00     7.03    863.33      .00       .00     863.34      .01       .05       .00     863.90
    1315.       0.      214.    1101.        0.      153.     1793.     102.       27.      861.00
     .81       .00      1.40      .61      .090      .060      .100      .046     856.30     33.16
  .000424     580.      600.     610.        1         0         0        .00     656.84    690.00
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*SECNO 2195.000

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS=      215.0      365.0  TYPE=     1  TARGET=      150.000

        VS  C JA 53

  2195.00      5.27    863.87       .00       .00    864.41       .54       .81       .26    862.30
    1315.       227.     1085.        3.      137.     169.        2.      119.       32.    862.30
      .85      1.66      6.42      1.08      .090      .045      .080      .050    858.60    215.00
 .005464      620.      970.      580.         3         0         0       .00    125.10    340.10

*SECNO 2372.000
   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=      788.0      825.0  TYPE=     1  TARGET=       37.000
  2372.00      6.59    864.49       .00       .00    865.08       .59       .65       .03    859.00
    1315.        4.     1306.        5.        5.     211.        6.      120.       33.    857.90
      .86       .75      6.19       .86      .090      .040      .080      .049    857.90    788.00
 .002529      227.      177.      207.         2         0         0       .00     37.00    825.00

*SECNO 2376.000

3470 ENCROACHMENT STATIONS=      789.0      824.0  TYPE=     1  TARGET=       35.000
  2376.00      6.60    864.50       .00       .00    865.10       .60       .01       .00    859.00
    1315.        0.     1315.        0.        0.     212.        0.      120.       33. 100000.00
      .86       .00      6.21       .00      .090      .040      .080      .049    857.90    789.00
 .003780        4.        4.        4.         0         0         0       .00     35.00    824.00

*SECNO 2377.000

3370 NORMAL BRIDGE,NRD= 15 MIN ELTRD=  868.70 MAX ELLC=  868.20

        BS  D JA 54    SILVER LAKE ROAD

  2377.00      6.60    864.50       .00       .00    865.10       .60       .00       .00    871.00
    1315.        0.     1315.        0.        0.     211.        0.      120.       33.    871.60
      .86       .00      6.22       .00      .040      .022      .040      .049    857.90    789.00
 .001555        1.        1.        1.         0         0         0       .00     35.00    824.00

*SECNO 2413.000

3370 NORMAL BRIDGE,NRD= 15 MIN ELTRD=  868.70 MAX ELLC=  868.20

  2413.00      6.68    864.58       .00       .00    865.16       .59       .06       .00    871.00
    1315.        0.     1315.        0.        0.     214.        0.      120.       33.    871.60
      .86       .00      6.15       .00      .040      .022      .040      .049    857.90    789.00
 .001504       36.       36.       36.         2         0         0       .00     35.00    824.00

*SECNO 2414.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      869.00 ELREA=      869.00
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 2414.00      6.68    864.58       .00       .00    865.17       .59       .00       .00    859.00
   1315.        0.     1315.        0.        0.      214.        0.      120.       33.    857.90
     .86       .00      6.15       .00      .087      .040      .087      .049    857.90    789.00
 .002450        1.        1.        1.         0         0         0       .00     35.00    824.00


*SECNO 2416.000
   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=     787.0     826.0  TYPE=     1  TARGET=     39.000
 2416.00      6.74    864.64       .00       .00    865.18       .54       .00       .01    859.00
   1315.       11.     1290.       14.       10.      216.       12.      120.       33.    857.90
     .86      1.07      5.97      1.10      .087      .040      .087      .049    857.90    787.00
 .002281        2.        2.        2.         2         0         0       .00     39.00    826.00


*SECNO 2420.000

3470 ENCROACHMENT STATIONS=     783.0     830.0  TYPE=     1  TARGET=     47.000
 2420.00      6.87    864.77       .00       .00    865.22       .45       .01       .03    859.00
   1315.       38.     1228.       49.       26.      221.       31.      120.       33.    857.90
     .86      1.46      5.57      1.56      .087      .040      .087      .048    857.90    783.00
 .001929        4.        4.        4.         2         0         0       .00     47.00    830.00


*SECNO 3515.000

        VS  E JA 55

 3515.00      6.01    866.11       .00       .00    866.15       .03       .80       .13    864.30
   1315.        2.     1313.        0.        5.      886.        0.      134.       37.    867.70
     1.07       .31      1.48       .00      .087      .040      .087      .046    860.10     93.98
 .000391      675.     1095.      675.         2         0         0       .00    308.28    402.26


*SECNO 4885.000

        VS  F JA 56

 4885.00      5.54    867.04       .00       .00    867.34       .30      1.06       .13    866.80
   1315.        0.       965.      350.        0.      190.      276.      155.       44.    863.70
     1.16       .01      5.07      1.27      .087      .040      .087      .045    861.50     45.50
 .002394     1150.     1370.     1100.         2         0         0       .00    199.10    244.60


*SECNO 6695.000

        VS  G JA 57

 6695.00      7.02    868.52       .00       .00    868.54       .03      1.12       .08    864.60
   1315.       102.      345.      868.      182.      151.     1125.      184.       53.    864.70
     1.52       .56      2.28       .77      .087      .040      .087      .045    861.50    175.95
 .000358     1150.     1810.     1210.         3         0         0       .00    420.17    596.12


*SECNO 8495.000
   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
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3470 ENCROACHMENT STATIONS=      657.0     1190.0  TYPE=      1  TARGET=      533.000

        VS  H JA 58

  8495.00      6.46    868.96       .00       .00    868.98       .02       .43       .00    865.40
    1315.       162.      326.      827.      312.      169.     1223.      230.       67.    865.60
     1.91       .52      1.93       .68      .087      .040      .087      .047    862.50    657.00
  .000281     1260.     1800.     1200.         3         0         0       .00    503.54   1160.54

*SECNO 8955.000

3470 ENCROACHMENT STATIONS=      734.0      950.0  TYPE=      1  TARGET=      216.000
  8955.00      5.82    869.12       .00       .00    869.27       .16       .23       .07    866.20
    1315.       162.      648.      505.      134.      150.      368.      240.       70.    866.40
     1.95      1.22      4.31      1.37      .087      .040      .087      .047    863.30    734.00
  .001659      347.      460.      373.         2         0         0       .00    216.00    950.00

*SECNO 9185.000

3470 ENCROACHMENT STATIONS=      302.0      403.0  TYPE=      1  TARGET=      101.000

        VS  I JA 59

  9185.00      5.76    869.46       .00       .00    869.93       .46       .50       .15    865.20
    1315.        82.     1103.      130.       55.      186.       82.      243.       70.    866.50
     1.96      1.48      5.93      1.60      .100      .045      .100      .047    863.70    302.00
  .003574      173.      230.      187.         2         0         0       .00    101.00    403.00

*SECNO 9316.000

3470 ENCROACHMENT STATIONS=      336.0      370.0  TYPE=      1  TARGET=       34.000
  9316.00      6.22    869.92       .00       .00    870.61       .69       .57      .11100000.00
    1315.         0.     1315.        0.        0.      197.        0.      243.       71. 100000.00
     1.97       .00      6.67       .00      .100      .045      .100      .047    863.70    336.00
  .005368      171.      131.      121.         2         0         0       .00     34.00    370.00

*SECNO 9317.000

3370 NORMAL BRIDGE,NRD= 18 MIN ELTRD=  871.50 MAX ELLC=  870.65

        BS  J JA 60    SPICER ROAD

  9317.00      6.27    869.97       .00       .00    870.63       .65       .00       .01    872.00
    1315.         0.     1315.        0.        0.      203.        0.      243.       71.    871.50
     1.97       .00      6.49       .00      .040      .022      .040      .047    863.70    400.00
  .001598        1.        1.        1.         2         0         0       .00     34.00    434.00

*SECNO 9333.000
   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= 18 MIN ELTRD=  871.50 MAX ELLC=  870.65
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 [illegible]      [illegible]   870.01      .00       .00   870.03      .64       .03       .00   872.00
   1315.        0.     1315.       0.        0.     204.       0.     243.       71.    871.50
    1.97       .00      6.44      .00      .040     .022     .040     .047    863.70    400.00
 .001563       16.       16.      16.         1        0        0      .00     34.00    434.00


*SECNO 9334.000

3470 ENCROACHMENT STATIONS=      336.0     370.0  TYPE=      1  TARGET=      34.000
  9334.00      6.30    870.00      .00       .00   870.67      .67       .00       .01100000.00
   1315.        0.     1315.       0.        0.     200.       0.     243.       71. 100000.00
    1.97       .00      6.57      .00      .070     .042     .070     .047    863.70    336.00
 .004481        1.        1.       1.         1        0        0      .00     34.00    370.00


*SECNO 9336.000

3470 ENCROACHMENT STATIONS=      334.0     372.0  TYPE=      1  TARGET=      38.000
  9336.00      6.40    870.10      .00       .00   870.70      .60       .01       .02    865.20
   1315.        5.     1300.      10.        5.     208.       7.     243.       71.    866.50
    1.97      1.03      6.24     1.37      .070     .042     .070     .047    863.70    334.00
 .002967        2.        2.       2.         2        0        0      .00     38.00    372.00


*SECNO 10535.000

3301 HV CHANGED MORE THAN HVINS


3470 ENCROACHMENT STATIONS=      275.0     772.0  TYPE=      1  TARGET=    -275.000

          VS  K JA 61

 10535.00      6.83    871.03      .00       .00   871.04      .01       .16       .18    865.50
    1350.      509.      520.     321.      1190.     638.     751.     278.       77.    865.50
     2.52       .43       .82      .43      .070     .042     .070     .046    864.20    275.00
 .000045      939.     1199.    1109.         3        0        0      .00    475.43    750.43


*SECNO 11745.000

3470 ENCROACHMENT STATIONS=         .0     600.0  TYPE=      1  TARGET=     599.999

          VS  L JA 62

 11745.00      6.58    871.08      .00       .00   871.08      .00       .04       .00    865.40
    1350.      150.      304.     897.      305.     473.    1873.     350.       91.    865.60
     3.16       .49       .64      .48      .035     .042     .050     .046    864.50     62.49
 .000028     1220.     1210.    1190.         2        0        0      .00    537.51    600.00


*SECNO 14395.000
    SECNO      DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
    Q          OLOB      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


          VS  M JA 63

 14395.00      5.49    871.19      .00       .00   871.21      .02       .12       .01    867.50
    1350.      605.      312.     433.      798.     193.     752.     439.      112.    867.20
     3.74       .76      1.62      .58      .070     .045     .100     .049    865.70    163.95
 .000277     1660.     2650.    1600.         2        0        0      .00    530.77    694.72
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*SECNO 15265.000

        VS  N JA 64

 15265.00     6.09   871.59      .00      .00   871.74      .15      .47      .07   867.90
    1475.      176.    1219.     80.     189.     356.     80.     462.     119.   868.30
     3.82      .93     3.43     1.00     .120     .050     .100     .049   865.50   111.43
  .001392     810.     870.     870.       2        0        0      .00   177.92   289.35

*SECNO 16255.000
3280 CROSS SECTION  16255.00 EXTENDED      3.48 FEET

3470 ENCROACHMENT STATIONS=     550.0    1000.0  TYPE=     1  TARGET=     450.000

        VS  O JA 65

 16255.00     6.08   872.28      .00      .00   872.29      .02      .51      .04   868.20
    1475.      326.     571.    578.     619.     377.    922.     489.     126.   868.30
     4.10      .53     1.51      .63     .120     .050     .100     .049   866.20   550.00
  .000282     890.     990.     900.       2        0        0      .00   450.00  1000.00

*SECNO 16476.000
3280 CROSS SECTION  16476.00 EXTENDED      3.53 FEET

3470 ENCROACHMENT STATIONS=     550.0    1000.0  TYPE=     1  TARGET=     450.000
 16476.00     7.33   872.33      .00      .00   872.33      .01      .04      .00   865.60
    1475.      491.     294.    690.     929.     238.    1313.    499.     128.   865.50
     4.18      .53     1.24      .53     .100     .050     .100     .049   865.00   550.00
  .000135     191.     221.     191.       2        0        0      .00   450.00  1000.00

*SECNO 16477.000
3280 CROSS SECTION  16477.00 EXTENDED      3.53 FEET

3470 ENCROACHMENT STATIONS=     550.0    1000.0  TYPE=     1  TARGET=     450.000

        BS  P JA 66    MARSHALL ROAD

 16477.00     7.33   872.33      .00      .00   872.33      .01      .00      .00   865.60
    1475.      491.     294.    690.     929.     238.    1314.    499.     128.   865.50
     4.18      .53     1.24      .53     .040     .020     .040     .049   865.00   550.00
  .000022       1.       1.       1.       0        0        0      .00   450.00  1000.00

SPECIAL BRIDGE

SB   XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
      .00      1.37      3.02       .00     30.67      .00     179.10      .00     865.00    865.00

*SECNO 16494.000

3265 DIVIDED FLOW

3280 CROSS SECTION  16494.00 EXTENDED      .45 FEET
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Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	QLOSS	BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	TWA	LEFT/RIGHT
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	ELMIN	SSTA
								TOPWID	ENDST

PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
873.77	872.33	.00	423.	1043.	179.	178.	870.80	872.10

3470 ENCROACHMENT STATIONS= .0 900.0 TYPE= 1 TARGET= 899.999

16494.00	7.85	872.85	.00	.00	873.05	.20	.71	.00	866.70
1475.	168.	1056.	251.	141.	251.	273.	500.	128.	866.10
4.18	1.19	4.21	.92	.040	.020	.040	.049	865.00	427.17
.000243	17.	17.	17.	2	0	0	.00	431.77	900.00

*SECNO 16495.000

3265 DIVIDED FLOW

3280 CROSS SECTION 16495.00 EXTENDED .45 FEET

3470 ENCROACHMENT STATIONS= .0 900.0 TYPE= 1 TARGET= 899.999

16495.00	7.85	872.85	.00	.00	873.05	.20	.00	.00	866.70
1475.	168.	1056.	250.	141.	251.	273.	500.	128.	866.10
4.18	1.19	4.21	.92	.100	.050	.100	.049	865.00	427.20
.001518	1.	1.	1.	0	0	0	.00	431.62	900.00

*SECNO 17145.000

VS Q JA 67

17145.00	7.76	873.66	.00	.00	873.74	.09	.66	.03	868.80
1475.	535.	930.	10.	624.	322.	16.	512.	133.	869.50
4.27	.86	2.88	.60	.100	.050	.100	.049	865.90	102.77
.000723	660.	650.	640.	2	0	0	.00	311.97	414.74

*SECNO 17925.000

3470 ENCROACHMENT STATIONS= 250.0 1090.0 TYPE= 1 TARGET= -250.000

VS R JA 68

17925.00	8.35	873.95	.00	.00	873.97	.02	.20	.02	868.60
1475.	355.	764.	356.	684.	559.	781.	537.	139.	869.00
4.49	.52	1.37	.46	.100	.050	.100	.049	865.60	250.00
.000144	650.	780.	780.	2	0	0	.00	429.09	679.09

*SECNO 18525.000

3265 DIVIDED FLOW

3280 CROSS SECTION 18525.00 EXTENDED .76 FEET

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3470 ENCROACHMENT STATIONS=      325.0      950.0  TYPE=      1  TARGET=      625.000

        VS  S JA 68A

 18525.00      8.46    874.06       .00       .00    874.10       .04       .12       .01    868.80
    1475.      330.     1060.      85.      512.      579.      203.      560.      145.    870.20
     4.60       .65      1.83       .42      .100      .050      .100      .049    865.60    325.00
  .000287      640.      600.      610.         2         0         0       .00    352.90    950.00

*SECNO 18955.000
3280 CROSS SECTION  18955.00 EXTENDED       .52 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=      450.0     1150.0  TYPE=      1  TARGET=      700.000

        VS  T JA 69    DOWNSTREAM SANDY BOTTOM LAKE

 18955.00     30.01    874.11       .00       .00    874.11       .00       .00       .01    868.50
    1475.       83.     1364.      29.     1215.     4050.      667.      588.      148.    868.50
     4.94       .07       .34       .04      .100      .050      .100      .049    844.10    450.00
  .000002      170.      430.      200.         0         0         0       .00    700.00   1150.00

CCHV=     .300 CEHV=     .500
*SECNO 20955.000

                FIELD  SECTION 70      SEC. U

                USE ENERGY GRADE OF SEC. T (16775) AS STARTING WSEL

 20955.00      7.71    874.11       .00       .00    874.12       .01       .00       .00    868.60
    1065.      350.      345.     370.     1023.      321.     1076.      589.      148.    868.60
     4.94       .34      1.07       .34      .110      .047      .110      .049    866.40     62.30
  .000083       10.       10.       10.         0         0         0       .00    568.39    630.69

*SECNO 21755.000

3470 ENCROACHMENT STATIONS=      125.0      750.0  TYPE=      1  TARGET=      625.000

                FIELD  SECTION 71      SEC. V

 21755.00      8.36    874.16       .00       .00    874.17       .01       .05       .00    869.10
    1065.      156.      482.     427.      715.      550.     1664.      639.      159.    868.80
     5.36       .22       .88       .26      .115      .045      .115      .049    865.80    125.00
  .000050      500.      800.     1000.         1         0         0       .00    625.00    750.00

*SECNO 22655.000

3470 ENCROACHMENT STATIONS=      150.0      950.0  TYPE=      1  TARGET=      800.000

                FIELD  SECTION 72      SEC. W

 22655.00      8.40    874.20       .00       .00    874.20       .00       .03       .00    868.70
    1065.      378.      342.     345.     1813.      502.     1779.      705.      172.    868.90
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   .00      .21      .60      .19      .113     .043     .113     .049   865.00   150.00
 .000029    900.     900.     750.       2        0        0      .00   800.00   950.00

*SECNO 24555.000

3470 ENCROACHMENT STATIONS=     250.0    1175.0  TYPE=     1  TARGET=    -250.000

                FIELD  SECTION 73     SEC. X

                USE ENERGY GRADE OF SEC. W (20475) AS WSEL

 24555.00     8.80   874.20      .00      .00   874.20      .00      .00      .00   869.00
    1065.     774.     164.     128.    3382.     268.     479.     706.     173.   869.00
     6.03      .23      .61      .27     .090     .042     .060     .049   865.40   250.00
  .000020      10.      10.      10.        0        0        0      .00   805.72  1055.72

*SECNO 25315.000
   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=     800.0    1330.0  TYPE=     1  TARGET=    -800.000

                FIELD  SECTION 74     SEC. Y

 25315.00     8.23   874.23      .00      .00   874.25      .01      .04      .01   872.50
    1065.     480.     545.      40.    1223.     442.      91.     778.     188.   871.30
     6.37      .39     1.23      .44     .100     .045     .060     .048   866.00   800.00
  .000118    1150.     760.     750.        1        0        0      .00   446.06  1246.06

*SECNO 26315.000

3470 ENCROACHMENT STATIONS=     610.0     674.0  TYPE=     1  TARGET=      64.000

                FIELD  SECTION 75     SEC. Z

 26315.00     8.31   874.41      .00      .00   874.50      .09      .22      .04100000.00
    1065.       0.    1065.       0.       0.     443.       0.     805.     194. 100000.00
     6.48      .00     2.40      .00     .090     .045     .080     .048   866.10   610.00
  .000496    1100.    1000.     900.        2        0        0      .00    64.00   674.00

*SECNO 26404.000

3301 HV CHANGED MORE THAN HVINS

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=     875.10 ELREA=     875.10

 26404.00     5.97   873.87      .00      .00   875.27     1.40      .11      .66   867.90
    1065.       0.    1065.       0.       0.     112.       0.     805.     194.   868.10
     6.49      .00     9.51      .00     .090     .045     .080     .048   867.90   531.00
  .007787      89.      89.      89.        2        0        0      .00    19.00   550.00

*SECNO 26405.000

3370 NORMAL BRIDGE,NRD= 14 MIN ELTRD=  875.10 MAX ELLC=  875.00
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3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      875.10 ELREA=      875.10

 26405.00      5.97    873.87       .00       .00    875.28      1.41       .01       .00    877.00
    1065.        0.     1065.        0.        0.     112.        0.      805.      194.    877.30
     6.49       .00      9.52       .00      .040      .022      .040      .048    867.90    531.00
  .005457        1.        1.        1.         0         0         0       .00     19.00    550.00


*SECNO 26436.000

3370 NORMAL BRIDGE,NRD= 14 MIN ELTRD=  875.10 MAX ELLC=  875.00


              FIELD SECTION 76 -  DOANE ROAD        SEC. AA

 26436.00      6.34    874.24       .00       .00    875.48      1.25       .16       .05    877.00
    1065.        0.     1065.        0.        0.     119.        0.      805.      194.    877.30
     6.49       .00      8.96       .00      .040      .022      .040      .048    867.90    531.00
  .004664       31.       31.       31.         2         0         0       .00     19.00    550.00


*SECNO 26437.000
   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


3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      875.10 ELREA=      875.10

 26437.00      6.34    874.24       .00       .00    875.49      1.24       .01       .00    867.90
    1065.        0.     1065.        0.        0.     119.        0.      805.      194.    868.10
     6.49       .00      8.95       .00      .100      .047      .100      .048    867.90    531.00
  .006947        1.        1.        1.         0         0         0       .00     19.00    550.00


*SECNO 26460.000

3301 HV CHANGED MORE THAN HVINS


3470 ENCROACHMENT STATIONS=      610.0      675.0  TYPE=      1  TARGET=      65.000
 26460.00      7.87    875.77       .00       .00    875.87       .10       .04       .34100001.80
    1065.        0.     1065.        0.        0.     419.        0.      806.      194. 100001.80
     6.49       .00      2.54       .00      .100      .047      .100      .048    867.90    610.00
  .000649       23.       23.       23.         3         0         0       .00     65.00    675.00


*SECNO 27160.000

              FIELD  SECTION 77      SEC. AB

 27160.00      7.86    876.26       .00       .00    876.33       .07       .46       .01    871.70
    1065.      437.      561.       67.      500.     194.       94.      815.      196.    872.20
     6.59       .87      2.89       .71      .110      .047      .095      .048    868.40     37.77
  .000681      650.      700.      530.         3         0         0       .00    217.50    255.27


*SECNO 28660.000

3470 ENCROACHMENT STATIONS=      200.0     1280.0  TYPE=      1  TARGET=     -200.000

              FIELD  SECTION 78      SEC. AC
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 [illegible]   [illegible]   [illegible]   .00   .00   [illegible]   .01   .57   .02   [illegible]
   1065.   594.   188.   283.   1342.   122.   663.   848.   207.   872.50
    7.08    .44   1.54    .43    .110   .043   .095   .049  869.20  200.00
 .000193   750.  1500.  1400.       2      0      0    .00  702.57  902.57


*SECNO 30110.000

          OVERBANK=1/3 OF SEC.AC; CHANNEL=SAME AS SEC.AC; ELEV=INCREASE 1.5'

 30110.00    6.44  877.14    .00    .00  877.33    .19    .52    .09  874.00
   1065.    414.    499.   152.   318.    101.   111.   877.   218.   874.00
    7.18    1.30    4.94   1.36   .110    .045   .095   .049  870.70   30.71
 .002811    750.   1450.  1250.      2       0      0    .00  237.30  268.01


*SECNO 30760.000
   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=     175.0     775.0  TYPE=     1  TARGET=     600.000

                FIELD  SECTION 79     SEC. AD

 30760.00    6.39  877.79    .00    .00  877.80    .02    .42    .05  873.80
   1065.    234.    303.   528.   407.    167.  1041.   892.   223.   873.80
    7.36     .57    1.82    .51   .110    .045   .095   .049  871.40  175.00
 .000319    500.    650.   600.      2       0      0    .00  600.00  775.00


*SECNO 32960.000

3470 ENCROACHMENT STATIONS=     250.0    1250.0  TYPE=     1  TARGET=    1000.000

                FIELD  SECTION 80     SEC. AE

 32960.00    4.76  878.16    .00    .00  878.16    .00    .35    .00  875.00
   1095.    128.     99.   868.   324.     82.  2120.   952.   245.   875.10
    8.19     .40    1.20    .41   .110    .045   .095   .050  873.40  250.00
 .000199   2350.   2200.   950.      3       0      0    .00 1000.00 1250.00


*SECNO 34860.000

3470 ENCROACHMENT STATIONS=     122.0     600.0  TYPE=     1  TARGET=    -122.000

                FIELD  SECTION 81     SEC. AF

 34860.00    3.30  878.80    .00    .00  879.18    .38    .83    .19  877.90
   1095.    476.    517.   102.   204.     76.    55.   989.   261.   877.90
    8.27    2.34    6.82   1.86   .110    .045   .095   .051  875.50  122.00
 .015452   1000.   1900.  1100.      3       0      0    .00  219.60  341.60


*SECNO 35010.000

3470 ENCROACHMENT STATIONS=     168.0     298.0  TYPE=     1  TARGET=     130.000
 35010.00    5.45  879.65    .00    .00  879.80    .14    .54    .07  876.60
   1095.    424.    588.    83.   296.    151.    60.   990.   261.   876.60
    8.28    1.43    3.89   1.38   .110    .045   .095   .051  874.20  168.00
 .001998    100.    150.   100.      2       0      0    .00  130.00  298.00
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SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.00	1.58	2.80	.00	16.30	.00	76.50	.00	874.20	874.20

*SECNO 35022.000

3301 HV CHANGED MORE THAN HVINS

PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
884.68	881.03	.00	484.	619.	77.	77.	878.90	879.80

FIELD SECTION 82 - PRIVATE DRIVE SEC. AG

35022.00	6.22	880.42	.00	.00	881.26	.84	1.47	.00	876.10
1095.	102.	884.	109.	50.	109.	46.	990.	261.	876.50
8.28	2.02	8.14	2.36	.040	.022	.040	.051	874.20	264.30
.001677	12.	12.	12.	4	0	0	.00	130.36	394.66

*SECNO 35622.000

3301 HV CHANGED MORE THAN HVINS

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

FIELD SECTION 83 SEC. AH

35622.00	7.17	882.17	.00	.00	882.23	.06	.73	.23	877.80
1095.	558.	377.	159.	519.	122.	175.	997.	263.	878.70
8.37	1.08	3.08	.91	.100	.047	.100	.051	875.00	49.85
.001029	550.	600.	450.	3	0	0	.00	255.30	305.15

*SECNO 35947.000

3301 HV CHANGED MORE THAN HVINS

35947.00	6.85	882.35	.00	.00	883.20	.85	.58	.39	878.20
1095.	130.	844.	121.	59.	101.	71.	999.	264.	878.80
8.38	2.20	8.36	1.71	.100	.047	.100	.051	875.50	189.98
.007449	175.	325.	225.	2	0	0	.00	117.76	307.74

*SECNO 36110.000

36110.00	7.72	883.42	.00	.00	884.18	.75	.95	.03	878.30
1095.	122.	829.	144.	56.	105.	86.	1000.	265.	878.80
8.39	2.17	7.93	1.67	.100	.047	.100	.051	875.70	207.60
.005523	88.	163.	113.	3	0	0	.00	109.45	317.05

*SECNO 36142.000

36142.00	7.[illegible]8	883.58	.00	.00	884.34	.76	.16	.00	878.40

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
8.39	2.20	7.98	1.70	.100	.047	.100	.051	875.70	211.33
.005547	18.	32.	23.	0	0	0	.00	106.98	318.31

*SECNO 36207.000

36207.00	8.10	883.90	.00	.00	884.68	.78	.33	.01	878.40
1095.	118.	824.	154.	52.	102.	87.	1000.	265.	878.90
8.39	2.24	8.09	1.77	.100	.047	.100	.051	875.80	216.58
.005506	35.	65.	45.	2	0	0	.00	101.22	317.79

*SECNO 36272.000

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
36272.00	8.27	884.17	.00	.00	885.10	.93	.35	.07	878.50
1095.	112.	856.	127.	49.	99.	77.	1001.	265.	878.90
8.39	2.29	8.67	1.65	.100	.047	.100	.051	875.90	222.23
.006238	35.	65.	45.	0	0	0	.00	95.39	317.62

*SECNO 36273.000

36273.00	8.60	884.50	.00	.00	885.18	.68	.00	.07	878.50
1095.	134.	790.	171.	56.	103.	99.	1001.	265.	878.90
8.39	2.39	7.67	1.73	.040	.022	.040	.051	875.90	220.54
.001013	1.	1.	1.	3	0	0	.00	106.45	326.99

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.00	1.59	2.80	.00	7.80	.00	53.84	.00	875.90	875.90

*SECNO 36287.000
PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
894.71	886.25	.00	603.	492.	54.	54.	882.80	885.10

FIELD SECTION 84 - PRIVATE DRIVE SEC. AI

36287.00	10.48	886.38	.00	.00	886.56	.18	1.38	.00	878.50
1095.	171.	580.	344.	114.	127.	286.	1001.	265.	878.90
8.40	1.50	4.55	1.20	.040	.022	.040	.051	875.90	204.54
.000268	14.	14.	14.	2	0	6	.00	183.93	388.48

*SECNO 36288.000

36288.00	10.46	886.36	.00	.00	886.58	.21	.00	.02	878.50
1095.	148.	615.	331.	114.	127.	285.	1001.	265.	878.90
8.40	1.30	4.83	1.16	.100	.045	.090	.051	875.90	204.61
.001265	1.	1.	1.	1	0	0	.00	183.59	388.20

*SECNO 37098.000

FIELD SECTION 85 SEC J

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 37098.00      8.98    886.98       .00       .00    887.00       .02       .36       .06    883.40
    1095.        9.      270.      816.       28.      149.     1065.      1016.      269.    881.20
     8.61       .34      1.81       .77      .100      .045      .090      .051    878.00     27.47
  .000244      750.      810.      750.         2         0         0       .00    247.47    274.93

*SECNO 37858.000
   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=      126.0      168.0  TYPE=      1  TARGET=      42.000
 37858.00      6.50    887.20       .00       .00    887.64       .44       .43       .21    882.30
    1095.       25.     1058.       11.       19.      195.       10.      1028.      271.    884.00
     8.65      1.33      5.42      1.17      .100      .045      .090      .051    880.70    126.00
  .002806      660.      760.      700.         2         0         0       .00     42.00    168.00

*SECNO 37898.000

3301 HV CHANGED MORE THAN HVINS

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      893.90 ELREA=      893.90

 37898.00      6.19    886.99       .00       .00    888.19      1.20       .17       .38    881.60
    1095.        0.     1095.        0.        0.      124.        0.      1028.      271.    880.80
     8.65       .00      8.80       .00      .100      .045      .090      .051    880.80    132.00
  .007060       40.       40.       40.         2         0         0       .00     22.00    154.00

*SECNO 37899.000

3370 NORMAL BRIDGE,NRD= 10 MIN ELTRD=  893.90 MAX ELLC=  894.30

 37899.00      6.19    886.99       .00       .00    888.19      1.20       .01       .00    896.10
    1095.        0.     1095.        0.        0.      125.        0.      1028.      271.    895.50
     8.65       .00      8.79       .00      .040      .022      .040      .051    880.80    132.00
  .004388        1.        1.        1.         0         0         0       .00     22.00    154.00

*SECNO 37942.000

3370 NORMAL BRIDGE,NRD= 10 MIN ELTRD=  893.90 MAX ELLC=  894.30

                FIELD SECTION 85 -   RUSHTON ROAD      SEC. AK

 37942.00      6.55    887.35       .00       .00    888.41      1.06       .17       .04    896.10
    1095.        0.     1095.        0.        0.      132.        0.      1028.      271.    895.50
     8.65       .00      8.27       .00      .040      .022      .040      .051    880.80    132.00
  .003732       43.       43.       43.         2         0         0       .00     22.00    154.00

*SECNO 37943.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      893.90 ELREA=      893.90

 37943.00      6.55    887.35       .00       .00    888.41      1.06       .00       .00    881.60
    1095.        0.     1095.        0.        0.      132.        0.      1028.      271.    880.80
     8.65       .00      8.27       .00      .080      .040      .090      .051    880.80    132.00
  .004536        1.        1.        1.         0         0         0       .00     22.00    154.00
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*SECNO 37953.000

3301 HV CHANGED MORE THAN HVINS

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

3470 ENCROACHMENT STATIONS=      126.0      168.0  TYPE=      1  TARGET=      42.000
 37953.00      7.55    888.35       .00       .00    888.66       .31       .02       .23    882.40
    1095.       27.     1057.       11.       23.      232.       13.     1028.      271.    884.10
     8.65      1.18      4.55       .85      .080      .040      .090      .051    880.80    126.00
  .001245       10.       10.       10.         3         0         0       .00     42.00    168.00

*SECNO 38123.000

                FIELD  SECTION 86      SEC. AL

 38123.00      8.27    888.77       .00       .00    888.82       .05       .09       .08    882.10
    1110.      182.      613.      316.      191.      257.      420.     1030.      271.    883.80
     8.68       .95      2.38       .75      .080      .040      .090      .051    880.50     89.82
  .000296      200.      170.      100.         2         0         0       .00    181.38    271.20

*SECNO 39313.000

                FIELD  SECTION 87      SEC. AM

 39313.00      6.37    889.37       .00       .00    889.61       .24       .69       .10    885.40
    1110.      112.      616.      382.       69.      120.      248.     1045.      275.    884.30
     8.76      1.62      5.14      1.54      .095      .045      .100      .051    883.00    133.18
  .002447      900.     1190.      900.         2         0         0       .00    142.91    276.10

*SECNO 40883.000

3265 DIVIDED FLOW

                FIELD  SECTION 88      SEC. AN

 40883.00      5.66    890.46       .00       .00    890.47       .01       .79       .07    888.00
    1110.      322.      103.      685.      581.       73.     1172.     1076.      285.    886.60
     9.31       .55      1.41       .58      .095      .047      .095      .051    884.80     57.20
  .000271      800.     1570.     1300.         3         0         0       .00    596.25    920.67

*SECNO 42053.000

                FIELD  SECTION 89      SEC. AO

 42053.00      4.39    890.79       .00       .00    890.82       .02       .34       .01    888.70
    1110.       26.      159.      925.       49.       66.     1139.     1101.      294.    888.70
     9.50       .54      2.41       .81      .100      .047      .100      .051    886.40     36.11
  .001041     1150.     1170.      550.         3         0         0       .00    596.28    632.39

*SECNO 42613.000

3265 DIVIDED 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

3470 ENCROACHMENT STATIONS=      300.0      950.0  TYPE=      1  TARGET=      650.000

                 FIELD  SECTION 90      SEC. AP

 42613.00      5.05    891.45       .00        .00    891.53       .08        .69        .03    888.90
    1110.       491.      300.     320.       371.       75.      334.      1110.       299.    889.20
     9.56      1.32      3.98       .96       .100      .047      .100       .052     886.40    300.00
  .002609      550.      560.     350.          2         0         0        .00     430.49    950.00

*SECNO 43433.000

3470 ENCROACHMENT STATIONS=          .0      400.0  TYPE=      1  TARGET=      399.999
 43433.00      5.42    893.72       .00        .00    894.01       .29       2.37        .10    891.10
    1110.       100.      650.     360.        90.      118.      273.      1120.       305.    890.70
     9.62      1.11      5.50      1.32       .100      .047      .100       .052     888.30    130.84
  .003895      699.      820.     699.          2         0         0        .00     269.16    400.00

*SECNO 43434.000

3470 ENCROACHMENT STATIONS=          .0      400.0  TYPE=      1  TARGET=      399.999
 43434.00      5.42    893.72       .00        .00    894.01       .29        .00        .00    889.60
    1110.       153.      563.     394.        96.       96.      241.      1120.       305.    889.60
     9.62      1.59      5.84      1.63       .040      .022      .040       .052     888.30    130.94
  .001173        1.         1.        1.          0         0         0        .00     269.06    400.00

SPECIAL BRIDGE

SB   XK        XKOR       COFQ       RDLEN      BWC        BHP        BAREA      SS         ELCHD      ELCHD
       .00      1.88       2.85        .00      12.57        .00      50.27        .00     888.30     888.30

*SECNO 43461.000
PRESSURE AND WEIR FLOW

 EGPRS      EGLWC       H3       QWEIR       QPR       BAREA    TRAPEZOID      ELLC      ELTRD
                                                                  AREA
  907.95    894.01      .00        933.      179.        50.       50.      892.30    892.40

3470 ENCROACHMENT STATIONS=          .0      400.0  TYPE=      1  TARGET=      399.999

                 FIELD SECTION 90A -  PRIVATE DRIVE      SEC. AO

 43461.00      5.55    893.85       .00        .00    894.09       .24        .08        .00    889.60
    1110.       158.      537.     416.       106.       99.      265.      1121.       305.    889.60
     9.62      1.49      5.41      1.57       .040      .022      .040       .052     888.30    127.47
  .000972       27.       27.       27.          2         0         6        .00     272.53    400.00

*SECNO 43462.000

3470 ENCROACHMENT STATIONS=          .0      400.0  TYPE=      1  TARGET=      399.999
 43462.00      5.54    893.84       .00        .00    894.10       .26        .00        .01    891.10
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     9.62      1.04      5.29      1.25      .100      .045      .100      .052    888.30    127.64
 .003193        1.        1.        1.         0         0         0       .00    272.36    400.00

*SECNO 43812.000
   SECNO     DEPTH     CWSEL     CRTWS     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      310.0  TYPE=      1  TARGET=      100.000

                FIELD  SECTION 91      SEC. AR

 43812.00      5.84    895.04       .00       .00    895.40       .37      1.25       .05    891.70
    1110.      309.      490.      311.      130.      72.      137.      1123.      306.    892.00
     9.64      2.37      6.82      2.28      .100      .045      .100      .052    889.20    210.00
 .005837      272.      350.      222.         2         0         0       .00    100.00    310.00

*SECNO 43902.000

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS=      230.0      285.0  TYPE=      1  TARGET=       55.000
 43902.00      5.69    895.44       .00       .00    896.53      1.09       .77       .36    892.25
    1110.      213.      710.      186.       63.      70.       58.      1124.      306.    892.55
     9.64      3.38     10.19      3.21      .100      .045      .100      .052    889.75    230.00
 .013575       90.       90.       90.         0         0         0       .00     55.00    285.00

*SECNO 43925.000

3470 ENCROACHMENT STATIONS=      236.0      279.0  TYPE=      1  TARGET=       43.000
 43925.00      5.67    895.56       .00       .00    897.13      1.57       .36       .24    892.39
    1110.      163.      805.      142.       44.      69.       40.      1124.      306.    892.69
     9.64      3.72     11.61      3.53      .100      .045      .100      .052    889.89    236.00
 .017776       23.       23.       23.         2         0         0       .00     43.00    279.00

*SECNO 43947.000

3301 HV CHANGED MORE THAN HVINS

   SECNO     DEPTH     CWSEL     CRTWS     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

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      241.0      273.0  TYPE=      1  TARGET=       32.000
 43947.00      5.80    895.83    895.83       .00    897.94      2.12       .42       .27    892.53
    1110.      113.      910.       86.       30.      71.       24.      1124.      306.    892.83
     9.65      3.84     12.77      3.60      .100      .045      .100      .052    890.03    241.00
 .020719       22.       22.       22.         2         8         0       .00     32.00    273.00

*SECNO 43969.000
   SECNO     DEPTH     CWSEL     CRTWS     WSELK     EG        HV        HL        OLOSS   BANK ELEV
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Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA    LEFT/RIGHT
TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN       SSTA
SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID      ENDST

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      246.0      267.0  TYPE=      1  TARGET=      21.000
 43969.00      6.27     896.44     896.44       .00     899.04      2.60        .45        .24     892.67
    1110.       49.      1044.        17.       15.        78.        7.      1124.       306.     892.97
     9.65      3.26      13.33       2.46      .100       .045      .100       .051     890.17     246.00
  .019898       22.        22.         22.         3          8         0        .00      21.00     267.00


*SECNO 43981.000
SECNO      DEPTH      CWSEL      CRTWS      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

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      250.0      265.0  TYPE=      1  TARGET=      15.000
 43981.00      6.56     896.80     896.80       .00     899.60      2.80        .30        .10     892.74
    1110.        0.      1110.         0.        0.        83.        0.      1124.       306. 100000.00
     9.65       .00      13.43        .00      .100       .045      .100       .051     890.24     250.00
  .031788       12.        12.         12.         2          8         0        .00      15.00     265.00


*SECNO 43987.000
SECNO      DEPTH      CWSEL      CRTWS      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


3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      251.5      263.5  TYPE=      1  TARGET=      12.000
 43987.00      7.16     897.43     897.43       .00     900.66      3.24        .21        .22100000.00
    1110.        0.      1110.         0.        0.        77.        0.      1124.       306. 100000.00
     9.65       .00      14.44        .00      .100       .045      .100       .051     890.27     251.50
  .039163        6.         6.          6.        20          8         0        .00      12.00     263.50


*SECNO 43992.000
SECNO      DEPTH      CWSEL      CRTWS      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


3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      252.5      262.5  TYPE=      1  TARGET=      10.000
 43992.00      7.83     898.13     898.13       .00     901.78      3.65        .22        .21100000.00
    1110.        0.      1110.         0.        0.        72.        0.      1124.       306. 100000.00
     9.65       .00      15.34        .00      .100       .045      .100       .051     890.30     252.50
  .048317        5.         5.          5.        20          8         0        .00      10.00     262.50
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SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.00	1.69	2.85	.00	8.53	.00	74.17	.00	890.30	890.30

*SECNO 44032.000

3301 HV CHANGED MORE THAN HVINS

PRESSURE FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
904.01	901.41	.00	0.	1110.	74.	74.	899.00	910.90

FIELD SECTION 92 - CHESAPEAKE & OHIO RAILROAD SEC. AS

44032.00	12.43	902.73	.00	.00	904.01	1.28	2.22	.00	910.90
1110.	0.	1110.	0.	0.	122.	0.	1124.	306.	910.90
9.65	.00	9.07	.00	.040	.022	.040	.051	890.30	500.00
.003305	40.	40.	40.	3	0	0	.00	10.00	510.00

*SECNO 44033.000
WATER EL=XS CARD= 903.300

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 911.00 ELREA= 911.00

44033.00	13.00	903.30	.00	.00	904.47	1.17	.00	.03	890.40
1110.	0.	1110.	0.	0.	128.	0.	1124.	306.	890.80
9.65	.00	8.67	.00	.040	.022	.040	.051	890.30	500.00
.000551	1.	1.	1.	0	0	0	.00	10.00	510.00

00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: GREEN OAK TOWNSHIP ~~100 YEAR NATURAL~~

3) WATERCOURSE: DAVIS CREEK

4) DOCUMENT TYPE: 100-YEAR NATURAL

00BREAK00

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*************************************************
 HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
 ERROR CORR -  01,02,03
 MODIFICATION -  50,51,52,53
*************************************************


C
T1      GREEN OAK TOWNSHIP FIS  J & A  FILE NO. 11259-00
T2      100-YEAR FLOOD;  NATURAL FLOODWAY;  FILE NAME: DAVISHEN
T3      DAVIS CREEK              HURON RIVER TO C & O RAILROAD   (A-AS)

J1  ICHECK     INQ       NINV      IDIR      STRT     METRIC    HVINS     D       WSEL      FQ

     -1.        4.        0.        0.   .000000      .00       .0       0.   863.250    .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH      FN      ALLDC     IBW     CHNIM    ITRACE

    -1.000     .000    -1.000     .000      .000     .000     .000     .000     .000     .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    38.000   39.000   40.000   41.000   42.000   43.000    1.000    8.000   10.000   12.000

     3.000    4.000   25.000     .000     .000     .000     .000     .000     .000     .000

QT     4.000  827.000 1178.000 1365.000 2080.000     .000     .000     .000     .000     .000
NC     .080     .080     .045     .300     .500     .000     .000     .000     .000     .000


        VS    JA 14

X1      .000   22.000  290.000  355.000     .000     .000     .000     .000     .000     .000
GR   866.800     .000  864.000   10.000  861.900   90.000  861.500  190.000  859.000  290.000
GR   857.500  295.000  856.500  300.000  855.600  310.000  855.200  320.000  854.800  330.000
GR   855.300  340.000  854.600  350.000  859.500  355.000  859.500  390.000  859.500  490.000
GR   859.600  590.000  859.700  690.000  859.800  790.000  860.200  890.000  861.800  950.000
GR   867.100  990.000  874.700 1040.000     .000     .000     .000     .000     .000     .000
QT     4.000  595.000 1040.000 1315.000 2080.000     .000     .000     .000     .000     .000
NC     .085     .070     .040     .000     .000     .000     .000     .000     .000     .000


        VS  A JA 51

X1    625.000   28.000  568.000  600.000  600.000  760.000  625.000     .000     .000     .000
X3      .000     .000     .000  400.000     .000     .000     .000     .000     .000     .000
GR   883.800     .000  869.300  100.000  864.400  142.000  862.800  200.000  860.600  300.000
GR   858.900  400.000  858.300  500.000  858.100  520.000  858.200  540.000  859.200  568.000
GR   857.600  573.000  857.300  578.000  856.800  582.000  856.700  587.000  855.900  594.000
GR   856.700  597.000  858.900  600.000  858.800  700.000  858.600  800.000  858.900  900.000
GR   859.500 1000.000  859.700 1056.000  857.700 1078.000  859.000 1100.000  859.200 1200.000
GR   859.300 1300.000  859.800 1340.000  874.300 1400.000     .000     .000     .000     .000
NC     .090     .100     .060     .000     .000     .000     .000     .000     .000     .000


        VS  B JA 52

X1   1225.000   19.000   33.000   61.000  580.000  610.000  600.000     .000     .000     .000
GR   875.200     .000  863.900   33.000  856.700   35.000  856.300   38.000  856.400   41.000
GR   85 .600   47.000  858.200   52.000  858.800   55.000  861.000   61.000  860.400  100.000
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[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
GR	860.500	700.000	861.400	767.000	868.100	800.000	877.100	845.000	.000	.000
NC	.090	.080	.045	.000	.000	.000	.000	.000	.000	.000

VS C JA 53

X1	2195.000	13.000	300.000	337.000	620.000	580.000	970.000	.000	.000	.000
X3	.000	.000	.000	215.000	.000	365.000	.000	.000	.000	.000
GR	870.700	.000	874.700	35.000	863.700	100.000	862.200	200.000	862.300	300.000
GR	859.200	305.000	859.200	310.000	858.800	320.000	858.600	325.000	859.000	330.000
GR	859.200	335.000	862.300	337.000	876.500	365.000	.000	.000	.000	.000
NC	.090	.080	.040	.000	.000	.000	.000	.000	.000	.000

X1	2372.000	21.000	789.000	824.000	227.000	207.000	177.000	.000	.000	.000
X3	.000	.000	.000	788.000	.000	825.000	.000	.000	.000	.000
GR	877.000	.000	873.200	99.000	870.300	197.000	868.800	296.000	868.900	394.000
GR	868.800	493.000	868.700	592.000	869.100	690.000	870.500	765.000	859.000	789.000
GR	858.800	794.000	858.800	799.000	858.700	804.000	858.400	809.000	858.200	814.000
GR	857.900	819.000	857.900	824.000	872.000	850.000	872.700	888.000	875.200	986.000
GR	879.000	1085.000	.000	.000	.000	.000	.000	.000	.000	.000

X1	2376.000	.000	.000	.000	4.000	4.000	4.000	.000	.000	.000
X3	.000	.000	.000	789.000	.000	824.000	.000	.000	.000	.000
NC	.040	.040	.022	.000	.000	.000	.000	.000	.000	.000

BS D JA 54 SILVER LAKE ROAD

X1	2377.000	21.000	789.000	824.000	1.000	1.000	1.000	.000	.000	.000
BT	15.000	.000	877.000	.000	99.000	873.200	.000	197.000	870.300	.000
BT	296.000	868.800	.000	394.000	868.900	.000	493.000	868.800	.000	592.000
BT	868.700	.000	690.000	869.100	.000	789.000	871.000	.000	789.000	871.000
BT	867.700	824.000	871.600	868.200	824.000	871.600	.000	888.000	872.700	.000
BT	986.000	875.200	.000	1085.000	879.000	.000	.000	.000	.000	.000
GR	877.000	.000	873.200	99.000	870.300	197.000	868.800	296.000	868.900	394.000
GR	868.800	493.000	868.700	592.000	869.100	690.000	871.000	789.000	859.000	789.000
GR	858.800	794.000	858.800	799.000	858.700	804.000	858.400	809.000	858.200	814.000
GR	857.900	819.000	857.900	824.000	871.600	824.000	872.700	888.000	875.200	986.000
GR	879.000	1085.000	.000	.000	.000	.000	.000	.000	.000	.000

X1	2413.000	.000	.000	.000	36.000	36.000	36.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.087	.087	.040	.000	.000	.000	.000	.000	.000	.000

X1	2414.000	21.000	789.000	824.000	1.000	1.000	1.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	869.000	869.000	.000
GR	877.000	.000	873.200	99.000	870.300	197.000	868.800	296.000	868.900	394.000
GR	868.800	493.000	868.700	592.000	869.100	690.000	870.500	765.000	859.000	789.000
GR	858.800	794.000	858.800	799.000	858.700	804.000	858.400	809.000	858.200	814.000
GR	857.900	819.000	857.900	824.000	872.000	850.000	872.700	888.000	875.200	986.000
GR	879.000	1085.000	.000	.000	.000	.000	.000	.000	.000	.000

X1	2416.000	.000	.000	.000	2.000	2.000	2.000	.000	.000	.000
X3	.000	.000	.000	787.000	.000	826.000	.000	.000	.000	.000

X1	2420.000	.000	.000	.000	4.000	4.000	4.000	.000	.000	.000
X3	.000	.000	.000	783.000	.000	830.000	.000	.000	.000	.000

VS E JA 55

X1	3515.000	24.000	100.000	403.000	675.000	675.000	1095.000	.000	.000	.000
GR	882.800	.000	870.300	80.000	864.300	100.000	862.100	102.000	860.100	105.000
GR	860.200	112.000	860.200	117.000	860.400	125.000	861.200	127.000	864.600	133.000
GR	865.900	173.000	864.900	200.000	863.300	222.000	862.500	285.000	862.300	300.000
GR	864.400	365.000	860.200	370.000	860.100	375.000	860.400	382.000	861.600	392.000
GR	861.200	400.000	867.700	403.000	878.500	417.000	881.000	440.000	.000	.000

VS F JA 56

X1	4805.000	19.000	46.000	83.000	1150.000	1100.000	1370.000	.000	.000	.000
GR	894.900	.000	883.400	20.000	869.700	40.000	866.800	46.000	863.200	48.000
GR	861.900	51.000	861.600	58.000	861.600	65.000	861.600	73.000	861.500	80.000
GR	861.500	82.000	863.700	83.000	864.700	100.000	865.700	200.000	866.000	230.000
GR	871.000	300.000	873.300	355.000	879.300	390.000	886.600	450.000	.000	.000

VS G JA 57

X1	6695.000	21.000	263.000	287.000	1150.000	1210.000	1810.000	.000	.000	.000
GR	886.400	.000	878.500	62.000	876.200	100.000	874.300	163.000	867.600	178.000
GR	867.400	200.000	864.600	263.000	862.400	265.000	861.700	270.000	861.800	275.000
GR	861.500	278.000	861.700	281.000	863.100	285.000	864.700	287.000	865.500	300.000
GR	864.100	400.000	864.800	500.000	865.700	590.000	870.300	600.000	876.100	618.000
GR	881.200	675.000	.000	.000	.000	.000	.000	.000	.000	.000

VS H JA 58

X1	8495.000	25.000	790.000	820.000	1260.000	1200.000	1800.000	.000	.000	.000
X3	.000	.000	.000	657.000	.000	1190.000	.000	.000	.000	.000
GR	894.200	.000	888.200	10.000	882.200	60.000	878.300	100.000	877.000	200.000
GR	874.500	300.000	871.600	400.000	869.700	500.000	868.300	600.000	867.100	700.000
GR	865.400	790.000	864.400	793.000	862.800	796.000	862.700	800.000	862.500	803.000
GR	862.800	809.000	863.100	813.000	863.300	816.000	864.400	818.000	865.600	820.000
GR	865.500	900.000	865.000	1000.000	865.300	1100.000	865.400	1150.000	878.900	1190.000

X1	8955.000	.000	.000	.000	347.000	373.000	460.000	.000	.800	.000
X3	.000	.000	.000	734.000	.000	950.000	.000	.000	.000	.000
NC	.100	.100	.045	.000	.000	.000	.000	.000	.000	.000

VS I JA 59

X1	9185.000	20.000	335.000	370.000	173.000	187.000	230.000	.000	.000	.000
X3	.000	.000	.000	302.000	.000	403.000	.000	.000	.000	.000
GR	891.900	.000	885.700	35.000	876.500	135.000	874.200	235.000	873.600	255.000
GR	871.200	265.000	868.200	320.000	865.200	335.000	864.000	340.000	863.800	345.000
GR	863.800	350.000	863.700	355.000	863.900	360.000	864.000	365.000	866.500	370.000
GR	867.400	400.000	868.400	435.000	870.200	460.000	874.200	535.000	883.500	635.000

X1	9316.000	.000	.000	.000	171.000	121.000	131.000	.000	.000	.000
X3	.000	.000	.000	336.000	.000	370.000	.000	.000	.000	.000
NC	.040	.040	.022	.000	.000	.000	.000	.000	.000	.000

BS J JA 60 SPICER ROAD

X1	9317.000	18.000	400.000	434.000	1.000	1.000	1.000	.000	.000	.000
BT	18.000	.000	891.400	.000	100.000	883.300	.000	200.000	878.400	.000
BT	300.000	874.800	.000	400.000	872.000	.000	400.000	872.000	870.650	405.000
BT	871.930	870.650	410.000	871.850	870.650	415.000	871.780	870.650	420.000	871.710

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
BT	434.000	871.500	.000	500.000	871.600	.000	600.000	874.800	.000	700.000
BT	880.000	.000	775.000	881.800	.000	.000	.000	.000	.000	.000
GR	891.400	.000	883.300	100.000	878.400	200.000	874.800	300.000	872.000	400.000
GR	865.400	400.000	864.000	405.000	863.800	410.000	863.800	415.000	863.700	420.000
GR	863.900	425.000	864.000	430.000	864.500	434.000	871.500	434.000	871.600	500.000
GR	878.800	600.000	880.000	700.000	881.800	775.000	.000	.000	.000	.000
X1	9333.000	.000	.000	.000	16.000	16.000	16.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.070	.070	.042	.000	.000	.000	.000	.000	.000	.000
X1	9334.000	20.000	335.000	370.000	1.000	1.000	1.000	.000	.000	.000
X3	.000	.000	.000	336.000	.000	370.000	.000	.000	.000	.000
GR	891.900	.000	885.700	35.000	876.500	135.000	874.200	235.000	873.600	255.000
GR	871.200	265.000	868.200	320.000	865.200	335.000	864.000	340.000	863.800	345.000
GR	863.800	350.000	863.700	355.000	863.900	360.000	864.000	365.000	866.500	370.000
GR	867.400	400.000	868.400	435.000	870.200	460.000	874.200	535.000	883.500	635.000
X1	9336.000	.000	.000	.000	2.000	2.000	2.000	.000	.000	.000
X3	.000	.000	.000	334.000	.000	372.000	.000	.000	.000	.000
OT	4.000	620.000	1070.000	1350.000	2125.000	.000	.000	.000	.000	.000

VS K JA 61

X1	10535.000	20.000	500.000	600.000	939.000	1109.000	1199.000	.000	.000	.000
GR	880.000	.000	868.000	100.000	867.000	200.000	866.200	300.000	865.500	400.000
GR	865.500	500.000	865.300	510.000	865.200	520.000	864.900	530.000	864.600	540.000
GR	864.300	550.000	864.200	560.000	864.200	570.000	864.200	580.000	864.300	590.000
GR	864.600	595.000	865.500	600.000	865.200	700.000	869.000	745.000	879.100	772.000
NC	.035	.050	.042	.000	.000	.000	.000	.000	.000	.000

VS L JA 62

X1	11745.000	21.000	175.000	250.000	1220.000	1190.000	1210.000	.000	.000	.000
GR	880.000	.000	870.000	70.000	868.600	125.000	865.400	175.000	864.900	180.000
GR	864.900	190.000	864.800	200.000	864.700	210.000	864.500	220.000	864.500	230.000
GR	864.500	240.000	865.000	245.000	865.600	250.000	865.700	350.000	865.700	450.000
GR	865.800	550.000	866.000	650.000	866.600	750.000	870.700	820.000	876.500	850.000
GR	880.000	862.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.070	.100	.045	.000	.000	.000	.000	.000	.000	.000

VS M JA 63

X1	14395.000	17.000	440.000	478.000	1660.000	1600.000	2650.000	.000	.000	.000
GR	886.000	.000	881.700	40.000	873.600	115.000	872.100	140.000	868.300	240.000
GR	867.600	340.000	867.500	440.000	866.500	445.000	866.100	450.000	865.700	460.000
GR	865.700	470.000	866.100	475.000	867.200	478.000	867.100	540.000	868.100	640.000
GR	868.800	690.000	884.000	720.000	.000	.000	.000	.000	.000	.000
OT	4.000	680.000	1175.000	1475.000	2355.000	.000	.000	.000	.000	.000
NC	.120	.100	.050	.000	.000	.000	.000	.000	.000	.000

VS N JA 64

X1	15265.000	16.000	190.000	255.000	810.000	870.000	870.000	.000	.000	.000
GR	889.500	.000	874.400	90.000	871.800	108.000	868.600	160.000	867.200	175.000
GR	867.900	190.000	866.600	195.000	866.200	200.000	865.600	210.000	865.800	220.000
GR	865.500	230.000	865.900	240.000	866.600	250.000	868.300	255.000	869.800	285.000
GR	884.200	320.000	.000	.000	.000	.000	.000	.000	.000	.000

VS 0 JA 65

X1	16255.000	29.000	700.000	771.000	890.000	900.000	990.000	.000	.000	.000
X3	.000	.000	.000	400.000	.000	1000.000	.000	.000	.000	.000
GR	887.700	.000	880.700	100.000	875.900	165.000	872.600	180.000	871.300	200.000
GR	868.900	300.000	869.100	400.000	869.000	500.000	868.000	600.000	868.200	700.000
GR	867.700	706.000	867.100	712.000	866.800	720.000	866.600	730.000	867.200	740.000
GR	866.600	747.000	866.200	750.000	866.700	755.000	866.600	764.000	867.300	768.000
GR	867.900	770.000	868.300	771.000	868.100	800.000	867.500	830.000	868.000	850.000
GR	868.300	900.000	868.800	1000.000	868.300	1100.000	868.800	1170.000	.000	.000
NC	.100	.100	.050	.000	.000	.000	.000	.000	.000	.000

X1	16476.000	29.000	720.000	755.000	191.000	191.000	221.000	.000	-1.200	.000
X3	10.000	.000	.000	550.000	.000	1000.000	.000	871.400	871.400	.000
GR	887.700	.000	880.700	100.000	875.900	165.000	872.600	180.000	871.300	200.000
GR	868.900	300.000	869.100	400.000	869.000	500.000	868.000	600.000	868.200	700.000
GR	867.700	706.000	867.100	712.000	866.800	720.000	866.600	730.000	867.200	740.000
GR	866.600	747.000	866.200	750.000	866.700	755.000	866.600	764.000	867.300	768.000
GR	867.900	770.000	868.300	771.000	868.100	800.000	867.500	830.000	868.000	850.000
GR	868.300	900.000	868.800	1000.000	868.300	1100.000	868.800	1170.000	.000	.000
NC	.040	.040	.020	.000	.000	.000	.000	.000	.000	.000

GS P JA 66 MARSHALL ROAD

X1	16477.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
X3	10.000	.000	.000	550.000	.000	1000.000	.000	871.400	871.400	.000
SB	.000	1.370	3.020	.000	30.670	.000	179.100	.000	865.000	865.000

X1	16494.000	21.000	500.000	536.000	17.000	17.000	17.000	.000	.000	.000
X2	.000	.000	1.000	870.800	872.100	.000	.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	900.000	.000	872.100	872.100	.000
BT	19.000	.000	887.700	.000	100.000	883.500	.000	200.000	878.900	.000
BT	300.000	874.800	.000	400.000	873.700	.000	500.000	873.900	866.700	500.000
BT	876.220	870.780	505.000	876.220	870.800	510.000	876.230	870.820	515.000	876.230
BT	870.840	520.000	876.230	870.860	525.000	876.230	870.880	530.000	876.240	870.900
BT	536.000	876.240	870.930	536.000	873.900	866.100	600.000	873.100	.000	700.000
BT	872.400	.000	800.000	872.100	.000	900.000	872.700	.000	.000	.000
GR	887.700	.000	883.500	100.000	878.900	200.000	874.800	300.000	873.700	400.000
GR	871.500	470.000	866.700	500.000	866.400	505.000	865.800	510.000	865.000	515.000
GR	865.400	520.000	865.900	525.000	866.200	530.000	866.100	536.000	871.500	570.000
GR	873.100	600.000	872.400	700.000	872.100	800.000	872.700	900.000	872.800	1000.000
GR	872.400	1100.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.100	.100	.050	.000	.000	.000	.000	.000	.000	.000

X1	16495.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	900.000	.000	872.100	872.100	.000

VS 0 JA 67

X1	17145.000	17.000	362.000	407.000	660.000	640.000	650.000	.000	.000	.000
GR	883.800	.000	873.700	100.000	872.100	200.000	869.700	300.000	868.800	362.000
GR	867.100	363.000	866.400	369.000	866.300	375.000	866.200	378.000	866.000	384.000
GR	865.900	389.000	866.000	396.000	867.200	402.000	868.000	406.000	869.500	407.000
GR	865.600	437.000	889.600	450.000	.000	.000	.000	.000	.000	.000

VS R JA 68

X1	17925.000	31.000	385.000	459.000	650.00	780.000	78 .000	.00	.000	.000

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GR     869.700     235.000     869.000     285.000     868.700     335.000     868.600     385.000     867.700     391.000
GR     866.500     395.000     865.900     405.000     865.700     415.000     865.600     425.000     865.600     433.000
GR     866.200     442.000     867.100     453.000     868.400     457.000     869.000     459.000     869.200     514.000
GR     869.400     565.000     871.100     615.000     873.300     665.000     875.600     715.000     878.400     765.000
GR     892.200     850.000     894.700     860.000     892.100     900.000     887.300     950.000     883.700     990.000
GR     890.700    1090.000        .000        .000        .000        .000        .000        .000        .000        .000

      VS  S JA 68A

X1   18525.000      30.000     756.000     838.000     640.000     610.000     600.000        .000        .000        .000
X3        .000        .000        .000        .000        .000     950.000        .000        .000        .000        .000
GR     876.400        .000     884.800      40.000     880.800      90.000     879.500     140.000     876.800     190.000
GR     872.500     250.000     870.700     280.000     871.300     315.000     872.300     330.000     874.400     380.000
GR     876.200     430.000     886.200     490.000     889.500     520.000     885.100     580.000     871.300     660.000
GR     869.300     690.000     868.800     756.000     868.300     760.000     868.000     777.000     867.300     788.000
GR     866.100     798.000     865.700     808.000     865.600     819.000     865.900     826.000     866.600     833.000
GR     869.100     835.000     870.200     838.000     872.500     890.000     873.400     940.000     873.300     990.000

      VS  T JA 69    DOWNSTREAM SANDY BOTTOM LAKE

X1   18955.000      39.000     685.000     880.000     170.000     200.000     430.000        .000        .000        .000
X3        .000        .000        .000     200.000        .000    1150.000        .000        .000        .000        .000
GR     883.000        .000     877.100      35.000     871.300      85.000     870.200     135.000     870.200     185.000
GR     869.100     235.000     869.100     285.000     868.400     335.000     869.000     385.000     869.000     435.000
GR     869.100     485.000     869.200     535.000     869.100     585.000     868.600     635.000     868.500     685.000
GR     867.200     690.000     866.600     695.000     865.900     700.000     856.600     715.000     846.800     735.000
GR     844.700     755.000     844.200     780.000     844.100     787.000     844.800     797.000     846.500     807.000
GR     849.100     817.000     851.500     627.000     854.000     837.000     859.500     847.000     861.600     850.000
GR     864.000     860.000     866.300     871.000     867.300     875.000     868.500     880.000     871.300     882.000
GR     870.400     925.000     871.900     975.000     871.600    1075.000     873.600    1175.000        .000        .000
NC        .035        .035        .035        .300        .500        .000        .000        .000        .000        .000
QT       4.000     550.000     880.000    1065.000    1570.000        .000        .000        .000        .000        .000
NC        .110        .110        .047        .000        .000        .000        .000        .000        .000        .000

            FIELD  SECTION 70     SEC. U

            USE ENERGY GRADE OF SEC. T (16775) AS STARTING WSEL

X1   20955.000      21.000     300.000     344.000      10.000      10.000      10.000        .000        .000        .000
GR     881.900        .000     871.900      80.000     871.200     100.000     868.800     200.000     868.600     300.000
GR     867.300     305.000     866.600     310.000     866.500     315.000     866.800     320.000     866.400     330.000
GR     866.600     332.000     866.600     336.000     866.600     340.000     868.600     344.000     868.500     400.000
GR     868.900     500.000     871.400     510.000     873.100     600.000     876.400     700.000     878.000     770.000
GR     882.800     790.000        .000        .000        .000        .000        .000        .000        .000        .000
NC        .115        .115        .045        .000        .000        .000        .000        .000        .000        .000

            FIELD  SECTION 71     SEC. V

X1   21755.000      24.000     325.000     400.000     500.000    1000.000     800.000        .000        .000        .000
GR     875.700        .000     873.200      10.000     872.800      25.000     872.000     125.000     870.600     225.000
GR     869.100     325.000     867.900     332.000     867.200     340.000     866.600     349.000     866.200     356.000
GR     865.900     362.000     865.800     369.000     866.100     376.000     866.400     385.000     867.200     392.000
GR     867.900     398.000     868.800     400.000     869.300     425.000     869.300     525.000     869.600     625.000
GR     869.400     725.000     870.200     825.000     870.200     885.000     875.700     900.000        .000        .000

            FIELD  SECTION 72     SEC. W

X1   22655.000      27.000     500.000     567.000     900.000     750.000     900.000        .000        .000        .000
GR     879.900        .000     873.900      60.000     871.900     100.000     868.600     200.000     869.200     300.000
GR     869.000     400.000     868.700     500.000     867.300     507.000     866.800     514.000     866.500     518.000
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GR	866.200	552.000	867.000	558.000	868.000	562.000	868.900	567.000	868.900	600.000
GR	870.900	700.000	869.200	800.000	869.100	900.000	869.100	1000.000	869.600	1100.000
GR	871.300	1160.000	881.300	1190.000	.000	.000	.000	.000	.000	.000
NC	.090	.060	.042	.000	.000	.000	.000	.000	.000	.000

FIELD SECTION 73 SEC. X

USE ENERGY GRADE OF SEC. W (20475) AS WSEL

X1	24555.000	27.000	875.000	909.000	10.000	10.000	10.000	.000	.000	.000
GR	880.400	.000	873.200	15.000	872.400	75.000	871.100	175.000	869.600	275.000
GR	869.500	375.000	867.800	475.000	868.400	575.000	868.700	675.000	868.900	775.000
GR	869.100	801.000	866.200	806.000	866.200	811.000	869.100	817.000	869.300	855.000
GR	869.000	875.000	866.400	878.000	865.900	882.000	865.400	886.000	865.400	891.000
GR	865.900	896.000	866.400	902.000	867.400	906.000	869.000	909.000	870.000	975.000
GR	875.200	1075.000	880.100	1175.000	.000	.000	.000	.000	.000	.000
NC	.100	.060	.045	.000	.000	.000	.000	.000	.000	.000

FIELD SECTION 74 SEC. Y

X1	25315.000	30.000	1130.000	1197.000	1150.000	750.000	760.000	.000	.000	.000
X3	.000	.000	.000	620.000	.000	.000	.000	.000	.000	.000
GR	881.300	.000	875.500	30.000	874.600	130.000	874.100	230.000	873.800	330.000
GR	873.300	430.000	873.100	530.000	872.400	630.000	871.600	730.000	870.800	830.000
GR	870.300	930.000	869.900	1030.000	870.400	1072.000	868.600	1080.000	870.400	1095.000
GR	872.600	1100.000	872.500	1130.000	867.600	1140.000	866.700	1147.000	866.300	1155.000
GR	866.000	1161.000	866.500	1167.000	867.300	1174.000	867.600	1181.000	867.700	1186.000
GR	868.000	1192.000	871.300	1197.000	872.500	1230.000	881.100	1310.000	883.200	1330.000
NC	.090	.080	.045	.000	.000	.000	.000	.000	.000	.000

FIELD SECTION 75 SEC. Z

X1	26315.000	29.000	600.000	683.000	1100.000	900.000	1000.000	.000	.000	.000
X3	.000	.000	.000	610.000	.000	674.000	.000	.000	.000	.000
GR	890.900	.000	888.100	30.000	876.400	80.000	875.000	100.000	874.300	200.000
GR	872.700	215.000	873.200	230.000	872.400	300.000	871.700	400.000	872.400	500.000
GR	872.400	600.000	868.700	611.000	868.400	620.000	868.000	622.000	867.800	630.000
GR	867.600	637.000	866.400	643.000	866.100	645.000	866.600	651.000	866.700	660.000
GR	867.900	670.000	872.500	683.000	872.900	700.000	873.600	800.000	876.900	900.000
GR	876.800	965.000	878.600	1000.000	884.200	1050.000	887.400	1065.000	.000	.000

X1	26404.000	17.000	531.000	550.000	89.000	89.000	89.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	875.100	875.100	.000
GR	889.800	.000	885.000	89.000	879.500	177.000	876.300	266.000	875.100	354.000
GR	875.600	443.000	876.700	510.000	867.900	531.000	868.000	536.000	867.900	540.000
GR	868.000	544.000	868.100	550.000	877.800	565.000	879.800	620.000	885.100	708.000
GR	891.000	797.000	895.000	859.000	.000	.000	.000	.000	.000	.000
NC	.040	.040	.022	.000	.000	.000	.000	.000	.000	.000

X1	26405.000	17.000	531.000	550.000	1.000	1.000	1.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	875.100	875.100	.000
BT	14.000	.000	889.800	.000	89.000	885.000	.000	177.000	879.500	.000
BT	266.000	876.300	.000	354.000	875.100	.000	443.000	875.600	.000	531.000
BT	877.000	.000	531.000	879.800	875.000	550.000	879.700	875.000	550.000	877.300
BT	.000	620.000	879.800	.000	708.000	885.100	.000	797.000	891.000	.000
BT	859.000	895.000	.000	.000	.000	.000	.000	.000	.000	.000
GR	889.800	.000	885.000	89.000	879.500	177.000	876.300	266.000	875.100	354.000
GR	875.600	443.000	877.000	531.000	867.900	531.000	868.000	536.000	867.900	540.000
GR	868.000	544.000	868.100	550.000	877.300	550.000	879.800	620.000	885.100	708.000
GR	891.000	797.000	895.000	859.000	.000	.000	.000	.000	.000	.000

FIELD SECTION 76 - DOANE ROAD SEC. AA

X1	26436.000	.000	.000	.000	31.000	31.000	31.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.100	.100	.047	.000	.000	.000	.000	.000	.000	.000
X1	26437.000	17.000	531.000	550.000	1.000	1.000	1.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	875.100	875.100	.000
GR	889.800	.000	885.000	89.000	879.500	177.000	876.300	266.000	875.100	354.000
GR	875.600	443.000	876.700	510.000	867.900	531.000	868.000	536.000	867.900	540.000
GR	868.000	544.000	868.100	550.000	877.800	565.000	879.800	620.000	885.100	708.000
GR	891.000	797.000	895.000	859.000	.000	.000	.000	.000	.000	.000
X1	26460.000	29.000	600.000	683.000	23.000	23.000	23.000	.000	1.800	.000
X3	.000	.000	.000	610.000	.000	675.000	.000	.000	.000	.000
GR	890.900	.000	888.100	30.000	876.400	80.000	875.000	100.000	874.300	200.000
GR	872.700	215.000	873.200	230.000	872.400	300.000	871.700	400.000	872.400	500.000
GR	872.400	600.000	868.700	611.000	868.400	620.000	868.000	622.000	867.800	630.000
GR	867.600	637.000	866.400	643.000	866.100	645.000	866.600	651.000	866.700	660.000
GR	867.900	670.000	872.500	683.000	872.900	700.000	873.600	800.000	876.900	900.000
GR	876.600	965.000	878.600	1000.000	884.200	1050.000	887.400	1065.000	.000	.000
NC	.110	.095	.047	.000	.000	.000	.000	.000	.000	.000

FIELD SECTION 77 SEC. AB

X1	27160.000	13.000	177.000	205.000	650.000	530.000	700.000	.000	.000	.000
GR	889.100	.000	875.500	40.000	872.900	80.000	871.600	130.000	871.700	177.000
GR	868.800	182.000	868.500	185.000	868.400	190.000	869.200	200.000	872.200	205.000
GR	874.600	230.000	876.100	255.000	890.400	280.000	.000	.000	.000	.000
NC	.110	.095	.043	.000	.000	.000	.000	.000	.000	.000

FIELD SECTION 78 SEC. AC

X1	28660.000	22.000	575.000	595.000	750.000	1400.000	1500.000	.000	.000	.000
GR	890.200	.000	887.700	20.000	876.200	80.000	873.700	180.000	873.900	280.000
GR	873.100	380.000	872.500	480.000	872.500	575.000	872.000	577.000	870.800	580.000
GR	869.300	585.000	869.200	589.000	871.600	593.000	872.500	595.000	872.500	615.000
GR	873.500	680.000	875.400	780.000	875.400	830.000	876.300	880.000	879.900	1080.000
GR	881.400	1180.000	903.500	1280.000	.000	.000	.000	.000	.000	.000
NC	.110	.095	.045	.000	.000	.000	.000	.000	.000	.000

OVERBANK=1/3 OF SEC.AC; CHANNEL=SAME AS SEC.AC; ELEV=INCREASE 1.5'

X1	30110.000	22.000	173.000	193.000	750.000	1250.000	1450.000	.000	.000	.000
GR	891.700	.000	889.200	6.000	877.700	24.000	875.200	54.000	875.400	84.000
GR	874.600	114.000	874.000	144.000	874.000	173.000	873.500	175.000	872.300	178.000
GR	870.800	183.000	870.700	187.000	873.100	191.000	874.000	193.000	874.000	199.000
GR	875.000	219.000	876.900	249.000	876.900	264.000	877.800	279.000	881.400	339.000
GR	882.900	369.000	905.000	399.000	.000	.000	.000	.000	.000	.000

FIELD SECTION 79 SEC. AD

X1	30760.000	25.000	284.000	314.000	500.000	600.000	650.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	875.000	.000	.000	.000	.000
GR	887.400	.000	883.700	.000	882.400	50.000	875.800	120.000	875.200	150.000
GR	873.700	250.000	873.400	265.000	873.800	284.000	873.100	287.000	871.900	292.000
GR	872.100	302.000	871.400	308.000	871.900	311.000	873.800	314.000	874.300	350.000
GR	875.400	450.000	876.500	550.000	876.500	650.000	874.600	715.000	875.400	750.000

	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1090.000	[illegible]	1100.000	[illegible]	1150.000
01	4.000	555.000	895.000	1095.000	1625.000	.000	.000	.000	.000	.000

FIELD SECTION 80 SEC. AF

X1	32960.000	27.000	356.000	375.000	2350.000	950.000	2200.000	.000	.000	.000
X3	.000	.000	.000	225.000	.000	.000	.000	.000	.000	.000
GR	900.800	.000	886.500	54.000	880.900	90.000	876.500	190.000	875.000	290.000
GR	875.000	356.000	874.000	358.000	873.400	362.000	873.900	366.000	873.500	373.000
GR	875.100	375.000	875.000	390.000	875.400	490.000	875.500	590.000	875.600	690.000
GR	875.200	790.000	876.000	890.000	875.200	990.000	876.300	1090.000	877.100	1190.000
GR	877.000	1290.000	877.700	1374.000	879.700	1397.000	883.700	1415.000	884.700	1427.000
GR	888.300	1527.000	894.600	1590.000	.000	.000	.000	.000	.000	.000

FIELD SECTION 81 SEC. AF

X1	34860.000	15.000	245.000	280.000	1000.000	1100.000	1900.000	.000	.000	.000
X3	.000	.000	.000	122.000	.000	.000	.000	.000	.000	.000
GR	891.200	.000	879.200	70.000	877.600	100.000	876.700	200.000	877.900	245.000
GR	876.400	258.000	875.600	264.000	875.500	268.000	876.400	272.000	877.900	280.000
GR	877.300	300.000	879.100	350.000	883.800	400.000	886.500	500.000	893.200	600.000

X1	35010.000	.000	.000	.000	100.000	100.000	150.000	.000	-1.300	.000
X3	.000	.000	.000	168.000	.000	298.000	.000	.000	.000	.000
NC	.040	.040	.022	.000	.000	.000	.000	.000	.000	.000
SB	.000	1.580	2.800	.000	16.300	.000	76.500	.000	874.200	874.200

FIELD SECTION 82 - PRIVATE DRIVE SEC. AG

X1	35022.000	14.000	350.000	371.000	12.000	12.000	12.000	.000	.000	.000
X2	.000	.000	1.000	878.900	879.800	.000	.000	.000	.000	.000
BT	11.000	.000	890.900	.000	50.000	887.500	.000	150.000	882.300	.000
BT	250.000	880.500	.000	350.000	879.900	876.100	350.000	879.900	878.900	371.000
BT	879.800	878.800	371.000	879.800	876.500	450.000	883.700	.000	550.000	888.100
BT	.000	600.000	892.200	.000	.000	.000	.000	.000	.000	.000
GR	890.900	.000	887.500	50.000	882.300	150.000	880.500	250.000	880.000	335.000
GR	876.100	350.000	875.700	355.000	874.200	360.000	874.700	365.000	876.500	371.000
GR	881.300	400.000	883.700	450.000	888.100	550.000	892.200	600.000	.000	.000
NC	.100	.100	.047	.000	.000	.000	.000	.000	.000	.000

881.3

FIELD SECTION 83 SEC. AH

X1	35622.000	15.000	210.000	232.000	550.000	450.000	600.000	.000	.000	.000
GR	893.300	.000	879.900	60.000	879.000	110.000	878.500	160.000	877.800	210.000
GR	876.700	215.000	875.200	219.000	875.000	222.000	876.000	225.000	877.700	228.000
GR	878.700	232.000	879.200	260.000	880.700	295.000	883.300	313.000	895.100	353.000

X1	35947.000	90.000	226.800	244.300	175.000	225.000	325.000	.000	.000	.000
GR	896.800	.000	895.700	7.800	894.700	15.600	893.700	23.500	892.700	31.300
GR	891.700	39.100	890.700	46.900	889.600	54.700	888.500	62.600	887.900	70.400
GR	887.500	78.200	887.100	86.000	886.700	93.800	886.300	101.600	886.000	109.500
GR	885.600	117.300	885.200	125.100	884.900	132.900	884.500	140.700	884.200	148.600
GR	883.900	156.400	883.500	164.200	883.200	172.000	882.900	179.800	882.500	187.700
GR	882.000	195.500	881.400	203.300	880.700	211.100	879.800	218.900	878.200	226.800
GR	877.800	227.300	877.400	227.900	877.100	228.500	876.900	229.100	876.800	229.700
GR	876.600	230.200	876.500	230.800	876.300	231.400	876.200	232.000	876.000	232.600
GR	875.800	233.200	875.700	233.700	875.600	234.300	875.500	234.900	875.500	235.500
GR	875.500	236.100	875.600	236.700	875.700	237.200	875.900	237.800	876.000	238.400
GR	876.200	239.000	876.500	239.600	876.700	240.200	877.000	240.700	877.100	241.300
GR	877.300	241.900	877.500	242.500	878.000	243.100	878.400	243.700	878.800	244.300

GR	881.700	287.700	881.900	294.900	882.200	302.200	882.400	309.400	882.700	316.700
GR	882.900	323.900	883.100	331.200	883.400	338.400	883.600	345.600	884.000	352.900
GR	884.500	360.100	885.000	367.400	885.600	374.600	886.300	381.800	887.200	389.100
GR	888.400	396.300	889.600	403.600	890.800	410.800	892.100	418.100	893.300	425.300
GR	894.500	432.500	895.700	439.800	896.900	447.000	898.200	454.300	899.600	461.500
X1	36110.000	90.000	235.100	250.400	88.000	113.000	163.000	.000	.000	.000
GR	898.500	.000	897.800	8.100	897.100	16.200	896.400	24.300	895.700	32.400
GR	895.000	40.500	894.300	48.600	893.400	56.800	892.500	64.900	891.900	73.000
GR	891.400	81.100	890.900	89.200	890.400	97.300	889.900	105.400	889.400	113.500
GR	888.900	121.600	888.400	129.700	887.900	137.800	887.400	145.900	886.900	154.000
GR	886.500	162.200	886.000	170.300	885.600	178.400	885.100	186.500	884.600	194.600
GR	883.900	202.700	883.100	210.800	882.000	218.900	880.700	227.000	878.300	235.100
GR	877.900	235.600	877.400	236.100	877.000	236.600	876.700	237.200	876.600	237.700
GR	876.500	238.200	876.500	238.700	876.300	239.200	876.200	239.700	876.100	240.200
GR	876.000	240.700	875.900	241.200	875.800	241.700	875.700	242.200	875.700	242.700
GR	875.700	243.300	875.800	243.800	875.900	244.300	876.000	244.800	876.100	245.300
GR	876.300	245.800	876.400	246.300	876.600	246.800	876.700	247.300	876.800	247.800
GR	876.900	248.300	877.200	248.800	877.800	249.400	878.300	249.900	878.800	250.400
GR	881.300	259.200	881.800	268.100	882.100	276.900	882.400	285.800	882.700	294.600
GR	882.900	303.500	883.200	312.300	883.600	321.100	883.900	330.000	884.100	338.800
GR	884.400	347.700	884.700	356.500	884.900	365.400	885.200	374.200	885.700	383.100
GR	886.200	391.900	886.800	400.800	887.400	409.600	888.200	418.400	889.200	427.300
GR	890.400	436.100	891.700	445.000	892.900	453.800	894.100	462.700	895.300	471.500
GR	896.600	480.400	897.800	489.200	899.000	498.100	900.400	506.900	901.800	515.800
X1	36142.000	90.000	236.800	251.600	18.000	23.000	32.000	.000	.000	.000
GR	898.800	.000	898.200	8.200	897.600	16.300	896.900	24.500	896.300	32.700
GR	895.700	40.800	895.000	49.000	894.200	57.200	893.300	65.300	892.700	73.500
GR	892.200	81.700	891.700	89.800	891.100	98.000	890.600	106.200	890.000	114.300
GR	889.500	122.500	889.000	130.600	888.500	138.800	887.900	147.000	887.500	155.100
GR	887.000	163.300	886.500	171.500	886.100	179.600	885.600	187.800	885.000	196.000
GR	884.200	204.100	883.500	212.300	882.200	220.500	880.900	228.600	878.400	236.800
GR	877.900	237.300	877.400	237.800	876.900	238.300	876.700	238.800	876.600	239.300
GR	876.500	239.800	876.400	240.300	876.300	240.700	876.200	241.200	876.100	241.700
GR	876.000	242.200	875.900	242.700	875.800	243.200	875.800	243.700	875.700	244.200
GR	875.800	244.700	875.800	245.200	875.900	245.700	876.000	246.200	876.100	246.700
GR	876.300	247.200	876.400	247.700	876.500	248.100	876.700	248.600	876.800	249.100
GR	876.800	249.600	877.200	250.100	877.700	250.600	878.300	251.100	878.900	251.600
GR	881.500	260.800	882.000	269.900	882.300	279.100	882.600	288.300	882.900	297.400
GR	883.200	306.600	883.500	315.800	883.800	324.900	884.200	334.100	884.400	343.300
GR	884.700	352.400	885.000	361.600	885.200	370.800	885.600	379.900	886.100	389.100
GR	886.600	398.300	887.100	407.400	887.700	416.600	888.500	425.800	889.600	434.900
GR	890.800	444.100	892.100	453.300	893.300	462.400	894.500	471.600	895.700	480.800
GR	897.000	489.900	898.200	499.100	899.400	508.300	900.800	517.400	902.300	526.600
X1	36207.000	90.000	240.100	254.000	35.000	45.000	65.000	.000	.000	.000
GR	899.500	.000	899.000	8.300	898.500	16.600	898.000	24.800	897.500	33.100
GR	897.000	41.400	896.400	49.700	895.700	58.000	895.000	66.200	894.300	74.500
GR	893.800	82.800	893.200	91.100	892.600	99.400	892.000	107.700	891.400	115.900
GR	890.800	124.200	890.200	132.500	889.700	140.800	889.100	149.100	888.600	157.300
GR	888.000	165.600	887.500	173.900	887.000	182.200	886.500	190.500	885.900	198.700
GR	885.000	207.000	884.100	215.300	882.800	223.600	881.300	231.900	878.400	240.100
GR	877.900	240.600	877.400	241.100	876.900	241.500	876.600	242.000	876.600	242.500
GR	876.500	242.900	876.400	243.400	876.300	243.900	876.200	244.300	876.200	244.800
GR	876.100	245.200	876.000	245.700	875.900	246.200	875.900	246.600	875.800	247.100
GR	875.900	247.600	875.900	248.000	876.000	248.500	876.100	249.000	876.200	249.400
GR	876.300	249.900	876.400	250.300	876.500	250.800	876.500	251.300	876.600	251.700
GR	876.700	252.200	877.000	252.700	877.600	253.100	878.300	253.600	878.900	254.000
GR	881.800	263.900	882.400	273.700	882.700	283.500	883.000	293.300	883.400	303.100
GR	883.700	312.900	884.100	322.700	884.400	332.500	884.700	342.300	885.000	352.100
GR	885.300	361.900	885.600	371.800	885.900	381.600	886.200	391.400	886.700	401.200

GR	891.700	460.000	892.900	469.800	894.100	479.600	895.300	489.500	896.600	499.300
GR	897.800	509.100	899.000	518.900	900.300	528.700	901.700	538.500	903.200	548.300
X1	36272.000	18.000	243.500	256.500	35.000	45.000	65.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	882.500	882.500	.000
GR	900.200	.000	897.900	50.000	890.300	150.000	886.900	200.000	884.600	220.000
GR	881.300	237.000	878.500	243.500	876.600	245.000	875.900	250.000	876.600	255.000
GR	878.900	256.500	881.500	261.000	882.500	270.000	885.300	350.000	886.700	400.000
GR	889.400	450.000	901.200	550.000	904.100	570.000	.000	.000	.000	.000
NC	.040	.040	.022	.000	.000	.000	.000	.000	.000	.000
X1	36273.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	882.500	882.500	.000
SB	.000	1.590	2.800	.000	7.800	.000	53.840	.000	875.900	875.900

FIELD SECTION 84 - PRIVATE DRIVE SEC. AI

X1	36287.000	.000	243.500	256.500	14.000	14.000	14.000	.000	.000	.000
X2	.000	.000	1.000	882.800	885.100	.000	.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	885.100	885.100	.000
BT	14.000	.000	900.200	.000	50.000	897.900	.000	150.000	890.300	.000
BT	200.000	886.900	.000	243.500	885.100	.000	243.500	865.100	878.500	250.000
BT	864.100	882.900	256.500	885.100	878.900	256.500	885.100	.000	350.000	885.300
BT	.000	400.000	886.700	.000	450.000	889.400	.000	550.000	901.200	.000
BT	570.000	904.100	.000	.000	.000	.000	.000	.000	.000	.000
NC	.100	.090	.045	.000	.000	.000	.000	.000	.000	.000
X1	36288.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	885.100	885.100	.000

FIELD SECTION 85 SEC. AJ

X1	37098.000	19.000	43.000	63.000	750.000	750.000	810.000	.000	.000	.000
GR	898.000	.000	888.700	20.000	883.400	43.000	879.900	45.000	879.000	49.000
GR	878.000	52.000	879.100	56.000	879.800	60.000	881.200	63.000	881.500	80.000
GR	881.800	180.000	882.000	230.000	882.200	260.000	888.600	280.000	889.200	295.000
GR	893.500	380.000	893.800	400.000	897.300	430.000	907.600	480.000	.000	.000
X1	37858.000	17.000	130.000	165.000	660.000	700.000	760.000	.000	.200	.000
X3	.000	.000	.000	126.000	.000	168.000	.000	.000	.000	.000
GR	900.500	.000	892.500	65.000	891.900	83.000	884.100	100.000	883.600	110.000
GR	882.100	130.000	881.300	135.000	880.900	140.000	880.500	145.000	881.800	153.000
GR	881.300	155.000	881.900	162.000	883.800	165.000	884.200	235.000	887.800	265.000
GR	896.400	320.000	900.200	345.000	.000	.000	.000	.000	.000	.000
X1	37898.000	14.000	132.000	154.000	40.000	40.000	40.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	893.900	893.900	.000
GR	902.600	.000	899.400	50.000	896.300	127.000	881.600	132.000	881.500	136.000
GR	881.700	140.000	881.500	144.000	880.900	149.000	880.800	154.000	895.300	160.000
GR	893.900	215.000	894.200	297.000	897.200	380.000	901.700	462.000	.000	.000
NC	.040	.040	.022	.000	.000	.000	.000	.000	.000	.000
X1	37899.000	14.000	132.000	154.000	1.000	1.000	1.000	.000	.000	.000
BT	10.000	.000	902.600	.000	50.000	899.400	.000	132.000	896.100	.000
BT	132.000	896.500	894.300	154.000	896.100	893.800	154.000	895.500	.000	215.000
BT	893.900	.000	297.000	894.200	.000	380.000	897.200	.000	462.000	901.700
BT	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

GR	902.600	.00	899.400	50.000	896.100	132.000	881.600	132.000	881.500	136.000
GR	881.700	140.000	881.500	144.000	880.900	149.000	880.800	154.000	895.500	154.000
GR	893.900	215.000	894.200	297.000	897.200	380.000	901.700	462.000	.000	.000

FIELD SECTION 85 - RUSHTON ROAD SEC. AK

X1	37942.000	.000	.000	.000	43.000	43.000	43.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.080	.090	.040	.000	.000	.000	.000	.000	.000	.000
X1	37943.000	14.000	132.000	154.000	1.000	1.000	1.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	893.900	893.900	.000
GR	902.600	.000	899.400	50.000	896.300	127.000	881.600	132.000	881.500	136.000
GR	881.700	140.000	881.500	144.000	880.900	149.000	880.800	154.000	895.300	160.000
GR	893.900	215.000	894.200	297.000	897.200	380.000	901.700	462.000	.000	.000
X1	37953.000	17.000	130.000	165.000	10.000	10.000	10.000	.000	.300	.000
X3	.000	.000	.000	126.000	.000	168.000	.000	.000	.000	.000
GR	900.500	.000	892.500	65.000	891.900	83.000	884.100	100.000	883.600	110.000
GR	882.100	130.000	881.300	135.000	880.900	140.000	880.500	145.000	881.800	153.000
GR	881.300	155.000	881.900	162.000	883.800	165.000	884.200	235.000	887.800	265.000
GR	896.400	320.000	900.200	345.000	.000	.000	.000	.000	.000	.000
DT	4.000	565.000	905.000	1110.000	1660.000	.000	.000	.000	.000	.000

FIELD SECTION 86 SEC. AL

X1	36123.000	17.000	130.000	165.000	200.000	100.000	170.000	.000	.000	.000
GR	900.500	.000	892.500	65.000	891.900	83.000	884.100	100.000	883.600	110.000
GR	882.100	130.000	881.300	135.000	880.900	140.000	880.500	145.000	881.800	153.000
GR	881.300	155.000	881.900	162.000	883.800	165.000	884.200	235.000	887.800	265.000
GR	896.400	320.000	900.200	345.000	.000	.000	.000	.000	.000	.000
NC	.095	.100	.045	.000	.000	.000	.000	.000	.000	.000

FIELD SECTION 87 SEC. AM

X1	39313.000	15.000	158.000	179.000	900.000	900.000	1190.000	.000	.000	.000
GR	902.800	.000	898.000	83.000	890.900	129.000	886.500	141.000	885.400	158.000
GR	884.000	161.000	883.400	164.000	883.100	168.000	883.000	170.000	883.800	176.000
GR	884.300	179.000	886.200	208.000	887.900	258.000	896.000	358.000	900.800	418.000
NC	.095	.095	.047	.000	.000	.000	.000	.000	.000	.000

FIELD SECTION 88 SEC. AN

X1	40883.000	27.000	530.000	545.000	800.000	1300.000	1570.000	.000	.000	.000
GR	901.900	.000	887.900	70.000	886.700	95.000	886.700	170.000	886.800	195.000
GR	898.600	270.000	903.600	310.000	903.600	345.000	894.800	405.000	898.200	445.000
GR	889.600	490.000	888.000	530.000	886.000	532.000	885.200	537.000	884.800	540.000
GR	885.200	543.000	886.600	545.000	886.700	550.000	886.000	563.000	885.400	567.000
GR	886.000	570.000	886.700	670.000	887.300	770.000	888.500	870.000	890.300	920.000
GR	893.900	935.000	900.000	970.000	.000	.000	.000	.000	.000	.000
NC	.100	.100	.047	.000	.000	.000	.000	.000	.000	.000

FIELD SECTION 89 SEC. AO

X1	42053.000	16.000	78.000	95.000	1150.000	550.000	1170.000	.000	.000	.000
GR	902.800	.000	890.500	37.000	888.700	78.000	887.000	80.000	886.500	82.000
GR	886.400	87.000	886.400	90.000	887.400	93.000	888.700	95.000	888.800	110.000
GR	887.900	210.000	888.800	410.000	888.800	510.000	889.600	610.000	890.400	630.000
GR	903.600	710.000	.000	.000	.000	.000	.000	.000	.000	.000

FIELD SECTION 90 SEC. AP

X1	42613.000	24.000	459.000	477.000	550.000	350.000	560.000	.000	.000	.000
X3	.000	.000	.000	300.000	.000	950.000	.000	.000	.000	.000
GR	908.100	.000	897.100	25.000	890.100	125.000	888.900	225.000	889.100	325.000
GR	889.200	425.000	888.900	459.000	888.300	461.000	887.100	464.000	886.800	469.000
GR	886.400	473.000	886.900	475.000	889.200	477.000	889.800	525.000	890.400	585.000
GR	893.200	625.000	899.400	725.000	900.300	745.000	890.800	825.000	889.800	850.000
GR	890.500	925.000	890.600	1025.000	890.900	1075.000	900.000	1125.000	.000	.000
X1	43433.000	20.000	199.000	223.000	699.000	699.000	820.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	400.000	.000	.000	.000	.000
GR	909.700	.000	899.500	8.000	900.500	18.000	898.500	23.000	894.800	103.000
GR	891.100	199.000	888.400	203.000	888.300	208.000	888.400	211.000	888.300	214.000
GR	888.500	219.000	890.700	223.000	891.400	250.000	892.600	303.000	892.600	403.000
GR	893.000	468.000	894.900	503.000	898.000	538.000	899.500	603.000	902.800	703.000
NC	.040	.040	.022	.000	.000	.000	.000	.000	.000	.000
X1	43434.000	36.000	201.000	221.000	1.000	1.000	1.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	400.000	.000	892.400	892.400	.000
GR	909.700	.000	899.500	8.000	900.500	18.000	898.500	23.000	894.800	103.000
GR	891.100	199.000	889.600	201.000	888.500	202.000	888.300	203.000	888.500	204.000
GR	889.600	205.000	889.600	206.000	888.500	207.000	888.300	208.000	888.500	209.000
GR	889.600	210.000	889.600	212.000	888.500	213.000	888.300	214.000	888.500	215.000
GR	889.600	216.000	889.600	217.000	888.500	218.000	888.300	219.000	888.500	220.000
GR	889.600	221.000	889.600	221.000	890.700	224.000	892.400	250.000	892.600	303.000
GR	892.600	403.000	893.000	468.000	894.900	503.000	898.000	538.000	899.500	603.000
GR	902.800	703.000	.000	.000	.000	.000	.000	.000	.000	.000
SB	.000	1.880	2.850	.000	12.570	.000	50.270	.000	888.300	888.300

FIELD SECTION 90A - PRIVATE DRIVE SEC. AQ

X1	43461.000	.000	201.000	221.000	27.000	27.000	27.000	.000	.000	.000
X2	.000	.000	1.000	892.300	892.400	.000	.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	400.000	.000	.000	.000	.000
BT	37.000	.000	909.700	.000	8.000	899.500	.000	18.000	900.500	.000
BT	23.000	898.500	.000	103.000	894.800	.000	201.000	893.300	889.600	201.000
BT	893.300	891.000	202.000	893.300	892.100	203.000	893.300	892.300	204.000	893.300
BT	892.100	205.000	893.300	891.000	205.000	893.300	889.600	206.000	893.300	889.600
BT	206.000	893.300	891.000	207.000	893.300	892.100	208.000	893.300	892.300	209.000
BT	893.300	892.100	210.000	893.300	891.000	210.000	893.300	889.600	212.000	893.300
BT	889.600	212.000	893.300	891.000	213.000	893.300	892.100	214.000	893.300	892.300
BT	215.000	893.300	892.100	216.000	893.300	891.000	216.000	893.300	889.600	217.000
BT	893.300	889.600	217.000	893.300	891.000	218.000	893.300	892.100	219.000	893.300
BT	892.300	220.000	893.300	892.100	221.000	893.300	891.000	221.000	893.300	889.600
BT	224.000	892.800	.000	250.000	892.400	.000	303.000	892.600	.000	400.000
BT	892.600	.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.100	.100	.045	.000	.000	.000	.000	.000	.000	.000
X1	43462.000	20.000	199.000	223.000	1.000	1.000	1.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	400.000	.000	.000	.000	.000
GR	909.700	.000	899.500	8.000	900.500	18.000	898.500	23.000	894.800	103.000
GR	891.100	199.000	888.400	203.000	888.300	208.000	888.400	211.000	888.300	214.000
GR	888.500	219.000	890.700	223.000	891.400	250.000	892.600	303.000	892.600	403.000
GR	893.000	468.000	894.900	503.000	898.000	538.000	899.500	603.000	902.800	703.000

FIELD SECTION 91 SEC. AR

X1	43812.000	15.000	250.000	265.000	272.000	222.000	350.000	.000	.000	.000

FIELD SECTION 92 - CHESAPEAKE & OHIO RAILROAD SEC. AS

X1	44032.000	21.000	500.000	510.000	40.000	40.000	910.900	.000	.000	.000
X2	.000	.000	1.000	.000	.000	.000	.000	.000	.000	.000
D1	17.000	.000	912.300	.000	100.000	911.800	.000	.000	.000	.000
B1	300.000	911.100	.000	400.000	910.900	.000	.000	.000	.000	.000
R1	910.900	894.000	502.000	910.900	896.300	505.000	910.900	899.000	508.000	910.900
F1	898.300	510.000	910.900	894.000	510.000	910.900	.000	600.000	911.100	.000
G1	700.000	911.400	.000	800.000	911.800	.000	900.000	912.300	.000	1000.000
B1	913.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
GR	912.300	.000	911.800	100.000	911.500	200.000	911.100	300.000	910.900	400.000
GR	910.900	500.000	500.000	500.000	890.400	890.400	890.400	501.000	890.400	502.000
GR	890.300	505.000	890.700	508.000	890.800	509.000	890.800	510.000	894.000	510.000
GR	910.900	510.000	911.100	600.000	911.400	700.000	911.800	800.000	912.300	900.000
GR	913.000	1000.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	44033.000	17.000	500.000	510.000	1.000	1.000	1.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	.000	911.000	.000
X5	4.000	.000	900.850	903.300	.000	.000	.000	.000	.000	.000
GR	912.300	.000	911.800	100.000	911.500	200.000	911.100	300.000	910.900	400.000
GR	890.400	500.000	890.400	501.000	890.400	502.000	890.400	505.000	890.700	508.000
GR	890.800	509.000	890.800	510.000	911.100	600.000	911.400	700.000	911.800	800.000
GR	912.300	900.000	913.000	1000.000	.000	.000	.000	.000	.000	.000
EJ	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

X1	43992.000	.000	.000	.000	5.000	5.000	.000	.000	.030	.000
X3	.000	.000	.000	.000	262.500	.000	252.500	.000	.000	.000
NC	.040	.000	.000	.000	.000	.000	.000	.022	.000	.000
SB	.000	1.690	2.850	.000	8.530	.000	.000	.000	74.170	.000	890.300

X1	43987.000	.000	.000	.000	6.000	6.000	.000	.000	.030	.000
X3	.000	.000	.000	.000	263.500	.000	251.500	.000	.000	.000

X1	43981.000	.000	.000	.000	12.000	12.000	.000	.000	.070	.000
X3	.000	.000	.000	.000	265.000	.000	250.000	.000	.000	.000

X1	43969.000	.000	.000	.000	22.000	22.000	.000	.000	.140	.000
X3	.000	.000	.000	.000	267.000	.000	246.000	.000	.000	.000

X1	43947.000	.000	.000	.000	22.000	22.000	.000	.000	.140	.000
X3	.000	.000	.000	.000	273.000	.000	241.000	.000	.000	.000

X1	43925.000	.000	.000	.000	23.000	23.000	.000	.000	.140	.000
X3	.000	.000	.000	.000	279.000	.000	236.000	.000	.000	.000

X1	43902.000	.000	.000	.000	90.000	90.000	.000	.000	.550	.000
X3	.000	.000	.000	.000	285.000	.000	250.000	.000	.000	.000

GR	892.000	350.000	893.000	433.000	896.700	450.000	902.000	470.000	904.200	570.000
GR	891.700	250.000	889.500	253.000	889.200	256.000	890.100	260.000	892.000	265.000
GR	911.000	.000	898.500	50.000	893.700	73.000	891.500	150.000	891.900	200.000
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

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*PROF 1

CCHV=     .300 CEHV=     .500
*SECNO .000
   SECNO      DEPTH     CWSEL     CRTWS     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

        VS    JA 14

     .00       8.65    863.25       .00    863.25    863.26       .01       .00       .00    859.00
    1365.      133.      500.      732.      490.      485.     2054.        0.        0.    859.50
     .00        .27      1.03       .36      .060      .045      .080      .000    854.60     38.57
  .000070        0.        0.        0.         0         0         0       .00    922.37    960.94

*SECNO 625.000

3470 ENCROACHMENT STATIONS=     400.0     1400.0  TYPE=     1  TARGET=     -400.000

        VS  A JA 51

   625.00       7.39    863.29       .00       .00    863.29       .00       .03       .00    859.20
    1315.      214.      132.      969.      803.      198.     3185.       60.       15.    858.90
     .59        .27       .67       .30      .085      .040      .070      .035    855.90    400.00
  .000030      600.      625.      760.         0         0         0       .00    954.47   1354.47

*SECNO 1225.000

        VS  B JA 52

  1225.00       7.03    863.33       .00       .00    863.34       .01       .04       .00    863.90
    1315.        0.      198.     1117.        0.      153.     1989.      104.       27.    861.00
     .84        .00      1.29       .56      .090      .060      .100      .046    856.30     33.16
  .000361      580.      600.      610.         1         0         0       .00    743.31    776.47

*SECNO 2195.000

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS=     215.0      365.0  TYPE=     1  TARGET=     150.000

        VS  C JA 53

  2195.00       5.17    863.77       .00       .00    864.34       .58       .72       .29    862.30
    1315.      215.     1098.        2.      129.      165.        2.      121.       33.    862.30
     .88       1.67      6.64      1.09      .090      .045      .080      .050    858.60    215.00
  .006011      620.      970.      580.         2         0         0       .00    124.90    339.90

*SECNO 2372.000
   SECNO      DEPTH     CWSEL     CRTWS     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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3470 ENCROACHMENT STATIONS=      788.0      825.0  TYPE=      1  TARGET=      37.000
  2372.00      6.54    864.44      .00       .00    865.04      .60       .69       .01    859.00
    1315.        4.    1306.       5.        5.     209.        6.      122.       34.    857.90
      .88       .76      6.24      .87      .090      .040     .080      .049    857.90    788.00
  .002604      227.      177.     207.         2         0        0       .00     37.00    825.00


*SECNO 2376.000

3470 ENCROACHMENT STATIONS=      789.0      824.0  TYPE=      1  TARGET=      35.000
  2376.00      6.55    864.45      .00       .00    865.06      .61       .01       .00    859.00
    1315.        0.    1315.       0.        0.     210.        0.      122.       34. 100000.00
      .88       .00      6.27      .00      .090      .040     .080      .049    857.90    789.00
  .003878        4.        4.       4.         0         0        0       .00     35.00    824.00


*SECNO 2377.000

3370 NORMAL BRIDGE,NRD= 15 MIN ELTRD=  868.70 MAX ELLC=  868.20

        BS  D JA 54    SILVER LAKE ROAD

  2377.00      6.55    864.45      .00       .00    865.06      .61       .00       .00    871.00
    1315.        0.    1315.       0.        0.     210.        0.      122.       34.    871.60
      .88       .00      6.27      .00      .040      .022     .040      .049    857.90    789.00
  .001593        1.        1.       1.         0         0        0       .00     35.00    824.00


*SECNO 2413.000

3370 NORMAL BRIDGE,NRD= 15 MIN ELTRD=  868.70 MAX ELLC=  868.20

  2413.00      6.63    864.53      .00       .00    865.12      .60       .06       .00    871.00
    1315.        0.    1315.       0.        0.     212.        0.      123.       34.    871.60
      .89       .00      6.20      .00      .040      .022     .040      .049    857.90    789.00
  .001539       36.       36.      36.         2         0        0       .00     35.00    824.00


*SECNO 2414.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      869.00 ELREA=      869.00

  2414.00      6.63    864.53      .00       .00    865.13      .60       .00       .00    859.00
    1315.        0.    1315.       0.        0.     212.        0.      123.       34.    857.90
      .89       .00      6.20      .00      .087      .040     .087      .049    857.90    789.00
  .002518        1.        1.       1.         0         0        0       .00     35.00    824.00


*SECNO 2416.000
    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=      787.0      826.0  TYPE=      1  TARGET=      39.000
  2416.00      6.69    864.59      .00       .00    865.14      .55       .00       .01    859.00
    1315.       11.    1240.      14.       10.     214.       12.      123.       34.    857.90
      .89      1.08      6.02     1.11      .087      .040     .087      .049    857.90    787.00
  .002342        2.        2.       2.         2         0        0       .00     39.00    826.00


*SECNO 2420.000
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3470 ENCROACHMENT STATIONS=      783.0      830.0  TYPE=      1  TARGET=      47.000
  2420.00      6.82    864.72      .00       .00    865.18      .46       .01       .03    859.00
    1315.       38.     1228.      49.       26.     219.       31.      123.       34.    857.90
      .89      1.47      5.61     1.58      .087     .040     .087      .049    857.90    783.00
  .001976        4.        4.       4.         2        0        0       .00     47.00    830.00

*SECNO 3515.000

        VS  E JA 55

  3515.00      6.00    866.10      .00       .00    866.13      .03       .82       .13    864.30
    1315.        2.     1313.       0.        5.     880.        0.      137.       38.    867.70
     1.09       .31      1.49      .00      .087     .040     .087      .046    860.10     94.05
  .000400      675.     1095.     675.         2        0        0       .00    308.21    402.26

*SECNO 4885.000

        VS  F JA 56

  4885.00      5.54    867.04      .00       .00    867.34      .30      1.08       .13    866.80
    1315.        0.      965.     350.        0.     190.     276.      157.       46.    863.70
     1.18       .01      5.07     1.27      .087     .040     .087      .045    861.50     45.50
  .002397     1150.     1370.    1100.         2        0        0       .00    199.08    244.58

*SECNO 6695.000

        VS  G JA 57

  6695.00      7.02    868.52      .00       .00    868.54      .03      1.12       .08    864.60
    1315.      102.      345.     868.      182.     151.    1125.      186.       55.    864.70
     1.54       .56      2.28      .77      .087     .040     .087      .045    861.50    175.95
  .000358     1150.     1810.    1210.         3        0        0       .00    420.17    596.12

*SECNO 8495.000
    SECNO      DEPTH      CWSEL      CRIWS      WSELK      FG         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=      657.0     1190.0  TYPE=      1  TARGET=     533.000

        VS  H JA 58

  8495.00      6.46    868.96      .00       .00    868.98      .02       .43       .00    865.40
    1315.      162.      326.     827.      312.     169.    1223.      232.       68.    865.60
     1.93       .52      1.93      .68      .087     .040     .087      .047    862.50    657.00
  .000282     1260.     1800.    1200.         3        0        0       .00    503.54   1160.54

*SECNO 8955.000

3470 ENCROACHMENT STATIONS=      734.0      950.0  TYPE=      1  TARGET=     216.000
  8955.00      5.82    869.12      .00       .00    869.27      .16       .23       .07    866.20
    1315.      162.      648.     505.      134.     150.     368.      243.       71.    866.40
     1.97      1.22      4.31     1.37      .087     .040     .087      .047    863.30    734.00
  .001659      347.      460.     373.         2        0        0       .00    216.00    950.00

*SECNO 9185.00
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3470 ENCROACHMENT STATIONS=      302.0      403.0  TYPE=      1  TARGET=      101.000

        VS  I JA 59

  9185.00      5.76    869.46       .00       .00    869.93       .46       .50       .15    865.20
     1315.       62.      1103.      130.       55.      186.       82.      245.       72.    866.50
     1.98      1.48      5.93      1.60      .100      .045      .100      .047    863.70    302.00
  .003570      173.      230.      187.         2         0         0       .00    101.00    403.00

*SECNO 9316.000

3470 ENCROACHMENT STATIONS=      336.0      370.0  TYPE=      1  TARGET=       34.000
  9316.00      6.22    869.92       .00       .00    870.61       .69       .57      .11100000.00
     1315.        0.      1315.        0.        0.      197.        0.      246.       72. 100000.00
     1.99       .00      6.67       .00      .100      .045      .100      .047    863.70    336.00
  .005369      171.      131.      121.         2         0         0       .00     34.00    370.00

*SECNO 9317.000

3370 NORMAL BRIDGE,NRD= 18 MIN ELTRD=  871.50 MAX FLLC=  870.65

        BS  J JA 60     SPICER ROAD

  9317.00      6.27    869.97       .00       .00    870.63       .65       .00       .01    872.00
     1315.        0.      1315.        0.        0.      203.        0.      246.       72.    871.50
     1.99       .00      6.49       .00      .040      .022      .040      .047    863.70    400.00
  .001598        1.        1.        1.         2         0         0       .00     34.00    434.00

*SECNO 9333.000
    SECNO      DEPTH      CWSEL      CRIWS      WSELK      FG         HV         HL         QLOSS     BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA       LEFT/RIGHT
    ITMF       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        FLMIN        SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID       ENDST

3370 NORMAL BRIDGE,NRD= 18 MIN ELTRD=  871.50 MAX FLLC=  870.65

  9333.00      6.31    870.01       .00       .00    870.65       .64       .03       .00    872.00
     1315.        0.      1315.        0.        0.      204.        0.      246.       72.    871.50
     1.99       .00      6.44       .00      .040      .022      .040      .047    863.70    400.00
  .001563       16.       16.       16.         1         0         0       .00     34.00    434.00

*SECNO 9334.000

3470 ENCROACHMENT STATIONS=      336.0      370.0  TYPE=      1  TARGET=       34.000
  9334.00      6.30    870.00       .00       .00    870.67       .67       .00      .01100000.00
     1315.        0.      1315.        0.        0.      200.        0.      246.       72. 100000.00
     1.99       .00      6.57       .00      .070      .042      .070      .047    863.70    336.00
  .004481        1.        1.        1.         1         0         0       .00     34.00    370.00

*SECNO 9336.000

3470 ENCROACHMENT STATIONS=      334.0      372.0  TYPE=      1  TARGET=       38.000
  9336.00      6.40    870.10       .00       .00    870.70       .60       .01       .02    865.20
     1315.        5.      1300.       10.        5.      208.        7.      246.       72.    866.50
     1.99      1.03      6.24      1.37      .070      .042      .070      .047    863.70    334.00
  .002967        2.        2.        2.         2         0         0       .00     38.00    372.00
```

*SECNO 10535.000

3301 HV CHANGED MORE THAN HVINS

VS K JA 61

10535.00	6.79	870.99	.00	.00	871.00	.00	.12	.18	865.50
1350.	641.	439.	270.	1890.	634.	745.	287.	80.	865.50
2.67	.34	.69	.36	.070	.042	.070	.046	864.20	75.05
.000033	939.	1199.	1109.	3	0	0	.00	675.28	750.33

*SECNO 11745.000

VS L JA 62

11745.00	6.52	871.02	.00	.00	871.03	.00	.03	.00	865.40
1350.	115.	237.	998.	299.	470.	2746.	381.	100.	865.60
3.53	.38	.50	.36	.035	.042	.050	.046	864.50	62.86
.000018	1220.	1210.	1190.	2	0	0	.00	758.80	821.66

*SECNO 14395.000

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

VS M JA 63

14395.00	5.40	871.10	.00	.00	871.12	.02	.08	.01	867.50
1350.	601.	316.	433.	773.	190.	733.	485.	125.	867.20
4.08	.78	1.67	.59	.070	.045	.100	.049	865.70	166.33
.000301	1660.	2650.	1600.	2	0	0	.00	528.21	694.54

*SECNO 15265.000

VS N JA 64

15265.00	6.03	871.53	.00	.00	871.69	.16	.50	.07	867.90
1475.	174.	1222.	79.	184.	352.	78.	508.	132.	868.30
4.16	.94	3.47	1.01	.120	.050	.100	.049	865.50	112.38
.001451	810.	870.	870.	2	0	0	.00	176.83	289.21

*SECNO 16255.000

3280 CROSS SECTION 16255.00 EXTENDED 3.36 FEET

3470 ENCROACHMENT STATIONS= 400.0 1000.0 TYPE= 1 TARGET= 600.000

VS O JA 65

16255.00	5.97	872.17	.00	.00	872.18	.01	.45	.04	868.20
1475.	460.	497.	498.	1084.	369.	896.	539.	140.	868.30
4.49	.44	1.35	.56	.120	.050	.100	.049	866.20	400.00
.000229	890.	990.	900.	2	0	0	.00	600.00	1000.00

*SECNO 16476.000

3280 CROSS SECTION 16476.00 EXTENDED 3.41 FEET

```
3470 ENCROACHMENT STATIONS=      550.0     1000.0  TYPE=      1  TARGET=      450.000
 16476.00      7.21    872.21       .00       .00    872.21       .01       .04       .00    865.60
    1475.      490.      296.      689.      909.      233.     1284.      550.      143.    865.50
     4.57       .54      1.27       .54      .100      .050      .100      .049    865.00    550.00
  .000145      191.      221.      191.         2         0         0       .00    450.00   1000.00
```

*SECNO 16477.000

3280 CROSS SECTION 16477.00 EXTENDED 3.41 FEET

```
3470 ENCROACHMENT STATIONS=      550.0     1000.0  TYPE=      1  TARGET=      450.000
        BS  P JA 66     MARSHALL ROAD

 16477.00      7.21    872.21       .00       .00    872.21       .01       .00       .00    865.60
    1475.      490.      296.      689.      909.      233.     1284.      550.      143.    865.50
     4.57       .54      1.27       .54      .040      .020      .040      .049    865.00    550.00
  .000023        1.        1.        1.         0         0         0       .00    450.00   1000.00
```

SPECIAL BRIDGE

SR	XK	XKOR	COFQ	RDLEN	BWC	BRP	BAREA	SS	ELCHU	ELCHD
	.00	1.37	5.02	.00	30.67	.00	179.10	.00	865.00	865.00

*SECNO 16494.000

3265 DIVIDED FLOW

3280 CROSS SECTION 16494.00 EXTENDED .39 FEET

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	OLOB	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	EGLRC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
873.65	872.21	.00	378.	1093.	179.	178.	870.80	872.10

```
3470 ENCROACHMENT STATIONS=        .0      900.0  TYPE=      1  TARGET=      899.999
 16494.00      7.79    872.79       .00       .00    873.00       .21       .78       .00    866.70
    1475.      167.     1065.      243.      137.      249.      255.      550.      143.    866.10
     4.58      1.22      4.28       .95      .040      .020      .040      .049    865.00    428.98
  .000254       17.       17.       17.         2         0         3       .00    420.77    900.00
```

*SECNO 16495.000

3265 DIVIDED FLOW

3280 CROSS SECTION 16495.00 EXTENDED .39 FEET

```
3470 ENCROACHMENT STATIONS=          .0      900.0  TYPE=      1  TARGET=      899.999
 16495.00      7.79    872.79       .00       .00    873.00      .21       .00       .00    866.70
    1475.      167.     1066.      243.      137.      249.      255.      550.      143.    866.10
     4.38      1.22      4.28       .95      .100      .050      .100      .049    865.00    429.01
  .001588        1.        1.        1.         0         0         0       .00    420.62    900.00

*SECNO 17145.000

        VS   W JA 67

 17145.00      7.73    873.63       .00       .00    873.72      .09       .68       .04    868.80
    1475.      532.      933.       10.      617.      321.       16.      562.       148.    869.50
     4.66       .86      2.90       .60      .100      .050      .100      .049    865.90    104.49
  .000737      660.      650.      640.         2         0         0       .00    310.21    414.69

*SECNO 17925.000

        VS   R JA 68

 17925.00      8.30    873.90       .00       .00    873.91      .01       .18       .02    868.60
    1475.      483.      679.      313.     1128.      555.      770.      590.      155.    869.00
     4.92       .43      1.22       .41      .100      .050      .100      .049    865.60     99.30
  .000116      650.      780.      780.         2         0         0       .00    578.72    678.02

*SECNO 18525.000

3265 DIVIDED FLOW

3280 CROSS SECTION  18525.00 EXTENDED        .69 FEET

3470 ENCROACHMENT STATIONS=          .0      950.0  TYPE=      1  TARGET=      949.999

        VS   S JA 68A

 18525.00      8.39    873.99       .00       .00    874.03      .03       .10       .01    868.80
    1475.      403.      995.       77.      717.      574.      196.      618.      163.    870.20
     5.05       .56      1.73       .39      .100      .050      .100      .049    865.60    229.16
  .000261      640.      600.      610.         2         0         0       .00    446.79    950.00

*SECNO 18955.000
3280 CROSS SECTION  18955.00 EXTENDED        .40 FEET

   SECNO      DEPTH      CWSEL      CRTWS      HSELK      EG         HV         HL         OLOSS     BANK ELEV
   Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA    LEFT/RIGHT
   TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN       SSTA
   SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID      ENDST

3470 ENCROACHMENT STATIONS=       200.0     1150.0  TYPE=      1  TARGET=      950.000

        VS   T JA 69     DOWNSTREAM SANDY BOTTOM LAKE

 18955.00     29.94    874.04       .00       .00    874.04      .00       .00       .01    868.50
    1475.      159.     1290.       26.     2464.     4036.      647.      649.      166.    868.50
     5.41       .01       .32       .04      .100      .050      .100      .049    844.10    200.00
```

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 .000002      170.      430.      200.        0        0        0      .00   910.00  1130.00

CCHV=     .300 CEHV=     .500
*SECNO 20955.000

                FIELD  SECTION 70      SEC. U

                USE ENERGY GRADE OF SEC. T (16775) AS STARTING WSEL

 20955.00      7.63   874.03      .00      .00   874.04      .01      .00      .00   868.60
    1065.      349.      347.      369.    1006.     318.    1054.     650.     167.   868.60
     5.41       .35      1.09      .35     .110     .047     .110     .049   866.40    62.89
 .000087       10.       10.       10.        0        0        0      .00   565.56   628.45

*SECNO 21755.000

                FIELD  SECTION 71      SEC. V

 21755.00      8.28   874.08      .00      .00   874.09      .00      .05      .00   869.10
    1065.      155.      422.      488.     886.     544.    2204.     706.     180.   868.80
     5.93       .18       .78      .22     .115     .045     .115     .049   865.80     6.49
 .000040      500.      800.     1000.        1        0        0      .00   889.08   895.57

*SECNO 22655.000

                FIELD  SECTION 72      SEC. W

 22655.00      8.31   874.11      .00      .00   874.11      .00      .02      .00   868.70
    1065.      336.      286.      444.    1983.     496.    2704.     789.     199.   868.90
     6.77       .17       .58      .16     .115     .045     .115     .049   865.80    57.89
 .000021      900.      900.      750.        2        0        0      .00  1110.55  1168.43

*SECNO 24555.000

                FIELD  SECTION 73      SEC. X

                USE ENERGY GRADE OF SEC. W (20475) AS WSEL

 24555.00      8.71   874.11      .00      .00   874.11      .00      .00      .00   869.00
    1065.      796.      152.      117.    3912.     265.     467.     790.     199.   869.00
     6.78       .20       .57      .25     .090     .042     .060     .049   865.40    13.10
 .000018       10.       10.       10.        0        0        0      .00  1040.97  1054.07

*SECNO 25315.000
   SECNO     DEPTH     CMSEL     CRIWS     WSELK      FG        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=      620.0     1330.0  TYPE=      1  TARGET=     -620.000

                FIELD  SECTION 74      SEC. Y

 25315.00      8.14   874.14      .00      .00   874.15      .01      .04      .00   872.50
    1065.      541.      490.      34.     1621.     436.      86.     874.     219.   871.30
     7.18       .33      1.12      .39     .100     .045     .060     .048   866.00   620.00
 .000100     1150.      760      750.        1        0        0      .00   625.22  1245.22
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*SECNO 26315.000

3470 ENCROACHMENT STATIONS=      610.0      674.0  TYPE=      1  TARGET=      64.000

                FIELD  SECTION 75      SEC. Z

 26315.00      8.20    874.30       .00       .00    874.39       .09       .20       .04100000.00
    1065.        0.      1065.        0.        0.      436.        0.      906.      228. 100000.00
     7.29       .00      2.44       .00      .090      .045      .080      .048    866.10    610.00
  .000522     1100.      1000.      900.         2         0         0       .00     64.00    674.00

*SECNO 26404.000

3301 HV CHANGED MORE THAN HVINS

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      875.10 ELREA=      875.10

 26404.00      5.83    873.73       .00       .00    875.20      1.48       .12       .69    867.90
    1065.        0.      1065.        0.        0.      109.        0.      906.      228.    868.10
     7.30       .00      9.76       .00      .090      .045      .080      .048    867.90    531.00
  .008486       89.       89.       89.         3         0         0       .00     19.00    550.00

*SECNO 26405.000

3370 NORMAL BRIDGE,NRD= 14 MIN ELTRD=  875.10 MAX ELLC=  875.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      875.10 ELREA=      875.10

 26405.00      5.84    873.74       .00       .00    875.21      1.48       .01       .00    877.00
    1065.        0.      1065.        0.        0.      109.        0.      906.      228.    877.30
     7.30       .00      9.75       .00      .040      .022      .040      .048    867.90    531.00
  .005811        1.        1.        1.         0         0         0       .00     19.00    550.00

*SECNO 26436.000

3370 NORMAL BRIDGE,NRD= 14 MIN ELTRD=  875.10 MAX ELLC=  875.00

                FIELD SECTION 76 -  DOANE ROAD        SEC. AA

 26436.00      6.26    874.16       .00       .00    875.44      1.28       .16       .06    877.00
    1065.        0.      1065.        0.        0.      117.        0.      906.      228.    877.30
     7.30       .00      9.07       .00      .040      .022      .040      .048    867.90    531.00
  .004816       31.       31.       31.         2         0         0       .00     19.00    550.00

*SECNO 26437.000
   SECNO     DEPTH     CWSEL     CRTWS     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

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      875.10 ELREA=      875.10

 26437.00      6.26    874.16       .00       .00    875.44      1.28       .01       .00    867.90
    1065.        0.      1065.        0.        0.      117.        0.      906.      228.    868.10
     7.30       .00      9.07       .00      .100      .047      .100      .048    867.90    531.0
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 .....  1.     1.     1.     0      0      0     .00    14.00   550.00

*SECNO 26460.000

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS=     610.0     675.0  TYPE=     1  TARGET=     65.000
 26460.00     7.83   875.73     .00     .00   875.83     .10     .04     .35100001.80
    1065.       0.    1065.      0.      0.     417.      0.    906.     228. 100001.80
     7.30      .00     2.56     .00    .100     .047    .100    .048  867.90   610.00
  .000662      23.      23.     23.       3        0       0     .00   65.00   675.00

*SECNO 27160.000

                FIELD  SECTION 77      SEC. AB

 27160.00     7.83   876.23     .00     .00   876.30     .07     .46     .01   871.70
    1065.     436.     563.     66.    496.     193.     93.    915.    230.   872.20
     7.40      .88     2.91     .72    .110     .047    .095    .048  868.40    37.86
  .000696     650.     700.    530.       3        0       0     .00  217.36   255.22

*SECNO 28660.000

                FIELD  SECTION 78      SEC. AC

 28660.00     7.46   876.66     .00     .00   876.67     .01     .35     .02   872.50
    1065.     624.     178.    263.   1554.     122.    649.    950.    242.   872.50
     7.93      .40     1.47     .41    .110     .043    .095    .049  869.20    77.61
  .000177     750.    1500.   1400.       2        0       0     .00  822.28   899.89

*SECNO 30110.000

          OVERBANK=1/3 OF SEC.AC; CHANNEL=SAME AS SEC.AC; ELEV=INCREASE 1.5'

 30110.00     6.36   877.06     .00     .00   877.26     .21     .49     .10   874.00
    1065.     409.     508.    148.    306.     99.    105.    981.    254.   874.00
     8.02     1.33     5.11    1.41    .110    .045    .095    .049  870.70    31.72
  .003079     750.    1450.   1250.       2        0       0     .00  234.89   266.61

*SECNO 30760.000
   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    TOC       ICONT     CORAR     TOPWID     ENDST

3470 ENCROACHMENT STATIONS=        .0     875.0  TYPE=     1  TARGET=    874.999

                FIELD  SECTION 79      SEC. AD

 30760.00     6.28   877.68     .00     .00   877.70     .01     .37     .06   873.80
    1065.     263.     268.    534.    546.     164.   1198.    997.    260.   873.80
     8.24      .48     1.64     .45    .110     .045    .095    .049  871.40   100.07
  .000267     500.     650.    600.       2        0       0     .00  774.92   875.00

*SECNO 32960.000

3470 ENCRO CHMENT STATIONS=     225.0    1590.0  TYPE=     1  TARGET=    -275.000
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                FIELD  SECTION 80      SEC. AE

 32960.00      4.64    878.04       .00       .00    878.04       .00       .34       .00    875.00
    1095.      144.       98.      853.      366.       80.     2108.     1064.      287.    875.10
     9.07       .39      1.23       .40      .110      .045      .095      .050    873.40    225.00
  .000217     2350.     2200.      950.         4         0         0       .00   1152.89   1377.89

*SECNO 34860.000

3470 ENCROACHMENT STATIONS=      122.0      600.0  TYPE=      1  TARGET=    -122.000

                FIELD  SECTION 81      SEC. AF

 34860.00      3.25    878.75       .00       .00    879.16       .42       .91       .21    877.90
    1095.      474.      522.       98.      196.       74.       51.     1101.      305.    877.90
     9.15      2.42      7.09      1.91      .110      .045      .095      .051    875.50    122.00
  .017329     1000.     1900.     1100.         3         0         0       .00    217.94    339.94

*SECNO 35010.000

3470 ENCROACHMENT STATIONS=      168.0      298.0  TYPE=      1  TARGET=    130.000
 35010.00      5.46    879.66       .00       .00    879.80       .14       .56       .08    876.60
    1095.      424.      588.       83.      296.      151.       60.     1102.      305.    876.60
     9.16      1.43      3.88      1.38      .110      .045      .095      .051    874.20    168.00
  .001990      100.      150.      100.         2         0         0       .00    130.00    298.00


SPECIAL BRIDGE

SB   XK        XKOR      COFD      RDLEN     BRC       BWP       BAREA     SS        ELCHU     ELCHD
      .00      1.58      2.80       .00     16.30       .00     76.50       .00     874.20    874.20

*SECNO 35022.000

3301 HV CHANGED MORE THAN HVINS

PRESSURE AND WEIR FLOW

 EGPRS      FGLNC      H3        QWEIR     QPR       BAREA     TRAPEZOID     ELLC      FLTRD
                                                               AREA
  884.69    881.03      .00       485.      618.      77.       77.       878.90    879.80


                FIELD SECTION 82 -   PRIVATE DRIVE      SEC. AG

 35022.00      6.22    880.42       .00       .00    881.26       .84      1.46       .00    876.10
    1095.      102.      884.      109.       50.      109.       46.     1102.      305.    876.50
     9.16      2.02      8.13      2.36      .040      .022      .040      .051    874.20    263.77
  .001672       12.       12.       12.         4         0         0       .00    130.91    394.68

*SECNO 35622.000

3301 HV CHANGED MORE THAN HVINS

   SECNO     DEPTH     CWSEL     CRTWS     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    TDC       ICONT     CORAR     TOPWID    ENDST
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35622.00     7.17    882.17      .00      .00    882.23      .06      .73      .23    877.80
    1095.     558.      377.     159.     519.     122.     175.    1108.     307.    878.70
     9.25     1.08      3.08      .91     .100     .047     .100     .051   875.00     49.85
 .001029     550.      600.     450.        3        0        0      .00   255.30    305.15

*SECNO 35947.000

3301 HV CHANGED MORE THAN HVINS

35947.00     6.85    882.35      .00      .00    883.20      .85      .58      .39    878.20
    1095.     130.      844.     121.      59.     101.      71.    1111.     308.    878.80
     9.26     2.20      8.36     1.71     .100     .047     .100     .051   875.50    189.98
 .007450     175.      325.     225.        2        0        0      .00   117.75    307.73

*SECNO 36110.000
36110.00     7.73    883.43      .00      .00    884.18      .75      .95      .03    878.30
    1095.     122.      829.     144.      56.     105.      86.    1112.     309.    878.80
     9.27     2.17      7.93     1.67     .100     .047     .100     .051   875.70    207.60
 .005523      88.      163.     113.        3        0        0      .00   109.45    317.05

*SECNO 36142.000
36142.00     7.88    883.58      .00      .00    884.34      .76      .16      .00    878.40
    1095.     121.      828.     146.      55.     104.      86.    1112.     309.    878.90
     9.27     2.20      7.98     1.70     .100     .047     .100     .051   875.70    211.33
 .005547      19.       32.      23.        0        0        0      .00   106.98    318.31

*SECNO 36207.000
36207.00     8.10    883.90      .00      .00    884.68      .78      .33      .01    878.40
    1095.     118.      824.     154.      52.     102.      87.    1112.     309.    878.90
     9.27     2.24      8.09     1.77     .100     .047     .100     .051   875.80    216.58
 .005506      35.       65.      45.        2        0        0      .00   101.22    317.80

*SECNO 36272.000
   SECNO      DEPTH     CWSFL     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

36272.00     8.27    884.17      .00      .00    885.10      .93      .35      .07    878.50
    1095.     112.      856.     127.      49.      99.      77.    1112.     309.    878.90
     9.28     2.29      8.67     1.65     .100     .047     .100     .051   875.90    222.23
 .006238      35.       65.      45.        0        0        0      .00    95.39    317.62

*SECNO 36273.000
36273.00     8.60    884.50      .00      .00    885.18      .68      .00      .07    878.50
    1095.     134.      790.     171.      56.     103.      99.    1112.     309.    878.90
     9.28     2.39      7.67     1.73     .040     .022     .040     .051   875.90    220.54
 .001013       1.        1.       1.        3        0        0      .00   106.45    326.99

SPECIAL BRIDGE

SB   XK       XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
      .00      1.59      2.80       .00      7.80       .00      53.84      .00    875.90    875.90
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*SECNO 36287.000
PRESSURE AND WEIR FLOW

 EGPRS      FGLWC      43       QWEIR      QPR       BAREA   TRAPEZOID    ELLC      FLTRD
                                                              AREA
 894.71     886.25     .00      603.       492.      54.      54.        882.80    885.10

              FIELD SECTION 84 -   PRIVATE DRIVE     SEC. AI

 36287.00   10.48    886.38     .00        .00     886.56     .18      1.38      .00     878.50
   1095.     171.     580.     344.       114.      127.     286.     1112.     309.     878.90
    9.28     1.50     4.55     1.20       .040      .022     .040      .051    875.90    204.54
 .000268     14.      14.      14.         2         0        6       .00     183.93    388.48

*SECNO 36288.000
 36288.00   10.46    886.36     .00        .00     886.58     .21      .00       .02     878.50
   1095.     148.     615.     331.       114.      127.     285.     1112.     309.     878.90
    9.28     1.30     4.83     1.16       .100      .045     .090      .051    875.90    204.61
 .001265      1.       1.       1.         1         0        0       .00     183.59    388.20

*SECNO 37098.000

              FIELD  SECTION 85     SEC. AJ

 37098.00    8.98    886.98     .00        .00     887.00     .02      .36       .06     883.40
   1095.       9.     270.     816.        28.      149.    1065.     1128.     313.     881.20
    9.49      .34     1.81      .77       .100      .045     .090      .051    878.00     27.47
 .000244     750.     810.     750.         2         0        0       .00     247.47    274.93

*SECNO 37858.000
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     FG        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     ITRTAL    IDC       ICONT     CORAR     TOPWID     ENDST

3470 ENCROACHMENT STATIONS=      126.0      168.0  TYPE=      1  TARGET=      42.000
 37858.00    6.50    887.20     .00        .00     887.64     .44      .43       .21     882.30
   1095.      25.     1058.     11.        19.      195.     10.     1140.     315.     884.00
    9.53     1.33     5.42     1.17       .100      .045     .090      .051    880.70    126.00
 .002806     660.     760.     700.         2         0        0       .00      42.00    168.00

*SECNO 37898.000

3301 HV CHANGED MORE THAN HVTNS

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      893.90 ELREA=      893.90

 37898.00    6.19    886.99     .00        .00     888.19    1.20      .17       .38     881.60
   1095.       0.     1095.      0.         0.      124.      0.     1140.     315.     880.80
    9.53      .00     8.80      .00       .100      .045     .090      .051    880.80    132.00
 .007060      40.      40.      40.         2         0        0       .00      22.00    154.00

*SECNO 37899.000
```

3370 NORMAL BRIDGE,NRD= 10 MIN ELTRD= 893.90 MAX ELLC= 894.30

37899.00	6.19	886.99	.00	.00	888.19	1.20	.01	.00	896.10
1095.	0.	1095.	0.	0.	125.	0.	1140.	315.	895.50
9.53	.00	8.79	.00	.040	.022	.040	.051	880.80	132.00
.004388	1.	1.	1.	0	0	0	.00	22.00	154.00

*SECNO 37942.000

3370 NORMAL BRIDGE,NRD= 10 MIN ELTRD= 893.90 MAX ELLC= 894.30

FIELD SECTION 85 - RUSHTON ROAD SEC. AK

37942.00	6.55	887.35	.00	.00	888.41	1.06	.17	.04	896.10
1095.	0.	1095.	0.	0.	132.	0.	1140.	315.	895.50
9.53	.00	8.27	.00	.040	.022	.040	.051	880.80	132.00
.003732	43.	43.	43.	2	0	0	.00	22.00	154.00

*SECNO 37943.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 893.90 ELREA= 893.90

37943.00	6.55	887.35	.00	.00	888.41	1.06	.00	.00	881.60
1095.	0.	1095.	0.	0.	132.	0.	1140.	315.	880.80
9.53	.00	8.27	.00	.080	.040	.090	.051	880.80	132.00
.004536	1.	1.	1.	0	0	0	.00	22.00	154.00

*SECNO 37953.000

3501 HV CHANGED MORE THAN HVINS

SECNO	DEPTH	CWSEL	CRTWS	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	ELMTN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3470 ENCROACHMENT STATIONS= 126.0 168.0 TYPE= 1 TARGET= 42.000

37953.00	7.55	888.35	.00	.00	888.66	.31	.02	.23	882.40
1095.	27.	1057.	11.	23.	232.	13.	1140.	315.	884.10
9.53	1.18	4.55	.85	.080	.040	.090	.051	880.80	126.00
.001245	10.	10.	10.	3	0	0	.00	42.00	168.00

*SECNO 38123.000

FIELD SECTION 86 SEC. AL

38123.00	8.27	888.77	.00	.00	888.82	.05	.09	.08	882.10
1110.	162.	613.	316.	191.	257.	420.	1142.	316.	883.80
9.56	.95	2.38	.75	.080	.040	.090	.051	880.50	89.82
.000296	200.	170.	100.	2	0	0	.00	181.38	271.20

*SECNO 39313.000

FIELD SECTION 87 SEC. AM

39313.00	6.37	889.37	.00	.00	889.61	.24	.69	.10	885.40
1110.	112.	616.	382.	69.	120.	248.	1157.	319.	884.30
9.64	1.62	5.14	1.54	.095	.045	.100	.051	883.00	133.18

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*SECNO 40883.000

3265 DIVIDED FLOW

                FIELD  SECTION 88      SEC. AN

 40883.00      5.66   890.46      .00       .00   890.47      .01       .79       .07   888.00
    1110.      322.     103.     685.      581.      73.     1172.     1187.      329.   886.60
    10.19       .55     1.41      .58      .095     .047      .095      .051   884.80    57.20
  .000271      800.    1570.    1300.         3        0         0       .00   596.25   920.67

*SECNO 42053.000

                FIELD  SECTION 89      SEC. AO

 42053.00      4.39   890.79      .00       .00   890.82      .02       .34       .01   888.70
    1110.       26.     159.     925.       49.      66.     1139.     1212.      338.   888.70
    10.38       .54     2.41      .81      .100     .047      .100      .052   886.40    36.11
  .001041     1150.    1170.     550.         3        0         0       .00   596.28   632.39

*SECNO 42613.000

3265 DIVIDED FLOW

   SECNO      DEPTH     CWSEL     CRTWS     WSELK      EG        HV        HL     OLOSS   BANK ELEV
   Q          OLOB      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=      300.0      950.0  TYPE=      1  TARGET=      650.000

                FIELD  SECTION 90      SEC. AP

 42613.00      5.05   891.45      .00       .00   891.53      .08       .69       .03   888.90
    1110.      491.     300.     320.      371.      75.      334.     1222.      343.   889.20
    10.45      1.32     3.98      .96      .100     .047      .100      .052   886.40   300.00
  .002609      550.     560.     350.         2        0         0       .00   430.49   950.00

*SECNO 43433.000

3470 ENCROACHMENT STATIONS=        .0      400.0  TYPE=      1  TARGET=      399.999
 43433.00      5.42   893.72      .00       .00   894.01      .29      2.37       .10   891.10
    1110.      100.     650.     360.       90.     118.      273.     1232.      349.   890.70
    10.50      1.11     5.50     1.32      .100     .047      .100      .052   888.30   130.84
  .003895      699.     820.     699.         2        0         0       .00   269.16   400.00

*SECNO 43434.000

3470 ENCROACHMENT STATIONS=        .0      400.0  TYPE=      1  TARGET=      399.999
 43434.00      5.42   893.72      .00       .00   894.01      .29       .00       .00   889.60
    1110.      153.     563.     394.       96.      96.      241.     1232.      349.   889.60
    10.50      1.59     5.84     1.63      .040     .022      .040      .052   888.30   130.94
  .001173        1.       1.       1.         0        0         0       .00   269.06   400.00
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SPECIAL BRIDGE

SB	XK	XKOR	COFQ	ROLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.00	1.88	2.85	.00	12.57	.00	50.27	.00	888.30	888.30

*SECNO 43461.000
PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
907.95	894.01	.00	933.	179.	50.	50.	892.30	892.40

3470 ENCROACHMENT STATIONS= .0 400.0 TYPE= 1 TARGET= 399.999

FIELD SECTION 90A - PRIVATE DRIVE SEC. AR

43461.00	5.55	893.85	.00	.00	894.09	.24	.08	.00	889.60
1110.	158.	537.	416.	106.	99.	265.	1232.	349.	889.60
10.50	1.49	5.41	1.57	.040	.022	.040	.052	888.30	127.47
.000972	27.	27.	27.	2	0	6	.00	272.53	400.00

*SECNO 43462.000

3470 ENCROACHMENT STATIONS= .0 400.0 TYPE= 1 TARGET= 399.999

43462.00	5.54	893.84	.00	.00	894.10	.26	.00	.01	891.10
1110.	102.	641.	367.	98.	121.	295.	1232.	349.	890.70
10.50	1.04	5.29	1.25	.100	.045	.100	.052	888.30	127.64
.003193	1.	1.	1.	0	0	0	.00	272.36	400.00

*SECNO 43812.000

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= 210.0 310.0 TYPE= 1 TARGET= 100.000

FIELD SECTION 91 SEC. AR

43812.00	5.84	895.04	.00	.00	895.40	.37	1.25	.05	891.70
1110.	309.	490.	311.	130.	72.	137.	1235.	350.	892.00
10.52	2.37	6.82	2.28	.100	.045	.100	.052	889.20	210.00
.005837	272.	350.	222.	2	0	0	.00	100.00	310.00

*SECNO 43902.000

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS= 230.0 285.0 TYPE= 1 TARGET= 55.000

43902.00	5.69	895.44	.00	.00	896.53	1.09	.77	.36	892.25
1110.	213.	710.	186.	63.	70.	58.	1236.	350.	892.55
10.53	3.36	10.19	3.21	.100	.045	.100	.052	889.75	230.00
.013575	90.	90.	90.	0	0	0	.00	55.00	285.00

*SECNO 43925.000

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43925.00      5.67    895.56      .00      .00    897.13     1.57      .36      .24    892.39
   1110.      163.     805.     142.      44.       69.      40.    1236.     350.    892.69
   10.53      3.72    11.61     3.53     .100      .045     .100     .052   889.89    236.00
 .017776       23.      23.      23.        2         0        0      .00    43.00    279.00


*SECNO 43947.000

3301 HV CHANGED MORE THAN HVINS

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

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      241.0      273.0  TYPE=      1  TARGET=      32.000
 43947.00      5.80    895.83   895.83      .00    897.94     2.12      .42      .27    892.53
   1110.      113.     910.      86.      30.       71.      24.    1236.     350.    892.83
   10.53      3.84    12.77     3.60     .100      .045     .100     .052   890.03    241.00
 .020719       22.      22.      22.        2         8        0      .00    32.00    273.00


*SECNO 43969.000
   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

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      246.0      267.0  TYPE=      1  TARGET=      21.000
 43969.00      6.27    896.44   896.44      .00    899.04     2.60      .45      .24    892.67
   1110.       49.     1044.     17.      15.       78.       7.    1236.     350.    892.97
   10.53      3.26    13.33     2.46     .100      .045     .100     .052   890.17    246.00
 .019898       22.      22.      22.        3         8        0      .00    21.00    267.00


*SECNO 43981.000
   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

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      250.0      265.0  TYPE=      1  TARGET=      15.000
 43981.00      6.56    896.80   896.80      .00    899.60     2.80      .30      .10    892.74
   1110.        0.     1110.      0.       0.       83.       0.    1236.     350. 100000.00
   10.53       .00    13.43      .00     .100      .045     .100     .052   890.24    250.00
 .031788       12.      12.      12.        2         8        0      .00    15.00    265.00


*SECNO 43987.000
   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
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3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      251.5      263.5  TYPE=      1  TARGET=      12.000
 43987.00      7.16    897.43    897.43       .00    900.66      3.24       .21       .22100000.00
    1110.        0.     1110.        0.        0.       77.        0.     1236.      350. 100000.00
    10.53       .00     14.44       .00      .100      .045      .100      .052    890.27    251.50
  .039163        6.        6.        6.       20         8         0       .00     12.00    263.50

*SECNO 43992.000
   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     IDC        ICONT      CORAR      TOPWID      ENDST

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=      252.5      262.5  TYPE=      1  TARGET=      10.000
 43992.00      7.83    898.13    898.13       .00    901.78      3.65       .22       .21100000.00
    1110.        0.     1110.        0.        0.       72.        0.     1236.      350. 100000.00
    10.53       .00     15.34       .00      .100      .045      .100      .052    890.30    252.50
  .048317        5.        5.        5.       20         8         0       .00     10.00    262.50

SPECIAL BRIDGE

SB   XK        XKOR       COFQ      RDLEN      BWC       BWP       BAREA      SS        ELCHU     ELCHD
      .00       1.69       2.85       .00      8.53       .00      74.17      .00      890.30    890.30

*SECNO 44032.000

3301 HV CHANGED MORE THAN HVTNS

PRESSURE FLOW

 EGPRS      FGLWC      H3         QWEIR      QPR        BAREA      TRAPEZOID AREA      ELLC      ELTRD
  904.01    901.41       .00        0.      1110.       74.        74.        899.00    910.90

                FIELD SECTION 92 -   CHESAPEAKE & OHIO RAILROAD    SEC. AS

 44032.00     12.43    902.73       .00       .00    904.01      1.28       2.22       .00    910.90
    1110.        0.     1110.        0.        0.      122.        0.     1236.      350.    910.90
    10.53       .00      4.07       .00      .040      .022      .040      .052    890.30    500.00
  .003305       40.       40.       40.        3         0         0       .00     10.00    510.00

*SECNO 44033.000
 WATER EL=XS CARD=    903.300

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLFA=      911.00 FLREA=      911.00
                                                                                  Hand comps
 44033.00     13.00    903.30       .00       .00    904.47      1.17       .00       .03    890.40
    1110.        0.     1110.        0.        0.      128.        0.     1236.      350.    890.80
    10.53       .00      8.67       .00      .040      .022      .040      .05      890.30    500.00
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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

DAVIS CREEK

SUMMARY PRINTOUT

SECNO	XLCH	FLTRD	FLLC	FLMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	TOPWID	AREA
.000	.00	.00	.00	854.60	1365.00	863.25	8.65	.01	.00	863.26	922.37	3029.15
625.000	625.00	.00	.00	855.90	1315.00	863.29	7.39	.00	.00	863.29	954.47	4185.90
1225.000	600.00	.00	.00	856.30	1315.00	863.33	7.03	.01	.00	863.34	743.31	2142.27
2195.000	970.00	.00	.00	858.60	1315.00	863.77	5.17	.58	.29	864.34	124.90	296.31
2372.000	177.00	.00	.00	857.90	1315.00	864.44	6.54	.60	.01	865.04	37.00	220.66
2376.000	4.00	.00	.00	857.90	1315.00	864.45	6.55	.61	.00	865.06	35.00	209.79
2377.000	1.00	868.70	868.20	857.90	1315.00	864.45	6.55	.61	.00	865.06	35.00	209.58
2413.000	36.00	868.70	868.20	857.90	1315.00	864.53	6.63	.60	.00	865.12	35.00	212.18
2414.000	1.00	.00	.00	857.90	1315.00	864.53	6.63	.60	.00	865.13	35.00	212.24
2416.000	2.00	.00	.00	857.90	1315.00	864.59	6.69	.55	.01	865.14	39.00	236.96
2420.000	4.00	.00	.00	857.90	1315.00	864.72	6.82	.46	.03	865.18	47.00	275.90
3515.000	1095.00	.00	.00	860.10	1315.00	866.10	6.00	.03	.13	866.13	308.21	885.78
4885.000	1370.00	.00	.00	861.50	1315.00	867.04	5.54	.30	.13	867.34	199.08	466.01
6695.000	1810.00	.00	.00	861.50	1315.00	868.52	7.02	.03	.08	868.54	420.17	1458.15
8495.000	1800.00	.00	.00	862.50	1315.00	868.96	6.46	.02	.00	868.98	503.54	1705.09
8955.000	460.00	.00	.00	863.30	1315.00	869.12	5.82	.16	.07	869.27	216.00	652.02
9185.000	230.00	.00	.00	863.70	1315.00	869.46	5.76	.46	.15	869.93	101.00	322.94
9316.000	131.00	.00	.00	863.70	1315.00	869.92	6.22	.69	.11	870.61	34.00	197.19
9317.000	1.00	871.50	870.65	863.70	1315.00	869.97	6.27	.65	.01	870.63	34.00	202.55
9333.000	16.00	871.50	870.65	863.70	1315.00	870.01	6.31	.64	.00	870.65	34.00	204.19

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	TOPWID	AREA
9334.000	1.00	.00	.00	863.70	1315.00	870.00	6.30	.67	.01	870.67	34.00	200.05
9336.000	2.00	.00	.00	863.70	1315.00	870.10	6.40	.60	.02	870.70	38.00	220.25
10535.000	1199.00	.00	.00	864.20	1350.00	870.99	6.79	.00	.18	871.00	675.28	3268.71
11745.000	1210.00	.00	.00	864.50	1350.00	871.02	6.52	.00	.00	871.03	758.80	3515.25
14395.000	2650.00	.00	.00	865.70	1350.00	871.10	5.40	.02	.01	871.12	528.21	1695.36
15265.000	870.00	.00	.00	865.50	1475.00	871.53	6.03	.16	.07	871.69	176.83	613.98
16255.000	990.00	.00	.00	866.20	1475.00	872.17	5.97	.01	.04	872.18	600.00	2350.18
16476.000	221.00	.00	.00	865.00	1475.00	872.21	7.21	.01	.00	872.21	450.00	2426.57
16477.000	1.00	.00	.00	865.00	1475.00	872.21	7.21	.01	.00	872.21	450.00	2426.66
16494.000	17.00	872.10	870.80	865.00	1475.00	872.79	7.79	.21	.00	873.00	420.77	640.71
16495.000	1.00	.00	.00	865.00	1475.00	872.79	7.79	.21	.00	873.00	420.62	640.37
17145.000	650.00	.00	.00	865.90	1475.00	873.63	7.73	.09	.04	873.72	310.21	954.35
17925.000	780.00	.00	.00	865.60	1475.00	873.90	8.30	.01	.02	873.91	578.72	2453.02
18525.000	600.00	.00	.00	865.60	1475.00	873.99	8.39	.03	.01	874.03	446.79	1486.84
18955.000	430.00	.00	.00	844.10	1475.00	874.04	29.94	.00	.01	874.04	950.00	7146.69
20955.000	10.00	.00	.00	866.40	1065.00	874.03	7.63	.01	.00	874.04	565.56	2378.31
21755.000	800.00	.00	.00	865.80	1065.00	874.08	8.28	.00	.00	874.09	889.08	3634.32
22655.000	900.00	.00	.00	865.80	1065.00	874.11	8.31	.00	.00	874.11	1110.55	5183.42
24555.000	10.00	.00	.00	865.40	1065.00	874.11	8.71	.00	.00	874.11	1040.97	4644.08
25315.000	760.00	.00	.00	866.00	1065.00	874.14	8.14	.01	.00	874.15	625.22	2143.79
26315.000	1000.00	.00	.00	866.10	1065.00	874.30	8.20	.09	.04	874.39	64.00	435.98
26404.000	89.00	.00	.00	867.90	1065.00	873.73	5.83	1.48	.69	875.20	19.00	109.15
26405.000	1.00	875.10	875.00	867.90	1065.00	873.74	5.84	1.48	.00	875.21	19.00	109.23
26436.000	31.00	875.10	875.00	867.90	1065.00	874.16	6.26	1.28	.06	875.44	19.00	117.45
26437.000	1.00	.00	.00	867.90	1065.00	874.16	6.26	1.28	.00	875.44	19.00	117.47
26460.000	23.00	.00	.00	867.90	1065.00	875.73	7.83	.10	.35	875.83	65.00	416.64
27160.000	700.00	.00	.00	868.40	1065.00	876.23	7.83	.07	.01	876.30	217.36	781.91
28660.000	1500.00	.00	.00	869.20	1065.00	876.66	7.46	.01	.02	876.67	822.28	2323.87
30110.000	1450.00	.00	.00	870.70	1065.00	877.06	6.36	.21	.10	877.26	234.89	511.14

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	TOPWID	AREA
30760.000	650.00	.00	.00	871.40	1065.00	877.68	6.28	.01	.06	877.70	774.92	1908.27
32960.000	2200.00	.00	.00	873.40	1095.00	878.04	4.64	.00	.00	878.04	1152.89	2553.72
34860.000	1900.00	.00	.00	875.50	1095.00	878.75	3.25	.42	.21	879.16	217.94	321.40
35010.000	150.00	.00	.00	874.20	1095.00	879.66	5.46	.14	.08	879.80	130.00	507.83
35022.000	12.00	879.80	878.90	874.20	1095.00	880.42	6.22	.84	.00	881.26	130.91	205.55
35622.000	600.00	.00	.00	875.00	1095.00	882.17	7.17	.06	.23	882.23	255.30	816.55
35947.000	325.00	.00	.00	875.50	1095.00	882.35	6.85	.85	.39	883.20	117.75	230.83
36110.000	163.00	.00	.00	875.70	1095.00	883.43	7.73	.75	.03	884.18	109.45	246.91
36142.000	32.00	.00	.00	875.70	1095.00	883.58	7.88	.76	.00	884.34	106.98	244.63
36207.000	65.00	.00	.00	875.80	1095.00	883.90	8.10	.78	.01	884.68	101.22	241.31
36272.000	65.00	.00	.00	875.90	1095.00	884.17	8.27	.93	.07	885.10	95.39	224.66
36273.000	1.00	.00	.00	875.90	1095.00	884.50	8.60	.68	.07	885.18	106.45	257.74
36287.000	14.00	885.10	882.80	875.90	1095.00	886.38	10.48	.18	.00	886.56	183.93	527.67
36288.000	1.00	.00	.00	875.90	1095.00	886.36	10.46	.21	.02	886.58	183.59	526.24
37098.000	810.00	.00	.00	878.00	1095.00	886.98	8.98	.02	.06	887.00	247.47	1241.89
37858.000	760.00	.00	.00	880.70	1095.00	887.20	6.50	.44	.21	887.64	42.00	223.90
37898.000	40.00	.00	.00	880.80	1095.00	886.99	6.19	1.20	.38	888.19	22.00	124.47
37899.000	1.00	893.90	894.30	880.80	1095.00	886.99	6.19	1.20	.00	888.19	22.00	124.53
37942.000	43.00	893.90	894.30	880.80	1095.00	887.35	6.55	1.06	.04	888.41	22.00	132.37
37943.000	1.00	.00	.00	880.80	1095.00	887.35	6.55	1.06	.00	888.41	22.00	132.44
37953.000	10.00	.00	.00	880.80	1095.00	888.35	7.55	.31	.23	888.66	42.00	267.99
38123.000	170.00	.00	.00	880.50	1110.00	888.77	8.27	.05	.08	888.82	181.38	868.68
39313.000	1190.00	.00	.00	883.00	1110.00	889.37	6.37	.24	.10	889.61	142.91	437.53
40883.000	1570.00	.00	.00	884.80	1110.00	890.46	5.66	.01	.07	890.47	596.25	1826.56
42053.000	1170.00	.00	.00	886.40	1110.00	890.79	4.39	.02	.01	890.82	596.28	1254.56
42613.000	560.00	.00	.00	886.40	1110.00	891.45	5.05	.08	.03	891.53	430.49	780.55
43433.000	820.00	.00	.00	888.30	1110.00	893.72	5.42	.29	.10	894.01	269.16	480.85
43434.000	1.00	.00	.00	888.30	1110.00	893.72	5.42	.29	.00	894.01	269.06	433.50
43461.000	27.00	892.40	892.30	888.30	1110.00	893.85	5.55	.24	.00	894.09	272.53	469.67

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	TOPWID	AREA
	43462.000	1.00	.00	.00	888.30	1110.00	893.84	5.54	.26	.01	894.10	272.36	514.28
	43812.000	350.00	.00	.00	889.20	1110.00	895.04	5.84	.37	.05	895.40	100.00	338.78
	43902.000	90.00	.00	.00	889.75	1110.00	895.44	5.69	1.09	.36	896.53	55.00	190.74
	43925.000	23.00	.00	.00	889.89	1110.00	895.56	5.67	1.57	.24	897.13	43.00	153.41
*	43947.000	22.00	.00	.00	890.03	1110.00	895.83	5.80	2.12	.27	897.94	32.00	124.78
*	43969.000	22.00	.00	.00	890.17	1110.00	896.44	6.27	2.60	.24	899.04	21.00	100.30
*	43981.000	12.00	.00	.00	890.24	1110.00	896.80	6.56	2.80	.10	899.60	15.00	82.66
*	43987.000	6.00	.00	.00	890.27	1110.00	897.43	7.16	3.24	.22	900.66	12.00	76.86
*	43992.000	5.00	.00	.00	890.30	1110.00	898.13	7.83	3.65	.21	901.78	10.00	72.35
	44032.000	40.00	910.90	899.00	890.30	1110.00	902.73	12.43	1.28	.00	904.01	10.00	122.40
*	44033.000	1.00	.00	.00	890.30	1110.00	903.30	13.00	1.17	.03	904.47	10.00	128.10

SUMMARY OF ERRORS

```
CAUTION   SECNO=43947.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION   SECNO=43947.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY

CAUTION   SECNO=43969.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION   SECNO=43969.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY

CAUTION   SECNO=43981.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION   SECNO=43981.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY

CAUTION   SECNO=43987.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION   SECNO=43987.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION   SECNO=43987.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION   SECNO=43992.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION   SECNO=43992.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION   SECNO=43992.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL

NOTE      SECNO=44033.000  PROFILE= 1  WSEL BASED ON X5 CARD
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00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: GREEN OAK

3) WATERCOURSE: DAVIS CREEK AND WALKER DRAIN

4) DOCUMENT TYPE: REPORTS

00BREAK00

GREEN OAK TOWNSHIP
LIVINGSTON COUNTY
MICHIGAN

FLOOD INSURANCE STUDY

DAVIS CREEK AND WALKER DRAIN

HYDRAULIC ANALYSIS
REFERENCES
SECNO TABLE
BRIDGE SKETCHES AND CALCULATIONS
SUPPLEMENTAL HAND CALCULATIONS

OCTOBER 1982

PROJECT MANAGER: MOW-SOUNG CHENG

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BRIDGE SKETCHES AND CALCULATIONS

HYDRAULIC ANALYSIS

A. Introduction

The Davis Creek and Walker Drain within the Township of Green Oak, Livingston County, Michigan, are the subject of this report. The study for the Davis Creek begins at its mouth and continues upstream for approximately 8.3 miles until Chesapeake & Ohio Railroad; and the study for Walker Drain begins at its mouth and continues upstream until Eight Mile Road, a corporate limit between Green Oak Township and Northfield Township. The total study reach length for Walker Drain is approximately 3.7 miles. The 10-, 50-, 100-, and 500-year frequency flood flows were obtained by the SCS Method. The estimate of the discharges has been submitted to the Michigan Department of Natural Resources for approval. The major floods on these two streams occur in the late winter or early spring months.

B. Method of Analysis

The flood profiles were calculated by the HEC-2 computer program developed by the U.S. Army Corps of Engineers. All of the bridges along the Davis Creek and Walker Drain have been modelled for the requirements of the normal bridge routine and special bridge routine.

C. Variables and Coefficients

The roughness factors (Manning's "n") were established by comparing the descriptions in Open-Channel Hydraulics (Reference 1) with photographs and field descriptions taken by survey crews in 1982, and field reconnaissance trips taken in 1982. Aerial photographs of Green Oak Township taken in 1978 were also used to determine the roughness coefficients and their extent. These roughness factors were determined assuming that flooding would occur during the late winter/early spring. The Manning's "n" for the channel ranges from 0.030 in areas with a sandy bottom to .055 in areas with a very

heavy brush and woods within banks. The Manning's "n" for the overbanks ranges from .040 in areas of short grass residential areas to 0.120 in areas of heavy brush and woods. The expansion and contraction coefficients chosen for this study were 0.5 and 0.3, respectively.

D. Starting Water Surface Elevations

The starting water surface elevations for the 10-, 50-, 100-, and 500-year floods at the Davis Creek were obtained from the stage-discharge relationship at Section P (SECNO = 16570) of the Huron River. Since the peak time of the Davis Creek is obviously much earlier than the peak time of the Huron River, a study has been done to determine the Huron River flows when Davis Creek is yielding peak flow (see Appendix A); and the starting water surface elevations have been then adjusted accordingly. For Walker Drain, since its peak time at mouth is approximately the same as that of the Davis Creek, the flood elevations at Sandy Bottom Lake are used as the starting water surface elevations for Walker Drain.

E. Encroachments

In most cases, the encroachments for the 100-year natural floodway were based on a 1:1 convergence into bridges and a 1:4 expansion from the downstream sides of bridges or natural constrictions. However, this method was sometimes not feasible due to the severe meandering of the river in places. In these cases, the 100-year natural floodway was based on the sweep and extent of moving floodwaters. Aerial photographs were utilized extensively in the location of encroachments for the hydraulic model of the Huron River.

For the 100-year encroached floodway, areas of shallow ponding have been encroached. These encroachments resulted in a rise of 0.1 foot or less in water surface elevation compared to the 100-year natural floodway profile.

It is found that the flood elevations for river reach between Sections AM and AS of the Davis Creek are very sensitive to the encroachment. For example, at Section AN, an encroachment of 50 feet at left overbank causes an approximately 0.5 ft. water surface raise. Therefore, an encroached floodway run has not been done for this river reach.

References

1. Chow, Ven Te, Open-Channel Hydraulics, McGraw-Hill, 1959.

Abrams Aerial Survey Corporation, Aerial Mosaic and Topographic Map of Green Oak Township, Scale 1" = 1000 ft., Photography 1978.

U.S. Army Corps of Engineers, Detroit District, Southeastern Michigan Water Resources Study; Gazetteer of the Huron River Basin, Technical Paper No. 7, June 1972.

U.S. Army Corps of Engineers, Hydrologic Engineering Center, Application of the HEC-2 Bridge Routines, Training Document No. 6, June 1974.

U.S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-2 Water-Surface Profile Users Manual, 1973.

U.S. Department of Interior, Geological Survey, Measurement of Peak Discharge at Dams by Indirect Methods, Techniques of Water Resources Investigations of the U.S. Geological Survey, Book 3, Chapter A5, 1976.

U.S. Department of Interior, Geological Survey, Water Resources Data for Michigan, Surface Water Records for Water Years 1952-1979.

U.S. Department of Transportation, Federal Highway Administration, Hydraulics of Bridge Waterways, Hydraulic Design Series No. 1, 1973.

APPENDIX A

Determine Huron River Flows when Davis Creek is Yielding Peak Flows.

(1) Examine the most recent two big flood events

(A) June 1968 event, and

(B) March 1974 event

(A) June 1968 event

(i) Peak time recorded at "Huron River near Hamburg" : June 30, 1968

Peak time recorded at "Huron River near New Hudson" : June 29 1968

(ii) From the precipitation data (see attachment) recorded at Ann Arbor, Howell, and Milford, the major portion of the rainfall occurred on June 25, 1968

(iii) Therefore, the peak time at "Huron River at Davis Creek" should be approximately

29.5 - 25 = 4.5 days

after the day when major rainfall occurred

(B) March 1974 event

(i) Peak time recorded at "Huron River near Hamburg" March 9, 1974

(ii) Peak time recorded at "Huron River near New Hudson" : March 8, 1974

(iii) From the precipitation data (see attachment) recorded at Ann Arbor,

Howell, and Milford, the major portion of the rainfall occurred on March 4, 1974

(iii) Therefore, the peak time at "Huron River at Davis Creek" should be approximately

$$8.5 - 4 = 4.5 \text{ days}$$

after the day when major rainfall occurred

(c) In summary, at the confluence of Huron River and Davis Creek, the Huron River will yield its peak flow 4.5 days after the major rainfall.

(2) From the TR-20 computer printout, at mouth of the Davis Creek, the Davis Creek has peak flow occurred approximately 2.5 days after the major rainfall.

⇒ So, the peak time of the Davis Creek is approximately 2.0 days earlier than the peak time of the Huron River

(3) When Davis Creek yields its peak flow, the ratio of the Huron River flow to the Huron River Peak flow is (from routing data)

$$739/1330 = 0.744 \text{ , for June 1968 event}$$

929 / 1050 = 0.885 , for March 1974 event

⇒ Average Ratio = 0.815 = 81.5 %

(4) It can then be assumed that, for the 10-, 50-, 100- and 500-year floods, the Huron River flow is 81.5 % of its peak flow when the Davis Creek is yielding peak flow

(5) Then, the flows in the Huron River when Davis Creek is yielding peak should be approximately

10-Year Flood	1015 × 0.815	=	827	cfs
50-Year Flood	1445 × 0.815	=	1178	cfs
100-Year Flood	1675 × 0.815	=	1365	cfs
500-Year Flood	2135 × 0.815	=	1740	cfs * ← use 2078 cfs for [illegible]

(2078 cfs [illegible]

DAILY PRECIPITATION

Continued

Station	Total	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
* * * EAST CENTRAL LOWER 07																																
BAD AXE	4.20	.11	.08								.08		.88	.09			T		.01	.17	.02	.03	.59		.09	.45	.96	.60	.02	.04		
BAY CITY SEWAGE PLANT	2.78	.17	T									.18	.02		T				.16			.03			.09	.87	1.03	.14	T	.11		
CARO STATE HOSPITAL	3.81	.26	.03						.03		.12	T	.17	.02		.08			.07	.12		.02	.43		.02	.68	.73	.37	.04	.22		
HARBOR BEACH 5 NW	4.85	.14	.03								.18	.37	.13		T		T			.14		.10	1.05	.16		1.38	.46	.36	.05	.06		
MILLINGTON 3 SW	4.59	.20						T				.51	.06			.05			.06	.41		.25	.43			.84	1.24	.27	T	.27		
SAGINAW COMSUM PWR CO	4.81	.16	.02								.20	.11	.24				T		.25	.09	.10	.03	.07		T	1.70	.88	.73	T	.21		
SAGINAW FAA AIRPORT	2.92	.14										.07	T		T				.16	.61		.01		T	.01	.57	.97	.04	.02	.12		
SAINT CHARLES	3.64	.17										1.63	.04		T	.10			.15	.37		.04	.28		.01	.92	1.03	.35	.02	.26		
SANDUSKY	4.90	.13	.02								.81	.36	.04	.02		.02			.02	.29	.02	.04	.24		.04	1.31	.91	.37	.05	.13		
SEBEWAING HIGH SCH CO	3.27			.20							.22		.04	.02						.20	.43		.09		.22	.72	.30	.59	.21		.05	
STANDISH 2 S	4.19	.20	T					T		T		.30	T						.18	.06		.20	.34	.48		.92	.97	.53	.11	.21		
* * * SOUTHWEST LOWER 08																																
ALLEGAN SEWAGE PLANT	4.99	.13	.07									T	T			.25			.33			*	1.04		.13	.21	1.87	.30	.24		.42	
BENTON HARBOR AIRPORT	6.24										.11					T			T	T		.50			2.30	2.37	.32	.53	.11			
BLOOMINGDALE	5.99	.04	.04									.04	.22			.04				.37			.62		.53	.07	2.77	.36	.73	.01	.63	
DOWAGIAC 1 W	7.87	.02									.07	.60	.02			.41	.04		.23	.08			.73		.47	4.20	.68	.17	.17	T		
EAU CLAIRE 4 NE	7.16	.09									.10	T				.18			.32				.46		.41	4.77	.63	.19				
GRAND HAVEN FIRE DEPT	4.86	.55										T	T		.15				1.12			.40			.36	.59	.67	.13	.01	.68		
GRAND RAPIDS WBAP KENT//R	5.02	.26										.09	T		.04	T			.21		T	.06		.04	.12	1.59	.77	.23	.01	1.01		
GULL LAKE BIOL. STA.	6.59	.13									T		.03		T	.18			.13			.80		.33	.30	2.30	1.25	.62	.10	.42		
HOLLAND HJBL	5.43	.30									T		T		T				.39	.02		.85	T	.03	.40	1.14	1.02	.17	.22	.69	T	
KALAMAZOO STATE HOSP	6.48	.03									.02	.41				.03	.01		.15	T		.33	.26		.74	2.58	1.04	.69	.09	.10		
KENT CITY 2 SW	3.09	.42												T	.07				.23			.21			.14	.51	.91	.31		.29		
LOWELL 6 NW	5.00	.26										.04	T						.22	.03		.14			.38	1.88	.76	.42	.12	.81	T	
NILES	8.74	.04							.02		.32	.42	T		.10	.19	.02		1.24			.38		.35	.16	4.49	.35	.44	.17	.01		
SOUTH HAVEN EXP FARM	5.32	.15									.18					.07			*	.51		.60	.20		1.03	1.38	.26	.15	.12	.65	T	
* * * SOUTH CENTRAL LOWER 09																																
ALBION	6.13	T										.29					.04	.07	.02			.35			.70	3.83	.55	.11		.17	T	
BATTLE CREEK WBCR	7.10	.02									T	.27	T		T	.16	.03		.06			.32		.47	.31	3.50	1.30	.34	.02	.04		
CHARLOTTE	6.62		.03									.55				.29	.02		.04			.25	.14		1.84	2.43	.50	.09	.02	.42		
COLDWATER STATE SCHOOL	6.71	.12						T			T	.55	.01		.01	.18	.02	T	.10	.04		.39		.13	.32	4.55	.36	.07	.06			
EAST LANSING 5 SE	7.16	.03										.91				.19	.01	.25	.01			.16	.49		1.42	2.46	.75	.11		.55		
EATON RAPIDS	7.63	.01											.19			.90	.03	.05		.02			.66	1.40			2.40	.58	.84	.01	.74		
GRAND LEDGE	7.07												.47							.09			1.72		1.70		1.60	.80	.03	.04	.60		
HASTINGS FISHERIES	5.57	.15	.01						.07			.51	T			.05		T	.08	.01		.26	.64		.10	1.52	.83	.65	.06	.63		
HILLSDALE	5.64	.24	.02								T	.03	T			T	.15	.24	.03	.14		T	.21		.52	3.70	.23	.07	.06	T	.02	
IONIA 5 NW	5.82	.24										.24							.23	.14		.14		1.04	.07	1.26	1.14	.51	.05	.74		
JACKSON FAA AIRPORT	5.99	T							.01		.01	.24	T			.06	.25	.02	.01			.27		1.26	.14	2.60	.79	.11	.01	.21		
LANSING WB AIRPORT //R	7.94	.04						.07			T	.35	.01		T	.13	.01		.08			1.56		1.69	.38	2.20	.61	.12	.06	.59		
OWOSSO SEWAGE PLANT	6.11		.16										.31	T		.36	T			.16	.03	T	.03		.05	1.38	1.74	.93	.07	.03	.86	
SAINT JOHNS	6.00	.46											.14			.16	T		.09	.04	T	.02	.07		.49	1.47	1.78	.68	.03	.31	.06	
THREE RIVERS	7.41	.04	.01						.17		.02		.17			.38	T			.49			.95		1.94	.12	2.76	.65	.13	T		
WILLIAMSTON	8.35											T	.44			.13	T	T	.40	T		T	1.17		.66	1.91	2.52	.67	T	.10	.33	
* * * SOUTHEAST LOWER 10																																
ADRIAN 2 NNE	5.31	.17									.08	.25	T			.08	.06	.11	T	.03		.06	.03	.14	.53	3.12	.46	.12	.07			
ANN ARBOR UNIV OF MICH	8.45										T	.19						.13				.07	1.94	.03	.30	4.01	1.28	.26	T	.09		
DEARBORN	6.26	.11	.01								T	.13	.28	T		.48	.01	.11	T			T	1.48		.16	.31	2.34	.13	.12	.37		
DETROIT CITY AIRPORT //R	6.05	.05										.38				.40	T	.21	T	T		.40		.19	T	3.53	.12	.17	.06	.54		
DETROIT WBAP M WAYNE C	6.99	.10	.01					T			.01	.35	.01	T	T	.22	T	.10	T			1.25		.15	.04	2.17	.35	.09	.02	.14		
DETROIT WBAP WILLOW RN//R	6.20	.07						T				.22	T	T		.21	.08	.02	T			1.87		.09	.02	3.23	.32	.05	.01	.01		
FLINT WB AIRPORT	5.40	.03						1.20	T			.08	.11		T	.20	.01		.08			.06		.12	.14	1.99	.45	.17	.07	.67		
GROSSE POINTE FARMS	5.66	.08											.20			.20	.02	.24				.01	.24		.21	.06	3.07	.21	.10	.42		
HOWELL SEWAGE PLANT	8.89		T									T	.78	T				.67	.16		.11		.87		.28	1.55	3.51	.70	.20	T	.41	
LAPEER	5.23	.06									T	.23	.09	.02		.13			.03	.07	.16	T	.16		.15	1.17	1.55	.60	.02	.55		
MILFORD GN PROVING GRN	8.46	.02									T	.36	.01		T	.16		.23	T	T		.83		.14	T	3.86	.19	.03	.09	.34		
MONROE SEWAGE PLANT	3.56	.16	T								.05	.14				.14	.08	.05		.17		.16	.01	.11	.26	1.45	.60	.08	.09			
MOUNT CLEMENS AF BASE	7.32		.04									T				.09	.01	.02		T		T	.27		.27	.71	4.76	.17	.10	.02	.25	
PONTIAC STATE HOSPITAL	7.88		.02										.24	.04		.21	.02	.17	T	T	.03	T	.33		.28	.55	4.70	.29	.02	.04	.75	
PORT HURON SEWAGE PL	5.31	.03	T								.02		.95	.05		.02	T	T	T	.15	.56	T	.32	T	.05	.64	1.99	.24	.03	.23		
ROMEO 1 N	5.39		.03									.32	.28	.03		.12	.02		.06			.02	.22		.21	.20	3.39	.18			.34	
WILLIS 9 SSW	5.00	.13										.31				.13		.07	T			.74		.26	.32	2.38	.23	.15	.08			
YALE 1 NNE	3.94	.03									.10		.08	.02		.08		T		.13	T	.14	.24		.10	1.47	1.17	.12	.02	.24	T	

.474 .049 (see next page)

.360 (see next page)

SUPPLEMENTAL DATA

Station	Wind (Speed - m.p.h.) Resultant Direction	Resultant Speed	Average	Fastest mile	Direction of fastest mile	Date of fastest mile	Relative humidity averages - percent, EASTERN STANDARD TIME 1 AM	7 AM	1 PM	7 PM	Number of days with precipitation: Trace	.01–.09	.10–.49	.50–.99	1.00–1.99	2.00 and over	Total	Percent of possible sunshine	Average sky cover sunrise to sunset
ALPENA WB AIRPORT	16	0.4	6.6	24	NE	26	87	85	63	72	6	6	5	3	0	0	20	48	7.2
DETROIT FAA AIRPORT CITY	24	2.4	8.6	29++	29	29+	74	75	57	60	4	2	7	1	0	1	15	-	-
DETROIT WBAP M. WAYNE CO.	24	2.3	8.7	36	SW	11	80	79	57	62	5	6	7	0	1	1	20	56	6.4
DETROIT WBAP WILLOW RUN	24	2.6	10.0	29++	30	29	77	81	58	60	4	8	3	0	1	1	17	-	6.5
FLINT WB AIRPORT	21	3.2	8.9	46++	23	11	85	83	65	66	2	6	6	1	2	0	17	-	6.9
GRAND RAPIDS WB AIRPORT	24	2.6	8.5	52	NW	29	81	80	62	63	3	4	4	2	2	0	15	54	6.8
HOUGHTON LAKE WB CITY	24	1.7	7.0	22++	27	21	87	85	63	67	5	4	6	4	1	0	20	-	6.7
LANSING WB AIRPORT	23	3.2	8.4	49	NW	23	73	72	59	60	2	6	4	2	2	1	17	58	6.5
MARQUETTE WB CITY	-	-	-	32	NW	14	-	-	-	-	4	5	11	3	1	0	24	44	8.1
MUSKEGON WB AIRPORT	24	3.2	9.3	35++	25	29	81	82	62	63	1	2	9	1	0	0	13	-	5.9
SAULT STE MARIE WB AIRPORT	12	0.7	8.8	28	SE	30	91	91	69	73	8	6	5	4	0	0	23	42	8.0

See reference notes following Station Index.

HOURLY PRECIPITATION

MICHIGAN
JUNE 1988

Station	A. M. Hour Ending 1	2	3	4	5	6	7	8	9	10	11	12	P. M. Hour Ending 1	2	3	4	5	6	7	8	9	10	11	12	Total
—24th—																									
STEUBEN 2 WNW																				.03	.03				.06
TRAVERSE CITY																							.05		.05
VASSAR 1 W																					.01	.01			.02
—25th—																									
ALLEGAN SEWAGE PLANT									.1		.1	.1	.2	.2	.4	.3	.4	.1							1.9
ANN ARBOR UNIV OF MICH										*	*	*	*	*	*	*	*	*	*	*	4.74				4.74
BEAVERTON //		.04	.13	.02	.02										.08	.05	.01								.35
BERRIEN SPRINGS 5 W				.03			.20	.09	.12	.52	.44	.48	.52	.23	.08	.02									2.73
BURNSIDE 1 E	.05	.06	.09	.02		.01			.05	.16	.01	.32	.03	.11	.07	.09	.26	.29	.22	.17	.24	.03			2.26
CASNOVIA 1 NNW									.06	.06	.06	.02	.05	.05	.06	.02									.38
COLOMA 3 NNW								.08	.01	.13	.20	.41	.33	.22	.77	.12									1.77
DETROIT AIRPORT CITY	.11							.04				.02	.03	.07	.17	.44	.27	.61	.32	.65	.46	.32	.02		3.53
DETROIT WBAP W WAYNE C											.02	.04	.08	.30	.11	.14	.36	.15	.33	.44					2.17
DETROIT WBAP WILLOW RN //											.02	.04	.10	.31	.19	.33	.39	.43	.93	.47	.02				3.23
EAST LANSING 3 SE										.01	.04	.04	.08	.40	.37	.46	.55	.25	.04	.01		.01	.03	.01	2.30
ESCANABA						.04	.01										.01	.01	.01	.01	.01			.02	.12
FIFE LAKE 4 SW		.1																							.1
FLINT WB AIRPORT	.02		.01	.02				.05	.01	.03		.01	.07	.09	.18	.16	.30	.43	.32	.25	.03			.01	1.99
GRAND HAVEN SWG PLANT						.03	.01	.04	.12	.08	.08	.05	.06	.06	.06	.02									.63
GRAND RAPIDS WBAP KENT				.10	.01			.02	.08	.07	.07	.19	.14	.23	.20	.26	.19	.02							1.58
GWINN 1 W	.01																								.01
HARBOR BEACH //	.03	.03		.53	.18	.16	.04	.06	.01	.01			.01		.01	.04	.11	.18	.24	.14	.03	.01			1.82
HOUGHTON LAKE WB AP	.25	.70	.25	.10	.13																				1.43
HOWELL SEWAGE PLANT	.2									.1	.1		.1	.1	.3	.4	.8	.7	.5	.2	.1				3.6
IRON MOUNTAIN WTR WKS			.02		.01	.01	.01	.01								.02	.03			.03				.07	.21
JACKSON 3 N										.1		.1	.2	.4	1.0	1.1	.7	1.1	.1					.1	4.9
KALAMAZOO POWER PLANT //	.01	.01					.01	.03	.04	.05	.17	.48	.68	.55	.37	.51	.14								3.03
LANSING WB AIRPORT //									.04		.02	.05	.03	.10	.35	.30	.50	.60	.11	.04		.01	.02	.03	2.20
LUDINGTON STATE PARK //	.02																								.02
LUPTON 4 S	.01	.02	.02	.12	.09	.02	.01	.02	.04	.02	.01								.01	.01					.40
MUSKEGON WB AIRPORT //								.01	.05	.03	.03	.02	.05	.05	.01										.27
OWOSSO SEWAGE PLANT	1.2	.2									.1			.1	.3	.3	.3	.4	.2	.1					3.2
ROSCOMMON FOR EXP STA	.05	.11	.12	.02	.01	.01	.01	.02																	.35
ROSE CITY	.04		.04	.06		.03	.03																		.20
SEBEWAING MICH SGR CO	.41	.14	.10	.02	.01	.06									.02	.03	.11	.12	.02	.01					1.05
STANTON	.02	.02							.09	.07	.12	.13	.10	.13	.08	.12	.03								.91
TRAVERSE CITY			.05	.14	.03		.03	.03		.01	.01														.30
VASSAR 1 W		.01	.02	.02	.03			.02	.16	.21	.02	.01		.08	.10	.07	.18	.22	.13	.09	.01			.01	1.39
—26th—																									
ALLEGAN SEWAGE PLANT										.1				.1				.1							.3
ALPENA WB AIRPORT //															.03	.01	.10	.04		.01	.11	.11	.05	.05	.51
ANN ARBOR UNIV OF MICH												.06	.13	.04	.01								.25		.49
BARAGA 1 N													.04		.02	.02	.02	.02		.01	.04	.09	.04	.02	.32
BEAVERTON //												.15	.04		.14	.24	.03	.15	.12	.03	.04	.11	.05	.09	1.19
BELLAIRE											.1		.1	.1	.1	.3						.1			.8
BERRIEN SPRINGS 5 W							.02	.06		.01	.01	.22			.10										.42
BIG BAY																		*	*	*	*	*	*	*	*
BURNSIDE 1 E													.04	.03	.02			.01		.16	.04	.01	.01		.34
CASNOVIA 1 NNW									.10	.38	.07	.02	.14	.09	.04		.01					.14	.03	.03	1.05
COLOMA 3 NNW								.07	.03			.13	.02												.25
COPPER HARB FT WILKNS																							.07	.08	.15
CRYSTAL FALLS 6 NE //						.03				.01	.01	.07	.12	.06	.03			.14	.07	.04	.02			.04	.64
DE TOUR 1 N																.01		.01				.04	.02	.02	.10
DETROIT AIRPORT CITY														.01	.02	.08	.01								.12
DETROIT WBAP W WAYNE C			.01	.01								.03	.04	.13	.04			.03	.02					.07	.38
DETROIT WBAP WILLOW RN //												.03	.11	.04	.01								.12	.01	.32
EAST LANSING 3 SE	.01	.03	.01	.01	.02	.02					.20	.08	.02	.04	.01			.15							.60
ESCANABA	.03	.02	.02	.01							.05	.06	.09	.02		.02	.11	.10	.02	.02	.02	.04	.06	.10	.79
FIFE LAKE 4 SW								.1			.1	.2		.2		.1		.1		.1					.9
FLINT WB AIRPORT	.02	.01	.01									.10	.06	.10	.04		.01		.02	.06				.02	.45
GRAND HAVEN SWG PLANT									.15	.29		.11	.10												.65
GRAND RAPIDS WBAP KENT										.27	.02	.11	.06	.06	.01	.11	.01	.03	.04		.03	.01		.01	.77
GWINN 1 W														.01	.04			.05	.17	.12	.02	.01	.03	.06	.51
HANCOCK HC LAIN ST PK																						.02	.03	.01	.06
HARBOR BEACH //	.02	.02	.01														.02	.03	.10	.06	.08	.09	.03	.04	.30
HOUGHTON LAKE WB AP							.01					.08	.08		.20	.05	.05	.02	.24	.06	.02		.03	.02	.86
HOWELL SEWAGE PLANT												.1	.1	.1					.3						.6
IRON MOUNTAIN WTR WKS	.08	.10	.06	.03	.04	.03	.01	.02		.01	.07	.10	.20	.07	.02	.01	.21	.09	.06	.04	.06	.13	.14	.12	1.70
JACKSON 3 N											.2	.1					.2	.1			.1	.1			.8
KALAMAZOO POWER PLANT //									.11	.03			.01	.06	.25			.31	.21	.04					1.02
KENTON U S FOREST												.01	.09	.06	.15	.02	.05	.04	.04	.03	.02	.08	.03	.03	.65
LANSING WB AIRPORT //											.20	.08	.08	.08	.04	.02	.05	.05				.01			.61
LUPTON 4 S													.05	.04	.01	.10	.08	.02	.01		.12	.05	.02	.01	.51
MARQUETTE WB CITY //															.02			.01	.07	.13	.08	.03	.01	.05	.40
MONTAGUE 2 N								.05	.05	.01	.17	.07	.35	.09			.02	.01				.03	.05		.90
MUSKEGON WB AIRPORT //							.04		.11	.18		.10	.08		.01					.01					.53
NEWBERRY STATE HOSP																-	-	-	-	-	-	-	-	-	-
ONTONAGON 2 SSE																.01		.01	.01	.02	.01		.02	.04	.12
OWOSSO SEWAGE PLANT											.1	.1		.1	.2	.1		.1	.2						.9
ROSCOMMON FOR EXP STA										.04		.01	.10		.26	.07	.01	.05	.14	.07		.02	.03		.80
ROSE CITY											.86														.86
SAULT STE MARIE WB AP //																								.06	.06
SEBEWAING MICH SGR CO													.05	.02		.03	.02	.03	.14	.09	.09	.03		.01	.53
STANTON										.01	.29	.05	.10	.10	.05	.06	.11		.03	.05	.04	.04	.22	.03	1.18
TRAVERSE CITY									.02	.11	.02	.17	.03	.09	.12	.10	.03	.06	.01	.02				.02	.82
TROUT LAKE																.01	.05	.01			.04	.02	.01	.10	.24
VANDERBILT TROUT STA													.03	.03	.01	.17	.03		.02	.03	.09	.04	.09	.12	.66
VASSAR 1 W		.02	.02										.05		.05	.13	.07	.03	.07	.30	.15			.02	.91
WAKEFIELD				.02	.01	.01	.02	.01								.05	.05	.05	.14	.06	.03			.02	.47
—27th—																									
ALLEGAN SEWAGE PLANT													.1							.1					.2
ALPENA WB AIRPORT //	.06	.03		.07	.08		.04	.01	.02	.04	.01				.03	.09	.09	.03		.01	.01				.62
ANN ARBOR UNIV OF MICH		.02																							.02
BARAGA 1 N							.03			.01	.01				.05	.02	.06	.02	.03	.03	.02				.30
BEAVERTON //	.02	.03	.01	.03	.02												.04								.15
BELLAIRE				.1							.2				.1			.1							.5
BERRIEN SPRINGS 5 W						.04	.02	.01		.01										.03	.04	.04		.06	.25
BIG BAY	*	.32	.02	.04	.09	.01		.05	.08	.04	.03	.04	.02	.07	.01	.01	.01	.01	.03	.01				.01	.90
BURNSIDE 1 E	.04	.02																.04	.05	.01					.16
CASNOVIA 1 NNW	.01			.01	.02	.02	.05	.01				.01								.01	.02	.04	.01		.21
CHEBOYGAN POWER PLANT //	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			-
COLOMA 3 NNW							.03	.33	.04		.02														.42
COPPER HARB FT WILKNS	.05	.05					.03	.02						.02											.17
CRYSTAL FALLS 6 NE //	.04	.02	.05	.06	.14	.10	.10	.05	.01																.57
DE TOUR 1 N	.01	.01		.01	.04	.01	.02		.01		.01		.02	.01	.01	.02			.02	.01			.01	.05	.27
DETROIT AIRPORT CITY																	.05	.01	.11						.17

DAILY PRECIPITATION

MICHIGAN
MARCH 1974

STATION	TOTAL	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
		DAY OF MONTH																														
MIDLAND	1 70		T			16	T	T	35	33						T	07			02		01	08	16	10				01	T	50	T
MT PLEASANT UNIVERSITY	2 83	01					71		08	34							40	03		16		07	.01	15			T			10	26	52
* * * EAST CENTRAL LOWER 03																																
BAD AXE	2 66	T	T			32	64		18	26						02	45			20		20	T	.05	T		17			T	10	01
BAY CITY	-					06	T		31	42						06	20		10			-	-	-	-						.05	
CARO	2 83	05	T			55	40		30	38						01	37			12		.22	08	01	T		07				32	
HARBOR BEACH 3 NW	3 02		04			32	67		23	34						T	32			24		23	10	05	T		14				34	
MILLINGTON 3 SW	2 83		01			56	37		46	15						T	30					30	06	T	01		T		08	20	33	
SAGINAW CONSUM PWR CO	3 15	T				58	79		38	23						T	43					22	T				T			T	55	
SAGINAW FAA AP	3 06		T			80	T		38	16						04	56		17	06	T	06	16	03	T		T		T	T	.57	T
SAINT CHARLES	3 68			03		06	68		65	02						01	46					10	06	T	T		07		15	12	36	T
SANDUSKY	1 98		T			06	.30		20	34						T	24			19		T	T		06		T				22	
SEBEWAING MICH SGA CO	2 16			02			60		32	16						T	27			15		15	T	06			T				26	
STANDISH	-						65		23	24						-	-			-	-	-	-	-			-	-		-	-	
* * * SOUTHWEST LOWER 06																																
ALLEGAN SEWAGE PLANT	6 35		07	01			80	04	02	1 50	64	20	02				74	02		26		14	22	17	06	02		T		60	72	15
BENTON HARBOR AIRPORT	0 5 22					94	T			61	1 43				15 T	12	18	T	T	T		53	0 060	100	10	T		06	35	40	03	56
BLOOMINGDALE	6 23						1 00			35	85	06					42	05		26		17	10	15	02	.06				72	80	18
COMMERCE 1 W	4 07					64	30			48	60			16		06	22					19	11	10	22				12		23	36
EAU CLAIRE 4 NE	5 23					67	22			38	1 03		06	15		18	21			17		.20	06	16	07				12	T	38	31
GRAND HAVEN FIRE DEPT	3 63		02			45	03			78	15					07	66		T	03		06		05	.02	T	T		46	T	84	05
GRAND RAPIDS WSO AP	5 12	12	02		1 34	01				72	29					21	24		17	T	02	06	06	06	10		06		41	T	1 21	T
GULL LAKE BIOL STA	3 93					30	10			28	24					24	39			20		15	16	.30	06				40	33	70	10
HOLLAND	3 75	T	08			10	76	T		48	40	T					61			07		10	T	34	03	02	T		10	33	31	21
KALAMAZOO STATE HOSP	2 76		03			60	32			43		01				06	28			31		06	08	05	08		T		32	13	10	02
KENT CITY 2 SW	4 68	08	11			55				63	05					03	75			26		15	05	15	14	T	11		55		88	11
LOWELL	5 22	T	15				1 35			15	38	22					T	05		17		12	15	15	20		T	11		12	54	95	T
MILES	3 64		T		1 24			T	38	27	T	18	T			23	06	T	18	04	02	15	T	13	16		T			10	T	48	
SOUTH HAVEN EXP FARM	3 77				51	15			84	17	T					09	38			28		16	T	05	T				68	04	49	17
* * * SOUTH CENTRAL LOWER 09																																
ALBION	4 96	03		10	1 33	58			86	27						12	16		11	03		10	15	T	05		T		44	08	79	
BATTLE CREEK	3 78		03		58	40			29		07					11	31			14		11	08	07	T				86	10	.84	T
CHARLOTTE	5 14		18		46	30		29	08	76	T					03	58			13		10		02	08		T		48	30	82	T
COLDWATER STATE SCHOOL	3 82	T	T	02	1 27			T	1 33	32						21	11		11	T		10	05	06	T			T	20	T	.15	
EAST LANSING 3 SE	4 30		17		48	61			1 00	27							21			12		13	06	07	05		T		37	23	64	
EATON RAPIDS	5 00		27		40	1 05			81	18	21						22	07		13		11	03							71	72	08
GRAND LEDGE 1 NW	4 38	T	16			80			66	45	08					T	24	05		10		08	07	07	T	T		T	09	83	83	15
HASTINGS	4 16	T	16		64	39			88	12	T					T	12			01		11		11	02	T	T		36	28	1 00	T
HILLSDALE	5 95	T	06		1 42	T		12	87	1 18	08					26	08		T	18		13	08	T	08				20	03	70	T
IONIA 1 ENE	4 96	T	02		74	82			81	27						T	35			12		06	07	06	18		06		38		66	01
JACKSON FAA AP	5 24	T	07	06	1 98				61	78						13	14		12	01		06	22	T	T		T		57		37	T
LANSING WSO AP	4 38	03	07		70	01			1 24	18						06	22		11	T	T	24	02	07	.06		.02	T	48	T	34	03
OWOSSO WASTEWATER PL	3 28	03	02		T	76			07	60	01					T	24	T		06		19	08	08	.04	02		T	T	36	16	53
SAINT JOHNS	3 36	T	T		60	60			70	16							31			07		09	01	T	07		T		18	18	62	01
THREE RIVERS	4 64	01			1 73	82			21	88	03		06			15	08			12		05	16	02	03				.12		28	08
WILLIAMSTON	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
* * * SOUTHEAST LOWER 10																																
ADRIAN 2 NNE	3 82		11		1 14	.02		18	1 06	52						11	11		11			10	T	10	T				03	T	18	
ANN ARBOR UNIV OF MICH	4.40	.08	18		50	61		11	84	.48	08					01	21			08		07	.06	T	01				.21	.38	46	T
DEARBORN	5 14	06	24		26	40		02	1 60	52	14					01	28			10		08	10		15				14	53	20	
DETROIT CITY AIRPORT	-	T	20	T	65	10	T	T	64	56						05	11		06	01		-	-	-	T				-	01	22	
DETROIT METRO WSO AP	4 20	T	41	T	67		T	06	86	37		T				22	07		10	02		16	06	08	01		T	T	60	T	17	
FLINT WSO AP	3 60	T	02		1 46	T			86	08						07	15		07	T	T	14	T	04	02		01		15	T	53	01
GROSSE POINTE FARMS	3 47	06	12	T	26	.13		T	57	46	T						21			04		06	01		01		T		06	1 43	.08	
HOWELL WASTEWATER PT	4 88	.15	.09	02	06	1.32		04	.99	83	09						18	08		14		07	08	01	02			T	10	66	93	04
LAPEER	1 16				30	28			T	10						T	06			04		.20	T	T	T			T	T		08	
MILFORD GM PROVING GRN	4 78		16		1.66	02	T	06	82	78						13	12		.13	T		.07	06	.03			T	T	38	06	29	T
MONROE	3 30		10	T	44	75		24	60	67	T					03				15		15		14		T			T	10	03	T
MOUNT CLEMENS AF BASE	3 38	T	02	T	44	T	T	02	68	88						21	08		07	02		04	03	07	02		T		47	.01	31	
PONTIAC STATE HOSPITAL	4 75	02	11			1 06		06	36	31	23						17	04		10		07	03	T	02	T		T	T	05	22	10
PORT HURON WASTEWTR PL	3 47	T	T		1 80	T	T	47	33	08						03	20		11	02		06	03	03	T		T		T	T	53	
WASHINGTON	4 70	13	15			1 92			54	50	34						10	12		10		03	12		.04					26	16	28
WILLIS 5 SSW	3 87		13		39	70		12	43	74						28	02		11			08	05	06	T		T		40	T	.41	
YALE 1 NNE	3 26			07	43	31			36	28							17		09			10	03	T	03		T			T	48	
YPSILANTI EAST MICH U	4 64	07	22	02	37	70		08	1 16	41	03					06	17			08		08	06	T	01				38	28	55	

.093 .005 (see next page)

.130 .010 (see next page)

SEE REFERENCE NOTES FOLLOWING STATION INDEX

HOURLY PRECIPITATION

HOURLY AMOUNTS

MICHIGAN
MARCH 1976

STATION	DATE	A M Hour Ending												P M Hour Ending												TOTAL
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	
		MONTHLY MAXIMUM AMOUNTS																								
		HOURS			1			2			3			6			12			24			ACCUMULATION			
		MINUTES			15			30			45			60			120			180						
		(Apply heading as appropriate)																								
ALLEGAN SEWAGE PLANT	2												.1													.1
	4										.2	.2			.1						.1					.8
	8			1.2	.1	.1					.1	.1	.1				.1		.1					.1	.1	1.9
	9										.2															.2
	15																	.1						.1	.1	.3
	18					.1			.1																	.2
	19																				.1	.1		.1		.3
	21				.1																					.1
	22								.1																	.1
	23	.1																								.1
	24													.1												.1
	28														.1	.2		.1	.1							.5
	29		.1																							.1
	30		.3	.1	.1		.1		.1																.1	.8
		AMOUNT			1.2			1.3			1.4			1.4			1.7			1.9						
		DATE/TIME OF ENDING			8/3:00A			8/4:00A			8/5:00A			8/5:00A			8/12:00A			8/12:00P						
		AMOUNT			.5			.9			1.2			1.2			1.3			1.4						
		DATE/TIME OF ENDING			8/2:30A			8/2:45A			8/2:45A			8/2:45A			8/3:30A			8/4:30A						
ALPENA WSO AP //	2		.01	.01																						.02
	3								.01																	.01
	4														.01	.02	.01	.01	.04	.02	.01	.01	.01			.14
	8														.01	.04										.05
	9										.01															.01
	15					.01	.02																			.03
	18																	.01	.02	.01	.01	.01				.06
	21							.01																		.01
	22																		.01	.04	.03	.04	.02			.14
	26						.02	.02	.01																	.05
	30									.01		.01	.01	.02	.02	.02	.02		.01							.12
		AMOUNT			.04			.07			.11			.14			.14			.14						
		DATE/TIME OF ENDING			22/9:00P+			22/9:00P+			22/9:00P			22/10:00P			22/10:00P+			22/10:00P+						
ANN ARBOR UNIV OF MICH	2	.06	.08	.06																		.08	.01			.20
	3								.12	.15	.02	.01	.04		.01							.20	.24	.12	.02	.93
	4																									.65
	5	.01				.02	.02																			.15
	7			.06	.06	.02	.01																			.83
	8	.04	.06		.05	.40	.05	.08	.02				.01	.11	.01											.47
	9												.37				.03	.02				.04	.01			.11
	15															.01	.02	.02	.04	.02						.11
	16		.01	.02		.01			.03	.02	.01			.01												.06
	18																				.01	.01	.04			.05
	19		.01	.03	.01																					.07
	21					.02	.01		.02	.02																.07
	22							.05	.07																	.01
	24										.01															.35
	28					.02	.01	.02							.05		.05	.06	.08	.03	.02	.01				.09
	29												.04	.01	.02	.02										.42
	30		.04	.08	.08	.10	.04	.03	.03																	
		AMOUNT			.40			.45			.46			.64			.78			.98						
		DATE/TIME OF ENDING			8/5:00A			8/6:00A+			4/11:00P			8/7:00A			8/1:00P			5/6:00A						
BARAGA 1 N	3					.1																				.1
	4																	.1	.1	.2	.1					.5
	23			.1																						.1
	30														.1											.1
		AMOUNT			.2			.3			.4			.5			.5			.5						
		DATE/TIME OF ENDING			8/7:00P			8/8:00P+			8/8:00P+			8/8:00P			8/8:00P			8/8:00P						
		AMOUNT			.1			.1			.2			.2			.4			.5						
		DATE/TIME OF ENDING			30/1:30P+			30/1:30P+			9/7:15P+			8/7:15P+			8/7:15P			8/7:15P						
BEAVERTON //	2	.05								.01	.01															.07
	4								.02	.02	.20	.08	.10	.09	.09	.05	.09	.08	.03		.01	.02				.58
	8						.07	.06					.01	.04	.04	.04	.01									.27
	9		.19	.02				.01				.02	.07	.06												.37
	15																						*	*	*	*
	16	*	*	*	*	*	*	*	*	*	.36															.36
	18																		*	*	*	*	*	*	.18	.18
	21	.01	.01			.01	.01	.03																		.07
	22															.03	.02		.05	.01	.03	.01	.02	.02		.19
	26							.05	.01	.01																.07
	28																		.01	.01	.02	.01				.05
	30							.08	.14	.09	.04	.10	.01													.46

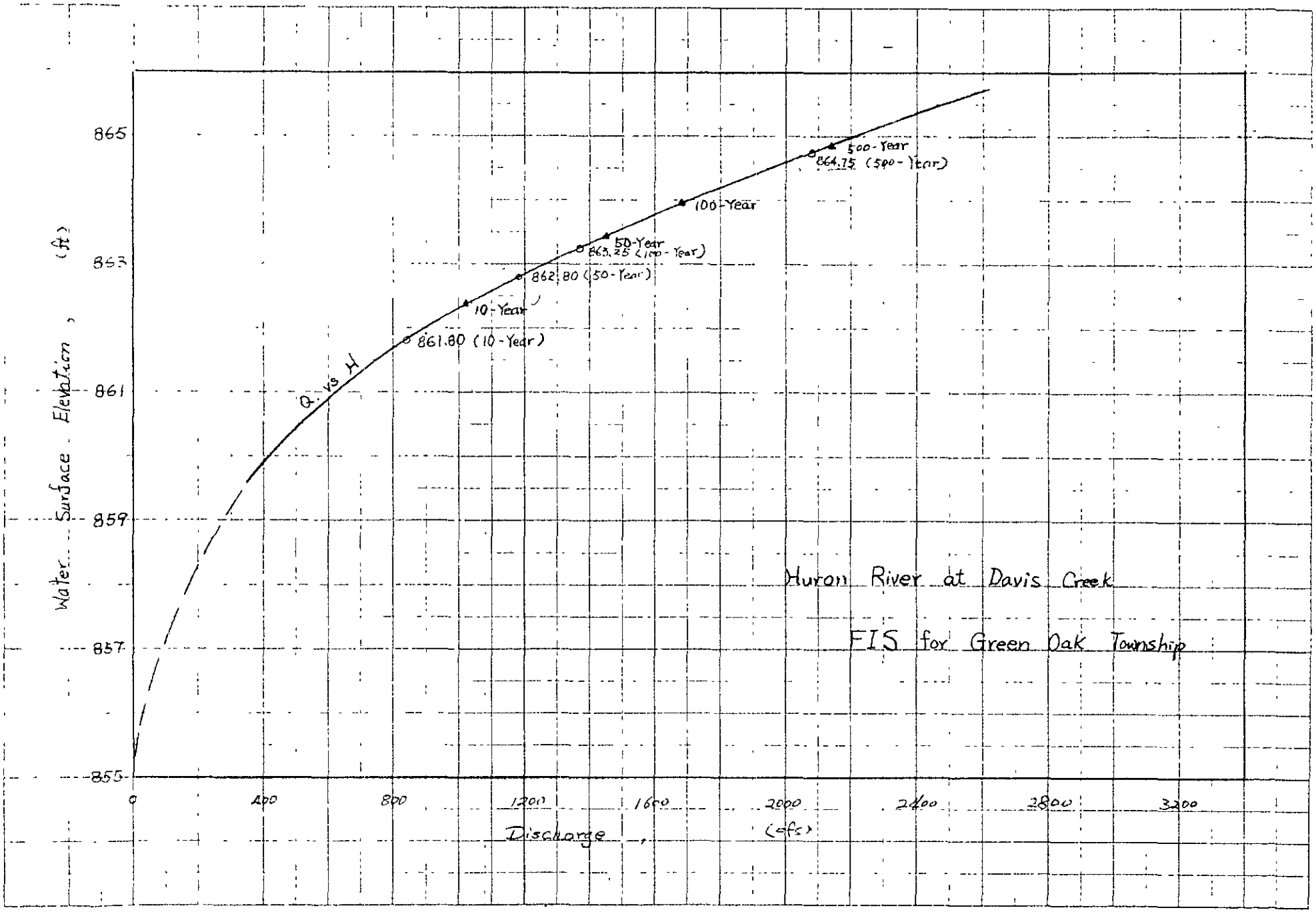
HOURLY PRECIPITATION

HOURLY AMOUNTS

MICHIGAN
MARCH 1974

STATION	DATE	A. M. Hour Ending 1	2	3	4	5	6	7	8	9	10	11	12	P. M. Hour Ending 1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
		MONTHLY MAXIMUM AMOUNTS																								
		HOURS			1			2			3			6			12			24			ACCUMULATION			
		MINUTES			15			30			45			60			120			180						
		(Apply heading as appropriate)																								
HOWELL WASTEWATER PL	2		.1	.1																						.2
	4								.1	.1	.1	.2	.1			.1		.1			.2	.2	.1			1.3
	5						.1																			.1
	8				.2	.2		.1	.1			.1	.1	.1												.4
	9	.1	.4										.1				.1									.7
	10		.1									.1														.2
	18																						.1			.1
	21					.1																				.1
	22			.1																						.1
	28							.1							.1		.1	.1				.1				.5
	29													.2												.2
	30				.1	.2		.1	.2																	.6
		AMOUNT				.4			.5			.5			.6			1.0			1.4					
		DATE/TIME OF ENDING			9/2:00A			9/2:00A			9/2:00A+			30/8:00A+			4/10:00P+			9/2:00A+					
		AMOUNT				.2			.3			.4			.4			.5			.5					
		DATE/TIME OF ENDING			29/0145P+			9/2:00A			9/2:00A			9/2:00A			9/2:00A			9/2:00A+					
IRON MOUNTAIN WTR WKS	1																.01	.01		.04	.04					.10
	5		.01		.01																					.02
	8																	.01	.06	.06	.02					.15
	14																.02									.02
	20																				.02	.01				.03
	22									.05	.01	.02	.02													.10
	30			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	.05						.05
		AMOUNT				.06			.12			.14			.15			.15			.15		ACC.		.05	
		DATE/TIME OF ENDING			8/7:00P+			8/7:00P			8/8:00P			8/8:00P			8/8:00P			8/8:00P			30/7:00P		
JACKSON 3 N	3																				.2	.1				.3
	4								.2	.1	.1	.1		.1					.2	.3	.1	.3	.1			1.8
	8				.3	.1	.1					.1	.1													.7
	9											.3									.1					.4
	15																.1									.1
	16					.1						.1														.2
	18																					.1				.1
	21			.1																						.1
	22	.1		.1																						.2
	28															.1	.1	.1	.1							.4
	29													.2												.2
	30	.1		.2		.1	.1	.1																		.6
		AMOUNT				.5			.7			.9			1.2			1.4			1.8					
		DATE/TIME OF ENDING			4/7:00P			4/7:00P			4/9:00P			4/10:00P			4/10:00P+			4/10:00P					
		AMOUNT				.3			.4			.5			.5			.8			1.0					
		DATE/TIME OF ENDING			8/3:30A+			4/7:00P			4/7:00P			4/7:00P			4/8:30P+			4/9:15P+					
KALAMAZOO WASTEWATER P //	1																								.05	.05
	3								.01	.02		.01	.01													.05
	4						.02	.03	.06	.09	.12	.05	.05	.03	.02	.07	.01	.14	.01	.12	.13					1.02
	8			.04	.10			.01			.02	.15	.10	.02	.01											.45
	9							.02			.13				.02	.03										.20
	15															.04	.01	.01	.01	.01	.02			.04	.06	.20
	16	.01			.02	.02				.01	.02			.01	.01											.10
	18																				.05	.07	.03	.02	.01	.18
	19	.02																								.02
	21	.02	.02	.01	.03								.01		.01											.10
	22											.02		.01	.02									.02		.07
	23	.01	.02																							.03
	28											.07	.09	.04	.05	.03										.28
	29										.02	.05													.13	.20
	30	.19	.09	.13	.06	.12	.03																			.62
		AMOUNT				.19			.32			.41			.72			.88			1.02					
		DATE/TIME OF ENDING			30/1:00A			30/1:00A			30/3:00A+			30/3:00A			4/8:00P			4/8:00P					
KENTON U S FOREST	1																			.01	.02					.03
	3														.01	.01	.01	.01				.01	.01			.04
	8																.04	.09	.05	.03	.01					.22
	18																		.01	.01	.01					.03
	22																		.02	.04	.02					.08
	30											.02	.06													.08
	31															.01	.01									.02
		AMOUNT				.09			.14			.18			.22			.22			.22					
		DATE/TIME OF ENDING			8/5:00P			8/6:00P			8/6:00P			4/8:00P			4/8:00P			4/8:00P					
LANSING WSO AP //	1																								.03	.03
	2	.07																								.07
	4										.10	.14	.02	.04	.03	.02	.01	.03	.12	.04	.12	.03				.70

K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.



SECNO TABLE

Green Oak Township - FIS
Livingston County, Michigan
11259-00-1

DAVIS CREEK

CROSS SECTION	SECNO	DESCRIPTION
A	625	J&A field section 51
B	1225	J&A field section 52
C	2195	J&A field section 53
D	2377	J&A field section 54 - Silver Lake Road
E	3515	J&A field section 55
F	4885	J&A field section 56
G	6695	J&A field section 57
H	8495	J&A field section 58
I	9185	J&A field section 59
J	9317	J&A field section 60 - Spicer Road
K	10535	J&A field section 61
L	11745	J&A field section 62
M	14395	J&A field section 63
N	15265	J&A field section 64
O	16255	J&A field section 65
P	16477	J&A field section 66 - Marshall Road
Q	17145	J&A field section 67
R	17925	J&A field section 68
S	18525	J&A field section 68A
T	18955	J&A field section 69 - d/s of Sandy Bottom Lake
U	20955	J&A field section 70
V	21755	J&A field section 71
W	22655	J&A field section 72
X	24555	J&A field section 73
Y	25315	J&A field section 74
Z	26315	J&A field section 75

DAVIS CREEK

CROSS SECTION	SECNO	DESCRIPTION
AA	26436	J&A field section 76 - Doane Road
AB	27160	J&A field section 77
AC	28660	J&A field section 78
AD	30760	J&A field section 79
AE	32960	J&A field section 80
AF	34860	J&A field section 81
AG	35022	J&A field section 82 - Private Driveway
AH	35622	J&A field section 83
AI	36287	J&A field section 84 - Private Driveway
AJ	37098	J&A field section 85
AK	37942	J&A field section 85A - Rushton Road
AL	38123	J&A field section 86
AM	39313	J&A field section 87
AN	40883	J&A field section 88
AO	42053	J&A field section 89
AP	42613	J&A field section 90
AQ	43461	J&A field section 90A - Private Driveway
AR	43812	J&A field section 91
AS	44032	J&A field section 92 - Chesapeake & Ohio Railroad

WALKER DRAIN

CROSS SECTION	SECNO	DESCRIPTION
A	0	J&A field section 94 - Mouth of Walker Drain, Start of Island Problem
B	520	J&A field section 95
C	1470	J&A field section 96 - End of Island Problem
D	2220	J&A field section 97
E	2830	J&A field section 98
F	2930	J&A field section 99
G	4440	J&A field section 100
H	4910	J&A field section 101 - Rushton Road
I	5140	J&A field section 102 - Spillway for Inchwagh Lake
J	5250	J&A field section 103 - Grand Trunk Western Railroad
K	5620	J&A field section 104
L	7300	J&A field section 105
M	9340	J&A field section 106
N	13750	J&A field section 107 - Nine Mile Road
O	13860	J&A field section 108
P	14670	J&A field section 109
Q	15180	J&A field section 110
R	16540	J&A field section 111
S	17830	J&A field section 112
T	19410	J&A field section 114
U	19560	J&A field section 115 - Eight Mile Road

WALKER DRAIN - South Branch

CROSS SECTION	SECNO	DESCRIPTION
A	0	J&A field section 93 - Mouth of Walker Drain, Start of Island Problem
B	1200	J&A field section 94
C	1900	J&A field section 95 - Driveway Bridge
D	2850	J&A field section 96 - End of Island Problem

BRIDGE SKETCHES
AND
CALCULATIONS

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2300 Dixie Hwy., Pontiac, MI 48055

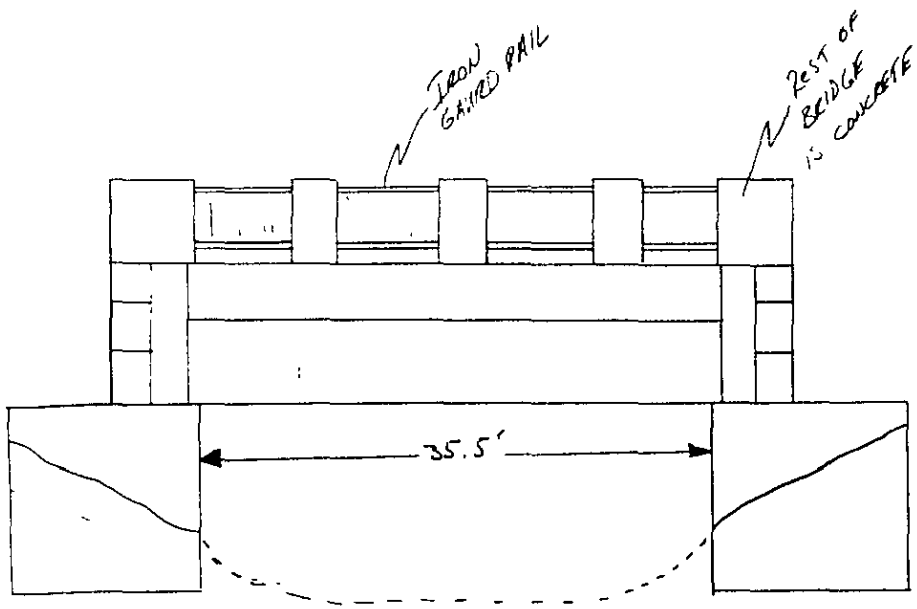
HYDRAULIC STRUCTURAL DATA
B. S. #54

Code No. 11259-00-211

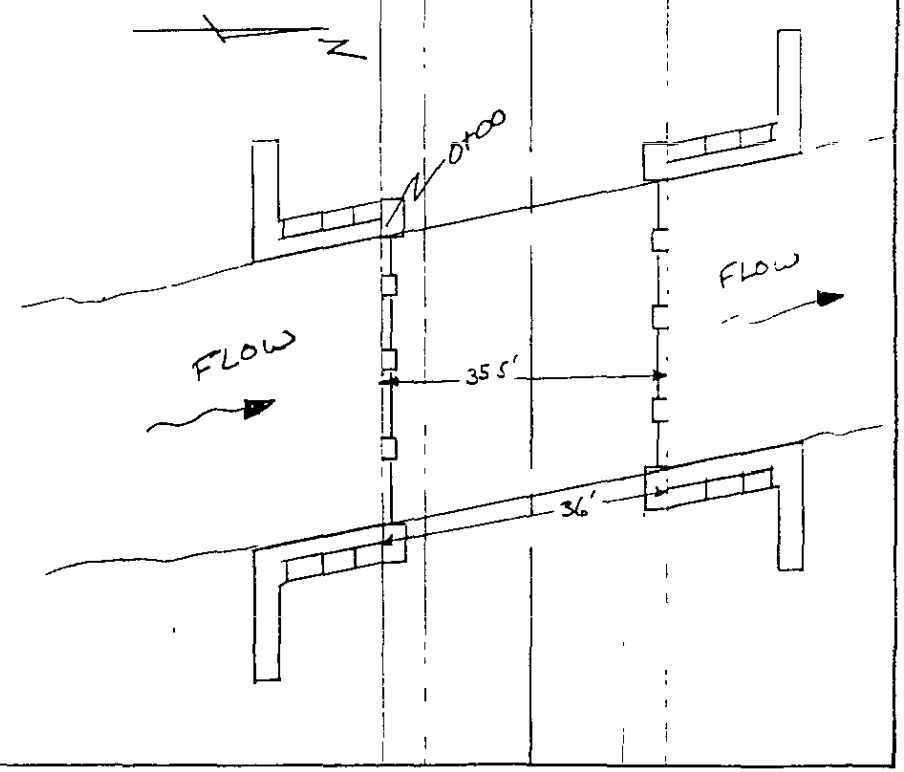
Job Name: GREEN OAKS TWP F.I.S.		By: L. Cumberworth	
Date: 2-18-82	Feature:	Water Course: DAVIS CREEK	
Remarks:			
Width of Piers: —	Pier Shape: —	No. of Piers: —	Area: —
Water Elevation: 860.6	Length: 35.5'	Width of Deck: 35.5'	Skew: 36.0'

FIELD SKETCH

Profile View



Plan View



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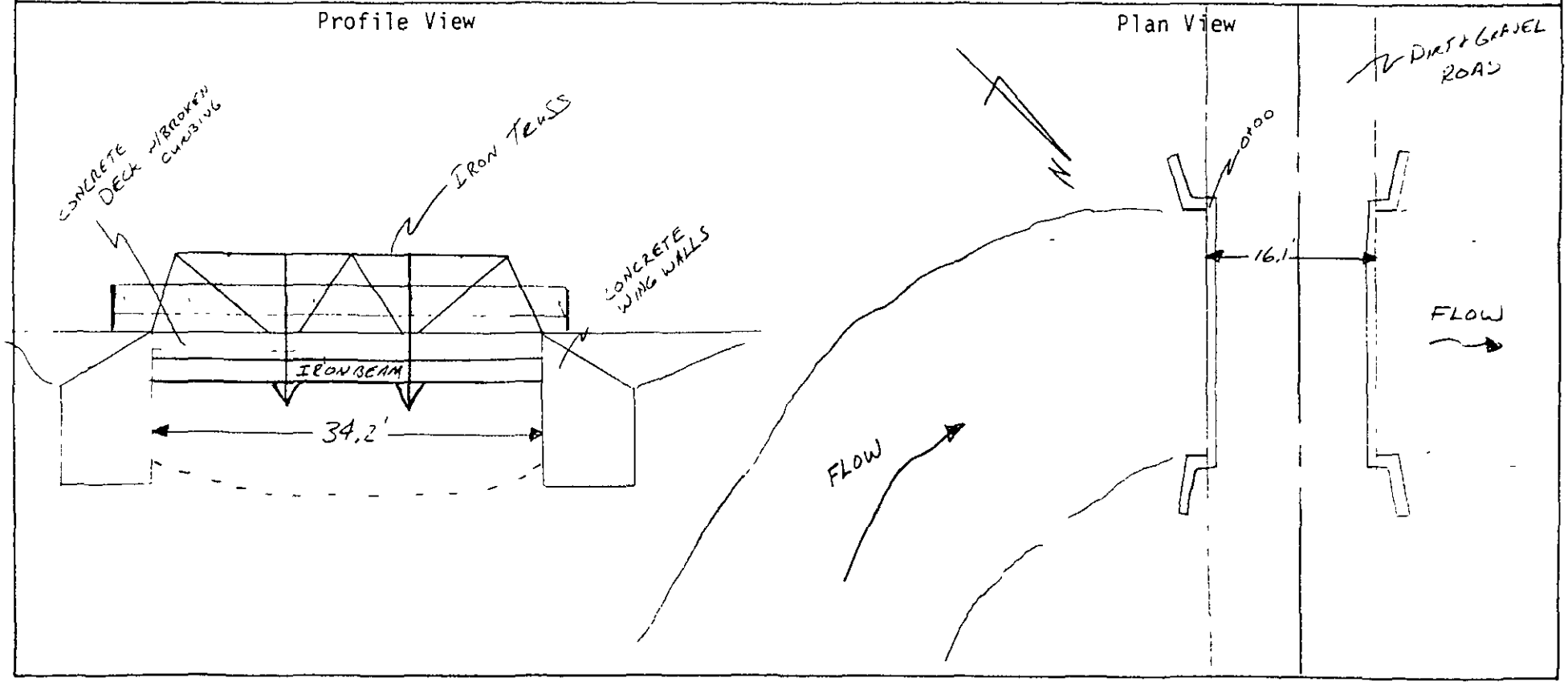
HYDRAULIC STRUCTURAL DATA
B.S. #60

Code No. 11259-00-211

Job Name: GREEN OAKS Twp F.I.S		By: L. Cumberworth	
Date: 3-15-82	Feature: TRUSS Bridge	Water Course: DAVIS CREEK	
Remarks: RIVER BASIN WAS FLOODED WHEN Bridge SECTION WAS DONE			
FAIRLANE OR (SPICER) Rd. Bridge			
Width of Piers: —	Pier Shape: —	No. of Piers: —	Area: —
Water Elevation: 868.0	Length: 34.2'	Width of Deck: 16.1'	Skew: —

FIELD SKETCH



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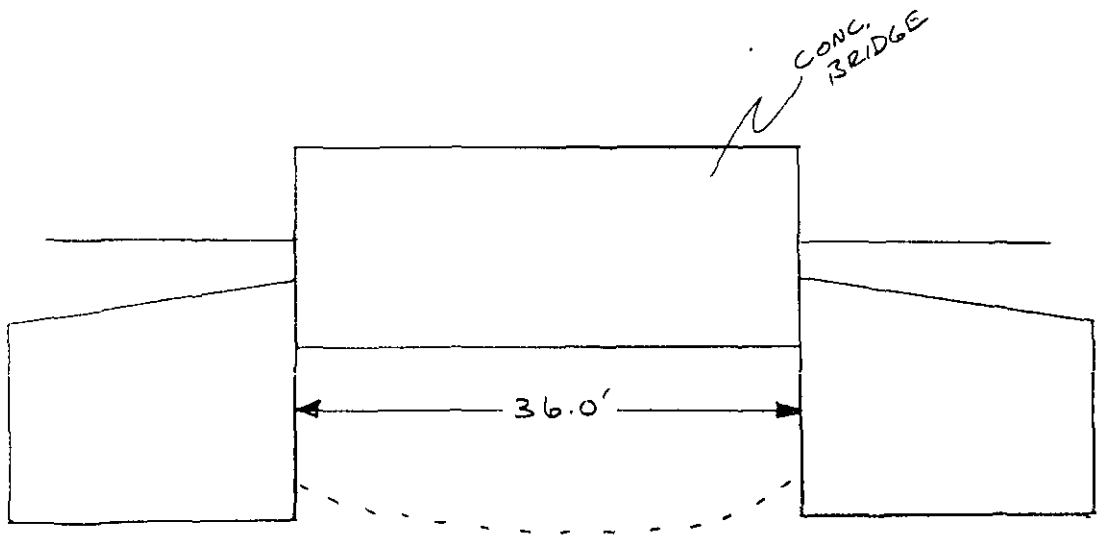
HYDRAULIC STRUCTURAL DATA
B.S. #66

Code No. 11259-00-2

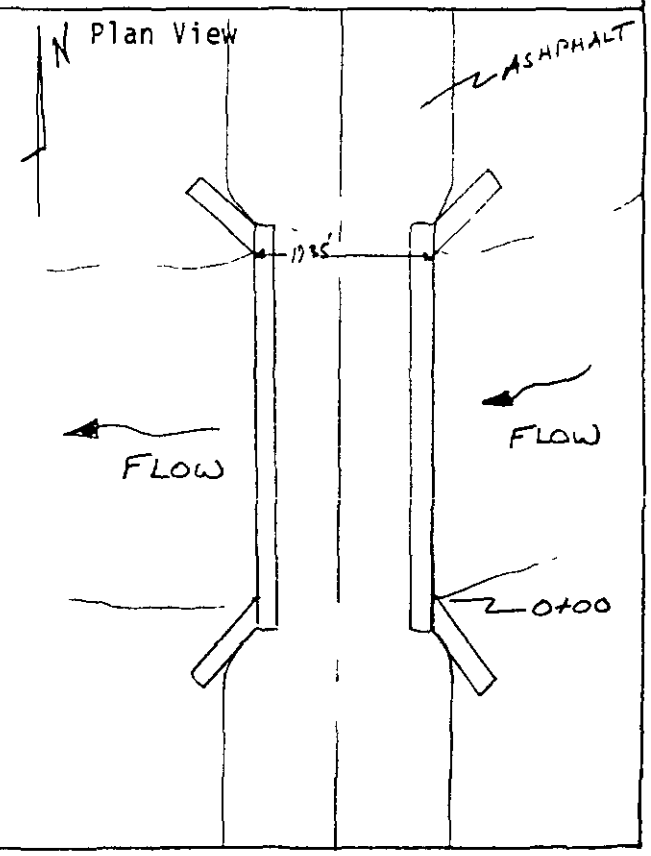
Job Name: Green Oaks Twp F.I.S.		By: L. Cumberworth	
Date: 4-7-82	Feature: One Lane Bridge	Water Course: Davis Creek	
Remarks: 15° - CLEAR (River is up)			
Marshall Rd Bridge			
Width of Piers: —	Pier Shape: —	No. of Piers: —	Area: —
Water Elevation: 869.5	Length: 36.0'	Width of Deck: 17.35	Skew: —

FIELD SKETCH

Profile View



Plan View



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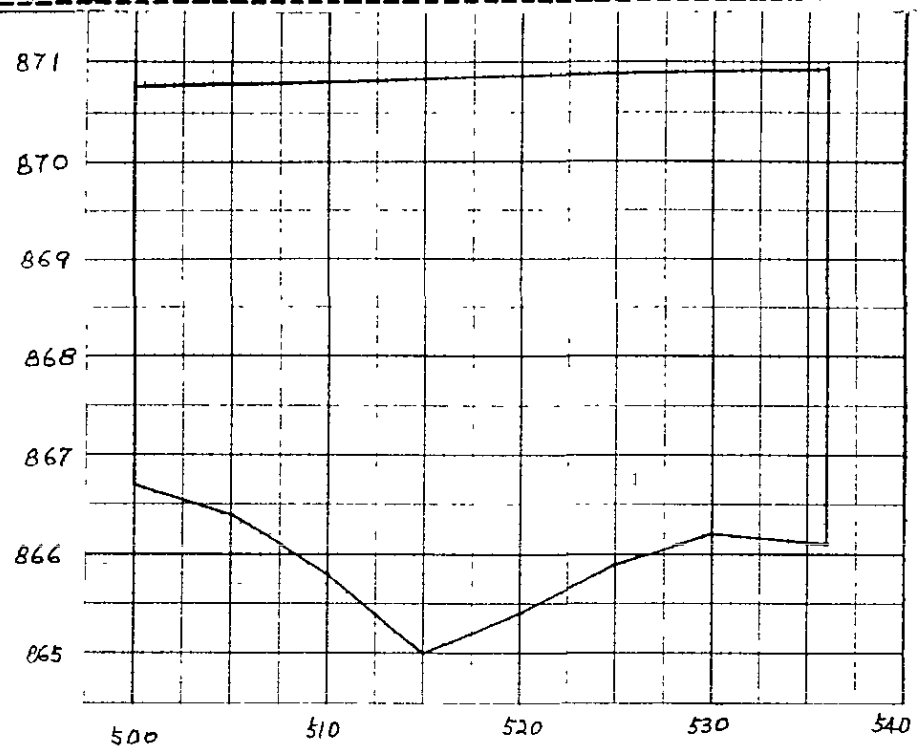
CONSULTING ENGINEERS

BY MSC DATE 9/9/82 JOB DESCRIPTION FIS - Green Oak Township SHEET 1 OF 1
SUBJECT Marshall Road over Davis Creek JOB NO. U259-00-L



Bridge Feature. Concrete Bridge with Sandy Bottom ($n = 0.020$)

Length. $L = 17$ ft

Bridge Area $A = 179.10$ ft^2

Wetted Perimeter $P = 81.07$ ft

Hydraulic Radius $R = A/P = 2.21$ ft

Entrance Loss $K_e = 0.3$

$$K_f = \frac{29.1\, n^2 L}{R^{4/3}} = 0.07$$

$$\Sigma K = 1 + K_e + K_f = 1.37$$

Max Top'k [illegible] = 5.24 ft

FWC = A/[illegible] = 30.[illegible] ft

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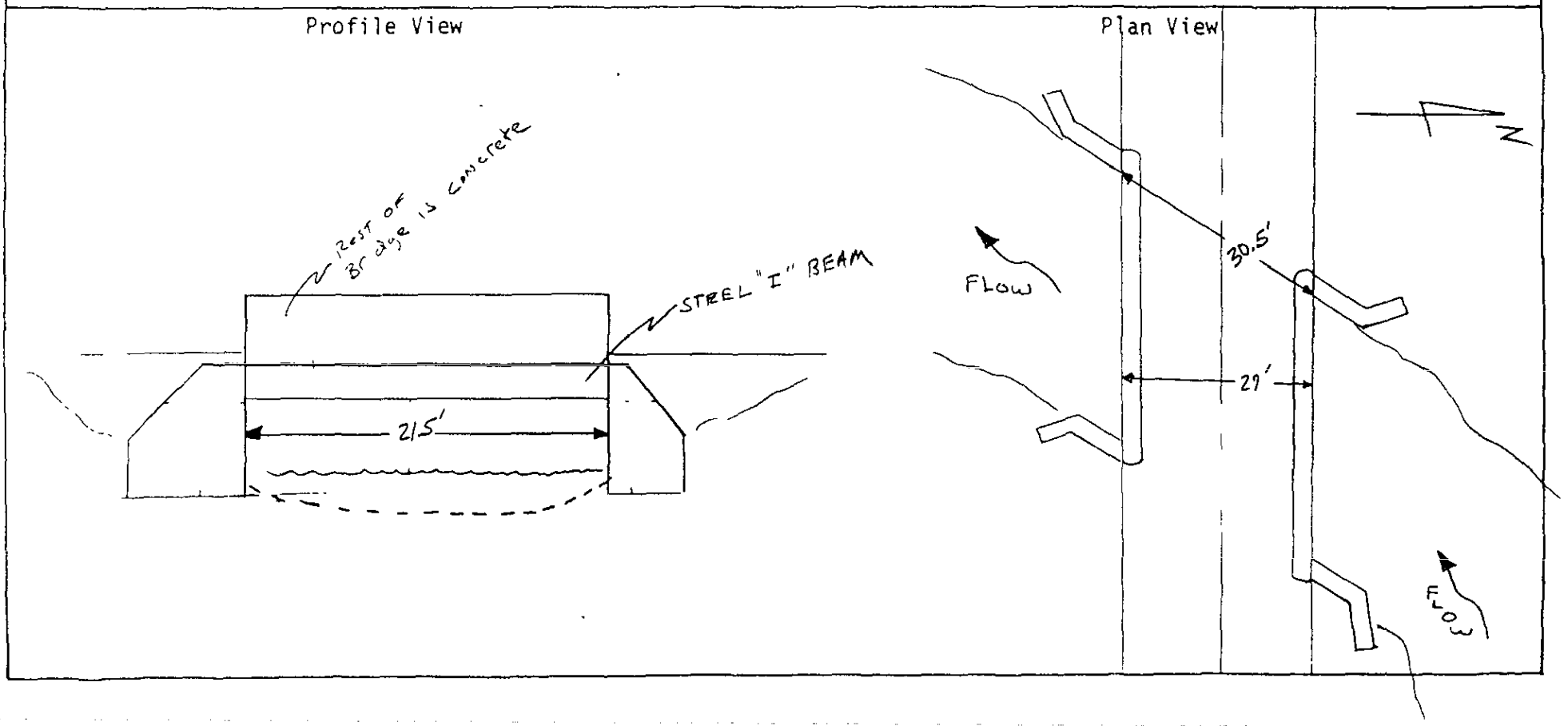
HYDRAULIC STRUCTURAL DATA
B.S. # 76

Code No. 11259-00-211

Job Name: Green Oaks Twp. F.I.S.		By: L. Cumberworth	
Date: 3-10-82	Feature:	Water Course: Davis Creek	
Remarks: Doane Rd. Bridge			
Width of Piers: —	Pier Shape: —	No. of Piers: —	Area: —
Water Elevation: 868.7	Length: 21.5'	Width of Deck: 27.0'	Skew: 30.5' IN FEET NOT DEGREES

FIELD SKETCH



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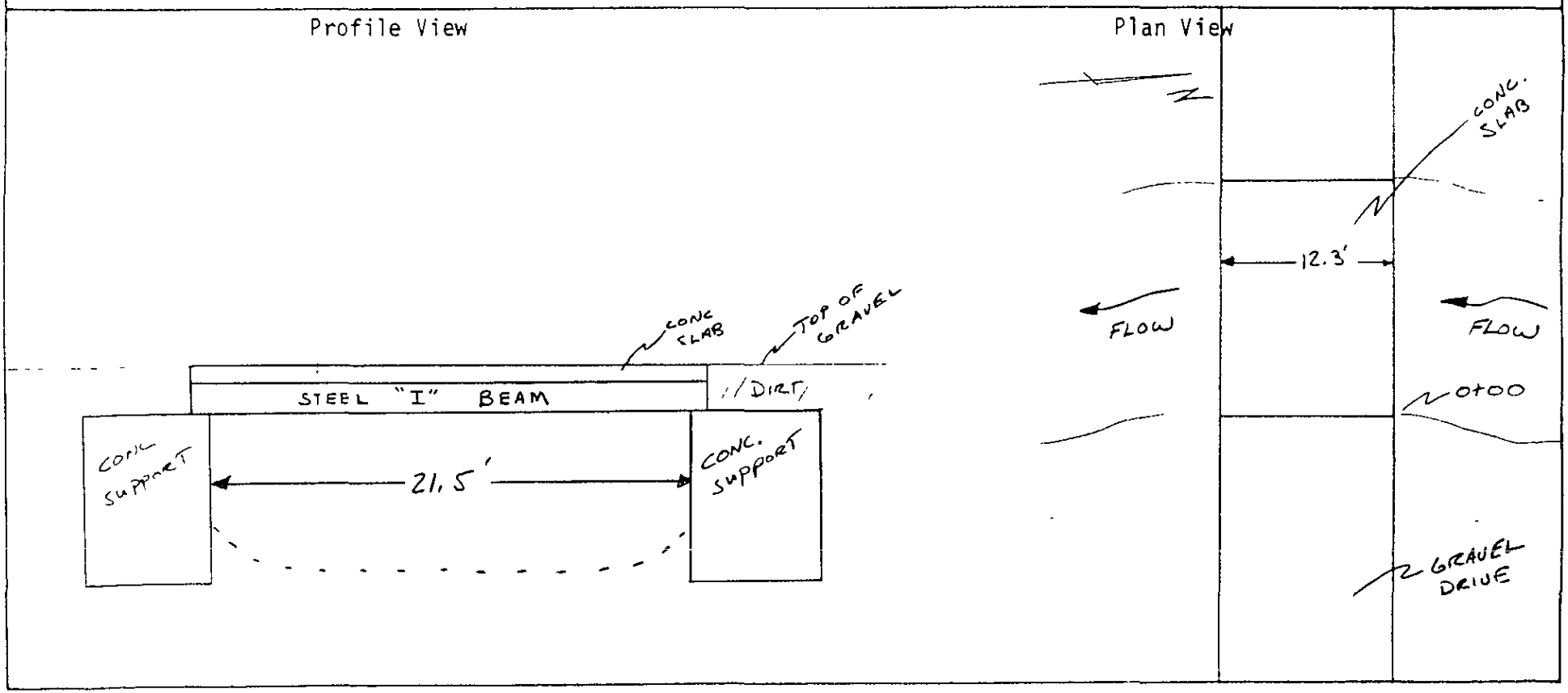
HYDRAULIC STRUCTURAL DATA
B.S. #82

Code No. 11259-00-211

Job Name. GREEN OAKS TWP F.I.S.		By: L. Cumberworth
Date. 4-7-82	Feature: ONE LANE BRIDGE	Water Course: DAVIS CREEK
Remarks: FINEBROOK LANE BRIDGE 20° - CLEAR		

Width of Piers:	Pier Shape:	No. of Piers:	Area:
Water Elevation: 878.2	Length: 21.5'	Width of Deck: 12.3'	Skew:

FIELD SKETCH



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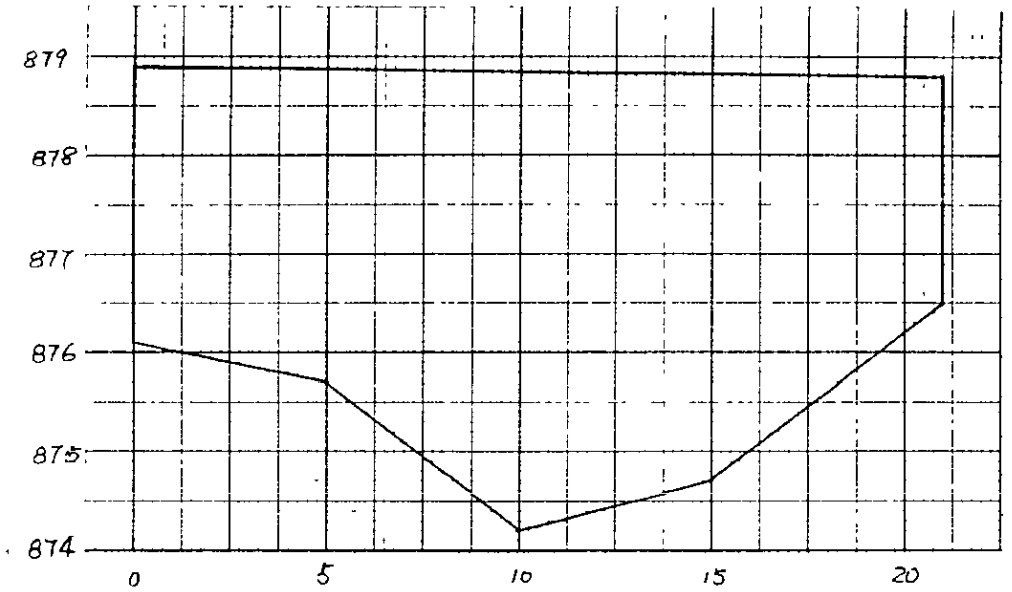
BY MSC DATE 9/21/82 JOB DESCRIPTION FIS - Green Oak Township SHEET 1 OF 1
SUBJECT Pinebrook Lane Bridge (Sec. AG) JOB NO. 11259-00-1



Culvert Feature . Concrete Bridge with Sandy Bottom ($n = 0.02$)

Length $L = 12.3$ ft

Area : $A = 76.5$ ft^2

Wetted Perimeter : $P = 47.4$ ft

Hydraulic Radius . $R = A/P = 1.61$ ft

Entrance Loss . $K_e = 0.5$

$$K_f = \frac{29.1\, n^2 L}{R^{4/3}} = 0.08$$

$$\times K \phi R = 1.58$$

Max Depth $D = 4.7$ ft

$$BWC = A/D = 16.3 \text{ ft}$$

Weir Coefficient $C = 2.80$ (Graph No.)

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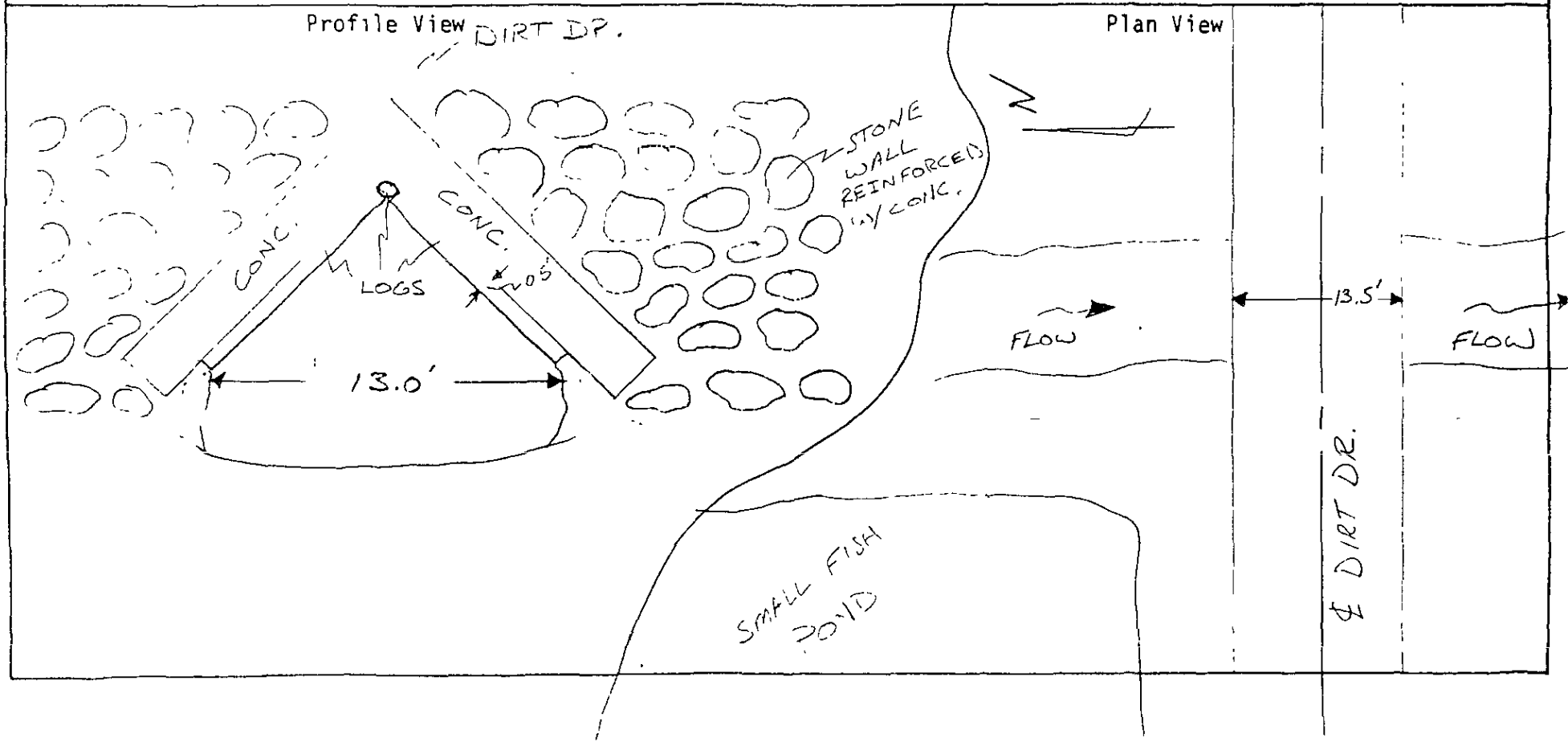
HYDRAULIC STRUCTURAL DATA
B.S. # 84

Code No. 11259-00-2

Job Name: GREEN OAKS TWP. F.I.S.		By: L Cumberworth	
Date: 5-20-82	Feature:	Water Course: DAVIS CREEK	
Remarks:			
Width of Piers:	Pier Shape:	No. of Piers:	Area:
Water Elevation: 878.2	Length:	Width of Deck:	Skew:

FIELD SKETCH



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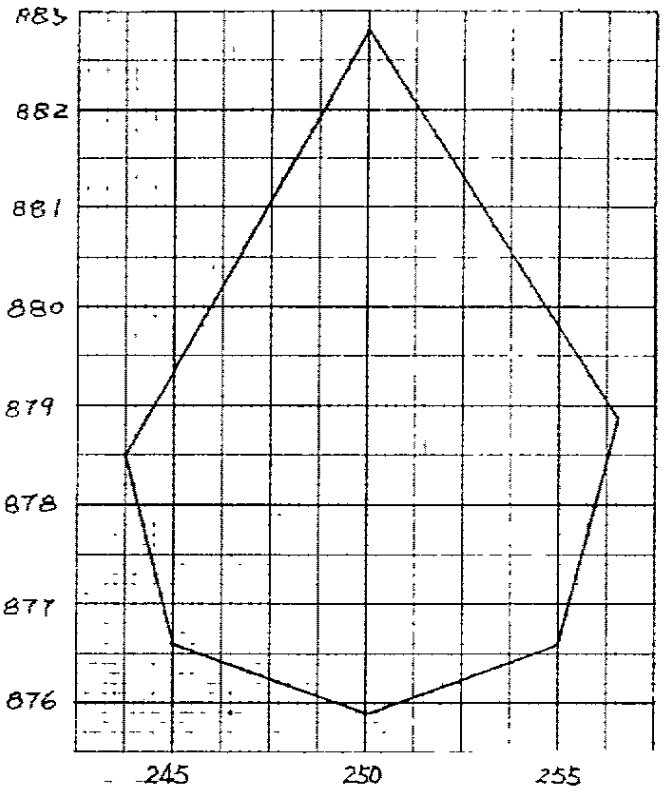
BY MSC DATE 9/19/82 JOB DESCRIPTION FIS - Green Oak Township SHEET 1 OF 1
SUBJECT Private Driveway Bridge (SEC A1) JOB NO. 11259-00-1



Culvert · Wood Bridge with Sandy Bottom (n = 0.022)

Area · $A = 53.84 \ ft^2$

Wetted Perimeter : $P = 30.5 \ ft$

Hydraulic Radius · $R = A/P = 1.77 \ ft$

Length . $L = 14 \ ft$

Entrance Loss $K_e = 0.5$

$$K_f = \frac{29.1 \, n^2 L}{R^{4/3}} = 0.09$$

$$\Sigma K \phi R = 1.59$$

Max Depth $D = 6.9 \ ft$

$$BWC = A/D = 7.80 \ ft$$

Weir Coefficient $C = 2.80$ (Gravel Road)

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Consulting Engineers
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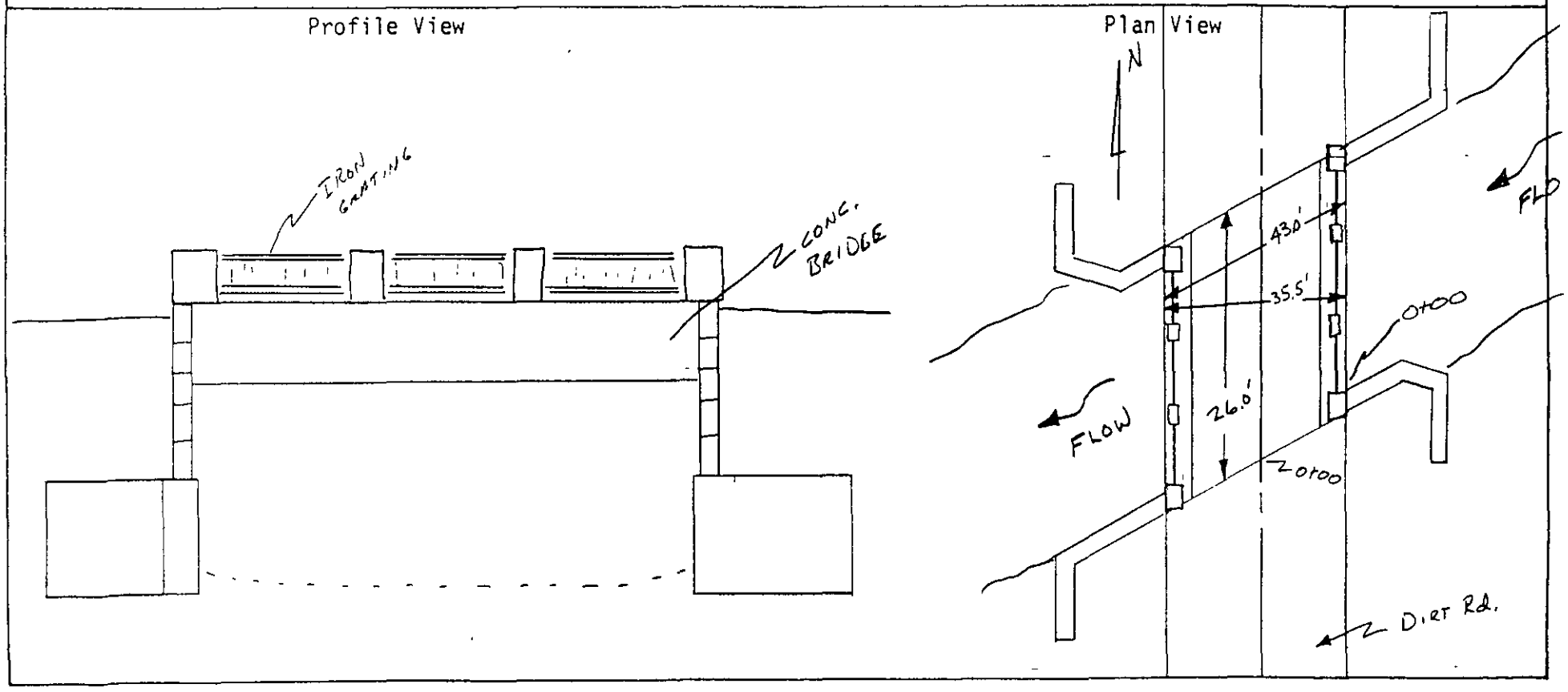
HYDRAULIC STRUCTURAL DATA
B.S. #85A

Code No. 11259-00-211

Job Name: GREEN OAKS TWP. F.I.S.		By: L. Cumberworth	
Date: 3-25-82	Feature:	Water Course: DAVIS CREEK	
Remarks: Rushton Rd. Bridge			
Width of Piers:	Pier Shape:	No. of Piers:	Area:
Water Elevation: 883.5	Length: 26.0'	Width of Deck: 35.5	Skew: 43.0'

FIELD SKETCH



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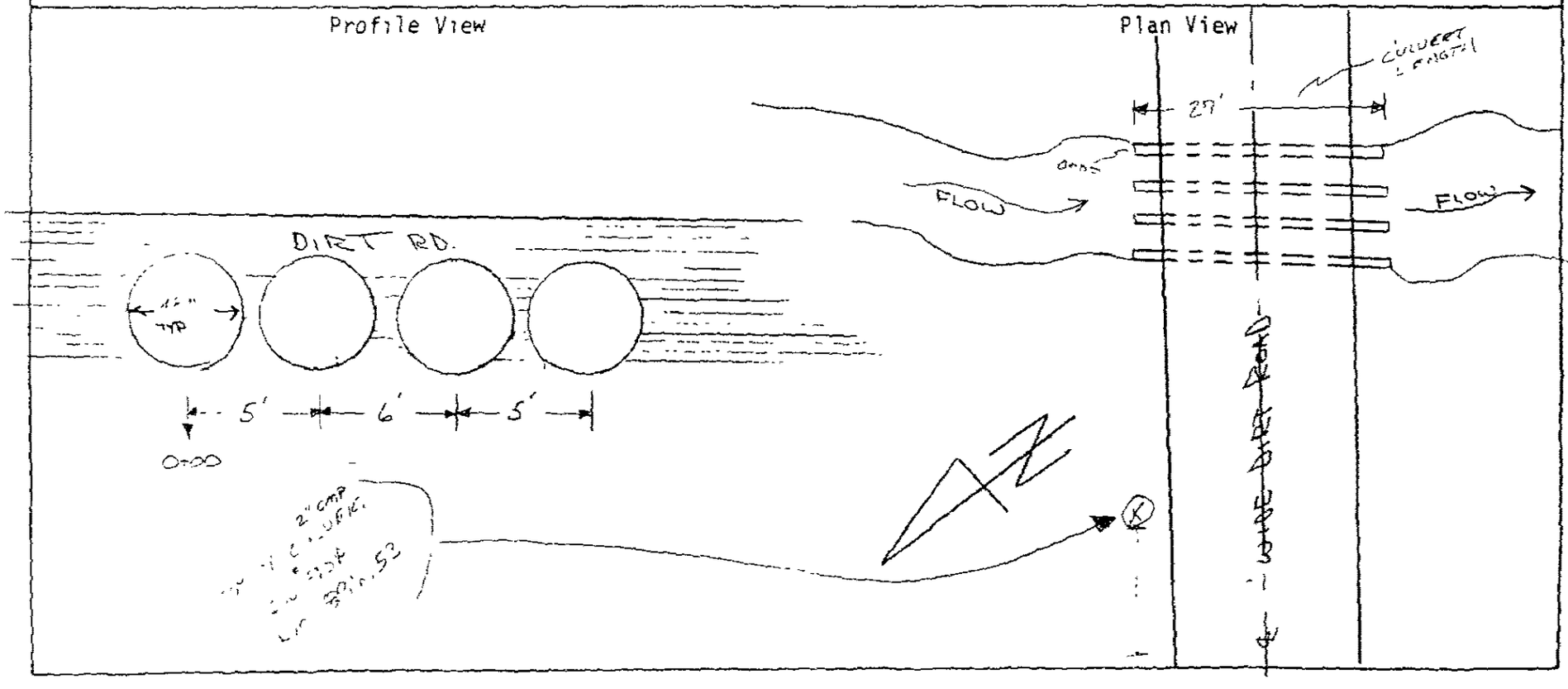
HYDRAULIC STRUCTURAL DATA
Bridge # 904

Code No. 11259-00-21

Job Name: GREEN OAKS TWP F.I.S.			By: SHIDELER
Date: 5-20-83	Feature: 4-48" RCP CULVERTS		Water Course: DAVIS CREEK
Remarks:			
Width of Piers:	Pier Shape:	No. of Piers:	Area:
Water Elevation: 890.1	Length:	Width of Deck:	Skew:

FIELD SKETCH



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CONSULTING ENGINEERS

BY MSC DATE 9/22/82 JOB DESCRIPTION FIS - Green Oak Township SHEET 1 OF 1
SUBJECT Driveway Bridge SEC A8 JOB NO. 11259-00-L

Bridge Feature : 4 - 48"ϕ RCP culverts

Length . $L = 27$ ft

Total Area $A = 50.27$ ft^2

Hydraulic Radius . $R = 48/12/4 = 1.0$ ft

Manning Coefficient . $n = 0.015$

Entrance Loss $K_e = 0.7$

$$K_f = \frac{29.1 n^2 L}{R^{4/3}} = 0.18$$

$$\Sigma K \phi R = 1 + 0.7 + 0.18 = 1.88$$

Max Depth $D = 4$ ft

$$BWC = A/D = 12.57 \text{ ft}$$

Weir Coefficient $C = 2.85$ (Gravel Road)

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Consulting Engineers
2300 Dixie Hwy., Pontiac, MI 48055

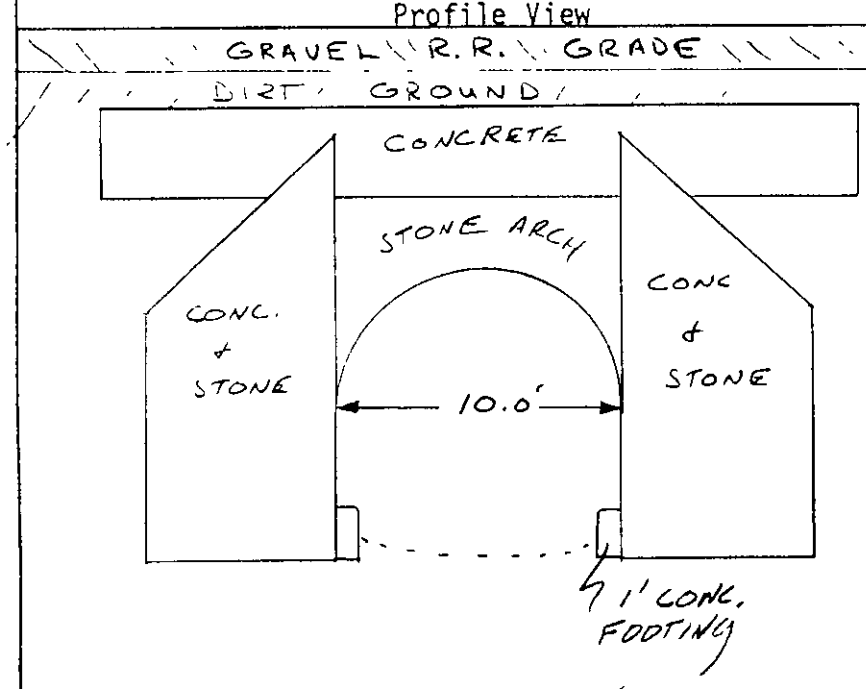
HYDRAULIC STRUCTURAL DATA
B.S. #92

Code No. 11259-00-211

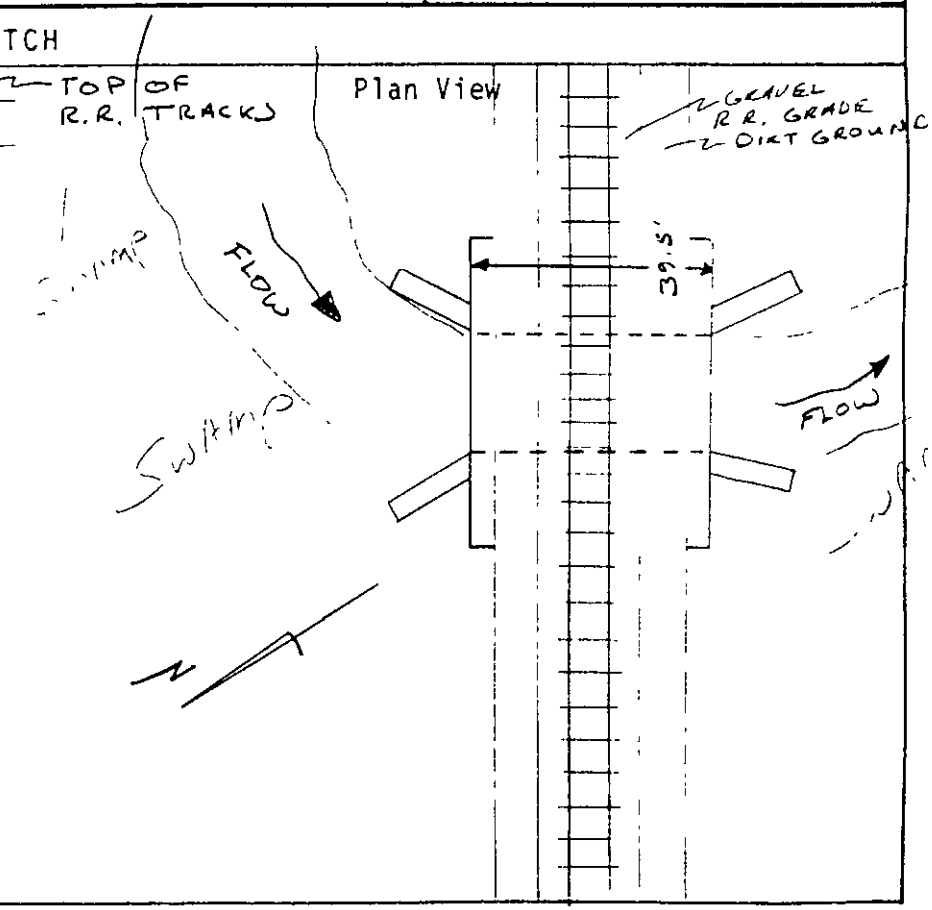
Job Name: GREEN OAKS TWP. F.I.S.		By: L. CUMBERWORTH	
Date: 4-7-82 5-3-82	Feature: STONE ARCH W/R.R.	Water Course: DAVIS CREEK	
Remarks:			
Width of Piers:	Pier Shape:	No. of Piers:	Area:
Water Elevation:	Length: 10.0' ARCH	Width of Deck: 39.5'	Skew:

FIELD SKETCH

Profile View

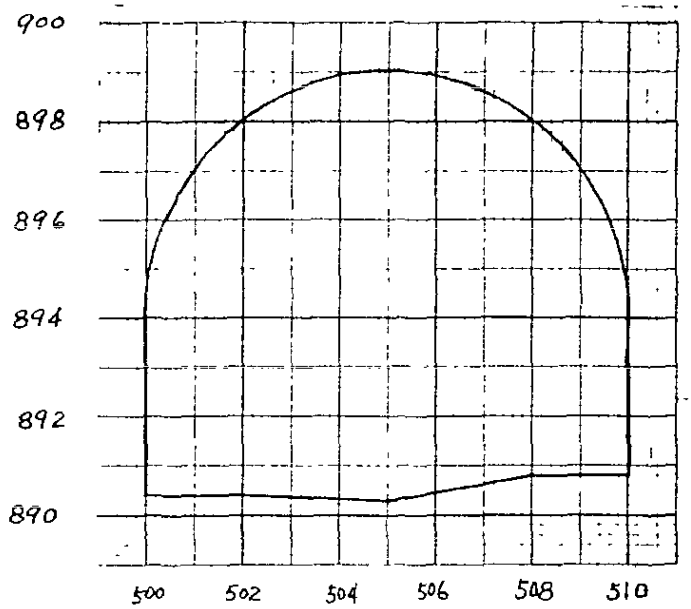


Plan View



JOHNSON & ANDERSON, INC.
CONSULTING ENGINEERS

BY MSC DATE 9/22/82 JOB DESCRIPTION FIS - Green Oak Township SHEET 1 OF 1
SUBJECT C & O Railroad SEC. AS JOB NO. 11259-00-L



Bridge Feature : Concrete Arch Bridge with Sandy Bottom ($n = 0.022$)

Area : $A = \frac{\pi}{8}(10)^2 + 34.9 = 74.17 \text{ ft}^2$

Wetted Perimeter. $P = 5\pi + 16.8 = 32.51 \text{ ft}$

Hydraulic Radius $R = A/P = 2.28 \text{ ft}$

Length. $L = 40 \text{ ft}$

Entrance Loss $K_e = 0.5$

$$K_f = \frac{29.1 n^2 L}{R^{4/3}} = 0.19$$

$\therefore \; \Sigma K \phi R = 1.69$

Max. Depth $D = 8.7 \text{ ft}$

$$BWC = \frac{A}{D} = 8.53 \text{ ft}$$

Weir Coefficient $C = 2.85$ (Sharp Rock)

JOB NAME: FIS - Green Oak Township	JOB NO.	11259	00	1	13

WATERCOURSE: Davis Creek

CULVERT LOCATION: Chesapeake & Ohio Railroad

CULVERT DESCRIPTION: Arch Stone Bridge

BY MSC | DATE

n = 0.022 | Q_{10} = 565 cfs | TW_{10} = 5.20

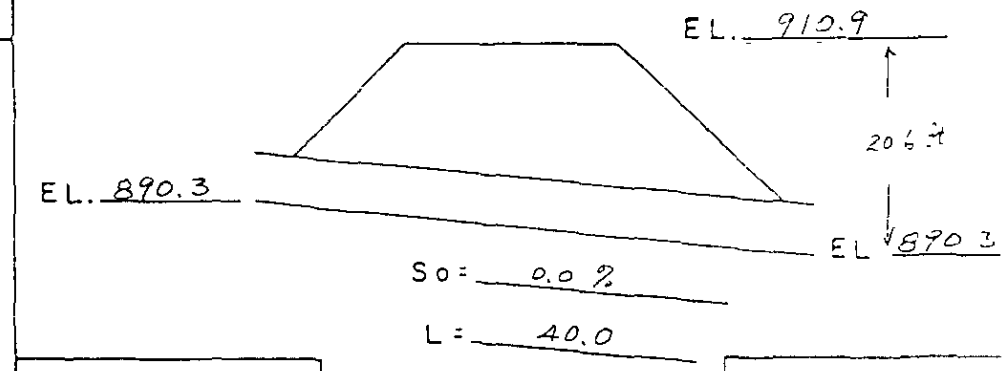
A = 74.17 ft² * | Q_{50} = 905 | TW_{50} = 6.91

R = 2.28 ft | Q_{100} = 1110 | TW_{100} = 7.83

Ke = 0.5 | Q_{500} = 1660 | TW_{500} = 10.06

D = 8.70 ft

LSo = 0.0



Sta. 41562 | Sta. 41522

HEADWATER ANALYSIS

Q	INLET CONT. HW/D	INLET CONT. HW	OUTLET CONT. HW = H + ho − LSo: H	dc	(dc+D)/2	ho	HW	HEC-2: D+(1+Ke) V²/2g	HEC-2: HW	FINAL ENERGY HW	FINAL HW ELEV	Δ H HEC-2
565	–	6.85	1.52	5.20	6.95	6.95	8.47	--- low flow	(Use HEC-2)			–
905	–	10.77	3.91	6.91	7.81	7.81	11.72	Pressure Flow		11.72	902.02	0.91
1110	–	14.01	5.88	7.83	8.27	8.27	14.15			14.15	904.45	0.44
1660	–	25.96	13.15	–	–	10.06	23.21	--- with Weir Flow	(Use HEC-2)			–

CALCULATIONS AND COMMENTS

* See Attached Sheet

Inlet Control

$HW = \left(\frac{1}{0.6}\right)^2 \frac{V^2}{2g} + \frac{D}{2}$

$= Q^2/127{,}540 + 4.35$

Outlet Control

$H = XKQR \frac{V^2}{2g}$

$= Q^2/209{,}631$

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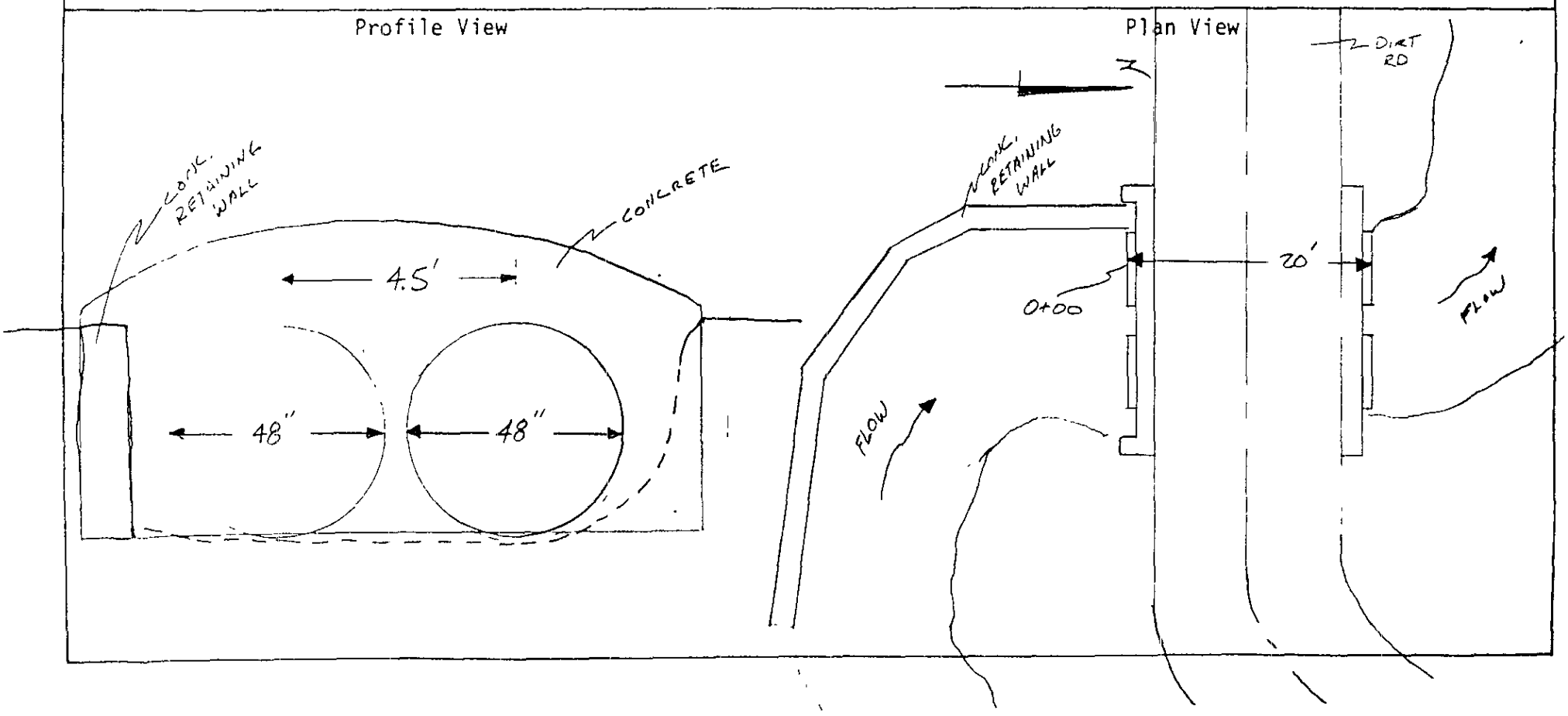
HYDRAULIC STRUCTURAL DATA
B.S. #98

Code No. 11259-00-212

Job Name: Green Oaks Twp. F.I.S.		By: L Cumberworth	
Date: 3-25-82	Feature: 2 48" CMP CULVERT BRIDGE	Water Course: WALKER DRAIN	
Remarks: High WATER THIS YEAR AT THIS AREA WAS 0.8'± Higher than WATER ELEVATION AT THIS DATE			
Width of Piers: —	Pier Shape: —	No. of Piers: —	Area: —
Water Elevation: 871.5	Length: 2 48" CMP	Width of Deck: 20.0'	Skew: —

FIELD SKETCH



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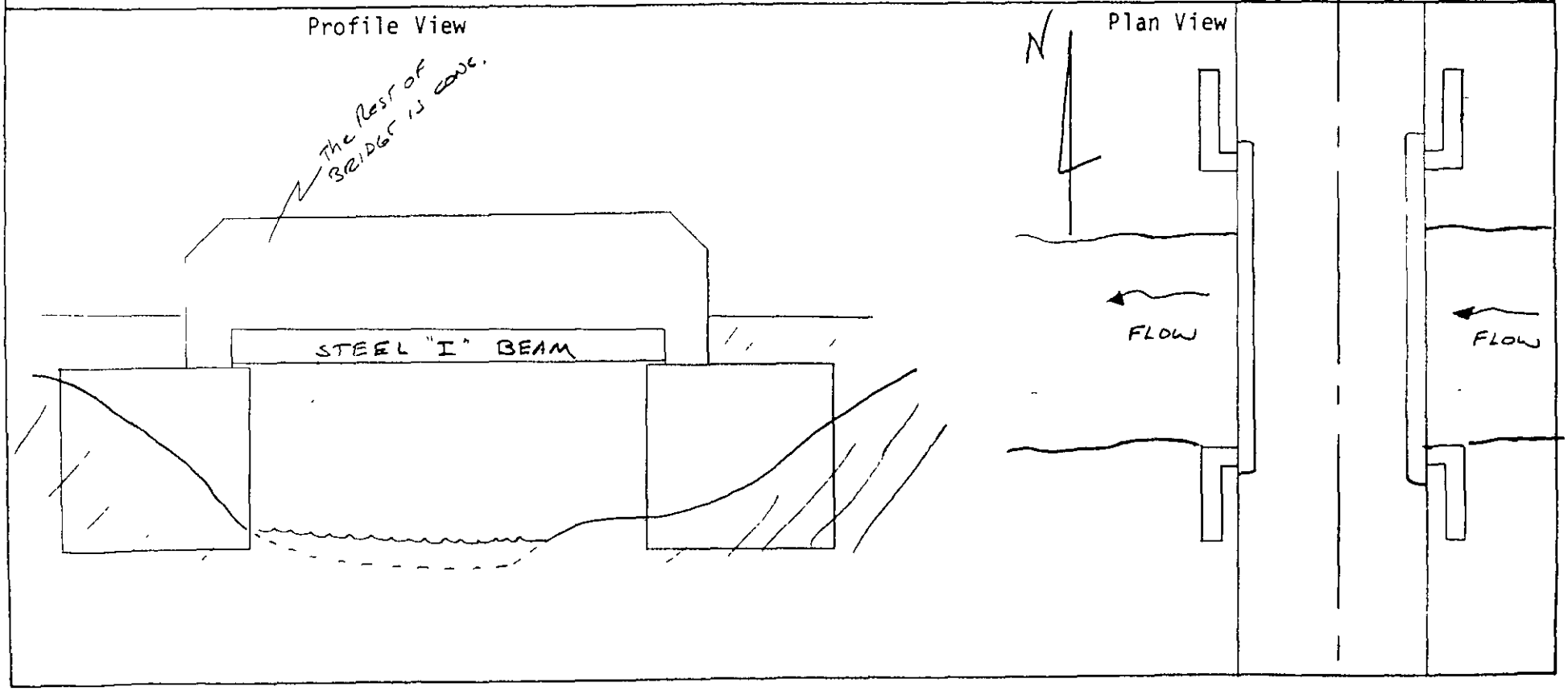
HYDRAULIC STRUCTURAL DATA
B.S. #101

Code No. 11259-00-21

Job Name: GREEN OAKS TWP FIS.		By: L. Cumberworth	
Date. 3-5-82	Feature:	Water Course: WALKER DRAIN	
Remarks: RUSHTON Rd. Bridge			
Width of Piers: —	Pier Shape: —	No. of Piers: —	Area: —
Water Elevation: 874.5	Length: 24'	Width of Deck: 29.5'	Skew: —

FIELD SKETCH



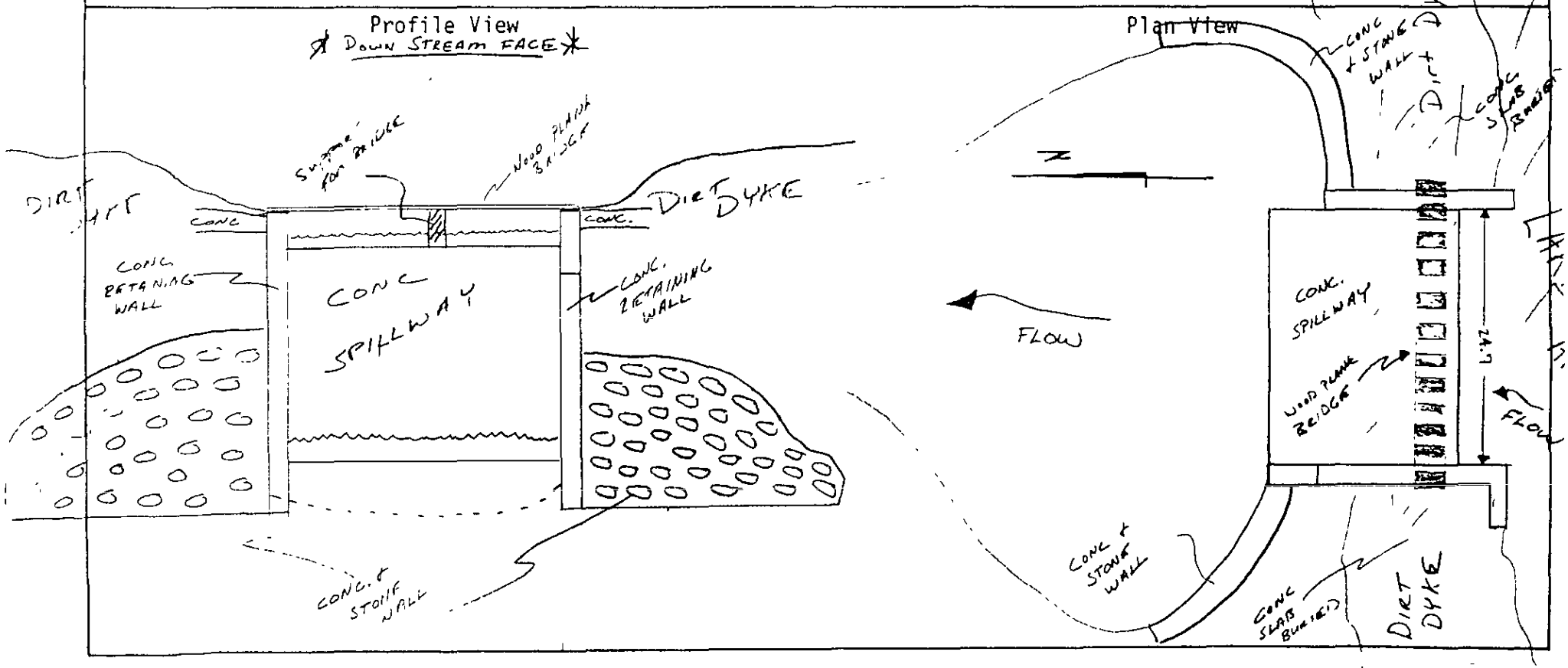
Johnson & Anderson, Inc.
Consulting Engineers
P O Box 1166 2300 Dixie Highway Pontiac, Michigan 48056

HYDRAULIC STRUCTURAL DATA
DAM #102

Code No. 11259-00-212

Job Name: GREEN OAKS TWP F.I.S		By: L. Camberworth	
Date: 3-19-82	Feature: Spillway DAM	Water Course: WALKER DRAIN	
Remarks:			
Width of Piers:	Pier Shape:	No. of Piers:	Area:
Water Elevation: 888.3	Length: 24.7'	Width of Deck:	Skew:

FIELD SKETCH



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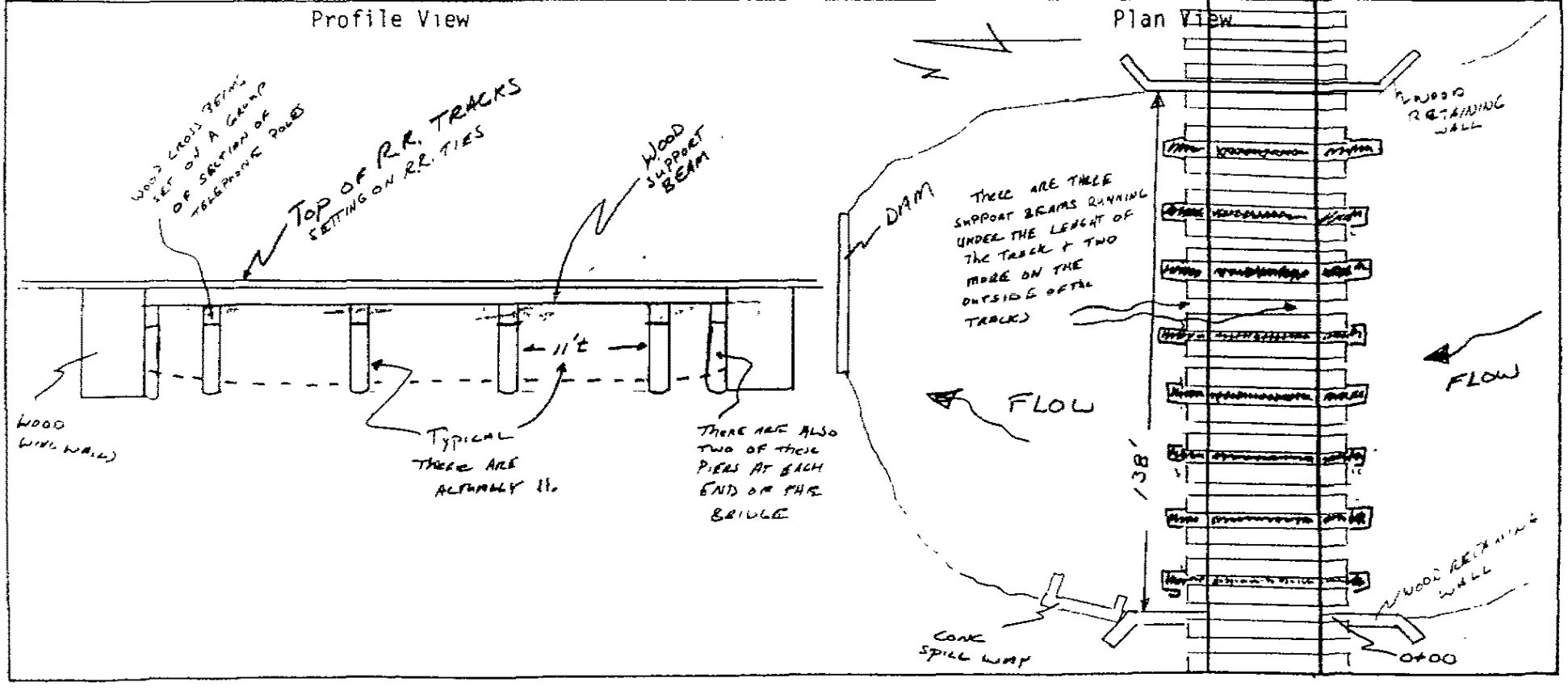
Consulting Engineers
2300 Dixie Hwy., Pontiac, MI 48055

HYDRAULIC STRUCTURAL DATA
B.S. #103

Code No. 11259-00-212

Job Name: GREEN OAKS TWP FIS.		By: L. Cumberworth	
Date: 3-4-82 3-19-82	Feature: Wood RR. Bridge	Water Course: WALKER DRAIN	
Remarks: TRACKS ARE NOT IN USE			
Width of Piers: 1'±	Pier Shape: SECTIONS OF Telephone Poles	No. of Piers: 11	Area:
Water Elevation: 888.3	Length: 138.0'	Width of Deck: 11.8'	Skew: —

FIELD SKETCH



Johnson & Anderson, Inc.
Consulting Engineers
2300 Dixie Hwy., Pontiac, MI 48055

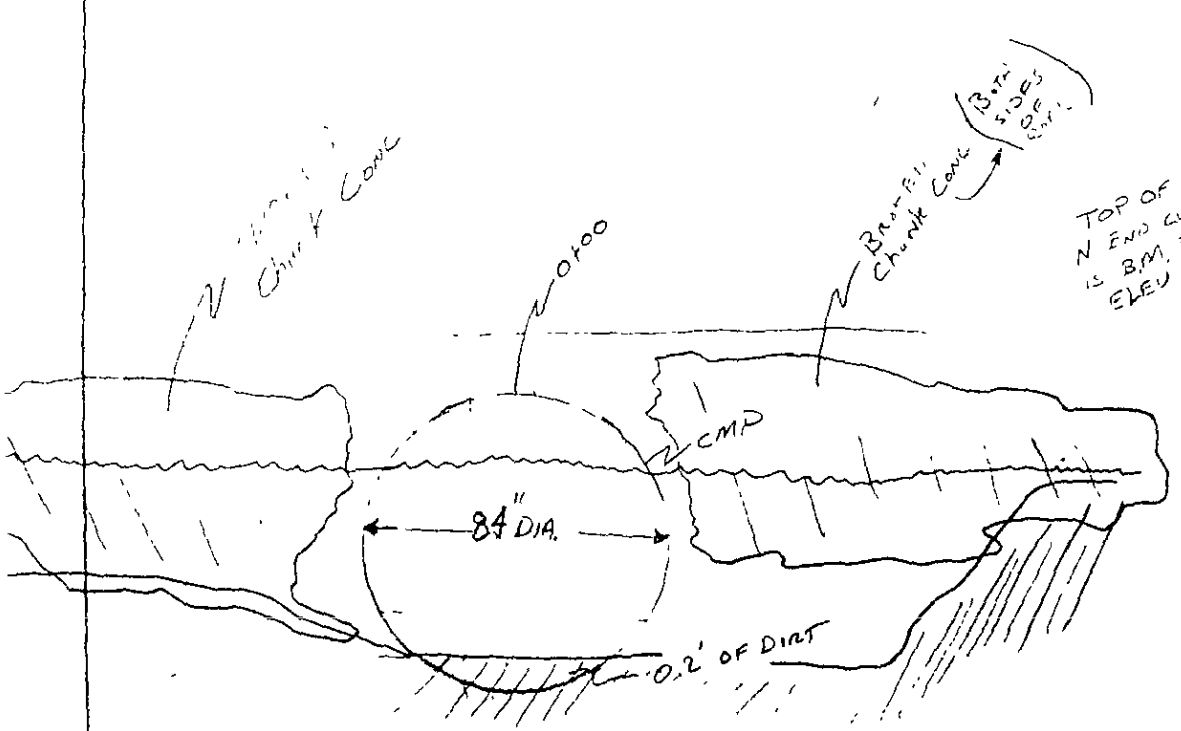
HYDRAULIC STRUCTURAL DATA
B.S. #107

Code No. 11259-00-2

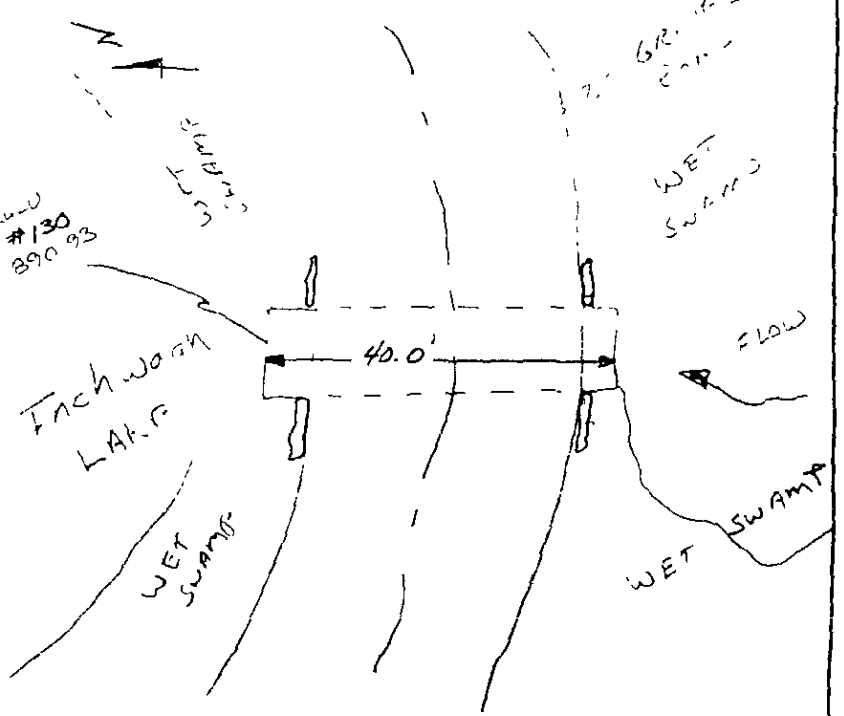
Job Name: [illegible] F.E.S.		By: L. Cumoerworth	
Date. [illegible]-4-82	Feature: 84" CMP	Water Course: Walker Drain	
Remarks: Gin Rd Culvert			
* Culvert Has Back Flow (SEE NOTES) *			
Width of Piers:	Pier Shape:	No. of Piers:	Area:
Water Elevation:	Length: 40.0'	Width of Deck:	Skew:

FIELD SKETCH

Profile View



Plan View



JOHNSON & ANDERSON, INC.
CONSULTING ENGINEERS

BY MSC DATE [illegible] JOB DESCRIPTION FEC - Green Oak Township SHEET 1 OF 1
SUBJECT 9 Mile Road over Wolf Drain JOB NO. 1259-00-1

Culvert Feature 8.4' ϕ CMP

Area $A = 38.48 \ ft^2$ (assume clean pipe when pressure flow occurs)

Hydraulic Radius. $R = D/4 = 1.75 \ ft$

Length $L = 40.0 \ ft$

Manning Coeff: $n = 0.024$

Entrance Loss: $K_e = 0.9$

$$K_f = \frac{29.1 \, (0.024)^2 \, 40}{(1.75)^{4/3}} = 0.32$$

$$XK\Phi R = 1 + K_e + K_f = 2.22$$

Max. Depth $D = 7.0 \ ft$

$$BWC = 38.48 / 7.0 = 5.50 \ ft$$

Weir Coefficient $C = 2.85$ (Gravel Road)

Johnson & Anderson, Inc.
Consulting Engineers
2300 Dixie Hwy., Pontiac, MI 48055

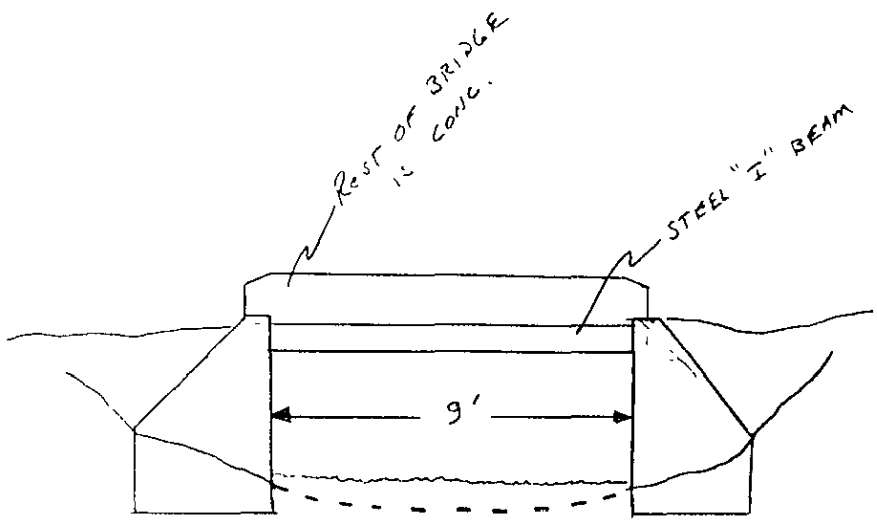
HYDRAULIC STRUCTURAL DATA
B.S. # 115

Code No. 11259-00-212

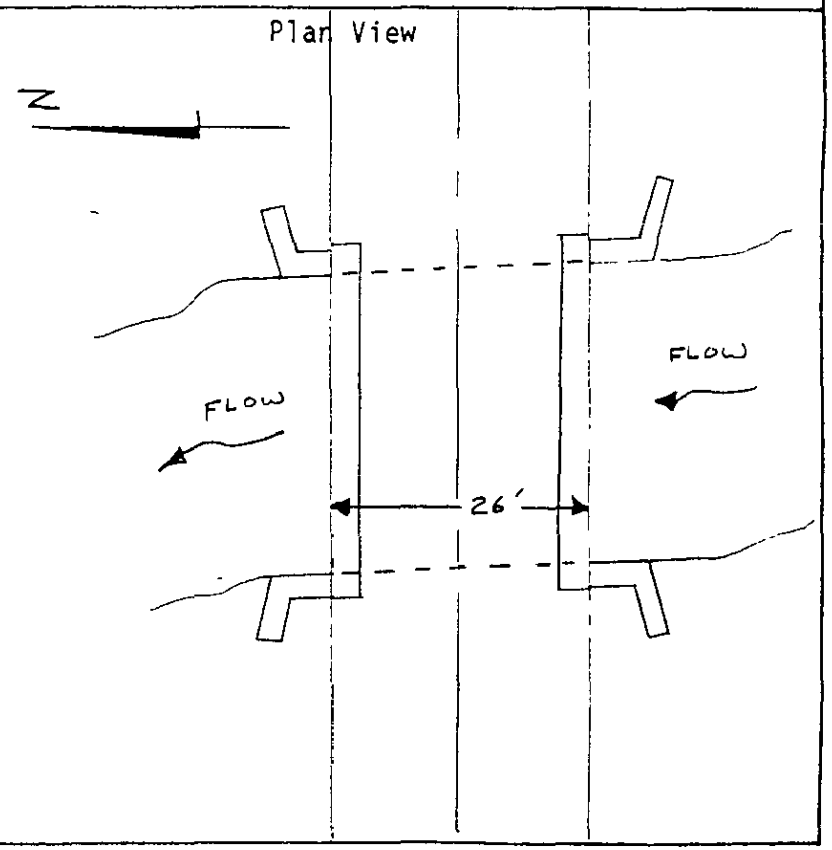
Job Name: GREEN OAKS TWP. F.I.S.		By: L. Cumberworth	
Date: 3-5-82	Feature:	Water Course: WALKER DRAIN	
Remarks: 8 mi Rd. Bridge			
Width of Piers: —	Pier Shape: —	No. of Piers: —	Area: —
Water Elevation: 898.6	Length: 9'	Width of Deck: 26'	Skew: SMALL SKEW S.E. TO N.W.

FIELD SKETCH

Profile View



Plan View



1) COUNTY: LIVINGSTON

2) STUDY NAME: GREEN OAK TWP.

3) WATERCOURSE: DAVIS CREEK

4) DOCUMENT TYPE: SUMMARY TABLES

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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

DAVIS CREEK

SUMMARY PRINTOUT

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	CLOSS	EG	TOPWID	AREA
.000	.00	.00	.00	854.60	827.00	861.80	7.20	.01	.00	861.81	835.00	1740.75
.000	.00	.00	.00	854.60	1178.00	862.80	8.20	.01	.00	862.81	901.83	2618.70
.000	.00	.00	.00	854.60	1365.00	863.25	8.65	.01	.00	863.26	922.37	3029.15
.000	.00	.00	.00	854.60	2080.00	864.75	10.15	.01	.00	864.76	964.94	4454.34
625.000	625.00	.00	.00	855.90	595.00	861.84	5.94	.00	.00	861.85	948.46	2804.70
625.000	625.00	.00	.00	855.90	1040.00	862.84	6.94	.00	.00	862.84	952.60	3755.26
625.000	625.00	.00	.00	855.90	1315.00	863.29	7.39	.00	.00	863.29	954.47	4185.90
625.000	625.00	.00	.00	855.90	2080.00	864.78	8.88	.00	.00	864.79	960.63	5612.98
1225.000	600.00	.00	.00	856.30	595.00	861.88	5.58	.01	.01	861.89	656.44	999.71
1225.000	600.00	.00	.00	856.30	1040.00	862.88	6.58	.01	.00	862.89	656.71	1647.95
1225.000	600.00	.00	.00	856.30	1315.00	863.33	7.03	.01	.00	863.34	656.84	1946.09
1225.000	600.00	.00	.00	856.30	2080.00	864.82	8.52	.01	.00	864.83	659.67	2926.21
2195.000	970.00	.00	.00	858.60	595.00	862.81	4.21	.28	.13	863.09	123.00	176.69
2195.000	970.00	.00	.00	858.60	1040.00	863.49	4.89	.46	.22	863.95	124.34	260.76
2195.000	970.00	.00	.00	858.60	1315.00	863.87	5.27	.54	.26	864.41	125.10	308.54
2195.000	970.00	.00	.00	858.60	2080.00	865.08	6.48	.60	.29	865.68	127.49	461.83
2372.000	177.00	.00	.00	857.90	595.00	863.25	5.35	.19	.03	863.44	37.00	176.40
2372.000	177.00	.00	.00	857.90	1040.00	864.07	6.17	.43	.01	864.50	37.00	207.06
2372.000	177.00	.00	.00	857.90	1315.00	864.49	6.59	.59	.03	865.08	37.00	222.62
2372.000	177.00	.00	.00	857.90	2080.00	865.62	7.72	1.05	.23	866.67	37.00	264.23
2376.000	4.00	.00	.00	857.90	595.00	863.25	5.35	.20	.00	863.45	35.00	167.83
2376.000	4.00	.00	.00	857.90	1040.00	864.08	6.18	.43	.00	864.51	35.00	196.81
2376.000	4.00	.00	.00	857.90	1315.00	864.50	6.60	.60	.00	865.10	35.00	211.60
2376.000	4.00	.00	.00	857.90	2080.00	865.64	7.74	1.06	.01	866.70	35.00	251.19
2377.000	1.00	868.70	868.20	857.90	595.00	863.25	5.35	.20	.00	863.45	35.00	167.68
2377.000	1.00	868.70	868.20	857.90	1040.00	864.08	6.18	.43	.00	864.52	35.00	196.62
2377.000	1.00	868.70	868.20	857.90	1315.00	864.50	6.60	.60	.00	865.10	35.00	211.42
2377.000	1.00	868.70	868.20	857.90	2080.00	865.64	7.74	1.07	.00	866.70	35.00	251.14
2413.000	36.00	868.70	868.20	857.90	595.00	863.28	5.38	.19	.00	863.47	35.00	168.79
2413.000	36.00	868.70	868.20	857.90	1040.00	864.13	6.23	.43	.00	864.56	35.00	198.42
2413.000	36.00	868.70	868.20	857.90	1315.00	864.58	6.68	.59	.00	865.16	35.00	213.94
2413.000	36.00	868.70	868.20	857.90	2080.00	865.78	7.88	1.02	.01	866.80	35.00	256.20

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	TOPWID	AREA
2414.000	1.00	.00	.00	857.90	595.00	863.28	5.38	.19	.00	863.47	35.00	168.56
2414.000	1.00	.00	.00	857.90	1040.00	864.14	6.24	.43	.00	864.56	35.00	198.46
2414.000	1.00	.00	.00	857.90	1315.00	864.58	6.68	.59	.00	865.17	35.00	213.99
2414.000	1.00	.00	.00	857.90	2080.00	865.78	7.88	1.02	.00	866.80	35.00	256.04
2416.000	2.00	.00	.00	857.90	595.00	863.30	5.40	.18	.00	863.48	39.00	186.20
2416.000	2.00	.00	.00	857.90	1040.00	864.18	6.28	.40	.01	864.57	39.00	220.85
2416.000	2.00	.00	.00	857.90	1315.00	864.64	6.74	.54	.01	865.18	39.00	238.85
2416.000	2.00	.00	.00	857.90	2080.00	865.89	7.99	.94	.02	866.83	39.00	287.67
2420.000	4.00	.00	.00	857.90	595.00	863.33	5.43	.16	.01	863.49	47.00	210.67
2420.000	4.00	.00	.00	857.90	1040.00	864.27	6.37	.33	.02	864.60	47.00	254.46
2420.000	4.00	.00	.00	857.90	1315.00	864.77	6.87	.45	.03	865.22	47.00	278.06
2420.000	4.00	.00	.00	857.90	2080.00	866.14	8.24	.76	.06	866.90	47.00	342.69
3515.000	1095.00	.00	.00	860.10	595.00	864.34	4.24	.03	.04	864.37	224.33	420.05
3515.000	1095.00	.00	.00	860.10	1040.00	865.50	5.40	.03	.09	865.54	283.06	711.32
3515.000	1095.00	.00	.00	860.10	1315.00	866.11	6.01	.03	.13	866.15	308.28	891.90
3515.000	1095.00	.00	.00	860.10	2080.00	867.68	7.58	.04	.22	867.71	314.25	1381.05
4885.000	1370.00	.00	.00	861.50	595.00	865.69	4.19	.22	.09	865.90	152.29	214.71
4885.000	1370.00	.00	.00	861.50	1040.00	866.58	5.08	.28	.12	866.86	191.97	375.44
4885.000	1370.00	.00	.00	861.50	1315.00	867.04	5.54	.30	.13	867.34	199.10	466.27
4885.000	1370.00	.00	.00	861.50	2080.00	868.24	6.74	.31	.14	868.55	218.46	717.84
6695.000	1810.00	.00	.00	861.50	595.00	867.03	5.53	.02	.06	867.05	384.46	848.49
6695.000	1810.00	.00	.00	861.50	1040.00	868.03	6.53	.03	.08	868.05	418.01	1252.65
6695.000	1810.00	.00	.00	861.50	1315.00	868.52	7.02	.03	.08	868.54	420.17	1458.25
6695.000	1810.00	.00	.00	861.50	2080.00	869.69	8.19	.03	.08	869.72	425.33	1952.66
8495.000	1800.00	.00	.00	862.50	595.00	867.48	4.98	.02	.00	867.49	487.87	965.35
8495.000	1800.00	.00	.00	862.50	1040.00	868.46	5.96	.02	.00	868.48	502.08	1457.30
8495.000	1800.00	.00	.00	862.50	1315.00	868.96	6.46	.02	.00	868.98	503.54	1705.18
8495.000	1800.00	.00	.00	862.50	2080.00	870.13	7.63	.02	.00	870.16	507.02	2298.89
8955.000	460.00	.00	.00	863.30	595.00	867.67	4.37	.14	.06	867.81	216.00	339.27
8955.000	460.00	.00	.00	863.30	1040.00	868.63	5.33	.15	.06	868.78	216.00	546.98
8955.000	460.00	.00	.00	863.30	1315.00	869.12	5.82	.16	.07	869.27	216.00	652.05
8955.000	460.00	.00	.00	863.30	2080.00	870.27	6.97	.18	.08	870.46	216.00	900.98
9185.000	230.00	.00	.00	863.70	595.00	868.09	4.39	.23	.04	868.32	82.46	195.15
9185.000	230.00	.00	.00	863.70	1040.00	869.00	5.30	.38	.12	869.38	97.76	276.77
9185.000	230.00	.00	.00	863.70	1315.00	869.46	5.76	.46	.15	869.93	101.00	322.95
9185.000	230.00	.00	.00	863.70	2080.00	870.55	6.85	.67	.24	871.22	101.00	432.94
9316.000	131.00	.00	.00	863.70	595.00	868.41	4.71	.26	.02	868.67	34.00	145.55
9316.000	131.00	.00	.00	863.70	1040.00	869.43	5.73	.52	.07	869.94	34.00	180.35
9316.000	131.00	.00	.00	863.70	1315.00	869.92	6.22	.69	.11	870.61	34.00	197.19
9316.000	131.00	.00	.00	863.70	2080.00	871.03	7.33	1.22	.27	872.25	34.00	234.89
9317.000	1.00	871.50	870.65	863.70	595.00	868.43	4.73	.24	.00	868.68	34.00	149.88
9317.000	1.00	871.50	870.65	863.70	1040.00	869.46	5.76	.49	.01	869.95	34.00	185.30
9317.000	1.00	871.50	870.65	863.70	1315.00	869.97	6.27	.65	.01	870.63	34.00	202.55
9317.000	1.00	871.50	870.65	863.70	2080.00	870.99	7.29	1.32	.05	872.31	34.00	225.60

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	TOPWID	AREA
9333.000	16.00	871.50	870.65	863.70	595.00	868.45	4.75	.24	.00	868.69	34.00	150.97
9333.000	16.00	871.50	870.65	863.70	1040.00	869.49	5.79	.48	.00	869.98	34.00	186.59
9333.000	16.00	871.50	870.65	863.70	1315.00	870.01	6.31	.64	.00	870.65	34.00	204.19
9333.000	16.00	871.50	870.65	863.70	2080.00	871.08	7.38	1.32	.00	872.40	34.00	225.60
9334.000	1.00	.00	.00	863.70	595.00	868.44	4.74	.25	.01	868.70	34.00	147.12
9334.000	1.00	.00	.00	863.70	1040.00	869.49	5.79	.50	.01	869.99	34.00	182.65
9334.000	1.00	.00	.00	863.70	1315.00	870.00	6.30	.67	.01	870.67	34.00	200.05
9334.000	1.00	.00	.00	863.70	2080.00	871.35	7.65	1.11	.06	872.46	34.00	246.06
9336.000	2.00	.00	.00	863.70	595.00	868.48	4.78	.23	.01	868.71	38.00	158.45
9336.000	2.00	.00	.00	863.70	1040.00	869.56	5.86	.45	.01	870.01	38.00	199.49
9336.000	2.00	.00	.00	863.70	1315.00	870.10	6.40	.60	.02	870.70	38.00	220.25
9336.000	2.00	.00	.00	863.70	2080.00	871.55	7.85	.97	.04	872.52	38.00	275.25
10535.000	1199.00	.00	.00	864.20	620.00	868.92	4.72	.00	.07	868.92	469.08	1581.01
10535.000	1199.00	.00	.00	864.20	1070.00	870.30	6.10	.00	.13	870.30	473.47	2229.24
10535.000	1199.00	.00	.00	864.20	1350.00	871.03	6.83	.01	.18	871.04	475.43	2578.16
10535.000	1199.00	.00	.00	864.20	2125.00	872.95	8.75	.01	.29	872.96	480.56	3495.02
11745.000	1210.00	.00	.00	864.50	620.00	868.97	4.47	.00	.00	868.97	489.33	1551.36
11745.000	1210.00	.00	.00	864.50	1070.00	870.34	5.84	.00	.00	870.34	532.36	2258.26
11745.000	1210.00	.00	.00	864.50	1350.00	871.08	6.58	.00	.00	871.08	537.51	2651.34
11745.000	1210.00	.00	.00	864.50	2125.00	872.99	8.49	.01	.00	873.00	550.91	3693.82
14395.000	2650.00	.00	.00	865.70	620.00	869.13	3.43	.03	.01	869.16	472.50	709.98
14395.000	2650.00	.00	.00	865.70	1070.00	870.47	4.77	.02	.01	870.48	510.34	1367.35
14395.000	2650.00	.00	.00	865.70	1350.00	871.19	5.49	.02	.01	871.21	530.77	1743.32
14395.000	2650.00	.00	.00	865.70	2125.00	873.08	7.38	.01	.00	873.09	574.74	2791.04
15265.000	870.00	.00	.00	865.50	680.00	869.94	4.44	.09	.03	870.03	147.07	356.00
15265.000	870.00	.00	.00	865.50	1175.00	870.97	5.47	.14	.06	871.10	166.33	517.60
15265.000	870.00	.00	.00	865.50	1475.00	871.59	6.09	.15	.07	871.74	177.92	624.34
15265.000	870.00	.00	.00	865.50	2355.00	873.31	7.81	.18	.08	873.49	195.95	946.89
16255.000	990.00	.00	.00	866.20	680.00	870.55	4.35	.01	.02	870.56	450.00	1138.15
16255.000	990.00	.00	.00	866.20	1175.00	871.65	5.45	.02	.04	871.67	450.00	1637.43
16255.000	990.00	.00	.00	866.20	1475.00	872.28	6.08	.02	.04	872.29	450.00	1917.96
16255.000	990.00	.00	.00	866.20	2355.00	873.96	7.76	.02	.05	873.98	450.00	2672.47
16476.000	221.00	.00	.00	865.00	680.00	870.57	5.57	.23	.11	870.80	35.00	176.25
16476.000	221.00	.00	.00	865.00	1175.00	871.70	6.70	.01	.00	871.71	450.00	2199.38
16476.000	221.00	.00	.00	865.00	1475.00	872.33	7.33	.01	.00	872.33	450.00	2480.24
16476.000	221.00	.00	.00	865.00	2355.00	874.01	9.01	.01	.00	874.02	450.00	3238.14
16477.000	1.00	.00	.00	865.00	680.00	870.57	5.57	.23	.00	870.80	35.00	176.29
16477.000	1.00	.00	.00	865.00	1175.00	871.70	6.70	.01	.00	871.71	450.00	2199.48
16477.000	1.00	.00	.00	865.00	1475.00	872.33	7.33	.01	.00	872.33	450.00	2480.34
16477.000	1.00	.00	.00	865.00	2355.00	874.01	9.01	.01	.00	874.02	450.00	3238.23
16494.000	17.00	872.10	870.80	865.00	680.00	870.63	5.63	.24	.00	870.88	36.00	171.20
16494.000	17.00	872.10	870.80	865.00	1175.00	872.33	7.33	.18	.00	872.51	255.92	479.30
16494.000	17.00	872.10	870.80	865.00	1475.00	872.85	7.85	.20	.00	873.05	431.77	664.95
16494.000	17.00	872.10	870.80	865.00	2355.00	874.07	9.07	.19	.00	874.25	533.41	1265.03

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	TOPWID	AREA
16495.000	1.00	.00	.00	865.00	680.00	870.63	5.63	.25	.00	870.88	36.00	171.18
16495.000	1.00	.00	.00	865.00	1175.00	872.33	7.33	.18	.00	872.51	256.03	479.35
16495.000	1.00	.00	.00	865.00	1475.00	872.85	7.85	.20	.00	873.05	431.62	664.62
16495.000	1.00	.00	.00	865.00	2355.00	874.07	9.07	.19	.00	874.25	533.30	1264.41
17145.000	650.00	.00	.00	865.90	680.00	871.64	5.74	.07	.05	871.71	191.75	462.30
17145.000	650.00	.00	.00	865.90	1175.00	873.09	7.19	.08	.03	873.16	275.30	795.59
17145.000	650.00	.00	.00	865.90	1475.00	873.66	7.76	.09	.03	873.74	311.97	962.90
17145.000	650.00	.00	.00	865.90	2355.00	874.86	8.96	.11	.02	874.97	328.49	1350.35
17925.000	780.00	.00	.00	865.60	680.00	871.91	6.31	.01	.02	871.92	383.11	1190.51
17925.000	780.00	.00	.00	865.60	1175.00	873.36 874.08	7.76	.01	.02	873.37	416.22	1773.66
17925.000	780.00	.00	.00	865.60	1475.00	873.95	8.35	.02	.02	873.97	429.09	2023.94
17925.000	780.00	.00	.00	865.60	2355.00	875.23	9.63	.03	.03	875.25	456.83	2589.09
18525.000	600.00	.00	.00	865.60	680.00	872.01	6.41	.02	.01	872.03	223.48	695.22
18525.000	600.00	.00	.00	865.60	1175.00	873.46	7.86	.03	.01	873.49	335.12	1087.72
18525.000	600.00	.00	.00	865.60	1475.00	874.06	8.46	.04	.01	874.10	352.90	1294.29
18525.000	600.00	.00	.00	865.60	2355.00	875.36	9.76	.05	.01	875.42	395.28	1780.93
18955.000	430.00	.00	.00	844.10	680.00	872.04	27.94	.00	.01	872.04	647.33	4509.93
18955.000	430.00	.00	.00	844.10	1175.00	873.50	29.40	.00	.01	873.50	700.00	5508.18
18955.000	430.00	.00	.00	844.10	1475.00	874.11	30.01	.00	.01	874.11	700.00	5931.60
18955.000	430.00	.00	.00	844.10	2355.00	875.44	31.34	.00	.02	875.44	700.00	6853.05
20955.000	10.00	.00	.00	866.40	550.00	872.03	5.63	.01	.00	872.04	464.92	1336.46
20955.000	10.00	.00	.00	866.40	880.00	873.50	7.10	.01	.00	873.51	545.10	2081.73
20955.000	10.00	.00	.00	866.40	1065.00	874.11	7.71	.01	.00	874.12	568.39	2420.25
20955.000	10.00	.00	.00	866.40	1570.00	875.43	9.03	.01	.00	875.44	619.11	3206.42
21755.000	800.00	.00	.00	865.80	550.00	872.10	6.30	.01	.00	872.11	625.00	1648.18
21755.000	800.00	.00	.00	865.80	880.00	873.55	7.75	.01	.00	873.56	625.00	2549.81
21755.000	800.00	.00	.00	865.80	1065.00	874.16	8.36	.01	.00	874.17	625.00	2929.26
21755.000	800.00	.00	.00	865.80	1570.00	875.49	9.69	.01	.00	875.49	625.00	3757.44
22655.000	900.00	.00	.00	865.80	550.00	872.15	6.35	.00	.00	872.15	800.00	2452.39
22655.000	900.00	.00	.00	865.80	880.00	873.59	7.79	.00	.00	873.59	800.00	3607.97
22655.000	900.00	.00	.00	865.80	1065.00	874.20	8.40	.00	.00	874.20	800.00	4093.35
22655.000	900.00	.00	.00	865.80	1570.00	875.52	9.72	.00	.00	875.53	800.00	5163.02
24555.000	10.00	.00	.00	865.40	550.00	872.15	6.75	.00	.00	872.15	766.28	2517.27
24555.000	10.00	.00	.00	865.40	880.00	873.59	8.19	.00	.00	873.59	794.05	3644.13
24555.000	10.00	.00	.00	865.40	1065.00	874.20	8.80	.00	.00	874.20	805.72	4129.44
24555.000	10.00	.00	.00	865.40	1570.00	875.53	10.13	.00	.00	875.53	831.63	5216.01
25315.000	760.00	.00	.00	866.00	550.00	872.19	6.19	.02	.01	872.21	389.69	876.32
25315.000	760.00	.00	.00	866.00	880.00	873.63	7.63	.01	.01	873.64	440.42	1487.53
25315.000	760.00	.00	.00	866.00	1065.00	874.23	8.23	.01	.01	874.25	446.06	1756.27
25315.000	760.00	.00	.00	866.00	1570.00	875.56	9.56	.01	.01	875.58	458.42	2357.04
26315.000	1000.00	.00	.00	866.10	550.00	872.44	6.34	.05	.02	872.48	64.00	316.75
26315.000	1000.00	.00	.00	866.10	880.00	873.82	7.72	.07	.03	873.89	64.00	405.09
26315.000	1000.00	.00	.00	866.10	1065.00	874.41	8.31	.09	.04	874.50	64.00	443.16
26315.000	1000.00	.00	.00	866.10	1570.00	875.72	9.62	.14	.06	875.86	64.00	527.09

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	TOPWID	AREA
26404.000	89.00	.00	.00	867.90	550.00	872.18	4.28	.74	.35	872.92	19.00	79.79
26404.000	89.00	.00	.00	867.90	880.00	873.39	5.49	1.14	.53	874.52	19.00	102.80
26404.000	89.00	.00	.00	867.90	1065.00	873.87	5.97	1.40	.66	875.27	19.00	112.01
26404.000	89.00	.00	.00	867.90	1570.00	875.40	7.50	1.04	.45	876.44	121.76	259.70
26405.000	1.00	875.10	875.00	867.90	550.00	872.18	4.28	.74	.00	872.92	19.00	79.80
26405.000	1.00	875.10	875.00	867.90	880.00	873.39	5.49	1.14	.00	874.53	19.00	102.77
26405.000	1.00	875.10	875.00	867.90	1065.00	873.87	5.97	1.41	.00	875.28	19.00	111.91
26405.000	1.00	875.10	875.00	867.90	1570.00	874.78	6.88	2.29	.63	877.07	19.00	129.18
26436.000	31.00	875.10	875.00	867.90	550.00	872.37	4.47	.68	.02	873.04	19.00	83.32
26436.000	31.00	875.10	875.00	867.90	880.00	873.67	5.77	1.03	.03	874.70	19.00	108.06
26436.000	31.00	875.10	875.00	867.90	1065.00	874.24	6.34	1.25	.05	875.48	19.00	118.92
26436.000	31.00	875.10	875.00	867.90	1570.00	875.75	7.85	1.77	.16	877.51	165.08	185.13
26437.000	1.00	.00	.00	867.90	550.00	872.37	4.47	.68	.00	873.05	19.00	83.39
26437.000	1.00	.00	.00	867.90	880.00	873.68	5.78	1.03	.00	874.70	19.00	108.13
26437.000	1.00	.00	.00	867.90	1065.00	874.24	6.34	1.24	.00	875.49	19.00	118.97
26437.000	1.00	.00	.00	867.90	1570.00	877.78	9.88	.21	.47	877.98	340.00	911.19
26460.000	23.00	.00	.00	867.90	550.00	873.20	5.30	.07	.18	873.27	65.00	252.35
26460.000	23.00	.00	.00	867.90	880.00	874.93	7.03	.09	.28	875.02	65.00	365.31
26460.000	23.00	.00	.00	867.90	1065.00	875.77	7.87	.10	.34	875.87	65.00	419.18
26460.000	23.00	.00	.00	867.90	1570.00	877.90	10.00	.12	.03	878.03	65.00	558.29
27160.000	700.00	.00	.00	868.40	550.00	873.91	5.51	.11	.02	874.01	158.33	340.71
27160.000	700.00	.00	.00	868.40	880.00	875.46	7.06	.08	.00	875.54	203.67	619.24
27160.000	700.00	.00	.00	868.40	1065.00	876.26	7.86	.07	.01	876.33	217.50	788.42
27160.000	700.00	.00	.00	868.40	1570.00	878.33	9.93	.06	.02	878.38	227.20	1248.49
28660.000	1500.00	.00	.00	869.20	550.00	874.88	5.68	.02	.03	874.90	552.42	960.53
28660.000	1500.00	.00	.00	869.20	880.00	876.04	6.84	.01	.02	876.05	665.34	1669.29
28660.000	1500.00	.00	.00	869.20	1065.00	876.71	7.51	.01	.02	876.72	702.57	2127.57
28660.000	1500.00	.00	.00	869.20	1570.00	878.59	9.39	.01	.02	878.60	807.15	3548.64
30110.000	1450.00	.00	.00	870.70	550.00	875.91	5.21	.21	.09	876.11	187.78	274.36
30110.000	1450.00	.00	.00	870.70	880.00	876.64	5.94	.22	.10	876.86	208.08	418.90
30110.000	1450.00	.00	.00	870.70	1065.00	877.14	6.44	.19	.09	877.33	237.30	531.00
30110.000	1450.00	.00	.00	870.70	1570.00	878.79	8.09	.11	.05	878.90	273.23	955.55
30760.000	650.00	.00	.00	871.40	550.00	876.64	5.24	.02	.06	876.65	600.00	926.32
30760.000	650.00	.00	.00	871.40	880.00	877.37	5.97	.02	.06	877.39	600.00	1362.15
30760.000	650.00	.00	.00	871.40	1065.00	877.79	6.39	.02	.05	877.80	600.00	1615.17
30760.000	650.00	.00	.00	871.40	1570.00	879.16	7.76	.01	.03	879.18	600.00	2442.16
32960.000	2200.00	.00	.00	873.40	555.00	877.11	3.71	.00	.00	877.12	1000.00	1478.05
32960.000	2200.00	.00	.00	873.40	895.00	877.79	4.39	.00	.00	877.79	1000.00	2145.92
32960.000	2200.00	.00	.00	873.40	1095.00	878.16	4.76	.00	.00	878.16	1000.00	2525.81
32960.000	2200.00	.00	.00	873.40	1625.00	879.39	5.99	.00	.00	879.39	1000.00	3747.32
34860.000	1900.00	.00	.00	875.50	555.00	878.08	2.58	.36	.18	878.43	199.56	183.30
34860.000	1900.00	.00	.00	875.50	895.00	878.53	3.03	.38	.19	878.91	212.28	277.56
34860.000	1900.00	.00	.00	875.50	1095.00	878.80	3.30	.38	.19	879.18	219.60	334.46
34860.000	1900.00	.00	.00	875.50	1625.00	879.74	4.24	.29	.14	880.03	234.83	550.75

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	TOPWID	AREA
35010.000	150.00	.00	.00	874.20	555.00	878.83	4.63	.06	.09	878.89	130.00	400.27
35010.000	150.00	.00	.00	874.20	895.00	879.38	5.18	.11	.08	879.49	130.00	471.46
35010.000	150.00	.00	.00	874.20	1095.00	879.65	5.45	.14	.07	879.80	130.00	507.13
35010.000	150.00	.00	.00	874.20	1625.00	880.34	6.14	.22	.02	880.57	130.00	596.54
35022.000	12.00	879.80	878.90	874.20	555.00	879.75	5.55	.33	.00	880.08	54.67	152.18
35022.000	12.00	879.80	878.90	874.20	895.00	880.36	6.16	.59	.00	880.95	120.80	198.32
35022.000	12.00	879.80	878.90	874.20	1095.00	880.42	6.22	.84	.00	881.26	130.36	205.15
* 35022.000	12.00	879.80	878.90	874.20	1625.00	881.03	6.83	1.12	-.03	882.15	177.78	302.24
35622.000	600.00	.00	.00	875.00	555.00	880.67	5.67	.07	.08	880.73	237.72	446.98
35622.000	600.00	.00	.00	875.00	895.00	881.69	6.69	.06	.16	881.75	249.78	694.24
35622.000	600.00	.00	.00	875.00	1095.00	882.17	7.17	.06	.23	882.23	255.30	816.59
35622.000	600.00	.00	.00	875.00	1625.00	883.18	8.18	.07	.31	883.25	266.85	1080.88
35947.000	325.00	.00	.00	875.50	555.00	881.12	5.62	.56	.24	881.67	63.78	119.52
35947.000	325.00	.00	.00	875.50	895.00	881.93	6.43	.79	.36	882.72	99.28	185.30
35947.000	325.00	.00	.00	875.50	1095.00	882.35	6.85	.85	.39	883.20	117.76	230.84
35947.000	325.00	.00	.00	875.50	1625.00	883.33	7.83	.87	.40	884.19	168.12	369.44
36110.000	163.00	.00	.00	875.70	555.00	881.97	6.27	.49	.02	882.46	54.18	128.83
36110.000	163.00	.00	.00	875.70	895.00	883.00	7.30	.67	.04	883.66	94.72	203.84
36110.000	163.00	.00	.00	875.70	1095.00	883.42	7.72	.75	.03	884.18	109.45	246.90
36110.000	163.00	.00	.00	875.70	1625.00	884.26	8.56	.92	.03	885.18	145.50	354.94
36142.000	32.00	.00	.00	875.70	555.00	882.10	6.40	.50	.01	882.60	51.74	127.03
36142.000	32.00	.00	.00	875.70	895.00	883.14	7.44	.68	.01	883.82	90.43	201.63
36142.000	32.00	.00	.00	875.70	1095.00	883.58	7.88	.76	.00	884.34	106.98	244.62
36142.000	32.00	.00	.00	875.70	1625.00	884.44	8.74	.95	.01	885.38	142.39	349.29
36207.000	65.00	.00	.00	875.80	555.00	882.36	6.56	.50	.00	882.86	47.04	126.63
36207.000	65.00	.00	.00	875.80	895.00	883.44	7.64	.70	.01	884.14	84.89	198.31
36207.000	65.00	.00	.00	875.80	1095.00	883.90	8.10	.78	.01	884.68	101.22	241.31
36207.000	65.00	.00	.00	875.80	1625.00	884.81	9.01	.95	.00	885.76	136.97	348.45
36272.000	65.00	.00	.00	875.90	555.00	882.60	6.70	.57	.03	883.17	42.63	116.70
36272.000	65.00	.00	.00	875.90	895.00	883.71	7.81	.81	.06	884.52	79.49	183.44
36272.000	65.00	.00	.00	875.90	1095.00	884.17	8.27	.93	.07	885.10	95.39	224.66
36272.000	65.00	.00	.00	875.90	1625.00	885.10	9.20	1.14	.09	886.24	129.12	330.50
36273.000	1.00	.00	.00	875.90	555.00	882.66	6.76	.52	.01	883.18	44.60	119.24
36273.000	1.00	.00	.00	875.90	895.00	883.92	8.02	.65	.05	884.57	87.26	202.65
36273.000	1.00	.00	.00	875.90	1095.00	884.50	8.60	.68	.07	885.18	106.45	257.74
36273.000	1.00	.00	.00	875.90	1625.00	885.80	9.90	.61	.16	886.40	158.13	428.28
36287.000	14.00	885.10	882.80	875.90	555.00	884.79	8.89	.42	.00	885.21	13.00	106.75
36287.000	14.00	885.10	882.80	875.90	895.00	886.07	10.17	.15	.00	886.23	170.49	474.04
36287.000	14.00	885.10	882.80	875.90	1095.00	886.38	10.48	.18	.00	886.56	183.93	527.67
36287.000	14.00	885.10	882.80	875.90	1625.00	886.95	11.05	.27	.00	887.22	205.59	641.16
36288.000	1.00	.00	.00	875.90	555.00	884.79	8.89	.42	.00	885.21	13.00	106.82
36288.000	1.00	.00	.00	875.90	895.00	886.06	10.16	.18	.01	886.24	170.23	473.03
36288.000	1.00	.00	.00	875.90	1095.00	886.36	10.46	.21	.02	886.58	183.59	526.24
36288.000	1.00	.00	.00	875.90	1625.00	886.93	11.03	.32	.03	887.25	204.63	635.21

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	TOPWID	AREA
37098.000	810.00	.00	.00	878.00	555.00	885.62	7.62	.01	.12	885.63	237.34	913.01
37098.000	810.00	.00	.00	878.00	895.00	886.58	8.58	.02	.05	886.59	244.48	1143.53
37098.000	810.00	.00	.00	878.00	1095.00	886.98	8.98	.02	.06	887.00	247.47	1241.89
37098.000	810.00	.00	.00	878.00	1625.00	887.82	9.82	.03	.09	887.85	253.76	1453.05
37858.000	760.00	.00	.00	880.70	555.00	885.81	5.11	.20	.10	886.01	42.00	165.61
37858.000	760.00	.00	.00	880.70	895.00	886.78	6.08	.34	.16	887.13	42.00	206.53
37858.000	760.00	.00	.00	880.70	1095.00	887.20	6.50	.44	.21	887.64	42.00	223.90
37858.000	760.00	.00	.00	880.70	1625.00	888.06	7.36	.73	.35	888.79	42.00	260.23
37898.000	40.00	.00	.00	880.80	555.00	885.76	4.96	.50	.15	886.27	22.00	97.57
37898.000	40.00	.00	.00	880.80	895.00	886.64	5.84	.91	.28	887.55	22.00	116.93
37898.000	40.00	.00	.00	880.80	1095.00	886.99	6.19	1.20	.38	888.19	22.00	124.47
37898.000	40.00	.00	.00	880.80	1625.00	887.58	6.78	2.17	.72	889.75	22.00	137.59
37899.000	1.00	893.90	894.30	880.80	555.00	885.77	4.97	.50	.00	886.27	22.00	97.63
37899.000	1.00	893.90	894.30	880.80	895.00	886.65	5.85	.91	.00	887.56	22.00	117.00
37899.000	1.00	893.90	894.30	880.80	1095.00	886.99	6.19	1.20	.00	888.19	22.00	124.53
37899.000	1.00	893.90	894.30	880.80	1625.00	887.60	6.80	2.16	.00	889.76	22.00	137.75
37942.000	43.00	893.90	894.30	880.80	555.00	885.90	5.10	.47	.01	886.37	22.00	100.61
37942.000	43.00	893.90	894.30	880.80	895.00	886.89	6.09	.83	.02	887.72	22.00	122.35
37942.000	43.00	893.90	894.30	880.80	1095.00	887.35	6.55	1.06	.04	888.41	22.00	132.37
37942.000	43.00	893.90	894.30	880.80	1625.00	888.56	7.76	1.62	.16	890.18	22.00	158.89
37943.000	1.00	.00	.00	880.80	555.00	885.90	5.10	.47	.00	886.37	22.00	100.51
37943.000	1.00	.00	.00	880.80	895.00	886.90	6.10	.83	.00	887.73	22.00	122.42
37943.000	1.00	.00	.00	880.80	1095.00	887.35	6.55	1.06	.00	888.41	22.00	132.44
37943.000	1.00	.00	.00	880.80	1625.00	888.57	7.77	1.62	.00	890.19	22.00	159.17
37953.000	10.00	.00	.00	880.80	555.00	886.31	5.51	.17	.09	886.48	42.00	182.71
37953.000	10.00	.00	.00	880.80	895.00	887.66	6.86	.26	.17	887.92	42.00	239.02
37953.000	10.00	.00	.00	880.80	1095.00	888.35	7.55	.31	.23	888.66	42.00	267.99
37953.000	10.00	.00	.00	880.80	1625.00	890.14	9.34	.43	.36	890.57	42.00	343.40
38123.000	170.00	.00	.00	880.50	565.00	886.57	6.07	.04	.04	886.61	160.09	491.30
38123.000	170.00	.00	.00	880.50	905.00	888.02	7.52	.05	.06	888.07	174.93	734.76
38123.000	170.00	.00	.00	880.50	1110.00	888.77	8.27	.05	.08	888.82	181.38	868.68
38123.000	170.00	.00	.00	880.50	1660.00	890.70	10.20	.06	.11	890.76	197.92	1234.65
39313.000	1190.00	.00	.00	883.00	565.00	887.38	4.38	.33	.14	887.71	104.07	185.62
39313.000	1190.00	.00	.00	883.00	905.00	888.67	5.67	.27	.11	888.94	132.46	342.02
39313.000	1190.00	.00	.00	883.00	1110.00	889.37	6.37	.24	.10	889.61	142.91	437.53
39313.000	1190.00	.00	.00	883.00	1660.00	891.16	8.16	.20	.07	891.36	170.94	718.36
40883.000	1570.00	.00	.00	884.80	565.00	889.04	4.24	.01	.10	889.04	525.76	1020.64
40883.000	1570.00	.00	.00	884.80	905.00	889.94	5.14	.01	.08	889.94	576.84	1519.01
40883.000	1570.00	.00	.00	884.80	1110.00	890.46	5.66	.01	.07	890.47	596.25	1826.56
40883.000	1570.00	.00	.00	884.80	1660.00	891.92	7.12	.01	.06	891.92	626.41	2714.82
42053.000	1170.00	.00	.00	886.40	565.00	889.62	3.22	.04	.02	889.66	553.78	577.55
42053.000	1170.00	.00	.00	886.40	905.00	890.35	3.95	.03	.01	890.37	588.12	987.93
42053.000	1170.00	.00	.00	886.40	1110.00	890.79	4.39	.02	.01	890.82	596.28	1254.56
42053.000	1170.00	.00	.00	886.40	1660.00	892.12	5.72	.01	.00	892.13	608.24	2048.63

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	TOPWID	AREA
42613.000	560.00	.00	.00	886.40	565.00	890.74	4.34	.07	.02	890.81	413.42	480.96
42613.000	560.00	.00	.00	886.40	905.00	891.17	4.77	.08	.03	891.26	424.08	659.94
42613.000	560.00	.00	.00	886.40	1110.00	891.45	5.05	.08	.03	891.53	430.49	780.55
42613.000	560.00	.00	.00	886.40	1660.00	892.45	6.05	.06	.02	892.51	453.14	1221.27
43433.000	820.00	.00	.00	888.30	565.00	892.82	4.52	.24	.09	893.07	245.64	247.50
43433.000	820.00	.00	.00	888.30	905.00	893.46	5.16	.27	.09	893.72	262.11	408.66
43433.000	820.00	.00	.00	888.30	1110.00	893.72	5.42	.29	.10	894.01	269.16	480.85
43433.000	820.00	.00	.00	888.30	1660.00	894.23	5.93	.36	.15	894.60	282.29	620.36
43434.000	1.00	.00	.00	888.30	565.00	892.76	4.46	.36	.06	893.13	244.20	187.63
43434.000	1.00	.00	.00	888.30	905.00	893.45	5.15	.29	.01	893.73	262.04	361.66
43434.000	1.00	.00	.00	888.30	1110.00	893.72	5.42	.29	.00	894.01	269.06	433.50
43434.000	1.00	.00	.00	888.30	1660.00	894.33	6.03	.29	.02	894.62	284.77	601.19
43461.000	27.00	892.40	892.30	888.30	565.00	893.16	4.86	.18	.00	893.34	254.68	288.30
43461.000	27.00	892.40	892.30	888.30	905.00	893.63	5.33	.22	.00	893.85	266.80	410.15
43461.000	27.00	892.40	892.30	888.30	1110.00	893.85	5.55	.24	.00	894.09	272.53	469.67
43461.000	27.00	892.40	892.30	888.30	1660.00	894.44	6.14	.26	.00	894.70	287.93	636.02
43462.000	1.00	.00	.00	888.30	565.00	893.21	4.91	.15	.01	893.35	255.62	343.98
43462.000	1.00	.00	.00	888.30	905.00	893.63	5.33	.22	.00	893.85	266.66	455.01
43462.000	1.00	.00	.00	888.30	1110.00	893.84	5.54	.26	.01	894.10	272.36	514.28
43462.000	1.00	.00	.00	888.30	1660.00	894.41	6.11	.32	.03	894.74	286.96	671.62
43812.000	350.00	.00	.00	889.20	565.00	894.01	4.81	.22	.03	894.23	100.00	236.14
43812.000	350.00	.00	.00	889.20	905.00	894.70	5.50	.31	.04	895.01	100.00	305.18
43812.000	350.00	.00	.00	889.20	1110.00	895.04	5.84	.37	.05	895.40	100.00	338.78
43812.000	350.00	.00	.00	889.20	1660.00	895.80	6.60	.52	.10	896.32	100.00	414.76
43902.000	90.00	.00	.00	889.75	565.00	894.38	4.63	.60	.19	894.99	55.00	132.43
43902.000	90.00	.00	.00	889.75	905.00	895.10	5.35	.90	.30	896.00	55.00	171.67
43902.000	90.00	.00	.00	889.75	1110.00	895.44	5.69	1.09	.36	896.53	55.00	190.74
43902.000	90.00	.00	.00	889.75	1660.00	896.18	6.43	1.65	.56	897.83	55.00	231.33
43925.000	23.00	.00	.00	889.89	565.00	894.54	4.65	.79	.09	895.33	43.00	110.01
43925.000	23.00	.00	.00	889.89	905.00	895.23	5.34	1.26	.18	896.50	43.00	139.51
43925.000	23.00	.00	.00	889.89	1110.00	895.56	5.67	1.57	.24	897.13	43.00	153.41
* 43925.000	23.00	.00	.00	889.89	1660.00	896.44	6.55	2.29	.32	898.72	43.00	191.15
43947.000	22.00	.00	.00	890.03	565.00	894.69	4.66	1.05	.13	895.74	32.00	88.44
43947.000	22.00	.00	.00	890.03	905.00	895.35	5.32	1.79	.27	897.15	32.00	109.71
* 43947.000	22.00	.00	.00	890.03	1110.00	895.83	5.80	2.12	.27	897.94	32.00	124.78
* 43947.000	22.00	.00	.00	890.03	1660.00	897.08	7.05	2.81	.26	899.89	32.00	164.68
43969.000	22.00	.00	.00	890.17	565.00	894.85	4.68	1.43	.19	896.28	21.00	66.99
* 43969.000	22.00	.00	.00	890.17	905.00	895.80	5.63	2.26	.23	898.06	21.00	86.83
* 43969.000	22.00	.00	.00	890.17	1110.00	896.44	6.27	2.60	.24	899.04	21.00	100.30
* 43969.000	22.00	.00	.00	890.17	1660.00	898.00	7.83	3.43	.31	901.44	21.00	133.17
43981.000	12.00	.00	.00	890.24	565.00	895.03	4.79	1.57	.07	896.59	15.00	56.23
* 43981.000	12.00	.00	.00	890.24	905.00	896.09	5.85	2.45	.09	898.54	15.00	72.12
* 43981.000	12.00	.00	.00	890.24	1110.00	896.80	6.56	2.80	.10	899.60	15.00	82.66
* 43981.000	12.00	.00	.00	890.24	1660.00	898.50	8.26	3.66	.11	902.16	15.00	108.15

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	TOPWID	AREA
*	43987.000	6.00	.00	.00	890.27	565.00	895.11	4.84	2.06	.24	897.17	12.00	49.11
*	43987.000	6.00	.00	.00	890.27	905.00	896.61	6.34	2.83	.19	899.44	12.00	67.05
*	43987.000	6.00	.00	.00	890.27	1110.00	897.43	7.16	3.24	.22	900.66	12.00	76.86
*	43987.000	6.00	.00	.00	890.27	1660.00	899.40	9.13	4.23	.29	903.63	12.00	100.59
*	43992.000	5.00	.00	.00	890.30	565.00	895.50	5.20	2.33	.14	897.84	10.00	46.08
*	43992.000	5.00	.00	.00	890.30	905.00	897.21	6.91	3.19	.18	900.40	10.00	63.13
*	43992.000	5.00	.00	.00	890.30	1110.00	898.13	7.83	3.65	.21	901.78	10.00	72.35
*	43992.000	5.00	.00	.00	890.30	1660.00	900.36	10.06	4.78	.27	905.14	10.00	94.66
	44032.000	40.00	910.90	899.00	890.30	565.00	897.51	7.21	1.19	.34	898.70	10.00	64.46
	44032.000	40.00	910.90	899.00	890.30	905.00	899.57	9.27	1.54	.00	901.11	10.00	90.87
	44032.000	40.00	910.90	899.00	890.30	1110.00	902.73	12.43	1.28	.00	904.01	10.00	122.40
	44032.000	40.00	910.90	899.00	890.30	1660.00	910.16	19.86	1.11	.00	911.27	10.00	196.69
	44033.000	1.00	.00	.00	890.30	565.00	897.89	7.59	.90	.09	898.79	10.00	74.05
*	44033.000	1.00	.00	.00	890.30	905.00	900.85	10.55	1.18	.11	902.03	10.00	103.60
*	44033.000	1.00	.00	.00	890.30	1110.00	903.30	13.00	1.17	.03	904.47	10.00	128.10
	44033.000	1.00	.00	.00	890.30	1660.00	910.16	19.86	1.11	.00	911.27	10.00	196.72

SUMMARY OF ERRORS

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CAUTION  SECNO=35022.000  PROFILE= 4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=35022.000  PROFILE= 4  WSEL ASSUMED BASED ON MIN DIFF
CAUTION  SECNO=35022.000  PROFILE= 4  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO=43925.000  PROFILE= 4  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=43925.000  PROFILE= 4  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=43947.000  PROFILE= 3  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=43947.000  PROFILE= 3  MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=43947.000  PROFILE= 4  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=43947.000  PROFILE= 4  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=43969.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=43969.000  PROFILE= 2  MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=43969.000  PROFILE= 3  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=43969.000  PROFILE= 3  MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=43969.000  PROFILE= 4  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=43969.000  PROFILE= 4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=43969.000  PROFILE= 4  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO=43981.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=43981.000  PROFILE= 2  MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=43981.000  PROFILE= 3  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=43981.000  PROFILE= 3  MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=43981.000  PROFILE= 4  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=43981.000  PROFILE= 4  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=43987.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=43987.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=43987.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=43987.000  PROFILE= 2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=43987.000  PROFILE= 2  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO=43987.000  PROFILE= 3  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=43987.000  PROFILE= 3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=43987.000  PROFILE= 3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO=43987.000  PROFILE= 4  CRITICAL DEPTH ASSUMED
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00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: GREEN OAK

3) WATERCOURSE: HURON RIVER

4) DOCUMENT TYPE: 100 - YEAR ENCROACHED

00BREAK00

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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  GREEN OAK TWP, LIVINGSTON CO.,MICHIGAN
T2  10-YEAR FLOOD              FILE: HURONENC
T3  MAIN BRANCH    HURON RIVER,ENCROACHED - MOW SOUNG CHENG, PROJECT MANAGER

J1  ICHECK     INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

     -1.        2.        0.        0.   .000000       .00        .0        0.   858.260      .000

J2  NPROF      IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    1.000      .000    -1.000      .000      .000      .000      .000      .000      .000      .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

   38.000    39.000    40.000    41.000    42.000    43.000     1.000     8.000    10.000    12.000


    3.000     4.000    25.000      .000      .000      .000      .000      .000      .000      .000

QT      4.000  1020.000  1450.000  1680.000  2140.000      .000      .000      .000      .000      .000
NC       .100      .070      .040      .300      .500      .000      .000      .000      .000      .000


        VS   A          CORPORATE LIMIT, FROM HAMBURG TWP FIS SECTION 80.925

X1       .000    18.000   235.000   345.000      .000      .000      .000      .000      .000      .000
X3       .000      .000      .000   200.000      .000   600.000      .000      .000      .000      .000
GR     868.600      .000   862.600    10.000   860.000    35.000   856.200   135.000   855.000   235.000
GR     849.800   247.000   851.300   262.000   851.800   285.000   852.100   301.000   852.800   323.000
GR     853.300   333.000   853.800   344.000   854.300   345.000   854.400   445.000   856.000   705.000
GR     858.000   825.000   860.000   865.000   860.800   945.000      .000      .000      .000      .000
NC       .000      .000      .045      .000      .000      .000      .000      .000      .000      .000


        VS   B JA 1

X1    1500.000    19.000   380.000   458.000  1300.000  1400.000  1500.000      .000      .000      .000
GR     869.500      .000   860.000    25.000   858.600    80.000   858.000   180.000   857.500   280.000
GR     856.200   380.000   852.800   385.000   851.700   390.000   851.400   400.000   851.200   410.000
GR     851.200   420.000   851.300   430.000   852.900   440.000   853.300   450.000   856.300   458.000
GR     857.800   480.000   867.600   540.000   868.000   580.000   872.600   680.000      .000      .000


        VS   C JA 2

X1    3090.000    21.000   645.000   703.000  1430.000  1580.000  1590.000      .000      .000      .000
GR     873.100      .000   868.700    20.000   862.600    45.000   860.100    55.000   859.300   145.000
GR     859.300   220.000   865.100   245.000   868.100   270.000   865.900   345.000   859.100   445.000
GR     856.900   545.000   856.000   645.000   852.400   650.000   851.800   655.000   851.400   665.000
GR     851.900   675.000   852.200   685.000   852.800   695.000   856.900   703.000   860.800   745.000
GR     867.000   790.000      .000      .000      .000      .000      .000      .000      .000      .000
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         VS   D JA 2A

X1   4280.000      33.000     920.000    1000.000    1500.000     800.000    1190.000       .000       .000       .000
X3       .000        .000        .000     400.000        .000    1300.000        .000       .000       .000       .000
GR    876.800        .000     872.000      10.000     867.400      20.000     861.300     35.000    858.500    120.000
GR    857.600     220.000     856.900     320.000     856.900     420.000     856.800    520.000    856.600    620.000
GR    856.500     720.000     856.300     820.000     856.200     920.000     854.800    925.000    853.900    930.000
GR    852.600     940.000     852.100     950.000     851.400     960.000     851.800    970.000    851.300    980.000
GR    850.300     990.000     851.900     995.000     856.200    1000.000     856.500   1020.000    856.700   1120.000
GR    856.800    1220.000     857.200    1320.000     858.500    1395.000     865.400   1420.000    869.300   1520.000
GR    863.300    1620.000     863.000    1720.000     869.700    1770.000        .000       .000       .000       .000

         VS   E JA 3

X1   5790.000      28.000     400.000     482.000     500.000     940.000    1510.000       .000       .000       .000
X3       .000        .000        .000     300.000        .000    1250.000        .000       .000       .000       .000
GR    871.400        .000     862.000      70.000     861.600     100.000     860.200    200.000    860.800    300.000
GR    856.900     400.000     854.200     403.000     853.600     410.000     853.400    420.000    853.000    430.000
GR    853.600     440.000     853.900     450.000     852.900     460.000     853.200    470.000    853.800    480.000
GR    857.300     482.000     857.000     500.000     856.900     600.000     856.300    700.000    856.600    800.000
GR    856.200     900.000     855.900    1000.000     856.000    1100.000     856.400   1200.000    857.600   1300.000
GR    858.700    1400.000     857.100    1500.000     856.600    1600.000        .000       .000       .000       .000

         VS   F JA 4

X1   7830.000      22.000     900.000     973.000    2200.000    1200.000    2040.000       .000       .000       .000
X3       .000        .000        .000     650.000        .000        .000        .000       .000       .000       .000
GR    866.600        .000     865.300     100.000     864.100     200.000     863.000    300.000    861.900    400.000
GR    859.500     500.000     859.400     600.000     859.000     700.000     857.500    800.000    857.200    900.000
GR    854.100     905.000     853.300     910.000     852.700     920.000     852.400    930.000    852.200    940.000
GR    852.300     950.000     852.600     957.000     855.600     967.000     857.400    973.000    858.100   1000.000
GR    858.300    1040.000     863.300    1050.000        .000        .000        .000       .000       .000       .000
NC       .100        .080        .045        .000        .000        .000        .000       .000       .000       .000

         VS   G JA 5

X1   9040.000      24.000     920.000    1005.000     900.000    1500.000    1210.000       .000       .000       .000
X3       .000        .000        .000     800.000        .000    1020.000        .000       .000       .000       .000
GR    866.300        .000     865.000     100.000     862.800     200.000     861.500    300.000    861.500    400.000
GR    859.100     500.000     858.100     600.000     857.600     700.000     857.400    800.000    858.000    900.000
GR    858.000     920.000     856.100     930.000     854.900     940.000     853.900    950.000    852.700    960.000
GR    852.600     970.000     853.000     980.000     852.400     990.000     854.300    997.000    857.100   1000.000
GR    857.900    1005.000     857.500    1100.000     859.700    1195.000     865.700   1220.000       .000       .000

X1   9340.000      23.000     600.000     670.000     200.000     300.000     300.000       .000       .000       .000
GR    864.400        .000     864.100     100.000     864.100     200.000     864.000    300.000    864.300    400.000
GR    865.100     500.000     866.400     598.000     862.900     598.000     859.200    600.000    856.400    608.000
GR    853.800     616.000     853.800     623.000     853.900     631.000     853.600    638.000    853.500    645.000
GR    853.700     652.000     855.600     659.000     857.300     668.000     863.500    670.000    867.000    672.000
GR    868.400     750.000     869.500     800.000     872.300     900.000        .000       .000       .000       .000
NC       .000        .000        .022        .000        .000        .000        .000       .000       .000       .000

         BS   H JA 6     PICKETT ROAD BRIDGE

X1   9341.000      24.000     600.000     670.000       1.000       1.000       1.000       .000       .000       .000
BT     15.000        .000     864.400        .000     100.000     864.100        .000    200.000    864.100       .000
BT    300.000     864.000        .000     400.000     864.300        .000     500.000    865.100       .000    598.000
BT    866.400        .000     600.000     866.400        .000     600.000     866.400    862.900    670.000    867.000

BT    863.500     670.000     867.000        .000     672.000     867.000        .000    750.000    868.400       .000
```

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.000	.000	.000	.000	.000
GR	864.400	.000	864.100	100.000	864.100	200.000	864.000	300.000	864.300	400.000
GR	865.100	500.000	866.400	598.000	866.400	600.000	859.200	600.000	856.400	608.000
GR	853.800	616.000	853.800	623.000	853.900	631.000	853.600	638.000	853.500	645.000
GR	853.700	652.000	855.600	659.000	857.300	668.000	863.500	670.000	867.000	670.000
GR	867.000	672.000	868.400	750.000	869.500	800.000	872.300	900.000	.000	.000
X1	9374.000	.000	.000	.000	33.000	33.000	33.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.000	.000	.045	.000	.000	.000	.000	.000	.000	.000
X1	9375.000	23.000	600.000	670.000	1.000	1.000	1.000	.000	.000	.000
GR	864.400	.000	864.100	100.000	864.100	200.000	864.000	300.000	864.300	400.000
GR	865.100	500.000	866.400	598.000	862.900	598.000	859.200	600.000	856.400	608.000
GR	853.800	616.000	853.900	623.000	853.900	631.000	853.600	638.000	853.500	645.000
GR	853.700	652.000	855.600	659.000	857.300	668.000	863.500	670.000	867.000	672.000
GR	868.400	750.000	869.500	800.000	872.300	900.000	.000	.000	.000	.000

VS J JA 7

X1	11100.000	22.000	900.000	963.000	1480.000	1700.000	1725.000	.000	.000	.000
X3	.000	.000	.000	500.000	.000	.000	.000	.000	.000	.000
GR	873.800	.000	873.400	100.000	864.800	200.000	861.300	225.000	860.700	300.000
GR	863.100	400.000	867.100	500.000	863.500	600.000	861.500	700.000	859.300	800.000
GR	860.300	900.000	855.100	902.000	854.600	910.000	853.900	920.000	853.500	930.000
GR	853.300	940.000	853.300	950.000	855.300	960.000	858.800	963.000	858.400	1000.000
GR	859.400	1085.000	864.000	1100.000	.000	.000	.000	.000	.000	.000
NC	.080	.070	.045	.000	.000	.000	.000	.000	.000	.000

VS J JA 8

X1	12960.000	24.000	740.000	810.000	800.000	2000.000	1860.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	1100.000	.000	.000	.000	.000
GR	874.500	.000	874.900	100.000	874.800	200.000	868.500	300.000	871.100	400.000
GR	866.900	500.000	865.600	600.000	859.900	700.000	859.000	740.000	858.100	745.000
GR	853.900	750.000	853.700	760.000	854.100	770.000	854.200	780.000	854.100	790.000
GR	854.900	800.000	858.100	805.000	858.700	810.000	858.600	900.000	859.700	1000.000
GR	860.400	1100.000	860.700	1160.000	863.700	1185.000	873.700	1200.000	.000	.000
NC	.070	.080	.045	.000	.000	.000	.000	.000	.000	.000

VS K JA 9

X1	14200.000	19.000	14.000	104.000	1250.000	1200.000	1240.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	380.000	.000	.000	.000	.000
GR	874.000	.000	860.300	14.000	858.300	20.000	857.400	30.000	856.200	40.000
GR	854.900	49.000	854.900	59.000	855.100	69.000	855.100	79.000	854.700	89.000
GR	854.500	97.000	859.300	104.000	859.300	150.000	859.300	250.000	859.300	350.000
GR	861.000	450.000	862.800	550.000	865.700	616.000	869.000	650.000	.000	.000
NC	.070	.080	.045	.000	.000	.000	.000	.000	.000	.000

VS L JA 10

X1	14970.000	16.000	13.000	66.000	950.000	600.000	770.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	130.000	.000	.000	.000	.000
GR	868.600	.000	861.000	13.000	856.000	18.000	854.600	23.000	854.600	35.000
GR	854.900	41.000	855.700	49.000	856.400	53.000	859.100	66.000	859.100	113.000
GR	858.800	213.000	859.500	313.000	859.500	413.000	859.500	513.000	862.500	613.000
GR	868.600	713.000	.000	.000	.000	.000	.000	.000	.000	.000

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X1  15099.000     21.000    500.000    571.000    120.000     90.000    129.000       .000       .000       .000
X3       .000       .000       .000    500.000       .000    571.000       .000       .000       .000       .000
GR    871.900       .000    870.500    100.000    869.600    200.000    869.200    300.000    869.200    400.000
GR    869.300    500.000    856.000    500.000    855.800    505.000    855.500    515.000    856.100    525.000
GR    856.100    535.000    856.200    545.000    856.500    555.000    857.600    571.000    869.200    571.000
GR    869.000    600.000    868.900    700.000    869.100    800.000    869.200    900.000    869.100   1000.000
GR    869.100   1100.000       .000       .000       .000       .000       .000       .000       .000       .000
NC       .040       .040       .022       .000       .000       .000       .000       .000       .000       .000

        BS   M JA 11    OLD US 23

X1  15100.000       .000       .000       .000      1.000      1.000      1.000       .000       .000       .000
BT     15.000       .000    871.900       .000    100.000    870.500       .000    200.000    869.600       .000
BT    300.000    869.200       .000    400.000    869.200       .000    500.000    869.200       .000    500.000
BT    869.600    863.900    571.000    869.700    863.900    571.000    869.200       .000    600.000    869.000
BT       .000    700.000    868.900       .000    800.000    869.100       .000    900.000    869.200       .000
BT   1000.000    869.100       .000   1100.000    869.100       .000       .000       .000       .000       .000

X1  15146.000       .000       .000       .000     46.000     46.000     46.000       .000       .000       .000
X2       .000       .000       .000       .000       .000       .000      1.000       .000       .000       .000

X1  15147.000       .000       .000       .000      1.000      1.000      1.000       .000       .000       .000
X3       .000       .000       .000    500.000       .000    571.000       .000       .000       .000       .000

X1  15229.000     28.000    400.000    479.900     82.000     82.000     82.000       .000       .000       .000
X3       .000       .000       .000    400.000       .000    479.900       .000       .000       .000       .000
GR    873.000       .000    871.400    100.000    870.000    200.000    869.300    300.000    868.900    398.000
GR    868.900    400.000    856.900    400.000    855.900    409.400    856.000    418.800    856.000    425.400
GR    855.600    432.900    855.700    438.500    855.700    438.500    855.700    441.300    855.700    441.300
GR    856.000    447.900    855.800    456.400    855.900    463.000    856.400    471.400    856.600    478.000
GR    856.900    479.900    868.900    479.900    868.900    481.900    868.800    600.000    868.800    700.000
GR    868.800    800.000    868.900    900.000    868.900   1000.000       .000       .000       .000       .000

        BS   N JA 12    US 23

X1  15230.000     28.000    400.000    479.900      1.000      1.000      1.000       .000       .000       .000
BT     17.000       .000    873.000       .000    100.000    871.400       .000    200.000    870.000       .000
BT    300.000    869.300       .000    398.000    868.900       .000    398.000    871.700       .000    400.000
BT    871.700       .000    400.000    871.700    866.100    479.900    871.700    866.100    479.900    871.700
BT       .000    481.900    871.700       .000    481.900    868.900       .000    600.000    868.800       .000
BT    700.000    868.800       .000    800.000    868.800       .000    900.000    868.900       .000   1000.000
BT    868.900       .000       .000       .000       .000       .000       .000       .000       .000       .000
GR    873.000       .000    871.400    100.000    870.000    200.000    869.300    300.000    868.900    398.000
GR    868.900    400.000    856.900    400.000    855.900    409.400    856.000    418.800    856.000    425.400
GR    855.600    432.900    855.700    438.500    866.100    438.500    866.100    441.300    855.700    441.300
GR    856.000    447.900    855.800    456.400    855.900    463.000    856.400    471.400    856.600    478.000
GR    856.900    479.900    868.900    479.900    868.900    481.900    868.800    600.000    868.800    700.000
GR    868.800    800.000    868.900    900.000    868.900   1000.000       .000       .000       .000       .000

X1  15282.000       .000       .000       .000     52.000     52.000     52.000       .000       .000       .000
X2       .000       .000       .000       .000       .000       .000      1.000       .000       .000       .000

X1  15283.000     28.000    400.000    479.900      1.000      1.000      1.000       .000       .000       .000
X3       .000       .000       .000    400.000       .000    479.900       .000       .000       .000       .000
GR    873.000       .000    871.400    100.000    870.000    200.000    869.300    300.000    868.900    398.000
GR    868.900    400.000    856.900    400.000    855.900    409.400    856.000    418.800    856.000    425.400
GR    855.600    432.900    855.700    438.500    855.700    438.500    855.700    441.300    855.700    441.300
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GR	856.900	479.900	868.900	479.900	868.900	481.900	868.800	600.000	868.800	700.000
GR	868.800	800.000	868.900	900.000	868.900	1000.000	.000	.000	.000	.000
X1	15325.000	.000	.000	.000	42.000	42.000	42.000	.000	.000	.000
X3	.000	.000	.000	400.000	.000	479.900	.000	.000	.000	.000
X1	15326.000	28.000	400.000	479.900	1.000	1.000	1.000	.000	.000	.000
BT	17.000	.000	873.000	.000	100.000	871.400	.000	200.000	870.000	.000
BT	300.000	869.300	.000	398.000	868.900	.000	398.000	871.700	.000	400.000
BT	871.700	.000	400.000	871.700	866.100	479.900	871.700	866.100	479.900	871.700
BT	.000	481.900	871.700	.000	481.900	868.900	.000	600.000	868.800	.000
BT	700.000	868.800	.000	800.000	868.800	.000	900.000	868.900	.000	1000.000
BT	868.900	.000	.000	.000	.000	.000	.000	.000	.000	.000
GR	873.000	.000	871.400	100.000	870.000	200.000	869.300	300.000	868.900	398.000
GR	868.900	400.000	856.900	400.000	855.900	409.400	856.000	418.800	856.000	425.400
GR	855.600	432.900	855.700	438.500	866.100	438.500	866.100	441.300	855.700	441.300
GR	856.000	447.900	855.800	456.400	855.900	463.000	856.400	471.400	856.600	478.000
GR	856.900	479.900	868.900	479.900	868.900	481.900	868.800	600.000	868.800	700.000
GR	868.800	800.000	868.900	900.000	868.900	1000.000	.000	.000	.000	.000
X1	15372.000	.000	.000	.000	46.000	46.000	46.000	.000	.000	.000
Y2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.000	.000	.045	.000	.000	.000	.000	.000	.000	.000
X1	15373.000	28.000	400.000	479.900	1.000	1.000	1.000	.000	.000	.000
X3	.000	.000	.000	400.000	.000	479.900	.000	.000	.000	.000
GR	873.000	.000	871.400	100.000	870.000	200.000	869.300	300.000	868.900	398.000
GR	868.900	400.000	856.900	400.000	855.900	409.400	856.000	418.800	856.000	425.400
GR	855.600	432.900	855.700	438.500	855.700	438.500	855.700	441.300	855.700	441.300
GR	856.000	447.900	855.800	456.400	855.900	463.000	856.400	471.400	856.600	478.000
GR	856.900	479.900	868.900	479.900	868.900	481.900	868.800	600.000	868.800	700.000
GR	868.800	800.000	868.900	900.000	868.900	1000.000	.000	.000	.000	.000
X1	15439.000	26.000	300.000	379.900	66.000	66.000	66.000	.000	.000	.000
X3	.000	.000	.000	300.000	.000	379.900	.000	.000	.000	.000
GR	871.700	.000	869.900	100.000	869.500	200.000	869.300	300.000	856.900	300.000
GR	855.900	303.800	855.200	311.300	855.100	318.800	855.100	325.400	855.400	333.800
GR	855.500	338.500	855.500	338.500	855.500	341.300	855.500	341.300	855.500	346.000
GR	855.400	353.600	855.500	362.000	855.700	369.500	855.700	374.200	857.100	379.900
GR	869.100	379.900	868.400	500.000	867.800	600.000	867.600	700.000	868.700	800.000
GR	868.900	900.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.000	.000	.022	.000	.000	.000	.000	.000	.000	.000

BS 0 JA 13 FIELDCREST DRIVE

X1	15440.000	26.000	300.000	379.900	1.000	1.000	1.000	.000	.000	.000
BT	12.000	.000	871.700	.000	100.000	869.900	.000	200.000	869.500	.000
BT	300.000	869.300	.000	300.000	869.900	866.800	379.900	869.800	866.800	379.900
BT	869.100	.000	500.000	868.400	.000	600.000	867.800	.000	700.000	867.600
BT	.000	800.000	868.700	.000	900.000	868.900	.000	.000	.000	.000
GR	871.700	.000	869.900	100.000	869.500	200.000	869.300	300.000	856.900	300.000
GR	855.900	303.800	855.200	311.300	855.100	318.800	855.100	325.400	855.400	333.800
GR	855.500	338.500	866.800	338.500	866.800	341.300	855.500	341.300	855.500	346.000
GR	855.400	353.600	855.500	362.000	855.700	369.500	855.700	374.200	857.100	379.900
GR	869.100	379.900	868.400	500.000	867.800	600.000	867.600	700.000	868.700	800.000
GR	868.900	900.000	.000	.000	.000	.000	.000	.000	.000	.000

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X2        .000      .000      .000      .000      .000      .000     1.000      .000      .000      .000
NC        .080      .080      .045      .000      .000      .000      .000      .000      .000      .000

X1   15474.000     26.000    300.000    379.900     1.000     1.000     1.000      .000      .000      .000
X3        .000      .000      .000    300.000      .000    379.900      .000      .000      .000      .000
GR     871.700      .000    869.900    100.000    869.500    200.000    869.300    300.000    856.900    300.000
GR     855.900    303.800    855.200    311.300    855.100    318.800    855.100    325.400    855.400    333.800
GR     855.500    338.500    855.500    338.500    855.500    341.300    855.500    341.300    855.500    346.000
GR     855.400    353.600    855.500    362.000    855.700    369.500    855.700    374.200    857.100    379.900
GR     869.100    379.900    868.400    500.000    867.800    600.000    867.600    700.000    868.700    800.000
GR     868.900    900.000      .000      .000      .000      .000      .000      .000      .000      .000

        VS   P JA 14    DOWNSTREAM FROM DAVIS CREEK

X1   16570.000     22.000    290.000    355.000    996.000   1096.000   1096.000      .000      .000      .000
X3        .000      .000      .000    200.000      .000    800.000      .000      .000      .000      .000
GR     866.800      .000    864.000     10.000    861.900     90.000    861.500    190.000    859.000    290.000
GR     857.500    295.000    856.500    300.000    855.600    310.000    855.200    320.000    854.800    330.000
GR     855.300    340.000    854.600    350.000    859.500    355.000    859.500    390.000    859.500    490.000
GR     859.600    590.000    859.700    690.000    859.800    790.000    860.200    890.000    861.800    950.000
GR     867.100    990.000    874.700   1040.000      .000      .000      .000      .000      .000      .000
QT       4.000    735.000   1020.000   1160.000   1490.000      .000      .000      .000      .000      .000

        VS   Q JA 15    UPSTREAM FROM DAVIS CREEK

X1   18010.000     20.000    215.000    290.000   1500.000   1000.000   1440.000      .000      .000      .000
GR     875.100      .000    872.800     15.000    862.400     70.000    860.300    115.000    860.000    215.000
GR     856.300    220.000    855.900    225.000    856.900    235.000    856.300    245.000    855.800    255.000
GR     855.300    265.000    855.300    275.000    857.000    285.000    860.300    290.000    859.700    315.000
GR     859.700    415.000    861.000    515.000    864.700    615.000    866.400    715.000    870.000    745.000

        VS   R JA 16

X1   19210.000     18.000    525.000    580.000   1100.000    900.000   1200.000      .000      .000      .000
GR     877.300      .000    872.900     25.000    873.600    125.000    862.200    190.000    861.400    225.000
GR     860.700    325.000    860.200    420.000    860.300    525.000    856.500    530.000    856.100    540.000
GR     855.900    550.000    854.900    560.000    855.300    570.000    855.700    575.000    860.500    580.000
GR     860.300    616.000    869.700    640.000    871.700    660.000      .000      .000      .000      .000

        VS   S JA 17

X1   20620.000     23.000     95.000    162.000   1300.000    800.000   1410.000      .000      .000      .000
X3        .000      .000      .000      .000      .000    700.000      .000      .000      .000      .000
GR     869.900      .000    865.200     12.000    864.600     53.000    860.300     95.000    857.200    100.000
GR     855.900    105.000    854.800    115.000    856.200    125.000    856.900    135.000    857.900    145.000
GR     857.800    155.000    859.600    162.000    860.100    195.000    860.400    295.000    860.300    395.000
GR     860.300    495.000    860.300    595.000    860.600    695.000    860.800    795.000    861.900    895.000
GR     864.100    995.000    868.700   1095.000    869.900   1145.000      .000      .000      .000      .000

        VS   T JA 18

X1   21960.000     17.000    500.000    548.000    900.000    900.000   1340.000      .000      .000      .000
GR     878.700      .000    869.600     50.000    862.700    100.000    861.200    200.000    861.100    300.000
GR     861.200    400.000    860.600    500.000    856.700    505.000    855.400    510.000    855.400    520.000
GR     855.700    530.000    856.300    540.000    858.300    546.000    860.400    548.000    872.500    570.000
GR     874.800    600.000    877.900    625.000      .000      .000      .000      .000      .000      .000
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X1	23400.000	15.000	58.000	105.000	1400.000	1400.000	1440.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	150.000	.000	.000	.000	.000
GR	872.300	.000	867.300	5.000	861.200	58.000	858.800	60.000	857.300	65.000
GR	855.600	75.000	854.900	85.000	855.000	95.000	855.200	100.000	861.200	105.000
GR	861.400	180.000	861.600	280.000	861.800	390.000	866.500	420.000	867.100	480.000
X1	23649.000	21.000	200.000	248.000	249.000	249.000	249.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	300.000	.000	.000	.000	.000
GR	888.600	.000	877.900	100.000	872.100	170.000	870.300	197.000	867.100	198.000
GR	859.500	200.000	858.700	210.000	856.900	220.000	856.900	230.000	857.700	240.000
GR	858.900	245.000	861.200	248.000	865.700	250.000	868.500	251.000	866.100	300.000
GR	863.900	400.000	863.900	500.000	865.500	600.000	865.800	700.000	866.200	800.000
GR	867.300	900.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.040	.040	.022	.000	.000	.000	.000	.000	.000	.000

BS V JA 20 MCCABE ROAD

X1	23650.000	21.000	200.000	248.000	1.000	1.000	1.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	300.000	.000	.000	.000	.000
BT	15.000	.000	888.600	.000	100.000	877.900	.000	170.000	872.100	.000
BT	197.000	870.300	.000	200.000	870.300	.000	200.000	870.300	867.500	248.000
BT	868.500	866.000	248.000	868.500	.000	251.000	868.500	.000	300.000	866.100
BT	.000	400.000	863.900	.000	500.000	863.900	.000	600.000	865.500	.000
BT	700.000	865.800	.000	800.000	866.200	.000	.000	.000	.000	.000
GR	888.600	.000	877.900	100.000	872.100	170.000	870.300	197.000	870.300	200.000
GR	859.500	200.000	858.700	210.000	856.900	220.000	856.900	230.000	857.700	240.000
GR	858.900	245.000	861.200	248.000	868.500	248.000	868.500	251.000	866.100	300.000
GR	863.900	400.000	863.900	500.000	865.500	600.000	865.800	700.000	866.200	800.000
GR	867.300	900.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	23673.000	.000	.000	.000	23.000	23.000	23.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	300.000	.000	.000	.000	.000
NC	.080	.080	.045	.000	.000	.000	.000	.000	.000	.000
X1	23674.000	21.000	200.000	248.000	1.000	1.000	1.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	300.000	.000	.000	.000	.000
GR	888.600	.000	877.900	100.000	872.100	170.000	870.300	197.000	867.100	198.000
GR	859.500	200.000	858.700	210.000	856.900	220.000	856.900	230.000	857.700	240.000
GR	858.900	245.000	861.200	248.000	865.700	250.000	868.500	251.000	866.100	300.000
GR	863.900	400.000	863.900	500.000	865.500	600.000	865.800	700.000	866.200	800.000
GR	867.300	900.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.080	.050	.045	.000	.000	.000	.000	.000	.000	.000

VS W JA 21

X1	24330.000	34.000	600.000	672.000	560.000	520.000	656.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	1232.000	.000	.000	.000	.000
GR	869.500	.000	868.600	100.000	866.900	200.000	861.500	235.000	861.400	300.000
GR	857.900	315.000	861.400	400.000	861.500	500.000	861.400	600.000	859.700	605.000
GR	857.500	615.000	857.300	625.000	857.500	635.000	857.900	645.000	857.800	650.000
GR	859.200	660.000	859.800	670.000	863.400	672.000	866.200	700.000	871.800	760.000
GR	883.000	800.000	886.000	840.000	864.200	900.000	863.800	1000.000	863.700	1100.000
GR	863.600	1200.000	863.600	1300.000	863.800	1400.000	864.200	1500.000	864.700	1600.000
GR	864.900	1700.000	866.800	1780.000	875.100	1800.000	883.400	1825.000	.000	.000
QT	4.000	710.000	990.000	1120.000	1450.000	.000	.000	.000	.000	.000
NC	.080	.070	.000	.000	.000	.000	.000	.000	.000	.000

VS X JA 22

X1	25110.000	23.000	14.000	84.000	780.000	650.000	780.000	.000	.000	.000
GR	866.800	.000	861.700	4.000	861.600	14.000	857.600	21.000	856.400	30.000
GR	856.900	39.000	856.800	49.000	856.900	59.000	857.600	69.000	859.400	79.000
GR	861.600	84.000	861.600	114.000	861.700	214.000	861.700	314.000	861.700	414.000
GR	861.800	514.000	861.800	614.000	861.800	714.000	861.900	814.000	862.000	914.000
GR	862.000	1014.000	862.000	1069.000	866.800	1069.000	.000	.000	.000	.000
NC	.070	.070	.041	.000	.000	.000	.000	.000	.000	.000

VS Y JA 23

X1	27960.000	32.000	800.000	866.000	1100.000	1700.000	2850.000	.000	.000	.000
X3	.000	.000	.000	700.000	.000	2000.000	.000	.000	.000	.000
GR	872.100	.000	869.100	100.000	866.100	200.000	862.600	300.000	862.100	325.000
GR	862.100	400.000	864.100	460.000	865.100	500.000	866.200	600.000	866.200	700.000
GR	864.300	800.000	857.500	805.000	856.000	810.000	855.600	820.000	856.300	830.000
GR	857.900	840.000	859.700	850.000	860.700	860.000	861.500	866.000	861.500	900.000
GR	861.500	1000.000	861.400	1100.000	861.400	1200.000	861.400	1300.000	861.400	1400.000
GR	861.400	1500.000	861.500	1600.000	861.600	1700.000	861.700	1800.000	861.700	1900.000
GR	862.700	2000.000	865.700	2050.000	.000	.000	.000	.000	.000	.000
NC	.080	.080	.042	.000	.000	.000	.000	.000	.000	.000

VS Z JA 24

X1	30760.000	21.000	474.000	530.000	1000.000	1700.000	2800.000	.000	.000	.000
GR	884.800	.000	875.600	30.000	865.600	50.000	865.100	130.000	863.900	230.000
GR	863.400	330.000	862.800	430.000	863.000	474.000	859.100	479.000	859.100	485.000
GR	859.100	493.000	858.900	502.000	858.900	510.000	858.800	520.000	858.600	525.000
GR	864.000	530.000	863.000	545.000	888.300	580.000	887.000	680.000	880.100	780.000
GR	883.100	880.000	.000	.000	.000	.000	.000	.000	.000	.000

VS AA JA 25

X1	31370.000	19.000	600.000	660.000	500.000	700.000	610.000	.000	.000	.000
X3	.000	.000	.000	400.000	.000	.000	.000	.000	.000	.000
GR	882.300	.000	865.800	80.000	865.600	100.000	865.100	200.000	864.600	300.000
GR	864.100	400.000	863.600	500.000	862.800	600.000	859.200	605.000	859.000	615.000
GR	858.600	625.000	858.700	635.000	858.700	643.000	859.000	650.000	860.800	655.000
GR	862.300	660.000	863.200	670.000	894.100	730.000	899.100	740.000	.000	.000

VS AB JA 26

X1	32300.000	27.000	315.000	400.000	600.000	650.000	930.000	.000	.000	.000
GR	883.300	.000	875.000	100.000	863.900	160.000	863.800	200.000	863.500	300.000
GR	863.400	315.000	859.000	320.000	859.000	330.000	858.900	340.000	858.900	350.000
GR	858.900	360.000	858.900	370.000	858.900	380.000	859.300	390.000	860.700	395.000
GR	863.100	400.000	863.300	415.000	878.300	458.000	877.200	500.000	863.600	560.000
GR	866.000	600.000	860.200	620.000	863.300	635.000	865.300	700.000	868.100	784.000
GR	873.800	800.000	883.300	825.000	.000	.000	.000	.000	.000	.000

VS AC JA 27

X1	32830.000	29.000	390.000	500.000	400.000	700.000	530.000	.000	.000	.000
X3	.000	.000	.000	150.000	.000	.000	.000	.000	.000	.000
GR	866.900	.000	862.800	100.000	863.700	200.000	863.600	300.000	863.600	390.000
GR	861.400	395.000	860.600	400.000	860.400	410.000	859.900	420.000	859.200	430.000
GR	859.300	440.000	860.100	450.000	860.200	460.000	860.100	470.000	860.000	480.000
GR	860.200	490.000	861.400	495.000	863.700	500.000	863.900	610.000	881.300	675.000

[illegible]	[illegible]	700.000	800.400	725.000	864.000	765.000	864.000	800.000	864.000	900.000
GR	860.800	909.000	864.000	918.000	865.100	995.000	888.600	1060.000	.000	.000
NC	.080	.080	.000	.000	.000	.000	.000	.000	.000	.000

VS AD JA 28

X1	33630.000	27.000	1095.000	1155.000	700.000	500.000	800.000	.000	.000	.000
X3	.000	.000	.000	950.000	.000	1200.000	.000	.000	.000	.000
GR	874.000	.000	868.700	10.000	864.900	35.000	864.500	95.000	864.500	195.000
GR	864.500	295.000	864.500	395.000	864.500	495.000	867.100	595.000	866.100	695.000
GR	866.100	795.000	865.600	895.000	864.600	995.000	864.200	1095.000	859.300	1100.000
GR	859.300	1105.000	859.500	1113.000	859.400	1125.000	859.500	1135.000	859.900	1145.000
GR	860.200	1150.000	863.700	1155.000	863.900	1195.000	865.500	1295.000	865.500	1315.000
GR	877.100	1345.000	880.200	1350.000	.000	.000	.000	.000	.000	.000

X1	33919.000	23.000	700.000	741.700	280.000	210.000	289.000	.000	.000	.000
GR	869.500	.000	869.500	100.000	869.700	200.000	869.700	300.000	869.800	400.000
GR	869.800	500.000	869.700	600.000	869.800	700.000	861.800	700.000	859.000	703.500
GR	859.000	707.100	858.800	714.100	858.600	721.200	858.800	728.300	859.900	735.400
GR	861.300	738.900	862.300	741.700	869.800	745.000	869.900	800.000	870.900	900.000
GR	873.400	1000.000	877.000	1100.000	880.200	1200.000	.000	.000	.000	.000
NC	.050	.050	.022	.000	.000	.000	.000	.000	.000	.000

BS AE JA 29 DRIVEWAY BRIDGE

X1	33920.000	23.000	700.000	741.700	1.000	1.000	1.000	.000	.000	.000
GR	869.500	.000	869.500	100.000	869.700	200.000	869.700	300.000	869.800	400.000
GR	869.800	500.000	869.700	600.000	869.800	700.000	861.800	700.000	859.000	703.500
GR	859.000	707.100	858.800	714.100	858.600	721.200	858.800	728.300	859.900	735.400
GR	861.300	738.900	862.300	741.700	869.800	745.000	869.900	800.000	870.900	900.000
GR	873.400	1000.000	877.000	1100.000	880.200	1200.000	.000	.000	.000	.000
SB	.000	1.410	3.020	.000	37.390	.000	280.420	.000	858.600	858.600

X1	33961.000	.000	.000	.000	41.000	41.000	41.000	.000	.000	.000
X2	.000	.000	1.000	866.100	869.500	.000	.000	.000	.000	.000
BT	17.000	.000	869.500	.000	100.000	869.500	.000	200.000	869.700	.000
BT	300.000	869.700	.000	400.000	869.800	.000	500.000	869.800	.000	600.000
BT	869.700	.000	700.000	869.800	.000	700.000	872.400	866.000	741.700	872.400
BT	866.100	741.700	869.800	.000	745.000	869.800	.000	800.000	869.900	.000
BT	900.000	870.200	.000	1000.000	873.400	.000	1100.000	877.000	.000	1200.000
BT	880.200	.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.060	.080	.045	.000	.000	.000	.000	.000	.000	.000

X1	33962.000	23.000	700.000	741.700	1.000	1.000	1.000	.000	.000	.000
GR	869.500	.000	869.500	100.000	869.700	200.000	869.700	300.000	869.800	400.000
GR	869.800	500.000	869.700	600.000	869.800	700.000	861.800	700.000	859.000	703.500
GR	859.000	707.100	858.800	714.100	858.600	721.200	858.800	728.300	859.900	735.400
GR	861.300	738.900	862.300	741.700	869.800	745.000	869.900	800.000	870.900	900.000
GR	873.400	1000.000	877.000	1100.000	880.200	1200.000	.000	.000	.000	.000

VS AF JA 30

X1	34740.000	38.000	1100.000	1227.000	530.000	730.000	778.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	1800.000	.000	.000	.000	.000
GR	874.100	.000	872.300	100.000	871.300	200.000	870.500	300.000	870.500	400.000
GR	869.900	500.000	869.800	600.000	869.800	650.000	865.500	665.000	864.600	700.000
GR	863.700	800.000	863.400	900.000	863.400	1000.000	863.000	1100.000	858.300	1105.000
GR	858.600	1110.000	859.600	1120.000	860.300	1130.000	860.700	1140.000	860.900	1150.000
GR	861.300	1160.000	861.500	1170.000	861.100	1180.000	860.500	1190.000	860.700	1200.000

GR	864.000	1500.000	863.000	1600.000	864.500	1700.000	863.000	1800.000	862.500	1900.000
GR	863.500	2000.000	864.500	2100.000	869.500	2130.000	.000	.000	.000	.000

VS AG JA 31

X1	37250.000	36.000	900.000	1000.000	1100.000	2050.000	2510.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	1500.000	.000	.000	.000	.000
GR	871.100	.000	868.800	100.000	868.400	200.000	871.500	300.000	867.400	400.000
GR	863.800	415.000	864.000	500.000	864.000	600.000	864.000	700.000	863.900	800.000
GR	863.300	900.000	861.200	905.000	861.100	910.000	860.900	920.000	860.900	930.000
GR	860.800	940.000	860.600	950.000	860.800	960.000	860.500	970.000	860.300	980.000
GR	860.400	990.000	860.500	995.000	863.200	1000.000	863.400	1100.000	863.600	1200.000
GR	863.800	1300.000	864.100	1400.000	865.700	1500.000	865.100	1600.000	866.300	1700.000
GR	865.700	1800.000	866.000	1900.000	866.100	2000.000	866.300	2100.000	867.000	2700.000
GR	880.000	2700.000	.000	.000	.000	.000	.000	.000	.000	.000

VS AH JA 32

X1	39670.000	20.000	350.000	425.000	1600.000	1150.000	2420.000	.000	.000	.000
GR	892.300	.000	867.200	50.000	866.800	150.000	865.800	250.000	864.000	350.000
GR	861.600	355.000	861.100	360.000	860.700	370.000	860.400	380.000	860.200	390.000
GR	860.100	400.000	861.400	410.000	861.600	420.000	864.400	425.000	864.700	450.000
GR	865.000	550.000	865.000	650.000	865.200	750.000	865.700	795.000	870.200	805.000

VS AI JA 33

X1	42170.000	30.000	975.000	1048.000	1600.000	1100.000	2500.000	.000	.000	.000
X3	.000	.000	.000	700.000	.000	1400.000	.000	.000	.000	.000
GR	884.600	.000	877.400	75.000	870.600	105.000	868.100	175.000	867.400	275.000
GR	868.000	375.000	868.600	475.000	866.700	575.000	865.800	675.000	865.700	775.000
GR	865.900	875.000	865.100	975.000	862.600	980.000	862.200	985.000	862.200	995.000
GR	862.500	1005.000	863.300	1010.000	862.200	1015.000	861.500	1025.000	861.700	1035.000
GR	861.700	1045.000	865.100	1048.000	865.500	1075.000	865.500	1175.000	865.900	1275.000
GR	865.900	1375.000	866.000	1475.000	866.500	1575.000	867.000	1590.000	871.200	1610.000
NC	.060	.080	.000	.000	.000	.000	.000	.000	.000	.000

VS AJ JA 34

X1	43250.000	24.000	12.000	87.000	800.000	800.000	1080.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	250.000	.000	.000	.000	.000
GR	875.900	.000	866.900	12.000	863.800	17.000	863.100	27.000	862.700	32.000
GR	862.500	44.000	862.700	59.000	862.200	67.000	862.200	72.000	862.800	77.000
GR	864.100	82.000	866.600	87.000	866.600	112.000	866.600	212.000	866.600	312.000
GR	866.600	362.000	878.000	412.000	872.900	512.000	870.300	612.000	869.800	712.000
GR	867.900	812.000	867.800	912.000	874.500	1012.000	892.600	1112.000	.000	.000

X1	43544.000	29.000	300.000	417.000	300.000	260.000	294.000	.000	.000	.000
GR	893.600	.000	892.800	100.000	892.100	200.000	891.800	300.000	874.100	300.000
GR	871.800	320.000	871.600	339.000	885.600	339.000	881.900	346.000	868.500	346.000
GR	867.000	357.000	864.400	359.000	862.900	365.000	861.800	371.000	861.500	377.000
GR	861.900	382.000	862.000	392.000	862.600	399.000	864.600	407.000	868.500	417.000
GR	892.000	417.000	892.000	500.000	892.200	600.000	892.400	700.000	892.600	800.000
GR	892.800	900.000	893.000	1000.000	893.200	1100.000	893.400	1200.000	.000	.000
NC	.050	.050	.022	.000	.000	.000	.000	.000	.000	.000

BS AK JA 35 C & O RR

X1	43545.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000

[illegible]	[illegible]	[illegible]	[illegible]	.000	[illegible]	[illegible]	.000	[illegible]	[illegible]	.000
BT	300.000	891.800	.000	300.000	891.800	885.100	339.000	891.900	885.600	346.000
BT	891.800	881.900	417.000	892.000	882.000	417.000	892.000	.000	500.000	892.000
BT	.000	600.000	892.000	.000	700.000	892.400	.000	800.000	892.600	.000
BT	900.000	892.800	.000	1000.000	893.000	.000	1100.000	893.200	.000	1200.000
BT	893.400	.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	43554.000	.000	.000	.000	9.000	9.000	9.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.060	.080	.045	.000	.000	.000	.000	.000	.000	.000
X1	43555.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
NC	.080	.080	.045	.000	.000	.000	.000	.000	.000	.000
VS AL JA 36										
X1	43970.000	25.000	30.000	100.000	480.000	380.000	415.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	250.000	.000	.000	.000	.000
GR	880.900	.000	866.700	15.000	866.700	30.000	862.200	35.000	861.700	40.000
GR	861.500	45.000	861.400	50.000	861.500	55.000	861.700	60.000	861.900	65.000
GR	862.100	75.000	861.700	85.000	861.800	95.000	866.700	100.000	866.700	125.000
GR	866.800	225.000	867.400	325.000	867.700	425.000	867.900	525.000	868.000	640.000
GR	871.200	725.000	870.100	825.000	876.900	925.000	875.400	1025.000	880.900	1125.000
X1	45129.000	27.000	650.000	722.400	850.000	600.000	1159.000	.000	.000	.000
GR	881.700	.000	877.400	50.000	872.700	150.000	869.000	250.000	867.900	350.000
GR	867.800	450.000	867.800	550.000	872.000	650.000	864.700	650.000	863.900	654.700
GR	863.200	659.400	862.900	668.800	863.000	678.200	863.700	684.800	863.700	684.800
GR	863.700	687.600	863.700	687.600	863.800	697.000	863.900	706.400	864.500	715.800
GR	866.200	722.400	872.600	724.000	872.000	750.000	872.700	850.000	879.000	950.000
GR	881.200	1050.000	884.100	1150.000	.000	.000	.000	.000	.000	.000
NC	.050	.050	.020	.000	.000	.000	.000	.000	.000	.000
BS AM JA 37 SUTHERLAND ROAD										
X1	45130.000	27.000	650.000	722.400	1.000	1.000	1.000	.000	.000	.000
BT	18.000	.000	881.700	.000	50.000	877.400	.000	150.000	872.700	.000
BT	250.000	869.000	.000	350.000	867.900	.000	450.000	867.800	.000	550.000
BT	867.800	.000	650.000	872.000	.000	650.000	872.000	869.100	684.800	872.300
BT	869.200	687.600	872.300	869.200	722.400	872.600	869.300	722.400	872.600	.000
BT	750.000	872.700	.000	850.000	872.700	.000	950.000	879.000	.000	1050.000
BT	881.200	.000	1150.000	884.100	.000	.000	.000	.000	.000	.000
GR	881.700	.000	877.400	50.000	872.700	150.000	869.000	250.000	867.900	350.000
GR	867.800	450.000	867.800	550.000	872.000	650.000	864.700	650.000	863.900	654.700
GR	863.200	659.400	862.900	668.800	863.000	678.200	863.700	684.800	869.200	684.800
GR	869.200	687.600	863.700	687.600	863.800	697.000	863.900	706.400	864.500	715.800
GR	866.200	722.400	872.600	722.400	872.000	750.000	872.700	850.000	879.000	950.000
GR	881.200	1050.000	884.100	1150.000	.000	.000	.000	.000	.000	.000
X1	45148.000	.000	.000	.000	18.000	18.000	18.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.080	.080	.045	.000	.000	.000	.000	.000	.000	.000
X1	45149.000	27.000	650.000	722.400	1.000	1.000	1.000	.000	.000	.000
GR	881.700	.000	877.400	50.000	872.700	150.000	869.000	250.000	867.900	350.000
GR	867.800	450.000	867.800	550.000	872.000	650.000	864.700	650.000	863.900	654.700
GR	863.200	659.400	862.900	668.800	863.000	678.200	863.700	684.800	863.700	684.800
GR	863.700	687.600	863.700	687.600	863.800	697.000	863.900	706.400	864.500	715.800

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
GR	881.200	1050.000	884.100	1150.000	.000	.000	.000	.000	.000	.000

VS AN JA 38

X1	46760.000	17.000	270.000	335.000	1450.000	1300.000	1611.000	.000	.000	.000
GR	899.400	.000	887.300	20.000	868.800	60.000	868.000	100.000	868.000	200.000
GR	867.300	270.000	863.600	275.000	864.100	280.000	864.300	290.000	863.900	300.000
GR	863.300	310.000	863.400	320.000	864.000	330.000	867.300	335.000	868.600	400.000
GR	882.400	425.000	888.800	435.000	.000	.000	.000	.000	.000	.000

VS AO JA 39

X1	48160.000	18.000	385.000	445.000	900.000	1200.000	1400.000	.000	.000	.000
GR	911.400	.000	893.100	40.000	873.400	90.000	870.100	140.000	867.500	240.000
GR	866.800	340.000	867.200	385.000	865.700	390.000	865.500	395.000	864.500	405.000
GR	863.100	415.000	863.200	425.000	863.700	435.000	864.200	440.000	868.000	445.000
GR	869.200	485.000	875.400	525.000	887.100	560.000	.000	.000	.000	.000
QT	4.000	540.000	750.000	850.000	1090.000	.000	.000	.000	.000	.000
NC	.070	.070	.045	.000	.000	.000	.000	.000	.000	.000

VS AP JA 40

X1	49545.000	23.000	300.000	360.000	1100.000	1500.000	1385.000	.000	.000	.000
GR	907.600	.000	895.100	35.000	884.200	75.000	868.200	110.000	867.900	200.000
GR	867.600	300.000	862.400	305.000	862.200	310.000	861.000	320.000	860.000	330.000
GR	860.300	340.000	861.400	350.000	862.600	355.000	868.200	360.000	884.800	400.000
GR	888.500	415.000	888.900	475.000	887.000	500.000	878.200	600.000	876.200	665.000
GR	878.600	700.000	885.300	800.000	891.800	900.000	.000	.000	.000	.000
NC	.080	.070	.045	.000	.000	.000	.000	.000	.000	.000

VS AQ JA 41

X1	50735.000	30.000	700.000	760.000	850.000	800.000	1190.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	830.000	.000	.000	.000	.000
GR	901.600	.000	881.700	100.000	880.100	200.000	874.500	300.000	868.500	350.000
GR	868.500	400.000	868.300	500.000	868.300	600.000	867.600	700.000	865.400	705.000
GR	864.400	710.000	863.800	720.000	863.600	725.000	864.200	735.000	864.300	745.000
GR	865.800	755.000	867.500	760.000	868.400	785.000	878.400	815.000	879.300	835.000
GR	875.000	900.000	869.100	975.000	868.800	1000.000	868.000	1100.000	867.900	1180.000
GR	870.600	1200.000	875.400	1300.000	873.400	1400.000	875.400	1465.000	884.300	1490.000

VS AR JA 42

X1	53335.000	27.000	700.000	768.000	1400.000	1400.000	2600.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	1100.000	.000	.000	.000	.000
GR	888.400	.000	883.900	100.000	878.200	200.000	876.700	300.000	874.900	400.000
GR	873.800	500.000	871.300	600.000	867.300	700.000	866.900	705.000	866.700	710.000
GR	866.000	718.000	863.300	725.000	862.800	730.000	862.700	740.000	862.700	745.000
GR	863.400	750.000	864.200	760.000	865.900	766.000	867.500	768.000	867.300	800.000
GR	867.300	900.000	867.300	1000.000	868.900	1100.000	870.300	1200.000	870.700	1300.000
GR	873.100	1400.000	885.100	1500.000	.000	.000	.000	.000	.000	.000
NC	.070	.060	.045	.000	.000	.000	.000	.000	.000	.000

VS AS JA 43

X1	55645.000	19.000	600.000	670.000	1500.000	1200.000	2310.000	.000	.000	.000
X3	.000	.000	.000	400.000	.000	.000	.000	.000	.000	.000
GR	892.500	.000	886.500	50.000	875.600	100.000	873.800	200.000	871.000	300.000

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
GR	865.000	625.000	864.800	635.000	864.600	640.000	864.600	650.000	865.200	660.000
GR	865.900	665.000	867.900	670.000	870.400	680.000	876.900	700.000	.000	.000
NC	.060	.060	.045	.000	.000	.000	.000	.000	.000	.000

VS AT JA 44

X1	57005.000	23.000	213.000	300.000	1400.000	1450.000	1360.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	365.000	.000	.000	.000	.000
GR	887.600	.000	883.500	100.000	875.300	167.000	870.800	183.000	868.900	213.000
GR	866.000	220.000	864.900	225.000	865.300	230.000	864.900	240.000	864.500	250.000
GR	864.300	260.000	864.100	270.000	864.500	280.000	864.800	290.000	865.500	297.000
GR	867.900	300.000	870.500	400.000	870.800	500.000	873.200	600.000	871.400	700.000
GR	878.000	800.000	882.600	900.000	886.000	930.000	.000	.000	.000	.000
X1	57294.000	25.000	372.000	415.000	200.000	250.000	289.000	.000	.000	.000
GR	889.200	.000	885.500	93.000	882.800	186.000	880.200	279.000	877.800	372.000
GR	865.700	372.000	865.600	377.000	865.500	381.000	865.300	391.000	865.200	400.000
GR	865.000	409.000	865.800	415.000	876.700	415.000	875.800	465.000	874.000	558.000
GR	873.200	651.000	873.600	744.000	874.500	837.000	875.200	930.000	877.000	1023.000
GR	879.700	1116.000	883.700	1209.000	887.800	1302.000	892.100	1395.000	896.100	1488.000
NC	.025	.025	.022	.000	.000	.000	.000	.000	.000	.000

BS AU JA 45 KENSINGTON ROAD

X1	57295.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
BT	20.000	.000	889.200	.000	93.000	885.500	.000	186.000	882.800	.000
BT	279.000	880.200	.000	372.000	877.800	.000	372.000	877.800	874.600	415.000
BT	876.700	873.500	415.000	876.700	.000	465.000	875.800	.000	558.000	874.000
BT	.000	651.000	873.200	.000	744.000	873.600	.000	837.000	874.500	.000
BT	930.000	875.200	.000	1023.000	877.000	.000	1116.000	879.700	.000	1209.000
BT	883.700	.000	1302.000	887.800	.000	1395.000	892.100	.000	1488.000	896.100
BT	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	57333.000	.000	.000	.000	38.000	38.000	38.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.150	.150	.035	.000	.000	.000	.000	.000	.000	.000
X1	57334.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
X1	57469.000	33.000	450.000	551.000	135.000	135.000	135.000	.000	-.450	.000
X3	.000	.000	.000	.000	.000	900.000	.000	.000	.000	.000
GR	892.900	.000	888.400	30.000	883.400	130.000	877.600	230.000	872.100	330.000
GR	869.000	430.000	865.700	435.000	865.700	440.000	865.600	450.000	866.100	460.000
GR	865.900	470.000	865.700	480.000	865.600	490.000	865.700	500.000	865.800	510.000
GR	865.800	520.000	865.600	530.000	865.700	540.000	865.600	545.000	869.000	551.000
GR	869.000	620.000	871.300	645.000	875.900	730.000	875.500	830.000	876.600	930.000
GR	871.200	1030.000	877.100	1130.000	881.300	1170.000	878.100	1230.000	883.000	1280.000
GR	881.900	1330.000	881.900	1350.000	887.500	1430.000	.000	.000	.000	.000

VS AV JA 45A

X1	58005.000	.000	.000	.000	555.000	315.000	536.000	.000	.450	.000
X3	.000	.000	.000	.000	.000	900.000	.000	.000	.000	.000

VS AW JA 46

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GR     903.100       .000    882.000    100.000    880.000    200.000    876.100    300.000    876.400    400.000
GR     875.200    500.000    874.700    600.000    874.700    700.000    873.600    800.000    872.000    900.000
GR     871.400   1000.000    870.400   1100.000    868.900   1150.000    866.800   1155.000    866.600   1160.000
GR     865.900   1170.000    865.500   1180.000    865.600   1190.000    866.000   1200.000    866.500   1210.000
GR     866.800   1220.000    867.100   1230.000    867.700   1240.000    869.000   1245.000    870.000   1250.000
GR     875.300   1290.000       .000       .000       .000       .000       .000       .000       .000       .000

        VS  AX JA 47

X1   61035.000     24.000     40.000    140.000    700.000   1300.000   1810.000       .000       .000       .000
GR     892.800       .000    869.700     40.000    867.600     45.000    867.300     50.000    866.900     60.000
GR     866.400     70.000    866.400     80.000    866.600     90.000    866.600    100.000    866.600    110.000
GR     866.900    120.000    867.000    130.000    867.600    135.000    869.500    140.000    870.700    200.000
GR     872.400    300.000    873.600    400.000    875.100    500.000    876.200    600.000    879.400    700.000
GR     876.100    800.000    885.500    900.000    887.500   1000.000    890.300   1050.000       .000       .000

        VS  AY JA 48

X1   62125.000     19.000     50.000    140.000   1150.000    800.000   1090.000       .000       .000       .000
GR     890.500       .000    870.600     40.000    869.900     50.000    868.200     55.000    867.700     60.000
GR     867.200     70.000    867.500     80.000    867.400     90.000    867.200    100.000    867.100    110.000
GR     866.900    120.000    867.200    130.000    867.700    135.000    869.600    140.000    870.200    150.000
GR     872.300    210.000    878.100    250.000    889.500    350.000    893.400    370.000       .000       .000

        VS  AZ JA 49

X1   62745.000     17.000    150.000    233.000    600.000    500.000    620.000       .000       .000       .000
GR     887.400       .000    881.100     50.000    874.100     75.000    871.400    150.000    869.100    153.000
GR     868.800    155.000    868.400    160.000    868.200    170.000    868.200    180.000    868.000    190.000
GR     867.700    200.000    868.000    210.000    868.200    220.000    868.800    226.000    871.300    233.000
GR     874.000    260.000    887.000    300.000       .000       .000       .000       .000       .000       .000

X1   62925.000      7.000    104.000    194.000    180.000    180.000    180.000       .000       .000       .000
GR     888.000       .000    888.000    104.000    867.800    104.000    867.900    193.990    867.900    194.000
GR     888.000    194.000    888.000    295.000       .000       .000       .000       .000       .000       .000
NC        .040       .040       .015       .000       .000       .000       .000       .000       .000       .000
SB        .000      5.000      3.300       .000       .010       .000       .000       .000    867.400    867.800

        DS  BA JA 50 KENT LAKE DAM

X1   62945.000      7.000    104.000    194.000     20.000     20.000     20.000       .000       .000       .000
X2        .000       .000      1.000       .000       .000       .000       .000       .000       .000       .000
BT       8.000       .000    888.000       .000    104.000    888.000       .000    104.000    884.000    867.800
BT     193.990    884.000    867.900    193.990    884.000    867.910    194.000    884.000    867.910    194.000
BT     884.000    867.900    194.000    888.000       .000    295.000    888.000       .000       .000       .000
GR     888.000       .000    888.000    104.000    867.400    104.000    867.400    193.990    867.400    194.000
GR     888.000    194.000    888.000    295.000       .000       .000       .000       .000       .000       .000
EJ        .000       .000       .000       .000       .000       .000       .000       .000       .000       .000
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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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T1  GREEN OAK TWP, LIVINGSTON CO.,MICHIGAN
T2  100-YEAR FLOOD
T3  MAIN BRANCH    HURON RIVER,ENCROACHED - MOW SOUNG CHENG, PROJECT MANAGER

J1  ICHECK    INQ       NINV      IDTR      STRT      METRIC    HVINS     Q         WSEL      FQ

     -10.       4.        0.        0.   .000000      .00       .0        0.   859.760     .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     3.000     .000    -1.000     .000      .000      .000      .000      .000      .000      .000

*PROF 3

CCHV=    .300 CEHV=    .500
*SECNO .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=     200.0     600.0  TYPE=     1  TARGET=     400.000

         VS    A          CORPORATE LIMIT, FROM HAMBURG TWP FIS SECTION 80.925

     .00      9.96    859.76      .00    859.76    859.77      .01       .00       .00    855.00
    1680.      49.      977.     654.     159.      842.     1298.       0.        0.     854.30
     .00      .31      1.16      .50      .100      .040      .070      .000    849.80    200.00
  .000066      0.        0.       0.        0         0         0       .00     400.00    600.00


*SECNO 1500.000

         VS    B JA 1

  1500.00     8.72    859.92      .00       .00    859.97      .06       .18       .02    856.20
    1680.     324.     1304.     52.      719.      596.      77.       60.       14.     856.30
     .22      .45      2.19      .68      .100      .045      .070      .046    851.20     28.33
  .000301    1300.     1500.    1400.       2         0         0       .00     464.62    492.95


*SECNO 3090.000

3265 DIVIDED FLOW


         VS    C JA 2

  3090.00     9.04    860.44      .00       .00    860.51      .07       .53       .01    856.00
    1680.     476.     1162.     42.      812.      457.      68.      107.       30.     856.90

     .45      .59      2.54      .62      .100      .045      .070      .046    851.40     53.63
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*SECNO 4280.000

3470 ENCROACHMENT STATIONS=      400.0     1300.0  TYPE=      1  TARGET=      900.000

          VS    D JA 2A

  4280.00     10.37    860.67       .00       .00    860.67       .01       .14       .02    856.20
    1680.      588.      642.      451.     2133.      665.     1181.      184.       50.    856.20
     1.05       .28       .96       .38      .100      .045      .070      .045    850.30    400.00
 .000053     1500.     1190.      800.         2         0         0       .00    900.00   1300.00


*SECNO 5790.000
3280 CROSS SECTION    5790.00 EXTENDED       4.12 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=      300.0     1250.0  TYPE=      1  TARGET=      950.000

          VS    E JA 3

  5790.00      7.82    860.72       .00       .00    860.72       .00       .05       .00    856.90
    1680.       28.      453.     1200.      187.      587.     3307.      268.       68.    857.30
     1.67       .15       .77       .36      .100      .045      .070      .049    852.90    302.12
 .000042      500.     1510.      940.         2         0         0       .00    947.88   1250.00


*SECNO 7830.000

3470 ENCROACHMENT STATIONS=      650.0     1050.0  TYPE=      1  TARGET=     -650.000

          VS    F JA 4

  7830.00      8.65    860.85       .00       .00    860.90       .05       .15       .02    857.20
    1680.      364.     1175.      142.      696.      547.      196.      365.       92.    857.40
     1.95       .52      2.15       .72      .100      .045      .070      .050    852.20    650.00
 .000298     2200.     2040.     1200.         2         0         0       .00    395.09   1045.09


*SECNO 9040.000

3470 ENCROACHMENT STATIONS=      800.0     1020.0  TYPE=      1  TARGET=      220.000

          VS    G JA 5

  9040.00      8.83    861.23       .00       .00    861.30       .07       .39       .01    858.00
    1680.      272.     1372.       36.      417.      592.       50.      397.      100.    857.90
     2.11       .65      2.32       .71      .100      .045      .080      .050    852.40    800.00
 .000380      900.     1210.     1500.         2         0         0       .00    220.00   1020.00


*SECNO 9340.000
  9340.00      7.83    861.33       .00       .00    861.55       .22       .18       .08    859.20
    1680.        0.     1680.        0.        1.      445.        0.      401.      101.    863.50
     2.14       .32      3.77       .00      .100      .045      .080      .050    853.50    598.85

 .001182      200.      300.      300.         1         0         0       .00     70.45    669.30
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*SECNO 9341.000

3370 NORMAL BRIDGE,NRD= 15 MIN ELTRD=  864.00 MAX ELLC=  863.50

          BS   H JA 6     PICKETT ROAD BRIDGE

  9341.00      7.83   861.33      .00      .00   861.55      .22      .00      .00   866.40
    1680.        0.    1680.       0.       0.     446.       0.     401.     101.   867.00
     2.14       .00     3.77      .00     .100     .022     .080     .050   853.50   600.00
 .000304        1.       1.       1.        0        0        0      .00    69.30   669.30

*SECNO 9374.000
   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=  864.00 MAX ELLC=  863.50

  9374.00      7.85   861.35      .00      .00   861.56      .22      .01      .00   866.40
    1680.        0.    1680.       0.       0.     447.       0.     402.     101.   867.00
     2.14       .00     3.76      .00     .100     .022     .080     .049   853.50   600.00
 .000301       33.      33.      33.        1        0        0      .00    69.31   669.31

*SECNO 9375.000
  9375.00      7.85   861.35      .00      .00   861.57      .22      .00      .00   859.20
    1680.        0.    1680.       0.       1.     446.       0.     402.     101.   863.50
     2.14       .33     3.77      .00     .100     .045     .080     .049   853.50   598.84
 .001177        1.       1.       1.        0        0        0      .00    70.46   669.31

*SECNO 11100.000

3470 ENCROACHMENT STATIONS=      500.0    1100.0  TYPE=     1  TARGET=    -500.000

          VS   I JA 7

 11100.00      9.15   862.45      .00      .00   862.50      .05      .88      .05   860.30
    1680.      215.    1127.     338.     492.     519.     459.     438.     110.   858.80
     2.42       .44     2.17      .74     .100     .045     .080     .049   853.30   652.60
 .000289     1480.    1725.    1700.        2        0        0      .00   442.34  1094.94

*SECNO 12960.000

3470 ENCROACHMENT STATIONS=         .0    1100.0  TYPE=     1  TARGET=    1099.999

          VS   J JA 8

 12960.00      9.17   862.87      .00      .00   862.90      .03      .39      .01   859.00
    1680.       99.     908.     673.     214.     549.    1033.     502.     126.   858.70
     2.85       .46     1.65      .65     .080     .045     .070     .048   853.70   647.92
 .000169      800.    1860.    2000.        2        0        0      .00   452.07  1100.00

*SECNO 14200.000

3470 ENCROACHMENT STATIONS=         .0     380.0  TYPE=     1  TARGET=     379.999
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          VS   K JA 9

  14200.00      8.59    863.09       .00       .00    863.12       .03       .22       .00    860.30
     1680.        1.     1050.      629.        4.      642.     1038.      550.      137.    859.30
      3.12       .29      1.64       .61      .070      .045      .080      .048    854.50     11.15
   .000184     1250.     1240.     1200.         2         0         0       .00    368.85    380.00


 *SECNO 14970.000
    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS   BANK ELEV
    Q         OLOB      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=        .0      130.0  TYPE=      1  TARGET=      129.999

          VS   L JA 10

  14970.00      8.67    863.27       .00       .00    863.42       .15       .25       .06    861.00
     1680.        3.     1320.      357.        4.      383.      267.      568.      141.    859.10
      3.19       .60      3.44      1.34      .070      .045      .080      .048    854.60      9.11
   .000829      950.      770.      600.         2         0         0       .00    120.89    130.00


 *SECNO 15099.000

 3470 ENCROACHMENT STATIONS=      500.0      571.0  TYPE=      1  TARGET=       71.000
  15099.00      7.87    863.37       .00       .00    863.54       .17       .11       .01    869.30
     1680.        0.     1680.        0.        0.      507.        0.      570.      141. 100000.00
      3.20       .00      3.32       .00      .070      .045      .080      .048    855.50    500.00
   .000922      120.      129.       90.         2         0         0       .00     71.00    571.00


 *SECNO 15100.000

 3370 NORMAL BRIDGE,NRD= 15 MIN ELTRD=  868.90 MAX ELLC=  863.90


          BS   M JA 11    OLD US 23

  15100.00      7.87    863.37       .00       .00    863.54       .17       .00       .00    869.30
     1680.        0.     1680.        0.        0.      507.        0.      570.      141.    869.20
      3.20       .00      3.32       .00      .040      .022      .040      .048    855.50    500.00
   .000267        1.        1.        1.         0         0         0       .00     71.00    571.00


 *SECNO 15146.000

 3370 NORMAL BRIDGE,NRD= 15 MIN ELTRD=  868.90 MAX ELLC=  863.90

  15146.00      7.89    863.39       .00       .00    863.56       .17       .01       .00    869.30
     1680.        0.     1680.        0.        0.      508.        0.      570.      141.    869.20
      3.20       .00      3.31       .00      .040      .022      .040      .048    855.50    500.00
   .000265       46.       46.       46.         1         0         0       .00     71.00    571.00


 *SECNO 15147.000

 3470 ENCROACHMENT STATIONS=      500.0      571.0  TYPE=      1  TARGET=       71.000
  15147.00      7.89    863.39       .00       .00    863.56       .17       .00       .00    869.30
     1680.        0.     1680.        0.        0.      508.        0.      570.      141. 100000.00

      3.20       .00      3.31       .00      .040      .022      .040      .048    855.50    500.00
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 ........        1.        1.        1.        0        0        0      .00     71.00    371.00

*SECNO 15229.000
   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    TDC       ICONT     CORAR     TOPWID     ENDST


3470 ENCROACHMENT STATIONS=      400.0      479.9  TYPE=      1  TARGET=      79.900
 15229.00      7.86    863.46       .00       .00    863.58       .12       .01       .01    868.90
    1680.        0.     1680.        0.        0.     594.        0.      572.      141. 100000.00
     3.21       .00      2.83       .00      .040      .022      .040      .048    855.60    400.00
  .000148       82.       82.       82.         2         0         0       .00     79.90    479.90

*SECNO 15230.000

3265 DIVIDED FLOW


3370 NORMAL BRIDGE,NRD= 17 MIN ELTRD=  868.80 MAX ELLC=  866.10


          BS    N JA 12     US 23

 15230.00      7.85    863.45       .00       .00    863.59       .13       .00       .00    868.90
    1680.        0.     1680.        0.        0.     572.        0.      572.      141.    868.90
     3.21       .00      2.94       .00      .040      .022      .040      .048    855.60    400.00
  .000233        1.        1.        1.         0         0         0       .00     77.10    479.90


*SECNO 15282.000

3265 DIVIDED FLOW


3370 NORMAL BRIDGE,NRD= 17 MIN ELTRD=  868.80 MAX ELLC=  866.10

 15282.00      7.87    863.47       .00       .00    863.60       .13       .01       .00    868.90
    1680.        0.     1680.        0.        0.     573.        0.      572.      141.    868.90
     3.21       .00      2.93       .00      .040      .022      .040      .048    855.60    400.00
  .000232       52.       52.       52.         0         0         0       .00     77.10    479.90


*SECNO 15283.000

3470 ENCROACHMENT STATIONS=      400.0      479.9  TYPE=      1  TARGET=      79.900
 15283.00      7.88    863.48       .00       .00    863.60       .12       .00       .00    868.90
    1680.        0.     1680.        0.        0.     595.        0.      572.      141. 100000.00
     3.21       .00      2.82       .00      .040      .022      .040      .048    855.60    400.00
  .000147        1.        1.        1.         1         0         0       .00     79.90    479.90


*SECNO 15325.000

3470 ENCROACHMENT STATIONS=      400.0      479.9  TYPE=      1  TARGET=      79.900
 15325.00      7.89    863.49       .00       .00    863.61       .12       .01       .00    868.90
    1680.        0.     1680.        0.        0.     596.        0.      573.      141. 100000.00
     3.22       .00      2.82       .00      .040      .022      .040      .048    855.60    400.00
  .000147       42.       42.       42.         0         0         0       .00     79.90    479.90
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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     TTRIAL    TOC       ICONT     CORAR     TOPWID      ENDST


3370 NORMAL BRIDGE,NRD= 17 MIN ELTRD=  868.80 MAX ELLC=  866.10

 15326.00      7.88    863.48       .00       .00    863.62       .13       .00       .00    868.90
    1680.        0.     1680.        0.        0.     574.        0.      573.      141.    868.90
      3.22      .00      2.93       .00      .040      .022      .040      .046    855.60    400.00
  .000230       1.        1.        1.         0         0         0       .00     77.10    479.90

*SECNO 15372.000

3265 DIVIDED FLOW

3370 NORMAL BRIDGE,NRD= 17 MIN ELTRD=  868.80 MAX ELLC=  866.10

 15372.00      7.89    863.49       .00       .00    863.63       .13       .01       .00    868.90
    1680.        0.     1680.        0.        0.     575.        0.      573.      142.    868.90
      3.22      .00      2.92       .00      .040      .022      .040      .048    855.60    400.00
  .000230      46.       46.       46.         0         0         0       .00     77.10    479.90

*SECNO 15373.000

3470 ENCROACHMENT STATIONS=      400.0      479.9  TYPE=      1  TARGET=      79.900
 15373.00      7.91    863.51       .00       .00    863.63       .12       .00       .00    868.90
    1680.        0.     1680.        0.        0.     597.        0.      573.      142. 100000.00
      3.22      .00      2.81       .00      .040      .045      .040      .048    855.60    400.00
  .000610       1.        1.        1.         1         0         0       .00     79.90    479.90


*SECNO 15439.000

3470 ENCROACHMENT STATIONS=      300.0      379.9  TYPE=      1  TARGET=      79.900
 15439.00      8.46    863.56       .00       .00    863.67       .11       .04       .00    869.30
    1680.        0.     1680.        0.        0.     642.        0.      574.      142. 100000.00
      3.23      .00      2.62       .00      .040      .045      .040      .048    855.10    300.00
  .000480      66.       66.       66.         2         0         0       .00     79.90    379.90


*SECNO 15440.000

3265 DIVIDED FLOW

3370 NORMAL BRIDGE,NRD= 12 MIN ELTRD=  867.60 MAX ELLC=  866.80

          BS    0 JA 13    FIELDCREST DRIVE

 15440.00      8.46    863.56       .00       .00    863.67       .11       .00       .00    869.30
    1680.        0.     1680.        0.        0.     620.        0.      574.      142.    869.10
      3.23      .00      2.71       .00      .040      .022      .040      .048    855.10    300.00
  .000180       1.        1.        1.         0         0         0       .00     77.10    379.90
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*SECNO 15473.000

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    IOC       ICONT     CORAR     TOPWID      ENDST

3370 NORMAL BRIDGE,NRD= 12 MIN ELTRD=  867.60 MAX ELLC=  866.80

 15473.00      8.47    863.57       .00       .00    863.68       .11       .01       .00    869.30
     1680.       0.     1680.       0.        0.      620.       0.       575.      142.    869.10
      3.23      .00      2.71      .00      .040      .022      .040      .048    855.10    300.00
   .000180      33.       33.       33.        0         0         0       .00     77.10    379.90

*SECNO 15474.000

3470 ENCROACHMENT STATIONS=      300.0      379.9  TYPE=      1  TARGET=      79.900
 15474.00      8.48    863.58       .00       .00    863.68       .11       .00       .00    869.30
     1680.       0.     1680.       0.        0.      643.       0.       575.      142. 100000.00
      3.23      .00      2.61      .00      .080      .045      .080      .048    855.10    300.00
   .000479       1.        1.        1.        1         0         0       .00     79.90    379.90

*SECNO 16570.000

3470 ENCROACHMENT STATIONS=      200.0      800.0  TYPE=      1  TARGET=     600.000

          VS    P JA 14     DOWNSTREAM FROM DAVIS CREEK

 16570.00      9.29    863.89       .00       .00    863.90       .01       .19       .03    859.00
     1680.     142.      652.      885.      339.      527.     1906.      617.      150.    859.50
      3.63      .42      1.24      .46      .080      .045      .080      .047    854.60    200.00
   .000091     996.     1096.     1096.        2         0         0       .00    600.00    800.00

*SECNO 18010.000

          VS    Q JA 15     UPSTREAM FROM DAVIS CREEK

 18010.00      8.70    864.00       .00       .00    864.01       .01       .10       .00    860.00
     1160.     183.      603.      374.      510.      575.     1015.      684.      165.    860.30
      4.12      .36      1.05      .37      .080      .045      .080      .048    855.30     61.56
   .000070    1500.     1440.     1000.        2         0         0       .00    534.41    595.97

*SECNO 19210.000

          VS    R JA 16

 19210.00      9.19    864.09       .00       .00    864.11       .02       .10       .00    860.30
     1160.     508.      584.      67.      1140.      436.      151.      731.      177.    860.50
      4.46      .45      1.34      .45      .080      .045      .080      .048    854.90    179.27
   .000112    1100.     1200.     900.        0         0         0       .00    446.38    625.66

*SECNO 20620.000
     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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 ---  -   ALOB    ACH     AROB    ITRIAL  IDC     ICONT   CORAR   TOPWID  ENDST

3470 ENCROACHMENT STATIONS=        .0      700.0  TYPE=     1  TARGET=     699.999

          VS    S JA 17

 20620.00      9.39   864.19      .00      .00   864.20      .01      .09      .00   860.30
    1160.       16.     438.     707.      74.     487.    2095.     784.     190.   859.60
     5.06      .21      .90      .34     .080     .045     .080     .048   854.80    56.94
  .000054    1300.    1410.     800.        0        0        0      .00   643.06   700.00

*SECNO 21960.000

          VS    T JA 18

 21960.00      8.88   864.28      .00      .00   864.30      .02      .09      .01   860.60
    1160.      570.     585.       4.    1206.     380.      14.     833.     202.   860.40
     5.36      .47     1.54      .32     .080     .045     .080     .048   855.40    88.56
  .000149      900.    1340.     900.        0        0        0      .00   466.50   555.05

*SECNO 23400.000

3470 ENCROACHMENT STATIONS=        .0      150.0  TYPE=     1  TARGET=     149.999

          VS    U JA 19

 23400.00      9.67   864.57      .00      .00   864.66      .09      .33      .04   861.20
    1160.       26.    1015.     119.      49.     392.     149.     868.     212.   861.20
     5.53      .53     2.59      .80     .080     .045     .080     .048   854.90    28.71
  .000410    1400.    1440.    1400.        2        0        0      .00   121.29   150.00

*SECNO 23649.000

3470 ENCROACHMENT STATIONS=        .0      300.0  TYPE=     1  TARGET=     299.999
 23649.00      7.77   864.67      .00      .00   864.87      .20      .15      .05   859.50
    1160.        2.    1157.       1.       4.     321.       3.     871.     212.   861.20
     5.55      .44     3.60      .46     .080     .045     .080     .048   856.90   198.64
  .000972      249.     249.     249.        2        0        0      .00    50.90   249.54

*SECNO 23650.000

3370 NORMAL BRIDGE,NRD= 15 MIN ELTRD=  863.90 MAX ELLC=  867.50

3470 ENCROACHMENT STATIONS=        .0      300.0  TYPE=     1  TARGET=     299.999

          BS    V JA 20     MCCABE ROAD

 23650.00      7.77   864.67      .00      .00   864.87      .20      .00      .00   870.30
    1160.        0.    1160.       0.       0.     321.       0.     871.     212.   868.50
     5.55      .00     3.61      .00     .040     .022     .040     .048   856.90   200.00
  .000349        1.       1.       1.        0        0        0      .00    48.00   248.00

*SECNO 23673.000
   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
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3370 NORMAL BRIDGE,NRD= 15 MIN ELTRD=  863.90 MAX ELLC=  867.50

3470 ENCROACHMENT STATIONS=        .0      300.0  TYPE=     1  TARGET=     299.999
 23673.00      7.78   864.68      .00       .00   864.88      .20       .01       .00   870.30
    1160.        0.     1160.       0.        0.     322.       0.      871.      212.   868.50
      5.55       .00     3.60      .00      .040     .022     .040      .048    856.90   200.00
   .000347       23.      23.      23.         0        0        0       .00     48.00   248.00

*SECNO 23674.000

3470 ENCROACHMENT STATIONS=        .0      300.0  TYPE=     1  TARGET=     299.999
 23674.00      7.78   864.68      .00       .00   864.88      .20       .00       .00   859.50
    1160.        2.     1157.       1.        4.     322.       3.      871.      212.   861.20
      5.55       .44     3.60      .46      .080     .045     .080      .048    856.90   198.64
   .000968        1.       1.       1.         0        0        0       .00     50.91   249.55

*SECNO 24330.000

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS=        .0     1232.0  TYPE=     1  TARGET=    1231.999

          VS    W JA 21

 24330.00      7.74   865.04      .00       .00   865.04      .01       .10       .06   861.40
    1160.       597.     442.     121.      1529.     476.     431.      889.      218.   863.40
      5.85       .39      .93      .28      .080     .045     .050      .048    857.30   212.09
   .000067      560.     656.     520.         2        0        0       .00    810.56  1232.00

*SECNO 25110.000

          VS    X JA 22

 25110.00      8.67   865.07      .00       .00   865.07      .00       .03       .00   861.60
    1120.        8.      332.     780.       39.     518.    3215.      940.      232.   861.60
      6.41       .21      .64      .24      .080     .045     .070      .048    856.40     1.36
   .000027      780.     780.     650.         2        0        0       .00   1067.64  1069.00

*SECNO 27960.000

3470 ENCROACHMENT STATIONS=      700.0     2000.0  TYPE=     1  TARGET=    1300.000

          VS    Y JA 23

 27960.00      9.52   865.12      .00       .00   865.12      .00       .04       .00   864.30
    1120.        1.      256.     863.       17.     464.    4040.     1114.      279.   861.50
      8.32       .05      .55      .21      .070     .041     .070      .049    855.60   757.09
   .000019     1100.    2850.    1700.         2        0        0       .00   1242.91  2000.00

*SECNO 30760.000
    SECNO     DEPTH     CWSEL     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
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          VS   Z JA 24

 30760.00      6.59    865.19       .00       .00    865.26       .07       .11       .03    863.00
    1120.      321.      799.        0.      534.      327.        1.      1225.      310.    864.00
      8.63       .60      2.44       .21      .080      .042      .080      .049    858.60    115.18
  .000492      1000.     2800.     1700.         2         0         0       .00    415.76    530.94

 *SECNO 31370.000

 3470 ENCROACHMENT STATIONS=      400.0      740.0  TYPE=      1  TARGET=     -400.000

          VS   AA JA 25

 31370.00      6.85    865.45       .00       .00    865.52       .07       .26       .00    862.80
    1120.      229.      870.       22.      386.      368.       32.      1235.      314.    862.30
      8.71       .59      2.36       .68      .080      .042      .080      .049    858.60    400.00
  .000413      500.      610.      700.         2         0         0       .00    274.38    674.38

 *SECNO 32300.000

 3265 DIVIDED FLOW

          VS   AB JA 26

 32300.00      6.83    865.73       .00       .00    865.76       .03       .22       .01    863.40
    1120.      128.      869.      123.      326.      545.      302.      1252.      319.    863.10
      8.89       .39      1.60       .41      .080      .042      .080      .049    858.90    150.13
  .000177      600.      930.      650.         2         0         0       .00    428.46    712.77

 *SECNO 32830.000

 3265 DIVIDED FLOW

 3470 ENCROACHMENT STATIONS=      150.0     1060.0  TYPE=      1  TARGET=     -150.000

          VS   AC JA 27

 32830.00      6.62    865.82       .00       .00    865.84       .02       .08       .00    863.60
    1120.      184.      736.      200.      535.      610.      640.      1271.      327.    863.70
      9.06       .34      1.21       .31      .080      .042      .080      .049    859.20    150.00
  .000120      400.      530.      700.         2         0         0       .00    703.64    997.00

 *SECNO 33630.000

 3470 ENCROACHMENT STATIONS=      950.0     1200.0  TYPE=      1  TARGET=      250.000

          VS   AD JA 28

 33630.00      6.65    865.95       .00       .00    866.04       .09       .17       .04    864.20
    1120.      112.      941.       67.      206.      362.       96.      1290.      334.    863.70
      9.15       .54      2.60       .69      .080      .042      .080      .049    859.30    950.00
  .000527      700.      800.      500.         2         0         0       .00    250.00   1200.00

 *SECNO 33919.000
    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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     SLOPE     XLOBL     XLCH     XLOBR    ITRIAL     TDC      ICONT    CORAR    TOPWID    ENDST

  33919.00      7.49   866.09       .00       .00   866.34       .25      .22       .08   869.80
      1120.        0.   1118.        2.        0.    280.        3.    1293.      334.   862.30
       9.17       .00     4.00       .54      .080     .042      .080     .049   858.60   700.00
   .001199      280.     289.      210.         2        0         0      .00    43.37   743.37

 *SECNO 33920.000

          BS  AE JA 29   DRIVEWAY BRIDGE

  33920.00      7.49   866.09       .00       .00   866.34       .25      .00       .00   869.80
      1120.        0.   1119.        1.        0.    280.        3.    1293.      334.   862.30
       9.17       .00     4.00       .45      .050     .022      .050     .049   858.60   700.00
   .000329        1.       1.        1.         0        0         0      .00    43.37   743.37


 SPECIAL BRIDGE

 SB   XK        XKOR      COFQ     RDLEN      BWC      BWP     BAREA      SS     ELCHU    ELCHD
       .00        1.41      3.02       .00    37.39      .00    280.42     .00    858.60   858.60

 *SECNO 33961.000
 PRESSURE FLOW


  EGPRS     EGLWC       H3     QWEIR      QPR     BAREA  TRAPEZOID     ELLC     ELTRD
                                                            AREA
  866.44    866.34      .00        0.    1120.     280.     280.    866.10    869.50


  33961.00      7.60   866.20       .00       .00   866.44       .24      .10       .00   869.80
      1120.        0.   1119.        1.        0.    284.        3.    1293.      335.   862.30
       9.17       .00     3.93       .45      .050     .022      .050     .049   858.60   700.00
   .000313       41.      41.       41.         2        0         0      .00    43.42   743.42


 *SECNO 33962.000
  33962.00      7.60   866.20       .00       .00   866.44       .24      .00       .00   869.80
      1120.        0.   1118.        2.        0.    284.        3.    1293.      335.   862.30
       9.17       .00     3.93       .57      .060     .045      .080     .049   858.60   700.00
   .001307        1.       1.        1.         0        0         0      .00    43.42   743.42


 *SECNO 34740.000

 3470 ENCROACHMENT STATIONS=        .0    1800.0  TYPE=      1  TARGET=     1799.999

          VS  AF JA 30

  34740.00      8.27   866.57       .00       .00   866.58       .00      .06       .07   863.00
      1120.       347.     444.      329.      1255.    762.      1623.    1324.      344.   862.50
       9.71       .28      .58       .20      .060     .045      .080     .049   856.30   661.25
   .000029       530.     778.      730.         2        0         0      .00  1138.75  1800.00


 *SECNO 37250.000
    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    TDC      ICONT    CORAR    TOPWID    ENDST
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3470 ENCROACHMENT STATIONS=        .0     1500.0  TYPE=     1  TARGET=     1499.999

          VS  AG JA 31

 37250.00      6.34   866.64      .00      .00   866.64      .00      .06      .00   863.30
    1120.      410.     385.     325.    1348.     580.    1383.    1466.     387.   863.20
    11.00       .30      .66      .24     .060     .045     .080     .049   860.30   403.19
  .000039     1100.    2510.    2050.        2        0        0      .00  1096.81  1500.00

 *SECNO 39670.000

          VS  AH JA 32

 39670.00      6.68   866.78      .00      .00   866.81      .03      .15      .01   864.00
    1120.      124.     713.     283.     236.     431.     655.    1550.     416.   864.40
    11.43       .52     1.65      .43     .060     .045     .080     .050   860.10   152.17
  .000250     1600.    2420.    1150.        2        0        0      .00   645.22   797.40

 *SECNO 42170.000

 3470 ENCROACHMENT STATIONS=      700.0     1400.0  TYPE=     1  TARGET=      700.000

          VS  AI JA 33

 42170.00      5.83   867.33      .00      .00   867.35      .02      .54      .00   865.10
    1120.      267.     597.     255.     453.     368.     576.    1601.     438.   865.10
    11.94       .59     1.62      .44     .060     .045     .080     .050   861.50   700.00
  .000292     1600.    2500.    1100.        2        0        0      .00   700.00  1400.00

 *SECNO 43250.000

 3470 ENCROACHMENT STATIONS=        .0      250.0  TYPE=     1  TARGET=      249.999

          VS  AJ JA 34

 43250.00      5.57   867.77      .00      .00   867.88      .11      .49      .04   866.90
    1120.        0.     997.     123.       1.     350.     191.    1621.     447.   866.60
    12.04       .38     2.85      .64     .060     .045     .080     .050   862.20    10.84
  .000986      800.    1080.     800.        2        0        0      .00   239.16   250.00

 *SECNO 43544.000
 43544.00      6.61   868.11      .00      .00   868.33      .22      .39      .06   891.80
    1120.        0.    1120.       0.       0.     295.       0.    1624.     448.   892.00
    12.06       .00     3.79      .00     .060     .045     .080     .050   861.50   348.89
  .001922      300.     294.     260.        2        0        0      .00    67.11   415.99

 *SECNO 43545.000
    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

 3370 NORMAL BRIDGE,NRD= 17 MIN ELTRD=  891.80 MAX ELLC=  885.60
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 43545.00      6.61    868.11       .00       .00    868.33       .22       .00       .00    891.80
    1120.        0.      1120.        0.        0.      295.        0.     1624.      448.    892.00
    12.06       .00      3.79       .00      .050      .022      .050      .050    861.50    348.88
  .000459        1.        1.        1.         0         0         0       .00     67.12    415.99


 *SECNO 43554.000

 3370 NORMAL BRIDGE,NRD= 17 MIN ELTRD=  891.80 MAX ELLC=  885.60

 43554.00      6.61    868.11       .00       .00    868.33       .22       .00       .00    891.80
    1120.        0.      1120.        0.        0.      296.        0.     1624.      448.    892.00
    12.06       .00      3.78       .00      .050      .022      .050      .050    861.50    348.80
  .000456        9.        9.        9.         0         0         0       .00     67.22    416.02


 *SECNO 43555.000
 43555.00      6.61    868.11       .00       .00    868.34       .22       .00       .00    891.80
    1120.        0.      1120.        0.        0.      296.        0.     1624.      448.    892.00
    12.06       .00      3.79       .00      .060      .045      .080      .050    861.50    348.84
  .001915        1.        1.        1.         0         0         0       .00     67.17    416.01


 *SECNO 43970.000

 3470 ENCROACHMENT STATIONS=        .0      250.0  TYPE=     1  TARGET=     249.999

          VS  AL JA 36

 43970.00      7.22    868.62       .00       .00    868.67       .06       .29       .05    866.70
    1120.       16.       956.      147.       31.      454.      278.     1629.      450.    866.70
    12.12       .53      2.11       .53      .080      .045      .080      .050    861.40     12.97
  .000361      480.      415.      380.         0         0         0       .00    237.02    250.00


 *SECNO 45129.000

 3265 DIVIDED FLOW

 45129.00      6.22    869.12       .00       .00    869.20       .08       .51       .01    872.00
    1120.      174.       946.        0.      345.      388.        1.     1646.      456.    866.20
    12.27       .50      2.44       .23      .080      .045      .080      .050    862.90    246.95
  .000635      850.     1159.      600.         2         0         0       .00    407.44    723.13


 *SECNO 45130.000

 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    TDC       ICONT     CORAR    TOPWID     ENDST


 3370 NORMAL BRIDGE,NRD= 18 MIN ELTRD=  867.80 MAX ELLC=  869.30

          BS  AM JA 37   SUTHERLAND ROAD

 45130.00      6.22    869.12       .00       .00    869.20       .09       .00       .00    872.00

    1120.      163.       957.        0.      347.      373.        0.     1646.      456.    872.60
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 .000213      1.      1.      1.       0       0       0     -.07   404.31   722.40

*SECNO 45148.000

3265 DIVIDED FLOW

3370 NORMAL BRIDGE,NRD= 18 MIN ELTRD=  867.80 MAX ELLC=  869.30

 45148.00    6.22  869.12     .00     .00  869.21     .09     .00     .00  872.00
    1120.     164.    956.      0.    348.    373.      0.   1646.    456.   872.60
    12.27     .47    2.56     .00    .050    .020    .050    .050  862.90  246.66
 .000215      18.     18.     18.       0       0       0    -.10   404.45  722.40


*SECNO 45149.000

3265 DIVIDED FLOW

 45149.00    6.23  869.13     .00     .00  869.21     .08     .00     .00  872.00
    1120.     176.    944.      0.    349.    389.      1.   1646.    456.   866.20
    12.27     .50    2.43     .23    .080    .045    .080    .050  862.90  246.58
 .000626      1.      1.      1.       1       0       0     .00   408.14  723.13


*SECNO 46760.000

        VS  AN JA 38

 46760.00    6.64  869.94     .00     .00  869.99     .05     .77     .01  867.30
    1120.     245.    799.     76.    417.    382.    131.   1675.    469.   867.30
    12.53     .59    2.09     .58    .080    .045    .080    .050  863.30   57.53
 .000396    1450.   1611.   1300.       2       0       0     .00   344.89  402.43


*SECNO 48160.000

        VS  AO JA 39

 48160.00    7.29  870.39     .00     .00  870.43     .04     .43     .00  867.20
    1120.     413.    671.     35.    637.    359.     76.   1701.    477.   868.00
    12.78     .65    1.87     .46    .080    .045    .080    .050  863.10  135.58
 .000306     900.   1400.   1200.       2       0       0     .00   357.10  492.69


*SECNO 49545.000
    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS   BANK ELEV
    Q         OLOB      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


        VS  AP JA 40

 49545.00   10.62  870.62     .00     .00  870.64     .02     .20     .01  867.60
     850.     197.    651.      1.    524.    533.      7.   1731.    486.   868.20
    13.14     .38    1.22     .21    .070    .045    .070    .050  860.00  104.71
 .000083    1100.   1385.   1500.       2       0       0     .00   261.11  365.83


*SECNO 50735.000
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- - - - - - STATIONS=        .0      550.0  TYPE=      1  TARGET=      629.999

          VS  AO JA 41

 50735.00      7.14    870.74       .00       .00    870.75       .01       .11       .00    867.60
     850.       353.      461.       37.      888.      362.       78.      1758.      493.    867.50
     13.48       .40      1.27       .47      .080      .045      .070      .050    863.60    331.37
  .000138       850.     1190.      800.         2         0         0       .00    460.63    792.01

 *SECNO 53335.000

 3470 ENCROACHMENT STATIONS=        .0     1100.0  TYPE=      1  TARGET=     1099.999

          VS  AR JA 42

 53335.00      8.22    870.92       .00       .00    870.93       .01       .18       .00    867.30
     850.        36.      389.      425.      165.      437.     1122.      1818.      510.    867.50
     14.39       .22       .89       .38      .080      .045      .070      .050    862.70    609.28
  .000062      1400.     2600.     1400.         1         0         0       .00    490.72   1100.00

 *SECNO 55645.000

 3470 ENCROACHMENT STATIONS=      400.0      700.0  TYPE=      1  TARGET=     -400.000

          VS  AS JA 43

 55645.00      6.52    871.12       .00       .00    871.15       .03       .21       .01    868.90
     850.       168.      670.       12.      327.      411.       21.      1865.      523.    867.90
     14.78       .52      1.63       .57      .070      .045      .060      .050    864.60    421.89
  .000238      1500.     2310.     1200.         2         0         0       .00    260.33    682.22

 *SECNO 57005.000

 3470 ENCROACHMENT STATIONS=        .0      365.0  TYPE=      1  TARGET=      364.999

          VS  AT JA 44

 57005.00      7.28    871.38       .00       .00    871.40       .02       .25       .00    868.90
     850.        18.      738.       94.       46.      555.      171.      1889.      531.    867.90
     15.09       .39      1.33       .55      .060      .045      .060      .050    864.10    180.94
  .000140      1400.     1360.     1450.         2         0         0       .00    184.06    365.00

 *SECNO 57294.000
    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    TDC       ICONT     CORAR     TOPWID     ENDST

 57294.00      6.40    871.40       .00       .00    871.56       .17       .09       .07    877.80
     850.        0.      850.        0.        0.      260.        0.      1892.      531.    876.70
     15.11       .00      3.27       .00      .060      .045      .060      .050    865.00    372.00
  .001215       200.      289.      250.         2         0         0       .00     43.00    415.00

 *SECNO 57295.000

 3370 NORMAL BRIDGE,NRD= 20 MIN ELTRD=  873.20 MAX ELLC=  874.60

          BS  AU JA 45   KENSINGTON ROAD
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 57295.00      6.40    871.40      .00      .00    871.56      .17      .00      .00    877.80
     850.        0.      850.       0.       0.     260.       0.    1892.     531.     876.70
   15.11       .00      3.27      .00     .025      .022     .025     .050   865.00    372.00
 .000373        1.        1.       1.        0         0        0      .00    43.00    415.00


*SECNO 57333.000

3370 NORMAL BRIDGE,NRD= 20 MIN ELTRD=  873.20 MAX ELLC=  874.60

 57333.00      6.41    871.41      .00      .00    871.58      .16      .01      .00    877.80
     850.        0.      850.       0.       0.     261.       0.    1892.     531.     876.70
   15.12       .00      3.26      .00     .025      .022     .025     .050   865.00    372.00
 .000369       38.       38.      38.        1         0        0      .00    43.00    415.00


*SECNO 57334.000
 57334.00      6.41    871.41      .00      .00    871.58      .16      .00      .00    877.80
     850.        0.      850.       0.       0.     261.       0.    1892.     531.     876.70
   15.12       .00      3.26      .00     .150      .035     .150     .050   865.00    372.00
 .000729        1.        1.       1.        0         0        0      .00    43.00    415.00


*SECNO 57469.000

3470 ENCROACHMENT STATIONS=        .0     900.0  TYPE=     1  TARGET=     899.999
 57469.00      6.47    871.62      .00      .00    871.64      .02      .02      .04    865.15
     850.       50.      757.      44.     272.      629.     266.    1895.     532.     868.55
   15.15       .18      1.20      .17     .150      .035     .150     .050   865.15    330.81
 .000071      135.      135.     135.        2         0        0      .00   328.50    659.32


*SECNO 58005.000
    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=        .0     900.0  TYPE=     1  TARGET=     899.999

          VS  AV JA 45A

 58005.00      6.06    871.66      .00      .00    871.69      .02      .04      .00    865.60
     850.       46.      766.      38.     226.      588.     223.    1907.     535.     869.00
   15.27       .20      1.30      .17     .150      .035     .150     .050   865.60    344.03
 .000091      555.      536.     315.        2         0        0      .00   307.71    651.74


*SECNO 59225.000

          VS  AW JA 46

 59225.00      6.30    871.80      .00      .00    871.84      .04      .14      .01    868.90
     850.       33.      813.       4.     210.      501.      24.    1927.     541.     869.00
   15.48       .16      1.62      .16     .150      .035     .150     .050   865.50    933.84
 .000161      700.     1220.     450.        2         0        0      .00   329.72   1263.56


*SECNO 61035.000

          VS  AX JA 47
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     850.      1.    820.     29.      5.    513.    175.   1953.    549.   869.50
   15.80     .13    1.60     .17    .150    .035    .150    .049  866.40    35.87
  .000162   700.   1810.   1300.       2       0       0     .00  245.54   281.42


*SECNO 62125.000

          VS  AY JA 48

 62125.00    5.39  872.29     .00     .00  872.35     .06     .22     .01  869.90
     850.      6.    828.     17.     23.    433.     86.   1967.    554.   869.60
   15.96     .24    1.91     .19    .150    .035    .150    .049  866.90    36.60
  .000252  1150.   1090.    800.       2       0       0     .00  173.18   209.78


*SECNO 62745.000

          VS  AZ JA 49

 62745.00    4.79  872.49     .00     .00  872.59     .10     .22     .02  871.40
     850.      3.    846.      1.     17.    340.      7.   1974.    556.   871.30
   16.03     .15    2.49     .16    .150    .035    .150    .049  867.70   119.69
  .000537   600.    620.    500.       2       0       0     .00  125.22   244.91


*SECNO 62925.000
    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


 62925.00    4.81  872.61     .00     .00  872.67     .06     .07     .01  888.00
     850.      0.    850.      0.      0.    428.      0.   1975.    556.   888.00
   16.06     .00    1.98     .00    .150    .035    .150    .049  867.80   104.00
  .000312   180.    180.    180.       2       0       0     .00   90.00   194.00


SPECIAL BRIDGE

SB   XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
       .00      5.00      3.30       .00       .01       .00       .00       .00     867.40    867.80

*SECNO 62945.000
PRESSURE AND WEIR FLOW

 EGPRS      EGLWC      H3       QWEIR     QPR       BAREA    TRAPEZOID      ELLC      ELTRD
                                                             AREA
#########   872.27     .00      850.       0.        0.        0.       867.91    884.00


          DS  BA JA 50 KENT LAKE DAM

 62945.00   18.61  886.01     .00     .00  886.02     .00   13.35     .00  888.00
     850.      0.    850.      0.      0.   1675.      0.   1976.    556.   888.00
   16.07     .00     .51     .00    .040    .015    .040    .049  867.40   104.00
  .000001    20.     20.     20.       0       0      10     .00   90.00   194.00
```

00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: GREEN OAK ~~FOW~~ TWP

3) WATERCOURSE: HURON RIVER

4) DOCUMENT TYPE: 100-YEAR NATURAL

00BREAK00

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**************************************************
 HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
 ERROR CORR -  01,02,03
 MODIFICATION -  50,51,52,53
**************************************************


C
T1  GREEN OAK TWP, LIVINGSTON CO.,MICHIGAN
T2  100-YEAR FLOOD              FILE: HURONHEC
T3  MAIN BRANCH    HURON RIVER - MOW SOUNG CHENG, PROJECT MANAGER

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

     -1.       2.        0.        0.     .000000     .00       .0        0.      859.730    .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSFCH     FN        ALLDC     IBW       CHNIM     ITRACE

    -1.000     .000    -1.000     .000      .000      .000      .000      .000      .000      .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    38.000   39.000   40.000   41.000   42.000   43.000    1.000    8.000   10.000   12.000


     3.000    4.000   25.000     .000      .000      .000      .000      .000      .000      .000

OT      1.000  1680.000     .000      .000      .000      .000      .000      .000      .000      .000
NC       .100     .070     .040      .300      .500      .000      .000      .000      .000      .000


        VS   A          CORPORATE LIMIT, FROM HAMBURG TWP FIS SECTION 80.925

X1       .000    18.000   235.000   345.000     .000      .000      .000      .000      .000      .000
GR    868.600      .000   862.600    10.000   860.000    35.000   856.200   135.000   855.000   235.000
GR    849.800   247.000   851.300   262.000   851.800   285.000   852.100   301.000   852.800   323.000
GR    853.300   333.000   853.800   340.000   854.300   345.000   854.400   445.000   856.000   705.000
GR    858.000   825.000   860.000   865.000   860.800   945.000     .000      .000      .000      .000
NC       .000     .000     .045      .000      .000      .000      .000      .000      .000      .000


        VS   B JA 1

X1    1500.000    19.000   380.000   458.000  1300.000  1400.000  1500.000     .000      .000      .000
GR    669.500      .000   860.000    25.000   858.600    80.000   858.000   180.000   857.500   280.000
GR    856.200   380.000   852.800   385.000   851.700   390.000   851.400   400.000   851.200   410.000
GR    851.200   420.000   851.300   430.000   852.900   440.000   853.300   450.000   856.300   458.000
GR    857.800   480.000   867.600   540.000   868.000   580.000   872.600   680.000     .000      .000


        VS   C JA 2

X1    3090.000    21.000   645.000   703.000  1430.000  1580.000  1590.000     .000      .000      .000
GR    873.100      .000   868.700    20.000   862.600    45.000   860.100    55.000   859.300   145.000
GR    859.300   220.000   865.100   245.000   868.100   270.000   865.900   345.000   859.100   445.000
GR    856.900   545.000   856.000   645.000   852.400   650.000   851.800   655.000   851.400   665.000
GR    851.900   675.000   852.200   685.000   852.800   695.000   856.900   703.000   860.800   745.000
GR    867.000   790.000     .000      .000      .000      .000      .000      .000      .000      .000


        VS   D JA 2A
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X1	4280.000	35.000	920.000	1000.000	1500.000	800.000	1190.000	.000	.000	.000
GR	876.800	.000	872.000	10.000	867.400	20.000	861.300	35.000	858.500	120.000
GR	857.600	220.000	856.900	320.000	856.900	420.000	856.800	520.000	856.600	620.000
GR	856.500	720.000	856.300	820.000	856.200	920.000	854.800	925.000	853.900	930.000
GR	852.600	940.000	852.100	950.000	851.400	960.000	851.800	970.000	851.300	980.000
GR	850.300	990.000	851.900	995.000	856.200	1000.000	856.500	1020.000	856.700	1120.000
GR	856.800	1220.000	857.200	1320.000	858.500	1395.000	865.400	1420.000	869.300	1520.000
GR	863.300	1620.000	863.000	1720.000	869.700	1770.000	.000	.000	.000	.000

VS E JA 3

X1	5790.000	28.000	400.000	482.000	500.000	940.000	1510.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	1500.000	.000	.000	.000	.000
GR	871.400	.000	862.000	70.000	861.600	100.000	860.200	200.000	860.800	300.000
GR	856.900	400.000	854.200	403.000	853.600	410.000	853.400	420.000	853.000	430.000
GR	853.600	440.000	853.900	450.000	852.900	460.000	853.200	470.000	853.800	480.000
GR	857.300	482.000	857.000	500.000	856.900	600.000	856.300	700.000	856.600	800.000
GR	856.200	900.000	855.900	1000.000	856.000	1100.000	856.400	1200.000	857.600	1300.000
GR	858.700	1400.000	857.100	1500.000	856.600	1600.000	.000	.000	.000	.000

VS F JA 4

X1	7830.000	22.000	900.000	973.000	2200.000	1200.000	2040.000	.000	.000	.000
GR	866.600	.000	865.300	100.000	864.100	200.000	863.000	300.000	861.900	400.000
GR	859.500	500.000	859.400	600.000	859.000	700.000	857.500	800.000	857.200	900.000
GR	854.100	905.000	853.300	910.000	852.700	920.000	852.400	930.000	852.200	940.000
GR	852.300	950.000	852.600	957.000	855.600	967.000	857.400	973.000	858.100	1000.000
GR	858.300	1040.000	863.300	1050.000	.000	.000	.000	.000	.000	.000
NC	.100	.080	.045	.000	.000	.000	.000	.000	.000	.000

VS G JA 5

X1	9040.000	24.000	920.000	1005.000	900.000	1500.000	1210.000	.000	.000	.000
X3	.000	.000	.000	800.000	.000	1020.000	.000	.000	.000	.000
GR	866.300	.000	865.000	100.000	862.800	200.000	861.500	300.000	861.500	400.000
GR	859.100	500.000	858.100	600.000	857.600	700.000	857.400	800.000	858.000	900.000
GR	858.000	920.000	856.100	930.000	854.900	940.000	853.900	950.000	852.700	960.000
GR	852.600	970.000	853.000	980.000	852.400	990.000	854.300	997.000	857.100	1000.000
GR	857.900	1005.000	857.500	1100.000	859.700	1195.000	865.700	1220.000	.000	.000

X1	9340.000	23.000	600.000	670.000	200.000	300.000	300.000	.000	.000	.000
GR	864.400	.000	864.100	100.000	864.100	200.000	864.000	300.000	864.300	400.000
GR	865.100	500.000	866.400	598.000	862.900	598.000	859.200	600.000	856.400	608.000
GR	853.800	616.000	853.800	623.000	853.900	631.000	853.600	638.000	853.500	645.000
GR	853.700	652.000	855.600	659.000	857.300	668.000	863.500	670.000	867.000	672.000
GR	868.400	750.000	869.500	800.000	872.300	900.000	.000	.000	.000	.000
NC	.000	.000	.022	.000	.000	.000	.000	.000	.000	.000

BS H JA 6 PICKETT ROAD BRIDGE

X1	9341.000	24.000	600.000	670.000	1.000	1.000	1.000	.000	.000	.000
BT	15.000	.000	864.400	.000	100.000	864.100	.000	200.000	864.100	.000
BT	300.000	864.000	.000	400.000	864.300	.000	500.000	865.100	.000	598.000
BT	866.400	.000	600.000	866.400	.000	600.000	866.400	862.900	670.000	867.000
BT	863.500	670.000	867.000	.000	672.000	867.000	.000	750.000	868.400	.000
BT	800.000	869.500	.000	900.000	872.300	.000	.000	.000	.000	.000
GR	864.400	.000	864.100	100.000	864.100	200.000	864.000	300.000	864.300	400.000
GR	865.100	500.000	866.400	598.000	866.400	600.000	859.200	600.000	856.400	608.000
GR	853.800	616.000	853.800	623.000	853.900	631.000	853.600	638.000	853.500	645.000
GR	853.700	652.000	855.600	659.000	857.300	668.000	863.500	670.000	867.000	670.000

	.000	872.000	868.400	750.000	869.300	800.000	872.300	900.000	.000	.000
X1	9374.000	.000	.000	.000	33.000	33.000	33.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.000	.000	.045	.000	.000	.000	.000	.000	.000	.000
X1	9375.000	23.000	600.000	670.000	1.000	1.000	1.000	.000	.000	.000
GR	864.400	.000	864.100	100.000	864.100	200.000	864.000	300.000	864.300	400.000
GR	865.100	500.000	866.400	598.000	862.900	598.000	859.200	600.000	856.400	608.000
GR	853.800	616.000	853.900	623.000	853.900	631.000	853.600	638.000	853.500	645.000
GR	853.700	652.000	855.600	659.000	857.300	668.000	863.500	670.000	867.000	672.000
GR	868.400	750.000	869.500	800.000	872.300	900.000	.000	.000	.000	.000

VS T JA 7

X1	11100.000	22.000	900.000	963.000	1480.000	1700.000	1725.000	.000	.000	.000
GR	873.800	.000	873.400	100.000	864.800	200.000	861.300	225.000	860.700	300.000
GR	863.100	400.000	867.100	500.000	863.500	600.000	861.500	700.000	859.300	800.000
GR	860.300	900.000	855.100	902.000	854.600	910.000	853.900	920.000	853.500	930.000
GR	853.300	940.000	853.300	950.000	855.300	960.000	858.800	963.000	858.400	1000.000
GR	859.400	1085.000	864.000	1100.000	.000	.000	.000	.000	.000	.000
NC	.080	.070	.045	.000	.000	.000	.000	.000	.000	.000

VS J JA 8

X1	12960.000	24.000	740.000	810.000	800.000	2000.000	1860.000	.000	.000	.000
GR	87[illegible].500	.000	874.900	100.000	874.800	200.000	868.500	300.000	871.100	400.000
GR	866.900	500.000	865.600	600.000	859.900	700.000	859.000	740.000	858.100	745.000
GR	853.900	750.000	853.700	760.000	854.100	770.000	854.200	780.000	854.100	790.000
GR	854.900	800.000	858.100	805.000	858.700	810.000	858.600	900.000	859.700	1000.000
GR	860.400	1100.000	860.700	1160.000	863.700	1185.000	873.700	1200.000	.000	.000
NC	.070	.080	.045	.000	.000	.000	.000	.000	.000	.000

VS K JA 9

X1	14200.000	19.000	14.000	104.000	1250.000	1200.000	1240.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	380.000	.000	.000	.000	.000
GR	874.000	.000	860.300	14.000	858.300	20.000	857.400	30.000	856.200	40.000
GR	854.900	49.000	854.900	59.000	855.100	69.000	855.100	79.000	854.700	89.000
GR	850.500	97.000	859.300	104.000	859.300	150.000	859.300	250.000	859.300	350.000
GR	861.000	450.000	862.800	550.000	865.700	616.000	869.000	650.000	.000	.000
NC	.070	.080	.045	.000	.000	.000	.000	.000	.000	.000

VS L JA 10

X1	14970.000	16.000	13.000	66.000	950.000	600.000	770.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	130.000	.000	.000	.000	.000
GR	868.600	.000	861.000	13.000	856.000	18.000	854.600	23.000	854.600	35.000
GR	854.900	41.000	855.700	49.000	856.400	53.000	859.100	66.000	859.100	113.000
GR	858.800	213.000	859.500	313.000	859.500	413.000	859.500	513.000	862.500	613.000
GR	868.600	713.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	15099.000	21.000	500.000	571.000	120.000	90.000	129.000	.000	.000	.000
X3	.000	.000	.000	500.000	.000	571.000	.000	.000	.000	.000
GR	871.900	.000	870.500	100.000	869.600	200.000	869.200	300.000	869.200	400.000
GR	869.300	500.000	856.000	500.000	855.800	505.000	855.500	515.000	856.100	525.000
GR	856.100	535.000	856.200	545.000	856.500	555.000	857.600	571.000	869.200	571.000
GR	869.000	600.000	868.900	700.000	869.100	800.000	869.200	900.000	869.100	1000.000
GR	869.100	1100.000	.000	.000	.000	.000	.000	.000	.000	.000

	.010	.030	.022	.000	.000	.000	.000	.000	.000	.000

BS M JA 11 OLD US 23

X1	15100.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
BT	15.000	.000	871.900	.000	100.000	870.500	.000	200.000	869.600	.000
BT	300.000	869.200	.000	400.000	869.200	.000	500.000	869.200	.000	500.000
BT	869.600	663.900	571.000	869.700	863.900	571.000	869.200	.000	600.000	869.000
BT	.000	700.000	868.900	.000	800.000	869.100	.000	900.000	869.200	.000
BT	1000.000	869.100	.000	1100.000	869.100	.000	.000	.000	.000	.000
X1	15146.000	.000	.000	.000	46.000	46.000	46.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
X1	15147.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
X3	.000	.000	.000	500.000	.000	571.000	.000	.000	.000	.000
X1	15229.000	28.000	400.000	479.900	82.000	82.000	82.000	.000	.000	.000
X3	.000	.000	.000	400.000	.000	479.900	.000	.000	.000	.000
GR	873.000	.000	871.400	100.000	870.000	200.000	869.300	300.000	868.900	398.000
GR	868.900	400.000	856.900	400.000	855.900	409.400	856.000	418.800	856.000	425.400
GR	855.600	432.900	855.700	438.500	855.700	438.500	855.700	441.300	855.700	441.300
GR	856.000	447.900	855.800	456.400	855.900	463.000	856.400	471.400	856.600	478.000
GR	856.900	479.900	868.900	479.900	868.900	481.900	868.800	600.000	868.800	700.000
GR	868.800	800.000	868.900	900.000	868.900	1000.000	.000	.000	.000	.000

BS N JA 12 US 23

X1	15230.000	28.000	400.000	479.900	1.000	1.000	1.000	.000	.000	.000
BT	17.000	.000	873.000	.000	100.000	871.400	.000	200.000	870.000	.000
BT	300.000	869.300	.000	398.000	868.900	.000	398.000	871.700	.000	400.000
BT	871.700	.000	400.000	871.700	866.100	479.900	871.700	866.100	479.900	871.700
BT	.000	481.900	871.700	.000	481.900	868.900	.000	600.000	868.800	.000
BT	700.000	868.800	.000	800.000	868.800	.000	900.000	868.900	.000	1000.000
BT	868.900	.000	.000	.000	.000	.000	.000	.000	.000	.000
GR	873.000	.000	871.400	100.000	870.000	200.000	869.300	300.000	868.900	398.000
GR	868.900	400.000	856.900	400.000	855.900	409.400	856.000	418.800	856.000	425.400
GR	855.600	432.900	855.700	438.500	866.100	438.500	866.100	441.300	855.700	441.300
GR	856.000	447.900	855.800	456.400	855.900	463.000	856.400	471.400	856.600	478.000
GR	856.900	479.900	868.900	479.900	868.900	481.900	868.800	600.000	868.800	700.000
GR	868.800	800.000	868.900	900.000	868.900	1000.000	.000	.000	.000	.000
X1	15282.000	.000	.000	.000	52.000	52.000	52.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
X1	15283.000	28.000	400.000	479.900	1.000	1.000	1.000	.000	.000	.000
X3	.000	.000	.000	400.000	.000	479.900	.000	.000	.000	.000
GR	873.000	.000	871.400	100.000	870.000	200.000	869.300	300.000	868.900	398.000
GR	868.900	400.000	856.900	400.000	855.900	409.400	856.000	418.800	856.000	425.400
GR	855.600	432.900	855.700	438.500	855.700	438.500	855.700	441.300	855.700	441.300
GR	856.000	447.900	855.800	456.400	855.900	463.000	856.400	471.400	856.600	478.000
GR	856.900	479.900	868.900	479.900	868.900	481.900	868.800	600.000	868.800	700.000
GR	868.800	800.000	868.900	900.000	868.900	1000.000	.000	.000	.000	.000
X1	15325.000	.000	.000	.000	42.000	42.000	42.000	.000	.000	.000
X3	.000	.000	.000	400.000	.000	479.900	.000	.000	.000	.000

X1	15439.000	26.000	300.000	379.900	66.000	66.000	379.900	300.000	26.000	15440.000
X3	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
GR	871.700	.000	869.900	100.000	869.500	200.000	869.300	300.000	856.900	300.000
GR	855.900	303.800	855.200	311.300	855.100	318.800	855.100	325.400	855.400	333.800
GR	855.500	338.500	855.500	338.500	855.500	341.300	855.500	341.300	855.500	346.000
GR	855.400	353.600	855.500	362.000	855.700	369.500	855.700	374.200	857.100	379.900
GR	869.100	379.900	868.400	500.000	867.800	600.000	867.600	700.000	868.700	800.000
GR	868.900	900.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.000	.000	.022	.000	.000	.000	.000	.000	.000	.000

BS 0 JA 13 FIELDCREST DRIVE

X1	15440.000	26.000	300.000	379.900	1.000	1.000	379.900	300.000	26.000	15440.000
B1	12.000	.000	871.700	.000	100.000	869.900	.000	200.000	869.500	.000
B1	300.000	.000	869.300	.000	869.900	866.800	379.900	869.800	866.800	379.900
B1	869.100	.000	500.000	868.400	.000	600.000	867.800	.000	700.000	867.600
B1	.000	.000	800.000	868.700	.000	900.000	.000	868.900	.000	.000
GR	871.700	.000	869.900	100.000	869.500	200.000	869.300	300.000	856.900	300.000
GR	855.900	303.800	855.200	311.300	855.100	318.800	855.100	325.400	855.400	333.800
GR	855.500	338.500	855.500	338.500	855.500	341.300	855.500	341.300	855.500	346.000
GR	855.400	353.600	855.500	362.000	855.700	369.500	855.700	374.200	857.100	379.900
GR	869.100	379.900	868.400	500.000	867.800	600.000	867.600	700.000	868.700	800.000
GR	868.900	900.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.000	.000	.045	.000	.000	.000	.000	.000	.000	.000
X1	15373.000	28.000	400.000	479.900	1.000	1.000	479.900	400.000	28.000	15373.000
X3	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
GR	873.000	.000	871.400	100.000	870.000	200.000	869.300	300.000	868.900	398.000
GR	868.900	400.000	856.900	400.000	855.900	409.400	856.000	418.800	856.000	425.400
GR	855.600	432.900	855.700	438.500	855.700	438.500	855.700	441.300	855.700	441.300
GR	856.000	447.900	855.800	456.400	855.900	463.000	856.400	471.400	856.600	478.000
GR	856.900	479.900	868.900	479.900	868.900	481.900	868.800	600.000	868.800	700.000
GR	868.800	800.000	868.900	900.000	868.900	1000.000	.000	.000	.000	.000
X1	15373.000	28.000	400.000	479.900	1.000	1.000	479.900	400.000	28.000	15373.000
X3	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
GR	873.000	.000	871.400	100.000	870.000	200.000	869.300	300.000	868.900	398.000
GR	868.900	400.000	856.900	400.000	855.900	409.400	856.000	418.800	856.000	425.400
GR	855.600	432.900	855.700	438.500	855.700	438.500	855.700	441.300	855.700	441.300
GR	856.000	447.900	855.800	456.400	855.900	463.000	856.400	471.400	856.600	478.000
GR	856.900	479.900	868.900	479.900	868.900	481.900	868.800	600.000	868.800	700.000
GR	868.800	800.000	868.900	900.000	868.900	1000.000	.000	.000	.000	.000
X1	15372.000	.000	.000	.000	46.000	46.000	.000	.000	.000	.000
X2	.000	.000	.000	.000	1.000	.000	.000	.000	.000	.000
NC	.000	.000	.045	.000	.000	.000	.000	.000	.000	.000
X1	15373.000	.000	.000	.000	33.000	37.000	.000	.000	.000	.000
X2	.000	.000	.000	.000	1.000	.000	.000	.000	.000	.000
NC	.080	.080	.045	.000	.000	.000	.000	.000	.000	.000
X1	15474.000	26.000	300.000	379.900	1.000	1.000	379.900	300.000	26.000	15474.000
X3	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
GR	871.700	.000	869.900	100.000	869.500	200.000	869.300	300.000	856.900	300.000
GR	855.900	303.800	855.200	311.300	855.100	318.800	855.100	325.400	855.400	333.800
GR	855.500	338.500	855.500	338.500	855.500	341.300	855.500	341.300	855.500	346.000
GR	855.400	353.600	855.500	362.000	855.700	369.500	855.700	374.200	857.100	379.900
GR	869.100	379.900	868.400	500.000	867.800	600.000	867.600	700.000	868.700	800.000
GR	868.900	900.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.080	.080	.045	.000	.000	.000	.000	.000	.000	.000
X1	15473.000	.000	.000	.000	33.000	37.000	.000	.000	.000	.000
X2	.000	.000	.000	.000	1.000	.000	.000	.000	.000	.000
NC	.000	.000	.045	.000	.000	.000	.000	.000	.000	.000

GR	869.100	379.900	868.400	500.000	867.800	600.000	867.600	700.000	868.700	800.000
GR	868.900	900.000	.000	.000	.000	.000	.000	.000	.000	.000

VS P JA 14 DOWNSTREAM FROM DAVIS CREEK

X1	16570.000	22.000	290.000	355.000	996.000	1096.000	1096.000	.000	.000	.000
GR	866.800	.000	864.000	10.000	861.900	90.000	861.500	190.000	859.000	290.000
GR	857.500	295.000	856.500	300.000	855.600	310.000	855.200	320.000	854.800	330.000
GR	855.300	340.000	854.600	350.000	859.500	355.000	859.500	390.000	859.500	490.000
GR	859.600	590.000	859.700	690.000	859.800	790.000	860.200	890.000	861.800	950.000
GR	867.100	990.000	874.700	1040.000	.000	.000	.000	.000	.000	.000
QT	1.000	1160.000	.000	.000	.000	.000	.000	.000	.000	.000

VS Q JA 15 UPSTREAM FROM DAVIS CREEK

X1	18010.000	20.000	215.000	290.000	1500.000	1000.000	1440.000	.000	.000	.000
GR	875.100	.000	872.800	15.000	862.400	70.000	860.300	115.000	860.000	215.000
GR	856.300	220.000	855.900	225.000	856.900	235.000	856.300	245.000	855.800	255.000
GR	855.300	265.000	855.300	275.000	857.000	285.000	860.300	290.000	859.700	315.000
GR	859.700	415.000	861.000	515.000	864.700	615.000	866.400	715.000	870.000	745.000

VS R JA 16

X1	19210.000	18.000	525.000	580.000	1100.000	900.000	1200.000	.000	.000	.000
GR	877.300	.000	872.900	25.000	873.600	125.000	862.200	190.000	861.400	225.000
GR	860.700	325.000	860.200	420.000	860.300	525.000	856.500	530.000	856.100	540.000
GR	855.900	550.000	854.900	560.000	855.300	570.000	855.700	575.000	860.500	580.000
GR	860.300	616.000	869.700	640.000	871.700	660.000	.000	.000	.000	.000

VS S JA 17

X1	20620.000	23.000	95.000	162.000	1300.000	800.000	1010.000	.000	.000	.000
GR	869.900	.000	865.200	12.000	864.600	53.000	860.300	95.000	857.200	100.000
GR	855.900	105.000	854.800	115.000	856.200	125.000	856.900	135.000	857.900	145.000
GR	857.800	155.000	859.600	162.000	860.100	195.000	860.400	295.000	860.300	395.000
GR	860.300	495.000	860.300	595.000	860.600	695.000	860.800	795.000	861.900	895.000
GR	864.100	995.000	868.700	1095.000	869.900	1145.000	.000	.000	.000	.000

VS T JA 18

X1	21960.000	17.000	500.000	548.000	900.000	900.000	1340.000	.000	.000	.000
GR	878.700	.000	869.600	50.000	862.700	100.000	861.200	200.000	861.100	300.000
GR	861.200	400.000	860.600	500.000	856.700	505.000	855.400	510.000	855.400	520.000
GR	855.700	530.000	856.300	540.000	858.300	546.000	860.400	548.000	872.500	570.000
GR	874.800	600.000	877.900	625.000	.000	.000	.000	.000	.000	.000

VS U JA 19

X1	23400.000	15.000	58.000	105.000	1400.000	1400.000	1480.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	150.000	.000	.000	.000	.000
GR	872.300	.000	867.300	5.000	861.200	58.000	858.800	60.000	857.300	65.000
GR	855.600	75.000	854.900	85.000	855.000	95.000	855.200	100.000	861.200	105.000
GR	861.400	180.000	861.600	280.000	861.800	390.000	866.500	420.000	867.100	480.000

X1	23649.000	21.000	200.000	248.000	249.000	249.000	249.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	560.000	.000	.000	.000	.000
GR	888.600	.000	877.900	100.000	872.100	170.000	870.300	197.000	867.100	198.000
GR	859.500	200.000	858.700	210.000	856.900	220.000	856.900	230.000	857.700	240.000

[illegible]	[illegible]	[illegible]	861.200	[illegible]	863.700	250.000	863.500	251.000	866.100	300.000
GR	863.900	400.000	863.900	500.000	865.500	600.000	865.800	700.000	866.200	800.000
GR	867.300	900.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.040	.040	.022	.000	.000	.000	.000	.000	.000	.000

BS V JA 20 MCCABE ROAD

X1	23650.000	21.000	200.000	248.000	1.000	1.000	1.000	.000	.000	.000
B1	15.000	.000	888.600	.000	100.000	877.900	.000	170.000	872.100	.000
BT	197.000	870.300	.000	200.000	870.300	.000	200.000	870.300	867.500	248.000
BT	868.500	866.000	248.000	868.500	.000	251.000	868.500	.000	300.000	866.100
BT	.000	400.000	863.900	.000	500.000	863.900	.000	600.000	865.500	.000
BT	700.000	865.800	.000	800.000	866.200	.000	.000	.000	.000	.000
GR	888.600	.000	877.900	100.000	872.100	170.000	870.300	197.000	870.300	200.000
GR	859.500	200.000	858.700	210.000	856.900	220.000	856.900	230.000	857.700	240.000
GR	858.900	245.000	861.200	248.000	868.500	248.000	868.500	251.000	866.100	300.000
GR	863.900	400.000	863.900	500.000	865.500	600.000	865.800	700.000	866.200	800.000
GR	867.300	900.000	.000	.000	.000	.000	.000	.000	.000	.000

X1	23673.000	.000	.000	.000	23.000	23.000	23.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.080	.080	.045	.000	.000	.000	.000	.000	.000	.000

X1	23674.000	21.000	200.000	248.000	1.000	1.000	1.000	.000	.000	.000
GR	888.600	.000	877.900	100.000	872.100	170.000	870.300	197.000	867.100	198.000
GR	859.500	200.000	858.700	210.000	856.900	220.000	856.900	230.000	857.700	240.000
GR	858.900	245.000	861.200	248.000	865.700	250.000	868.500	251.000	866.100	300.000
GR	863.900	400.000	863.900	500.000	865.500	600.000	865.800	700.000	866.200	800.000
GR	867.300	900.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.080	.050	.045	.000	.000	.000	.000	.000	.000	.000

VS W JA 21

X1	24330.000	34.000	600.000	672.000	560.000	520.000	656.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	1232.000	.000	.000	.000	.000
GR	869.500	.000	868.600	100.000	866.900	200.000	861.500	235.000	861.400	300.000
GR	857.900	315.000	861.400	400.000	861.500	500.000	861.400	600.000	859.700	605.000
GR	857.500	615.000	857.300	625.000	857.500	635.000	857.900	645.000	857.800	650.000
GR	859.200	660.000	859.800	670.000	863.400	672.000	866.200	700.000	871.800	760.000
GR	883.000	800.000	886.000	840.000	864.200	900.000	863.800	1000.000	863.700	1100.000
GR	863.600	1200.000	863.600	1300.000	863.800	1400.000	864.200	1500.000	864.700	1600.000
GR	864.900	1700.000	866.800	1780.000	875.100	1800.000	883.400	1825.000	.000	.000
QT	1.000	1120.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.080	.070	.000	.000	.000	.000	.000	.000	.000	.000

VS X JA 22

X1	25110.000	23.000	14.000	84.000	780.000	650.000	780.000	.000	.000	.000
GR	866.800	.000	861.700	4.000	861.600	14.000	857.600	21.000	856.400	30.000
GR	856.900	39.000	856.800	49.000	856.900	59.000	857.600	69.000	859.400	79.000
GR	861.600	84.000	861.600	114.000	861.700	214.000	861.700	314.000	861.700	414.000
GR	861.800	514.000	861.800	614.000	861.800	714.000	861.900	814.000	862.000	914.000
GR	862.000	1014.000	862.000	1069.000	866.800	1069.000	.000	.000	.000	.000
NC	.070	.070	.041	.000	.000	.000	.000	.000	.000	.000

VS Y JA 23

X1	27960.000	32.000	800.000	866.000	1100.000	1700.000	2850.000	.000	.000	.000
GR	872.100	.000	869.100	100.000	866.100	200.000	862.600	300.000	862.100	325.000
GR	862.100	400.000	864.100	460.000	865.100	500.000	866.200	600.000	866.200	700.000

GR	857.900	840.000	859.700	850.000	860.700	860.000	861.500	866.000	861.500	900.000
GR	861.500	1000.000	861.400	1100.000	861.400	1200.000	861.400	1300.000	861.400	1400.000
GR	861.400	1500.000	861.500	1600.000	861.600	1700.000	861.700	1800.000	861.700	1900.000
GR	862.700	2000.000	865.700	2050.000	.000	.000	.000	.000	.000	.000
NC	.080	.080	.042	.000	.000	.000	.000	.000	.000	.000

VS / JA 24

X1	30760.000	21.000	474.000	530.000	1000.000	1700.000	2800.000	.000	.000	.000
GR	884.800	.000	875.600	30.000	865.600	50.000	865.100	130.000	863.900	230.000
GR	863.400	330.000	862.800	430.000	863.000	474.000	859.100	479.000	859.100	485.000
GR	859.100	493.000	858.900	502.000	858.900	510.000	858.800	520.000	858.600	525.000
GR	864.000	530.000	883.000	545.000	888.300	580.000	887.000	680.000	880.100	780.000
GR	883.100	880.000	.000	.000	.000	.000	.000	.000	.000	.000

VS AA JA 25

X1	31370.000	19.000	600.000	660.000	500.000	700.000	610.000	.000	.000	.000
GR	882.300	.000	865.800	80.000	865.600	100.000	865.100	200.000	864.600	300.000
GR	864.100	400.000	863.600	500.000	862.800	600.000	859.200	605.000	859.000	615.000
GR	858.600	625.000	858.700	635.000	858.700	643.000	859.000	650.000	860.800	655.000
GR	862.300	660.000	863.200	670.000	894.100	730.000	899.100	740.000	.000	.000

VS AB JA 26

X1	32300.000	27.000	315.000	400.000	600.000	650.000	930.000	.000	.000	.000
GR	883.300	.000	875.000	100.000	863.900	160.000	863.800	200.000	863.500	300.000
GR	863.400	315.000	859.000	320.000	859.000	330.000	858.900	340.000	858.900	350.000
GR	858.900	360.000	858.900	370.000	858.900	380.000	859.300	390.000	860.700	395.000
GR	863.100	400.000	863.300	415.000	878.300	458.000	877.200	500.000	863.600	560.000
GR	866.000	600.000	860.200	620.000	863.300	635.000	865.300	700.000	868.100	784.000
GR	873.800	800.000	883.300	825.000	.000	.000	.000	.000	.000	.000

VS AC JA 27

X1	32830.000	29.000	390.000	500.000	400.000	700.000	530.000	.000	.000	.000
X3	.000	.000	.000	150.000	.000	.000	.000	.000	.000	.000
GR	866.900	.000	862.800	100.000	863.700	200.000	863.600	300.000	863.600	390.000
GR	861.400	395.000	860.600	400.000	860.400	410.000	859.900	420.000	859.200	430.000
GR	859.300	440.000	860.100	450.000	860.200	460.000	860.100	470.000	860.000	480.000
GR	860.200	490.000	861.400	495.000	863.700	500.000	863.900	610.000	881.300	675.000
GR	884.600	700.000	880.400	725.000	864.000	765.000	864.000	800.000	864.000	900.000
GR	860.800	909.000	864.000	918.000	865.100	995.000	888.600	1060.000	.000	.000
NC	.080	.080	.000	.000	.000	.000	.000	.000	.000	.000

VS AD JA 28

X1	33630.000	27.000	1095.000	1155.000	700.000	500.000	800.000	.000	.000	.000
X3	.000	.000	.000	950.000	.000	1200.000	.000	.000	.000	.000
GR	874.000	.000	868.700	10.000	864.900	35.000	864.500	95.000	864.500	195.000
GR	864.500	295.000	864.500	395.000	864.500	495.000	867.100	595.000	866.100	695.000
GR	866.100	795.000	865.600	895.000	864.600	995.000	864.200	1095.000	859.300	1100.000
GR	859.300	1105.000	859.500	1113.000	859.400	1125.000	859.500	1135.000	859.900	1145.000
GR	860.200	1150.000	863.700	1155.000	863.900	1195.000	865.500	1295.000	865.500	1315.000
GR	877.100	1345.000	880.200	1350.000	.000	.000	.000	.000	.000	.000

X1	33919.000	23.000	700.000	741.700	280.000	210.000	289.000	.000	.000	.000
GR	869.500	.000	869.500	100.000	869.700	200.000	869.700	300.000	869.800	400.000
GR	869.800	500.000	869.700	600.000	869.800	700.000	861.800	700.000	859.000	703.500

[illegible]	[illegible]	707.100	[illegible]	714.100	[illegible]	721.200	858.800	728.500	859.900	735.400
GR	861.300	738.900	862.300	741.700	869.800	745.000	869.900	800.000	870.900	900.000
GR	873.400	1000.000	877.000	1100.000	880.200	1200.000	.000	.000	.000	.000
NC	.050	.050	.022	.000	.000	.000	.000	.000	.000	.000

BS AE JA 29 DRIVEWAY BRIDGE

X1	33920.000	23.000	700.000	741.700	1.000	1.000	1.000	.000	.000	.000
GR	869.500	.000	869.500	100.000	869.700	200.000	869.700	300.000	869.800	400.000
GR	869.800	500.000	869.700	600.000	869.800	700.000	861.800	700.000	859.000	703.500
GR	859.000	707.100	858.800	714.100	858.600	721.200	858.800	728.300	859.900	735.400
GR	861.300	738.900	862.300	741.700	869.800	745.000	869.900	800.000	870.900	900.000
GR	873.400	1000.000	877.000	1100.000	880.200	1200.000	.000	.000	.000	.000
SB	.000	1.410	3.020	.000	37.390	.000	280.420	.000	858.600	858.600
X1	33961.000	.000	.000	.000	41.000	41.000	41.000	.000	.000	.000
X2	.000	.000	1.000	866.100	869.500	.000	.000	.000	.000	.000
BT	17.000	.000	869.500	.000	100.000	869.500	.000	200.000	869.700	.000
BT	300.000	869.700	.000	400.000	869.800	.000	500.000	869.800	.000	600.000
BT	869.700	.000	700.000	869.800	.000	700.000	872.400	866.000	741.700	872.400
BT	866.100	741.700	869.800	.000	745.000	869.800	.000	800.000	869.900	.000
BT	900.000	870.200	.000	1000.000	873.400	.000	1100.000	877.000	.000	1200.000
BT	880.200	.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.060	.080	.045	.000	.000	.000	.000	.000	.000	.000
X1	33962.000	23.000	700.000	741.700	1.000	1.000	1.000	.000	.000	.000
GR	869.500	.000	869.500	100.000	869.700	200.000	869.700	300.000	869.800	400.000
GR	869.800	500.000	869.700	600.000	869.800	700.000	861.800	700.000	859.000	703.500
GR	859.000	707.100	858.800	714.100	858.600	721.200	858.800	728.300	859.900	735.400
GR	861.300	738.900	862.300	741.700	869.800	745.000	869.900	800.000	870.900	900.000
GR	873.400	1000.000	877.000	1100.000	880.200	1200.000	.000	.000	.000	.000

VS AF JA 30

X1	34740.000	38.000	1100.000	1227.000	530.000	730.000	778.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	1960.000	.000	.000	.000	.000
GR	874.100	.000	872.300	100.000	871.300	200.000	870.500	300.000	870.500	400.000
GR	869.900	500.000	869.800	600.000	869.800	650.000	865.500	665.000	864.600	700.000
GR	863.700	800.000	863.400	900.000	863.400	1000.000	863.000	1100.000	858.300	1105.000
GR	858.600	1110.000	859.600	1120.000	860.300	1130.000	860.700	1140.000	860.900	1150.000
GR	861.300	1160.000	861.500	1170.000	861.100	1180.000	860.500	1190.000	860.700	1200.000
GR	860.500	1210.000	860.600	1220.000	862.500	1227.000	863.500	1300.000	864.500	1400.000
GR	864.000	1500.000	863.000	1600.000	864.500	1700.000	863.000	1800.000	862.500	1900.000
GR	863.500	2000.000	864.500	2100.000	869.500	2130.000	.000	.000	.000	.000

VS AG JA 31

X1	37250.000	36.000	900.000	1000.000	1100.000	2050.000	2510.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	2206.000	.000	.000	.000	.000
GR	871.100	.000	868.800	100.000	868.400	200.000	871.500	300.000	867.400	400.000
GR	863.800	415.000	864.000	500.000	864.000	600.000	864.000	700.000	863.900	800.000
GR	863.300	900.000	861.200	905.000	861.100	910.000	860.900	920.000	860.900	930.000
GR	860.800	940.000	860.600	950.000	860.800	960.000	860.500	970.000	860.300	980.000
GR	860.400	990.000	860.500	995.000	863.200	1000.000	863.400	1100.000	863.600	1200.000
GR	863.800	1300.000	864.100	1400.000	865.700	1500.000	865.100	1600.000	866.300	1700.000
GR	865.700	1800.000	866.000	1900.000	866.100	2000.000	866.300	2100.000	867.000	2700.000
GR	880.000	2700.000	.000	.000	.000	.000	.000	.000	.000	.000

VS AH JA 32

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.000	.000	.000
GR	892.300	.000	867.200	50.000	866.800	150.000	865.800	250.000	864.000	350.000
GR	861.600	355.000	861.100	360.000	860.700	370.000	860.400	380.000	860.200	390.000
GR	860.100	400.000	861.400	410.000	861.600	420.000	864.400	425.000	864.700	450.000
GR	865.000	550.000	865.000	650.000	865.200	750.000	865.700	795.000	870.200	805.000

VS AJ JA 33

X1	42170.000	30.000	975.000	1048.000	1600.000	1100.000	2500.000	.000	.000	.000
GR	884.600	.000	877.400	75.000	870.600	105.000	868.100	175.000	867.400	275.000
GR	868.000	375.000	868.600	475.000	866.700	575.000	865.800	675.000	865.700	775.000
GR	865.900	875.000	865.100	975.000	862.600	980.000	862.200	985.000	862.200	995.000
GR	862.500	1005.000	863.300	1010.000	862.200	1015.000	861.500	1025.000	861.700	1035.000
GR	861.700	1045.000	865.100	1048.000	865.500	1075.000	865.500	1175.000	865.900	1275.000
GR	865.900	1375.000	866.000	1475.000	866.500	1575.000	867.000	1590.000	871.200	1610.000
NC	.060	.080	.000	.000	.000	.000	.000	.000	.000	.000

VS AJ JA 34

XI	43250.000	24.000	12.000	87.000	800.000	800.000	1080.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	250.000	.000	.000	.000	.000
GR	875.900	.000	866.900	12.000	863.800	17.000	863.100	27.000	862.700	32.000
GR	862.500	44.000	862.700	59.000	862.200	67.000	862.200	72.000	862.800	77.000
GR	864.100	82.000	866.600	87.000	866.600	112.000	866.600	212.000	866.600	312.000
GR	866.600	362.000	878.000	412.000	872.900	512.000	870.300	612.000	869.800	712.000
GR	867.900	812.000	867.800	912.000	874.500	1012.000	892.600	1112.000	.000	.000

X1	43540.000	29.000	300.000	417.000	300.000	260.000	294.000	.000	.000	.000
GR	893.600	.000	892.800	100.000	892.100	200.000	891.800	300.000	874.100	300.000
GR	871.800	320.000	871.600	339.000	885.600	339.000	881.900	346.000	868.500	346.000
GR	867.000	357.000	864.400	359.000	862.900	365.000	861.800	371.000	861.500	377.000
GR	861.900	382.000	862.000	392.000	862.600	399.000	864.600	407.000	868.500	417.000
GR	892.000	417.000	892.000	500.000	892.200	600.000	892.400	700.000	892.600	800.000
GR	892.800	900.000	893.000	1000.000	893.200	1100.000	893.400	1200.000	.000	.000
NC	.050	.050	.022	.000	.000	.000	.000	.000	.000	.000

BS AK JA 35 C & O RR

X1	43545.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
BT	17.000	.000	893.600	.000	100.000	892.800	.000	200.000	892.100	.000
BT	300.000	891.800	.000	300.000	891.800	885.100	339.000	891.900	885.600	346.000
BT	891.800	881.900	417.000	892.000	882.000	417.000	892.000	.000	500.000	892.000
BT	.000	600.000	892.000	.000	700.000	892.400	.000	800.000	892.600	.000
BT	900.000	892.800	.000	1000.000	893.000	.000	1100.000	893.200	.000	1200.000
BT	893.400	.000	.000	.000	.000	.000	.000	.000	.000	.000

XI	43554.000	.000	.000	.000	9.000	9.000	9.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.060	.080	.045	.000	.000	.000	.000	.000	.000	.000

X1	43555.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
NC	.080	.080	.045	.000	.000	.000	.000	.000	.000	.000

VS AL JA 36

X1	43970.000	25.000	30.000	100.000	480.000	380.000	415.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	480.000	.000	.000	.000	.000
GR	880.900	.000	866.700	15.000	866.700	30.000	862.200	35.000	861.700	40.000
GR	861.500	45.000	861.400	50.000	861.500	55.000	861.700	60.000	861.900	65.000

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
GR	866.800	225.000	867.400	325.000	867.700	425.000	867.900	525.000	868.000	640.000
GR	871.200	725.000	870.100	825.000	876.900	925.000	875.400	1025.000	880.900	1125.000
X1	45129.000	27.000	650.000	722.400	850.000	600.000	1159.000	.000	.000	.000
GR	881.700	.000	877.400	50.000	872.700	150.000	869.000	250.000	867.900	350.000
GR	867.800	450.000	867.800	550.000	872.000	650.000	864.700	650.000	863.900	654.700
GR	863.200	659.400	862.900	668.800	863.000	678.200	863.700	684.800	863.700	684.800
GR	863.700	687.600	863.700	687.600	863.800	697.000	863.900	706.400	864.500	715.800
GR	866.200	722.400	872.600	724.000	872.000	750.000	872.700	850.000	879.000	950.000
GR	881.200	1050.000	884.100	1150.000	.000	.000	.000	.000	.000	.000
NC	.050	.050	.020	.000	.000	.000	.000	.000	.000	.000

BS AM JA 37 SUTHERLAND ROAD

X1	45130.000	27.000	650.000	722.400	1.000	1.000	1.000	.000	.000	.000
BT	18.000	.000	881.700	.000	50.000	877.400	.000	150.000	872.700	.000
BT	250.000	869.000	.000	350.000	867.900	.000	450.000	867.800	.000	550.000
BT	867.800	.000	650.000	872.000	.000	650.000	872.000	869.100	684.800	872.300
BT	869.200	687.600	872.300	869.200	722.400	872.600	869.300	722.400	872.600	.000
BT	750.000	872.700	.000	850.000	872.700	.000	950.000	879.000	.000	1050.000
BT	881.200	.000	1150.000	884.100	.000	.000	.000	.000	.000	.000
GR	881.700	.000	877.400	50.000	872.700	150.000	869.000	250.000	867.900	350.000
GR	867.800	450.000	867.800	550.000	872.000	650.000	864.700	650.000	863.900	654.700
GR	863.200	659.400	862.900	668.800	863.000	678.200	863.700	684.800	869.200	684.800
GR	869.200	687.600	863.700	687.600	863.800	697.000	863.900	706.400	864.500	715.800
GR	866.200	722.400	872.600	722.400	872.000	750.000	872.700	850.000	879.000	950.000
GR	881.200	1050.000	884.100	1150.000	.000	.000	.000	.000	.000	.000
X1	45148.000	.000	.000	.000	18.000	18.000	18.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.080	.080	.045	.000	.000	.000	.000	.000	.000	.000
X1	45149.000	27.000	650.000	722.400	1.000	1.000	1.000	.000	.000	.000
GR	881.700	.000	877.400	50.000	872.700	150.000	869.000	250.000	867.900	350.000
GR	867.800	450.000	867.800	550.000	872.000	650.000	864.700	650.000	863.900	654.700
GR	863.200	659.400	862.900	668.800	863.000	678.200	863.700	684.800	863.700	684.800
GR	863.700	687.600	863.700	687.600	863.800	697.000	863.900	706.400	864.500	715.800
GR	866.200	722.400	872.600	724.000	872.000	750.000	872.700	850.000	879.000	950.000
GR	881.200	1050.000	884.100	1150.000	.000	.000	.000	.000	.000	.000

VS AN JA 38

X1	46760.000	17.000	270.000	335.000	1450.000	1300.000	1611.000	.000	.000	.000
GR	899.400	.000	887.300	20.000	868.800	60.000	868.000	100.000	868.000	200.000
GR	867.300	270.000	863.600	275.000	864.100	280.000	864.300	290.000	863.900	300.000
GR	863.300	310.000	863.400	320.000	864.000	330.000	867.300	335.000	868.600	400.000
GR	882.400	425.000	888.800	435.000	.000	.000	.000	.000	.000	.000

VS AO JA 39

X1	48160.000	18.000	385.000	405.000	900.000	1200.000	1400.000	.000	.000	.000
GR	911.400	.000	893.100	40.000	873.400	90.000	870.100	140.000	867.500	240.000
GR	866.800	340.000	867.200	385.000	865.700	390.000	865.500	395.000	864.500	405.000
GR	863.100	415.000	863.200	425.000	863.700	435.000	864.200	440.000	868.000	445.000
GR	869.200	485.000	875.400	525.000	887.100	560.000	.000	.000	.000	.000
BT	1.000	850.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.070	.070	.045	.000	.000	.000	.000	.000	.000	.000

X1	49545.000	23.000	300.000	360.000	1100.000	1500.000	1385.000	.000	.000	.000
GR	907.600	.000	895.100	35.000	884.200	75.000	868.200	110.000	867.900	200.000
GR	867.600	300.000	862.400	305.000	862.200	310.000	861.000	320.000	860.000	330.000
GR	860.300	340.000	861.400	350.000	862.600	355.000	868.200	360.000	884.800	400.000
GR	888.500	415.000	888.900	475.000	887.000	500.000	878.200	600.000	876.200	665.000
GR	878.600	700.000	885.300	800.000	891.800	900.000	.000	.000	.000	.000
NC	.080	.070	.045	.000	.000	.000	.000	.000	.000	.000

VS AQ JA 41

X1	50735.000	30.000	700.000	760.000	850.000	800.000	1190.000	.000	.000	.000
GR	901.600	.000	881.700	100.000	880.100	200.000	874.500	300.000	868.500	350.000
GR	868.500	400.000	868.300	500.000	868.300	600.000	867.600	700.000	865.400	705.000
GR	864.400	710.000	863.800	720.000	863.600	725.000	864.200	735.000	864.300	745.000
GR	865.800	755.000	867.500	760.000	868.400	785.000	878.400	815.000	879.300	835.000
GR	875.000	900.000	869.100	975.000	868.800	1000.000	868.000	1100.000	867.900	1180.000
GR	870.600	1200.000	875.400	1300.000	873.400	1400.000	875.400	1465.000	884.300	1490.000

VS AR JA 42

X1	53335.000	27.000	700.000	768.000	1400.000	1400.000	2600.000	.000	.000	.000
GR	888.400	.000	883.900	100.000	878.200	200.000	876.700	300.000	870.900	400.000
GR	873.800	500.000	871.300	600.000	867.300	700.000	866.900	705.000	866.700	710.000
GR	866.000	718.000	863.300	725.000	862.800	730.000	862.700	740.000	862.700	745.000
GR	863.400	750.000	864.200	760.000	865.900	766.000	867.500	768.000	867.300	800.000
GR	867.300	900.000	867.300	1000.000	868.900	1100.000	870.300	1200.000	870.700	1300.000
GR	873.100	1400.000	885.100	1500.000	.000	.000	.000	.000	.000	.000
NC	.070	.060	.045	.000	.000	.000	.000	.000	.000	.000

VS AS JA 43

X1	55645.000	19.000	600.000	670.000	1500.000	1200.000	2310.000	.000	.000	.000
GR	892.500	.000	886.500	50.000	875.600	100.000	873.800	200.000	871.000	300.000
GR	871.800	400.000	868.700	500.000	868.900	600.000	865.400	605.000	865.100	612.000
GR	865.000	625.000	864.800	635.000	864.600	640.000	864.600	650.000	865.200	660.000
GR	865.900	665.000	867.900	670.000	870.400	680.000	876.900	700.000	.000	.000
NC	.060	.060	.045	.000	.000	.000	.000	.000	.000	.000

VS AT JA 44

X1	57005.000	23.000	213.000	300.000	1400.000	1450.000	1360.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	365.000	.000	.000	.000	.000
GR	887.600	.000	883.500	100.000	875.300	167.000	870.800	183.000	868.900	213.000
GR	866.000	220.000	864.900	225.000	865.300	230.000	864.900	240.000	864.500	250.000
GR	864.300	260.000	864.100	270.000	864.500	280.000	864.800	290.000	865.500	297.000
GR	867.900	300.000	870.500	400.000	870.800	500.000	873.200	600.000	871.400	700.000
GR	878.000	800.000	882.600	900.000	886.000	930.000	.000	.000	.000	.000

X1	57294.000	25.000	372.000	415.000	200.000	250.000	289.000	.000	.000	.000
GR	889.200	.000	885.500	93.000	882.800	186.000	880.200	279.000	877.800	372.000
GR	865.700	372.000	865.600	377.000	865.500	381.000	865.300	391.000	865.200	400.000
GR	865.000	409.000	865.800	415.000	876.700	415.000	875.800	465.000	874.000	558.000
GR	873.200	651.000	873.600	744.000	874.500	837.000	875.200	930.000	877.000	1023.000
GR	879.700	1116.000	883.700	1209.000	887.800	1302.000	892.100	1395.000	896.100	1488.000
NC	.025	.025	.022	.000	.000	.000	.000	.000	.000	.000

BS AU JA 45 KENSINGTON ROAD

	.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
BT	20.000	.000	889.200	.000	93.000	885.500	.000	186.000	882.800	.000
BT	279.000	880.200	.000	372.000	877.800	.000	372.000	877.800	874.600	415.000
BT	876.700	873.500	415.000	876.700	.000	465.000	875.800	.000	558.000	874.000
BT	.000	651.000	873.200	.000	744.000	873.600	.000	837.000	874.500	.000
BT	930.000	875.200	.000	1023.000	877.000	.000	1116.000	879.700	.000	1209.000
BT	883.700	.000	1302.000	887.800	.000	1395.000	892.100	.000	1488.000	896.100
BT	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	57333.000	.000	.000	.000	38.000	38.000	38.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.150	.150	.035	.000	.000	.000	.000	.000	.000	.000
X1	57334.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
X1	57469.000	33.000	450.000	551.000	135.000	135.000	135.000	.000	-.450	.000
X3	.000	.000	.000	.000	.000	900.000	.000	.000	.000	.000
GR	892.900	.000	888.400	30.000	883.400	130.000	877.600	230.000	872.100	330.000
GR	869.000	430.000	865.700	435.000	865.700	440.000	865.600	450.000	866.100	460.000
GR	865.900	470.000	865.700	480.000	865.600	490.000	865.700	500.000	865.800	510.000
GR	865.800	520.000	865.600	530.000	865.700	540.000	865.600	545.000	869.000	551.000
GR	869.000	620.000	871.300	645.000	875.900	730.000	875.500	830.000	876.600	930.000
GR	871.200	1030.000	877.100	1130.000	881.300	1170.000	878.100	1230.000	883.000	1280.000
GR	881.900	1330.000	881.900	1350.000	887.500	1430.000	.000	.000	.000	.000
VS AV JA 45A										
X1	58005.000	.000	.000	.000	555.000	315.000	536.000	.000	.450	.000
X3	.000	.000	.000	.000	.000	900.000	.000	.000	.000	.000
VS AW JA 46										
X1	59225.000	26.000	1150.000	1245.000	700.000	450.000	1220.000	.000	.000	.000
GR	903.100	.000	882.000	100.000	880.000	200.000	876.100	300.000	876.400	400.000
GR	875.200	500.000	874.700	600.000	874.700	700.000	873.600	800.000	872.000	900.000
GR	871.400	1000.000	870.400	1100.000	868.900	1150.000	866.800	1155.000	866.600	1160.000
GR	865.900	1170.000	865.500	1180.000	865.600	1190.000	866.000	1200.000	866.500	1210.000
GR	866.800	1220.000	867.100	1230.000	867.700	1240.000	869.000	1245.000	870.000	1250.000
GR	875.300	1290.000	.000	.000	.000	.000	.000	.000	.000	.000
VS AX JA 47										
X1	61035.000	24.000	40.000	140.000	700.000	1300.000	1810.000	.000	.000	.000
GR	892.800	.000	869.700	40.000	867.600	45.000	867.300	50.000	866.900	60.000
GR	866.400	70.000	866.400	80.000	866.600	90.000	866.600	100.000	866.600	110.000
GR	866.900	120.000	867.000	130.000	867.600	135.000	869.500	140.000	870.700	200.000
GR	872.400	300.000	873.600	400.000	875.100	500.000	876.200	600.000	879.400	700.000
GR	876.100	800.000	885.500	900.000	887.500	1000.000	890.300	1050.000	.000	.000
VS AY JA 48										
X1	62125.000	19.000	50.000	140.000	1150.000	800.000	1090.000	.000	.000	.000
GR	890.500	.000	870.600	40.000	869.900	50.000	868.200	55.000	867.700	60.000
GR	867.200	70.000	867.500	80.000	867.400	90.000	867.200	100.000	867.100	110.000
GR	866.900	120.000	867.200	130.000	867.700	135.000	869.600	140.000	870.200	150.000
GR	872.300	210.000	878.100	250.000	889.500	350.000	893.400	370.000	.000	.000
VS AZ JA 49										

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X1  62745.000     17.000    150.000    233.000    600.000    500.000    620.000       .000       .000       .000
GR    887.400       .000    881.100     50.000    874.100     75.000    871.400    150.000    869.100    153.000
GR    868.800    155.000    868.400    160.000    868.200    170.000    868.200    180.000    868.000    190.000
GR    867.700    200.000    868.000    210.000    868.200    220.000    868.800    226.000    871.300    233.000
GR    874.000    260.000    887.000    300.000       .000       .000       .000       .000       .000       .000

X1  62925.000      7.000    104.000    194.000    180.000    180.000    180.000       .000       .000       .000
GR    888.000       .000    888.000    104.000    867.800    104.000    867.900    193.990    867.900    194.000
GR    888.000    194.000    888.000    295.000       .000       .000       .000       .000       .000       .000
NC       .040       .040       .015       .000       .000       .000       .000       .000       .000       .000
SH       .000      5.000      3.300       .000       .010       .000       .000       .000    867.800    867.800

        DS  BA JA SO KENT LAKE DAM

X1  62945.000      7.000    104.000    194.000     20.000     20.000     20.000       .000       .000       .000
X2       .000       .000      1.000       .000       .000       .000       .000       .000       .000       .000
BT      8.000       .000    888.000       .000    104.000    888.000       .000    104.000    884.000    867.800
BI    193.990    884.000    867.900    193.990    884.000    867.910    194.000    884.000    867.910    194.000
BT    884.000    867.900    194.000    888.000       .000    295.000    888.000       .000       .000       .000
GR    888.000       .000    888.000    104.000    867.800    104.000    867.900    193.990    867.900    194.000
GR    888.000    194.000    888.000    295.000       .000       .000       .000       .000       .000       .000
FJ       .000       .000       .000       .000       .000       .000       .000       .000       .000       .000
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*PROF 1

CCHV=     .300 CEHV=     .500
*SECNO .000
   SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         QLOSS    BANK ELEV
   Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA    LEFT/RIGHT
   TTME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN       SSTA
   SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID      ENDST

                                                                                                  One like  858.6 max  April 1950

        VS    A          CORPORATE LIMIT, FROM HAMBURG TWP FIS SECTION 80.925
                                859.76
     .00       9.93     859.73       .00     859.73     859.74        .01        .00        .00     855.00
    1680.      127.      784.      770.      577.      839.      2073.        0.        0.      854.30
     .00        .22       .93       .37       .100      .040       .070      .000     849.80      42.11
  .000043       0.        0.        0.         0         0          0        .00     817.49     859.60

*SECNO 1500.000

        VS    B JA 1

  1500.00      8.64     859.84       .00       .00     859.90        .06        .13        .03     856.20
    1680.      314.     1316.       51.      691.      590.        74.        78.        20.      856.30
     .22        .45      2.23       .68       .100      .045       .070      .047     851.20      31.46
  .000317     1300.     1500.     1400.        2         0          0        .00     461.01     492.46

*SECNO 3090.000

3265 DIVIDED FLOW

        VS    C JA 2

  3090.00      8.99     860.39       .00       .00     860.46        .07        .56        .01     856.00
    1680.      469.     1171.       41.      791.      454.        65.       124.        36.      856.90
     .44        .59      2.58       .62       .100      .045       .070      .046     851.40      53.85
  .000412     1430.     1590.     1580.        2         0          0        .00     485.33     740.56

*SECNO 4280.000

        VS    D JA 2A

  4280.00     10.29     860.59       .00       .00     860.60        .00        .11        .02     856.20
    1680.      680.      546.      455.     3044.      659.      1441.       219.        64.      856.20
    1.21        .22       .83       .32       .100      .045       .070      .045     850.30      56.52
  .000039     1500.     1190.      800.        2         0          0        .00    1346.06    1402.58

*SECNO 5790.000

3265 DIVIDED FLOW

3280 CROSS SECTION    5790.00 EXTENDED       4.03 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        WTN        ELMIN       SSTA
   SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID      ENDST
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3470 ENCROACHMENT STATIONS=        .0     1500.0  TYPE=     1  TARGET=     1499.999

        VS   E JA 3

  5790.00      7.73    860.63       .00       .00    860.63       .00       .04       .00    856.90
    1680.       25.      410.     1245.      201.      580.     3928.      317.       88.    857.30
     1.89       .12       .71       .32      .100      .045      .070      .050    852.90    169.24
  .000036      500.     1510.      940.         2         0         0       .00   1298.21   1500.00

*SECNO 7830.000

        VS   F JA 4

  7830.00      8.54    860.74       .00       .00    860.79       .05       .13       .02    857.20
    1680.      409.     1139.      132.      904.      539.      188.      428.      123.    857.40
     2.19       .45      2.11       .70      .100      .045      .070      .051    852.20    448.23
  .000293     2200.     2040.     1200.         2         0         0       .00    596.65   1044.88

*SECNO 9040.000

3470 ENCROACHMENT STATIONS=      800.0     1020.0  TYPE=     1  TARGET=      220.000

        VS   G JA 5

  9040.00      8.73    861.13       .00       .00    861.20       .07       .40       .01    858.00
    1680.      267.     1378.       35.      405.      484.       49.      461.      132.    857.90
     2.35       .66      2.36       .72      .100      .045      .080      .050    852.40    800.00
  .000403      900.     1210.     1500.         2         0         0       .00    220.00   1020.00

*SECNO 9340.000
  9340.00      7.74    861.24       .00       .00    861.47       .23       .19       .08    859.20
    1680.        0.     1680.        0.        1.      439.        0.      466.      133.    863.50
     2.37       .32      3.82       .00      .100      .045      .080      .050    853.50    598.90
  .001234      200.      300.      300.         2         0         0       .00     70.37    669.27

*SECNO 9341.000

3370 NORMAL BRIDGE,NRD= 15 MIN ELTRD=  864.00 MAX ELLC=  863.50

        BS   H JA 6     PICKETT ROAD BRIDGE

  9341.00      7.74    861.24       .00       .00    861.47       .23       .00       .00    866.40
    1680.        0.     1680.        0.        0.      439.        0.      466.      133.    867.00
     2.37       .00      3.82       .00      .100      .022      .080      .050    853.50    600.00
  .000317        1.        1.        1.         0         0         0       .00     69.27    669.27

*SECNO 9374.000
   SECNO     DEPTH     CWSEL     CRTWS     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

3370 NORMAL BRIDGE,NRD= 15 MIN ELTRD=  864.00 MAX ELLC=  863.50

  9374.00      7.75    861.25       .00       .00    861.48       .23       .01       .00    866.40
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     2.37        .00       3.81        .00        .100       .022       .080       .050     853.50     600.00
  .000314        33.        33.        33.          1          0          0        .00      69.28     669.28

*SECNO 9375.000
 9375.00       7.75     861.25        .00        .00     861.48        .23        .00        .00     859.20
    1680.         0.      1680.         0.         1.       440.         0.       466.       133.     863.50
     2.37        .32       3.82        .00        .100       .045       .080       .050     853.50     598.89
  .001233         1.         1.         1.          0          0          0        .00      70.39     669.28

*SECNO 11100.000

3265 DIVIDED FLOW

        VS   I JA 7

 11100.00       9.07     862.37        .00        .00     862.42        .05        .89        .05     860.30
    1680.        249.      1106.       326.       640.       515.       449.       505.       145.     858.80
     2.67        .39       2.15        .72        .100       .045       .080       .049     853.30     217.33
  .000287      1480.      1725.      1700.          2          0          0        .00     590.85    1094.70

*SECNO 12960.000

        VS   J JA 8

 12960.00       9.09     862.79        .00        .00     862.81        .02        .38        .01     859.00
    1680.         93.       879.       708.       206.       543.      1161.       572.       164.     858.70
     3.11        .45       1.62        .61        .080       .045       .070       .049     853.70     649.40
  .000165       800.      1860.      2000.          2          0          0        .00     527.97    1177.37

*SECNO 14200.000

3470 ENCROACHMENT STATIONS=          .0      380.0  TYPE=      1  TARGET=      379.999

        VS   K JA 9

 14200.00       8.51     863.01        .00        .00     863.04        .03        .22        .00     860.30
    1680.         1.      1057.       622.         4.       634.      1015.       622.       177.     859.30
     3.38        .29       1.67        .61        .070       .045       .080       .048     854.50      11.23
  .000194      1250.      1240.      1200.          2          0          0        .00     368.76     380.00

*SECNO 14970.000
    SECNO      DEPTH      CWSEL      CRTWS      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=          .0      130.0  TYPE=      1  TARGET=      129.999

        VS   L JA 10

 14970.00       8.60     863.20        .00        .00     863.36        .15        .26        .06     861.00
    1680.         2.      1323.       354.         4.       380.       263.       639.       180.     859.10
     3.44        .60       3.49       1.35        .070       .045       .080       .048     854.60       9.24
  .000861       950.       770.       600.          2          0          0        .00     120.76     130.00

*SECNO 15099.000
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3470 ENCROACHMENT STATIONS=      500.0      571.0  TYPE=      1  TARGET=      71.000
 15099.00      7.80    863.30      .00       .00    863.48      .17       .11       .01    869.30
    1680.        0.     1680.       0.        0.      502.       0.      641.      180. 100000.00
     3.45       .00      3.35      .00      .070      .045     .080      .048    855.50    500.00
  .000949      120.      129.      90.         2         0        0       .00     71.00    571.00


*SECNO 15100.000

3370 NORMAL BRIDGE,NRD= 15 MIN ELTRD=  868.90 MAX FLLC=  863.90

        BS    M JA 11     OLD US 23

 15100.00      7.80    863.30      .00       .00    863.48      .17       .00       .00    869.30
    1680.        0.     1680.       0.        0.      502.       0.      641.      180.    869.20
     3.45       .00      3.35      .00      .040      .022     .040      .048    855.50    500.00
  .000275        1.        1.       1.         0         0        0       .00     71.00    571.00


*SECNO 15146.000

3370 NORMAL BRIDGE,NRD= 15 MIN ELTRD=  868.90 MAX FLLC=  863.90

 15146.00      7.82    863.32      .00       .00    863.49      .17       .01       .00    869.30
    1680.        0.     1680.       0.        0.      503.       0.      642.      181.    869.20
     3.46       .00      3.34      .00      .040      .022     .040      .048    855.50    500.00
  .000272       46.       46.      46.         1         0        0       .00     71.00    571.00


*SECNO 15147.000

3470 ENCROACHMENT STATIONS=      500.0      571.0  TYPE=      1  TARGET=      71.000
 15147.00      7.82    863.32      .00       .00    863.49      .17       .00       .00    869.30
    1680.        0.     1680.       0.        0.      503.       0.      642.      181. 100000.00
     3.46       .00      3.34      .00      .040      .022     .040      .048    855.50    500.00
  .000225        1.        1.       1.         0         0        0       .00     71.00    571.00


*SECNO 15229.000
   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        WIN        ELMIN       SSTA
   SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID      ENDST


3470 ENCROACHMENT STATIONS=      400.0      479.9  TYPE=      1  TARGET=      79.900
 15229.00      7.79    863.39      .00       .00    863.52      .13       .02       .01    868.90
    1680.        0.     1680.       0.        0.      589.       0.      643.      181. 100000.00
     3.46       .00      2.85      .00      .040      .022     .040      .048    855.60    400.00
  .000152       82.       82.      82.         2         0        0       .00     79.90    479.90


*SECNO 15230.000

3265 DIVIDED FLOW


3370 NORMAL BRIDGE,NRD= 17 MIN ELTRD=  868.80 MAX ELLC=  866.10

        BS    N JA 12     US 23

 15230.00      7.79    863.39      .00       .00    863.53      .14       .01       .00    868.90
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   .  .        .      1680.      0.       0.      567.      0.      643.     181.    868.90
   3.46       .00     2.96      .00     .040     .022     .040     .048   855.60   400.00
 .000239       1.       1.       1.       0        0        0      .00    77.10   479.90

*SECNO 15282.000

3265 DIVIDED FLOW

3370 NORMAL BRIDGE,NRD= 17 MIN ELTRD=  868.80 MAX ELLC=  866.10

 15282.00     7.80   863.40      .00      .00   863.54      .14      .01      .00   868.90
    1680.       0.    1680.       0.       0.     568.       0.     643.     181.   868.90
     3.47      .00     2.96      .00     .040     .022     .040     .048   855.60   400.00
  .000238      52.      52.      52.       0        0        0      .00    77.10   479.90

*SECNO 15283.000

3470 ENCROACHMENT STATIONS=      400.0      479.9  TYPE=     1  TARGET=      79.900
 15283.00     7.82   863.42      .00      .00   863.54      .13      .00      .00   868.90
    1680.       0.    1680.       0.       0.     590.       0.     643.     181. 100000.00
     3.47      .00     2.85      .00     .040     .022     .040     .048   855.60   400.00
  .000152       1.       1.       1.       1        0        0      .00    79.90   479.90

*SECNO 15325.000

3470 ENCROACHMENT STATIONS=      400.0      479.9  TYPE=     1  TARGET=      79.900
 15325.00     7.82   863.42      .00      .00   863.55      .13      .01      .00   868.90
    1680.       0.    1680.       0.       0.     591.       0.     644.     181. 100000.00
     3.47      .00     2.84      .00     .040     .022     .040     .048   855.60   400.00
  .000151      42.      42.      42.       0        0        0      .00    79.90   479.90

*SECNO 15326.000

3265 DIVIDED FLOW

    SECNO      DEPTH      CWSEL      CRTWS      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

3370 NORMAL BRIDGE,NRD= 17 MIN ELTRD=  868.80 MAX ELLC=  866.10

 15326.00     7.82   863.42      .00      .00   863.55      .14      .00      .00   868.90
    1680.       0.    1680.       0.       0.     569.       0.     644.     181.   868.90
     3.47      .00     2.95      .00     .040     .022     .040     .048   855.60   400.00
  .000236       1.       1.       1.       0        0        0      .00    77.10   479.90

*SECNO 15372.000

3265 DIVIDED FLOW

3370 NORMAL BRIDGE,NRD= 17 MIN ELTRD=  868.80 MAX ELLC=  866.10

 15372.00     7.83   863.43      .00      .00   863.56      .14      .01      .00   868.90
    1680.       0.    1680.       0.       0.     570.       0.     645.     181.   868.90
     3.48      .00     2.95      .00     .040     .022     .040     .048   855.60   400.00
  .000236      46.      46.      46.       0        0        0      .00    77.10   479.90
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*SECNO 15373.000

3470 ENCROACHMENT STATIONS=      400.0      479.9  TYPE=      1  TARGET=      79.900
 15373.00      7.84    863.44      .00       .00    863.57      .13       .00       .00    868.90
    1680.        0.     1680.       0.        0.      592.       0.      645.      181. 100000.00
     3.48       .00      2.84      .00      .040      .045     .040      .048    855.60    400.00
  .000627        1.        1.       1.         1         0        0       .00     79.90    479.90

*SECNO 15439.000

3470 ENCROACHMENT STATIONS=      300.0      379.9  TYPE=      1  TARGET=      79.900
 15439.00      8.40    863.50      .00       .00    863.61      .11       .04       .01    869.30
    1680.        0.     1680.       0.        0.      637.       0.      645.      181. 100000.00
     3.48       .00      2.64      .00      .040      .045     .040      .048    855.10    300.00
  .000492       66.       66.      66.         2         0        0       .00     79.90    379.90

*SECNO 15440.000

3265 DIVIDED FLOW

3370 NORMAL BRIDGE,NRD= 12 MIN ELTRD=  867.60 MAX ELLC=  866.80

        BS    0 JA 13    FIELDCREST DRIVE

 15440.00      8.40    863.50      .00       .00    863.61      .12       .00       .00    869.30
    1680.        0.     1680.       0.        0.      615.       0.      645.      181.    869.10
     3.49       .00      2.73      .00      .040      .022     .040      .048    855.10    300.00
  .000184        1.        1.       1.         0         0        0       .00     77.10    379.90

*SECNO 15473.000

3265 DIVIDED FLOW

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

3370 NORMAL BRIDGE,NRD= 12 MIN ELTRD=  867.60 MAX ELLC=  866.80

 15473.00      8.40    863.50      .00       .00    863.62      .12       .01       .00    869.30
    1680.        0.     1680.       0.        0.      615.       0.      646.      181.    869.10
     3.49       .00      2.73      .00      .040      .022     .040      .048    855.10    300.00
  .000184       33.       33.      33.         0         0        0       .00     77.10    379.90

*SECNO 15474.000

3470 ENCROACHMENT STATIONS=      300.0      379.9  TYPE=      1  TARGET=      79.900
 15474.00      8.41    863.51      .00       .00    863.62      .11       .00       .00    869.30
    1680.        0.     1680.       0.        0.      638.       0.      646.      181. 100000.00
     3.49       .00      2.63      .00      .080      .045     .080      .048    855.10    300.00
  .000490        1.        1.       1.         1         0        0       .00     79.90    379.90

*SECNO 16570.000
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        VS    P JA 14     DOWNSTREAM FROM DAVIS CREEK

 16570.00      9.20    863.80       .00       .00    863.81       .01       .16       .03    859.00
    1680.      191.      559.      930.      635.      521.     2391.      698.      194.    859.50
     3.99       .30      1.07       .39      .080      .045      .080      .048    854.60     17.47
 .000069      996.     1096.     1096.         2         0         0       .00    947.65    965.12

*SECNO 18010.000

        VS    Q JA 15     UPSTREAM FROM DAVIS CREEK

 18010.00      8.59    863.89       .00       .00    863.90       .01       .09       .00    860.00
    1160.      180.      611.      369.      494.      567.      984.      774.      214.    860.30
     4.46       .36      1.08       .38      .080      .045      .080      .048    855.30     62.11
 .000075     1500.     1440.     1000.         2         0         0       .00    531.05    593.16

*SECNO 19210.000

        VS    R JA 16

 19210.00      9.09    863.99       .00       .00    864.01       .02       .10       .00    860.30
    1160.      502.      592.       67.     1110.      432.      147.      820.      226.    860.50
     4.79       .45      1.37       .45      .080      .045      .080      .048    854.90    179.78
 .000119     1100.     1200.      900.         2         0         0       .00    445.65    625.43

*SECNO 20620.000
   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       WIN     ELMIN       SSTA
   SLOPE      YLOBL      XLCH     XLOBR    ITRIAL       IOC     ICONT     CORAR    TOPWID       ENDST

        VS    S JA 17

 20620.00      9.29    864.09       .00       .00    864.09       .00       .08       .00    860.30
    1160.       13.      379.      768.       70.      481.     2747.      879.      241.    859.60
     5.52       .18       .79       .28      .080      .045      .080      .046    854.80     57.92
 .000042     1300.     1410.      800.         1         0         0       .00    936.92    994.84

*SECNO 21960.000

        VS    T JA 18

 21960.00      8.76    864.16       .00       .00    864.18       .02       .08       .01    860.60
    1160.      559.      597.        4.     1159.      374.       13.      933.      256.    860.40
     5.81       .48      1.59       .33      .080      .045      .080      .049    855.40     89.39
 .000162      900.     1340.      900.         1         0         0       .00    465.46    554.85

*SECNO 23400.000

3470 ENCROACHMENT STATIONS=        .0     150.0  TYPE=     1  TARGET=     149.999

        VS    U JA 19

 23400.00      9.58    864.48       .00       .00    864.57       .10       .36       .04    861.20
    1160.       25.     1019.      116.       47.      387.      145.      968.      266.    861.20
     5.97       .53      2.63       .80      .080      .045      .080      .048    854.90     29.53
 .000429     1400.     1440.     1400.         2         0         0       .00    120.47    150.00
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*SECNO 23649.000

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS=          .0      560.0  TYPE=      1  TARGET=     559.999
 23649.00      7.68    864.58       .00       .00    864.77       .19       .15       .05    859.50
    1160.        1.    1120.       39.        3.      317.       96.      970.      267.    861.20
     5.99       .43      3.53       .40      .080      .045      .080      .048    856.90    198.66
  .000949      249.      249.      249.         2         0         0       .00    224.74    542.78

*SECNO 23650.000

3265 DIVIDED FLOW

3370 NORMAL BRIDGE,NRD= 15 MIN ELTRD=  863.90 MAX ELLC=  867.50

        BS    V  JA 20     MCCABE ROAD

 23650.00      7.69    864.59       .00       .00    864.77       .18       .00       .00    870.30
    1160.        0.    1115.       45.        0.      317.       94.      970.      267.    868.50
     5.99       .00      3.51       .47      .040      .022      .040      .048    856.90    200.00
  .000334        1.        1.        1.         0         0         0       .00    221.97    542.83

*SECNO 23673.000

3265 DIVIDED FLOW

    SECNO     DEPTH     CWSEL     CRTWS    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    ITRTAL     TOC       ICONT     CORAR  TOPWID      ENDST

3370 NORMAL BRIDGE,NRD= 15 MIN ELTRD=  863.90 MAX ELLC=  867.50

 23673.00      7.70    864.60       .00       .00    864.78       .18       .01       .00    870.30
    1160.        0.    1114.       46.        0.      318.       97.      971.      267.    868.50
     6.00       .00      3.50       .48      .040      .022      .040      .048    856.90    200.00
  .000330       23.       23.       23.         0         0         0       .00    223.86    543.92

*SECNO 23674.000

3265 DIVIDED FLOW

 23674.00      7.70    864.60       .00       .00    864.78       .19       .00       .00    859.50
    1160.        1.    1119.       40.        3.      318.       99.      971.      267.    861.20
     6.00       .43      3.52       .40      .080      .045      .080      .048    856.90    198.66
  .000940        1.        1.        1.         0         0         0       .00    226.24    543.65

*SECNO 24330.000

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS=          .0     1232.0  TYPE=      1  TARGET=    1231.999
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VS N JA 21

24350.00	7.68	864.94	.00	.00	864.95	.01	.11	.05	861.40
1160.	599.	450.	111.	1492.	469.	397.	989.	273.	863.40
6.28	.40	.96	.28	.080	.045	.050	.048	857.30	212.70
.000073	560.	656.	520.	2	0	0	.00	808.73	1232.00

*SECNO 25110.000

VS X JA 22

25110.00	8.58	864.98	.00	.00	864.98	.00	.03	.00	861.60
1120.	8.	338.	774.	37.	511.	3125.	1038.	288.	861.60
6.82	.21	.66	.25	.080	.045	.070	.048	856.40	1.43
.000029	780.	780.	650.	2	0	0	.00	1067.57	1069.00

*SECNO 27960.000

3265 DIVIDED FLOW

VS Y JA 23

27960.00	9.42	865.02	.00	.00	865.02	.00	.04	.00	864.30
1120.	77.	241.	802.	516.	458.	3980.	1215.	339.	861.50
8.87	.15	.53	.20	.070	.041	.070	.049	855.60	230.78
.000017	1100.	2850.	1700.	2	0	0	.00	1542.90	2038.71

*SECNO 30760.000

SECNO	DEPTH	CWSEL	CRIT S	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	TDC	ICONT	CORAR	TOPWID	ENDST

VS Z JA 24

30760.00	6.49	865.09	.00	.00	865.17	.07	.10	.04	863.00
1120.	304.	815.	0.	499.	322.	0.	1330.	373.	864.00
9.16	.61	2.53	.21	.080	.042	.080	.050	858.60	130.75
.000543	1000.	2800.	1700.	2	0	0	.00	400.11	530.86

*SECNO 31370.000

VS AA JA 25

31370.00	6.78	865.38	.00	.00	865.44	.06	.27	.00	862.80
1120.	263.	837.	20.	533.	363.	31.	1341.	379.	862.30
9.25	.49	2.30	.65	.080	.042	.080	.050	858.60	144.82
.000399	500.	610.	700.	2	0	0	.00	529.40	674.23

*SECNO 32300.000

3265 DIVIDED FLOW

VS AB JA 26

32300.00	6.74	865.64	.00	.00	865.67	.03	.23	.01	863.40
1120.	124.	878.	119.	312.	538.	287.	1358.	386.	863.10
9.42	.40	1.63	.41	.080	.042	.080	.049	858.90	150.59
.000189	600.	930.	650.	2	0	0	.00	423.15	710.24

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*SECNO 32830.000

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS=      150.0     1060.0  TYPE=      1  TARGET=     -150.000

        VS  AC JA 27

 32830.00      6.55    865.75       .00       .00    865.76       .02       .08       .00    863.60
    1120.      180.      746.      194.      516.      602.      613.     1376.      393.    863.70
     9.58       .35      1.24       .32      .080      .042      .080      .049    859.20    150.00
  .000129      400.      530.      700.         2         0         0       .00    702.94    996.79

*SECNO 33630.000

3470 ENCROACHMENT STATIONS=      950.0     1200.0  TYPE=      1  TARGET=      250.000

        VS  AD JA 28

 33630.00      6.58    865.88       .00       .00    865.98       .09       .18       .04    864.20
    1120.      106.      949.       65.      196.      358.       93.     1395.      400.    863.70
     9.67       .54      2.65       .70      .080      .042      .080      .049    859.30    950.00
  .000556      700.      800.      500.         2         0         0       .00    250.00   1200.00

*SECNO 33919.000
    SECNO     DEPTH     CHSEL     CRIWS     WSELK      FG        HV        HL      OLOSS   BANK ELEV
      Q       ALOB      OCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
     TIME     VLOB      VCH       VROB      XNL       XNCH      XNR       WTN      ELMIN      SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    TOC       ICONT     CORAR    TOPWID     ENDST

 33919.00      7.43    866.03       .00       .00    866.29       .25       .23       .08    869.80
    1120.        0.     1118.        2.        0.      277.        3.     1398.      401.    862.30
     9.69       .00      4.03       .54      .080      .042      .080      .049    858.60    700.00
  .001233      280.      289.      210.         2         0         0       .00     43.34    743.34

*SECNO 33920.000

        BS  AE JA 29   DRIVEWAY BRIDGE

 33920.00      7.43    866.03       .00       .00    866.29       .25       .00       .00    869.80
    1120.        0.     1119.        1.        0.      277.        3.     1398.      401.    862.30
     9.69       .00      4.03       .45      .050      .022      .050      .049    858.60    700.00
  .000338        1.        1.        1.         0         0         0       .00     43.34    743.34

SPECIAL BRIDGE

SB   XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
      .00      1.41      3.02       .00     37.39       .00    280.42       .00    858.60    858.60

*SECNO 33961.000
PRESSURE FLOW

 EGPRS     EGLWC     H3        QWEIR     QPR       BAREA     TRAPEZOID     ELLC      ELTRD
                                                              AREA
  866.38    866.29     .00        0.     1120.      280.      280.       866.10    869.50
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33961.00      7.54    866.14      .00       .00    866.38      .24      .10      .00    869.80
   1120.        0.      1119.      1.        0.      282.       3.     1398.     401.    862.30
    9.69       .00      3.97      .45      .050     .022     .050      .049    858.60    700.00
 .000322       41.       41.      41.        2        0        0       .00     43.39    743.39


*SECNO 33962.000
33962.00      7.54    866.14      .00       .00    866.38      .24      .00      .00    869.80
   1120.        0.      1118.      2.        0.      282.       3.     1398.     401.    862.30
    9.69       .00      3.97      .57      .060     .045     .080      .049    858.60    700.00
 .001346        1.        1.       1.        0        0        0       .00     43.39    743.39


*SECNO 34740.000

3470 ENCROACHMENT STATIONS=        .0     1960.0  TYPE=     1  TARGET=     1959.999

        VS  AF JA 30

34740.00      8.21    866.51      .00       .00    866.51      .00      .06      .07    863.00
   1120.       304.      397.     419.     1227.      753.    2184.     1433.     411.    862.50
   10.32       .25       .53      .19      .060     .045     .080      .049    858.30    661.48
 .000024      530.      778.     730.        2        0        0       .00   1298.52   1960.00


*SECNO 37250.000
 SECNO      DEPTH     CWSEL     CRIWS     WSELK     FG        HV        HL        OLOSS    BANK ELEV
 O          QLOB      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=        .0     2206.0  TYPE=     1  TARGET=     2205.999

        VS  AG JA 31

37250.00      6.27    866.57      .00       .00    866.57      .00      .06      .00    863.30
   1120.       391.      376.     353.     1312.      572.    1786.     1597.     475.    863.20
   11.70       .30       .66      .20      .060     .045     .080      .050    860.30    403.49
 .000039     1100.     2510.    2050.        2        0        0       .00   1802.51   2206.00


*SECNO 39670.000

        VS  AH JA 32

39670.00      6.61    866.71      .00       .00    866.74      .03      .15      .01    864.00
   1120.       119.      726.     275.      222.      426.     629.     1685.     514.    864.40
   12.11       .54      1.70      .44      .060     .045     .080      .050    860.10    159.20
 .000270     1600.     2420.    1150.        2        0        0       .00    638.04    797.24


*SECNO 42170.000

        VS  AI JA 33

42170.00      5.74    867.24      .00       .00    867.26      .02      .52      .00    865.10
   1120.       290.      544.     285.      574.      362.     751.     1739.     541.    865.10
   12.68       .51      1.50      .38      .060     .045     .080      .050    861.50    546.48
 .000256     1600.     2500.    1100.        2        0        0       .00   1044.67   1591.15


*SECNO 43250.000
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3470 ENCROACHMENT STATIONS=          .0      250.0  TYPE=      1  TARGET=      249.999

        VS  AJ JA 34

 43250.00      5.46    867.66       .00       .00    867.78       .12       .46       .05    866.90
    1120.        0.    1010.      109.        0.      341.      172.     1762.      553.    866.60
    12.78       .37      2.96       .64      .060      .045      .080      .050    862.20     10.99
  .001100      800.    1080.      800.         2         0         0       .00    239.01    250.00

*SECNO 43544.000
 43544.00      6.53    868.03       .00       .00    868.26       .23       .43       .05    891.80
    1120.        0.    1120.        0.        0.      290.        0.     1764.      554.    892.00
    12.80       .00      3.86       .00      .060      .045      .080      .050    861.50    349.47
  .002011      300.     294.      260.         2         0         0       .00     66.32    415.79

*SECNO 43545.000
   SECNO     DEPTH     CWSEL     CRIWS     WSELK        EG        HV        HL     OLOSS    BANK ELEV
   Q         OLOB      QCH       QROB      ALOB       ACH      AROB       VOL       TWA   LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL        XNCH     XNR        WTM       ELMIN      SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL     IOC      ICONT      CORAR     TOPWID     ENDST

3370 NORMAL BRIDGE,NRD= 17 MIN ELTRD=  891.80 MAX FLLC=  885.60

        BS  AK JA 35   C & O RR

 43545.00      6.53    868.03       .00       .00    868.26       .23       .00       .00    891.80
    1120.        0.    1120.        0.        0.      290.        0.     1764.      554.    892.00
    12.80       .00      3.86       .00      .050      .022      .050      .050    861.50    349.46
  .000480        1.       1.        1.         0         0         0       .00     66.33    415.79

*SECNO 43554.000

3370 NORMAL BRIDGE,NRD= 17 MIN ELTRD=  891.80 MAX FLLC=  885.60

 43554.00      6.53    868.03       .00       .00    868.26       .23       .00       .00    891.80
    1120.        0.    1120.        0.        0.      291.        0.     1764.      554.    892.00
    12.80       .00      3.85       .00      .050      .022      .050      .050    861.50    349.38
  .000477        9.       9.        9.         0         0         0       .00     66.44    415.82

*SECNO 43555.000
 43555.00      6.53    868.03       .00       .00    868.26       .23       .00       .00    891.80
    1120.        0.    1120.        0.        0.      291.        0.     1765.      554.    892.00
    12.80       .00      3.85       .00      .060      .045      .080      .050    861.50    349.42
  .002003        1.       1.        1.         0         0         0       .00     66.39    415.81

*SECNO 43970.000

3470 ENCROACHMENT STATIONS=          .0      480.0  TYPE=      1  TARGET=      479.999

        VS  AL JA 36

 43970.00      7.14    868.54       .00       .00    868.59       .05       .27       .05    866.70
    1120.       14.     886.      219.       30.      449.      515.     1770.      556.    866.70
    12.87       .49      1.97       .43      .080      .045      .080      .050    861.40     13.05
  .000321      480.     415.      380.         1         0         0       .00    466.95    480.00

*SECNO 45129.000
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3265 DIVIDED FLOW

45129.00	6.12	869.02	.00	.00	869.10	.09	.49	.02	872.00
1120.	156.	964.	0.	312.	381.	1.	1788.	564.	866.20
13.01	.50	2.53	.24	.080	.045	.080	.050	862.90	249.64
.000700	850.	1159.	600.	2	0	0	.00	402.36	723.10

*SECNO 45130.000

3265 DIVIDED FLOW

SECNO	DEPTH	C*SEL	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= 18 MIN ELTRD= 867.80 MAX ELLC= 869.30

BS AM JA 37 SUTHERLAND ROAD

45130.00	6.11	869.01	.00	.00	869.11	.10	.00	.01	872.00
1120.	139.	981.	0.	312.	366.	0.	1788.	564.	872.60
13.01	.45	2.68	.00	.050	.020	.050	.050	862.90	249.58
.000215	1.	1.	1.	0	0	0	.00	398.96	722.40

*SECNO 45148.000

3265 DIVIDED FLOW

3370 NORMAL BRIDGE,NRD= 18 MIN ELTRD= 867.80 MAX ELLC= 869.30

45148.00	6.11	869.01	.00	.00	869.11	.10	.00	.00	872.00
1120.	139.	981.	0.	313.	366.	0.	1789.	565.	872.60
13.01	.45	2.68	.00	.050	.020	.050	.050	862.90	249.52
.000215	18.	18.	18.	0	0	0	.00	399.07	722.40

*SECNO 45149.000

3265 DIVIDED FLOW

45149.00	6.13	869.03	.00	.00	869.12	.09	.00	.00	872.00
1120.	158.	962.	0.	314.	381.	1.	1789.	565.	866.20
13.01	.50	2.52	.24	.080	.045	.080	.050	862.90	249.42
.000694	1.	1.	1.	1	0	0	.00	402.77	723.11

*SECNO 46760.000

VS AN JA 38

46760.00	6.60	869.90	.00	.00	869.95	.05	.83	.01	867.30
1120.	241.	804.	75.	408.	379.	128.	1817.	577.	867.30
13.27	.59	2.12	.58	.080	.045	.080	.050	863.30	57.62
.000411	1450.	1611.	1300.	2	0	0	.00	344.73	402.35

*SECNO 48160.000

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48160.00      7.26    870.36      .00      .00    870.40      .04      .44      .00    867.20
   1120.       411.     674.      35.     630.     357.      75.    1842.     585.    868.00
   13.52       .65     1.89      .47     .080     .045     .080     .050   863.10    135.99
 .000313      900.    1400.    1200.        2        0        0      .00   356.52    492.51

*SECNO 49545.000
   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   IOC      ICONT    CORAR   TOPWID    ENDST

        VS  AP JA 40

49545.00      10.60   870.60      .00      .00    870.61      .02      .21      .01    867.60
    850.       196.     653.       1.     520.     531.       7.    1872.     594.    868.20
   13.87       .38     1.23      .21     .070     .045     .070     .050   860.00    104.76
 .000064      1100.    1385.    1500.        2        0        0      .00   261.01    365.77

*SECNO 50735.000

3265 DIVIDED FLOW

        VS  AQ JA 41

50735.00       7.10   870.70      .00      .00    870.71      .01      .09      .00    867.60
    850.       273.     362.     215.     875.     360.     615.    1904.     604.    867.50
   14.34       .31     1.00      .35     .080     .045     .070     .050   863.60    331.68
 .000087      850.    1190.     800.        2        0        0      .00   707.60   1202.06

*SECNO 53335.000

        VS  AR JA 42

53335.00       8.14   870.84      .00      .00    870.85      .01      .14      .00    867.30
    850.        34.     380.     436.     157.     432.    1254.    1974.     628.    867.50
   15.26       .21      .88      .35     .060     .045     .070     .050   862.70    611.34
 .000062      1400.    2600.    1400.        1        0        0      .00   694.77   1306.10

*SECNO 55645.000

3265 DIVIDED FLOW

        VS  AS JA 43

55645.00       6.44   871.04      .00      .00    871.08      .04      .21      .01    868.90
    850.       163.     676.      11.     313.     405.      20.    2022.     644.    867.90
   15.63       .52     1.67      .58     .070     .045     .060     .051   864.60    298.54
 .000253      1500.    2310.    1200.        2        0        0      .00   264.03    681.97

*SECNO 57005.000

3470 ENCROACHMENT STATIONS=        .0      365.0  TYPE=      1  TARGET=      364.999

        VS  AT JA 44
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 ...0.     7.21    871.51      .00      .00   871.54      .05      .26      .00   868.90
   850.      17.      741.      92.      44.     550.     167.    2045.     651.   867.90
  15.94      .38     1.35      .55     .060     .045     .060     .050   864.10   181.18
 .000146    1400.    1360.    1450.        2        0        0      .00   183.82   365.00


*SECNO 57294.000
   SECNO     DEPTH    CWSEL    CRIWS    WSELK      EG       HV       HL    OLOSS   BANK ELEV
   Q         QLOB     QCH      QROB     ALOB       ACH      AROB     VOL   TWA    LEFT/RIGHT
   TIME      VLOB     VCH      VROB     XML        XNCH     XNR      WTN   ELMIN      SSTA
   SLOPE     XLOBL    XLCH     XLOBR    ITRIAL     IDC      ICONT    CORAR TOPWID     ENDST

 57294.00     6.33   871.33      .00      .00   871.50      .17      .09      .07   877.80
     850.       0.     850.       0.       0.     257.       0.    2049.     652.   876.70
    15.96      .00     3.30      .00     .060     .045     .060     .050   865.00   372.00
  .001254     200.     289.     250.        2        0        0      .00    43.00   415.00


*SECNO 57295.000

3370 NORMAL BRIDGE,NRD= 20 MIN ELTRD=  873.20 MAX ELLC=  874.60


        BS  AU JA 45   KENSINGTON ROAD

 57295.00     6.33   871.33      .00      .00   871.50      .17      .00      .00   877.80
     850.       0.     850.       0.       0.     257.       0.    2049.     652.   876.70
    15.96      .00     3.30      .00     .025     .022     .025     .050   865.00   372.00
  .000385       1.       1.       1.        0        0        0      .00    43.00   415.00


*SECNO 57333.000

3370 NORMAL BRIDGE,NRD= 20 MIN ELTRD=  873.20 MAX ELLC=  874.60

 57333.00     6.35   871.35      .00      .00   871.52      .17      .01      .00   877.80
     850.       0.     850.       0.       0.     258.       0.    2049.     652.   876.70
    15.97      .00     3.29      .00     .025     .022     .025     .050   865.00   372.00
  .000380      38.      38.      38.        1        0        0      .00    43.00   415.00


*SECNO 57334.000
 57334.00     6.35   871.35      .00      .00   871.52      .17      .00      .00   877.80
     850.       0.     850.       0.       0.     258.       0.    2049.     652.   876.70
    15.97      .00     3.29      .00     .150     .035     .150     .050   865.00   372.00
  .000752       1.       1.       1.        0        0        0      .00    43.00   415.00


*SECNO 57469.000

3470 ENCROACHMENT STATIONS=        .0     900.0  TYPE=     1  TARGET=     899.999
 57469.00     6.42   871.57      .00      .00   871.59      .02      .02      .04   865.15
     850.      49.     758.      43.     265.     623.     259.    2051.     652.   868.55
    16.00      .18     1.22      .17     .150     .035     .150     .050   865.15   332.71
  .000073     135.     135.     135.        2        0        0      .00   325.52   658.23


*SECNO 58005.000
   SECNO     DEPTH    CWSEL    CRIWS    WSELK      EG       HV       HL    OLOSS   BANK ELEV
   Q         QLOB     QCH      QROB     ALOB       ACH      AROB     VOL   TWA    LEFT/RIGHT
   TIME      VLOB     VCH      VROB     XML        XNCH     XNR      WTN   ELMIN      SSTA
   SLOPE     XLOBL    XLCH     XLOBR    ITRIAL     IDC      ICONT    CORAR TOPWID     ENDST
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- - - - - - CNT STATIO.S-        .0      400.0   I FF-      1   TARGET-      899.999

        VS   AV JA 45A

 58005.00      6.01    871.61       .00       .00    871.63       .02       .04       .00    865.60
     850.        46.      767.       37.      220.      582.      217.     2063.      656.    869.00
    16.12       .21      1.32       .17      .150      .035      .150      .050    865.60    345.88
  .000094      555.      536.      315.         2         0         0       .00    304.81    650.69

*SECNO 59225.000

        VS   AW JA 46

 59225.00      6.24    871.74       .00       .00    871.79       .04       .14       .01    868.90
     850.        32.      814.        4.      199.      496.       23.     2083.      662.    869.00
    16.33       .16      1.64       .17      .150      .035      .150      .050    865.50    942.52
  .000167      700.     1220.      450.         2         0         0       .00    320.65   1263.17

*SECNO 61035.000

        VS   AX JA 47

 61035.00      5.64    872.04       .00       .00    872.08       .04       .30       .00    869.70
     850.         1.      821.       28.        5.      509.      169.     2108.      670.    869.50
    16.64       .13      1.61       .17      .150      .035      .150      .049    866.40     35.94
  .000167      700.     1810.     1300.         2         0         0       .00    243.00    278.94

*SECNO 62125.000

        VS   AY JA 48

 62125.00      5.36    872.26       .00       .00    872.31       .06       .22       .01    869.90
     850.         5.      828.       16.       23.      430.       84.     2123.      674.    869.60
    16.80       .24      1.93       .20      .150      .035      .150      .049    866.90     36.67
  .000258     1150.     1090.      800.         2         0         0       .00    172.09    208.76

*SECNO 62745.000

        VS   AZ JA 49

 62745.00      4.76    872.46       .00       .00    872.56       .10       .23       .02    871.40
     850.         2.      847.        1.       16.      337.        7.     2129.      676.    871.30
    16.87       .15      2.51       .16      .150      .035      .150      .049    867.70    120.53
  .000550      600.      620.      500.         2         0         0       .00    124.08    244.61

*SECNO 62925.000
   SECNO     DEPTH     CWSEL     CRIWS     WSELK        EG        HV        HL     QLOSS   BANK ELEV
   Q         ALOB      QCH       QROB      ALOB       ACH      ARUB       VOL       TWA   LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL        XNCH     XNR       WTN       ELMIN      SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL     IDC      ICONT     CORAR     TOPWID     ENDST

 62925.00      4.78    872.58       .00       .00    872.64       .06       .07       .01    888.00
     850.         0.      850.        0.        0.      426.        0.     2131.      677.    888.00
    16.90       .00      2.00       .00      .150      .035      .150      .049    867.80    104.00
  .000318      180.      180.      180.         2         0         0       .00     90.00    194.00
```

SPECIAL BRIDGE

	AKUR	CUFB	RDLE	R C	BWP	BAREA	SS	ELCHU	ELCHD
.00	5.00	3.30	.00	.01	.00	.00	.00	867.80	867.80

*SECNO 62945.000
PRESSURE AND WEIR FLOW

EGPRS	FGLWC	H3	QWEIR	QPR	AAREA	TRAPEZOID AREA	ELLC	ELTRD
#########	872.64	.00	850.	0.	0.	0.	867.91	884.00

US BA JA SO KENT LAKE DAM

62945.00	18.21	886.01	.00	.00	886.02	.00	13.37	.00	888.00
650.	0.	850.	0.	0.	1635.	0.	2131.	677.	888.00
16.91	.00	.52	.00	.040	.015	.040	.049	867.80	104.00
.000001	20.	20.	20.	0	0	10	.00	90.00	194.00

$Q_D = (3.9)(90)\,(EG - 884)^{1.5} \Rightarrow EG = 885.8$

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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

BRANCH HURON RIVER -

SUMMARY PRINTOUT

SECNO	XLCH	FLTRD	FLLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	TOPWID	AREA
.000	.00	.00	.00	849.80	1680.00	859.73	9.93	.01	.00	859.74	817.49	3489.19
1500.000	1500.00	.00	.00	851.20	1680.00	859.84	8.64	.06	.03	859.90	461.01	1354.70
3090.000	1590.00	.00	.00	851.40	1680.00	860.39	8.99	.07	.01	860.46	485.33	1310.59
4280.000	1190.00	.00	.00	850.30	1680.00	860.59	10.29	.00	.02	860.60	1346.06	5144.26
5790.000	1510.00	.00	.00	852.90	1680.00	860.63	7.73	.00	.00	860.63	1298.21	4708.54
7830.000	2040.00	.00	.00	852.20	1680.00	860.74	8.54	.05	.02	860.79	596.65	1631.88
9040.000	1210.00	.00	.00	852.40	1680.00	861.13	8.73	.07	.01	861.20	220.00	1037.88
9340.000	300.00	.00	.00	853.50	1680.00	861.24	7.74	.23	.08	861.47	70.37	440.48
9341.000	1.00	864.00	863.50	853.50	1680.00	861.24	7.74	.23	.00	861.47	69.27	439.42
9374.000	33.00	864.00	863.50	853.50	1680.00	861.25	7.75	.23	.00	861.48	69.28	440.72
9375.000	1.00	.00	.00	853.50	1680.00	861.25	7.75	.23	.00	861.48	70.39	440.65
11100.000	1725.00	.00	.00	853.30	1680.00	862.37	9.07	.05	.05	862.42	590.85	1603.66
12960.000	1860.00	.00	.00	853.70	1680.00	862.79	9.09	.02	.01	862.81	527.97	1910.13
14200.000	1240.00	.00	.00	854.50	1680.00	863.01	8.51	.03	.00	863.04	368.76	1653.21
14970.000	770.00	.00	.00	854.60	1680.00	863.20	8.60	.15	.06	863.36	120.76	646.63
15099.000	129.00	.00	.00	855.50	1680.00	863.30	7.80	.17	.01	863.48	71.00	501.78
15100.000	1.00	868.90	863.90	855.50	1680.00	863.30	7.80	.17	.00	863.48	71.00	501.85
15146.000	46.00	868.90	863.90	855.50	1680.00	863.32	7.82	.17	.00	863.49	71.00	503.33
15147.000	1.00	.00	.00	855.50	1680.00	863.32	7.82	.17	.00	863.49	71.00	502.82
15229.000	82.00	.00	.00	855.60	1680.00	863.39	7.79	.13	.01	863.52	79.90	588.67

SECNO	XLCH	FLTRD	ELLC	FLMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	TOPWID	AREA
15230.000	1.00	868.80	866.10	855.60	1680.00	863.39	7.79	.14	.00	863.53	77.10	567.15
15282.000	52.00	868.80	866.10	855.60	1680.00	863.40	7.80	.14	.00	863.54	77.10	567.55
15283.000	1.00	.00	.00	855.60	1680.00	863.42	7.82	.13	.00	863.54	79.90	589.83
15325.000	42.00	.00	.00	855.60	1680.00	863.42	7.82	.13	.00	863.55	79.90	591.02
15326.000	1.00	868.80	866.10	855.60	1680.00	863.42	7.82	.14	.00	863.55	77.10	569.32
15372.000	46.00	868.80	866.10	855.60	1680.00	863.43	7.83	.14	.00	863.56	77.10	569.63
15373.000	1.00	.00	.00	855.60	1680.00	863.44	7.84	.13	.00	863.57	79.90	591.97
15439.000	66.00	.00	.00	855.10	1680.00	863.50	8.40	.11	.01	863.61	79.90	637.07
15440.000	1.00	867.60	866.80	855.10	1680.00	863.50	8.40	.12	.00	863.61	77.10	614.72
15473.000	33.00	867.60	866.80	855.10	1680.00	863.50	8.40	.12	.00	863.62	77.10	615.25
15474.000	1.00	.00	.00	855.10	1680.00	863.51	8.41	.11	.00	863.62	79.90	637.71
16570.000	1096.00	.00	.00	854.60	1680.00	863.80	9.20	.01	.03	863.81	947.65	3547.03
18010.000	1440.00	.00	.00	855.30	1160.00	863.89	8.59	.01	.00	863.90	531.05	2044.98
19210.000	1200.00	.00	.00	854.90	1160.00	863.99	9.09	.02	.00	864.01	445.65	1688.12
20620.000	1410.00	.00	.00	854.80	1160.00	864.09	9.29	.00	.00	864.09	936.92	3298.21
21960.000	1340.00	.00	.00	855.40	1160.00	864.16	8.76	.02	.01	864.18	465.46	1545.99
23400.000	1440.00	.00	.00	854.90	1160.00	864.48	9.58	.10	.04	864.57	120.47	578.61
23649.000	249.00	.00	.00	856.90	1160.00	864.58	7.68	.19	.05	864.77	224.74	417.10
23650.000	1.00	863.90	867.50	856.90	1160.00	864.59	7.69	.18	.00	864.77	221.97	411.30
23673.000	23.00	863.90	867.50	856.90	1160.00	864.60	7.70	.18	.00	864.78	223.86	415.20
23674.000	1.00	.00	.00	856.90	1160.00	864.60	7.70	.19	.00	864.78	226.24	420.22
24330.000	656.00	.00	.00	857.30	1160.00	864.94	7.64	.01	.05	864.95	808.73	2359.05
25110.000	780.00	.00	.00	856.40	1120.00	864.98	8.58	.00	.00	864.98	1067.57	3673.53
27960.000	2850.00	.00	.00	855.60	1120.00	865.02	9.42	.00	.00	865.02	1542.90	4954.12
30760.000	2800.00	.00	.00	858.60	1120.00	865.09	6.49	.07	.04	865.17	400.11	820.93
31370.000	610.00	.00	.00	858.60	1120.00	865.38	6.78	.06	.00	865.44	529.40	927.07
32300.000	930.00	.00	.00	858.90	1120.00	865.64	6.74	.03	.01	865.67	423.15	1136.10
32830.000	530.00	.00	.00	859.20	1120.00	865.75	6.55	.02	.00	865.76	702.94	1730.76
33630.000	800.00	.00	.00	859.30	1120.00	865.88	6.58	.09	.04	865.98	250.00	646.94

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	TOPWID	AREA
33919.000	289.00	.00	.00	858.60	1120.00	866.03	7.43	.25	.08	866.29	43.34	280.48
33920.000	1.00	.00	.00	858.60	1120.00	866.03	7.43	.25	.00	866.29	43.34	280.52
33961.000	41.00	869.50	866.10	858.60	1120.00	866.14	7.54	.24	.00	866.38	43.39	285.08
33962.000	1.00	.00	.00	858.60	1120.00	866.14	7.54	.24	.00	866.38	43.39	285.07
34740.000	778.00	.00	.00	858.30	1120.00	866.51	8.21	.00	.07	866.51	1298.52	4164.14
37250.000	2510.00	.00	.00	860.30	1120.00	866.57	6.27	.00	.00	866.57	1802.51	3670.48
39670.000	2420.00	.00	.00	860.10	1120.00	866.71	6.61	.03	.01	866.74	638.04	1276.98
42170.000	2500.00	.00	.00	861.50	1120.00	867.24	5.74	.02	.00	867.26	1044.67	1687.30
43250.000	1080.00	.00	.00	862.20	1120.00	867.66	5.46	.12	.05	867.78	239.01	513.63
43544.000	294.00	.00	.00	861.50	1120.00	868.03	6.53	.23	.05	868.26	66.32	290.07
43545.000	1.00	891.80	885.60	861.50	1120.00	868.03	6.53	.23	.00	868.26	66.33	290.16
43554.000	9.00	891.80	885.60	861.50	1120.00	868.03	6.53	.23	.00	868.26	66.44	290.88
43555.000	1.00	.00	.00	861.50	1120.00	868.03	6.53	.23	.00	868.26	66.39	290.55
43970.000	415.00	.00	.00	861.40	1120.00	868.54	7.14	.05	.05	868.59	466.95	993.97
45129.000	1159.00	.00	.00	862.90	1120.00	869.02	6.12	.09	.02	869.10	402.36	693.12
45130.000	1.00	867.80	869.30	862.90	1120.00	869.01	6.11	.10	.01	869.11	398.96	678.12
45148.000	18.00	867.80	869.30	862.90	1120.00	869.01	6.11	.10	.00	869.11	399.07	678.96
45149.000	1.00	.00	.00	862.90	1120.00	869.03	6.13	.09	.00	869.12	402.77	696.38
46760.000	1611.00	.00	.00	863.30	1120.00	869.90	6.60	.05	.01	869.95	344.73	915.82
48160.000	1400.00	.00	.00	863.10	1120.00	870.36	7.26	.04	.00	870.40	356.52	1062.13
49545.000	1385.00	.00	.00	860.00	850.00	870.60	10.60	.02	.01	870.61	261.01	1057.90
50735.000	1190.00	.00	.00	863.60	850.00	870.70	7.10	.01	.00	870.71	707.60	1850.31
53335.000	2600.00	.00	.00	862.70	850.00	870.84	8.14	.01	.00	870.85	694.77	1842.73
55645.000	2310.00	.00	.00	864.60	850.00	871.04	6.44	.04	.01	871.08	264.03	737.08
57005.000	1360.00	.00	.00	864.10	850.00	871.31	7.21	.03	.00	871.34	183.82	760.89
57294.000	289.00	.00	.00	865.00	850.00	871.33	6.33	.17	.07	871.50	43.00	257.34
57295.000	1.00	873.20	874.60	865.00	850.00	871.33	6.33	.17	.00	871.50	43.00	257.37
57333.000	38.00	873.20	874.60	865.00	850.00	871.35	6.35	.17	.00	871.52	43.00	258.40
57334.000	1.00	.00	.00	865.00	850.00	871.35	6.35	.17	.00	871.52	43.00	258.09

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	TOPWID	AREA
57469.000	135.00	.00	.00	865.15	850.00	871.57	6.42	.02	.04	871.59	325.52	1147.86
58005.000	536.00	.00	.00	865.60	850.00	871.61	6.01	.02	.00	871.63	304.81	1019.19
59225.000	1220.00	.00	.00	865.50	850.00	871.74	6.24	.04	.01	871.79	320.65	717.62
61035.000	1810.00	.00	.00	866.40	850.00	872.04	5.64	.04	.00	872.08	243.00	683.20
62125.000	1090.00	.00	.00	866.90	850.00	872.26	5.36	.06	.01	872.31	172.09	536.88
62745.000	620.00	.00	.00	867.70	850.00	872.46	4.76	.10	.02	872.56	124.08	359.62
62925.000	180.00	.00	.00	867.80	850.00	872.58	4.78	.06	.01	872.64	90.00	425.79
62945.000	20.00	884.00	867.91	867.80	850.00	886.01	18.21	.00	.00	886.02	90.00	1634.95

SUMMARY OF ERRORS

00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: GREEN OAK TWP

3) WATERCOURSE: HURON RIVER

4) DOCUMENT TYPE: SUMMARY TABLE

00BREAK00

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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

BRANCH HURON RIVER,E

SUMMARY PRINTOUT

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	TOPWID	AREA
.000	.00	.00	.00	849.80	1020.00	858.26	8.46	.01	.00	858.27	400.00	1699.32
.000	.00	.00	.00	849.80	1450.00	859.32	9.52	.01	.00	859.33	400.00	2123.32
.000	.00	.00	.00	849.80	1680.00	859.76	9.96	.01	.00	859.77	400.00	2299.32
.000	.00	.00	.00	849.80	2140.00	860.74	10.94	.02	.00	860.76	400.00	2691.32
1500.000	1500.00	.00	.00	851.20	1020.00	858.41	7.21	.05	.02	858.46	371.84	745.42
1500.000	1500.00	.00	.00	851.20	1450.00	859.47	8.27	.06	.02	859.53	444.39	1188.98
1500.000	1500.00	.00	.00	851.20	1680.00	859.92	8.72	.06	.02	859.97	464.62	1391.53
1500.000	1500.00	.00	.00	851.20	2140.00	860.89	9.69	.06	.02	860.95	476.26	1851.64
3090.000	1590.00	.00	.00	851.40	1020.00	858.97	7.57	.07	.01	859.04	274.48	744.89
3090.000	1590.00	.00	.00	851.40	1450.00	860.00	8.60	.07	.01	860.07	461.75	1126.70
3090.000	1590.00	.00	.00	851.40	1680.00	860.44	9.04	.07	.01	860.51	487.17	1337.02
3090.000	1590.00	.00	.00	851.40	2140.00	861.35	9.95	.07	.01	861.42	516.04	1794.81
4280.000	1190.00	.00	.00	850.30	1020.00	859.20	8.90	.01	.02	859.21	900.00	2661.14
4280.000	1190.00	.00	.00	850.30	1450.00	860.23	9.93	.01	.02	860.23	900.00	3583.00
4280.000	1190.00	.00	.00	850.30	1680.00	860.67	10.37	.01	.02	860.67	900.00	3978.78
4280.000	1190.00	.00	.00	850.30	2140.00	861.56	11.26	.01	.02	861.57	900.00	4784.74
5790.000	1510.00	.00	.00	852.90	1020.00	859.27	6.37	.00	.00	859.27	910.67	2732.28
5790.000	1510.00	.00	.00	852.90	1450.00	860.28	7.38	.00	.00	860.28	936.65	3668.04
5790.000	1510.00	.00	.00	852.90	1680.00	860.72	7.82	.00	.00	860.72	947.88	4080.89
5790.000	1510.00	.00	.00	852.90	2140.00	861.61	8.71	.00	.00	861.61	950.00	4926.85
7830.000	2040.00	.00	.00	852.20	1020.00	859.42	7.22	.05	.02	859.47	392.25	879.81
7830.000	2040.00	.00	.00	852.20	1450.00	860.41	8.21	.05	.02	860.46	394.22	1267.94
7830.000	2040.00	.00	.00	852.20	1680.00	860.85	8.65	.05	.02	860.90	395.09	1439.10
7830.000	2040.00	.00	.00	852.20	2140.00	861.72	9.52	.05	.02	861.78	396.84	1786.45
9040.000	1210.00	.00	.00	852.40	1020.00	859.81	7.41	.05	.00	859.86	220.00	748.78
9040.000	1210.00	.00	.00	852.40	1450.00	860.79	8.39	.06	.01	860.85	220.00	963.98
9040.000	1210.00	.00	.00	852.40	1680.00	861.23	8.83	.07	.01	861.30	220.00	1060.00
9040.000	1210.00	.00	.00	852.40	2140.00	862.09	9.69	.08	.01	862.17	220.00	1249.84
9340.000	300.00	.00	.00	853.50	1020.00	859.93	6.43	.13	.04	860.06	69.24	349.04
9340.000	300.00	.00	.00	853.50	1450.00	860.90	7.40	.19	.06	861.09	70.06	416.58
9340.000	300.00	.00	.00	853.50	1680.00	861.33	7.83	.22	.08	861.55	70.45	446.47
9340.000	300.00	.00	.00	853.50	2140.00	862.18	8.68	.28	.10	862.46	71.19	507.00

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	TOPWID	AREA
9341.000	1.00	864.00	863.50	853.50	1020.00	859.93	6.43	.13	.00	860.06	68.85	348.94
9341.000	1.00	864.00	863.50	853.50	1450.00	860.90	7.40	.19	.00	861.09	69.16	415.85
9341.000	1.00	864.00	863.50	853.50	1680.00	861.33	7.83	.22	.00	861.55	69.30	445.81
9341.000	1.00	864.00	863.50	853.50	2140.00	862.18	8.68	.28	.00	862.46	69.57	504.69
9374.000	33.00	864.00	863.50	853.50	1020.00	859.94	6.44	.13	.00	860.07	68.85	349.91
9374.000	33.00	864.00	863.50	853.50	1450.00	860.91	7.41	.19	.00	861.10	69.17	417.00
9374.000	33.00	864.00	863.50	853.50	1680.00	861.35	7.85	.22	.00	861.56	69.31	447.10
9374.000	33.00	864.00	863.50	853.50	2140.00	862.19	8.69	.28	.00	862.47	69.58	506.08
9375.000	1.00	.00	.00	853.50	1020.00	859.94	6.44	.13	.00	860.07	69.25	348.94
9375.000	1.00	.00	.00	853.50	1450.00	860.91	7.41	.19	.00	861.10	70.09	416.62
9375.000	1.00	.00	.00	853.50	1680.00	861.35	7.85	.22	.00	861.57	70.46	447.15
9375.000	1.00	.00	.00	853.50	2140.00	862.19	8.69	.28	.00	862.47	71.20	507.28
11100.000	1725.00	.00	.00	853.30	1020.00	860.92	7.62	.05	.02	860.97	363.26	853.61
11100.000	1725.00	.00	.00	853.30	1450.00	861.97	8.67	.05	.04	862.02	416.81	1264.66
11100.000	1725.00	.00	.00	853.30	1680.00	862.45	9.15	.05	.05	862.50	442.34	1470.54
11100.000	1725.00	.00	.00	853.30	2140.00	863.35	10.05	.05	.07	863.40	490.54	1892.69
12960.000	1860.00	.00	.00	853.70	1020.00	861.40	7.70	.03	.01	861.43	426.26	1149.57
12960.000	1860.00	.00	.00	853.70	1450.00	862.41	8.71	.03	.01	862.43	443.91	1587.48
12960.000	1860.00	.00	.00	853.70	1680.00	862.87	9.17	.03	.01	862.90	452.07	1795.86
12960.000	1860.00	.00	.00	853.70	2140.00	863.75	10.05	.03	.01	863.77	467.41	2197.72
14200.000	1240.00	.00	.00	854.50	1020.00	861.64	7.14	.02	.00	861.66	367.37	1149.75
14200.000	1240.00	.00	.00	854.50	1450.00	862.63	8.13	.03	.00	862.65	368.38	1513.59
14200.000	1240.00	.00	.00	854.50	1680.00	863.09	8.59	.03	.00	863.12	368.85	1683.48
14200.000	1240.00	.00	.00	854.50	2140.00	863.95	9.45	.03	.00	863.98	369.73	2002.60
14970.000	770.00	.00	.00	854.60	1020.00	861.84	7.24	.10	.04	861.95	118.44	484.34
14970.000	770.00	.00	.00	854.60	1450.00	862.82	8.22	.13	.05	862.95	120.11	600.46
14970.000	770.00	.00	.00	854.60	1680.00	863.27	8.67	.15	.06	863.42	120.89	655.26
14970.000	770.00	.00	.00	854.60	2140.00	864.12	9.52	.18	.08	864.30	122.34	758.63
15099.000	129.00	.00	.00	855.50	1020.00	861.94	6.44	.10	.00	862.04	71.00	404.68
15099.000	129.00	.00	.00	855.50	1450.00	862.91	7.41	.15	.01	863.06	71.00	474.10
15099.000	129.00	.00	.00	855.50	1680.00	863.37	7.87	.17	.01	863.54	71.00	506.55
15099.000	129.00	.00	.00	855.50	2140.00	864.22	8.72	.22	.02	864.44	71.00	566.97
15100.000	1.00	868.90	863.90	855.50	1020.00	861.94	6.44	.10	.00	862.04	71.00	404.74
15100.000	1.00	868.90	863.90	855.50	1450.00	862.91	7.41	.15	.00	863.06	71.00	474.16
15100.000	1.00	868.90	863.90	855.50	1680.00	863.37	7.87	.17	.00	863.54	71.00	506.62
15100.000	1.00	868.90	863.90	855.50	2140.00	864.21	8.71	.24	.01	864.45	71.00	544.10
15146.000	46.00	868.90	863.90	855.50	1020.00	861.95	6.45	.10	.00	862.04	71.00	405.77
15146.000	46.00	868.90	863.90	855.50	1450.00	862.93	7.43	.14	.00	863.07	71.00	475.47
15146.000	46.00	868.90	863.90	855.50	1680.00	863.39	7.89	.17	.00	863.56	71.00	508.06
15146.000	46.00	868.90	863.90	855.50	2140.00	864.25	8.75	.24	.00	864.49	71.00	544.10
15147.000	1.00	.00	.00	855.50	1020.00	861.95	6.45	.10	.00	862.04	71.00	405.39
15147.000	1.00	.00	.00	855.50	1450.00	862.93	7.43	.14	.00	863.07	71.00	475.01
15147.000	1.00	.00	.00	855.50	1680.00	863.39	7.89	.17	.00	863.56	71.00	507.57
15147.000	1.00	.00	.00	855.50	2140.00	864.28	8.78	.22	.01	864.49	71.00	570.76

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	TOPWID	AREA
15229.000	82.00	.00	.00	855.60	1020.00	861.99	6.39	.07	.01	862.06	79.90	476.65
15229.000	82.00	.00	.00	855.60	1450.00	862.99	7.39	.11	.01	863.10	79.90	556.45
15229.000	82.00	.00	.00	855.60	1680.00	863.46	7.86	.12	.01	863.58	79.90	593.87
15229.000	82.00	.00	.00	855.60	2140.00	864.37	8.77	.16	.02	864.53	79.90	666.44
15230.000	1.00	868.80	866.10	855.60	1020.00	861.99	6.39	.08	.00	862.07	77.10	459.05
15230.000	1.00	868.80	866.10	855.60	1450.00	862.99	7.39	.11	.00	863.10	77.10	536.05
15230.000	1.00	868.80	866.10	855.60	1680.00	863.45	7.85	.13	.00	863.59	77.10	572.17
15230.000	1.00	868.80	866.10	855.60	2140.00	864.36	8.76	.17	.01	864.53	77.10	642.19
15282.000	52.00	868.80	866.10	855.60	1020.00	862.00	6.40	.08	.00	862.07	77.10	459.38
15282.000	52.00	868.80	866.10	855.60	1450.00	863.00	7.40	.11	.00	863.11	77.10	536.43
15282.000	52.00	868.80	866.10	855.60	1680.00	863.47	7.87	.13	.00	863.60	77.10	572.56
15282.000	52.00	868.80	866.10	855.60	2140.00	864.38	8.78	.17	.00	864.55	77.10	642.60
15283.000	1.00	.00	.00	855.60	1020.00	862.01	6.41	.07	.00	862.08	79.90	477.14
15283.000	1.00	.00	.00	855.60	1450.00	863.01	7.41	.11	.00	863.11	79.90	557.46
15283.000	1.00	.00	.00	855.60	1680.00	863.48	7.88	.12	.00	863.60	79.90	595.01
15283.000	1.00	.00	.00	855.60	2140.00	864.39	8.79	.16	.00	864.55	79.90	667.78
15325.000	42.00	.00	.00	855.60	1020.00	862.01	6.41	.07	.00	862.08	79.90	478.17
15325.000	42.00	.00	.00	855.60	1450.00	863.02	7.42	.10	.00	863.12	79.90	558.48
15325.000	42.00	.00	.00	855.60	1680.00	863.49	7.89	.12	.00	863.61	79.90	596.17
15325.000	42.00	.00	.00	855.60	2140.00	864.40	8.80	.16	.00	864.56	79.90	669.19
15326.000	1.00	868.80	866.10	855.60	1020.00	862.01	6.41	.08	.00	862.08	77.10	460.45
15326.000	1.00	868.80	866.10	855.60	1450.00	863.01	7.41	.11	.00	863.12	77.10	537.93
15326.000	1.00	868.80	866.10	855.60	1680.00	863.48	7.88	.13	.00	863.62	77.10	574.29
15326.000	1.00	868.80	866.10	855.60	2140.00	864.40	8.80	.17	.01	864.57	77.10	644.74
15372.000	46.00	868.80	866.10	855.60	1020.00	862.02	6.42	.08	.00	862.09	77.10	460.72
15372.000	46.00	868.80	866.10	855.60	1450.00	863.02	7.42	.11	.00	863.13	77.10	538.22
15372.000	46.00	868.80	866.10	855.60	1680.00	863.49	7.89	.13	.00	863.63	77.10	574.59
15372.000	46.00	868.80	866.10	855.60	2140.00	864.41	8.81	.17	.00	864.58	77.10	645.05
15373.000	1.00	.00	.00	855.60	1020.00	862.02	6.42	.07	.00	862.09	79.90	478.51
15373.000	1.00	.00	.00	855.60	1450.00	863.03	7.43	.10	.00	863.14	79.90	559.30
15373.000	1.00	.00	.00	855.60	1680.00	863.51	7.91	.12	.00	863.63	79.90	597.09
15373.000	1.00	.00	.00	855.60	2140.00	864.42	8.82	.16	.00	864.58	79.90	670.29
15439.000	66.00	.00	.00	855.10	1020.00	862.06	6.96	.06	.00	862.12	79.90	522.19
15439.000	66.00	.00	.00	855.10	1450.00	863.08	7.98	.09	.00	863.17	79.90	603.74
15439.000	66.00	.00	.00	855.10	1680.00	863.56	8.46	.11	.00	863.67	79.90	642.06
15439.000	66.00	.00	.00	855.10	2140.00	864.49	9.39	.14	.01	864.63	79.90	716.14
15440.000	1.00	867.60	866.80	855.10	1020.00	862.06	6.96	.06	.00	862.12	77.10	503.85
15440.000	1.00	867.60	866.80	855.10	1450.00	863.08	7.98	.10	.00	863.18	77.10	582.55
15440.000	1.00	867.60	866.80	855.10	1680.00	863.56	8.46	.11	.00	863.67	77.10	619.53
15440.000	1.00	867.60	866.80	855.10	2140.00	864.49	9.39	.15	.01	864.63	77.10	691.02
15473.000	33.00	867.60	866.80	855.10	1020.00	862.07	6.97	.06	.00	862.13	77.10	504.25
15473.000	33.00	867.60	866.80	855.10	1450.00	863.09	7.99	.10	.00	863.18	77.10	583.03
15473.000	33.00	867.60	866.80	855.10	1680.00	863.57	8.47	.11	.00	863.68	77.10	620.05
15473.000	33.00	867.60	866.80	855.10	2140.00	864.49	9.39	.15	.00	864.64	77.10	691.58

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	TOPWID	AREA
15474.000	1.00	.00	.00	855.10	1020.00	862.07	6.97	.06	.00	862.13	79.90	522.36
15474.000	1.00	.00	.00	855.10	1450.00	863.10	8.00	.09	.00	863.18	79.90	603.94
15474.000	1.00	.00	.00	855.10	1680.00	863.58	8.48	.11	.00	863.68	79.90	642.69
15474.000	1.00	.00	.00	855.10	2140.00	864.51	9.41	.14	.00	864.65	79.90	716.90
16570.000	1096.00	.00	.00	854.60	1020.00	862.33	7.73	.01	.01	862.34	600.00	1829.42
16570.000	1096.00	.00	.00	854.60	1450.00	863.39	8.79	.01	.02	863.40	600.00	2470.44
16570.000	1096.00	.00	.00	854.60	1680.00	863.89	9.29	.01	.03	863.90	600.00	2772.29
16570.000	1096.00	.00	.00	854.60	2140.00	864.86	10.26	.01	.04	864.87	600.00	3353.20
18010.000	1440.00	.00	.00	855.30	735.00	862.46	7.16	.01	.00	862.47	484.72	1316.85
18010.000	1440.00	.00	.00	855.30	1020.00	863.50	8.20	.01	.00	863.51	518.37	1839.17
18010.000	1440.00	.00	.00	855.30	1160.00	864.00	8.70	.01	.00	864.01	534.41	2100.50
18010.000	1440.00	.00	.00	855.30	1490.00	864.95	9.65	.01	.00	864.96	573.49	2628.68
19210.000	1200.00	.00	.00	854.90	735.00	862.58	7.68	.02	.00	862.60	433.95	1064.62
19210.000	1200.00	.00	.00	854.90	1020.00	863.60	8.70	.02	.00	863.62	442.38	1512.44
19210.000	1200.00	.00	.00	854.90	1160.00	864.09	9.19	.02	.00	864.11	446.38	1727.71
19210.000	1200.00	.00	.00	854.90	1490.00	865.04	10.14	.02	.00	865.05	454.24	2156.02
20620.000	1410.00	.00	.00	854.80	735.00	862.73	7.93	.01	.00	862.73	628.70	1721.32
20620.000	1410.00	.00	.00	854.80	1020.00	863.72	8.92	.01	.00	863.72	638.41	2350.86
20620.000	1410.00	.00	.00	854.80	1160.00	864.19	9.39	.01	.00	864.20	643.06	2656.27
20620.000	1410.00	.00	.00	854.80	1490.00	865.13	10.33	.01	.00	865.14	683.56	3272.24
21960.000	1340.00	.00	.00	855.40	735.00	862.85	7.45	.03	.01	862.88	453.50	939.60
21960.000	1340.00	.00	.00	855.40	1020.00	863.81	8.41	.02	.01	863.83	462.26	1382.24
21960.000	1340.00	.00	.00	855.40	1160.00	864.28	8.88	.02	.01	864.30	466.50	1599.22
21960.000	1340.00	.00	.00	855.40	1490.00	865.20	9.80	.02	.01	865.22	474.91	2036.23
23400.000	1440.00	.00	.00	854.90	735.00	863.21	8.31	.06	.02	863.27	109.47	432.97
23400.000	1440.00	.00	.00	854.90	1020.00	864.13	9.23	.08	.03	864.22	117.47	537.42
23400.000	1440.00	.00	.00	854.90	1160.00	864.57	9.67	.09	.04	864.66	121.29	590.02
23400.000	1440.00	.00	.00	854.90	1490.00	865.47	10.57	.11	.05	865.58	129.06	701.94
23649.000	249.00	.00	.00	856.90	735.00	863.30	6.40	.13	.03	863.43	49.94	258.82
23649.000	249.00	.00	.00	856.90	1020.00	864.23	7.33	.18	.05	864.41	50.59	305.33
23649.000	249.00	.00	.00	856.90	1160.00	864.67	7.77	.20	.05	864.87	50.90	327.58
23649.000	249.00	.00	.00	856.90	1490.00	865.56	8.66	.26	.07	865.81	51.52	372.60
23650.000	1.00	863.90	867.50	856.90	735.00	863.30	6.40	.13	.00	863.43	48.00	255.96
23650.000	1.00	863.90	867.50	856.90	1020.00	864.23	7.33	.18	.00	864.41	48.00	300.38
23650.000	1.00	863.90	867.50	856.90	1160.00	864.67	7.77	.20	.00	864.87	48.00	321.42
23650.000	1.00	863.90	867.50	856.90	1490.00	865.56	8.66	.26	.00	865.82	48.00	364.08
23673.000	23.00	863.90	867.50	856.90	735.00	863.31	6.41	.13	.00	863.44	48.00	256.55
23673.000	23.00	863.90	867.50	856.90	1020.00	864.24	7.34	.18	.00	864.42	48.00	301.04
23673.000	23.00	863.90	867.50	856.90	1160.00	864.68	7.78	.20	.00	864.88	48.00	322.11
23673.000	23.00	863.90	867.50	856.90	1490.00	865.57	8.67	.26	.00	865.83	48.00	364.85
23674.000	1.00	.00	.00	856.90	735.00	863.31	6.41	.13	.00	863.44	49.94	259.19
23674.000	1.00	.00	.00	856.90	1020.00	864.24	7.34	.18	.00	864.42	50.60	305.77
23674.000	1.00	.00	.00	856.90	1160.00	864.68	7.78	.20	.00	864.88	50.91	328.05
23674.000	1.00	.00	.00	856.90	1490.00	865.57	8.67	.26	.00	865.83	51.54	373.65

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	TOPWID	AREA
24330.000	656.00	.00	.00	857.30	735.00	863.61	6.31	.01	.04	863.62	493.18	1356.36
24330.000	656.00	.00	.00	857.30	1020.00	864.58	7.28	.01	.05	864.59	801.78	2068.23
24330.000	656.00	.00	.00	857.30	1160.00	865.04	7.74	.01	.06	865.04	810.56	2436.09
24330.000	656.00	.00	.00	857.30	1490.00	865.98	8.68	.01	.08	865.99	828.86	3215.92
25110.000	780.00	.00	.00	856.40	710.00	863.66	7.26	.00	.00	863.67	1066.54	2271.71
25110.000	780.00	.00	.00	856.40	990.00	864.62	8.22	.00	.00	864.62	1067.29	3291.18
25110.000	780.00	.00	.00	856.40	1120.00	865.07	8.67	.00	.00	865.07	1067.64	3771.95
25110.000	780.00	.00	.00	856.40	1450.00	866.01	9.61	.00	.00	866.01	1068.38	4774.95
27960.000	2850.00	.00	.00	855.60	710.00	863.74	8.14	.00	.00	863.75	1199.59	2858.17
27960.000	2850.00	.00	.00	855.60	990.00	864.67	9.07	.00	.00	864.67	1219.64	3977.03
27960.000	2850.00	.00	.00	855.60	1120.00	865.12	9.52	.00	.00	865.12	1242.91	4521.50
27960.000	2850.00	.00	.00	855.60	1450.00	866.05	10.45	.00	.00	866.05	1291.87	5700.49
30760.000	2800.00	.00	.00	858.60	710.00	863.89	5.29	.09	.05	863.98	298.00	401.22
30760.000	2800.00	.00	.00	858.60	990.00	864.77	6.17	.08	.04	864.84	372.83	695.59
30760.000	2800.00	.00	.00	858.60	1120.00	865.19	6.59	.07	.03	865.26	415.76	862.35
30760.000	2800.00	.00	.00	858.60	1450.00	866.11	7.51	.05	.03	866.16	482.67	1288.51
31370.000	610.00	.00	.00	858.60	710.00	864.27	5.67	.07	.01	864.34	272.08	463.14
31370.000	610.00	.00	.00	858.60	990.00	865.07	6.47	.07	.00	865.14	273.64	681.57
31370.000	610.00	.00	.00	858.60	1120.00	865.45	6.85	.07	.00	865.52	274.38	785.91
31370.000	610.00	.00	.00	858.60	1450.00	866.31	7.71	.07	.01	866.37	276.03	1020.27
32300.000	930.00	.00	.00	858.90	710.00	864.57	5.67	.03	.01	864.60	354.16	720.05
32300.000	930.00	.00	.00	858.90	990.00	865.36	6.46	.03	.01	865.39	405.56	1020.00
32300.000	930.00	.00	.00	858.90	1120.00	865.73	6.83	.03	.01	865.76	428.46	1172.06
32300.000	930.00	.00	.00	858.90	1450.00	866.55	7.65	.03	.01	866.58	469.60	1548.41
32830.000	530.00	.00	.00	859.20	710.00	864.68	5.48	.02	.00	864.69	664.81	989.37
32830.000	530.00	.00	.00	859.20	990.00	865.46	6.26	.02	.00	865.48	700.42	1532.60
32830.000	530.00	.00	.00	859.20	1120.00	865.82	6.62	.02	.00	865.84	703.64	1785.57
32830.000	530.00	.00	.00	859.20	1450.00	866.64	7.44	.01	.01	866.65	710.94	2362.93
33630.000	800.00	.00	.00	859.30	710.00	864.86	5.56	.08	.03	864.94	230.90	392.40
33630.000	800.00	.00	.00	859.30	990.00	865.61	6.31	.09	.04	865.70	250.00	578.10
33630.000	800.00	.00	.00	859.30	1120.00	865.95	6.65	.09	.04	866.04	250.00	663.82
33630.000	800.00	.00	.00	859.30	1450.00	866.74	7.44	.09	.04	866.83	250.00	859.25
33919.000	289.00	.00	.00	858.60	710.00	865.02	6.42	.14	.03	865.16	42.90	236.65
33919.000	289.00	.00	.00	858.60	990.00	865.76	7.16	.21	.06	865.98	43.22	268.70
33919.000	289.00	.00	.00	858.60	1120.00	866.09	7.49	.25	.08	866.34	43.37	282.99
33919.000	289.00	.00	.00	858.60	1450.00	866.84	8.24	.34	.12	867.18	43.70	315.74
33920.000	1.00	.00	.00	858.60	710.00	865.02	6.42	.14	.00	865.16	42.90	236.68
33920.000	1.00	.00	.00	858.60	990.00	865.76	7.16	.21	.00	865.98	43.22	268.74
33920.000	1.00	.00	.00	858.60	1120.00	866.09	7.49	.25	.00	866.34	43.37	283.03
33920.000	1.00	.00	.00	858.60	1450.00	866.84	8.24	.34	.00	867.18	43.70	315.79
33961.000	41.00	869.50	866.10	858.60	710.00	865.03	6.43	.14	.00	865.17	42.90	235.26
33961.000	41.00	869.50	866.10	858.60	990.00	865.77	7.17	.21	.00	865.99	43.23	266.36
33961.000	41.00	869.50	866.10	858.60	1120.00	866.20	7.60	.24	.00	866.44	43.42	287.78
33961.000	41.00	869.50	866.10	858.60	1450.00	867.12	8.52	.31	.00	867.43	43.82	327.77

SECNO	XLCH	FLTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	TOPWID	AREA
33962.000	1.00	.00	.00	858.60	710.00	865.03	6.43	.14	.00	865.17	42.90	237.12
33962.000	1.00	.00	.00	858.60	990.00	865.78	7.18	.21	.00	865.99	43.23	269.32
33962.000	1.00	.00	.00	858.60	1120.00	866.20	7.60	.24	.00	866.44	43.42	287.78
33962.000	1.00	.00	.00	858.60	1450.00	867.12	8.52	.31	.00	867.43	43.82	327.76
34740.000	778.00	.00	.00	858.30	710.00	865.30	7.00	.00	.04	865.30	1127.23	2192.33
34740.000	778.00	.00	.00	858.30	990.00	866.13	7.83	.00	.06	866.13	1137.18	3129.70
34740.000	778.00	.00	.00	858.30	1120.00	866.57	8.27	.00	.07	866.58	1138.75	3640.02
34740.000	778.00	.00	.00	858.30	1450.00	867.57	9.27	.00	.09	867.57	1142.22	4776.35
37250.000	2510.00	.00	.00	860.30	710.00	865.41	5.11	.00	.00	865.42	1073.41	1969.62
37250.000	2510.00	.00	.00	860.30	990.00	866.21	5.91	.00	.00	866.21	1095.00	2834.19
37250.000	2510.00	.00	.00	860.30	1120.00	866.64	6.34	.00	.00	866.64	1096.81	3310.26
37250.000	2510.00	.00	.00	860.30	1450.00	867.62	7.32	.00	.00	867.62	1105.23	4386.78
39670.000	2420.00	.00	.00	860.10	710.00	865.67	5.57	.04	.02	865.71	535.33	670.34
39670.000	2420.00	.00	.00	860.10	990.00	866.38	6.28	.03	.02	866.42	604.78	1074.75
39670.000	2420.00	.00	.00	860.10	1120.00	866.78	6.68	.03	.01	866.81	645.22	1322.04
39670.000	2420.00	.00	.00	860.10	1450.00	867.71	7.61	.02	.01	867.73	750.48	1996.59
42170.000	2500.00	.00	.00	861.50	710.00	866.53	5.03	.03	.00	866.56	700.00	836.68
42170.000	2500.00	.00	.00	861.50	990.00	867.05	5.55	.03	.00	867.08	700.00	1202.85
42170.000	2500.00	.00	.00	861.50	1120.00	867.33	5.83	.02	.00	867.35	700.00	1396.37
42170.000	2500.00	.00	.00	861.50	1450.00	868.06	6.56	.02	.00	868.07	700.00	1909.77
43250.000	1080.00	.00	.00	862.20	710.00	867.06	4.86	.08	.02	867.14	238.21	370.82
43250.000	1080.00	.00	.00	862.20	990.00	867.54	5.34	.11	.04	867.65	238.86	486.67
43250.000	1080.00	.00	.00	862.20	1120.00	867.77	5.57	.11	.04	867.88	239.16	541.02
43250.000	1080.00	.00	.00	862.20	1450.00	868.38	6.18	.12	.05	868.51	239.98	687.89
43544.000	294.00	.00	.00	861.50	710.00	867.32	5.82	.13	.02	867.45	59.33	245.74
43544.000	294.00	.00	.00	861.50	990.00	867.87	6.37	.19	.04	868.06	64.73	279.57
43544.000	294.00	.00	.00	861.50	1120.00	868.11	6.61	.22	.06	868.33	67.11	295.38
43544.000	294.00	.00	.00	861.50	1450.00	868.71	7.21	.29	.08	869.00	71.00	337.34
43545.000	1.00	891.80	885.60	861.50	710.00	867.32	5.82	.13	.00	867.45	59.34	245.80
43545.000	1.00	891.80	885.60	861.50	990.00	867.87	6.37	.19	.00	868.06	64.74	279.65
43545.000	1.00	891.80	885.60	861.50	1120.00	868.11	6.61	.22	.00	868.33	67.12	295.47
43545.000	1.00	891.80	885.60	861.50	1450.00	868.71	7.21	.29	.00	869.00	71.00	337.45
43554.000	9.00	891.80	885.60	861.50	710.00	867.33	5.83	.13	.00	867.45	59.41	246.18
43554.000	9.00	891.80	885.60	861.50	990.00	867.87	6.37	.19	.00	868.07	64.84	280.25
43554.000	9.00	891.80	885.60	861.50	1120.00	868.11	6.61	.22	.00	868.33	67.22	296.16
43554.000	9.00	891.80	885.60	861.50	1450.00	868.72	7.22	.29	.00	869.00	71.00	338.31
43555.000	1.00	.00	.00	861.50	710.00	867.33	5.83	.13	.00	867.45	59.37	245.98
43555.000	1.00	.00	.00	861.50	990.00	867.87	6.37	.19	.00	868.07	64.79	279.96
43555.000	1.00	.00	.00	861.50	1120.00	868.11	6.61	.22	.00	868.34	67.17	295.84
43555.000	1.00	.00	.00	861.50	1450.00	868.72	7.22	.29	.00	869.00	71.00	337.94
43970.000	415.00	.00	.00	861.40	710.00	867.66	6.26	.04	.03	867.70	236.00	534.48
43970.000	415.00	.00	.00	861.40	990.00	868.33	6.93	.06	.04	868.38	236.71	693.42
43970.000	415.00	.00	.00	861.40	1120.00	868.62	7.22	.06	.05	868.67	237.02	762.89
43970.000	415.00	.00	.00	861.40	1450.00	869.31	7.91	.07	.07	869.38	237.76	927.35

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	TOPWID	AREA
45129.000	1159.00	.00	.00	862.90	710.00	868.13	5.23	.07	.02	868.21	301.85	382.31
45129.000	1159.00	.00	.00	862.90	990.00	868.83	5.93	.08	.01	868.91	382.16	621.21
45129.000	1159.00	.00	.00	862.90	1120.00	869.12	6.22	.08	.01	869.20	407.44	733.39
45129.000	1159.00	.00	.00	862.90	1450.00	869.80	6.90	.07	.00	869.87	442.45	1024.65
45130.000	1.00	867.80	869.30	862.90	710.00	868.13	5.23	.08	.00	868.21	298.61	369.55
45130.000	1.00	867.80	869.30	862.90	990.00	868.83	5.93	.09	.01	868.92	378.80	606.32
45130.000	1.00	867.80	869.30	862.90	1120.00	869.12	6.22	.09	.00	869.20	404.31	720.25
45130.000	1.00	867.80	869.30	862.90	1450.00	869.81	6.91	.07	.00	869.88	441.80	966.09
45148.000	18.00	867.80	869.30	862.90	710.00	868.13	5.23	.08	.00	868.21	299.08	370.76
45148.000	18.00	867.80	869.30	862.90	990.00	868.83	5.93	.09	.00	868.92	379.07	607.19
45148.000	18.00	867.80	869.30	862.90	1120.00	869.12	6.22	.09	.00	869.21	404.45	721.41
45148.000	18.00	867.80	869.30	862.90	1450.00	869.81	6.91	.07	.00	869.88	442.41	970.55
45149.000	1.00	.00	.00	862.90	710.00	868.14	5.24	.07	.00	868.21	301.92	382.50
45149.000	1.00	.00	.00	862.90	990.00	868.84	5.94	.08	.00	868.92	382.87	623.57
45149.000	1.00	.00	.00	862.90	1120.00	869.13	6.23	.08	.00	869.21	408.14	739.02
45149.000	1.00	.00	.00	862.90	1450.00	869.81	6.91	.07	.00	869.88	443.30	1032.01
46760.000	1611.00	.00	.00	863.30	710.00	868.99	5.69	.05	.01	869.03	341.10	602.95
46760.000	1611.00	.00	.00	863.30	990.00	869.67	6.37	.05	.01	869.72	343.82	836.89
46760.000	1611.00	.00	.00	863.30	1120.00	869.94	6.64	.05	.01	869.99	344.89	930.25
46760.000	1611.00	.00	.00	863.30	1450.00	870.56	7.26	.05	.01	870.61	347.36	1144.94
48160.000	1400.00	.00	.00	863.10	710.00	869.45	6.35	.03	.01	869.48	321.43	748.79
48160.000	1400.00	.00	.00	863.10	990.00	870.12	7.02	.03	.00	870.16	351.28	976.25
48160.000	1400.00	.00	.00	863.10	1120.00	870.39	7.29	.04	.00	870.43	357.10	1071.79
48160.000	1400.00	.00	.00	863.10	1450.00	871.01	7.91	.04	.00	871.05	370.44	1296.41
49545.000	1385.00	.00	.00	860.00	540.00	869.64	9.64	.01	.00	869.65	256.60	809.68
49545.000	1385.00	.00	.00	860.00	750.00	870.34	10.34	.02	.01	870.35	259.83	990.94
49545.000	1385.00	.00	.00	860.00	850.00	870.62	10.62	.02	.01	870.64	261.11	1063.84
49545.000	1385.00	.00	.00	860.00	1090.00	871.25	11.25	.02	.01	871.28	264.04	1231.02
50735.000	1190.00	.00	.00	863.60	540.00	869.74	6.14	.02	.00	869.75	449.32	874.23
50735.000	1190.00	.00	.00	863.60	750.00	870.45	6.85	.01	.00	870.46	457.40	1197.22
50735.000	1190.00	.00	.00	863.60	850.00	870.74	7.14	.01	.00	870.75	460.63	1328.35
50735.000	1190.00	.00	.00	863.60	1090.00	871.38	7.78	.01	.00	871.40	467.95	1628.28
53335.000	2600.00	.00	.00	862.70	540.00	869.94	7.24	.01	.00	869.95	465.98	1249.86
53335.000	2600.00	.00	.00	862.70	750.00	870.64	7.94	.01	.00	870.65	483.62	1584.91
53335.000	2600.00	.00	.00	862.70	850.00	870.92	8.22	.01	.00	870.93	490.72	1723.35
53335.000	2600.00	.00	.00	862.70	1090.00	871.56	8.86	.01	.00	871.57	510.53	2040.20
55645.000	2310.00	.00	.00	864.60	540.00	870.14	5.54	.03	.01	870.17	225.21	518.15
55645.000	2310.00	.00	.00	864.60	750.00	870.84	6.24	.03	.01	870.87	250.27	685.14
55645.000	2310.00	.00	.00	864.60	850.00	871.12	6.52	.03	.01	871.15	260.33	757.80
55645.000	2310.00	.00	.00	864.60	1090.00	871.76	7.16	.04	.01	871.80	282.87	931.09
57005.000	1360.00	.00	.00	864.10	540.00	870.37	6.27	.02	.00	870.38	175.17	589.90
57005.000	1360.00	.00	.00	864.10	750.00	871.08	6.98	.02	.00	871.11	183.01	719.06
57005.000	1360.00	.00	.00	864.10	850.00	871.38	7.28	.02	.00	871.40	184.06	773.07
57005.000	1360.00	.00	.00	864.10	1090.00	872.03	7.93	.03	.00	872.06	186.38	893.89

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	TOPWID	AREA
57294.000	289.00	.00	.00	865.00	540.00	870.40	5.40	.10	.04	870.49	43.00	217.35
57294.000	289.00	.00	.00	865.00	750.00	871.11	6.11	.14	.06	871.25	43.00	247.63
57294.000	289.00	.00	.00	865.00	850.00	871.40	6.40	.17	.07	871.56	43.00	260.09
57294.000	289.00	.00	.00	865.00	1090.00	872.04	7.04	.22	.10	872.26	43.00	287.53
57295.000	1.00	873.20	874.60	865.00	540.00	870.40	5.40	.10	.00	870.49	43.00	217.13
57295.000	1.00	873.20	874.60	865.00	750.00	871.11	6.11	.14	.00	871.25	43.00	247.66
57295.000	1.00	873.20	874.60	865.00	850.00	871.40	6.40	.17	.00	871.56	43.00	260.12
57295.000	1.00	873.20	874.60	865.00	1090.00	872.04	7.04	.22	.00	872.26	43.00	287.56
57333.000	38.00	873.20	874.60	865.00	540.00	870.41	5.41	.10	.00	870.50	43.00	217.80
57333.000	38.00	873.20	874.60	865.00	750.00	871.12	6.12	.14	.00	871.26	43.00	248.55
57333.000	38.00	873.20	874.60	865.00	850.00	871.41	6.41	.16	.00	871.58	43.00	261.12
57333.000	38.00	873.20	874.60	865.00	1090.00	872.06	7.06	.22	.00	872.28	43.00	288.80
57334.000	1.00	.00	.00	865.00	540.00	870.41	5.41	.10	.00	870.50	43.00	217.58
57334.000	1.00	.00	.00	865.00	750.00	871.12	6.12	.14	.00	871.26	43.00	248.27
57334.000	1.00	.00	.00	865.00	850.00	871.41	6.41	.16	.00	871.58	43.00	260.81
57334.000	1.00	.00	.00	865.00	1090.00	872.06	7.06	.22	.00	872.28	43.00	288.44
57469.000	135.00	.00	.00	865.15	540.00	870.53	5.38	.01	.02	870.55	275.55	838.43
57469.000	135.00	.00	.00	865.15	750.00	871.30	6.15	.02	.04	871.32	312.25	1064.44
57469.000	135.00	.00	.00	865.15	850.00	871.62	6.47	.02	.04	871.64	328.50	1167.05
57469.000	135.00	.00	.00	865.15	1090.00	872.34	7.19	.02	.06	872.36	354.99	1410.79
58005.000	536.00	.00	.00	865.60	540.00	870.57	4.97	.02	.00	870.58	257.61	727.56
58005.000	536.00	.00	.00	865.60	750.00	871.34	5.74	.02	.00	871.36	291.37	940.23
58005.000	536.00	.00	.00	865.60	850.00	871.66	6.06	.02	.00	871.69	307.71	1036.71
58005.000	536.00	.00	.00	865.60	1090.00	872.38	6.78	.03	.00	872.41	340.08	1269.42
59225.000	1220.00	.00	.00	865.50	540.00	870.69	5.19	.03	.01	870.72	184.07	459.27
59225.000	1220.00	.00	.00	865.50	750.00	871.47	5.97	.04	.01	871.51	273.08	636.56
59225.000	1220.00	.00	.00	865.50	850.00	871.80	6.30	.04	.01	871.84	329.72	734.55
59225.000	1220.00	.00	.00	865.50	1090.00	872.52	7.02	.05	.01	872.56	401.25	1002.90
61035.000	1810.00	.00	.00	866.40	540.00	870.97	4.57	.03	.00	870.99	177.81	456.68
61035.000	1810.00	.00	.00	866.40	750.00	871.76	5.36	.03	.00	871.79	225.69	616.20
61035.000	1810.00	.00	.00	866.40	850.00	872.08	5.68	.04	.00	872.12	245.54	693.47
61035.000	1810.00	.00	.00	866.40	1090.00	872.80	6.40	.05	.00	872.85	298.94	887.58
62125.000	1090.00	.00	.00	866.90	540.00	871.17	4.27	.04	.01	871.21	138.95	368.36
62125.000	1090.00	.00	.00	866.90	750.00	871.96	5.06	.05	.01	872.01	163.12	487.77
62125.000	1090.00	.00	.00	866.90	850.00	872.29	5.39	.06	.01	872.35	173.18	543.05
62125.000	1090.00	.00	.00	866.90	1090.00	873.01	6.11	.07	.01	873.08	179.74	669.82
62745.000	620.00	.00	.00	867.70	540.00	871.39	3.69	.07	.02	871.46	83.89	248.42
62745.000	620.00	.00	.00	867.70	750.00	872.17	4.47	.09	.02	872.25	112.93	324.66
62745.000	620.00	.00	.00	867.70	850.00	872.49	4.79	.10	.02	872.59	125.22	363.39
62745.000	620.00	.00	.00	867.70	1090.00	873.20	5.50	.11	.02	873.31	152.08	461.97
62925.000	180.00	.00	.00	867.80	540.00	871.51	3.71	.04	.01	871.55	90.00	328.99
62925.000	180.00	.00	.00	867.80	750.00	872.28	4.48	.05	.01	872.34	90.00	398.90
62925.000	180.00	.00	.00	867.80	850.00	872.61	4.81	.06	.01	872.67	90.00	428.28
62925.000	180.00	.00	.00	867.80	1090.00	873.32	5.52	.08	.01	873.40	90.00	492.42

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	TOPWID	AREA
62945.000	20.00	884.00	867.91	867.40	540.00	885.49	18.09	.00	.00	885.49	90.00	1628.20
62945.000	20.00	884.00	867.91	867.40	750.00	885.85	18.45	.00	.00	885.85	90.00	1660.94
62945.000	20.00	884.00	867.91	867.40	850.00	886.01	18.61	.00	.00	886.02	90.00	1675.45
62945.000	20.00	884.00	867.91	867.40	1090.00	886.38	18.98	.01	.00	886.39	90.00	1709.14

SUMMARY OF ERRORS

00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: GREEN OAK TWP

3) WATERCOURSE: WALKER DRAIN

4) DOCUMENT TYPE: 100-YEAR ENCROACHED

00BREAK00

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*****************************************************
HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
ERROR CORR -  01,02,03
MODIFICATION -  50,51,52,53
*****************************************************


C
T1      GREEN OAK TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN
T2      10-YEAR FLOOD:      FILE: WALKEREN
T3      WALKER DRAIN,  ENCROACHED FLOODWAY

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSFL      FQ

      -1.       2.        0.        0.   .000000      .00        .0        0.   872.040    .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     1.000     .000    -1.000     .000      .000      .000      .000      .000      .000      .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    58.000    39.000    40.000    41.000    42.000    43.000     1.000     8.000    10.000    12.000

     3.000     4.000    25.000      .000      .000      .000      .000      .000      .000      .000

QT     4.000   450.000   795.000  1060.000  1670.000      .000      .000      .000      .000      .000
QT     4.000   445.000   790.000  1055.000  1665.000      .000      .000      .000      .000      .000
NC      .090      .090      .040      .300      .500      .000      .000      .000      .000      .000
NH     7.000      .050   373.000      .040   425.000      .050   897.000      .040   940.000      .090
NH  1324.000      .040  1382.000      .090  2065.000      .000      .000      .000      .000      .000


        VS  A JA 94   MOUTH OF WALKER DRAIN AT SANDY BOTTOM LAKE

              START OF ISLAND PROBLEM

X1      .000    57.000   897.000  1382.000      .000      .000      .000      .000      .000      .000
X3      .000      .000      .000   725.000      .000      .000      .000      .000      .000      .000
GR   899.700      .000   892.100    65.000   888.200   107.000   883.400   165.000   880.800   265.000
GR   879.600   315.000   874.700   373.000   867.000   388.000   865.600   400.000   865.400   405.000
GR   866.600   415.000   868.300   420.000   872.200   425.000   873.400   465.000   873.700   565.000
GR   874.700   594.000   877.400   665.000   880.500   686.000   882.800   725.000   880.200   765.000
GR   875.600   807.000   873.100   808.000   871.300   897.000   868.300   902.000   867.500   906.000
GR   866.500   913.000   866.200   918.000   866.100   922.000   866.700   927.000   867.400   935.000
GR   869.700   940.000   869.500   965.000   869.200  1015.000   869.100  1065.000   869.200  1115.000
GR   869.100  1165.000   869.200  1215.000   868.800  1265.000   868.500  1324.000   867.300  1327.000
GR   867.100  1332.000   866.800  1342.000   866.600  1352.000   866.800  1362.000   866.900  1372.000
GR   867.400  1379.000   868.400  1382.000   868.400  1455.000   868.600  1515.000   868.800  1565.000
GR   868.800  1615.000   869.800  1715.000   870.700  1815.000   870.300  1915.000   871.400  1990.000
GR   880.500  2043.000   886.800  2065.000      .000      .000      .000      .000      .000      .000
NH     7.000      .050   243.800      .025   246.200      .050   701.000      .040   763.000      .090
NH  1613.000      .040  1675.000      .090  2175.000      .000      .000      .000      .000      .000


        VS  B JA 95

X1   520.000    61.000   701.000  1675.000   800.000   300.000   520.000      .000      .000      .000
X3      .000      .000      .000   475.000      .000      .000      .000      .000      .000      .000
GR   883.400      .000   881.600    75.000   879.500   175.000   879.200   243.800   868.200   243.800
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GR	867.800	244.200	867.400	245.000	867.600	245.800	868.200	246.200	879.200	246.200
GR	879.500	275.000	883.800	375.000	886.000	425.000	886.900	475.000	885.900	525.000
GR	876.100	625.000	872.900	675.000	870.800	701.000	868.300	703.000	867.200	708.000
GR	864.800	713.000	864.000	718.000	863.900	728.000	864.300	738.000	865.900	748.000
GR	867.900	758.000	871.700	763.000	870.100	775.000	870.400	825.000	870.300	875.000
GR	870.400	925.000	869.700	975.000	869.700	1025.000	870.000	1075.000	870.000	1125.000
GR	869.900	1175.000	869.900	1225.000	869.600	1275.000	870.400	1325.000	870.600	1375.000
GR	871.400	1425.000	870.700	1475.000	870.200	1525.000	868.900	1575.000	868.900	1613.000
GR	867.900	1615.000	867.100	1625.000	866.700	1640.000	866.600	1647.000	866.600	1657.000
GR	867.300	1667.000	869.000	1675.000	868.800	1725.000	869.000	1825.000	870.800	1925.000
GR	871.400	1975.000	872.200	2050.000	871.600	2075.000	873.400	2100.000	882.200	2145.000
GR	887.900	2175.000	.000	.000	.000	.000	.000	.000	.000	.000
NH	9.000	.090	170.000	.040	190.000	.090	400.000	.040	451.000	.090
NH	857.000	.040	888.000	.090	1942.000	.040	2017.000	.090	2488.000	.000

VS C JA 96 END OF ISLAND PROBLEM

X1	1470.000	69.000	857.000	2017.000	700.000	200.000	950.000	.000	.000	.000
X3	.000	.000	.000	800.000	.000	.000	.000	.000	.000	.000
GR	875.900	.000	868.100	20.000	868.800	58.000	868.500	88.000	868.300	170.000
GR	867.100	173.000	866.100	178.000	866.300	183.000	868.300	188.000	868.600	190.000
GR	868.100	290.000	868.600	358.000	868.600	400.000	868.300	403.000	867.200	413.000
GR	866.600	423.000	866.600	436.000	867.300	441.000	868.300	446.000	868.600	451.000
GR	871.200	488.000	872.100	588.000	872.000	688.000	874.500	788.000	874.900	857.000
GR	867.300	860.000	866.600	865.000	866.100	868.000	866.100	873.000	867.700	880.000
GR	868.300	883.000	871.000	888.000	870.800	938.000	870.700	988.000	870.500	1038.000
GR	869.700	1088.000	870.400	1138.000	870.100	1188.000	870.200	1238.000	869.900	1288.000
GR	870.300	1338.000	870.200	1388.000	870.600	1438.000	869.600	1488.000	869.600	1538.000
GR	869.600	1588.000	870.400	1638.000	870.400	1688.000	870.900	1738.000	870.700	1788.000
GR	870.800	1838.000	870.000	1888.000	868.500	1942.000	867.400	1944.000	867.200	1950.000
GR	866.800	1960.000	866.700	1971.000	867.100	1983.000	867.000	1988.000	867.100	1997.000
GR	867.800	2007.000	868.500	2017.000	868.800	2088.000	868.800	2188.000	869.400	2288.000
GR	874.000	2388.000	876.600	2408.000	879.300	2423.000	885.400	2488.000	.000	.000
QT	4.000	270.000	510.000	720.000	1190.000	.000	.000	.000	.000	.000
NC	.080	.060	.040	.000	.000	.000	.000	.000	.000	.000

VS D JA 97

X1	2220.000	24.000	1030.000	1052.000	500.000	800.000	750.000	.000	.000	.000
X3	.000	.000	.000	550.000	.000	1300.000	.000	.000	.000	.000
GR	878.700	.000	871.700	40.000	871.500	130.000	871.400	230.000	870.900	330.000
GR	869.200	430.000	868.600	530.000	868.300	630.000	868.500	675.000	870.300	680.000
GR	870.900	730.000	870.300	830.000	870.700	930.000	870.000	1030.000	868.000	1032.000
GR	866.600	1038.000	867.100	1045.000	868.400	1050.000	870.100	1052.000	870.900	1065.000
GR	871.100	1130.000	872.300	1230.000	872.600	1255.000	880.000	2355.000	.000	.000
X1	2829.000	28.000	943.000	951.500	400.000	560.000	609.000	.000	.000	.000
X3	10.000	.000	.000	450.000	.000	960.000	.000	872.500	872.500	.000
GR	884.900	.000	879.900	25.000	877.100	125.000	878.700	180.000	874.400	225.000
GR	873.100	245.000	872.600	325.000	872.100	425.000	872.200	525.000	871.900	625.000
GR	871.300	725.000	871.600	825.000	871.300	925.000	872.300	935.000	872.300	940.000
GR	868.800	942.000	868.500	943.000	867.800	945.000	867.500	948.000	867.300	949.500
GR	868.800	951.500	870.100	954.000	871.600	958.000	872.300	965.000	873.000	995.000
GR	874.000	1045.000	878.500	1145.000	885.600	1245.000	.000	.000	.000	.000
NC	.090	.090	.024	.000	.000	.000	.000	.000	.000	.000

BS E JA 98

X1	2830.000	29.000	943.000	951.500	1.000	1.000	1.000	.000	.000	.000
X3	10.000	.000	.000	450.000	.000	960.000	.000	872.500	872.500	.000
BT	33.000	.000	884.900	.000	25.000	879.900	.000	125.000	877.100	.000
BT	180.00	878.700	.000	225.00	874.400	.00	245.000	873.100	.000	325.000

BT	872.600	.000	425.000	872.100	.000	525.000	872.200	.000	625.000	871.900
BT	.000	725.000	871.300	.000	825.000	871.600	.000	925.000	871.300	.000
BT	943.000	872.500	.000	943.000	872.500	869.100	943.000	872.500	870.500	944.000
BT	872.500	871.600	945.000	872.500	871.800	946.000	872.500	871.600	947.000	872.500
BT	870.500	947.000	872.500	869.100	947.500	872.500	868.600	947.500	872.500	870.000
BT	948.500	872.500	871.100	949.500	872.500	871.300	950.500	872.500	871.100	951.500
BT	872.500	870.000	951.500	872.500	868.600	951.500	872.500	.000	995.000	873.000
BT	.000	1045.000	874.000	.000	1145.000	878.500	.000	1245.000	885.600	.000
GR	884.900	.000	879.900	25.000	877.100	125.000	878.700	180.000	874.400	225.000
GR	873.100	245.000	872.600	325.000	872.100	425.000	872.200	525.000	871.900	625.000
GR	871.300	725.000	871.600	825.000	871.300	925.000	872.500	943.000	869.100	943.000
GR	868.000	944.000	867.800	945.000	868.000	946.000	869.100	947.000	868.600	947.500
GR	867.500	948.500	867.300	949.500	867.500	950.500	868.600	951.500	872.500	951.500
GR	873.000	995.000	874.000	1045.000	878.500	1145.000	885.600	1245.000	.000	.000
X1	2850.000	.000	.000	.000	20.000	20.000	20.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
X3	10.000	.000	.000	450.000	.000	960.000	.000	872.500	872.500	.000
NC	.090	.090	.040	.000	.000	.000	.000	.000	.000	.000
X1	2851.000	28.000	940.000	958.000	1.000	1.000	1.000	.000	.000	.000
X3	10.000	.000	.000	450.000	.000	960.000	.000	872.500	872.500	.000
GR	884.900	.000	879.900	25.000	877.100	125.000	878.700	180.000	874.400	225.000
GR	873.100	245.000	872.600	325.000	872.100	425.000	872.200	525.000	871.900	625.000
GR	871.300	725.000	871.600	825.000	871.300	925.000	872.300	935.000	872.300	940.000
GR	868.800	942.000	868.500	943.000	867.800	945.000	867.500	948.000	867.300	949.500
GR	868.800	951.500	870.100	954.000	871.600	958.000	872.300	965.000	873.000	995.000
GR	874.000	1045.000	878.500	1145.000	885.600	1245.000	.000	.000	.000	.000

VS F JA 99

X1	2930.000	21.000	937.000	960.000	70.000	70.000	79.000	.000	.000	.000
X3	.000	.000	.000	450.000	.000	.000	.000	.000	.000	.000
GR	884.900	.000	879.900	25.000	877.100	125.000	878.700	180.000	874.400	225.000
GR	873.100	245.000	872.600	325.000	872.100	425.000	872.200	525.000	871.900	625.000
GR	871.300	725.000	871.600	825.000	871.300	925.000	871.100	937.000	870.500	940.000
GR	869.000	945.000	867.200	952.000	868.100	955.000	873.700	960.000	877.100	980.000
GR	886.400	1025.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	3430.000	.000	.000	.000	350.000	350.000	500.000	.000	1.700	.000
X3	.000	.000	.000	450.000	.000	.000	.000	.000	.000	.000
NC	.090	.070	.040	.000	.000	.000	.000	.000	.000	.000

VS G JA 100

X1	4440.000	13.000	285.000	305.000	680.000	750.000	1010.000	.000	.000	.000
GR	890.500	.000	881.900	15.000	879.700	85.000	877.100	103.000	875.000	185.000
GR	874.900	285.000	872.700	287.000	872.500	290.000	872.400	295.000	872.600	303.000
GR	874.900	305.000	878.400	385.000	895.900	435.000	.000	.000	.000	.000
NC	.060	.060	.040	.000	.000	.000	.000	.000	.000	.000
X1	4909.000	17.000	375.000	400.000	440.000	450.000	469.000	.000	.000	.000
GR	895.200	.000	893.000	75.000	887.900	175.000	882.900	275.000	881.800	375.000
GR	873.500	376.000	873.400	380.000	873.800	385.000	874.200	389.000	875.600	391.000
GR	875.800	399.000	875.800	400.000	881.800	400.000	882.500	475.000	886.300	575.000
GR	892.400	675.000	895.200	715.000	.000	.000	.000	.000	.000	.000
NC	.060	.060	.024	.000	.000	.000	.000	.000	.000	.000

BS H JA 101 RUSHTON ROAD

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X1   4910.000     17.000    375.000    400.000      1.000      1.000      1.000       .000       .000       .000
BT     12.000       .000    895.200       .000     75.000    893.000       .000    175.000    887.900       .000
BT    275.000    882.900       .000    375.000    881.800       .000    375.000    884.400    879.700    400.000
BT    884.400    879.700    400.000    881.800       .000    475.000    882.500       .000    575.000    886.300
BT       .000    675.000    892.400       .000    715.000    895.200       .000       .000       .000       .000
GR    895.200       .000    893.000     75.000    887.900    175.000    882.900    275.000    881.800    375.000
GR    873.500    376.000    873.400    380.000    873.800    385.000    874.200    389.000    875.600    391.000
GR    875.800    399.000    875.800    400.000    881.800    400.000    882.500    475.000    886.300    575.000
GR    892.400    675.000    895.200    715.000       .000       .000       .000       .000       .000       .000

X1   4940.000       .000       .000       .000     30.000     30.000     30.000       .000       .000       .000
X2       .000       .000       .000       .000       .000       .000      1.000       .000       .000       .000
NC       .060       .060       .040       .000       .000       .000       .000       .000       .000       .000

X1   4941.000     17.000    375.000    400.000      1.000      1.000      1.000       .000       .000       .000
X3     10.000       .000       .000       .000       .000       .000       .000    881.800    881.800       .000
GR    895.200       .000    893.000     75.000    887.900    175.000    882.900    275.000    881.800    375.000
GR    873.500    376.000    873.400    380.000    873.800    385.000    874.200    389.000    875.600    391.000
GR    875.800    399.000    875.800    400.000    881.800    400.000    882.500    475.000    886.300    575.000
GR    892.400    675.000    895.200    715.000       .000       .000       .000       .000       .000       .000

     DAM I JA 102   SPTLLWAY FOR INCHWAGH LAKE

X1   5140.000     16.000    100.000    125.000     20.000    350.000    199.000       .000       .000       .000
GR    889.000       .000    889.100     15.000    891.800     50.000    892.300     88.000    890.800     95.000
GR    873.700    100.000    872.900    125.000    890.500    133.000    891.300    139.000    891.400    150.000
GR    891.400    200.000    891.200    207.000    889.300    217.000    889.100    237.000    889.400    250.000
GR    895.600    300.000       .000       .000       .000       .000       .000       .000       .000       .000
NC       .050       .050       .020       .000       .000       .000       .000       .000       .000       .000
SB       .000      1.000      3.050       .000       .001       .000       .001       .000    872.900    872.900

X1   5160.000     16.000    100.000    125.000     20.000     20.000     20.000       .000       .000       .000
X2       .000       .000      1.000       .000    887.000       .000       .000       .000       .000       .000
X3       .000       .000       .000     50.000       .000       .000       .000       .000       .000       .000
BT     18.000     50.000    891.800       .000     50.000    891.800       .000     50.000    891.800       .000
BT     88.000    892.300       .000     95.000    890.800       .000    100.000    890.100       .000    100.000
BT    887.000       .000    125.000    887.100       .000    125.000    889.400       .000    133.000    890.500
BT       .000    139.000    891.300       .000    150.000    891.400       .000    200.000    891.400       .000
BT    207.000    891.200       .000    217.000    889.300       .000    237.000    889.100       .000    250.000
BT    889.400       .000    300.000    895.600       .000       .000       .000       .000       .000       .000
GR    891.800     50.000    891.800     50.000    891.800     50.000    892.300     88.000    890.800     95.000
GR    873.700    100.000    872.900    125.000    890.500    133.000    891.300    139.000    891.400    150.000
GR    891.400    200.000    891.200    207.000    889.300    217.000    889.100    237.000    889.400    250.000
GR    895.600    300.000       .000       .000       .000       .000       .000       .000       .000       .000

X1   5249.000     29.000    101.000    237.000     30.000    130.000     89.000       .000       .000       .000
X3     10.000       .000       .000       .000       .000       .000       .000    892.300    892.300       .000
GR    892.500       .000    893.400     77.000    888.100    101.000    887.300    105.000    885.800    110.000
GR    884.800    115.000    883.500    120.000    880.800    130.000    879.800    140.000    879.600    150.000
GR    880.100    160.000    880.500    170.000    881.000    180.000    881.100    190.000    881.600    200.000
GR    882.100    210.000    882.600    220.000    883.300    225.000    884.100    230.000    885.300    235.000
GR    885.600    237.000    892.600    300.000    892.900    400.000    893.400    500.000    893.900    600.000
GR    894.400    700.000    894.900    800.000    895.500    900.000    895.500   1000.000       .000       .000
NC       .040       .040       .030       .000       .000       .000       .000       .000       .000       .000

     BS  J JA 103   RAILROAD BRIDGE UPSTREAM OF SPILLWAY

X1   5250.000     71.000    101.000    237.000      1.000      1.000      1.000       .000       .000       .000
X3     10.00       000.       000        000        000         00        000        000        000        000
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BT	36.000	.000	892.500	.000	77.000	893.400	.000	101.000	892.700	.000
BT	101.000	892.700	890.800	108.000	892.700	890.790	109.000	892.700	890.790	120.000
BT	892.600	890.770	121.000	892.600	890.770	132.000	892.500	890.750	133.000	892.500
BT	890.750	144.000	892.500	890.730	145.000	892.500	890.750	156.000	892.500	890.790
BT	157.000	892.500	890.720	168.000	892.500	890.700	169.000	892.500	890.700	180.000
BT	892.400	890.680	181.000	892.400	890.680	192.000	892.400	890.670	193.000	892.400
BT	890.670	204.000	892.400	890.650	205.000	892.400	890.650	216.000	892.300	890.630
BT	217.000	892.300	890.630	228.000	892.300	890.630	229.000	892.300	890.630	237.000
BT	892.300	890.600	237.000	892.300	.000	300.000	892.600	.000	400.000	892.900
BT	.000	500.000	893.400	.000	600.000	893.900	.000	700.000	894.000	.000
BT	800.000	894.900	.000	900.000	895.500	.000	1000.000	895.500	.000	.000
GR	892.500	.000	893.400	77.000	892.700	101.000	887.300	101.000	886.400	108.000
GR	890.790	108.000	890.790	109.000	886.100	109.000	885.800	110.000	884.800	115.000
GR	883.500	120.000	890.770	120.000	890.770	121.000	883.200	121.000	880.800	130.000
GR	880.600	132.000	890.750	132.000	890.750	133.000	880.500	133.000	879.800	140.000
GR	879.700	144.000	890.730	144.000	890.730	145.000	879.700	145.000	879.600	150.000
GR	880.400	156.000	890.720	156.000	890.720	157.000	880.600	157.000	881.000	160.000
GR	880.600	168.000	890.700	168.000	890.700	169.000	880.500	169.000	880.500	170.000
GR	881.000	180.000	890.680	180.000	890.680	181.000	881.000	181.000	881.100	190.000
GR	881.200	192.000	890.670	192.000	890.670	193.000	881.200	193.000	881.600	200.000
GR	881.800	204.000	890.650	204.000	890.650	205.000	881.800	205.000	882.100	210.000
GR	882.400	216.000	890.630	216.000	890.630	217.000	882.400	217.000	882.600	220.000
GR	883.300	225.000	883.800	228.000	890.620	228.000	890.620	229.000	883.900	229.000
GR	884.100	230.000	885.600	237.000	892.300	237.000	892.600	300.000	892.900	400.000
GR	893.400	500.000	893.900	600.000	894.400	700.000	894.900	800.000	895.500	900.000
GR	895.900	1000.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	5262.000	.000	.000	.000	12.000	12.000	12.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.090	.080	.040	.000	.000	.000	.000	.000	.000	.000
X1	5263.000	29.000	101.000	237.000	1.000	1.000	1.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	892.300	892.300	.000
GR	892.500	.000	893.400	77.000	888.100	101.000	887.300	105.000	885.800	110.000
GR	884.800	115.000	883.500	120.000	880.800	130.000	879.800	140.000	879.600	150.000
GR	880.100	160.000	880.500	170.000	881.000	180.000	881.100	190.000	881.600	200.000
GR	882.100	210.000	882.600	220.000	883.300	225.000	884.100	230.000	885.300	235.000
GR	885.600	237.000	892.600	300.000	892.900	400.000	893.400	500.000	893.900	600.000
GR	894.400	700.000	894.900	800.000	895.500	900.000	895.500	1000.000	.000	.000
NC	.120	.075	.055	.000	.000	.000	.000	.000	.000	.000

VS K JA 104

X1	5620.000	15.000	68.000	275.000	400.000	200.000	357.000	.000	.000	.000
GR	901.400	.000	896.900	20.000	893.600	48.000	887.700	68.000	884.400	90.000
GR	883.300	112.000	881.900	137.000	881.300	162.000	880.700	187.000	880.700	212.000
GR	880.900	237.000	881.900	253.000	883.900	260.000	887.400	275.000	895.300	285.000
NC	.120	.120	.045	.000	.000	.000	.000	.000	.000	.000

VS L JA 105

X1	7300.000	18.000	145.000	502.000	1600.000	1700.000	1680.000	.000	.000	.000
X3	.000	.000	.000	230.000	.000	.000	.000	.000	.000	.000
GR	902.800	.000	894.600	100.000	893.100	145.000	887.600	157.000	884.300	195.000
GR	883.800	230.000	882.600	265.000	882.400	293.000	882.200	320.000	882.400	345.000
GR	882.000	370.000	884.500	400.000	884.200	425.000	884.600	450.000	885.200	475.000
GR	887.600	500.000	889.500	502.000	901.000	535.000	.000	.000	.000	.000

VS M JA 106

X1	9340.000	17.000	0.000	185.00	2200.000	1650.000	2040.000	.000	.000	.000

G	897.400	.000	896.800	25.000	884.000	50.000	886.800	60.000	885.600	85.000
GR	884.900	95.000	883.500	110.000	883.500	119.000	883.300	127.000	884.000	135.000
GR	884.500	142.000	884.700	152.000	885.400	170.000	886.100	185.000	886.600	200.000
GR	888.500	215.000	897.600	240.000	.000	.000	.000	.000	.000	.000
QT	4.000	290.000	485.000	620.000	960.000	.000	.000	.000	.000	.000

USE ENERGY GRADE AT SEC. M (9340) AS STARTING WSFL

X1	13710.000	27.000	596.500	603.500	20.000	20.000	20.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	889.900	889.900	.000
GR	897.100	.000	896.000	100.000	893.800	200.000	892.000	300.000	890.000	400.000
GR	889.000	500.000	888.000	570.000	886.700	573.000	885.300	580.000	884.800	590.000
GR	885.700	596.500	884.400	598.000	883.900	600.000	884.400	602.000	885.100	603.500
GR	889.000	625.000	890.000	700.000	892.000	800.000	892.200	900.000	893.000	1000.000
GR	895.100	1100.000	895.800	1200.000	895.100	1300.000	894.900	1400.000	895.100	1500.000
GR	896.400	1600.000	897.400	1650.000	.000	.000	.000	.000	.000	.000
NC	.040	.040	.024	.000	.000	.000	.000	.000	.000	.000
SB	.000	2.220	2.850	.000	5.500	.000	38.480	.000	883.900	883.100

BS N JA 107 9-MILE ROAD

X1	13750.000	26.000	596.500	603.500	40.000	40.000	40.000	.000	.000	.000
X2	.000	.000	1.000	889.900	890.800	.000	.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	890.800	890.800	.000
BT	26.000	.000	897.100	.000	100.000	896.000	.000	200.000	893.800	.000
BT	300.000	892.000	.000	400.000	891.100	.000	500.000	890.800	.000	596.500
BT	891.300	.000	596.500	891.300	885.200	596.500	891.300	887.600	598.000	891.300
BT	889.400	600.000	891.300	889.900	602.000	891.300	889.400	603.500	891.300	887.600
BT	603.500	891.300	885.200	603.500	891.300	.000	700.000	891.500	.000	800.000
BT	892.000	.000	900.000	892.200	.000	1000.000	893.000	.000	1100.000	895.100
BT	.000	1200.000	895.800	.000	1300.000	895.100	.000	1400.000	894.900	.000
BT	1500.000	895.100	.000	1600.000	896.500	.000	1650.000	897.400	.000	.000
GR	897.100	.000	896.000	100.000	893.800	200.000	892.000	300.000	891.100	400.000
GR	890.800	500.000	891.150	570.000	886.700	573.000	885.300	580.000	884.800	590.000
GR	885.700	596.500	884.400	598.000	883.900	600.000	884.400	602.000	885.100	603.500
GR	891.300	625.000	891.500	700.000	892.000	800.000	892.200	900.000	893.000	1000.000
GR	895.100	1100.000	895.800	1200.000	895.100	1300.000	894.900	1400.000	895.100	1500.000
GR	896.400	1600.000	897.400	1650.000	.000	.000	.000	.000	.000	.000
NC	.080	.080	.040	.000	.000	.000	.000	.000	.000	.000

X1	13751.000	29.000	596.500	603.500	1.000	1.000	1.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	890.800	890.800	.000
GR	897.100	.000	896.000	100.000	893.800	200.000	892.000	300.000	891.100	400.000
GR	890.800	500.000	891.150	570.000	885.700	573.000	884.300	580.000	883.800	590.000
GR	884.700	596.500	883.400	598.000	883.100	599.200	883.100	600.000	883.100	600.800
GR	883.400	602.000	884.100	603.500	891.300	625.000	891.500	700.000	892.000	800.000
GR	892.200	900.000	893.000	1000.000	895.100	1100.000	895.800	1200.000	895.100	1300.000
GR	894.900	1400.000	895.100	1500.000	896.400	1600.000	897.400	1650.000	.000	.000

VS O JA 108

X1	13860.000	24.000	505.000	613.000	100.000	100.000	109.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	700.000	.000	.000	.000	.000
GR	902.200	.000	895.600	70.000	891.100	170.000	890.500	270.000	889.700	370.000
GR	888.000	470.000	887.400	492.000	885.200	505.000	885.200	519.000	885.400	524.000
GR	884.800	541.000	884.200	557.000	884.200	570.000	885.400	585.000	885.600	598.000
GR	886.800	613.000	887.600	670.000	896.000	770.000	899.300	870.000	897.600	905.000
GR	890.800	970.000	889.700	1040.000	894.600	1070.000	900.000	1170.000	.000	.000

VS P JA 109

X1	14610.000	20.000	520.000	765.000	700.000	400.000	810.000	.000	.000	.000
X3	.000	.000	.000	170.000	.000	700.000	.000	.000	.000	.000
GR	902.500	.000	894.700	65.000	891.000	100.000	890.000	165.000	887.700	265.000
GR	889.100	365.000	887.500	465.000	887.200	520.000	886.000	540.000	885.500	550.000
GR	885.900	553.000	886.000	557.000	886.600	565.000	886.700	665.000	886.300	740.000
GR	887.200	765.000	888.800	808.000	892.700	825.000	895.200	855.000	901.100	865.000

VS 0 JA 110

X1	15180.000	30.000	765.000	790.000	550.000	520.000	510.000	.000	.000	.000
X3	.000	.000	.000	400.000	.000	1050.000	.000	.000	.000	.000
GR	904.100	.000	893.500	65.000	890.500	165.000	890.300	265.000	889.900	365.000
GR	888.900	465.000	887.600	565.000	887.200	665.000	886.900	757.000	886.900	760.000
GR	887.400	765.000	887.000	766.000	887.000	770.000	886.800	775.000	886.900	780.000
GR	887.000	785.000	887.000	788.000	887.300	790.000	887.000	865.000	887.100	965.000
GR	887.300	1065.000	888.000	1165.000	888.000	1265.000	888.200	1365.000	888.200	1465.000
GR	887.700	1565.000	887.800	1665.000	888.300	1685.000	898.400	1765.000	900.600	1790.000
QT	4.000	190.000	315.000	410.000	635.000	.000	.000	.000	.000	.000

VS R JA 111

X1	16540.000	27.000	95.000	106.000	1050.000	1150.000	1360.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	800.000	.000	.000	.000	.000
GR	903.900	.000	893.000	40.000	889.600	95.000	887.200	98.000	886.900	100.000
GR	887.200	103.000	889.600	106.000	890.200	195.000	891.100	273.000	896.100	295.000
GR	897.100	310.000	896.100	325.000	892.000	355.000	890.900	395.000	890.500	495.000
GR	890.600	595.000	890.800	695.000	890.200	760.000	896.000	795.000	898.000	820.000
GR	896.100	845.000	891.000	895.000	889.700	920.000	889.900	995.000	889.900	1095.000
GR	890.000	1400.000	900.000	1840.000	.000	.000	.000	.000	.000	.000
NC	.090	.090	.046	.000	.000	.000	.000	.000	.000	.000

X1	16862.000	90.000	233.300	243.800	287.500	300.000	322.000	.000	.000	.000
X3	.000	.000	.000	50.000	.000	740.000	.000	.000	.000	.000
GR	904.600	.000	903.500	8.000	902.400	16.100	901.300	24.100	900.200	32.200
GR	899.000	40.200	897.800	48.300	896.900	56.300	896.100	64.300	895.400	72.400
GR	894.700	80.400	894.000	88.500	893.400	96.500	893.100	104.600	893.000	112.600
GR	892.800	120.600	892.700	128.700	892.500	136.700	892.400	144.800	892.200	152.800
GR	892.000	160.900	891.900	168.900	891.700	176.900	891.600	185.000	891.400	193.000
GR	891.300	201.100	891.200	209.100	891.100	217.200	890.900	225.200	890.800	233.300
GR	890.600	233.600	890.300	234.000	890.000	234.300	889.700	234.700	889.500	235.000
GR	889.200	235.400	888.900	235.700	888.600	236.100	888.500	236.400	888.400	236.800
GR	888.400	237.100	888.300	237.500	888.300	237.800	888.200	238.200	888.200	238.500
GR	888.300	238.900	888.300	239.200	888.300	239.600	888.300	239.900	888.400	240.300
GR	888.400	240.600	888.500	241.000	888.700	241.300	889.000	241.700	889.300	242.000
GR	889.500	242.400	889.800	242.700	890.100	243.100	890.400	243.400	890.700	243.800
GR	891.000	289.000	891.300	334.300	892.900	379.500	894.300	424.800	891.600	470.000
GR	891.500	515.300	891.400	560.500	891.500	605.800	891.600	651.000	891.700	696.300
GR	891.500	741.500	896.000	786.800	894.900	832.000	891.300	877.300	891.300	922.500
GR	891.400	967.800	891.400	1013.000	891.500	1058.300	891.600	1103.500	891.700	1148.800
GR	891.900	1194.000	892.000	1239.300	892.800	1284.500	894.100	1329.800	895.300	1375.000
GR	896.600	1420.300	897.900	1465.500	899.100	1510.800	900.400	1556.000	901.700	1601.300

X1	17185.000	90.000	371.500	381.500	287.500	300.000	323.000	.000	.000	.000
X3	.000	.000	.000	70.000	.000	750.000	.000	.000	.000	.000
GR	905.400	.000	904.000	12.800	902.700	25.600	901.400	38.400	900.100	51.200
GR	898.600	64.100	897.100	76.900	896.100	89.700	895.400	102.500	894.800	115.300
GR	894.400	128.100	894.000	140.900	893.500	153.700	893.400	166.500	893.300	179.300
GR	893.200	192.200	893.100	205.000	893.000	217.800	892.900	230.600	892.800	243.400
GR	892.600	256.200	892.500	269.000	892.400	281.800	892.300	294.600	892.300	307.400
GR	892.200	320.300	892.100	333.100	892.100	345.900	892.100	358.700	892.100	371.500
GR	891.800	371.800	891.500	372.200	891.300	372.500	891.000	372.800	890.800	373.200
GR	890.500	373.500	890.300	373.800	890.000	374.200	889.900	374.500	889.800	374.800

GR	889.700	375.200	889.600	375.500	889.600	375.800	889.500	376.200	889.500	376.500
GR	889.500	376.800	889.500	377.200	889.600	377.500	889.600	377.800	889.600	378.200
GR	889.700	378.500	889.700	378.800	889.900	379.200	890.100	379.500	890.400	379.800
GR	890.700	380.200	890.900	380.500	891.200	380.800	891.500	381.200	891.800	381.500
GR	891.900	414.200	892.100	446.900	893.100	479.600	894.100	512.300	892.400	545.000
GR	892.300	577.700	892.300	610.400	892.400	643.100	892.500	675.800	892.700	708.500
GR	892.600	741.200	895.700	773.900	895.000	806.600	892.700	839.300	892.700	872.000
GR	892.800	904.700	892.900	937.400	893.100	970.100	893.300	1002.800	893.500	1035.500
GR	893.700	1068.200	893.900	1100.900	894.800	1133.600	896.100	1166.300	897.300	1199.000
GR	898.500	1231.700	899.700	1264.400	900.900	1297.100	902.100	1329.800	903.300	1362.500
X1	17507.000	90.000	509.800	519.300	290.000	300.000	322.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	630.000	.000	.000	.000	.000
GR	906.100	.000	904.600	17.600	903.100	35.200	901.600	52.700	900.000	70.300
GR	898.200	87.900	896.400	105.500	895.400	123.000	894.700	140.600	894.300	158.200
GR	894.100	175.800	893.900	193.400	893.700	210.900	893.600	228.500	893.600	246.100
GR	893.600	263.700	893.500	281.200	893.500	298.800	893.400	316.400	893.300	334.000
GR	893.200	351.600	893.100	369.100	893.000	386.700	893.100	404.300	893.100	421.900
GR	893.100	439.400	893.100	457.000	893.200	474.600	893.200	492.200	893.300	509.800
GR	893.000	510.100	892.800	510.400	892.600	510.700	892.400	511.000	892.100	511.300
GR	891.900	511.700	891.700	512.000	891.400	512.300	891.200	512.600	891.100	512.900
GR	891.000	513.200	891.000	513.600	890.900	513.900	890.800	514.200	890.800	514.500
GR	890.800	514.800	890.800	515.100	890.800	515.500	890.800	515.800	890.900	516.100
GR	890.900	516.400	890.900	516.700	891.000	517.000	891.200	517.400	891.500	517.700
GR	891.800	518.000	892.000	518.300	892.300	518.600	892.600	518.900	892.800	519.300
GR	892.900	539.400	893.000	559.600	893.400	579.700	893.900	599.800	893.100	620.000
GR	893.100	640.100	893.100	660.300	893.300	680.400	893.500	700.600	893.600	720.700
GR	893.700	740.900	895.300	761.000	895.100	781.200	894.000	801.300	894.100	821.500
GR	894.300	841.600	894.400	861.800	894.700	881.900	895.000	902.100	895.300	922.200
GR	895.600	942.400	895.900	962.500	896.900	982.700	898.000	1002.800	899.200	1023.000
GR	900.300	1043.100	901.500	1063.300	902.600	1083.400	903.800	1103.600	904.900	1123.800

VS S JA 112

X1	17830.000	18.000	648.000	657.000	290.000	3000.000	3230.000	.000	.000	.000
X3	.000	.000	.000	400.000	.000	.000	.000	.000	.000	.000
GR	906.800	.000	900.300	85.000	895.100	140.000	893.800	185.000	893.900	285.000
GR	894.000	385.000	893.700	485.000	894.100	585.000	894.500	648.000	892.400	651.000
GR	892.000	653.000	892.200	655.000	893.900	657.000	893.700	685.000	894.000	710.000
GR	895.900	785.000	897.900	825.000	906.600	885.000	.000	.000	.000	.000
QT	4.000	120.000	205.000	260.000	405.000	.000	.000	.000	.000	.000
X1	18330.000	.000	.000	.000	500.000	500.000	500.000	.000	1.600	.000
X3	.000	.000	.000	500.000	.000	720.000	.000	.000	.000	.000

VS T JA 114

X1	19410.000	15.000	300.000	321.000	1000.000	1000.000	1080.000	.000	.000	.000
X3	.000	.000	.000	269.000	.000	352.000	.000	.000	.000	.000
GR	911.900	.000	908.400	100.000	906.200	125.000	901.000	172.000	900.200	200.000
GR	901.000	300.000	897.600	306.000	897.000	310.000	897.100	315.000	901.000	321.000
GR	900.900	400.000	907.400	500.000	908.500	600.000	912.500	700.000	913.900	800.000
X1	19559.000	19.000	500.000	509.000	150.000	150.000	149.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	905.000	905.000	.000
GR	913.600	.000	911.800	100.000	909.300	200.000	907.400	300.000	906.000	400.000
GR	905.600	475.000	899.400	500.000	899.300	501.000	898.200	502.000	898.100	505.000
GR	898.200	508.000	899.200	509.000	905.500	530.000	905.300	600.000	906.500	700.000
GR	908.700	800.000	910.400	900.000	912.400	1000.000	913.500	1100.000	.000	.000
NC	.040	.040	.020	.000	.000	.000	.000	.000	.000	.000

BS U JA 115 8-MILE ROAD

X1	19560.000	19.000	500.000	509.000	1.000	1.000	1.000	.000	.000	.000
BT	15.000	.000	913.600	.000	100.000	911.800	.000	200.000	909.300	.000
BT	300.000	907.400	.000	400.000	906.000	.000	500.000	905.500	.000	500.000
BT	905.500	903.400	509.000	905.500	903.400	509.000	905.500	.000	600.000	905.300
BT	.000	700.000	906.500	.000	800.000	908.700	.000	900.000	910.400	.000
BT	1000.000	912.400	.000	1100.000	913.500	.000	.000	.000	.000	.000
GR	913.600	.000	911.800	100.000	909.300	200.000	907.400	300.000	906.000	400.000
GR	905.500	500.000	899.400	500.000	899.300	501.000	898.200	502.000	898.100	505.000
GR	898.200	508.000	899.200	509.000	905.500	509.000	905.300	600.000	906.500	700.000
GR	908.700	800.000	910.400	900.000	912.400	1000.000	913.500	1100.000	.000	.000
X1	19586.000	.000	.000	.000	26.000	26.000	26.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.090	.080	.042	.000	.000	.000	.000	.000	.000	.000
X1	19587.000	19.000	500.000	509.000	1.000	1.000	1.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	905.300	905.300	.000
GR	913.600	.000	911.800	100.000	909.300	200.000	907.400	300.000	906.000	400.000
GR	905.600	475.000	899.400	500.000	899.300	501.000	898.200	502.000	898.100	505.000
GR	898.200	508.000	899.200	509.000	905.500	530.000	905.300	600.000	906.500	700.000
GR	908.700	800.000	910.400	900.000	912.400	1000.000	913.500	1100.000	.000	.000
QT	4.000	5.000	5.000	5.000	5.000	.000	.000	.000	.000	.000
NC	.090	.090	.040	.300	.500	.000	.000	.000	.000	.000
NH	7.000	.050	373.000	.040	425.000	.050	897.000	.040	940.000	.090
NH	1324.000	.040	1382.000	.090	2065.000	.000	.000	.000	.000	.000

VS A JA 93 START ISLAND PROBLEM FOR ANOTHER BRANCH

X1	.100	28.000	350.000	408.000	.000	.000	.000	.000	.000	.000
X5	4.000	872.040	873.500	874.110	875.440	.000	.000	.000	.000	.000
GR	868.800	.000	871.100	50.000	869.800	100.000	869.800	150.000	869.300	200.000
GR	868.900	250.000	868.600	300.000	868.800	350.000	867.100	353.000	865.600	360.000
GR	864.700	367.000	864.200	375.000	864.300	382.000	865.500	392.000	866.300	395.000
GR	867.000	399.000	868.300	405.000	868.600	408.000	870.500	455.000	871.400	500.000
GR	871.400	575.000	872.400	650.000	873.300	665.000	887.300	695.000	883.300	750.000
GR	881.200	800.000	876.100	850.000	873.700	900.000	.000	.000	.000	.000
NH	7.000	.050	373.000	.040	425.000	.050	897.000	.040	940.000	.090
NH	1324.000	.040	1382.000	.090	2065.000	.000	.000	.000	.000	.000

VS B JA 94

X1	1200.000	57.000	373.000	425.000	1400.000	1200.000	1200.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	725.000	.000	.000	.000	.000
GR	899.700	.000	892.100	65.000	888.200	107.000	883.400	165.000	880.800	265.000
GR	879.600	315.000	874.700	373.000	867.000	388.000	865.600	400.000	865.400	405.000
GR	866.600	415.000	868.300	420.000	872.200	425.000	873.400	465.000	873.700	565.000
GR	874.700	594.000	877.400	665.000	880.500	686.000	882.800	725.000	880.200	765.000
GR	875.600	807.000	873.100	808.000	871.300	897.000	868.300	902.000	867.500	906.000
GR	866.500	913.000	866.200	918.000	866.100	922.000	866.700	927.000	867.400	935.000
GR	869.700	940.000	869.500	965.000	869.200	1015.000	869.100	1065.000	869.200	1115.000
GR	869.100	1165.000	869.200	1215.000	868.800	1265.000	868.500	1324.000	867.300	1327.000
GR	867.100	1332.000	866.800	1342.000	866.600	1352.000	866.800	1362.000	866.900	1372.000
GR	867.400	1379.000	868.400	1382.000	868.400	1455.000	868.600	1515.000	868.800	1565.000
GR	868.800	1615.000	869.800	1715.000	870.700	1815.000	870.300	1915.000	871.400	1990.000
GR	880.500	2043.000	886.800	2065.000	.000	.000	.000	.000	.000	.000
NC	.050	.050	.040	.000	.000	.000	.000	.000	.000	.000

VS C J 95

X1	1900.000	14.000	243.800	246.200	700.000	800.000	700.000	.000	.000	.000
GR	883.400	.000	881.600	75.000	879.500	175.000	879.200	243.800	868.200	243.800
GR	867.800	244.200	867.400	245.000	867.600	245.800	868.200	246.200	879.200	246.200
GR	879.500	275.000	883.800	375.000	886.000	425.000	886.900	475.000	.000	.000
NC	.050	.050	.025	.000	.000	.000	.000	.000	.000	.000
SB	.000	2.400	3.000	.000	2.400	.000	4.910	.000	867.800	867.400

X1	1920.000	.000	.000	.000	20.000	20.000	20.000	.000	.000	.000
X2	.000	.000	1.000	869.900	879.200	.000	.000	.000	.000	.000
BT	14.000	.000	883.400	.000	75.000	881.600	.000	175.000	879.500	.000
BT	243.800	879.200	868.200	243.800	879.200	869.100	244.200	879.200	869.700	245.000
BT	879.200	869.900	245.800	879.200	869.700	246.200	879.200	869.100	246.200	879.200
BT	868.200	275.000	879.500	.000	375.000	883.800	.000	425.000	886.000	.000
BT	475.000	886.900	.000	.000	.000	.000	.000	.000	.000	.000
NH	9.000	.090	170.000	.040	190.000	.090	400.000	.040	451.000	.090
NH	857.000	.040	888.000	.090	1942.000	.040	2017.000	.090	2488.000	.000

VS D JA 96 END OF ISLAND PROBLEM

X1	2850.100	69.000	170.000	451.000	900.000	700.000	930.000	.000	.000	.000
X3	.000	.000	.000	270.000	.000	800.000	.000	.000	.000	.000
GR	875.900	.000	868.100	20.000	868.800	58.000	868.500	88.000	868.300	170.000
GR	867.100	173.000	866.100	178.000	866.300	183.000	868.300	188.000	868.600	190.000
GR	868.100	290.000	868.600	358.000	868.600	400.000	868.300	403.000	867.200	413.000
GR	866.600	423.000	866.600	436.000	867.300	441.000	868.300	446.000	868.600	451.000
GR	871.200	488.000	872.100	588.000	872.000	688.000	874.500	788.000	874.900	857.000
GR	867.300	860.000	866.600	865.000	866.100	868.000	866.100	873.000	867.700	880.000
GR	868.300	883.000	871.000	888.000	870.800	938.000	870.700	988.000	870.500	1038.000
GR	869.700	1088.000	870.400	1138.000	870.100	1188.000	870.200	1238.000	869.900	1288.000
GR	870.300	1338.000	870.200	1388.000	870.600	1438.000	869.600	1488.000	869.600	1538.000
GR	869.600	1588.000	870.400	1638.000	870.400	1688.000	870.900	1738.000	870.700	1788.000
GR	870.800	1838.000	870.000	1888.000	868.500	1942.000	867.400	1944.000	867.200	1950.000
GR	866.800	1960.000	866.700	1971.000	867.100	1983.000	867.000	1988.000	867.100	1997.000
GR	867.800	2007.000	868.500	2017.000	868.800	2088.000	868.800	2188.000	869.400	2288.000
GR	874.000	2388.000	876.600	2408.000	879.300	2423.000	885.400	2488.000	.000	.000
EJ	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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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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T1       GREEN OAK TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN
T2       100-YEAR FLOOD;       FILE: WALKEREN
T3       WALKER DRAIN,  ENCROACHED FLOODWAY

J1  ICHECK     INQ       NINV      IDIR      STRT      METRIC    HVINS     0         WSEL      FQ

     -10.       4.        0.        0.   .000000       .00        .0        0.   874.110     .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH      FN       ALLDC     IBW      CHNIM     ITRACE

     3.000     .000    -1.000     .000      .000      .000      .000      .000      .000      .000

*PROF 3

CCHV=     .300 CEHV=     .500
1490 NH CARD USED
*SECNO .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=     725.0     2065.0  TYPE=     1  TARGET=    -725.000

         VS  A JA 94   MOUTH OF WALKER DRAIN AT SANDY BOTTOM LAKE


              START OF ISLAND PROBLEM

     .00      8.01    874.11      .00    874.11    874.11      .00       .00       .00    871.30
   1055.       25.      610.     419.      170.     2623.    2783.        0.        0.    868.40
     .00       .15       .23      .15      .050      .050     .090      .000    866.10    807.60
 .000011        0.        0.       0.         0         0        0       .00   1198.19   2005.78

1490 NH CARD USED
*SECNO 520.000

3470 ENCROACHMENT STATIONS=     475.0     2175.0  TYPE=     1  TARGET=    -475.000

         VS  B JA 95

  520.00     10.21    874.11      .00       .00    874.12      .00       .00       .00    870.80
   1055.       10.      834.     211.       70.     4343.    1626.       59.       14.    869.00
     .71       .14       .19      .13      .050      .054     .090      .045    863.90    656.00
 .000009      800.      520.     300.         0         0        0       .00   1447.66   2103.66

1490 NH CARD USED
*SECNO 1470.000

3470 ENCROACHMENT STATIONS=     800.0     2[illegible]8.0  TYPE=     1  TARGET=    8[illegible]0.0
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        VS  C JA 96        END OF ISLAND PROBLEM

  1470.00      8.02    874.12       .00       .00    874.12       .00       .01       .00    874.90
     1055.       0.      811.      244.        0.     4806.     1665.      167.       39.    868.50
      2.05       .00       .17       .15      .050      .044      .090      .047    866.10    857.31
  .000010      700.      950.      200.         0         0         0       .00   1531.62   2388.93

*SECNO 2220.000

3470 ENCROACHMENT STATIONS=      550.0     1300.0  TYPE=     1  TARGET=     750.000

        VS  D JA 97

  2220.00      7.53    874.13       .00       .00    874.13       .00       .01       .00    870.00
     720.      492.       89.      139.     2008.      144.      597.      242.       58.    870.10
      2.70       .25       .62       .23      .080      .040      .060      .046    866.60    550.00
  .000025      500.      750.      800.         0         0         0       .00    750.00   1300.00

*SECNO 2829.000
   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=      450.0      960.0  TYPE=     1  TARGET=     510.000
  2829.00      6.85    874.15       .00       .00    874.16       .01       .02       .00    868.50
     720.      600.       97.       23.     1197.       54.       30.      262.       64.    868.80
      2.88       .50      1.80       .78      .080      .040      .060      .048    867.30    450.00
  .000220      400.      609.      560.         1         0         0       .00    510.00    960.00

*SECNO 2830.000

3370 NORMAL BRIDGE,NRD= 33 MIN ELTRD=  871.30 MAX ELLC=  871.80

3470 ENCROACHMENT STATIONS=      450.0      960.0  TYPE=     1  TARGET=     510.000

        BS  E JA 98

  2830.00      6.86    874.16       .00       .00    874.16       .01       .00       .00    872.50
     720.      669.       46.        5.     1195.       39.       14.      262.       64.    872.50
      2.88       .56      1.19       .38      .090      .024      .090      .048    867.30    450.00
  .000348        1.        1.        1.         0         0         0    -13.53    510.00    960.00

*SECNO 2850.000

3370 NORMAL BRIDGE,NRD= 33 MIN ELTRD=  871.30 MAX ELLC=  871.80

3470 ENCROACHMENT STATIONS=      450.0      960.0  TYPE=     1  TARGET=     510.000
  2850.00      6.86    874.16       .00       .00    874.17       .01       .01       .00    872.50
     720.      669.       46.        5.     1201.       39.       14.      262.       64.    872.50
      2.89       .56      1.19       .38      .090      .024      .090      .047    867.30    450.00
  .000343       20.       20.       20.         0         0         0    -13.53    510.00    960.00

*SECNO 2851.000

3470 ENCROACHMENT STATIONS=      450.0      960.0  TYPE=     1  TARGET=     510.000
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   2[illegible]1.00      [illegible]      874.16      .00      .00      874.17      .01      .00      .00      872.50
     720.      574.      144.      1.      1194.      92.      5.      263.      64.      871.60
    2.89       .48      1.57      .29      .090      .040      .090      .047      867.30      450.00
 .000256       1.        1.        1.        0         0         0       .00      510.00      960.00

*SECNO 2930.000

3470 ENCROACHMENT STATIONS=      450.0      1025.0  TYPE=      1  TARGET=      -450.000

        VS  F JA 99

 2930.00      6.98      874.18      .00      .00      874.19      .01      .02      .00      871.10
     720.      556.      164.      0.      1206.      111.      1.      265.      65.      873.70
    2.92       .46      1.48      .10      .090      .040      .090      .047      867.20      450.00
 .000230      70.       79.       70.       0         0         0       .00      512.85      962.85

*SECNO 3430.000
   SECNO      DEPTH      CWSEL      CRTWS      WSELK      EG      HV      HL      OLOSS      BANK ELEV
   Q          QLOB       QCH        QROB       ALOB       ACH     AROB    VOL     TWA     LEFT/RIGHT
   TTME       VLOB       VCH        VROB       XML        XNCH    XNR     WTN     ELMIN      SSTA
   SLOPE      XLOBL      XLCH       XLOBR      ITRTAL     TDC     ICONT   CORAR   TOPWID     ENDST

3470 ENCROACHMENT STATIONS=      450.0      1025.0  TYPE=      1  TARGET=      -450.000
 3430.00      5.45      874.35      .00      .00      874.47      .12      .22      .06      872.80
     720.      404.      316.      0.      457.      76.      0.      272.      69.      875.40
    2.97       .89      4.15      .00      .090      .040      .090      .047      868.90      450.00
 .002789      350.      500.      350.       2         0         0       .00      509.06      959.06

*SECNO 4440.000

        VS  G JA 100

 4440.00      4.35      876.75      .00      .00      876.95      .20      2.45      .04      874.90
     720.      292.      385.      43.      240.      80.      39.      280.      75.      874.90
    3.04      1.22      4.82      1.11      .090      .040      .070      .048      872.40      116.63
 .003022      680.      1010.      750.       4         0         0       .00      230.68      347.31

*SECNO 4909.000

3301 HV CHANGED MORE THAN HVINS

 4909.00      5.24      878.64      .00      .00      879.44      .81      2.19      .30      881.80
     720.       0.       720.       0.       0.      100.       0.      282.      77.      881.80
    3.06       .00      7.21       .00      .060      .040      .060      .047      873.40      375.38
 .008430      440.      469.      450.       2         0         0       .00      24.62      400.00

*SECNO 4910.000

3370 NORMAL BRIDGE,NRD= 12 MIN ELTRD=  881.80 MAX ELLC=  879.70

        BS  H JA 101   PUSHTON ROAD

 4910.00      5.24      878.64      .00      .00      879.45      .80      .01      .00      881.80
     720.       0.       720.       0.       0.      100.       0.      282.      77.      881.80
    3.06       .00      7.20       .00      .060      .024      .060      .047      873.40      375.38
 .003379       1.        1.        1.        0         0         0       .00      24.62      400.00
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*SECNO 4940.000

3370 NORMAL BRIDGE,NRD= 12 MIN ELTRD=  881.80 MAX ELLC=  879.70

  4940.00      5.43    878.83       .00       .00    879.56       .74       .10       .02    881.80
     720.        0.      720.        0.        0.     104.        0.      282.       77.    881.80
     3.06       .00      6.89       .00      .060      .024      .060      .047    873.40    375.36
  .002984       30.       30.       30.         0         0         0       .00     24.64    400.00


*SECNO 4941.000
   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=      881.80 ELREA=      881.80

  4941.00      5.43    878.83       .00       .00    879.57       .74       .00       .00    881.80
     720.        0.      720.        0.        0.     105.        0.      282.       77.    881.80
     3.06       .00      6.88       .00      .060      .040      .060      .047    873.40    375.36
  .007331        1.        1.        1.         0         0         0       .00     24.64    400.00


*SECNO 5140.000

        DAM 1 JA 102   SPILLWAY FOR INCHWAGH LAKE

  5140.00      6.98    879.88       .00       .00    880.16       .28       .45       .14    873.70
     720.        4.      704.       12.        6.     164.       11.      283.       77.    872.90
     3.07       .74      4.28      1.04      .060      .040      .060      .046    872.90     98.19
  .001079       20.      199.      350.         2         0         0       .00     29.98    128.17


SPECIAL BRIDGE

SB   XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
      .00      1.00      3.05       .00       .00       .00       .00       .00    872.90    872.90

*SECNO 5160.000

3265 DIVIDED FLOW

PRESSURE AND WEIR FLOW

 EGPRS      EGLAC      H3       QWEIR      QPR       BAREA    TRAPEZOID      ELLC      ELTRD
                                                              AREA
#########   880.16     .00       726.       0.        0.        -1.        .00     887.00


3470 ENCROACHMENT STATIONS=      50.0     300.0  TYPE=     1  TARGET=     -50.000
  5160.00     17.69    890.59      .00       .00    890.63       .04     10.47       .00    873.70
     720.        7.      691.       22.       42.     432.      126.      283.       77.    872.90
     3.08       .17      1.60      .18      .050      .020      .050      .046    872.90     95.06
  .000010       20.       20.       20.         2         0        10       .00     88.00    259.60


*SECNO 5249.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      892.30 ELREA=      892.30
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5249.00     11.03    890.63      .0       .00    890.64      .01      .00      .01    888.10
  720.        0.      720.       0.        0.     1171.       0.     285.      77.     885.60
  3.12       .00       .61      .00      .050      .020     .050     .046   879.60    101.00
.000004      30.       89.     130.        0         0        0      .00   136.00    237.00

*SECNO 5250.000

3265 DIVIDED FLOW

3370 NORMAL BRIDGE,NRD= 36 MIN ELTRD=  892.30 MAX ELLC=  890.80

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=     892.70 ELREA=     892.30

        BS  J JA 103   RAILROAD BRIDGE UPSTREAM OF SPILLWAY

5250.00     11.03    890.63      .00       .00    890.64      .01      .00      .00    892.70
  720.        0.      720.       0.        0.     1071.       0.     285.      77.     892.30
  3.12       .00       .67      .00      .040      .030     .040     .046   879.60    101.00
.000043       1.        1.       1.        0         0        0     -.17   127.00    237.00

*SECNO 5262.000

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= 36 MIN ELTRD=  892.30 MAX ELLC=  890.80

5262.00     11.03    890.63      .00       .00    890.64      .01      .00      .00    892.70
  720.        0.      720.       0.        0.     1071.       0.     285.      77.     892.30
  3.12       .00       .67      .00      .040      .030     .040     .046   879.60    101.00
.000043      12.       12.      12.        0         0        0     -.17   127.00    237.00

*SECNO 5263.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=     892.30 ELREA=     892.30

5263.00     11.03    890.63      .00       .00    890.64      .01      .00      .00    888.10
  720.        0.      720.       0.        0.     1171.       0.     285.      77.     885.60
  3.12       .00       .61      .00      .090      .040     .080     .046   879.60    101.00
.000016       1.        1.       1.        0         0        0      .00   136.00    237.00

*SECNO 5620.000

        VS  K JA 104

5620.00      9.94    890.64      .00       .00    890.65      .00      .01      .00    887.70
  720.        1.      719.       1.       15.     1690.       7.     297.      78.     887.40
  3.36       .06       .43      .09      .120      .055     .075     .046   880.70     58.02
.000015     400.      357.     200.        0         0        0      .00   221.08    279.11

*SECNO 7300.000
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3470 ENCROACHMENT STATIONS-      250.0      355.0  TYPE=      1  TARGET=     -250.000

        VS   L JA 105

  7300.00      8.66    890.66       .00       .00    890.67       .00       .02      .00100000.00
      720.        0.      720.        0.        0.     1930.        2.      368.       88.    889.50
     4.61       .00       .37       .03      .120      .045      .120      .046    882.00    230.00
  .000010     1600.     1680.     1700.         0         0         0       .00    275.35    505.35

*SECNO 9340.000

        VS   M JA 106

  9340.00      7.40    890.70       .00       .00    890.72       .01       .04       .01    886.80
      720.        6.      683.       31.       33.      726.      119.      433.       98.    886.10
     5.23       .20       .94       .26      .120      .045      .120      .046    883.30     44.57
  .000078     2200.     2040.     1650.         1         0         0       .00    176.47    221.03

*SECNO 13710.000
    SECNO      DEPTH     CWSEL     CRTWS     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

        USE ENERGY GRADE AT SEC. M (9340) AS STARTING WSEL

 13710.00      6.78    890.68       .00       .00    890.74       .06       .00       .02    885.70
      620.       340.      156.      124.      420.       44.      180.      433.       99.    885.10
     5.23       .81      3.59       .69      .120      .045      .120      .046    883.90    365.33
  .001183       20.       20.       20.         1         0         0       .00    369.35    734.67

SPECIAL BRIDGE

SB   XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
      .00      2.22      2.85       .00      5.50       .00      38.48       .00    883.90    883.10

*SECNO 13750.000
PRESSURE AND WEIR FLOW

 EGPRS      EGLWC      H3        QWEIR     QPR       BAREA     TRAPEZOID AREA     ELLC      ELTRD
  899.63    893.84      .00       416.      209.      38.       33.       889.90    890.80

        BS   N JA 107   9-MILE ROAD

 13750.00      7.74    891.64       .00       .00    891.70       .06       .96       .00    885.70
      620.       351.      169.      100.      286.       50.       94.      434.       99.    885.10
     5.24      1.23      3.37      1.07      .040      .024      .040      .046    883.90    340.30
  .000246       40.       40.       40.         2         0         7       .00    387.16    727.46

*SECNO 13751.000
 13751.00      8.54    891.64       .00       .00    891.70       .07       .00       .00    884.70
      620.       333.      193.       94.      311.       57.      104.      434.       99.    884.10
     5.24      1.07      3.39       .90      .080      .040      .080      .046    883.10    340.23
  .000578        1.        1.        1.         0         0         0       .00    387.35    727.58
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*SECNO 13860.000

3470 ENCROACHMENT STATIONS=        .0      700.0  TYPE=      1  TARGET=      699.999

         VS  O JA 108

 13860.00      7.52   891.72      .00       .00   891.73      .00      .01      .02   885.20
     620.      114.     432.      74.      706.     717.     344.     436.     100.   886.80
    5.30       .16      .60      .22      .080     .040     .080     .046   884.20   156.13
  .000021      100.     109.     100.        2        0        0      .00   543.87   700.00

*SECNO 14670.000

3470 ENCROACHMENT STATIONS=      170.0      700.0  TYPE=      1  TARGET=      530.000

         VS  P JA 109

 14670.00      6.24   891.74      .00       .00   891.74      .00      .01      .00   887.20
     620.      206.     414.       0.     1200.     936.       0.     469.     109. 100000.00
    5.90       .17      .44      .00      .080     .040     .080     .045   885.50   170.00
  .000016      700.     810.     400.        2        0        0      .00   530.00   700.00

*SECNO 15180.000
   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=      400.0     1050.0  TYPE=      1  TARGET=      650.000

         VS  Q JA 110

 15180.00      4.95   891.75      .00       .00   891.75      .00      .01      .00   887.40
     620.      294.      56.     271.     1419.     120.    1203.     498.     116.   887.30
    6.52       .21      .46      .23      .080     .040     .080     .045   886.80   400.00
  .000019      550.     510.     520.        0        0        0      .00   650.00  1050.00

*SECNO 16540.000

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS=        .0      800.0  TYPE=      1  TARGET=      799.999

         VS  R JA 111

 16540.00      4.89   891.79      .00       .00   891.80      .01      .05      .01   889.60
     410.       16.      76.     319.       39.      44.     708.     544.     132.   889.60
    6.98       .40     1.72      .45      .080     .040     .080     .045   886.90    59.51
  .000410     1050.    1360.    1150.        2        0        0      .00   623.67   769.62

*SECNO 16862.000

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS=       50.0      740.0  TYPE=      1  TARGET=      690.000
 16862.00      3.85   892.05      .00       .00   892.16      .11      .30      .05   890.80
     410.        [illegible]     137.     224.      [illegible]      32.      2[illegible]1.     548.      13[illegible]      [illegible]90.70
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     7.02      1.03      4.54       .93      .090      .046      .090      .045    800.20    134.01
  .005046      288.      322.      300.         3         0         0       .00    473.87    740.00

*SECNO 17185.000

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS=       70.0     750.0  TYPE=      1  TARGET=     680.000
 17185.00      3.73    893.23       .00       .00    893.27       .04      1.09       .02    892.10
     410.      102.       92.      216.      130.       29.      267.      550.      140.    891.80
     7.09       .79      3.12       .81      .090      .046      .090      .045    889.50    188.73
  .002688      288.      323.      300.         4         0         0       .00    513.74    747.81

*SECNO 17507.000

3470 ENCROACHMENT STATIONS=          .0     630.0  TYPE=      1  TARGET=     629.999
 17507.00      3.34    894.14       .00       .00    894.18       .04       .91       .00    893.30
     410.      230.       81.       99.      260.       25.      102.      553.      143.    892.80
     7.15       .88      3.28       .97      .090      .046      .090      .046    890.80    172.06
  .003473      290.      322.      300.         2         0         0       .00    457.94    630.00

*SECNO 17830.000
   SECNO     DEPTH     CWSEL     CRIWS     WSELK        FG        HV        HL     QLOSS   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       JDC     ICONT     CORAR    TOPWID      ENDST

3470 ENCROACHMENT STATIONS=      400.0     885.0  TYPE=      1  TARGET=    -400.000

          VS  S JA 112

 17830.00      3.81    895.81       .00       .00    895.82       .01      1.62       .01    894.50
     410.      277.       41.       92.      456.       27.      171.      567.      154.    893.90
     7.70       .61      1.51       .54      .090      .046      .090      .052    892.00    400.00
  .000597      290.     3230.     3000.         6         0         0       .00    381.73    781.73

*SECNO 18330.000

3470 ENCROACHMENT STATIONS=      500.0     720.0  TYPE=      1  TARGET=     220.000
 18330.00      2.75    896.35       .00       .00    896.43       .09       .58       .04    896.10
     260.      113.       72.       75.       99.       18.       56.      571.      157.    895.50
     7.77      1.15      4.07      1.34      .090      .046      .090      .052    893.60    500.00
  .007717      500.      500.      500.         2         0         0       .00    220.00    720.00

*SECNO 19410.000

3470 ENCROACHMENT STATIONS=      269.0     352.0  TYPE=      1  TARGET=      83.000

          VS  T JA 114

 19410.00      4.41    901.41       .00       .00    901.61       .20      5.12       .06    901.00
     260.       10.      243.        7.       16.       65.       13.      575.      161.    901.00
     7.86       .62      3.73       .54      .090      .046      .090      .051    897.00    269.00
  .003363     1000.     1080.     1000.         5         0         0       .00     83.00    352.00

*SECNO 19559.000
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3301 HV CHANGED MO E THAN HVINS

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      905.00 ELREA=      905.00

 19559.00      3.78    901.88       .00       .00    902.95      1.07       .91       .44    899.40
     260.        0.      260.        0.        0.       31.        0.      575.      161.    899.20
     7.86       .00      8.32       .00      .090      .046      .090      .051    898.10    500.00
  .014322      150.      149.      150.         2         0         0       .00      9.00    509.00

*SECNO 19560.000

3370 NORMAL BRIDGE,NRD= 15 MIN ELTRD=  905.30 MAX ELLC=  903.40

         BS  U JA 115   8-MILE ROAD

 19560.00      3.79    901.89       .00       .00    902.96      1.07       .01       .00    905.50
     260.        0.      260.        0.        0.       31.        0.      575.      161.    905.50
     7.86       .00      8.31       .00      .040      .020      .040      .051    898.10    500.00
  .006998        1.        1.        1.         0         0         0       .00      9.00    509.00

*SECNO 19586.000
   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=  905.30 MAX ELLC=  903.40

 19586.00      4.27    902.37       .00       .00    903.19       .82       .15       .07    905.50
     260.        0.      260.        0.        0.       36.        0.      575.      161.    905.50
     7.86       .00      7.28       .00      .040      .020      .040      .051    898.10    500.00
  .005108       26.       26.       26.         2         0         0       .00      9.00    509.00

*SECNO 19587.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      905.30 ELREA=      905.30

 19587.00      4.28    902.38       .00       .00    903.20       .82       .01       .00    899.40
     260.        0.      260.        0.        0.       36.        0.      575.      161.    899.20
     7.86       .00      7.29       .00      .090      .042      .080      .051    898.10    500.00
  .007684        1.        1.        1.         0         0         0       .00      9.00    509.00

CCHV=     .300 CEHV=     .500
1490 NH CARD USED
*SECNO .100
 WATER EL=XS CARD=    874.110

3265 DIVIDED FLOW

3280 CROSS SECTION        .10 EXTENDED       5.31 FEET

         VS  A JA 93    START ISLAND PROBLEM FOR ANOTHER BRANCH

       .10      9.91    874.11       .00       .00    874.11       .00       .00       .25    868.80
        5.        3.        1.        1.      1623.      484.      747.      575.      161.    868.60
      7.8        00       .00        00       050        0.0       050       051    864.20       00
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 .000000      0.      0.      0.      0      0      0     .00   675.28   900.00

1490 NH CARD USED
*SECNO 1200.000

3470 ENCROACHMENT STATIONS=        .0     725.0  TYPE=     1  TARGET=     724.999

          VS  B JA 94

  1200.00     8.71   874.11     .00     .00   874.11     .00     .00     .00   874.70
       5.       0.       5.      0.      0.     320.    111.    624.    174.   872.20
   33.29      .00      .01     .00    .050     .040    .050    .050  865.40   374.15
 .000000    1400.    1200.   1200.       2        0       0     .00  202.74   576.89

*SECNO 1900.000

          VS  C JA 95

  1900.00     6.71   874.11     .00     .00   874.11     .00     .00     .00   879.20
       5.       0.       5.      0.      0.      15.      0.    628.    175.   879.20
   33.89      .00      .32     .00    .050     .040    .050    .050  867.40   243.80
 .000072     700.     700.    800.       0        0       0     .00    2.40   246.20


SPECIAL BRIDGE

SB   XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
      .00      2.40      3.00       .00      2.40       .00      4.91       .00     867.80    867.40

*SECNO 1920.000
 PRESS FLOW BECAUSE EGLWC OF     874.51  EXCEEDS 1.5 DEPTH
   SECNO     DEPTH     CWSEL     CRTWS     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


PRESSURE FLOW

 EGPRS     EGLWC      H3       QWETR      QPR       BAREA   TRAPEZOID      ELLC      ELTRD
                                                             AREA
  874.15   874.51     .00        0.        5.        5.        5.      869.90    879.20


  1920.00     6.75   874.15     .00     .00   874.15     .00     .04     .00   879.20
       5.       0.       5.      0.      0.      16.      0.    628.    175.   879.20
   33.91      .00      .32     .00    .050     .025    .050    .050  867.40   243.80
 .000028      20.      20.     20.       0        0       0     .00    2.40   246.20


1490 NH CARD USED
*SECNO 2850.100

3470 ENCROACHMENT STATIONS=     270.0     800.0  TYPE=     1  TARGET=     530.000

          VS  D JA 96     END OF ISLAND PROBLEM

  2850.10     7.55   874.15     .00     .00   874.15     .00     .00     .00100000.00
       5.       0.       4.      1.      0.    1095.    709.    645.    180.   868.60
  112.90      .00      .00     .00    .050     .040    .090    .049  866.60   270.00
 .000000     900.     930.    700.       2        0       0     .00  503.93   773.93
```

00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: GREEN OAK TWP.

3) WATERCOURSE: WALKER DRAIN

4) DOCUMENT TYPE: 100-YR NATURAL

00BREAK00

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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
*****************************************************

C
T1      GREEN OAK TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN
T2      100-YEAR FLOOD:      FILE: WALKERNA
T3      WALKER DRAIN, NATURAL ENCROACHMENT

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ
      -1.      4.       0.       0.    .000000     .00      .0       0.    874.040   .000

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE
    -1.000    .000    -1.000    .000     .000     .000     .000     .000     .000     .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT
    38.000   39.000   40.000   41.000   42.000   43.000    1.000    8.000   10.000   12.000

     3.000    4.000   25.000     .000     .000     .000     .000     .000     .000     .000

QT     4.000  450.000  795.000 1060.000 1670.000     .000     .000     .000     .000     .000
QT     4.000  445.000  790.000 1055.000 1665.000     .000     .000     .000     .000     .000
NC      .090    .090     .040     .300     .500     .000     .000     .000     .000     .000
NH     7.000    .050  373.000     .040  425.000     .050  897.000     .040  940.000     .090
NH  1324.000    .040 1382.000     .090 2065.000     .000     .000     .000     .000     .000

        VS  A JA 94   MOUTH OF WALKER DRAIN AT SANDY BOTTOM LAKE

            START OF ISLAND PROBLEM

X1      .000   57.000  897.000 1382.000     .000     .000     .000     .000     .000     .000
X3      .000     .000     .000  725.000     .000     .000     .000     .000     .000     .000
GR   899.700     .000  892.100   65.000  888.200  107.000  883.400  165.000  880.800  265.000
GR   879.600  315.000  874.700  373.000  867.000  388.000  865.600  400.000  865.400  405.000
GR   866.600  415.000  868.300  420.000  872.200  425.000  873.400  465.000  873.700  565.000
GR   874.700  594.000  877.400  665.000  880.500  686.000  882.800  725.000  880.200  765.000
GR   875.600  807.000  873.100  808.000  871.300  897.000  868.300  902.000  867.500  906.000
GR   866.500  913.000  866.200  918.000  866.100  922.000  866.700  927.000  867.400  935.000
GR   869.700  940.000  869.500  965.000  869.200 1015.000  869.100 1065.000  869.200 1115.000
GR   869.100 1165.000  869.200 1215.000  868.800 1265.000  868.500 1324.000  867.300 1327.000
GR   867.100 1332.000  866.800 1342.000  866.600 1352.000  866.800 1362.000  866.900 1372.000
GR   867.400 1379.000  868.400 1382.000  868.400 1455.000  868.600 1515.000  868.800 1565.000
GR   868.800 1615.000  869.800 1715.000  870.700 1815.000  870.300 1915.000  871.400 1990.000
GR   880.500 2043.000  886.800 2065.000     .000     .000     .000     .000     .000     .000
NH     7.000    .050  243.800     .025  246.200     .050  701.000     .040  763.000     .090
NH  1613.000    .040 1675.000     .090 2175.000     .000     .000     .000     .000     .000

        VS  B JA 95

X1    520.000   61.000  701.000 1675.000  800.000  300.000  520.000     .000     .000     .000
X3      .000     .000     .000  475.000     .000     .000     .000     .000     .000     .000
GR   883.400     .000  881.600   75.000  879.500  175.000  879.200  243.800  868.200  2[illegible]3.800
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GR	867.000	244.200	867.400	245.000	867.600	245.000	886.200	245.200	[illegible]	245.200
GR	879.500	275.000	883.800	375.000	886.000	425.000	886.900	475.000	885.900	525.000
GR	876.100	625.000	872.900	675.000	870.800	701.000	868.300	703.000	867.200	708.000
GR	864.800	713.000	864.000	718.000	863.900	728.000	864.300	738.000	865.900	748.000
GR	867.900	758.000	871.700	763.000	870.100	775.000	870.400	825.000	870.300	875.000
GR	870.400	925.000	869.700	975.000	869.700	1025.000	870.000	1075.000	870.000	1125.000
GR	869.900	1175.000	869.900	1225.000	869.600	1275.000	870.400	1325.000	870.600	1375.000
GR	871.400	1425.000	870.700	1475.000	870.200	1525.000	868.900	1575.000	868.900	1613.000
GR	867.900	1615.000	867.100	1625.000	866.700	1640.000	866.600	1647.000	866.600	1657.000
GR	867.300	1667.000	869.000	1675.000	868.800	1725.000	869.000	1825.000	870.800	1925.000
GR	871.400	1975.000	872.200	2050.000	871.600	2075.000	873.400	2100.000	882.200	2145.000
GR	887.900	2175.000	.000	.000	.000	.000	.000	.000	.000	.000
NH	9.000	.090	170.000	.040	190.000	.090	400.000	.040	451.000	.090
NH	857.000	.040	888.000	.090	1942.000	.040	2017.000	.090	2488.000	.000

VS C JA 96 END OF ISLAND PROBLEM

X1	1470.000	69.000	857.000	2017.000	700.000	200.000	950.000	.000	.000	.000
X3	.000	.000	.000	800.000	.000	.000	.000	.000	.000	.000
GR	875.900	.000	868.100	20.000	868.800	58.000	868.500	88.000	868.300	170.000
GR	867.100	173.000	866.100	178.000	866.300	183.000	868.300	188.000	868.600	190.000
GR	868.100	290.000	868.600	358.000	868.600	400.000	868.300	403.000	867.200	413.000
GR	866.600	423.000	866.600	436.000	867.300	441.000	868.300	446.000	868.600	451.000
GR	871.200	488.000	872.100	588.000	872.000	688.000	874.500	788.000	874.900	857.000
GR	867.300	860.000	866.600	865.000	866.100	868.000	866.100	873.000	867.700	880.000
GR	868.300	883.000	871.000	888.000	870.800	938.000	870.700	988.000	870.500	1038.000
GR	869.700	1088.000	870.400	1138.000	870.100	1188.000	870.200	1238.000	869.900	1288.000
GR	870.300	1338.000	870.200	1388.000	870.600	1438.000	869.600	1488.000	869.600	1538.000
GR	869.600	1588.000	870.400	1638.000	870.400	1688.000	870.900	1738.000	870.700	1788.000
GR	870.800	1838.000	870.000	1888.000	868.500	1942.000	867.400	1944.000	867.200	1950.000
GR	866.800	1960.000	866.700	1971.000	867.100	1983.000	867.000	1988.000	867.100	1997.000
GR	867.800	2007.000	868.500	2017.000	868.800	2088.000	868.800	2188.000	869.400	2288.000
GR	874.000	2388.000	876.600	2408.000	879.300	2423.000	885.400	2488.000	.000	.000
QT	4.000	270.000	510.000	720.000	1190.000	.000	.000	.000	.000	.000
NC	.080	.060	.040	.000	.000	.000	.000	.000	.000	.000

VS D JA 97

X1	2220.000	24.000	1030.000	1052.000	500.000	800.000	750.000	.000	.000	.000
X3	.000	.000	.000	150.000	.000	1300.000	.000	.000	.000	.000
GR	878.700	.000	871.700	40.000	871.500	130.000	871.400	230.000	870.900	330.000
GR	869.200	430.000	868.600	530.000	868.300	630.000	868.500	675.000	870.300	680.000
GR	870.900	730.000	870.300	830.000	870.700	930.000	870.000	1030.000	868.000	1032.000
GR	866.600	1038.000	867.100	1045.000	868.400	1050.000	870.100	1052.000	870.900	1065.000
GR	871.100	1130.000	872.300	1230.000	872.600	1255.000	880.000	2355.000	.000	.000

X1	2829.000	28.000	943.000	951.500	400.000	560.000	609.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	960.000	.000	872.500	872.500	.000
GR	884.900	.000	879.900	25.000	877.100	125.000	878.700	180.000	874.400	225.000
GR	873.100	245.000	872.600	325.000	872.100	425.000	872.200	525.000	871.900	625.000
GR	871.300	725.000	871.600	825.000	871.300	925.000	872.300	935.000	872.300	940.000
GR	868.800	942.000	868.500	943.000	867.800	945.000	867.500	948.000	867.300	949.500
GR	868.800	951.500	870.100	954.000	871.600	958.000	872.300	965.000	873.000	995.000
GR	874.000	1045.000	878.500	1145.000	885.600	1245.000	.000	.000	.000	.000
NC	.090	.090	.024	.000	.000	.000	.000	.000	.000	.000

BS E JA 98

X1	2830.000	29.000	943.000	951.500	1.000	1.000	1.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	960.000	.000	872.500	872.500	.000
BT	33.000	.000	884.900	.000	25.000	879.900	.000	125.000	877.100	.000
BT	1[illegible].00	87[illegible].700	[illegible].000	235.0[illegible]	874.00	[illegible].000	2[illegible].00	173.100	[illegible].00	325.000

BT	872.600	.000	425.000	872.100	.000	325.000	872.200	.000	625.000	871.900
BT	.000	725.000	871.300	.000	825.000	871.600	.000	925.000	871.300	.000
BT	943.000	872.500	.000	943.000	872.500	869.100	943.000	872.500	870.500	944.000
BT	872.500	871.600	945.000	872.500	871.800	946.000	872.500	871.600	947.000	872.500
BT	870.500	947.000	872.500	869.100	947.500	872.500	868.600	947.500	872.500	870.000
BT	948.500	872.500	871.100	949.500	872.500	871.300	950.500	872.500	871.100	951.500
BT	872.500	870.000	951.500	872.500	868.600	951.500	872.500	.000	995.000	873.000
BT	.000	1045.000	874.000	.000	1145.000	878.500	.000	1245.000	885.600	.000
GR	884.900	.000	879.900	25.000	877.100	125.000	878.700	180.000	874.400	225.000
GR	873.100	245.000	872.600	325.000	872.100	425.000	872.200	525.000	871.900	625.000
GR	871.300	725.000	871.600	825.000	871.300	925.000	872.500	943.000	869.100	943.000
GR	868.000	944.000	867.800	945.000	868.000	946.000	869.100	947.000	868.600	947.500
GR	867.500	948.500	867.300	949.500	867.500	950.500	868.600	951.500	872.500	951.500
GR	873.000	995.000	874.000	1045.000	878.500	1145.000	885.600	1245.000	.000	.000
X1	2850.000	.000	.000	.000	20.000	20.000	20.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	960.000	.000	872.500	872.500	.000
NC	.090	.090	.040	.000	.000	.000	.000	.000	.000	.000
X1	2851.000	28.000	940.000	958.000	1.000	1.000	1.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	960.000	.000	872.500	872.500	.000
GR	884.900	.000	879.900	25.000	877.100	125.000	878.700	180.000	874.400	225.000
GR	873.100	245.000	872.600	325.000	872.100	425.000	872.200	525.000	871.900	625.000
GR	871.300	725.000	871.600	825.000	871.300	925.000	872.300	935.000	872.300	940.000
GR	868.800	942.000	868.500	943.000	867.800	945.000	867.500	948.000	867.300	949.500
GR	868.800	951.500	870.100	954.000	871.600	958.000	872.300	965.000	873.000	995.000
GR	874.000	1045.000	878.500	1145.000	885.600	1245.000	.000	.000	.000	.000

VS F JA 99

X1	2930.000	21.000	937.000	960.000	70.000	70.000	79.000	.000	.000	.000
GR	884.900	.000	879.900	25.000	877.100	125.000	878.700	180.000	874.400	225.000
GR	873.100	245.000	872.600	325.000	872.100	425.000	872.200	525.000	871.900	625.000
GR	871.300	725.000	871.600	825.000	871.300	925.000	871.100	937.000	870.500	940.000
GR	869.000	945.000	867.200	952.000	868.100	955.000	873.700	960.000	877.100	980.000
GR	886.400	1025.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	3430.000	.000	.000	.000	350.000	350.000	500.000	.000	1.700	.000
NC	.090	.070	.040	.000	.000	.000	.000	.000	.000	.000

VS G JA 100

X1	4440.000	13.000	285.000	305.000	680.000	750.000	1010.000	.000	.000	.000
GR	890.500	.000	881.900	15.000	879.700	85.000	877.100	103.000	875.000	185.000
GR	874.900	285.000	872.700	287.000	872.500	290.000	872.400	295.000	872.600	303.000
GR	874.900	305.000	878.400	385.000	895.900	435.000	.000	.000	.000	.000
NC	.060	.060	.040	.000	.000	.000	.000	.000	.000	.000
X1	4909.000	17.000	375.000	400.000	440.000	450.000	469.000	.000	.000	.000
GR	895.200	.000	893.000	75.000	887.900	175.000	882.900	275.000	881.800	375.000
GR	873.500	376.000	873.400	380.000	873.800	385.000	874.200	389.000	875.600	391.000
GR	875.800	399.000	875.800	400.000	881.800	400.000	882.500	475.000	886.300	575.000
GR	892.400	675.000	895.200	715.000	.000	.000	.000	.000	.000	.000
NC	.060	.060	.024	.000	.000	.000	.000	.000	.000	.000

BS H JA 101 RUSHTON ROAD

X1	4910.000	17.000	375.00	400.00	1.00	1.000	1.000	.000	.000	.000

BT	12.000	.000	895.200	.000	75.000	895.000	.000	175.000	887.900	.000
BT	275.000	882.900	.000	375.000	881.800	.000	375.000	884.400	879.700	400.000
BT	884.400	879.700	400.000	881.800	.000	475.000	882.500	.000	575.000	886.300
BT	.000	675.000	892.400	.000	715.000	895.200	.000	.000	.000	.000
GR	895.200	.000	893.000	75.000	887.900	175.000	882.900	275.000	881.800	375.000
GR	873.500	376.000	873.400	380.000	873.800	385.000	874.200	389.000	875.600	391.000
GR	875.800	399.000	875.800	400.000	881.800	400.000	882.500	475.000	886.300	575.000
GR	892.400	675.000	895.200	715.000	.000	.000	.000	.000	.000	.000
X1	4940.000	.000	.000	.000	30.000	30.000	30.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.060	.060	.040	.000	.000	.000	.000	.000	.000	.000
X1	4941.000	17.000	375.000	400.000	1.000	1.000	1.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	881.800	881.800	.000
GR	895.200	.000	893.000	75.000	887.900	175.000	882.900	275.000	881.800	375.000
GR	873.500	376.000	873.400	380.000	873.800	385.000	874.200	389.000	875.600	391.000
GR	875.800	399.000	875.800	400.000	881.800	400.000	882.500	475.000	886.300	575.000
GR	892.400	675.000	895.200	715.000	.000	.000	.000	.000	.000	.000

DAM I JA 102 SPILLWAY FOR INCHWAGH LAKE

X1	5140.000	16.000	100.000	125.000	20.000	350.000	199.000	.000	.000	.000
GR	889.000	.000	889.100	15.000	891.800	50.000	892.300	88.000	890.800	95.000
GR	873.700	100.000	872.900	125.000	890.500	133.000	891.300	139.000	891.400	150.000
GR	891.400	200.000	891.200	207.000	889.300	217.000	889.100	237.000	889.400	250.000
GR	895.600	300.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.050	.050	.020	.000	.000	.000	.000	.000	.000	.000
SB	.000	1.000	3.050	.000	.001	.000	.001	.000	872.900	872.900
X1	5160.000	16.000	100.000	125.000	20.000	20.000	20.000	.000	.000	.000
X2	.000	.000	1.000	.000	887.000	.000	.000	.000	.000	.000
X3	.000	.000	.000	50.000	.000	.000	.000	.000	.000	.000
BT	18.000	50.000	891.800	.000	50.000	891.800	.000	50.000	891.800	.000
BT	88.000	892.300	.000	95.000	890.800	.000	100.000	890.100	.000	100.000
BT	887.000	.000	125.000	887.100	.000	125.000	889.400	.000	133.000	890.500
BT	.000	139.000	891.300	.000	150.000	891.400	.000	200.000	891.400	.000
BT	207.000	891.200	.000	217.000	889.300	.000	237.000	889.100	.000	250.000
BT	889.400	.000	300.000	895.600	.000	.000	.000	.000	.000	.000
GR	891.800	50.000	891.800	50.000	891.800	50.000	892.300	88.000	890.800	95.000
GR	873.700	100.000	872.900	125.000	890.500	133.000	891.300	139.000	891.400	150.000
GR	891.400	200.000	891.200	207.000	889.300	217.000	889.100	237.000	889.400	250.000
GR	895.600	300.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	5249.000	29.000	101.000	237.000	30.000	130.000	89.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	892.300	892.300	.000
GR	892.500	.000	893.400	77.000	888.100	101.000	887.300	105.000	885.800	110.000
GR	884.800	115.000	883.500	120.000	880.800	130.000	879.800	140.000	879.600	150.000
GR	880.100	160.000	880.500	170.000	881.000	180.000	881.100	190.000	881.600	200.000
GR	882.100	210.000	882.600	220.000	883.300	225.000	884.100	230.000	885.300	235.000
GR	885.600	237.000	892.600	300.000	892.900	400.000	893.400	500.000	893.900	600.000
GR	894.400	700.000	894.900	800.000	895.500	900.000	895.500	1000.000	.000	.000
NC	.040	.040	.030	.000	.000	.000	.000	.000	.000	.000

BS J JA 103 RAILROAD BRIDGE UPSTREAM OF SPILLWAY

X1	5250.000	71.000	101.000	237.000	1.000	1.000	1.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
BT	36.000	.000	892.500	.000	77.000	893.400	.000	101.000	892.700	.000
BT	101.000	892.700	890.800	10[illegible].00	892.700	8[illegible]	109.000	892.700	890.790	120.000

BT	892.600	890.770	121.000	892.600	890.770	132.000	892.500	890.750	133.000	892.500
BT	890.750	144.000	892.500	890.730	145.000	892.500	890.750	156.000	892.500	890.790
BT	157.000	892.500	890.720	168.000	892.500	890.700	169.000	892.500	890.700	180.000
BT	892.400	890.680	181.000	892.400	890.680	192.000	892.400	890.670	193.000	892.400
BT	890.670	204.000	892.400	890.650	205.000	892.400	890.650	216.000	892.300	890.630
BT	217.000	892.300	890.630	228.000	892.300	890.630	229.000	892.300	890.630	237.000
BT	892.300	890.600	237.000	892.300	.000	300.000	892.600	.000	400.000	892.900
BT	.000	500.000	893.400	.000	600.000	893.900	.000	700.000	894.000	.000
BT	800.000	894.900	.000	900.000	895.500	.000	1000.000	895.500	.000	.000
GR	892.500	.000	893.400	77.000	892.700	101.000	887.300	101.000	886.400	108.000
GR	890.790	108.000	890.790	109.000	886.100	109.000	885.800	110.000	884.800	115.000
GR	883.500	120.000	890.770	120.000	890.770	121.000	883.200	121.000	880.800	130.000
GR	880.600	132.000	890.750	132.000	890.750	133.000	880.500	133.000	879.800	140.000
GR	879.700	144.000	890.730	144.000	890.730	145.000	879.700	145.000	879.600	150.000
GR	880.400	156.000	890.720	156.000	890.720	157.000	880.600	157.000	881.000	160.000
GR	880.600	168.000	890.700	168.000	890.700	169.000	880.500	169.000	880.500	170.000
GR	881.000	180.000	890.680	180.000	890.680	181.000	881.000	181.000	881.100	190.000
GR	881.200	192.000	890.670	192.000	890.670	193.000	881.200	193.000	881.600	200.000
GR	881.800	204.000	890.650	204.000	890.650	205.000	881.800	205.000	882.100	210.000
GR	882.400	216.000	890.630	216.000	890.630	217.000	882.400	217.000	882.600	220.000
GR	883.300	225.000	883.800	228.000	890.620	228.000	890.620	229.000	883.900	229.000
GR	884.100	230.000	885.600	237.000	892.300	237.000	892.600	300.000	892.900	400.000
GR	893.400	500.000	893.900	600.000	894.400	700.000	894.900	800.000	895.500	900.000
GR	895.900	1000.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	5262.000	.000	.000	.000	12.000	12.000	12.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.090	.080	.040	.000	.000	.000	.000	.000	.000	.000
X1	5263.000	29.000	101.000	237.000	1.000	1.000	1.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	892.300	892.300	.000
GR	892.500	.000	893.400	77.000	888.100	101.000	887.300	105.000	885.800	110.000
GR	884.800	115.000	883.500	120.000	880.800	130.000	879.800	140.000	879.600	150.000
GR	880.100	160.000	880.500	170.000	881.000	180.000	881.100	190.000	881.600	200.000
GR	882.100	210.000	882.600	220.000	883.300	225.000	884.100	230.000	885.300	235.000
GR	885.600	237.000	892.600	300.000	892.900	400.000	893.400	500.000	893.900	600.000
GR	894.400	700.000	894.900	800.000	895.500	900.000	895.500	1000.000	.000	.000
NC	.120	.075	.055	.000	.000	.000	.000	.000	.000	.000

VS K JA 104

X1	5620.000	15.000	68.000	275.000	400.000	200.000	357.000	.000	.000	.000
GR	901.400	.000	896.900	20.000	893.600	48.000	887.700	68.000	884.400	90.000
GR	883.300	112.000	881.900	137.000	881.300	162.000	880.700	187.000	880.700	212.000
GR	880.900	237.000	881.900	253.000	883.900	260.000	887.400	275.000	895.300	285.000
NC	.120	.120	.045	.000	.000	.000	.000	.000	.000	.000

VS L JA 105

X1	7300.000	18.000	145.000	502.000	1600.000	1700.000	1680.000	.000	.000	.000
GR	902.800	.000	894.600	100.000	893.100	145.000	887.600	157.000	884.300	195.000
GR	883.800	230.000	882.600	265.000	882.400	293.000	882.200	320.000	882.400	345.000
GR	882.000	370.000	884.500	400.000	884.200	425.000	884.600	450.000	885.200	475.000
GR	887.600	500.000	889.500	502.000	901.000	535.000	.000	.000	.000	.000

VS M JA 106

X1	9340.000	17.000	60.000	185.000	2200.000	1650.000	2040.000	.000	.000	.000
GR	897.400	.000	896.800	25.000	889.000	50.000	886.800	60.000	885.600	85.000
GR	884.900	95.000	883.500	110.000	883.500	119.000	883.300	127.000	884.000	135.000
GR	8[illegible]4.500	142.000	8[illegible].700	152.00[illegible]	8[illegible]	170.000	886.100	185.0[illegible]	8[illegible]6.600	200.000

GR	888.500	215.000	897.600	240.000	.000	.000	.000	.000	.000	.000
QT	4.000	290.000	485.000	620.000	960.000	.000	.000	.000	.000	.000

USE ENERGY GRADE AT SEC. M (9340) AS STARTING WSEL

X1	13710.000	27.000	596.500	603.500	20.000	20.000	20.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	889.900	889.900	.000
GR	897.100	.000	896.000	100.000	893.800	200.000	892.000	300.000	890.000	400.000
GR	889.000	500.000	888.000	570.000	886.700	573.000	885.300	580.000	884.800	590.000
GR	885.700	596.500	884.400	598.000	883.900	600.000	884.400	602.000	885.100	603.500
GR	889.000	625.000	890.000	700.000	892.000	800.000	892.200	900.000	893.000	1000.000
GR	895.100	1100.000	895.800	1200.000	895.100	1300.000	894.900	1400.000	895.100	1500.000
GR	896.400	1600.000	897.400	1650.000	.000	.000	.000	.000	.000	.000
NC	.040	.040	.024	.000	.000	.000	.000	.000	.000	.000
SB	.000	2.220	2.850	.000	5.500	.000	38.480	.000	883.900	883.100

BS N JA 107 9-MILE ROAD

X1	13750.000	26.000	596.500	603.500	40.000	40.000	40.000	.000	.000	.000
X2	.000	.000	1.000	889.900	890.800	.000	.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	890.800	890.800	.000
BT	26.000	.000	897.100	.000	100.000	896.000	.000	200.000	893.800	.000
BT	300.000	892.000	.000	400.000	891.100	.000	500.000	890.800	.000	596.500
BT	891.300	.000	596.500	891.300	885.200	596.500	891.300	887.600	598.000	891.300
BT	889.400	600.000	891.300	889.900	602.000	891.300	889.400	603.500	891.300	887.600
BT	603.500	891.300	885.200	603.500	891.300	.000	700.000	891.500	.000	800.000
BT	892.000	.000	900.000	892.200	.000	1000.000	893.000	.000	1100.000	895.100
BT	.000	1200.000	895.800	.000	1300.000	895.100	.000	1400.000	894.900	.000
BT	1500.000	895.100	.000	1600.000	896.500	.000	1650.000	897.400	.000	.000
GR	897.100	.000	896.000	100.000	893.800	200.000	892.000	300.000	891.100	400.000
GR	890.800	500.000	891.150	570.000	886.700	573.000	885.300	580.000	884.800	590.000
GR	885.700	596.500	884.400	598.000	883.900	600.000	884.400	602.000	885.100	603.500
GR	891.300	625.000	891.500	700.000	892.000	800.000	892.200	900.000	893.000	1000.000
GR	895.100	1100.000	895.800	1200.000	895.100	1300.000	894.900	1400.000	895.100	1500.000
GR	896.400	1600.000	897.400	1650.000	.000	.000	.000	.000	.000	.000
NC	.080	.080	.040	.000	.000	.000	.000	.000	.000	.000

X1	13751.000	29.000	596.500	603.500	1.000	1.000	1.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	890.800	890.800	.000
GR	897.100	.000	896.000	100.000	893.800	200.000	892.000	300.000	891.100	400.000
GR	890.800	500.000	891.150	570.000	885.700	573.000	884.300	580.000	883.800	590.000
GR	884.700	596.500	883.400	598.000	883.100	599.200	883.100	600.000	883.100	600.800
GR	883.400	602.000	884.100	603.500	891.300	625.000	891.500	700.000	892.000	800.000
GR	892.200	900.000	893.000	1000.000	895.100	1100.000	895.800	1200.000	895.100	1300.000
GR	894.900	1400.000	895.100	1500.000	896.400	1600.000	897.400	1650.000	.000	.000

VS O JA 108

X1	13860.000	24.000	505.000	613.000	100.000	100.000	109.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	800.000	.000	.000	.000	.000
GR	902.200	.000	895.600	70.000	891.100	170.000	890.500	270.000	889.700	370.000
GR	888.000	470.000	887.400	492.000	885.200	505.000	885.200	519.000	885.400	524.000
GR	884.800	541.000	884.200	557.000	884.200	570.000	885.400	585.000	885.600	598.000
GR	886.800	613.000	887.600	670.000	896.000	770.000	899.300	870.000	897.600	905.000
GR	890.800	970.000	889.700	1040.000	894.600	1070.000	900.000	1170.000	.000	.000

VS P JA 109

X1	14670.000	20.000	520.000	765.000	700.000	400.000	810.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	1550.000	.000	.000	.000	.000
GR	902.500	.000	897.700	65.000	891.000	100.000	890.000	165.000	887.700	265.000

GR	889.100	365.000	887.500	465.000	887.200	520.000	886.000	540.000	885.500	550.000
GR	885.900	553.000	886.000	557.000	886.600	565.000	886.700	665.000	886.300	740.000
GR	887.200	765.000	888.800	808.000	892.700	825.000	895.200	855.000	901.100	865.000

VS Q JA 110

X1	15180.000	30.000	765.000	790.000	550.000	520.000	510.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	1500.000	.000	.000	.000	.000
GR	904.100	.000	893.500	65.000	890.500	165.000	890.300	265.000	889.900	365.000
GR	888.900	465.000	887.600	565.000	887.200	665.000	886.900	757.000	886.900	760.000
GR	887.400	765.000	887.000	766.000	887.000	770.000	886.800	775.000	886.900	780.000
GR	887.000	785.000	887.000	788.000	887.300	790.000	887.000	865.000	887.100	965.000
GR	887.300	1065.000	888.000	1165.000	888.000	1265.000	888.200	1365.000	888.200	1465.000
GR	887.700	1565.000	887.800	1665.000	888.300	1685.000	898.400	1765.000	900.600	1790.000
QT	4.000	190.000	315.000	410.000	635.000	.000	.000	.000	.000	.000

VS R JA 111

X1	16540.000	27.000	95.000	106.000	1050.000	1150.000	1360.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	1000.000	.000	.000	.000	.000
GR	903.900	.000	893.000	40.000	889.600	95.000	887.200	98.000	886.900	100.000
GR	887.200	103.000	889.600	106.000	890.200	195.000	891.100	273.000	896.100	295.000
GR	897.100	310.000	896.100	325.000	892.000	355.000	890.900	395.000	890.500	495.000
GR	890.600	595.000	890.800	695.000	890.200	760.000	896.000	795.000	898.000	820.000
GR	896.100	845.000	891.000	895.000	889.700	920.000	889.900	995.000	889.900	1095.000
GR	890.000	1400.000	900.000	1840.000	.000	.000	.000	.000	.000	.000
MC	.090	.090	.046	.000	.000	.000	.000	.000	.000	.000

X1	16862.000	90.000	233.300	243.800	287.500	300.000	322.000	.000	.000	.000
X3	.000	.000	.000	50.000	.000	900.000	.000	.000	.000	.000
GR	904.600	.000	903.500	8.000	902.400	16.100	901.300	24.100	900.200	32.200
GR	899.000	40.200	897.800	48.300	896.900	56.300	896.100	64.300	895.400	72.400
GR	894.700	80.400	894.000	88.500	893.400	96.500	893.100	104.600	893.000	112.600
GR	892.800	120.600	892.700	128.700	892.500	136.700	892.400	144.800	892.200	152.800
GR	892.000	160.900	891.900	168.900	891.700	176.900	891.600	185.000	891.400	193.000
GR	891.300	201.100	891.200	209.100	891.100	217.200	890.900	225.200	890.800	233.300
GR	890.600	233.600	890.300	234.000	890.000	234.300	889.700	234.700	889.500	235.000
GR	889.200	235.400	888.900	235.700	888.600	236.100	888.500	236.400	888.400	236.800
GR	888.400	237.100	888.300	237.500	888.300	237.800	888.200	238.200	888.200	238.500
GR	888.300	238.900	888.300	239.200	888.300	239.600	888.300	239.900	888.400	240.300
GR	888.400	240.600	888.500	241.000	888.700	241.300	889.000	241.700	889.300	242.000
GR	889.500	242.400	889.800	242.700	890.100	243.100	890.400	243.400	890.700	243.800
GR	891.000	289.000	891.300	334.300	892.900	379.500	894.300	424.800	891.600	470.000
GR	891.500	515.300	891.400	560.500	891.500	605.800	891.600	651.000	891.700	696.300
GR	891.500	741.500	896.000	786.800	894.900	832.000	891.300	877.300	891.300	922.500
GR	891.400	967.800	891.400	1013.000	891.500	1058.300	891.600	1103.500	891.700	1148.800
GR	891.900	1194.000	892.000	1239.300	892.800	1284.500	894.100	1329.800	895.300	1375.000
GR	896.600	1420.300	897.900	1465.500	899.100	1510.800	900.400	1556.000	901.700	1601.300

X1	17185.000	90.000	371.500	381.500	287.500	300.000	323.000	.000	.000	.000
X3	.000	.000	.000	70.000	.000	850.000	.000	.000	.000	.000
GR	905.400	.000	904.000	12.800	902.700	25.600	901.400	38.400	900.100	51.200
GR	898.600	64.100	897.100	76.900	896.100	89.700	895.400	102.500	894.800	115.300
GR	894.400	128.100	894.000	140.900	893.500	153.700	893.400	166.500	893.300	179.300
GR	893.200	192.200	893.100	205.000	893.000	217.800	892.900	230.600	892.800	243.400
GR	892.600	256.200	892.500	269.000	892.400	281.800	892.300	294.600	892.300	307.400
GR	892.200	320.300	892.100	333.100	892.100	345.900	892.100	358.700	892.100	371.500
GR	891.800	371.800	891.500	372.200	891.300	372.500	891.000	372.800	890.800	373.200
GR	890.500	373.500	890.300	373.800	890.000	374.200	889.900	374.500	889.800	374.800
GR	889.700	375.200	889.600	375.500	889.600	375.800	889.500	376.200	889.500	376.500
GR	889.500	376.800	889.500	377.200	889.600	377.500	889.600	377.800	889.600	378.200
GR	889.700	378.500	889.700	378.800	889.900	379.2[illegible]	890.100	379.500	890.[illegible]00	379.800

GR	890.700	380.200	890.900	380.700	891.200	380.800	891.500	381.200	891.800	381.500
GR	891.900	414.200	892.100	446.900	893.100	479.600	894.100	512.300	892.400	545.000
GR	892.300	577.700	892.300	610.400	892.400	643.100	892.500	675.800	892.700	708.500
GR	892.600	741.200	895.700	773.900	895.000	806.600	892.700	839.300	892.700	872.000
GR	892.800	904.700	892.900	937.400	893.100	970.100	893.300	1002.800	893.500	1035.500
GR	893.700	1068.200	893.900	1100.900	894.800	1133.600	896.100	1166.300	897.300	1199.000
GR	898.500	1231.700	899.700	1264.400	900.900	1297.100	902.100	1329.800	903.300	1362.500

X1	17507.000	90.000	509.800	519.300	290.000	300.000	322.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	650.000	.000	.000	.000	.000
GR	906.100	.000	904.600	17.600	903.100	35.200	901.600	52.700	900.000	70.300
GR	898.200	87.900	896.400	105.500	895.400	123.000	894.700	140.600	894.300	158.200
GR	894.100	175.800	893.900	193.400	893.700	210.900	893.600	228.500	893.600	246.100
GR	893.600	263.700	893.500	281.200	893.500	298.800	893.400	316.400	893.300	334.000
GR	893.200	351.600	893.100	369.100	893.000	386.700	893.100	404.300	893.100	421.900
GR	893.100	439.400	893.100	457.000	893.200	474.600	893.200	492.200	893.300	509.800
GR	893.000	510.100	892.800	510.400	892.600	510.700	892.400	511.000	892.100	511.300
GR	891.900	511.700	891.700	512.000	891.400	512.300	891.200	512.600	891.100	512.900
GR	891.000	513.200	891.000	513.600	890.900	513.900	890.800	514.200	890.800	514.500
GR	890.800	514.800	890.800	515.100	890.800	515.500	890.800	515.800	890.900	516.100
GR	890.900	516.400	890.900	516.700	891.000	517.000	891.200	517.400	891.500	517.700
GR	891.800	518.000	892.000	518.300	892.300	518.600	892.600	518.900	892.800	519.300
GR	892.900	539.400	893.000	559.600	893.400	579.700	893.900	599.800	893.100	620.000
GR	893.100	640.100	893.100	660.300	893.300	680.400	893.500	700.600	893.600	720.700
GR	893.700	740.900	895.300	761.000	895.100	781.200	894.000	801.300	894.100	821.500
GR	894.300	841.600	894.400	861.800	894.700	881.900	895.000	902.100	895.300	922.200
GR	895.600	942.400	895.900	962.500	896.900	982.700	898.000	1002.800	899.200	1023.000
GR	900.300	1043.100	901.500	1063.300	902.600	1083.400	903.800	1103.600	904.900	1123.800

VS S JA 112

X1	17830.000	18.000	648.000	657.000	290.000	3000.000	3230.000	.000	.000	.000
X3	.000	.000	.000	400.000	.000	.000	.000	.000	.000	.000
GR	906.800	.000	900.300	85.000	895.100	140.000	893.800	185.000	893.900	285.000
GR	894.000	385.000	893.700	485.000	894.100	585.000	894.500	648.000	892.400	651.000
GR	892.000	653.000	892.200	655.000	893.900	657.000	893.700	685.000	894.000	710.000
GR	895.900	785.000	897.900	825.000	906.600	885.000	.000	.000	.000	.000
OT	4.000	120.000	205.000	260.000	405.000	.000	.000	.000	.000	.000

X1	18330.000	.000	.000	.000	500.000	500.000	500.000	.000	1.600	.000
X3	.000	.000	.000	500.000	.000	720.000	.000	.000	.000	.000

VS T JA 114

X1	19410.000	15.000	300.000	321.000	1000.000	1000.000	1080.000	.000	.000	.000
X3	.000	.000	.000	269.000	.000	352.000	.000	.000	.000	.000
GR	911.900	.000	908.400	100.000	906.200	125.000	901.000	172.000	900.200	200.000
GR	901.000	300.000	897.600	306.000	897.000	310.000	897.100	315.000	901.000	321.000
GR	900.900	400.000	907.400	500.000	908.500	600.000	912.500	700.000	913.900	800.000

X1	19559.000	19.000	500.000	509.000	150.000	150.000	149.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	905.000	905.000	.000
GR	913.600	.000	911.800	100.000	909.300	200.000	907.400	300.000	906.000	400.000
GR	905.600	475.000	899.400	500.000	899.300	501.000	898.200	502.000	898.100	505.000
GR	898.200	508.000	899.200	509.000	905.500	530.000	905.300	600.000	906.500	700.000
GR	908.700	800.000	910.400	900.000	912.400	1000.000	913.500	1100.000	.000	.000
NC	.040	.040	.020	.000	.000	.000	.000	.000	.000	.000

BS U JA 115 8-MILE ROAD

X1	19560.000	19.000	500.000	509.000	1.000	1.000	1.000	.000	.000	.000
BT	15.000	.000	913.600	.000	100.000	911.800	.000	200.000	909.300	.000
BT	300.000	907.400	.000	400.000	906.000	.000	500.000	905.500	.000	500.000
BT	905.500	903.400	509.000	905.500	903.400	509.000	905.500	.000	600.000	905.300
BT	.000	700.000	906.500	.000	800.000	908.700	.000	900.000	910.400	.000
BT	1000.000	912.400	.000	1100.000	913.500	.000	.000	.000	.000	.000
GR	913.600	.000	911.800	100.000	909.300	200.000	907.400	300.000	906.000	400.000
GR	905.500	500.000	899.400	500.000	899.300	501.000	898.200	502.000	898.100	505.000
GR	898.200	508.000	899.200	509.000	905.500	509.000	905.300	600.000	906.500	700.000
GR	908.700	800.000	910.400	900.000	912.400	1000.000	913.500	1100.000	.000	.000
X1	19586.000	.000	.000	.000	26.000	26.000	26.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.090	.080	.042	.000	.000	.000	.000	.000	.000	.000
X1	19587.000	19.000	500.000	509.000	1.000	1.000	1.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	905.300	905.300	.000
GR	913.600	.000	911.800	100.000	909.300	200.000	907.400	300.000	906.000	400.000
GR	905.600	475.000	899.400	500.000	899.300	501.000	898.200	502.000	898.100	505.000
GR	898.200	508.000	899.200	509.000	905.500	530.000	905.300	600.000	906.500	700.000
GR	908.700	800.000	910.400	900.000	912.400	1000.000	913.500	1100.000	.000	.000
BT	4.000	5.000	5.000	5.000	5.000	.000	.000	.000	.000	.000
NC	.090	.090	.040	.300	.500	.000	.000	.000	.000	.000
NH	7.000	.050	373.000	.040	425.000	.050	897.000	.040	940.000	.090
NH	1324.000	.040	1382.000	.090	2065.000	.000	.000	.000	.000	.000

VS A JA 93 START ISLAND PROBLEM FOR ANOTHER BRANCH

X1	.100	28.000	350.000	408.000	.000	.000	.000	.000	.000	.000
X5	4.000	.000	.000	874.040	.000	.000	.000	.000	.000	.000
GR	868.800	.000	871.100	50.000	869.800	100.000	869.800	150.000	869.300	200.000
GR	868.900	250.000	868.600	300.000	868.800	350.000	867.100	353.000	865.600	360.000
GR	864.700	367.000	864.200	375.000	864.300	382.000	865.500	392.000	866.300	395.000
GR	867.000	399.000	868.300	405.000	868.600	408.000	870.500	455.000	871.400	500.000
GR	871.400	575.000	872.400	650.000	873.300	665.000	887.300	695.000	883.300	750.000
GR	881.200	800.000	876.100	850.000	873.700	900.000	.000	.000	.000	.000
NH	7.000	.050	373.000	.040	425.000	.050	897.000	.040	940.000	.090
NH	1324.000	.040	1382.000	.090	2065.000	.000	.000	.000	.000	.000

VS B JA 94

X1	1200.000	57.000	373.000	425.000	1400.000	1200.000	1200.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	725.000	.000	.000	.000	.000
GR	899.700	.000	892.100	65.000	888.200	107.000	883.400	165.000	880.800	265.000
GR	879.600	315.000	874.700	373.000	867.000	388.000	865.600	400.000	865.400	405.000
GR	866.600	415.000	868.300	420.000	872.200	425.000	873.400	465.000	873.700	565.000
GR	874.700	594.000	877.400	665.000	880.500	686.000	882.800	725.000	880.200	765.000
GR	875.600	807.000	873.100	808.000	871.300	897.000	868.300	902.000	867.500	906.000
GR	866.500	913.000	866.200	918.000	866.100	922.000	866.700	927.000	867.400	935.000
GR	869.700	940.000	869.500	965.000	869.200	1015.000	869.100	1065.000	869.200	1115.000
GR	869.100	1165.000	869.200	1215.000	868.800	1265.000	868.500	1324.000	867.300	1327.000
GR	867.100	1332.000	866.800	1342.000	866.600	1352.000	866.800	1362.000	866.900	1372.000
GR	867.400	1379.000	868.400	1382.000	868.400	1455.000	868.600	1515.000	868.800	1565.000
GR	868.800	1615.000	869.800	1715.000	870.700	1815.000	870.300	1915.000	871.400	1990.000
GR	880.500	2043.000	886.800	2065.000	.000	.000	.000	.000	.000	.000
NC	.050	.050	.040	.000	.000	.000	.000	.000	.000	.000

VS C JA 95

X1	1900.000	14.000	243.800	246.200	700.000	800.000	700.000	.000	.000	.000
GR	883.400	.00	891.600	75.000	879.500	175.000	879.20	243.00	868.200	2[illegible]3.800

GR	867.800	244.200	867.400	245.000	867.600	245.000	868.200	246.200	871.200	246.200
GR	879.500	275.000	883.800	375.000	886.000	425.000	886.900	475.000	.000	.000
NC	.050	.050	.025	.000	.000	.000	.000	.000	.000	.000
SB	.000	2.400	3.000.	.000	2.400	.000	4.910	.000	867.800	867.400

X1	1920.000	.000	.000	.000	20.000	20.000	20.000	.000	.000	.000
X2	.000	.000	1.000	869.900	879.200	.000	.000	.000	.000	.000
BT	14.000	.000	883.400	.000	75.000	881.600	.000	175.000	879.500	.000
BT	243.800	879.200	868.200	243.800	879.200	869.100	244.200	879.200	869.700	245.000
BT	879.200	869.900	245.800	879.200	869.700	246.200	879.200	869.100	246.200	879.200
BT	868.200	275.000	879.500	.000	375.000	883.800	.000	425.000	886.000	.000
BT	475.000	886.900	.000	.000	.000	.000	.000	.000	.000	.000
NH	9.000	.090	170.000	.040	190.000	.090	400.000	.040	451.000	.090
NH	857.000	.040	888.000	.090	1942.000	.040	2017.000	.090	2488.000	.000

VS D JA 96 END OF ISLAND PROBLEM

X1	2850.100	69.000	170.000	451.000	900.000	700.000	930.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	800.000	.000	.000	.000	.000
GR	875.900	.000	868.100	20.000	868.800	58.000	868.500	88.000	868.300	170.000
GR	867.100	173.000	866.100	178.000	866.300	183.000	868.300	188.000	868.600	190.000
GR	868.100	290.000	868.600	358.000	868.600	400.000	868.300	403.000	867.200	413.000
GR	866.600	423.000	866.600	436.000	867.300	441.000	868.300	446.000	868.600	451.000
GR	871.200	488.000	872.100	588.000	872.000	688.000	874.500	788.000	874.900	857.000
GR	867.300	860.000	866.600	865.000	866.100	868.000	866.100	873.000	867.700	880.000
GR	868.300	883.000	871.000	888.000	870.800	938.000	870.700	988.000	870.500	1038.000
GR	869.700	1088.000	870.400	1138.000	870.100	1188.000	870.200	1238.000	869.900	1288.000
GR	870.300	1338.000	870.200	1388.000	870.600	1438.000	869.600	1488.000	869.600	1538.000
GR	869.600	1588.000	870.400	1638.000	870.400	1688.000	870.900	1738.000	870.700	1788.000
GR	870.800	1838.000	870.000	1888.000	868.500	1942.000	867.400	1944.000	867.200	1950.000
GR	866.800	1960.000	866.700	1971.000	867.100	1983.000	867.000	1988.000	867.100	1997.000
GR	867.800	2007.000	868.500	2017.000	868.800	2088.000	868.800	2188.000	869.400	2288.000
GR	874.000	2388.000	876.600	2408.000	879.300	2423.000	885.400	2488.000	.000	.000
EJ	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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*PROF 1

CCHV=     .300 CEHV=     .500
1490 NH CARD USED
*SECNO .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    IOC       ICONT     CORAR     TOPWID      ENDSI


3470 ENCROACHMENT STATIONS=      725.0     2065.0  TYPE=      1  TARGET=     -725.000

        VS  A JA 94   MOUTH OF WALKER DRAIN AT SANDY BOTTOM LAKE


              START OF ISLAND PROBLEM

      .00      7.94    874.04       .00    874.04    874.04       .00       .00       .00    871.30
    1055.       24.      612.      418.      164.     2589.     2740.        0.        0.    868.40
      .00       .15       .24       .15      .050      .050      .090      .000    866.10    807.62
  .000011        0.        0.        0.         0         0         0       .00   1197.75   2005.38

1490 NH CARD USED
*SECNO 520.000

3470 ENCROACHMENT STATIONS=      475.0     2175.0  TYPE=      1  TARGET=     -475.000

        VS  B JA 95

   520.00     10.14    874.04       .00       .00    874.05       .00       .00       .00    870.80
    1055.       10.      835.      210.       67.     4275.     1596.       58.       14.    869.00
      .70       .14       .20       .13      .050      .054      .090      .045    863.90    657.09
  .000010      800.      520.      300.         0         0         0       .00   1446.21   2103.30


1490 NH CARD USED
*SECNO 1470.000

3470 ENCROACHMENT STATIONS=      800.0     2488.0  TYPE=      1  TARGET=     -800.000

        VS  C JA 96      END OF ISLAND PROBLEM

  1470.00      7.95    874.05       .00       .00    874.05       .00       .01       .00    874.90
    1055.        0.      810.      245.        0.     4726.     1639.      164.       39.    868.50
     2.01       .00       .17       .15      .050      .044      .090      .047    866.10    857.33
  .000010      700.      950.      200.         0         0         0       .00   1531.06   2388.39


*SECNO 2220.000

3470 ENCROACHMENT STATIONS=      150.0     1300.0  TYPE=      1  TARGET=     1150.000

        VS  D JA 97

  2220.00      7.46    874.06       .00       .00    874.06       .00       .01       .00    870.00
     720.      571.       59.       90.      3502.      142.      580.      247.       60.    870.10
     3.02       .16       .41       .15      .080      .040      .060      .047    866.60    150.00
  .000011      500.      750.      800.         0         0         0       .00   1150.00   1300.00
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*SECNO 2829.000
   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=        .0      960.0  TYPE=     1  TARGET=     959.999
  2829.00      6.77     874.07       .00        .00     874.08        .01        .01        .00     868.50
     720.      615.        84.       20.      1483.        53.        29.       275.        69.     868.80
     3.23       .42       1.59       .69       .080       .040       .060       .048     867.30     230.15
  .000176      400.       609.      560.          0          0          0        .00     729.85     960.00

*SECNO 2830.000

3370 NORMAL BRIDGE,NRD= 33 MIN ELTRD=  871.30 MAX ELLC=  871.80

3470 ENCROACHMENT STATIONS=        .0      960.0  TYPE=     1  TARGET=     959.999

        BS  E JA 98

  2830.00      6.77     874.07       .00        .00     874.08        .00        .00        .00     872.50
     720.      677.        39.        4.      1480.        38.        13.       275.        69.     872.50
     3.23       .46       1.04       .32       .090       .024       .090       .048     867.30     230.09
  .000270        1.         1.        1.          0          0          0     -13.53     729.91     960.00

*SECNO 2850.000

3370 NORMAL BRIDGE,NRD= 33 MIN ELTRD=  871.30 MAX ELLC=  871.80

3470 ENCROACHMENT STATIONS=        .0      960.0  TYPE=     1  TARGET=     959.999
  2850.00      6.78     874.08       .00        .00     874.08        .00        .01        .00     872.50
     720.      677.        39.        4.      1487.        38.        13.       275.        69.     872.50
     3.24       .46       1.03       .32       .090       .024       .090       .048     867.30     229.95
  .000267       20.        20.       20.          0          0          0     -13.53     730.04     960.00

*SECNO 2851.000

3470 ENCROACHMENT STATIONS=        .0      960.0  TYPE=     1  TARGET=     959.999
  2851.00      6.78     874.08       .00        .00     874.08        .01        .00        .00     872.30
     720.      593.       126.        1.      1480.        90.         5.       275.        69.     871.60
     3.24       .40       1.40       .25       .090       .040       .090       .048     867.30     229.94
  .000206        1.         1.        1.          0          0          0        .00     730.06     960.00

*SECNO 2930.000

        VS  F JA 99

  2930.00      6.89     874.09       .00        .00     874.10        .01        .01        .00     871.10
     720.      576.       144.        0.      1494.       109.         0.       278.        71.     873.70
     3.28       .39       1.32       .08       .090       .040       .090       .048     867.20     229.70
  .000188       70.        79.       70.          0          0          0        .00     732.63     962.32

*SECNO 3430.000
   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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3430.00      5.31    874.21      .00       .00    874.38      .17      .20      .08    872.80
   720.      379.      341.       0.      419.      73.       0.     287.      76.     875.40
  3.32       .90      4.67      .00      .090     .040     .090     .048   868.90    342.46
.003681     350.      500.     350.         2         0        0      .00   616.48    958.94


*SECNO 4440.000

        VS  G JA 100

4440.00      4.44    876.84      .00       .00    877.02      .18     2.63      .01    874.90
   720.      299.      375.      46.      255.      82.      43.     294.      83.     874.90
  3.40      1.17      4.59     1.07      .090     .040     .070     .048   872.40    113.14
.002659     680.     1010.     750.         4         0        0      .00   236.20    349.35


*SECNO 4909.000

3301 HV CHANGED MORE THAN HVINS

4909.00      5.16    878.56      .00       .00    879.40      .84     2.06      .33    881.80
   720.        0.      720.       0.        0.      98.       0.     297.      84.     881.80
  3.42       .00      7.34      .00      .060     .040     .060     .047   873.40    375.39
.008900     440.      469.     450.         2         0        0      .00    24.61    400.00


*SECNO 4910.000

3370 NORMAL BRIDGE,NRD= 12 MIN ELTRD=  881.80 MAX ELLC=  879.70


        BS  H JA 101   RUSHTON ROAD

4910.00      5.17    878.57      .00       .00    879.41      .83      .01      .00    881.80
   720.        0.      720.       0.        0.      98.       0.     297.      84.     881.80
  3.42       .00      7.33      .00      .060     .024     .060     .047   873.40    375.39
.003560       1.        1.       1.         0         0        0      .00    24.61    400.00


*SECNO 4940.000

3370 NORMAL BRIDGE,NRD= 12 MIN ELTRD=  881.80 MAX ELLC=  879.70

4940.00      5.37    878.77      .00       .00    879.53      .76      .10      .02    881.80
   720.        0.      720.       0.        0.     103.       0.     297.      84.     881.80
  3.42       .00      7.00      .00      .060     .024     .060     .047   873.40    375.37
.003116      30.       30.      30.         0         0        0      .00    24.63    400.00


*SECNO 4941.000
  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       WTM      ELMIN      SSTA
  SLOPE      XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR    TOPWID     ENDST


3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      881.80 ELREA=      881.80

4941.00      5.38    878.78      .00       .00    879.53      .76      .00      .00    881.80
   720.        0.      720.       0.        0.     103.       0.     297.      84.     881.80
  3.42       .00      6.98      .00      .060     .040     .060     .047   873.40    375.36
.007644       1.        1.       1.         0         0        0      .00    24.64    400.00
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*SECNO 5140.000

        DAM I JA 102   SPILLWAY FOR INCHWAGH LAKE

  5140.00      6.96    879.86       .00       .00    880.14       .28       .46       .14    873.70
     720.        4.      704.       11.        6.      164.       11.      297.       84.    872.90
     3.43       .74      4.30      1.04      .060      .040      .060      .047    872.90     98.20
  .001092       20.      199.      350.         2         0         0       .00     29.96    128.16


SPECIAL BRIDGE

SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
      .00      1.00      3.05       .00       .00       .00       .00       .00    872.90    872.90

*SECNO 5160.000

3265 DIVIDED FLOW

PRESSURE AND WEIR FLOW

 EGPRS      EGLWC      H3       QWEIR      QPR       BAREA   TRAPEZOID      ELLC      FLTRD
                                                             AREA
##########  880.14     .00       726.       0.        0.      -1.        .00      887.00


3470 ENCROACHMENT STATIONS=      50.0      300.0  TYPE=      1  TARGET=      -50.000
  5160.00     17.69    890.59       .00       .00    890.63       .04     10.49       .00    873.70
     720.        7.      691.       22.       42.      432.      126.      298.       84.    872.90
     3.44       .17      1.60       .18      .050      .020      .050      .047    872.90     95.06
  .000010       20.       20.       20.         2         0        10       .00     88.00    259.60


*SECNO 5249.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      892.30 ELREA=      892.30

  5249.00     11.03    890.63       .00       .00    890.64       .01       .00       .01    888.10
     720.        0.      720.        0.        0.     1172.        0.      299.       85.    885.60
     3.48       .00       .61       .00      .050      .020      .050      .046    879.60    101.00
  .000004       30.       89.      130.         0         0         0       .00    136.00    237.00
```

stage may be
couple tenths high
Dam inspection use different datum

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*SECNO 5250.000

3265 DIVIDED FLOW

3370 NORMAL BRIDGE,NRD= 36 MIN ELTRD=  892.30 MAX ELLC=  890.80

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      892.70 ELREA=      892.30

        BS  J JA 103   RAILROAD BRIDGE UPSTREAM OF SPILLWAY

  5250.00     11.03    890.63       .00       .00    890.64       .01       .00       .00    892.70
     720.        0.      720.        0.        0.     1071.        0.      299.       85.    892.30
     3.48       .00       .67       .00      .040      .030      .040      .046    879.60    101.00
  .000043        1.        1.        1.         0         0         0      -.17    127.00    237.00
```

```
*SECNO 5262.000

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= 36 MIN ELTRD= 892.30 MAX ELLC= 890.80

  5262.00     11.03     890.63       .00        .00     890.64        .01        .00        .00     892.70
     720.        0.       720.        0.         0.      1071.        0.       300.        85.     892.30
     3.48       .00        .67       .00       .040       .030       .040       .046     879.60     101.00
  .000043       12.        12.       12.          0          0          0      -.17     127.00     237.00

*SECNO 5263.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      892.30 FLREA=      892.30

  5263.00     11.03     890.63       .00        .00     890.64        .01        .00        .00     888.10
     720.        0.       720.        0.         0.      1171.        0.       300.        85.     885.60
     3.48       .00        .61       .00       .090       .040       .080       .046     879.60     101.00
  .000016        1.         1.        1.          0          0          0       .00     136.00     237.00

*SECNO 5620.000

        VS  K JA 104

  5620.00      9.94     890.64       .00        .00     890.65        .00        .01        .00     887.70
     720.        1.       719.        1.        15.      1690.        7.       312.        86.     887.40
     3.72       .06        .43       .09       .120       .055       .075       .047     880.70      58.02
  .000015      400.       357.      200.          0          0          0       .00     221.08     279.11

*SECNO 7300.000

        VS  L JA 105

  7300.00      8.66     890.66       .00        .00     890.66        .00        .02        .00     893.10
     720.        0.       720.        0.         0.      2351.        2.       390.        97.     889.50
     5.24       .00        .31       .02       .120       .045       .120       .046     882.00     150.30
  .000007     1600.      1680.     1700.          0          0          0       .00     355.05     505.35

*SECNO 9340.000

        VS  M JA 106

  9340.00      7.39     890.69       .00        .00     890.70        .01        .03        .01     886.80
     720.        6.       683.       31.        32.       724.      119.       465.       110.     886.10
     5.86       .20        .94       .26       .120       .045       .120       .046     883.30      44.60
  .000079     2200.      2040.     1650.          0          0          0       .00     176.39     221.00

*SECNO 13710.000
   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
```

USE ENERGY GRADE AT SEC. M (9340) AS STARTING WSEL

13710.00	6.77	890.67	.00	.00	890.73	.06	.00	.02	885.70
620.	340.	157.	123.	414.	43.	177.	465.	110.	885.10
5.87	.82	3.63	.69	.120	.045	.120	.046	883.90	366.51
.001217	20.	20.	20.	2	0	0	.00	366.98	733.49

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.00	2.22	2.85	.00	5.50	.00	38.48	.00	883.90	883.10

*SECNO 13750.000
PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	OPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
899.62	893.84	.00	414.	210.	38.	33.	889.90	890.80

BS N JA 107 9-MILE ROAD

13750.00	7.74	891.64	.00	.00	891.70	.06	.97	.00	885.70
620.	351.	169.	100.	286.	50.	93.	466.	110.	885.10
5.87	1.23	3.37	1.07	.040	.024	.040	.046	883.90	340.44
.000246	40.	40.	40.	2	0	7	.00	386.76	727.20

*SECNO 13751.000

13751.00	8.53	891.63	.00	.00	891.70	.07	.00	.00	884.70
620.	332.	193.	94.	311.	57.	104.	466.	110.	884.10
5.87	1.07	3.39	.90	.080	.040	.080	.046	883.10	340.37
.000579	1.	1.	1.	0	0	0	.00	386.96	727.33

*SECNO 13860.000

3470 ENCROACHMENT STATIONS= .0 800.0 TYPE= 1 TARGET= 799.999

VS O JA 108

13860.00	7.52	891.72	.00	.00	891.73	.00	.01	.02	885.20
620.	114.	432.	74.	705.	717.	359.	469.	111.	886.80
5.93	.16	.60	.21	.080	.040	.080	.046	884.20	156.15
.000021	100.	109.	100.	2	0	0	.00	562.93	719.08

*SECNO 14670.000

3470 ENCROACHMENT STATIONS= .0 1550.0 TYPE= 1 TARGET= 1549.999

VS P JA 109

14670.00	6.24	891.74	.00	.00	891.74	.00	.01	.00	887.20
620.	162.	434.	23.	1290.	1273.	179.	506.	121.	887.20
6.69	.13	.34	.13	.080	.040	.080	.046	885.50	93.03
.000009	700.	810.	400.	2	0	0	.00	727.77	820.80

*SECNO 15180.000

SECNO	DEPTH	CWSEL	CRIT S	WSEL	EG	HV	HI	QLOS	RAN ELEV

```
Q          QLOB       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=          .0     1500.0  TYPE=      1  TARGET=     1499.999

        VS  Q JA 110

 15180.00      4.94    891.74       .00        .00    891.74        .00        .00        .00    887.40
     620.      208.       34.      377.      1813.      120.      2899.       552.       134.    887.30
     7.78       .11       .29       .13       .080      .040       .080       .045     886.80    123.51
  .000007      550.      510.      520.          0         0          0        .00    1376.49   1500.00

*SECNO 16540.000

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS=          .0     1000.0  TYPE=      1  TARGET=      999.999

        VS  R JA 111

 16540.00      4.86    891.76       .00        .00    891.77        .01        .02        .00    889.60
     410.       12.       61.      336.       37.       44.       878.       626.       162.    889.60
     8.38       .32      1.41       .38       .080      .040       .080       .045     886.90     60.18
  .000277     1050.     1360.     1150.          0         0          0        .00     733.43   1000.00

*SECNO 16862.000

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS=         50.0      900.0  TYPE=      1  TARGET=      850.000
 16862.00      3.72    891.92       .00        .00    892.08        .17        .24        .08    890.80
     410.       45.      155.      210.       38.       30.       207.       631.       166.    890.70
     8.41      1.16      5.15      1.01       .090      .046       .090       .045     888.20    167.78
  .007538      288.      322.      300.          3         0          0        .00     495.21    900.00

*SECNO 17185.000

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS=         70.0      850.0  TYPE=      1  TARGET=      780.000
 17185.00      3.77    893.27       .00        .00    893.30        .04       1.18        .04    892.10
     410.      103.       87.      220.      136.       30.       287.       633.       169.    891.80
     8.48       .75      2.94       .77       .090      .046       .090       .046     889.50    184.04
  .002355      288.      323.      300.          3         0          0        .00     539.40    850.00

*SECNO 17507.000

3470 ENCROACHMENT STATIONS=          .0      650.0  TYPE=      1  TARGET=      649.999
 17507.00      3.31    894.11       .00        .00    894.15        .04        .85        .00    893.30
     410.      216.       79.      114.      251.       25.       120.       636.       173.    892.80
     8.54       .86      3.24       .96       .090      .046       .090       .046     890.80    174.50
  .003446      290.      322.      300.          3         0          0        .00     475.50    650.00

*SECNO 17830.000
   SECNO     DEPTH     C SEL     CRT S     SELK      FG        HV        HL        LOSS    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

3470 ENCROACHMENT STATIONS=      400.0      885.0  TYPE=      1  TARGET=     -400.000

        VS  S JA 112

 17830.00      3.82    895.82       .00        .00    895.83        .01       1.66        .01    894.50
     410.       277.      41.       92.       458.      27.       171.       650.       184.    893.90
     9.12       .60      1.50       .54       .090      .046      .090       .052    892.00    400.00
  .000591       290.    3230.     3000.          6         0         0        .00    381.94    781.94

*SECNO 18330.000

3470 ENCROACHMENT STATIONS=      500.0      720.0  TYPE=      1  TARGET=      220.000
 18330.00      2.75    896.35       .00        .00    896.44        .09        .57        .04    896.10
     260.       113.      72.       75.        99.      18.        56.       655.       188.    895.50
     9.19       1.14     4.06      1.34       .090      .046      .090       .052    893.60    500.00
  .007666       500.     500.      500.          2         0         0        .00    220.00    720.00

*SECNO 19410.000

3470 ENCROACHMENT STATIONS=      269.0      352.0  TYPE=      1  TARGET=       83.000

        VS  T JA 114

 19410.00      4.40    901.40       .00        .00    901.61        .20       5.11        .06    901.00
     260.       10.      243.       7.        16.       65.        13.       658.       191.    901.00
     9.27       .62      3.74       .54       .090      .046      .090       .051    897.00    269.00
  .003374      1000.    1080.     1000.          5         0         0        .00     83.00    352.00

*SECNO 19559.000

3301 HV CHANGED MORE THAN HVINS

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      905.00 ELREA=      905.00

 19559.00      3.78    901.88       .00        .00    902.95       1.07        .91        .44    899.40
     260.        0.      260.        0.         0.       31.         0.       658.       191.    899.20
     9.27       .00      8.32       .00       .090      .046      .090       .051    898.10    500.00
  .014322       150.     149.      150.          2         0         0        .00      9.00    509.00

*SECNO 19560.000

3370 NORMAL BRIDGE,NRD= 15 MIN ELTRD=  905.30 MAX ELLC=  903.40

        8S  U JA 115   8-MILE ROAD

 19560.00      3.79    901.89       .00        .00    902.97       1.07        .01        .00    905.50
     260.        0.      260.        0.         0.       31.         0.       658.       191.    905.50
     9.27       .00      8.31       .00       .040      .020      .040       .051    898.10    500.00
  .006998        1.        1.        1.          0         0         0        .00      9.00    509.00

*SECNO 19586.000
  SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS    BANK ELEV
  Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        T        LEFT/RIGHT
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   TIME      VLOB      VCH       VLOB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


3370 NORMAL BRIDGE,NRD= 15 MIN ELTRD=  905.30 MAX ELLC=  903.40

 19586.00      4.27    902.37       .00       .00    903.19       .82       .15       .07    905.50
     260.        0.      260.        0.        0.      36.        0.      658.      191.    905.50
      9.27       .00      7.28       .00      .040      .020      .040      .051    898.10    500.00
  .005107       26.       26.       26.         2         0         0       .00      9.00    509.00


*SECNO 19587.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      905.30 ELREA=      905.30

 19587.00      4.28    902.38       .00       .00    903.20       .82       .01       .00    899.40
     260.        0.      260.        0.        0.      36.        0.      658.      191.    899.20
      9.27       .00      7.29       .00      .090      .042      .080      .051    898.10    500.00
  .007682        1.        1.        1.         0         0         0       .00      9.00    509.00


CCHV=     .300 CEHV=     .500
1490 NH CARD USED
*SECNO .100
 WATER EL=XS CARD=    874.040

3265 DIVIDED FLOW

3280 CROSS SECTION        .10 EXTENDED       5.24 FEET


          VS   A JA 93     START ISLAND PROBLEM FOR ANOTHER BRANCH

       .10      9.84    874.04       .00       .00    874.04       .00       .00       .25    868.80
        5.        3.        1.        1.      1599.      480.      728.      658.      191.    868.60
      9.27       .00       .00       .00      .050      .040      .050      .051    864.20       .00
  .000000        0.        0.        0.         0         0         0       .00    673.67    900.00


1490 NH CARD USED
*SECNO 1200.000

3470 ENCROACHMENT STATIONS=          .0      725.0  TYPE=      1  TARGET=      724.999

          VS   B JA 94

  1200.00      8.64    874.04       .00       .00    874.04       .00       .00       .00    874.70
        5.        0.        5.        0.        0.      316.      100.      707.      204.    872.20
     34.06       .00       .01       .00      .050      .040      .050      .050    865.40    374.29
  .000000     1400.     1200.     1200.         2         0         0       .00    200.57    574.86


*SECNO 1900.000

          VS   C JA 95

  1900.00      6.64    874.04       .00       .00    874.04       .00       .00       .00    879.20
        5.        0.        5.        0.        0.       15.        0.      710.      206.    879.20
     34.65       .00       .33       .00      .050      .040      .050      .050    867.40    243.80
  .000074      700.      700.      800.         0         0         0       .00      2.40    246.20
```

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.00	2.40	3.00	.00	2.40	.00	4.91	.00	867.80	867.40

*SECNO 1920.000

PRESS FLOW BECAUSE EGLWC OF 874.44 EXCEEDS 1.5 DEPTH

SECNO	DEPTH	CWSEL	CRIWS	WSELK	FG	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

PRESSURE FLOW

EGPRS	EGLWC	H3	QWETR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
874.08	874.44	.00	0.	5.	5.	5.	869.90	879.20
1920.00	6.68	874.08	.00	.00	874.08	.00	.04	.00	879.20
5.	0.	5.	0.	0.	15.	0.	710.	206.	879.20
34.67	.00	.33	.00	.050	.025	.050	.050	867.40	243.80
.000029	20.	20.	20.	0	0	0	.00	2.40	246.20

1490 NH CARD USED
*SECNO 2850.100

3470 ENCROACHMENT STATIONS= .0 800.0 TYPE= 1 TARGET= 799.999

VS D JA 96 END OF ISLAND PROBLEM

2850.10	7.98	874.08	.00	.00	874.08	.00	.00	.00	868.30
5.	1.	3.	1.	888.	1678.	687.	743.	213.	868.60
185.47	.00	.00	.00	.090	.047	.090	.049	866.10	4.67
.000000	900.	930.	700.	2	0	0	.00	766.46	771.13

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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

WALKER DRAIN, NATURAL EN

SUMMARY PRINTOUT

SECNO	XLCH	FLTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	TOPWID	AREA
.000	.00	.00	.00	866.10	1055.00	874.04	7.94	.00	.00	874.04	1197.75	5492.60
520.000	520.00	.00	.00	863.90	1055.00	874.04	10.14	.00	.00	874.05	1446.21	5937.94
1470.000	950.00	.00	.00	866.10	1055.00	874.05	7.95	.00	.00	874.05	1531.06	6364.51
2220.000	750.00	.00	.00	866.60	720.00	874.06	7.46	.00	.00	874.06	1150.00	4224.87
2829.000	609.00	.00	.00	867.30	720.00	874.07	6.77	.01	.00	874.08	729.85	1564.92
2830.000	1.00	871.30	871.80	867.30	720.00	874.07	6.77	.00	.00	874.08	729.91	1531.17
2850.000	20.00	871.30	871.80	867.30	720.00	874.08	6.78	.00	.00	874.08	730.04	1537.49
2851.000	1.00	.00	.00	867.30	720.00	874.08	6.78	.01	.00	874.08	730.06	1574.87
2930.000	79.00	.00	.00	867.20	720.00	874.09	6.89	.01	.00	874.10	732.63	1603.09
3430.000	500.00	.00	.00	868.90	720.00	874.21	5.31	.17	.08	874.38	616.48	492.27
4440.000	1010.00	.00	.00	872.40	720.00	876.84	4.44	.18	.01	877.02	236.20	379.81
4909.000	469.00	.00	.00	873.40	720.00	878.56	5.16	.84	.33	879.40	24.61	98.07
4910.000	1.00	881.80	879.70	873.40	720.00	878.57	5.17	.83	.00	879.41	24.61	98.20
4940.000	30.00	881.80	879.70	873.40	720.00	878.77	5.37	.76	.02	879.53	24.63	102.87
4941.000	1.00	.00	.00	873.40	720.00	878.78	5.38	.76	.00	879.53	24.64	103.17
5140.000	199.00	.00	.00	872.90	720.00	879.86	6.96	.28	.14	880.14	29.96	180.41
5160.000	20.00	887.00	.00	872.90	720.00	890.59	17.69	.04	.00	890.63	88.00	600.42
5249.000	89.00	.00	.00	879.60	720.00	890.63	11.03	.01	.01	890.64	136.00	1171.52
5250.000	1.00	892.30	890.80	879.60	720.00	890.63	11.03	.01	.00	890.64	127.00	1070.80
5262.000	12.00	892.30	890.80	879.60	720.00	890.63	11.03	.01	.00	890.64	127.00	1070.77

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	TOPWID	AREA
5263.000	1.00	.00	.00	879.60	720.00	890.63	11.03	.01	.00	890.64	136.00	1171.06
5620.000	357.00	.00	.00	880.70	720.00	890.64	9.94	.00	.00	890.65	221.08	1711.73
7300.000	1680.00	.00	.00	882.00	720.00	890.66	8.66	.00	.00	890.66	355.05	2352.75
9340.000	2040.00	.00	.00	883.30	720.00	890.69	7.39	.01	.01	890.70	176.39	875.03
13710.000	20.00	.00	.00	883.90	620.00	890.67	6.77	.06	.02	890.73	366.98	634.32
13750.000	40.00	890.80	889.90	883.90	620.00	891.64	7.74	.06	.00	891.70	386.76	429.36
13751.000	1.00	.00	.00	883.10	620.00	891.63	8.53	.07	.00	891.70	386.96	472.20
13860.000	109.00	.00	.00	884.20	620.00	891.72	7.52	.00	.02	891.73	562.93	1781.22
14670.000	810.00	.00	.00	885.50	620.00	891.74	6.24	.00	.00	891.74	727.77	2743.19
15180.000	510.00	.00	.00	886.80	620.00	891.74	4.94	.00	.00	891.74	1376.49	4830.89
16540.000	1360.00	.00	.00	886.90	410.00	891.76	4.86	.01	.00	891.77	733.43	959.08
16862.000	322.00	.00	.00	888.20	410.00	891.92	3.72	.17	.08	892.08	495.21	275.67
17185.000	323.00	.00	.00	889.50	410.00	893.27	3.77	.04	.04	893.30	539.40	453.21
17507.000	322.00	.00	.00	890.80	410.00	894.11	3.31	.04	.00	894.15	475.50	395.10
17830.000	3230.00	.00	.00	892.00	410.00	895.82	3.82	.01	.01	895.83	381.94	656.58
18330.000	500.00	.00	.00	893.60	260.00	896.35	2.75	.09	.04	896.44	220.00	172.42
19410.000	1080.00	.00	.00	897.00	260.00	901.40	4.40	.20	.06	901.61	83.00	94.49
19559.000	149.00	.00	.00	898.10	260.00	901.88	3.78	1.07	.44	902.95	9.00	31.26
19560.000	1.00	905.30	903.40	898.10	260.00	901.89	3.79	1.07	.00	902.97	9.00	31.31
19586.000	26.00	905.30	903.40	898.10	260.00	902.37	4.27	.82	.07	903.19	9.00	35.70
19587.000	1.00	.00	.00	898.10	260.00	902.38	4.28	.82	.00	903.20	9.00	35.68
* .100	1.00	.00	.00	864.20	5.00	874.04	9.84	.00	.25	874.04	673.67	2807.29
1200.000	1200.00	.00	.00	865.40	5.00	874.04	8.64	.00	.00	874.04	200.57	416.43
1900.000	700.00	.00	.00	867.40	5.00	874.04	6.64	.00	.00	874.04	2.40	15.26
1920.000	20.00	879.20	869.90	867.40	5.00	874.08	6.68	.00	.00	874.08	2.40	15.35
2850.100	930.00	.00	.00	866.10	5.00	874.08	7.98	.00	.00	874.08	766.46	3252.70

SUMMARY OF ERRORS

NOTE SECNO= .100 PROFILE= 1 WSEL BASED ON XS CARD

00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: GREEN OAK TWP

3) WATERCOURSE: WALKER DRAIN

4) DOCUMENT TYPE: SUMMARY TABLES

00BREAK00

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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

WALKER DRAIN, ENCROACHE

SUMMARY PRINTOUT

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	TOPWID	AREA
.000	.00	.00	.00	866.10	445.00	872.04	5.94	.00	.00	872.04	1133.32	3137.10
.000	.00	.00	.00	866.10	790.00	873.50	7.40	.00	.00	873.50	1194.39	4846.72
.000	.00	.00	.00	866.10	1055.00	874.11	8.01	.00	.00	874.11	1198.19	5576.46
.000	.00	.00	.00	866.10	1665.00	875.44	9.34	.00	.00	875.44	1206.47	7175.56
520.000	520.00	.00	.00	863.90	445.00	872.04	8.14	.00	.00	872.04	1374.69	3094.73
520.000	520.00	.00	.00	863.90	790.00	873.50	9.60	.00	.00	873.50	1434.99	5158.44
520.000	520.00	.00	.00	863.90	1055.00	874.11	10.21	.00	.00	874.12	1447.66	6038.83
520.000	520.00	.00	.00	863.90	1665.00	875.45	11.55	.00	.00	875.45	1475.26	7983.72
1470.000	950.00	.00	.00	866.10	445.00	872.05	5.95	.00	.00	872.05	1487.50	3344.16
1470.000	950.00	.00	.00	866.10	790.00	873.51	7.41	.00	.00	873.51	1519.78	5537.54
1470.000	950.00	.00	.00	866.10	1055.00	874.12	8.02	.00	.00	874.12	1531.62	6470.91
1470.000	950.00	.00	.00	866.10	1665.00	875.45	9.35	.00	.00	875.45	1599.17	8558.13
2220.000	750.00	.00	.00	866.60	270.00	872.06	5.46	.00	.00	872.06	660.02	1241.23
2220.000	750.00	.00	.00	866.60	510.00	873.52	6.92	.00	.00	873.52	750.00	2290.18
2220.000	750.00	.00	.00	866.60	720.00	874.13	7.53	.00	.00	874.13	750.00	2749.40
2220.000	750.00	.00	.00	866.60	1190.00	875.46	8.86	.00	.00	875.46	750.00	3748.26
2829.000	609.00	.00	.00	867.30	270.00	871.57	4.27	1.11	.55	872.68	8.50	31.93
2829.000	609.00	.00	.00	867.30	510.00	873.54	6.24	.01	.01	873.55	510.00	967.77
2829.000	609.00	.00	.00	867.30	720.00	874.15	6.85	.01	.00	874.16	510.00	1281.03
2829.000	609.00	.00	.00	867.30	1190.00	875.48	8.18	.01	.00	875.49	510.00	1960.09
2830.000	1.00	871.30	871.80	867.30	270.00	873.01	5.71	.00	.33	873.02	510.00	668.96
2830.000	1.00	871.30	871.80	867.30	510.00	873.54	6.24	.01	.00	873.55	510.00	933.98
2830.000	1.00	871.30	871.80	867.30	720.00	874.16	6.86	.01	.00	874.16	510.00	1247.54
2830.000	1.00	871.30	871.80	867.30	1190.00	875.49	8.19	.01	.00	875.49	510.00	1926.25
2850.000	20.00	871.30	871.80	867.30	270.00	873.02	5.72	.00	.00	873.02	510.00	670.55
2850.000	20.00	871.30	871.80	867.30	510.00	873.55	6.25	.01	.00	873.56	510.00	941.61
2850.000	20.00	871.30	871.80	867.30	720.00	874.16	6.86	.01	.00	874.17	510.00	1253.40
2850.000	20.00	871.30	871.80	867.30	1190.00	875.49	8.19	.01	.00	875.50	510.00	1930.00
2851.000	1.00	.00	.00	867.30	270.00	873.02	5.72	.01	.00	873.03	510.00	707.20
2851.000	1.00	.00	.00	867.30	510.00	873.55	6.25	.01	.00	873.56	510.00	979.28
2851.000	1.00	.00	.00	867.30	720.00	874.16	6.86	.01	.00	874.17	510.00	1290.73
2851.000	1.00	.00	.00	867.30	1190.00	875.49	8.19	.01	.00	875.50	510.00	1966.99

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	TOPWID	AREA
2930.000	79.00	.00	.00	867.20	270.00	873.03	5.83	.01	.00	873.04	509.41	733.08
2930.000	79.00	.00	.00	867.20	510.00	873.57	6.37	.01	.00	873.58	509.89	1007.74
2930.000	79.00	.00	.00	867.20	720.00	874.18	6.98	.01	.00	874.19	512.85	1317.77
2930.000	79.00	.00	.00	867.20	1190.00	875.50	8.30	.01	.00	875.51	520.61	1999.87
3430.000	500.00	.00	.00	868.90	270.00	873.03	4.13	.49	.24	873.52	60.63	49.93
3430.000	500.00	.00	.00	868.90	510.00	873.68	4.78	.41	.20	874.09	360.90	216.81
3430.000	500.00	.00	.00	868.90	720.00	874.35	5.45	.12	.06	874.47	509.06	533.03
3430.000	500.00	.00	.00	868.90	1190.00	875.61	6.71	.04	.01	875.65	511.26	1179.64
4440.000	1010.00	.00	.00	872.40	270.00	876.08	3.68	.08	.12	876.16	188.85	217.25
4440.000	1010.00	.00	.00	872.40	510.00	876.72	4.32	.11	.09	876.82	228.85	352.18
4440.000	1010.00	.00	.00	872.40	720.00	876.75	4.35	.20	.04	876.95	230.68	358.99
4440.000	1010.00	.00	.00	872.40	1190.00	876.92	4.52	.44	.20	877.37	241.37	399.75
4909.000	469.00	.00	.00	873.40	270.00	877.03	3.63	.31	.11	877.34	24.43	60.44
4909.000	469.00	.00	.00	873.40	510.00	877.86	4.46	.62	.26	878.48	24.53	80.89
4909.000	469.00	.00	.00	873.40	720.00	878.64	5.24	.81	.30	879.44	24.62	99.85
4909.000	469.00	.00	.00	873.40	1190.00	880.09	6.69	1.19	.38	881.29	24.79	135.88
4910.000	1.00	881.80	879.70	873.40	270.00	877.03	3.63	.31	.00	877.34	24.43	60.52
4910.000	1.00	881.80	879.70	873.40	510.00	877.87	4.47	.62	.00	878.49	24.53	81.00
4910.000	1.00	881.80	879.70	873.40	720.00	878.64	5.24	.80	.00	879.45	24.62	100.00
4910.000	1.00	881.80	879.70	873.40	1190.00	880.01	6.61	1.38	.10	881.39	24.78	126.12
4940.000	30.00	881.80	879.70	873.40	270.00	877.12	3.72	.29	.01	877.41	24.44	62.64
4940.000	30.00	881.80	879.70	873.40	510.00	878.03	4.63	.56	.02	878.59	24.55	85.14
4940.000	30.00	881.80	879.70	873.40	720.00	878.83	5.43	.74	.02	879.56	24.64	104.43
4940.000	30.00	881.80	879.70	873.40	1190.00	880.29	6.89	1.38	.00	881.67	24.82	126.12
4941.000	1.00	.00	.00	873.40	270.00	877.12	3.72	.29	.00	877.41	24.44	62.69
4941.000	1.00	.00	.00	873.40	510.00	878.04	4.64	.56	.00	878.60	24.55	85.12
4941.000	1.00	.00	.00	873.40	720.00	878.83	5.43	.74	.00	879.57	24.64	104.62
4941.000	1.00	.00	.00	873.40	1190.00	880.92	7.52	.90	.14	881.82	24.89	156.35
5140.000	199.00	.00	.00	872.90	270.00	877.64	4.74	.09	.06	877.74	28.31	116.00
5140.000	199.00	.00	.00	872.90	510.00	878.91	6.01	.19	.11	879.10	29.25	152.30
5140.000	199.00	.00	.00	872.90	720.00	879.88	6.98	.28	.14	880.16	29.98	181.10
5140.000	199.00	.00	.00	872.90	1190.00	881.98	9.08	.43	.14	882.41	31.55	245.81
5160.000	20.00	887.00	.00	872.90	270.00	889.34	16.44	.01	.00	889.35	68.00	502.71
5160.000	20.00	887.00	.00	872.90	510.00	890.11	17.21	.02	.00	890.13	80.60	559.99
5160.000	20.00	887.00	.00	872.90	720.00	890.59	17.69	.04	.00	890.63	88.00	600.42
5160.000	20.00	887.00	.00	872.90	1190.00	891.34	18.44	.09	.00	891.43	114.49	673.38
5249.000	89.00	.00	.00	879.60	270.00	889.35	9.75	.00	.00	889.35	136.00	997.57
5249.000	89.00	.00	.00	879.60	510.00	890.13	10.53	.00	.01	890.13	136.00	1104.05
5249.000	89.00	.00	.00	879.60	720.00	890.63	11.03	.01	.01	890.64	136.00	1171.45
5249.000	89.00	.00	.00	879.60	1190.00	891.44	11.84	.01	.02	891.46	136.00	1281.41
5250.000	1.00	892.30	890.80	879.60	270.00	889.35	9.75	.00	.00	889.35	125.00	910.34
5250.000	1.00	892.30	890.80	879.60	510.00	890.13	10.53	.00	.00	890.14	125.00	1008.36
5250.000	1.00	892.30	890.80	879.60	720.00	890.63	11.03	.01	.00	890.64	127.00	1070.80
5250.000	1.00	892.30	890.80	879.60	1190.00	891.44	11.84	.02	.00	891.46	136.00	1080.04

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	TOPWID	AREA
5262.000	12.00	892.30	890.80	879.60	270.00	889.35	9.75	.00	.00	889.35	125.00	910.33
5262.000	12.00	892.30	890.80	879.60	510.00	890.13	10.53	.00	.00	890.14	125.00	1008.34
5262.000	12.00	892.30	890.80	879.60	720.00	890.63	11.03	.01	.00	890.64	127.00	1070.77
5262.000	12.00	892.30	890.80	879.60	1190.00	891.44	11.84	.02	.00	891.46	136.00	1080.04
5263.000	1.00	.00	.00	879.60	270.00	889.35	9.75	.00	.00	889.35	136.00	996.31
5263.000	1.00	.00	.00	879.60	510.00	890.13	10.53	.00	.00	890.14	136.00	1102.95
5263.000	1.00	.00	.00	879.60	720.00	890.63	11.03	.01	.00	890.64	136.00	1171.06
5263.000	1.00	.00	.00	879.60	1190.00	891.45	11.85	.01	.00	891.46	136.00	1281.33
5620.000	357.00	.00	.00	880.70	270.00	889.35	8.65	.00	.00	889.35	215.06	1429.65
5620.000	357.00	.00	.00	880.70	510.00	890.14	9.44	.00	.00	890.14	218.73	1600.56
5620.000	357.00	.00	.00	880.70	720.00	890.64	9.94	.00	.00	890.65	221.08	1711.73
5620.000	357.00	.00	.00	880.70	1190.00	891.47	10.77	.01	.00	891.48	224.96	1897.41
7300.000	1680.00	.00	.00	882.00	270.00	889.36	7.36	.00	.00	889.36	271.85	1572.44
7300.000	1680.00	.00	.00	882.00	510.00	890.15	8.15	.00	.00	890.15	273.88	1790.03
7300.000	1680.00	.00	.00	882.00	720.00	890.66	8.66	.00	.00	890.67	275.35	1931.48
7300.000	1680.00	.00	.00	882.00	1190.00	891.51	9.51	.00	.00	891.52	277.79	2165.85
9340.000	2040.00	.00	.00	883.30	270.00	889.37	6.07	.00	.00	889.37	168.53	647.11
9340.000	2040.00	.00	.00	883.30	510.00	890.18	6.88	.01	.00	890.18	173.32	784.71
9340.000	2040.00	.00	.00	883.30	720.00	890.70	7.40	.01	.01	890.72	176.47	877.18
9340.000	2040.00	.00	.00	883.30	1190.00	891.58	8.28	.03	.01	891.61	181.73	1035.45
13710.000	20.00	.00	.00	883.90	290.00	888.58	4.68	1.57	.79	890.16	7.00	28.80
13710.000	20.00	.00	.00	883.90	485.00	890.15	6.25	.07	.03	890.22	314.69	456.11
13710.000	20.00	.00	.00	883.90	620.00	890.68	6.78	.06	.02	890.74	369.35	643.03
13710.000	20.00	.00	.00	883.90	960.00	891.57	7.67	.05	.01	891.62	458.07	1010.08
13750.000	40.00	890.80	889.90	883.90	290.00	889.48	5.58	1.06	.00	890.54	7.00	35.11
13750.000	40.00	890.80	889.90	883.90	485.00	891.48	7.58	.05	.00	891.53	333.15	371.77
13750.000	40.00	890.80	889.90	883.90	620.00	891.64	7.74	.06	.00	891.70	387.16	429.86
13750.000	40.00	890.80	889.90	883.90	960.00	891.91	8.01	.10	.00	892.02	473.54	549.35
13751.000	1.00	.00	.00	883.10	290.00	890.06	6.96	.62	.13	890.68	7.00	45.94
13751.000	1.00	.00	.00	883.10	485.00	891.48	8.38	.05	.00	891.53	333.54	414.62
13751.000	1.00	.00	.00	883.10	620.00	891.64	8.54	.07	.00	891.70	387.35	472.69
13751.000	1.00	.00	.00	883.10	960.00	891.91	8.81	.12	.01	892.03	473.64	592.09
13860.000	109.00	.00	.00	884.20	290.00	890.86	6.66	.00	.19	890.86	490.46	1310.35
13860.000	109.00	.00	.00	884.20	485.00	891.54	7.34	.00	.01	891.54	539.79	1667.13
13860.000	109.00	.00	.00	884.20	620.00	891.72	7.52	.00	.02	891.73	543.87	1766.54
13860.000	109.00	.00	.00	884.20	960.00	892.06	7.86	.01	.03	892.07	551.39	1951.99
14670.000	810.00	.00	.00	885.50	290.00	890.87	5.37	.00	.00	890.87	530.00	1674.36
14670.000	810.00	.00	.00	885.50	485.00	891.55	6.05	.00	.00	891.55	530.00	2036.10
14670.000	810.00	.00	.00	885.50	620.00	891.74	6.24	.00	.00	891.74	530.00	2135.96
14670.000	810.00	.00	.00	885.50	960.00	892.09	6.59	.00	.00	892.10	530.00	2323.18
15180.000	510.00	.00	.00	886.80	290.00	890.87	4.07	.00	.00	890.88	650.00	2172.47
15180.000	510.00	.00	.00	886.80	485.00	891.56	4.76	.00	.00	891.56	650.00	2617.77
15180.000	510.00	.00	.00	886.80	620.00	891.75	4.95	.00	.00	891.75	650.00	2742.16
15180.000	510.00	.00	.00	886.80	960.00	892.11	5.31	.00	.00	892.12	650.00	2977.49

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	TOPWID	AREA
16540.000	1360.00	.00	.00	886.90	190.00	890.88	3.98	.05	.03	890.93	545.32	252.08
16540.000	1360.00	.00	.00	886.90	315.00	891.59	4.69	.01	.01	891.60	610.34	660.71
16540.000	1360.00	.00	.00	886.90	410.00	891.79	4.89	.01	.01	891.80	623.67	791.31
16540.000	1360.00	.00	.00	886.90	635.00	892.19	5.29	.01	.01	892.20	643.08	1042.52
16862.000	322.00	.00	.00	888.20	190.00	891.59	3.39	.18	.07	891.77	348.53	118.34
16862.000	322.00	.00	.00	888.20	315.00	891.83	3.63	.16	.08	891.99	451.31	219.09
16862.000	322.00	.00	.00	888.20	410.00	892.05	3.85	.11	.05	892.16	473.87	319.89
16862.000	322.00	.00	.00	888.20	635.00	892.45	4.25	.07	.03	892.52	511.30	522.16
17185.000	323.00	.00	.00	889.50	190.00	892.86	3.36	.04	.04	892.89	442.47	247.33
17185.000	323.00	.00	.00	889.50	315.00	893.12	3.62	.04	.04	893.16	491.77	368.24
17185.000	323.00	.00	.00	889.50	410.00	893.23	3.73	.04	.02	893.27	513.74	426.15
17185.000	323.00	.00	.00	889.50	635.00	893.47	3.97	.05	.01	893.52	560.23	558.18
17507.000	322.00	.00	.00	890.80	190.00	893.72	2.92	.05	.01	893.77	408.88	202.42
17507.000	322.00	.00	.00	890.80	315.00	893.98	3.18	.05	.00	894.03	443.59	313.98
17507.000	322.00	.00	.00	890.80	410.00	894.14	3.34	.04	.00	894.18	457.94	387.47
17507.000	322.00	.00	.00	890.80	635.00	894.46	3.66	.04	.00	894.50	478.50	533.05
17830.000	3230.00	.00	.00	892.00	190.00	895.25	3.25	.00	.01	895.26	359.47	445.53
17830.000	3230.00	.00	.00	892.00	315.00	895.60	3.60	.01	.01	895.61	373.17	572.72
17830.000	3230.00	.00	.00	892.00	410.00	895.81	3.81	.01	.01	895.82	381.73	654.54
17830.000	3230.00	.00	.00	892.00	635.00	896.24	4.24	.01	.01	896.25	391.84	819.10
* 18330.000	500.00	.00	.00	893.60	120.00	895.86	2.26	.21	.10	896.06	181.19	67.10
18330.000	500.00	.00	.00	893.60	205.00	896.09	2.49	.16	.08	896.25	219.18	114.95
18330.000	500.00	.00	.00	893.60	260.00	896.35	2.75	.09	.04	896.43	220.00	172.01
18330.000	500.00	.00	.00	893.60	405.00	896.82	3.22	.06	.02	896.89	220.00	275.34
19410.000	1080.00	.00	.00	897.00	120.00	900.60	3.60	.10	.03	900.70	19.69	48.39
19410.000	1080.00	.00	.00	897.00	205.00	901.29	4.29	.15	.00	901.43	83.00	84.85
19410.000	1080.00	.00	.00	897.00	260.00	901.41	4.41	.20	.06	901.61	83.00	94.68
19410.000	1080.00	.00	.00	897.00	405.00	901.75	4.75	.33	.13	902.08	83.00	122.83
19559.000	149.00	.00	.00	898.10	120.00	900.98	2.88	.42	.16	901.40	9.00	23.16
19559.000	149.00	.00	.00	898.10	205.00	901.66	3.56	.76	.31	902.42	9.00	29.27
19559.000	149.00	.00	.00	898.10	260.00	901.88	3.78	1.07	.44	902.95	9.00	31.26
* 19559.000	149.00	.00	.00	898.10	405.00	902.37	4.27	2.01	.84	904.38	9.00	35.64
19560.000	1.00	905.30	903.40	898.10	120.00	900.99	2.89	.42	.00	901.40	9.00	23.17
19560.000	1.00	905.30	903.40	898.10	205.00	901.67	3.57	.76	.00	902.43	9.00	29.33
19560.000	1.00	905.30	903.40	898.10	260.00	901.89	3.79	1.07	.00	902.96	9.00	31.30
19560.000	1.00	905.30	903.40	898.10	405.00	903.22	5.12	1.36	.19	904.58	9.00	43.31
19586.000	26.00	905.30	903.40	898.10	120.00	901.11	3.01	.38	.01	901.49	9.00	24.30
19586.000	26.00	905.30	903.40	898.10	205.00	901.94	3.84	.65	.03	902.59	9.00	31.76
19586.000	26.00	905.30	903.40	898.10	260.00	902.37	4.27	.82	.07	903.19	9.00	35.69
19586.000	26.00	905.30	903.40	898.10	405.00	903.58	5.48	1.26	.03	904.85	9.00	44.90
19587.000	1.00	.00	.00	898.10	120.00	901.12	3.02	.38	.00	901.49	9.00	24.33
19587.000	1.00	.00	.00	898.10	205.00	901.95	3.85	.65	.00	902.59	9.00	31.80
19587.000	1.00	.00	.00	898.10	260.00	902.38	4.28	.82	.00	903.20	9.00	35.68
19587.000	1.00	.00	.00	898.10	405.00	903.87	5.77	1.05	.06	904.92	9.00	49.19

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	TOPWID	AREA
*	.100	1.00	.00	.00	864.20	5.00	872.04	7.84	.00	.11	872.04	623.00	1492.51
*	.100	1.00	.00	.00	864.20	5.00	873.50	9.30	.00	.19	873.50	665.43	2446.44
*	.100	1.00	.00	.00	864.20	5.00	874.11	9.91	.00	.25	874.11	675.28	2854.50
*	.100	1.00	.00	.00	864.20	5.00	875.44	11.24	.00	.32	875.44	705.84	3772.94
	1200.000	1200.00	.00	.00	865.40	5.00	872.04	6.64	.00	.00	872.04	46.61	218.64
	1200.000	1200.00	.00	.00	865.40	5.00	873.50	8.10	.00	.00	873.50	123.00	318.72
	1200.000	1200.00	.00	.00	865.40	5.00	874.11	8.71	.00	.00	874.11	202.74	430.55
	1200.000	1200.00	.00	.00	865.40	5.00	875.44	10.04	.00	.00	875.44	249.22	729.53
	1900.000	700.00	.00	.00	867.40	5.00	872.04	4.64	.00	.00	872.04	2.40	10.46
	1900.000	700.00	.00	.00	867.40	5.00	873.50	6.10	.00	.00	873.50	2.40	13.96
	1900.000	700.00	.00	.00	867.40	5.00	874.11	6.71	.00	.00	874.11	2.40	15.42
	1900.000	700.00	.00	.00	867.40	5.00	875.44	8.04	.00	.00	875.44	2.40	18.62
	1920.000	20.00	879.20	869.90	867.40	5.00	872.07	4.67	.00	.00	872.08	2.40	10.54
	1920.000	20.00	879.20	869.90	867.40	5.00	873.54	6.14	.00	.00	873.54	2.40	14.05
	1920.000	20.00	879.20	869.90	867.40	5.00	874.15	6.75	.00	.00	874.15	2.40	15.51
	1920.000	20.00	879.20	869.90	867.40	5.00	875.48	8.08	.00	.00	875.48	2.40	18.71
	2850.100	930.00	.00	.00	866.60	5.00	872.08	5.48	.00	.00	872.08	396.80	847.09
	2850.100	930.00	.00	.00	866.60	5.00	873.54	6.94	.00	.00	873.54	479.53	1504.39
	2850.100	930.00	.00	.00	866.60	5.00	874.15	7.55	.00	.00	874.15	503.93	1804.37
	2850.100	930.00	.00	.00	866.60	5.00	875.48	8.88	.00	.00	875.48	530.00	2502.20

SUMMARY OF ERRORS

```
CAUTION  SECNO=18330.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=18330.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=18330.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO=19559.000  PROFILE= 4  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=19559.000  PROFILE= 4  MINIMUM SPECIFIC ENERGY

NOTE     SECNO=      .100  PROFILE= 1  WSEL BASED ON XS CARD
NOTE     SECNO=      .100  PROFILE= 2  WSEL BASED ON XS CARD
NOTE     SECNO=      .100  PROFILE= 3  WSEL BASED ON XS CARD
NOTE     SECNO=      .100  PROFILE= 4  WSEL BASED ON XS CARD
```

00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: Hamburg

3) WATERCOURSE: Huron River

4) DOCUMENT TYPE: Encroached Run
Whitewood Lake to Gallagher Lk.

00BREAK00

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*****************************************************
*  WATER SURFACE PROFILES                           *
*  VERSION OF NOVEMBER 1976                         *
*  UPDATED JULY 1979                                *
*                                                   *
*  RUN DATE TUE, JUL 21, 1981, 4:48 PM              *
*****************************************************
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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    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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"Whitewood Lake To Gallagher Lake"

(Encroached Run)

Note: see microfiche

Data Revised

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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
*****************************************************

C
T1      HAMBURG TOWNSHIP FIS - JOB NO. 6504-03  FILE:  GALMUL
T2      10-YEAR FLOW - WHITEWOOD LAKES TO GALLAGHER LAKE
T3      HURON RIVER - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ
     -1.       2.       0.       0.    .000000     .00      .0       0.    854.560   .000

J2  NPROF    IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIN    ITRACE
     1.000    .000   -1.000    .000     .000     .800     .000     .000     .000     .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT
    38.000   40.000   41.000   42.000   43.000   1.000    8.000   10.000   12.000    3.000

    33.000    4.000   25.000    .000     .000     .000     .000     .000     000      .000

NC    .125     .125     .040     .300     .500     .000     .000     .000     .000     .000
QT   4.000 1500.000 2050.000 2410.000 3115.000     .000     .000     .000     .000     .000

X1  73.747   31.000 2170.000 2317.000     .000     .000     .000     .000     .000     .000
X3    .000     .000     .000 1700.000     .000 2800.000     .000     .000     .000     .000
GR  870.000    .000  860.000  120.000  858.000  210.000  858.000  320.000  860.000  380.000
GR  864.000  490.000  864.400  720.000  866.000  810.000  870.000  890.000  876.000 1040.000
GR  876.000 1190.000  866.000 1370.000  864.000 1470.000  856.000 1570.000  854.000 1630.000
GR  852.100 2170.000  851.200 2173.000  850.200 2187.000  848.300 2206.000  845.200 2223.000
GR  844.600 2240.000  845.200 2255.000  846.300 2275.000  855.200 2300.000  857.100 2315.000
GR  851.900 2317.000  854.000 3010.000  854.000 3160.000  854.000 3630.000  856.000 3670.000
GR  870.000 3730.000    .000    .000     .000     .000     .000     .000     .000     .000

        VALLEY SECTION 11   (D)

X1  73.834    .000     .000     .000  500.000  460.000  460.000     .000     .000     .000
X3    .000    .000     .000 1700.000     .000 2800.000     .000     .000     .000     .000
NC    .125    .125     .040     .000     .000     .000     .000     .000     .000     .000

        VALLEY SECTION 12   (E)

X1  73.999   33.000 1600.000 1910.000  750.000  780.000  870.000     .000     .000     .000
X3    .000    .000     .000 1100.000     .000 2200.000     .000     .000     .000     .000
GR  859.500    .000  858.000   90.000  856.000  160.000  854.000  190.000  854.000  260.000
GR  863.500  370.000  856.000  450.000  855.400  500.000  856.000  530.000  858.000  580.000
GR  858.000  610.000  854.000  640.000  852.800  880.000  852.800 1500.000  852.500 1600.000
GR  851.200 1602.000  849.100 1625.000  840.500 1650.000  834.700 1675.000  826.700 1750.000
```

GR	832.500	1800.000	846.700	1850.000	848.500	1875.000	850.200	1905.000	852.000	1910.000
GR	854.000	2220.000	856.000	2320.000	856.000	2380.000	854.000	2510.000	854.000	2590.000
GR	856.000	2620.000	858.000	2640.000	860.000	2670.000	.000	.000	.000	.000
EJ	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

FORM 1411 ½ Gs
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*PROF 1

CCHV=    .300 CEHV=    .500
*SECNO 73.747

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     CORAR     TOPWID    ENDST

3470 ENCROACHMENT STATIONS=    1700.0    2800.0  TYPE=     1  TARGET=    1100.000
    73.75      9.96    854.56       .00    854.56    854.58       .02       .00       .00    852.10
    1500.      131.     1191.      177.      768.      879.      931.        0.        0.    851.90
      .00       .17      1.36       .19      .100      .032      .100      .000    844.60   1700.00
  .000069        0.        0.        0.         0         0         0       .00   1082.22   2800.00

*SECNO 73.834

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS=    1700.0    2800.0  TYPE=     1  TARGET=    1100.000

          VALLEY SECTION 11   (D)

    73.83      9.99    854.59       .00       .00    854.61       .02       .03       .00    852.10
    1500.      134.     1186.      180.      783.      883.      947.       28.       12.    851.90
      .12       .17      1.34       .19      .100      .032      .100      .032    844.60   1700.00
  .000067      500.      460.      460.         0         0         0       .00   1082.33   2800.00

*SECNO 73.999

3470 ENCROACHMENT STATIONS=    1100.0    2200.0  TYPE=     1  TARGET=    1100.000

          VALLEY SECTION 12   (E)

    74.00     27.92    854.62       .00       .00    854.62       .00       .00       .01    852.50
    1500.       21.     1468.       11.      926.     4927.      489.      114.       32.    852.00
      .93       .02       .30       .02      .100      .032      .100      .032    826.70   1100.00
  .000001      750.      870.      780.         2         0         0       .00   1100.00   2200.00
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FORM 1431 5 GB
PRINTED IN U.S.A.

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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
*****************************************************

T1       HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2       50-YEAR FLOW - WHITEWOOD LAKES TO GALLAGHER LAKE
T3       HURON RIVER - PROJECT MANAGER, N.S.CHENG

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

     -10.      3.       0.       0.    .000000     .00      .0       0.    855.160   .000

J2  NPROF    IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

     2.000    .000    -1.000    .000     .000     .800     .000     .000     .000     .000

*PROF 2

CCHV=     .300 CEHV=     .500
*SECNO 73.747

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=    1700.0    2800.0  TYPE=     1  TARGET=    1100.000
    73.75    10.56   855.16      .00   855.16   855.19      .03      .00      .00   852.10
    2050.     244.    1499.     308.    1050.     957.    1221.       0.       0.   851.90
      .00      .23     1.57      .25     .100     .032     .100     .000   844.60  1700.00
  .000084       0.       0.       0.        0        0        0      .00  1084.14  2800.00

*SECNO 73.834

3265 DIVIDED FLOW


3470 ENCROACHMENT STATIONS=    1700.0    2800.0  TYPE=     1  TARGET=    1100.000

          VALLEY SECTION 11    (D)

    73.83    10.60   855.20      .00      .00   855.23      .03      .04      .00   852.10
    2050.     248.    1491.     312.    1068.     962.    1240.      35.      12.   851.90
      .11      .23     1.55      .25     .100     .032     .100     .032   844.60  1700.00
  .000082     500.     460.     460.        0        0        0      .00  1084.27  2800.00

*SECNO 73.999
```

3470 ENCROACHMENT STATIONS= 1100.0 2200.0 TYPE= 1 TARGET= 1100.000

VALLEY SECTION 12 (E)

74.00	28.54	855.24	.00	.00	855.24	.00	.00	.01	852.50
2050.	43.	1984.	22.	1233.	5118.	667.	133.	32.	852.00
.74	.04	.39	.03	.100	.032	.100	.032	826.70	1100.00
.000002	750.	870.	780.	2	0	0	.00	1100.00	2200.00

FORM 1411 5 68
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*****************************************
 HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
 ERROR CORR -  01,02,03
 MODIFICATION -  50,51,52,53
*****************************************

T1      HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2      100-YEAR FLOW - WHITEWOOD LAKES TO GALLAGHER LAKE
T3      HURON RIVER - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ
   -10.       4.       0.       0.    .000000     .00      .0       0.     855.440    .000
J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIN    ITRACE
     3.000     .000    -1.000    .000     .000     .800     .000     .000     .000     .000

*PROF 3

CCHV=    .300 CEHV=    .500
*SECNO 73.747

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     CORAR     TOPWID      ENDST

3470 ENCROACHMENT STATIONS=     1700.0     2800.0  TYPE=     1  TARGET=     1100.000
    73.75     10.84    855.44      .00    855.44    855.47      .03       .00       .00    852.10
    2410.     319.     1697.     394.     1181.     994.     1356.       0.        0.     851.90
      .00      .27      1.71      .29      .100      .032      .100      .000    844.60   1700.00
  .000097       0.        0.       0.        0         0         0       .00   1086.26   2800.00

*SECNO 73.834

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS=     1700.0     2800.0  TYPE=     1  TARGET=     1100.000

          VALLEY SECTION 11    (D)

    73.83     10.89    855.49      .00       .00    855.52      .03       .04       .00    852.10
    2410.     324.     1687.     399.     1203.     1000.     1379.      39.       12.     851.90
      .10      .27      1.69      .29      .100      .032      .100      .032    844.60   1700.00
  .000094     500.      460.     460.        0         0         0       .00   1086.64   2800.00

*SECNO 73.999
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See Microfiche

Data Revised

3470 ENCROACHMENT STATIONS= 1100.0 2200.0 TYPE= 1 TARGET= 1100.000

VALLEY SECTION 12 (E)

74.00	28.83	855.53	.00	.00	855.53	.00	.01	.01	852.50	
2410.	59.	2319.	31.	1379.	5208.	752.	142.	32.	852.00	
.65	.04	.45	.04	.100	.032	.100	.032	826.70	1100.00	
.000002	750.	870.	780.	2	0	0	.00	1100.00	2200.00	

FORM 1411 ½ GB
PRINTED IN U.S.A.

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*****************************************************
 HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
 ERROR CORR #  01,02,03
 MODIFICATION -   50,51,52,53
*****************************************************

T1      HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2      500-YEAR FLOW - WHITEWOOD LAKES TO GALLAGHER LAKE
T3      HURON RIVER - PROJECT MANAGER, N.S.CHENG

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

    -10.      5.        0.        0.      .000000     1.00      .0        0.      856.010     .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    15.000     .000    -1.000     .000      .000      .800      .000      .000      .000      .000

*PROF 4

CCHV=     .300 CEHV=     .500
*SECNO 73.747

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=     1700.0     2800.0  TYPE=     1  TARGET=     1100.000
    73.75     11.41    856.01      .00    856.01    856.05      .04       .00       .00    852.10
    3115.     488.     2044.     583.     1449.     1071.     1632.       0.        0.     851.90
      .00      .34      1.91      .36      .100      .032      .100      .000    844.60   1700.00
  .000115       0.        0.        0.        0         0         0       .00   1090.97   2800.00

*SECNO 73.834

3265 DIVIDED FLOW


3470 ENCROACHMENT STATIONS=     1700.0     2800.0  TYPE=     1  TARGET=     1100.000

          VALLEY SECTION 11    (D)

    73.83     11.46    856.06      .00       .00    856.10      .04       .05       .00    852.10
    3115.     494.     2031.     590.     1475.     1079.     1658.      46.       12.     851.90
      .10      .34      1.88      .36      .100      .032      .100      .031    844.60   1700.00
  .000112     500.      460.     460.        0         0         0       .00   1091.43   2800.00

*SECNO 73.999
```

3470 ENCROACHMENT STATIONS= 1100.0 2200.0 TYPE= 1 TARGET= 1100.000

VALLEY SECTION 12 (E)

74.00	29.41	856.11	.00	.00	856.12	.00	.01	.01	852.50	
3115.	99.	2964.	53.	1672.	5390.	922.	160.	32.	852.00	
.54	.06	.55	.06	.100	.032	.100	.032	826.70	1100.00	
.000003	750.	870.	780.	2	0	0	.00	1100.00	2200.00	

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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

HURON RIVER - PROJECT MA

SUMMARY PRINTOUT

SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	K*CHSL	TOPWID	AREA
73.747	.00	.00	844.60	1500.00	854.56	9.96	.02	.00	854.58	.00	1082.22	2577.83
73.747	.00	.00	844.60	2050.00	855.16	10.56	.03	.00	855.19	.00	1084.14	3227.73
73.747	.00	.00	844.60	2410.00	855.44	10.84	.03	.00	855.47	.00	1086.26	3531.57
73.747	.00	.00	844.60	3115.00	856.01	11.41	.04	.00	856.05	.00	1090.97	4152.08
73.834	.00	.00	844.60	1500.00	854.59	9.99	.02	.00	854.61	.00	1082.33	2613.05
73.834	.00	.00	844.60	2050.00	855.20	10.60	.03	.00	855.23	.00	1084.27	3270.79
73.834	.00	.00	844.60	2410.00	855.49	10.89	.03	.00	855.52	.00	1086.64	3581.45
73.834	.00	.00	844.60	3115.00	856.06	11.46	.04	.00	856.10	.00	1091.43	4211.51
73.999	.00	.00	826.70	1500.00	854.62	27.92	.00	.01	854.62	-20.57	1100.00	6342.48
73.999	.00	.00	826.70	2050.00	855.24	28.54	.00	.01	855.24	-20.57	1100.00	7018.19
73.999	.00	.00	826.70	2410.00	855.53	28.83	.00	.01	855.53	-20.57	1100.00	7339.06
73.999	.00	.00	826.70	3115.00	856.11	29.41	.00	.01	856.12	-20.57	1100.00	7983.43

SUMMARY OF ERRORS

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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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00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: Hamburg Twp.

3) WATERCOURSE: Huron River
STROWBERRY LK to
CORP. LIMITS

4) DOCUMENT TYPE: 100 year FLOOD

00BREAK00

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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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T1       HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2       100-YEAR FLOW - STRAWBERRY LAKE TO CORPORATE LIMITS
T3       HURON RIVER - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

    -10.       4.        0.        0.    .000000      .00       .0        0.     856.160    .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    3.000     .000    -1.000      .000      .000      .800      .000      .000      .000      .000

*PROF 3

CCHV=     .300 CEHV=     .500
*SECNO 76.798
   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=     625.0     1145.0  TYPE=     1  TARGET=     520.000

          VALLEY SECTION 20   (O)

    76.80     10.66    856.16      .00    856.16    856.22      .06       .00       .00    853.30
    2200.     210.      1632.    358.      378.      748.    869.        0.        0.     852.20
      .00      .56      2.18      .41      .048      .032      .100      .000    845.50    625.00
  .000134      0.        0.       0.         0         0         0       .00    520.00   1145.00

*SECNO 77.030

3470 ENCROACHMENT STATIONS=     300.0     1200.0  TYPE=     1  TARGET=     900.000

          VALLEY SECTION 21   (P)

    77.03      8.84    856.34      .00       .00    856.36      .02       .14       .01    852.60
    2200.     473.      1228.    499.     1533.      757.    1194.       80.       21.     852.20
      .32      .31      1.62      .42      .100      .032      .080      .031    847.50    300.00
  .000090    1420.      1220.   1180.         0         0         0       .00    900.00   1200.00

*SECNO 77.232

3470 ENCROACHMENT STATIONS=    1200.0     2200.0  TYPE=     1  TARGET=    1000.000
    77.23      7.94    856.44      .00       .00    856.49      .04       .12       .01    853.60
    2200.     810.      1369.     22.     2223.      662.     32.       142.       39.     853.20
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      .51       .36      2.07       .67      .100      .032      .048      .033    848.50   1200.00
  .000175      780.     1070.      760.         0         0         0       .00   1000.00   2200.00


*SECNO 77.353

3470 ENCROACHMENT STATIONS=      230.0      720.0  TYPE=      1  TARGET=      490.000

          VALLEY SECTION 22    (Q)

    77.35      7.47    856.57       .00       .00    856.61       .05       .12       .00    852.90
    1950.      419.     1454.       77.     1061.      735.      116.      193.       56.    853.90
      .64       .39      1.98       .67      .100      .032      .048      .032    849.10    230.00
  .000151     1060.      640.      640.         1         0         0       .00    490.00    720.00

*SECNO 77.499
   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=      290.0      500.0  TYPE=      1  TARGET=      210.000

          VALLEY SECTION 23    (R)

    77.50      9.99    856.69       .00       .00    856.80       .11       .15       .03    853.10
    1950.      119.     1831.        0.      259.      666.        0.      220.       62.    857.70
      .73       .46      2.75       .00      .100      .032      .048      .032    846.70    290.00
  .000263      910.      770.      570.         0         0         0       .00    192.98    482.98

*SECNO 77.566

3470 ENCROACHMENT STATIONS=      562.0      626.0  TYPE=      1  TARGET=       64.000
    77.57      8.36    856.76       .00       .00    857.00       .24       .14       .07100000.00
    1950.        0.     1950.        0.        0.      495.        0.      226.       63. 100000.00
      .75       .00      3.94       .00      .100      .032      .048      .032    848.40    562.00
  .000603      400.      353.      420.         1         0         0       .00     64.00    626.00


*SECNO 77.567

3370 NORMAL BRIDGE,NRD= 12 MIN ELTRD=  861.00 MAX ELLC=  858.80

          BRIDGE SECTION 4 - ANN ARBOR RAILROAD - D/S FACE    (S)

    77.57      8.35    856.75       .00       .00    857.01       .26       .00       .01    858.80
    1950.        0.     1950.        0.        0.      473.        0.      226.       63.    858.80
      .75       .00      4.12       .00      .032      .020      .032      .032    848.40    300.00
  .000274        1.        1.        1.         1         0         0       .00     64.00    364.00


*SECNO 77.569

          BRIDGE SECTION 4 - ANN ARBOR RAILROAD - U/S FACE    (S)
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    77.57      8.25    856.75      .00      .00   857.02      .27      .00      .00   858.80
    1950.        0.    1950.       0.       0.     467.       0.     226.      63.   858.80
      .75       .00      4.18     .00     .032     .020     .032     .032   848.50   300.00
  .000285       16.      16.      16.        0        0        0      .00    64.00   364.00


*SECNO 77.570

3470 ENCROACHMENT STATIONS=      561.0      627.0  TYPE=      1  TARGET=      66.000
    77.57      8.30    856.80      .00      .00   857.03      .23      .00      .01100000.00
    1950.        0.    1950.       0.       0.     504.       0.     226.      63. 100000.00
      .75       .00      3.87     .00     .080     .032     .048     .032   848.50   561.00
  .000585        1.       1.       1.        2        0        0      .00    66.00   627.00


*SECNO 77.602
   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=      554.0      672.0  TYPE=      1  TARGET=     118.000
    77.60      8.65    857.05      .00      .00   857.12      .08      .05      .05   852.20
    1950.       13.    1937.       0.      29.     869.       0.     229.      64. 100000.00
      .77       .45      2.23     .00     .080     .032     .048     .032   848.40   554.00
  .000160      180.     176.     200.        2        0        0      .00   118.00   672.00


*SECNO 77.603

3370 NORMAL BRIDGE,NRD= 44 MIN ELTRD=  860.00 MAX ELLC=  857.90


          BRIDGE SECTION 5 - ABANDONED GRAND TRUNK RAILROAD - D/S FACE   (T)

    77.60      8.64    857.04      .00      .00   857.14      .10      .00      .01   860.30
    1950.        0.    1950.       0.       0.     781.       0.     229.      64.   860.10
      .77       .00      2.50     .00     .032     .020     .032     .032   848.40   300.00
  .000253        1.       1.       1.        1        0        0   -68.14   118.00   418.00


*SECNO 77.605

3370 NORMAL BRIDGE,NRD= 44 MIN ELTRD=  860.00 MAX ELLC=  857.90


          BRIDGE SECTION 5 - ABANDONED GRAND TRUNK RAILROAD - U/S FACE   (T)

    77.61      8.64    857.04      .00      .00   857.14      .10      .00      .00   860.30
    1950.        0.    1950.       0.       0.     781.       0.     229.      64.   860.10
      .78       .00      2.50     .00     .032     .020     .032     .032   848.40   300.00
  .000253       12.      12.      12.        0        0        0   -68.12   118.00   418.00


*SECNO 77.606

3470 ENCROACHMENT STATIONS=      553.0      673.0  TYPE=      1  TARGET=     120.000
    77.61      8.67    857.07      .00      .00   857.14      .07      .00      .01   852.20
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  1950.      26.     1923.       1.      34.     871.       4.     229.      64.    853.20
   .78       .77      2.21      .19     .048     .032     .080     .032   848.40    553.00
 .000150      1.        1.       1.       2        0        0      .00   120.00    673.00


*SECNO 77.717

3470 ENCROACHMENT STATIONS=        .0     500.0  TYPE=     1  TARGET=     499.999

          VALLEY SECTION 24   (U)

   77.72     7.89   857.19      .00      .00   857.24      .05      .09      .01   853.20
  1950.      20.     1450.     480.      35.     739.    1029.     249.      68.   853.20
    .88      .56      1.96      .47     .048     .032     .080     .031   849.30    52.38
 .000137    560.      589.     690.       0        0        0      .00   447.62   500.00


*SECNO 77.899
   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=        .0     275.0  TYPE=     1  TARGET=     274.999

          VALLEY SECTION 25   (V)

   77.90     8.13   857.33      .00      .00   857.40      .07      .15      .01   853.80
  1950.       5.     1730.     215.      15.     756.     375.     279.      75.   853.70
   1.01      .35      2.29      .57     .080     .032     .080     .032   849.20    46.47
 .000190    980.      960.     820.       0        0        0      .00   228.53   275.00


*SECNO 77.999

3470 ENCROACHMENT STATIONS=      60.0     144.0  TYPE=     1  TARGET=      84.000
   78.00     7.63   857.43      .00      .00   857.61      .18      .15      .05100000.00
  1950.       0.     1950.       0.       0.     576.       0.     289.      77. 100000.00
   1.05      .00      3.39      .00     .080     .032     .080     .032   849.80    60.00
 .000479    550.      533.     500.       1        0        0      .00    84.00   144.00


*SECNO 78.000

3370 NORMAL BRIDGE,NRD= 26 MIN ELTRD=  862.60 MAX ELLC=  860.40

          BRIDGE SECTION 6 - M-36 BRIDGE - D/S FACE   (W)

   78.00     7.63   857.43      .00      .00   857.61      .18      .00      .00   863.50
  1950.       0.     1950.       0.       0.     566.       0.     289.      77.   863.50
   1.05      .00      3.45      .00     .024     .020     .024     .032   849.80   225.00
 .000217      1.        1.       1.       0        0        0   -10.84    84.00   309.00


*SECNO 78.005

3370 NORMAL BRIDGE,NRD= 26 MIN ELTRD=  862.60 MAX ELLC=  860.40
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        BRIDGE SECTION 6 - M-36 BRIDGE - U/S FACE   (W)

    78.00      7.63   857.43      .00      .00   857.62      .18      .01      .00   863.50
    1950.        0.    1950.       0.       0.     566.       0.     290.      77.   863.50
     1.05       .00     3.44      .00     .024     .020     .024     .032   849.80   225.00
  .000217       26.      26.      26.        0        0        0   -10.90    84.00   309.00

 *SECNO 78.006

 3470 ENCROACHMENT STATIONS=      235.0     321.0  TYPE=     1  TARGET=      86.000
    78.01      7.65   857.45      .00      .00   857.62      .17      .00      .00100000.00
    1950.        0.    1950.       0.       0.     582.       0.     290.      77. 100000.00
     1.05       .00     3.35      .00     .056     .032     .048     .032   849.80   235.00
  .000480        1.       1.       1.        1        0        0      .00    86.00   321.00

 *SECNO 78.045
    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=       75.0     370.0  TYPE=     1  TARGET=     295.000

        VALLEY SECTION 26   (X)

    78.05      7.93   857.63      .00      .00   857.71      .08      .07      .03   855.20
    1950.      199.    1723.     28.     306.     717.     50.     294.      78.   856.20
     1.08       .65     2.40      .55     .056     .032     .048     .032   849.70    75.00
  .000225      210.     209.     210.        2        0        0      .00   295.00   370.00

 1490 NH CARD USED
 *SECNO 78.283

 3470 ENCROACHMENT STATIONS=      620.0    1110.0  TYPE=     1  TARGET=    -620.000

        VALLEY SECTION 27   (Y)

    78.28      8.42   857.92      .00      .00   858.00      .08      .28      .00   855.30
    1950.       46.    1501.    402.     69.     587.    681.     328.      87.   853.70
     1.24       .67     2.56      .59     .048     .032     .079     .032   849.50   620.00
  .000228     1270.    1260.    1120.        2        0        0      .00   355.98   975.98

 1490 NH CARD USED
 *SECNO 78.522

 3470 ENCROACHMENT STATIONS=      890.0    1380.0  TYPE=     1  TARGET=    -890.000

        VALLEY SECTION 28   (Z)

    78.52      8.19   858.19      .00      .00   858.23      .05      .23      .01   853.80
    1950.      521.    1393.     35.     954.     672.     54.     371.      98.   854.00
     1.45       .55     2.07      .66     .068     .032     .056     .032   850.00   890.00
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 .000148    1260.    1260.    1240.       1        0        0      .00   455.48  1345.48


*SECNO 78.819

3470 ENCROACHMENT STATIONS=      880.0    1210.0  TYPE=      1  TARGET=    -880.000

          VALLEY SECTION 29    (AA)

   78.82     8.47   858.47      .00      .00   858.58      .11      .31      .03   854.70
   1950.      268.   1681.       1.     370.     590.       4.     414.     110.   857.00
    1.62      .72     2.85      .37     .056     .032     .056     .032   850.00   880.00
 .000312    1270.    1570.    1650.        0        0        0      .00   294.89  1174.89


1490 NH CARD USED
*SECNO 79.018

3470 ENCROACHMENT STATIONS=        .0      350.0  TYPE=      1  TARGET=     349.999

          VALLEY SECTION 30    (AB)

   79.02     8.24   858.74      .00      .00   858.79      .05      .20      .02   855.30
   1950.      11.    1693.     246.      38.     884.     514.     443.     117.   854.40
    1.79      .30     1.92      .48     .080     .032     .080     .032   850.50    58.01
 .000126    1010.    1050.    1050.        2        0        0      .00   291.99   350.00


*SECNO 79.369
   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


          VALLEY SECTION 31    (AC)

   79.37     8.87   858.97      .00      .00   859.02      .05      .22      .00   854.90
   1950.        3.   1743.     204.      13.     911.     532.     503.     130.   854.30
    2.08      .23     1.91      .39     .100     .032     .080     .032   850.10    33.52
 .000117    1950.    1850.    1740.        2        0        0      .00   369.29   402.81


1490 NH CARD USED
*SECNO 79.600

          VALLEY SECTION 32    (AD)

   79.60     8.51   859.11      .00      .00   859.15      .04      .13      .00   854.90
   1950.      141.   1754.      56.     406.    1013.     158.     545.     140.   854.60
    2.29      .35     1.73      .35     .080     .032     .080     .032   850.60   108.86
 .000096    1300.    1220.    1100.        0        0        0      .00   362.28   471.14


*SECNO 79.861

3470 ENCROACHMENT STATIONS=       88.0      212.0  TYPE=      1  TARGET=     124.000
   79.86     8.07   859.27      .00      .00   859.34      .08      .18      .02   855.20
   1950.        2.   1948.       0.       8.     882.       0.     584.     148. 100000.00
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     2.47       .30      2.21       .00      .080      .032      .056      .032    851.20     88.00
  .000174     1440.     1384.     1350.         1         0         0       .00    124.00    212.00

*SECNO 79.862

3370 NORMAL BRIDGE,NRD= 15 MIN ELTRD=  863.00 MAX ELLC=  863.10

          BRIDGE SECTION 7 - WINANS LAKE ROAD - D/S FACE   (AE)

          U.S.G.S. GAGING STATION LOCATED AT DOWNSTREAM FACE OF BRIDGE.

    79.86      8.04    859.24       .00       .00    859.37       .14       .00       .03    867.20
     1950.        0.     1950.        0.        0.     659.        0.      584.      148.    865.70
     2.47       .00      2.96       .00      .032      .020      .032      .032    851.20    106.42
  .000221        1.        1.        1.         2         0         0    -37.43    123.06    229.48

*SECNO 79.869

3370 NORMAL BRIDGE,NRD= 15 MIN ELTRD=  863.00 MAX ELLC=  863.10

          BRIDGE SECTION 7 - WINANS LAKE ROAD - U/S FACE   (AE)

          U.S.G.S. GAGING STATION LOCATED AT DOWNSTREAM FACE OF BRIDGE

    79.87      8.04    859.24       .00       .00    859.38       .14       .01       .00    867.20
     1950.        0.     1950.        0.        0.     660.        0.      585.      148.    865.70
     2.47       .00      2.95       .00      .032      .020      .032      .032    851.20    106.39
  .000220       35.       35.       35.         0         0         0    -37.46    123.14    229.53

*SECNO 79.870
   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=      87.0     213.0  TYPE=      1  TARGET=     126.000
    79.87      8.13    859.33       .00       .00    859.40       .07       .00       .02    855.20
     1950.        9.     1941.        0.       12.     896.        0.      585.      148. 100000.00
     2.47       .73      2.17       .00      .040      .034      .040      .032    851.20     87.00
  .000182        1.        1.        1.         2         0         0       .00    126.00    213.00

*SECNO 79.886

3470 ENCROACHMENT STATIONS=        .0     300.0  TYPE=      1  TARGET=     299.999

          VALLEY SECTION 33   (AF)

    79.89      7.77    859.37       .00       .00    859.42       .05       .01       .01    855.60
     1950.       69.     1704.      178.       84.     867.      211.      587.      149.    855.70
     2.48       .82      1.97       .84      .040      .034      .040      .032    851.60     49.76
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 .000153     90.     89.     90.      2      0      0    .00   250.24   300.00


*SECNO 80.145

3470 ENCROACHMENT STATIONS=     100.0     780.0  TYPE=     1  TARGET=  -100.000

          VALLEY SECTION 34   (AG)

   80.14     7.00   859.60     .00     .00   859.66     .06     .24     .00   855.50
   1930.     263.    1516.    151.    304.    704.    161.    623.    157.   856.10
    2.68      .87     2.15     .94    .048    .034    .048    .032  852.60   146.06
 .000203    1400.   1370.   1260.       1       0       0    .00   291.92   437.98


*SECNO 80.459

3470 ENCROACHMENT STATIONS=     100.0     560.0  TYPE=     1  TARGET=    460.000

          VALLEY SECTION 35   (AH)

   80.46     8.02   859.72     .00     .00   859.72     .00     .05     .02   855.00
   1905.       0.    1905.      0.      0.    3430.      0.     710.    171. 100000.00
    3.51      .00      .56     .00    .040    .034    .040    .032  851.70   100.00
 .000011    1350.   1660.   1800.       2       0       0    .00   460.00   560.00


*SECNO 80.560
3280 CROSS SECTION      80.56 EXTENDED        .93 FEET


3470 ENCROACHMENT STATIONS=     100.0     600.0  TYPE=     1  TARGET=    500.000

          VALLEY SECTION 36   (AI)

   80.56    10.13   859.73     .00     .00   859.73     .00     .01     .00   855.10
   1680.       0.    1680.      0.      0.    3266.      0.     751.    177. 100000.00
    3.79      .00      .51     .00    .040    .034    .080    .032  849.60   100.00
 .000011     520.    530.    570.       2       0       0    .00   500.00   600.00


*SECNO 80.925
   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=     200.0     600.0  TYPE=     1  TARGET=    400.000

          VALLEY SECTION 37   (AJ)

   80.93     9.96   859.76     .00     .00   859.77     .01     .04     .00   855.00
   1680.      49.    977.    654.    159.    842.   1296.    876.    197.   854.30
    4.41      .31     1.16     .50    .080    .032    .056    .032  849.80   200.00
 .000042    1330.   1930.   2160.       1       0       0    .00   400.00   600.00
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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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T1       HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2       500-YEAR FLOW - STRAWBERRY LAKE TO CORPORATE LIMITS
T3       HURON RIVER - PROJECT MANAGER, N.S.CHENG

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

     -10.       5.        0.        0.   .000000       .00        .0        0.   856.770     .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    15.000     .000    -1.000     .000      .000      .800      .000      .000      .000      .000

*PROF 4

CCHV=     .300 CEHV=     .500
*SECNO 76.798
   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=     625.0     1145.0  TYPE=     1  TARGET=     520.000

          VALLEY SECTION 20   (O)

    76.80     11.27    856.77       .00    856.77    856.84       .07       .00       .00    853.30
    2850.      360.     1991.      499.     500.      802.     1010.        0.        0.    852.20
      .00       .72      2.48       .49      .048      .032      .100      .000    845.50    625.00
  .000158        0.        0.        0.        0         0         0       .00    520.00   1145.00

*SECNO 77.030

3470 ENCROACHMENT STATIONS=     300.0     1200.0  TYPE=     1  TARGET=     900.000

          VALLEY SECTION 21   (P)

    77.03      9.48    856.98       .00       .00    857.01       .03       .15       .01    852.60
    2850.      672.     1493.      686.     1834.      825.     1401.       93.       21.    852.20
      .30       .37      1.81       .49      .100      .032      .080      .031    847.50    300.00
  .000100     1420.     1220.     1180.        0         0         0       .00    900.00   1200.00

*SECNO 77.232

3470 ENCROACHMENT STATIONS=    1200.0     2200.0  TYPE=     1  TARGET=    1000.000
    77.23      8.59    857.09       .00       .00    857.14       .04       .12       .01    853.60
    2850.     1194.     1624.       32.     2799.      731.       42.      167.       39.    853.20
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      .48       .43      2.22       .78      .100      .032      .048      .034    848.50   1200.00
  .000177      780.     1070.      760.         0         0         0       .00   1000.00   2200.00


*SECNO 77.353

3470 ENCROACHMENT STATIONS=      230.0      720.0  TYPE=      1  TARGET=      490.000

          VALLEY SECTION 22   (Q)

    77.35      8.12    857.22       .00       .00    857.28       .06       .14       .01    852.90
    2550.      609.     1819.      122.     1280.      810.      148.      229.       56.    853.90
      .60       .48      2.25       .83      .100      .032      .048      .032    849.10    230.00
  .000171     1060.      640.      640.         2         0         0       .00    490.00    720.00


*SECNO 77.499
   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=      290.0      500.0  TYPE=      1  TARGET=      210.000

          VALLEY SECTION 23   (R)

    77.50     10.66    857.36       .00       .00    857.51       .15       .18       .05    853.10
    2550.      193.     2357.        0.      325.      728.        0.      260.       62.    857.70
      .67       .59      3.24       .00      .100      .032      .048      .032    846.70    290.00
  .000331      910.      770.      570.         0         0         0       .00    194.30    484.30


*SECNO 77.566

3470 ENCROACHMENT STATIONS=      562.0      626.0  TYPE=      1  TARGET=       64.000
    77.57      9.03    857.43       .00       .00    857.78       .35       .17       .10100000.00
    2550.        0.     2550.        0.        0.      538.        0.      267.       63. 100000.00
      .70       .00      4.74       .00      .100      .032      .048      .032    848.40    562.00
  .000801      400.      353.      420.         2         0         0       .00     64.00    626.00


*SECNO 77.567

3370 NORMAL BRIDGE,NRD= 12 MIN ELTRD=  861.00 MAX ELLC=  858.80

          BRIDGE SECTION 4 - ANN ARBOR RAILROAD - D/S FACE   (S)

    77.57      9.02    857.42       .00       .00    857.79       .38       .00       .02    858.80
    2550.        0.     2550.        0.        0.      516.        0.      267.       63.    858.80
      .70       .00      4.94       .00      .032      .020      .032      .032    848.40    300.00
  .000358        1.        1.        1.         1         0         0       .00     64.00    364.00


*SECNO 77.569

          BRIDGE SECTION 4 - ANN ARBOR RAILROAD - U/S FACE   (S)
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    77.57      8.92    857.42      .00      .00    857.81      .39      .01      .00    858.80
    2550.        0.     2550.       0.       0.      510.       0.     267.      63.    858.80
      .70       .00      5.00      .00     .032      .020     .032     .032   848.50    300.00
  .000372       16.       16.      16.        0         0        0      .00    64.00    364.00


*SECNO 77.570

3470 ENCROACHMENT STATIONS=      561.0      627.0  TYPE=      1  TARGET=      66.000
    77.57      8.99    857.49      .00      .00    857.82      .33      .00      .02100000.00
    2550.        0.     2550.       0.       0.      549.       0.     267.      63. 100000.00
      .70       .00      4.64      .00     .080      .032     .048     .031   848.50    561.00
  .000767        1.        1.       1.        2         0        0      .00    66.00    627.00


*SECNO 77.602
   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=      554.0      672.0  TYPE=      1  TARGET=     118.000
    77.60      9.44    857.84      .00      .00    857.95      .11      .06      .07    852.20
    2550.       18.     2532.       0.       34.      958.       0.     270.      64. 100000.00
      .72       .53      2.64      .00     .080      .032     .048     .032   848.40    554.00
  .000200      180.      176.     200.        2         0        0      .00   118.00    672.00


*SECNO 77.603

3370 NORMAL BRIDGE,NRD= 44 MIN ELTRD=  860.00 MAX ELLC=  857.90


          BRIDGE SECTION 5 - ABANDONED GRAND TRUNK RAILROAD - D/S FACE   (T)

    77.60      9.43    857.83      .00      .00    857.97      .14      .00      .01    860.30
    2550.        0.     2550.       0.       0.      863.       0.     270.      64.    860.10
      .72       .00      2.96      .00     .032      .020     .032     .031   848.40    300.00
  .000454        1.        1.       1.        1         0        0   -80.52   118.00    418.00


*SECNO 77.605

3370 NORMAL BRIDGE,NRD= 44 MIN ELTRD=  860.00 MAX ELLC=  857.90


          BRIDGE SECTION 5 - ABANDONED GRAND TRUNK RAILROAD - U/S FACE   (T)

    77.61      9.44    857.84      .00      .00    857.97      .14      .01      .00    860.30
    2550.        0.     2550.       0.       0.      863.       0.     271.      64.    860.10
      .72       .00      2.96      .00     .032      .020     .032     .031   848.40    300.00
  .000454       12.       12.      12.        0         0        0   -80.28   118.00    418.00


*SECNO 77.606

3470 ENCROACHMENT STATIONS=      553.0      673.0  TYPE=      1  TARGET=     120.000
    77.61      9.48    857.88      .00      .00    857.98      .10      .00      .01    852.20
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    2550.      36.    2513.      1.      40.     961.      5.     271.      64.    853.20
     .72      .90     2.61     .22     .048     .032    .080     .031   848.40    553.00
 .000184       1.       1.      1.       2        0       0      .00   120.00    673.00


*SECNO 77.717

3470 ENCROACHMENT STATIONS=        .0      500.0  TYPE=     1  TARGET=     499.999

          VALLEY SECTION 24   (U)

    77.72     8.74   858.04     .00      .00   858.09     .05      .10      .02   853.20
    2550.      34.    1791.    725.      52.     829.   1303.     294.      68.   853.20
      .82      .65     2.16     .56     .048     .032    .080     .031   849.30    48.64
 .000142     560.     589.    690.       2        0       0      .00   451.36   500.00


*SECNO 77.899
   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       WTH       ELMIN      SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID     ENDST


3470 ENCROACHMENT STATIONS=        .0      275.0  TYPE=     1  TARGET=     274.999

          VALLEY SECTION 25   (V)

    77.90     8.98   858.18     .00      .00   858.27     .09      .16      .02   853.80
    2550.      10.    2215.    325.      23.     852.    469.     330.      75.   853.70
      .93      .43     2.60     .69     .080     .032    .080     .032   849.20    44.39
 .000209     980.     960.    820.       1        0       0      .00   230.61   275.00


*SECNO 77.999

3470 ENCROACHMENT STATIONS=       60.0      144.0  TYPE=     1  TARGET=      84.000
    78.00     8.48   858.28     .00      .00   858.52     .24      .17      .07100000.00
    2550.       0.    2550.      0.       0.     647.      0.     342.      77. 100000.00
      .96      .00     3.94     .00     .080     .032    .080     .032   849.80    60.00
 .000568     550.     533.    500.       0        0       0      .00    84.00   144.00


*SECNO 78.000

3370 NORMAL BRIDGE,NRD= 26 MIN ELTRD=  862.60 MAX ELLC=  860.40

          BRIDGE SECTION 6 - M-36 BRIDGE - D/S FACE   (W)

    78.00     8.47   858.27     .00      .00   858.53     .26      .00      .01   863.50
    2550.       0.    2550.      0.       0.     627.      0.     342.      77.    863.50
      .96      .00     4.07     .00     .024     .020    .024     .032   849.80   225.00
 .000279       1.       1.      1.       0        0       0   -21.19    84.00   309.00


*SECNO 78.005

3370 NORMAL BRIDGE,NRD= 26 MIN ELTRD=  862.60 MAX ELLC=  860.40
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        BRIDGE SECTION 6 - M-36 BRIDGE - U/S FACE   (W)

    78.00      8.48    858.28      .00      .00    858.54      .26      .01      .00    863.50
    2550.        0.     2550.       0.       0.      627.       0.     342.      77.    863.50
      .97       .00      4.07      .00     .024      .020     .024     .032   849.80    225.00
  .000279       26.       26.      26.        0         0        0   -21.24    84.00    309.00

 *SECNO 78.006

 3470 ENCROACHMENT STATIONS=      235.0     321.0  TYPE=      1  TARGET=      86.000
    78.01      8.51    858.31      .00      .00    858.54      .23      .00      .01100000.00
    2550.        0.     2550.       0.       0.      657.       0.     342.      77. 100000.00
      .97       .00      3.88      .00     .056      .032     .048     .032   849.80    235.00
  .000561        1.        1.       1.        2         0        0      .00    86.00    321.00

 *SECNO 78.045
    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=       75.0     370.0  TYPE=      1  TARGET=     295.000

        VALLEY SECTION 26   (X)

    78.05      8.87    858.57      .00      .00    858.66      .09      .07      .04    855.20
    2550.      360.     2123.     67.     442.      820.     87.     347.      78.    856.20
      .99       .81      2.59      .77     .056      .032     .048     .032   849.70     75.00
  .000219      210.      209.     210.        2         0        0      .00   295.00    370.00

 1490 NH CARD USED
 *SECNO 78.283

 3470 ENCROACHMENT STATIONS=      620.0    1110.0  TYPE=      1  TARGET=    -620.000

        VALLEY SECTION 27   (Y)

    78.28      9.34    858.84      .00      .00    858.93      .09      .28      .00    855.30
    2550.       92.     1828.    630.     106.      664.    901.     389.      87.    853.70
     1.15       .87      2.75      .70     .048      .032     .079     .032   849.50    620.00
  .000224     1270.     1260.   1120.        2         0        0      .00   363.70    983.70

 1490 NH CARD USED
 *SECNO 78.522

 3470 ENCROACHMENT STATIONS=      890.0    1380.0  TYPE=      1  TARGET=    -890.000

        VALLEY SECTION 28   (Z)

    78.52      9.11    859.11      .00      .00    859.16      .05      .22      .01    853.80
    2550.      830.     1665.     55.    1268.      760.     74.     443.      99.    854.00
     1.36       .65      2.19      .74     .066      .032     .056     .032   850.00    890.00
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 .000141    1260.    1260.    1240.       1        0        0      .00   457.79  1347.79


*SECNO 78.819

3470 ENCROACHMENT STATIONS=     880.0    1210.0  TYPE=     1  TARGET=    -880.000

          VALLEY SECTION 29   (AA)

   78.82     9.37   859.37      .00      .00   859.49      .12      .30      .03   854.70
   2550.     502.    2043.       5.     552.     672.       9.     497.     110.   857.00
    1.52      .91     3.04      .50     .056     .032     .056     .032   850.00   880.00
 .000299    1270.    1570.    1650.       1        0        0      .00   297.93  1177.93


1490 NH CARD USED
*SECNO 79.018

3470 ENCROACHMENT STATIONS=         .0     350.0  TYPE=     1  TARGET=     349.999

          VALLEY SECTION 30   (AB)

   79.02     9.15   859.65      .00      .00   859.71      .06      .20      .02   855.30
   2550.      22.    2155.     373.      60.     997.     645.     532.     117.   854.40
    1.67      .36     2.16      .58     .080     .032     .080     .032   850.50    52.24
 .000137    1010.    1050.    1050.       2        0        0      .00   297.76   350.00


*SECNO 79.369
   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


          VALLEY SECTION 31   (AC)

   79.37     9.79   859.89      .00      .00   859.95      .06      .24      .00   854.90
   2550.       5.    2188.     356.      20.    1024.     782.     606.     132.   854.30
    1.94      .27     2.14      .46     .100     .032     .080     .032   850.10    32.05
 .000125    1950.    1850.    1740.       2        0        0      .00   430.81   462.86


1490 NH CARD USED
*SECNO 79.600

          VALLEY SECTION 32   (AD)

   79.60     9.44   860.04      .00      .00   860.09      .05      .14      .00   854.90
   2550.     243.    2211.      96.     561.    1140.     223.     657.     143.   854.60
    2.13      .43     1.94      .43     .080     .032     .080     .032   850.60    99.52
 .000103    1300.    1220.    1100.       0        0        0      .00   380.72   480.24


*SECNO 79.861

3470 ENCROACHMENT STATIONS=      88.0     212.0  TYPE=     1  TARGET=     124.000
   79.86     9.01   860.21      .00      .00   860.31      .10      .19      .03   855.20
   2550.       3.    2547.       0.      10.     996.       0.     704.     152. 100000.00
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     2.28       .33      2.56       .00       .080      .032      .056      .032    851.20     88.00
  .000199     1440.     1384.     1350.         0         0         0       .00    124.00    212.00

*SECNO 79.862

3370 NORMAL BRIDGE,NRD=  15 MIN ELTRD=  863.00 MAX ELLC=  863.10

          BRIDGE SECTION 7 - WINANS LAKE ROAD - D/S FACE   (AE)

          U.S.G.S. GAGING STATION LOCATED AT DOWNSTREAM FACE OF BRIDGE.

    79.86      8.98    860.18       .00       .00    860.34       .17       .00       .03    867.20
    2550.        0.     2550.        0.        0.     772.        0.      704.      152.    865.70
     2.28       .00      3.30       .00      .032      .020      .032      .032    851.20    103.00
  .000240        1.        1.        1.         2         0         0    -42.13    127.00    230.00

*SECNO 79.869

3370 NORMAL BRIDGE,NRD=  15 MIN ELTRD=  863.00 MAX ELLC=  863.10

          BRIDGE SECTION 7 - WINANS LAKE ROAD - U/S FACE   (AE)

          U.S.G.S. GAGING STATION LOCATED AT DOWNSTREAM FACE OF BRIDGE

    79.87      8.98    860.18       .00       .00    860.35       .17       .01       .00    867.20
    2550.        0.     2550.        0.        0.     773.        0.      705.      152.    865.70
     2.29       .00      3.30       .00      .032      .020      .032      .032    851.20    102.97
  .000239       35.       35.       35.         0         0         0    -42.17    127.03    230.00

*SECNO 79.870
   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=      87.0      213.0  TYPE=      1  TARGET=     126.000
    79.87      9.08    860.28       .00       .00    860.37       .10       .00       .02    855.20
    2550.       12.     2538.        0.       15.    1013.        0.      705.      152. 100000.00
     2.29       .82      2.51       .00      .040      .034      .040      .032    851.20     87.00
  .000209        1.        1.        1.         2         0         0       .00    126.00    213.00

*SECNO 79.886

3470 ENCROACHMENT STATIONS=        .0      300.0  TYPE=      1  TARGET=     299.999

          VALLEY SECTION 33   (AF)

    79.89      8.74    860.34       .00       .00    860.40       .06       .02       .01    855.60
    2550.      124.     2122.      304.      127.     989.      293.      707.      152.    855.70
     2.30       .98      2.15      1.04      .040      .034      .040      .032    851.60     43.47
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 .000153     190.     89.     90.      2      0      0     .00   256.52   300.00

*SECNO 80.145

3470 ENCROACHMENT STATIONS=     100.0     780.0  TYPE=     1  TARGET=    -100.000

          VALLEY SECTION 34   (AG)

    80.14     7.97   860.57     .00     .00   860.63     .06     .23     .00   855.50
    2510.     427.    1851.    232.    432.     813.    219.    752.    161.   856.10
     2.49      .99     2.28    1.06    .048     .034    .048    .032  852.60   132.82
 .000187    1400.    1370.   1260.       1        0       0     .00  310.06   442.87

*SECNO 80.459

3470 ENCROACHMENT STATIONS=     100.0     560.0  TYPE=     1  TARGET=     460.000

          VALLEY SECTION 35   (AH)

    80.46     8.99   860.69     .00     .00   860.70     .01     .05     .02   855.00
    2465.       0.     2465.      0.      0.    3878.      0.    853.    175. 100000.00
     3.21      .00      .64     .00    .040     .034    .040    .032  851.70   100.00
 .000012    1350.    1660.   1800.       2        0       0     .00  460.00   560.00

*SECNO 80.560
3280 CROSS SECTION      80.56 EXTENDED       1.90 FEET

3470 ENCROACHMENT STATIONS=     100.0     600.0  TYPE=     1  TARGET=     500.000

          VALLEY SECTION 36   (AI)

    80.56    11.10   860.70     .00     .00   860.71     .01     .01     .00   855.10
    2140.       0.     2140.      0.      0.    3753.      0.    899.    181. 100000.00
     3.47      .00      .57     .00    .040     .034    .080    .032  849.60   100.00
 .000012     520.     530.    570.       2        0       0     .00  500.00   600.00

*SECNO 80.925
   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=     200.0     600.0  TYPE=     1  TARGET=     400.000

          VALLEY SECTION 37   (AJ)

    80.93    10.94   860.74     .00     .00   860.75     .02     .04     .01   855.00
    2140.      66.     1197.    877.    193.     949.   1545.   1044.    201.   854.30
     4.04      .34     1.26     .57    .080     .032    .056    .032  849.80   200.00
 .000042    1330.    1930.   2160.       1        0       0     .00  400.00   600.00
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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

HURON RIVER - PROJECT MA

SUMMARY PRINTOUT

SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	K*CHSL	TOPWID	AREA
76.798	.00	.00	845.50	1350.00	855.13	9.63	.04	.00	855.17	.00	520.00	1459.06
76.798	.00	.00	845.50	1900.00	855.82	10.32	.05	.00	855.87	.00	520.00	1817.86
76.798	.00	.00	845.50	2200.00	856.16	10.66	.06	.00	856.22	.00	520.00	1994.66
76.798	.00	.00	845.50	2850.00	856.77	11.27	.07	.00	856.84	.00	520.00	2311.86
77.030	.00	.00	847.50	1350.00	855.26	7.76	.02	.01	855.28	1.64	900.00	2514.22
77.030	.00	.00	847.50	1900.00	855.98	8.48	.02	.01	856.01	1.64	900.00	3164.81
77.030	.00	.00	847.50	2200.00	856.34	8.84	.02	.01	856.36	1.64	900.00	3483.24
77.030	.00	.00	847.50	2850.00	856.98	9.48	.03	.01	857.01	1.64	900.00	4059.74
77.232	.00	.00	848.50	1350.00	855.36	6.86	.04	.01	855.40	.93	1000.00	1843.50
77.232	.00	.00	848.50	1900.00	856.09	7.59	.04	.01	856.13	.93	1000.00	2563.66
77.232	.00	.00	848.50	2200.00	856.44	7.94	.04	.01	856.49	.93	1000.00	2916.81
77.232	.00	.00	848.50	2850.00	857.09	8.59	.04	.01	857.14	.93	1000.00	3572.17
77.353	.00	.00	849.10	1200.00	855.48	6.38	.03	.00	855.51	.94	490.00	1379.74
77.353	.00	.00	849.10	1710.00	856.21	7.11	.04	.00	856.25	.94	490.00	1737.15
77.353	.00	.00	849.10	1950.00	856.57	7.47	.05	.00	856.61	.94	490.00	1911.71
77.353	.00	.00	849.10	2550.00	857.22	8.12	.06	.01	857.28	.94	490.00	2236.90
77.499	.00	.00	846.70	1200.00	855.58	8.88	.06	.02	855.64	-3.12	190.77	713.47
77.499	.00	.00	846.70	1710.00	856.33	9.63	.10	.03	856.42	-3.12	192.26	855.90
77.499	.00	.00	846.70	1950.00	856.69	9.99	.11	.03	856.80	-3.12	192.98	924.66
77.499	.00	.00	846.70	2550.00	857.36	10.66	.15	.05	857.51	-3.12	194.30	1052.96
77.566	.00	.00	848.40	1200.00	855.64	7.24	.12	.03	855.76	4.82	64.00	423.47
77.566	.00	.00	848.40	1710.00	856.40	8.00	.20	.05	856.60	4.82	64.00	472.44
77.566	.00	.00	848.40	1950.00	856.76	8.36	.24	.07	857.00	4.82	64.00	495.37
77.566	.00	.00	848.40	2550.00	857.43	9.03	.35	.10	857.78	4.82	64.00	538.13
77.567	861.00	858.80	848.40	1200.00	855.63	7.23	.14	.01	855.77	.00	64.00	402.02
77.567	861.00	858.80	848.40	1710.00	856.39	7.99	.22	.01	856.61	.00	64.00	450.37
77.567	861.00	858.80	848.40	1950.00	856.75	8.35	.26	.01	857.01	.00	64.00	473.37
77.567	861.00	858.80	848.40	2550.00	857.42	9.02	.38	.02	857.79	.00	64.00	516.36
77.569	.00	.00	848.50	1200.00	855.63	7.13	.14	.00	855.77	6.25	64.00	395.46
77.569	.00	.00	848.50	1710.00	856.39	7.89	.23	.00	856.62	6.25	64.00	444.04
77.569	.00	.00	848.50	1950.00	856.75	8.25	.27	.00	857.02	6.25	64.00	467.04
77.569	.00	.00	848.50	2550.00	857.42	8.92	.39	.00	857.81	6.25	64.00	510.06

FORM 1411 ½ CG
PRINTED IN U.S.A.

SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	K*CHSL	TOPWID	AREA
77.570	.00	.00	848.50	1200.00	855.66	7.16	.12	.01	855.78	.00	66.00	428.74
77.570	.00	.00	848.50	1710.00	856.43	7.93	.20	.01	856.63	.00	66.00	479.74
77.570	.00	.00	848.50	1950.00	856.80	8.30	.23	.01	857.03	.00	66.00	503.86
77.570	.00	.00	848.50	2550.00	857.49	8.99	.33	.02	857.82	.00	66.00	549.44
77.602	.00	.00	848.40	1200.00	855.79	7.39	.04	.02	855.84	-.57	118.00	749.84
77.602	.00	.00	848.40	1710.00	856.65	8.25	.07	.04	856.71	-.57	118.00	850.36
77.602	.00	.00	848.40	1950.00	857.05	8.65	.08	.05	857.12	-.57	118.00	897.73
77.602	.00	.00	848.40	2550.00	857.84	9.44	.11	.07	857.95	-.57	118.00	991.62
77.603	860.00	857.90	848.40	1200.00	855.79	7.39	.05	.01	855.84	.00	118.00	645.31
77.603	860.00	857.90	848.40	1710.00	856.64	8.24	.08	.01	856.72	.00	118.00	738.17
77.603	860.00	857.90	848.40	1950.00	857.04	8.64	.10	.01	857.14	.00	118.00	781.39
77.603	860.00	857.90	848.40	2550.00	857.83	9.43	.14	.01	857.97	.00	118.00	862.66
77.605	860.00	857.90	848.40	1200.00	855.79	7.39	.05	.00	855.84	.00	118.00	644.81
77.605	860.00	857.90	848.40	1710.00	856.64	8.24	.08	.00	856.72	.00	118.00	737.44
77.605	860.00	857.90	848.40	1950.00	857.04	8.64	.10	.00	857.14	.00	118.00	781.10
77.605	860.00	857.90	848.40	2550.00	857.84	9.44	.14	.00	857.97	.00	118.00	862.53
77.606	.00	.00	848.40	1200.00	855.81	7.41	.04	.00	855.85	.00	120.00	756.54
77.606	.00	.00	848.40	1710.00	856.67	8.27	.06	.01	856.73	.00	120.00	860.55
77.606	.00	.00	848.40	1950.00	857.07	8.67	.07	.01	857.14	.00	120.00	909.04
77.606	.00	.00	848.40	2550.00	857.88	9.48	.10	.01	857.98	.00	120.00	1005.74
77.717	.00	.00	849.30	1200.00	855.88	6.58	.04	.00	855.92	1.53	441.86	1222.00
77.717	.00	.00	849.30	1710.00	856.78	7.48	.04	.01	856.82	1.53	445.78	1616.78
77.717	.00	.00	849.30	1950.00	857.19	7.89	.05	.01	857.24	1.53	447.62	1802.65
77.717	.00	.00	849.30	2550.00	858.04	8.74	.05	.02	858.09	1.53	451.36	2183.69
77.899	.00	.00	849.20	1200.00	856.01	6.81	.05	.01	856.06	-.10	225.35	848.17
77.899	.00	.00	849.20	1710.00	856.91	7.71	.07	.01	856.98	-.10	227.52	1050.98
77.899	.00	.00	849.20	1950.00	857.33	8.13	.07	.01	857.40	-.10	228.53	1146.35
77.899	.00	.00	849.20	2550.00	858.18	8.98	.09	.02	858.27	-.10	230.61	1343.73
77.999	.00	.00	849.80	1200.00	856.11	6.31	.10	.03	856.21	1.13	84.00	464.24
77.999	.00	.00	849.80	1710.00	857.01	7.21	.16	.04	857.17	1.13	84.00	540.58
77.999	.00	.00	849.80	1950.00	857.43	7.63	.18	.05	857.61	1.13	84.00	575.59
77.999	.00	.00	849.80	2550.00	858.28	8.48	.24	.07	858.52	1.13	84.00	647.02
78.000	862.60	860.40	849.80	1200.00	856.11	6.31	.10	.00	856.21	.00	84.00	463.83
78.000	862.60	860.40	849.80	1710.00	857.01	7.21	.16	.00	857.17	.00	84.00	534.63
78.000	862.60	860.40	849.80	1950.00	857.43	7.63	.18	.00	857.61	.00	84.00	565.72
78.000	862.60	860.40	849.80	2550.00	858.27	8.47	.26	.01	858.53	.00	84.00	626.66
78.005	862.60	860.40	849.80	1200.00	856.11	6.31	.10	.00	856.21	.00	84.00	464.35
78.005	862.60	860.40	849.80	1710.00	857.02	7.22	.16	.00	857.18	.00	84.00	535.14
78.005	862.60	860.40	849.80	1950.00	857.43	7.63	.18	.00	857.62	.00	84.00	566.16
78.005	862.60	860.40	849.80	2550.00	858.28	8.48	.26	.00	858.54	.00	84.00	626.88
78.006	.00	.00	849.80	1200.00	856.11	6.31	.10	.00	856.21	.00	86.00	467.79
78.006	.00	.00	849.80	1710.00	857.03	7.23	.15	.00	857.18	.00	86.00	545.86
78.006	.00	.00	849.80	1950.00	857.45	7.65	.17	.00	857.62	.00	86.00	582.06
78.006	.00	.00	849.80	2550.00	858.31	8.51	.23	.01	858.54	.00	86.00	656.80

FORM 1411 1, GR
PRINTED IN U.S.A.

SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	K*CHSL	TOPWID	AREA
78.045	.00	.00	849.70	1200.00	856.22	6.52	.07	.01	856.29	-.48	278.31	665.59
78.045	.00	.00	849.70	1710.00	857.19	7.49	.08	.02	857.27	-.48	292.85	942.41
78.045	.00	.00	849.70	1950.00	857.63	7.93	.08	.03	857.71	-.48	295.00	1073.55
78.045	.00	.00	849.70	2550.00	858.57	8.87	.09	.04	858.66	-.48	295.00	1348.55
78.283	.00	.00	849.50	1200.00	856.51	7.01	.07	.00	856.58	-.16	334.72	846.08
78.283	.00	.00	849.50	1710.00	857.48	7.98	.08	.00	857.56	-.16	352.34	1182.63
78.283	.00	.00	849.50	1950.00	857.92	8.42	.08	.00	858.00	-.16	355.98	1337.25
78.283	.00	.00	849.50	2550.00	858.84	9.34	.09	.00	858.93	-.16	363.70	1670.79
78.522	.00	.00	850.00	1200.00	856.78	6.78	.05	.01	856.83	.40	451.98	1045.06
78.522	.00	.00	850.00	1710.00	857.75	7.75	.05	.01	857.80	.40	454.41	1484.61
78.522	.00	.00	850.00	1950.00	858.19	8.19	.05	.01	858.23	.40	455.48	1680.02
78.522	.00	.00	850.00	2550.00	859.11	9.11	.05	.01	859.16	.40	457.79	2101.52
78.819	.00	.00	850.00	1200.00	857.11	7.11	.09	.02	857.20	.00	241.67	575.42
78.819	.00	.00	850.00	1710.00	858.05	8.05	.11	.03	858.16	.00	293.48	839.59
78.819	.00	.00	850.00	1950.00	858.47	8.47	.11	.03	858.58	.00	294.89	963.68
78.819	.00	.00	850.00	2550.00	859.37	9.37	.12	.03	859.49	.00	297.93	1233.86
79.018	.00	.00	850.50	1200.00	857.36	6.86	.03	.02	857.40	.48	283.12	1036.11
79.018	.00	.00	850.50	1710.00	858.33	7.83	.05	.02	858.38	.48	289.34	1315.01
79.018	.00	.00	850.50	1950.00	858.74	8.24	.05	.02	858.79	.48	291.99	1435.30
79.018	.00	.00	850.50	2550.00	859.65	9.15	.06	.02	859.71	.48	297.76	1702.03
79.369	.00	.00	850.10	1200.00	857.55	7.45	.03	.00	857.59	-.22	282.79	999.42
79.369	.00	.00	850.10	1710.00	858.55	8.45	.05	.00	858.59	-.22	341.23	1306.46
79.369	.00	.00	850.10	1950.00	858.97	8.87	.05	.00	859.02	-.22	369.29	1456.16
79.369	.00	.00	850.10	2550.00	859.89	9.79	.06	.00	859.95	-.22	430.81	1825.75
79.600	.00	.00	850.60	1200.00	857.67	7.07	.03	.00	857.70	.41	319.51	1080.65
79.600	.00	.00	850.60	1710.00	858.68	8.08	.04	.00	858.72	.41	353.76	1424.44
79.600	.00	.00	850.60	1950.00	859.11	8.51	.04	.00	859.15	.41	362.28	1576.92
79.600	.00	.00	850.60	2550.00	860.04	9.44	.05	.00	860.09	.41	380.72	1924.14
79.861	.00	.00	851.20	1200.00	857.81	6.61	.04	.01	857.86	.43	124.00	709.03
79.861	.00	.00	851.20	1710.00	858.83	7.63	.07	.01	858.90	.43	124.00	836.08
79.861	.00	.00	851.20	1950.00	859.27	8.07	.08	.02	859.34	.43	124.00	889.48
79.861	.00	.00	851.20	2550.00	860.21	9.01	.10	.03	860.31	.43	124.00	1005.91
79.862	863.00	863.10	851.20	1200.00	857.79	6.59	.09	.02	857.88	.00	106.04	500.62
79.862	863.00	863.10	851.20	1710.00	858.81	7.61	.12	.03	858.93	.00	118.02	609.63
79.862	863.00	863.10	851.20	1950.00	859.24	8.04	.14	.03	859.37	.00	123.06	659.16
79.862	863.00	863.10	851.20	2550.00	860.18	8.98	.17	.03	860.34	.00	127.00	772.18
79.869	863.00	863.10	851.20	1200.00	857.79	6.59	.09	.00	857.88	.00	106.10	501.16
79.869	863.00	863.10	851.20	1710.00	858.81	7.61	.12	.00	858.94	.00	118.10	610.36
79.869	863.00	863.10	851.20	1950.00	859.24	8.04	.14	.00	859.38	.00	123.14	659.97
79.869	863.00	863.10	851.20	2550.00	860.18	8.98	.17	.00	860.35	.00	127.03	773.12
79.870	.00	.00	851.20	1200.00	857.85	6.65	.04	.01	857.90	.00	126.00	722.29
79.870	.00	.00	851.20	1710.00	858.89	7.69	.06	.02	858.95	.00	126.00	852.93
79.870	.00	.00	851.20	1950.00	859.33	8.13	.07	.02	859.40	.00	126.00	907.71
79.870	.00	.00	851.20	2550.00	860.28	9.08	.10	.02	860.37	.00	126.00	1027.67

SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	DLOSS	EG	K*CHSL	TOPWID	AREA
79.886	.00	.00	851.60	1200.00	857.87	6.27	.04	.00	857.91	4.49	233.54	795.93
79.886	.00	.00	851.60	1710.00	858.92	7.32	.05	.00	858.97	4.49	246.86	1049.84
79.886	.00	.00	851.60	1950.00	859.37	7.77	.05	.01	859.42	4.49	250.24	1161.76
79.886	.00	.00	851.60	2550.00	860.34	8.74	.06	.01	860.40	4.49	256.52	1408.87
80.145	.00	.00	852.60	1190.00	858.12	5.52	.05	.00	858.17	.73	262.44	760.71
80.145	.00	.00	852.60	1700.00	859.16	6.56	.06	.00	859.22	.73	283.28	1045.04
80.145	.00	.00	852.60	1930.00	859.60	7.00	.06	.00	859.66	.73	291.92	1169.28
80.145	.00	.00	852.60	2510.00	860.57	7.97	.06	.00	860.63	.73	310.06	1464.17
80.459	.00	.00	851.70	1180.00	858.23	6.53	.00	.01	858.23	-.54	460.00	2743.09
80.459	.00	.00	851.70	1680.00	859.28	7.58	.00	.02	859.28	-.54	460.00	3227.35
80.459	.00	.00	851.70	1905.00	859.72	8.02	.00	.02	859.72	-.54	460.00	3429.96
80.459	.00	.00	851.70	2465.00	860.69	8.99	.01	.02	860.70	-.54	460.00	3878.10
80.560	.00	.00	849.60	1020.00	858.23	8.63	.00	.00	858.23	-3.96	500.00	2518.51
80.560	.00	.00	849.60	1450.00	859.29	9.69	.00	.00	859.29	-3.96	500.00	3045.43
80.560	.00	.00	849.60	1680.00	859.73	10.13	.00	.00	859.73	-3.96	500.00	3265.81
80.560	.00	.00	849.60	2140.00	860.70	11.10	.01	.00	860.71	-3.96	500.00	3753.49
80.925	.00	.00	849.80	1020.00	858.26	8.46	.01	.00	858.27	.10	400.00	1697.80
80.925	.00	.00	849.80	1450.00	859.32	9.52	.01	.00	859.33	.10	400.00	2120.11
80.925	.00	.00	849.80	1680.00	859.76	9.96	.01	.00	859.77	.10	400.00	2297.00
80.925	.00	.00	849.80	2140.00	860.74	10.94	.02	.01	860.75	.10	400.00	2687.46

SUMMARY OF ERRORS

00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: Hamburg Twp.

3) WATERCOURSE: Huron River
STRAWBERRY LK to
CORP LIMITS

4) DOCUMENT TYPE: 100 year FLOOD

00BREAK00

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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
*****************************************************

T1       HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2       100-YEAR FLOW - STRAWBERRY LAKE TO CORPORATE LIMITS
T3       HURON RIVER - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

    -10.       4.        0.        0.    .000000      .00       .0        0.    856.160    .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     3.000     .000    -1.000     .000      .000      .800      .000      .000      .000      .000

*PROF 3

CCHV=     .300 CEHV=     .500
*SECNO 76.798
   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=     625.0     1145.0  TYPE=     1  TARGET=     520.000

          VALLEY SECTION 20   (O)

    76.80     10.66    856.16      .00    856.16    856.22      .06       .00       .00    853.30
    2200.     210.     1632.     358.     378.      748.      869.       0.        0.     852.20
      .00      .56      2.18      .41      .048      .032      .100      .000    845.50    625.00
  .000134      0.        0.        0.       0         0         0       .00     520.00   1145.00


*SECNO 77.030
3470 ENCROACHMENT STATIONS=     300.0     1200.0  TYPE=     1  TARGET=     900.000

          VALLEY SECTION 21   (P)

    77.03      8.84    856.34      .00       .00    856.36      .02       .14       .01    852.60
    2200.     473.     1228.     499.     1533.     757.     1194.      80.       21.     852.20
      .32      .31      1.62      .42      .100      .032      .080      .031    847.50    300.00
  .000090    1420.     1220.    1180.       0         0         0       .00     900.00   1200.00


*SECNO 77.232
3470 ENCROACHMENT STATIONS=    1200.0     2200.0  TYPE=     1  TARGET=    1000.000
    77.23      7.94    856.44      .00       .00    856.49      .04       .12       .01    853.60
    2200.     810.     1369.      22.     2223.     662.       32.      142.       39.     853.20
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      .51       .36      2.07       .67      .100      .032      .048      .033    848.50   1200.00
  .000175      780.     1070.      760.         0         0         0       .00   1000.00   2200.00

*SECNO 77.353

3470 ENCROACHMENT STATIONS=     230.0     720.0  TYPE=     1  TARGET=     490.000

          VALLEY SECTION 22   (Q)

    77.35      7.47    856.57       .00       .00    856.61       .05       .12       .00    852.90
    1950.      419.     1454.       77.     1061.     735.      116.      193.       56.    853.90
      .64       .39      1.98       .67      .100      .032      .048      .032    849.10    230.00
  .000151     1060.      640.      640.         1         0         0       .00    490.00    720.00

*SECNO 77.499
   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=     290.0     500.0  TYPE=     1  TARGET=     210.000

          VALLEY SECTION 23   (R)

    77.50      9.99    856.69       .00       .00    856.80       .11       .15       .03    853.10
    1950.      119.     1831.        0.      259.     666.        0.      220.       62.    857.70
      .73       .46      2.75       .00      .100      .032      .048      .032    846.70    290.00
  .000263      910.      770.      570.         0         0         0       .00    192.98    482.98

*SECNO 77.566

3470 ENCROACHMENT STATIONS=     562.0     626.0  TYPE=     1  TARGET=      64.000
    77.57      8.36    856.76       .00       .00    857.00       .24       .14       .07100000.00
    1950.        0.     1950.        0.        0.     495.        0.      226.       63. 100000.00
      .75       .00      3.94       .00      .100      .032      .048      .032    848.40    562.00
  .000603      400.      353.      420.         1         0         0       .00     64.00    626.00

*SECNO 77.567

3370 NORMAL BRIDGE,NRD= 12 MIN ELTRD=  861.00 MAX ELLC=  858.80

          BRIDGE SECTION 4 - ANN ARBOR RAILROAD - D/S FACE   (S)

    77.57      8.35    856.75       .00       .00    857.01       .26       .00       .01    858.80
    1950.        0.     1950.        0.        0.     473.        0.      226.       63.    858.80
      .75       .00      4.12       .00      .032      .020      .032      .032    848.40    300.00
  .000274        1.        1.        1.         1         0         0       .00     64.00    364.00

*SECNO 77.569

          BRIDGE SECTION 4 - ANN ARBOR RAILROAD - U/S FACE   (S)
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    77.57      8.25    856.75       .00       .00    857.02       .27       .00       .00    858.80
    1950.        0.     1950.        0.        0.      467.        0.      226.       63.    858.80
      .75       .00      4.18       .00      .032      .020      .032      .032    848.50    300.00
  .000285       16.       16.       16.         0         0         0       .00     64.00    364.00


*SECNO 77.570

3470 ENCROACHMENT STATIONS=      561.0      627.0  TYPE=      1  TARGET=      66.000
    77.57      8.30    856.80       .00       .00    857.03       .23       .00       .01100000.00
    1950.        0.     1950.        0.        0.      504.        0.      226.       63. 100000.00
      .75       .00      3.87       .00      .080      .032      .048      .032    848.50    561.00
  .000585        1.        1.        1.         2         0         0       .00     66.00    627.00


*SECNO 77.602
   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=      554.0      672.0  TYPE=      1  TARGET=     118.000
    77.60      8.65    857.05       .00       .00    857.12       .08       .05       .05    852.20
    1950.       13.     1937.        0.       29.      869.        0.      229.       64. 100000.00
      .77       .45      2.23       .00      .080      .032      .048      .032    848.40    554.00
  .000160      180.      176.      200.         2         0         0       .00    118.00    672.00


*SECNO 77.603

3370 NORMAL BRIDGE,NRD= 44 MIN ELTRD=  860.00 MAX ELLC=  857.90


          BRIDGE SECTION 5 - ABANDONED GRAND TRUNK RAILROAD - D/S FACE   (T)

    77.60      8.64    857.04       .00       .00    857.14       .10       .00       .01    860.30
    1950.        0.     1950.        0.        0.      781.        0.      229.       64.    860.10
      .77       .00      2.50       .00      .032      .020      .032      .032    848.40    300.00
  .000253        1.        1.        1.         1         0         0    -68.14    118.00    418.00


*SECNO 77.605

3370 NORMAL BRIDGE,NRD= 44 MIN ELTRD=  860.00 MAX ELLC=  857.90


          BRIDGE SECTION 5 - ABANDONED GRAND TRUNK RAILROAD - U/S FACE   (T)

    77.61      8.64    857.04       .00       .00    857.14       .10       .00       .00    860.30
    1950.        0.     1950.        0.        0.      781.        0.      229.       64.    860.10
      .78       .00      2.50       .00      .032      .020      .032      .032    848.40    300.00
  .000253       12.       12.       12.         0         0         0    -68.12    118.00    418.00


*SECNO 77.606

3470 ENCROACHMENT STATIONS=      553.0      673.0  TYPE=      1  TARGET=     120.000
    77.61      8.67    857.07       .00       .00    857.14       .07       .00       .01    852.20
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  1950.      26.    1923.      1.      34.     871.      4.     229.      64.    853.20
   .78       .77     2.21     .19     .048     .032    .080     .032   848.40   553.00
 .000150      1.       1.      1.       2        0       0      .00   120.00   673.00


*SECNO 77.717

3470 ENCROACHMENT STATIONS=        .0     500.0  TYPE=     1  TARGET=     499.999

          VALLEY SECTION 24   (U)

  77.72     7.89   857.19     .00      .00   857.24     .05      .09      .01   853.20
  1950.      20.    1450.    480.      35.     739.   1029.     249.      68.   853.20
   .88       .56     1.96     .47     .048     .032    .080     .031   849.30    52.38
 .000137    560.     589.    690.       0        0       0      .00   447.62   500.00


*SECNO 77.899
   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=        .0     275.0  TYPE=     1  TARGET=     274.999

          VALLEY SECTION 25   (V)

  77.90     8.13   857.33     .00      .00   857.40     .07      .15      .01   853.80
  1950.       5.    1730.    215.      15.     756.    375.     279.      75.   853.70
   1.01      .35     2.29     .57     .080     .032    .080     .032   849.20    46.47
 .000190    980.     960.    820.       0        0       0      .00   228.53   275.00


*SECNO 77.999

3470 ENCROACHMENT STATIONS=      60.0     144.0  TYPE=     1  TARGET=      84.000
  78.00     7.63   857.43     .00      .00   857.61     .18      .15      .05100000.00
  1950.       0.    1950.      0.       0.     576.      0.     289.      77. 100000.00
   1.05      .00     3.39     .00     .080     .032    .080     .032   849.80    60.00
 .000479    550.     533.    500.       1        0       0      .00    84.00   144.00


*SECNO 78.000

3370 NORMAL BRIDGE,NRD= 26 MIN ELTRD=  862.60 MAX ELLC=  860.40

          BRIDGE SECTION 6 - M-36 BRIDGE - D/S FACE   (W)

  78.00     7.63   857.43     .00      .00   857.61     .18      .00      .00   863.50
  1950.       0.    1950.      0.       0.     566.      0.     289.      77.   863.50
   1.05      .00     3.45     .00     .024     .020    .024     .032   849.80   225.00
 .000217      1.       1.      1.       0        0       0   -10.84    84.00   309.00


*SECNO 78.005

3370 NORMAL BRIDGE,NRD= 26 MIN ELTRD=  862.60 MAX ELLC=  860.40
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        BRIDGE SECTION 6 - M-36 BRIDGE - U/S FACE   (W)

    78.00      7.63   857.43      .00      .00   857.62      .18      .01      .00   863.50
    1950.        0.    1950.       0.       0.     566.       0.     290.      77.   863.50
     1.05       .80     3.44      .00     .024     .020     .024     .032   849.80   225.00
  .000217       26.      26.      26.        0        0        0   -10.90    84.00   309.00

 *SECNO 78.006

 3470 ENCROACHMENT STATIONS=      235.0     321.0  TYPE=     1  TARGET=      86.000
    78.01      7.65   857.45      .00      .00   857.62      .17      .00      .00100000.00
    1950.        0.    1950.       0.       0.     582.       0.     290.      77. 100000.00
     1.05       .00     3.35      .00     .056     .032     .048     .032   849.80   235.00
  .000480        1.       1.       1.        1        0        0      .00    86.00   321.00

 *SECNO 78.045
    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=       75.0     370.0  TYPE=     1  TARGET=     295.000

        VALLEY SECTION 26   (X)

    78.05      7.93   857.63      .00      .00   857.71      .08      .07      .03   855.20
    1950.      199.    1723.     28.     306.     717.     50.     294.      78.   856.20
     1.08       .65     2.40      .55     .056     .032     .048     .032   849.70    75.00
  .000225      210.     209.     210.        2        0        0      .00   295.00   370.00

 1490 NH CARD USED
 *SECNO 78.283

 3470 ENCROACHMENT STATIONS=      620.0    1110.0  TYPE=     1  TARGET=    -620.000

        VALLEY SECTION 27   (Y)

    78.28      8.42   857.92      .00      .00   858.00      .08      .28      .00   855.30
    1950.       46.    1501.    402.     69.     587.    681.     328.      87.   853.70
     1.24       .67     2.56      .59     .048     .032     .079     .032   849.50   620.00
  .000228     1270.    1260.    1120.        2        0        0      .00   355.98   975.98

 1490 NH CARD USED
 *SECNO 78.522

 3470 ENCROACHMENT STATIONS=      890.0    1380.0  TYPE=     1  TARGET=    -890.000

        VALLEY SECTION 28   (Z)

    78.52      8.19   858.19      .00      .00   858.23      .05      .23      .01   853.80
    1950.      521.    1393.     35.     954.     672.     54.     371.      98.   854.00
     1.45       .55     2.07      .66     .068     .032     .056     .032   850.00   890.00
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 .000148   1260.    1260.    1240.       1        0        0      .00   455.48  1345.48


*SECNO 78.819

3470 ENCROACHMENT STATIONS=     880.0    1210.0  TYPE=     1  TARGET=    -880.000

          VALLEY SECTION 29   (AA)

   78.82     8.47   858.47      .00      .00   858.58      .11      .31      .03   854.70
   1950.      268.    1681.       1.     370.     590.       4.     414.     110.   857.00
    1.62      .72     2.85      .37     .056     .032     .056     .032   850.00   880.00
 .000312    1270.    1570.    1650.        0        0        0      .00   294.89  1174.89


1490 NH CARD USED
*SECNO 79.018

3470 ENCROACHMENT STATIONS=       .0     350.0  TYPE=     1  TARGET=     349.999

          VALLEY SECTION 30   (AB)

   79.02     8.24   858.74      .00      .00   858.79      .05      .20      .02   855.30
   1950.      11.    1693.     246.      38.     884.     514.     443.     117.   854.40
    1.79      .30     1.92      .48     .080     .032     .080     .032   850.50    58.01
 .000126    1010.    1050.    1050.        2        0        0      .00   291.99   350.00


*SECNO 79.369
   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


          VALLEY SECTION 31   (AC)

   79.37     8.87   858.97      .00      .00   859.02      .05      .22      .00   854.90
   1950.       3.    1743.     204.      13.     911.     532.     503.     130.   854.30
    2.08      .23     1.91      .38     .100     .032     .080     .032   850.10    33.52
 .000117    1950.    1850.    1740.        2        0        0      .00   369.29   402.81


1490 NH CARD USED
*SECNO 79.600

          VALLEY SECTION 32   (AD)

   79.60     8.51   859.11      .00      .00   859.15      .04      .13      .00   854.90
   1950.     141.    1754.      56.     406.    1013.     158.     545.     140.   854.60
    2.29      .35     1.73      .35     .080     .032     .080     .032   850.60   108.86
 .000096    1300.    1220.    1100.        0        0        0      .00   362.28   471.14


*SECNO 79.861

3470 ENCROACHMENT STATIONS=      88.0     212.0  TYPE=     1  TARGET=     124.000
   79.86     8.07   859.27      .00      .00   859.34      .08      .18      .02   855.20
   1950.       2.    1948.       0.       8.     882.       0.     584.     148. 100000.00
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     2.47       .30      2.21       .00      .080      .032      .056      .032    851.20     88.00
  .000174     1440.     1384.     1350.         1         0         0       .00    124.00    212.00

*SECNO 79.862

3370 NORMAL BRIDGE,NRD= 15 MIN ELTRD=  863.00 MAX ELLC=  863.10

          BRIDGE SECTION 7 - WINANS LAKE ROAD - D/S FACE   (AE)

          U.S.G.S. GAGING STATION LOCATED AT DOWNSTREAM FACE OF BRIDGE.

    79.86      8.04    859.24       .00       .00    859.37       .14       .00       .03    867.20
     1950.        0.     1950.        0.        0.     659.        0.      584.      148.    865.70
     2.47       .00      2.96       .00      .032      .020      .032      .032    851.20    106.42
  .000221        1.        1.        1.         2         0         0    -37.43    123.06    229.48

*SECNO 79.869

3370 NORMAL BRIDGE,NRD= 15 MIN ELTRD=  863.00 MAX ELLC=  863.10

          BRIDGE SECTION 7 - WINANS LAKE ROAD - U/S FACE   (AE)

          U.S.G.S. GAGING STATION LOCATED AT DOWNSTREAM FACE OF BRIDGE

    79.87      8.04    859.24       .00       .00    859.38       .14       .01       .00    867.20
     1950.        0.     1950.        0.        0.     660.        0.      585.      148.    865.70
     2.47       .00      2.95       .00      .032      .020      .032      .032    851.20    106.39
  .000220       35.       35.       35.         0         0         0    -37.46    123.14    229.53

*SECNO 79.870
   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=      87.0      213.0  TYPE=      1  TARGET=     126.000
    79.87      8.13    859.33       .00       .00    859.40       .07       .00       .02    855.20
     1950.        9.     1941.        0.       12.     896.        0.      585.      148. 100000.00
     2.47       .73      2.17       .00      .040      .034      .040      .032    851.20     87.00
  .000182        1.        1.        1.         2         0         0       .00    126.00    213.00

*SECNO 79.886

3470 ENCROACHMENT STATIONS=        .0      300.0  TYPE=      1  TARGET=     299.999

          VALLEY SECTION 33   (AF)

    79.89      7.77    859.37       .00       .00    859.42       .05       .01       .01    855.60
     1950.       69.     1704.      178.       84.     867.      211.      587.      149.    855.70
     2.48       .82      1.97       .84      .040      .034      .040      .032    851.60     49.76
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 .000153      90.      89.      90.       2       0       0     .00   250.24   300.00


*SECNO 80.145

3470 ENCROACHMENT STATIONS=     100.0     780.0  TYPE=     1  TARGET=   -100.000


          VALLEY SECTION 34   (AG)

    80.14     7.00   859.60      .00      .00   859.66      .06      .24      .00   855.50
    1930.     263.    1516.     151.     304.     704.     161.     623.     157.   856.10
     2.68      .87     2.15      .94     .048     .034     .048     .032   852.60   146.06
 .000203    1400.    1370.    1260.       1       0       0      .00   291.92   437.98


*SECNO 80.459

3470 ENCROACHMENT STATIONS=     100.0     560.0  TYPE=     1  TARGET=    460.000

          VALLEY SECTION 35   (AH)

    80.46     8.02   859.72      .00      .00   859.72      .00      .05      .02   855.00
    1905.       0.    1905.       0.       0.    3430.       0.     710.     171. 100000.00
     3.51      .00      .56      .00     .040     .034     .040     .032   851.70   100.00
 .000011    1350.    1660.    1800.       2       0       0      .00   460.00   560.00


*SECNO 80.560
3280 CROSS SECTION      80.56 EXTENDED        .93 FEET


3470 ENCROACHMENT STATIONS=     100.0     600.0  TYPE=     1  TARGET=    500.000

          VALLEY SECTION 36   (AI)

    80.56    10.13   859.73      .00      .00   859.73      .00      .01      .00   855.10
    1680.       0.    1680.       0.       0.    3266.       0.     751.     177. 100000.00
     3.79      .00      .51      .00     .040     .034     .080     .032   849.60   100.00
 .000011     520.     530.     570.       2       0       0      .00   500.00   600.00


*SECNO 80.925
   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=     200.0     600.0  TYPE=     1  TARGET=    400.000

          VALLEY SECTION 37   (AJ)

    80.93     9.96   859.76      .00      .00   859.77      .01      .04      .00   855.00
    1680.      49.     977.     654.     159.     842.    1296.     876.     197.   854.30
     4.41      .31     1.16      .50     .080     .032     .056     .032   849.80   200.00
 .000042    1330.    1930.    2160.       1       0       0      .00   400.00   600.00
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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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T1       HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2       500-YEAR FLOW - STRAWBERRY LAKE TO CORPORATE LIMITS
T3       HURON RIVER - PROJECT MANAGER, N.S.CHENG

J1   ICHECK     INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

     -10.        5.        0.        0.    .000000      .00       .0        0.    856.770    .000

J2   NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     15.000     .000    -1.000     .000      .000      .800      .000      .000      .000      .000

*PROF 4

CCHV=     .300 CEHV=     .500
*SECNO 76.798
   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=     625.0    1145.0  TYPE=     1  TARGET=     520.000

          VALLEY SECTION 20   (O)

    76.80     11.27    856.77      .00    856.77    856.84      .07       .00       .00    853.30
    2850.      360.     1991.     499.     500.      802.     1010.       0.        0.     852.20
      .00       .72      2.48      .49      .048      .032      .100      .000    845.50    625.00
  .000158       0.        0.        0.       0         0         0        .00    520.00   1145.00

*SECNO 77.030

3470 ENCROACHMENT STATIONS=     300.0    1200.0  TYPE=     1  TARGET=     900.000

          VALLEY SECTION 21   (P)

    77.03      9.48    856.98      .00       .00    857.01      .03       .15       .01    852.60
    2850.      672.     1493.     686.    1834.      825.     1401.      93.       21.     852.20
      .30       .37      1.81      .49      .100      .032      .080      .031    847.50    300.00
  .000100    1420.     1220.    1180.       0         0         0        .00    900.00   1200.00

*SECNO 77.232

3470 ENCROACHMENT STATIONS=    1200.0    2200.0  TYPE=     1  TARGET=    1000.000
    77.23      8.59    857.09      .00       .00    857.14      .04       .12       .01    853.60
    2850.     1194.     1624.      32.    2799.      731.       42.      167.       39.     853.20
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      .48       .43      2.22       .78      .100      .032      .048      .034   848.50   1200.00
  .000177      780.     1070.      760.         0         0         0       .00  1000.00   2200.00

*SECNO 77.353

3470 ENCROACHMENT STATIONS=      230.0      720.0  TYPE=      1  TARGET=      490.000

          VALLEY SECTION 22   (Q)

    77.35      8.12    857.22       .00       .00    857.28       .06       .14       .01    852.90
    2550.      609.     1819.      122.     1280.     810.      148.      229.       56.    853.90
      .60       .48      2.25       .83      .100      .032      .048      .032   849.10   230.00
  .000171     1060.      640.      640.         2         0         0       .00   490.00   720.00

*SECNO 77.499
   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=      290.0      500.0  TYPE=      1  TARGET=      210.000

          VALLEY SECTION 23   (R)

    77.50     10.66    857.36       .00       .00    857.51       .15       .18       .05    853.10
    2550.      193.     2357.        0.      325.     728.        0.      260.       62.    857.70
      .67       .59      3.24       .00      .100      .032      .048      .032   846.70   290.00
  .000331      910.      770.      570.         0         0         0       .00   194.30   484.30

*SECNO 77.566

3470 ENCROACHMENT STATIONS=      562.0      626.0  TYPE=      1  TARGET=       64.000
    77.57      9.03    857.43       .00       .00    857.78       .35       .17       .10100000.00
    2550.        0.     2550.        0.        0.     538.        0.      267.       63. 100000.00
      .70       .00      4.74       .00      .100      .032      .048      .032   848.40   562.00
  .000801      400.      353.      420.         2         0         0       .00    64.00   626.00

*SECNO 77.567

3370 NORMAL BRIDGE,NRD= 12 MIN ELTRD=  861.00 MAX ELLC=  858.80

          BRIDGE SECTION 4 - ANN ARBOR RAILROAD - D/S FACE   (S)

    77.57      9.02    857.42       .00       .00    857.79       .38       .00       .02    858.80
    2550.        0.     2550.        0.        0.     516.        0.      267.       63.    858.80
      .70       .00      4.94       .00      .032      .020      .032      .032   848.40   300.00
  .000358        1.        1.        1.         1         0         0       .00    64.00   364.00

*SECNO 77.569

          BRIDGE SECTION 4 - ANN ARBOR RAILROAD - U/S FACE   (S)
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    77.57      8.92    857.42      .00      .00   857.81      .39      .01      .00   858.80
    2550.        0.     2550.       0.       0.     510.       0.     267.      63.    858.80
      .70       .00      5.00      .00     .032     .020     .032     .032   848.50   300.00
  .000372       16.       16.      16.        0        0        0      .00    64.00   364.00


*SECNO 77.570

3470 ENCROACHMENT STATIONS=     561.0     627.0  TYPE=     1  TARGET=     66.000
    77.57      8.99    857.49      .00      .00   857.82      .33      .00      .02100000.00
    2550.        0.     2550.       0.       0.     549.       0.     267.      63. 100000.00
      .70       .00      4.64      .00     .080     .032     .048     .031   848.50   561.00
  .000767        1.        1.       1.        2        0        0      .00    66.00   627.00


*SECNO 77.602
   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=     554.0     672.0  TYPE=     1  TARGET=    118.000
    77.60      9.44    857.84      .00      .00   857.95      .11      .06      .07   852.20
    2550.       18.     2532.       0.       34.    958.       0.     270.      64. 100000.00
      .72       .53      2.64      .00     .080     .032     .048     .032   848.40   554.00
  .000200      180.      176.     200.        2        0        0      .00   118.00   672.00


*SECNO 77.603

3370 NORMAL BRIDGE,NRD= 44 MIN ELTRD=  860.00 MAX ELLC=  857.90


          BRIDGE SECTION 5 - ABANDONED GRAND TRUNK RAILROAD - D/S FACE   (T)

    77.60      9.43    857.83      .00      .00   857.97      .14      .00      .01   860.30
    2550.        0.     2550.       0.       0.     863.       0.     270.      64.    860.10
      .72       .00      2.96      .00     .032     .020     .032     .031   848.40   300.00
  .000454        1.        1.       1.        1        0        0   -80.52   118.00   418.00


*SECNO 77.605

3370 NORMAL BRIDGE,NRD= 44 MIN ELTRD=  860.00 MAX ELLC=  857.90


          BRIDGE SECTION 5 - ABANDONED GRAND TRUNK RAILROAD - U/S FACE   (T)

    77.61      9.44    857.84      .00      .00   857.97      .14      .01      .00   860.30
    2550.        0.     2550.       0.       0.     863.       0.     271.      64.    860.10
      .72       .00      2.96      .00     .032     .020     .032     .031   848.40   300.00
  .000454       12.       12.      12.        0        0        0   -80.28   118.00   418.00


*SECNO 77.606

3470 ENCROACHMENT STATIONS=     553.0     673.0  TYPE=     1  TARGET=    120.000
    77.61      9.48    857.88      .00      .00   857.98      .10      .00      .01   852.20
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   2550.      36.    2513.      1.      40.     961.      5.     271.     64.    853.20
    .72       .90     2.61     .22     .048     .032    .080     .031   848.40   553.00
 .000184      1.       1.      1.       2        0       0      .00    120.00   673.00


*SECNO 77.717

3470 ENCROACHMENT STATIONS=        .0      500.0  TYPE=     1  TARGET=     499.999

          VALLEY SECTION 24   (U)

   77.72     8.74   858.04     .00      .00   858.09     .05     .10      .02   853.20
   2550.      34.    1791.    725.      52.    829.    1303.    294.      68.   853.20
    .82       .65     2.16     .56     .048     .032    .080     .031   849.30    48.64
 .000142     560.     589.    690.       2        0       0      .00   451.36   500.00


*SECNO 77.899
   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=        .0      275.0  TYPE=     1  TARGET=     274.999

          VALLEY SECTION 25   (V)

   77.90     8.98   858.18     .00      .00   858.27     .09     .16      .02   853.80
   2550.      10.    2215.    325.      23.    852.     469.    330.      75.   853.70
    .93       .43     2.60     .69     .080     .032    .080     .032   849.20    44.39
 .000209     980.     960.    820.       1        0       0      .00   230.61   275.00


*SECNO 77.999

3470 ENCROACHMENT STATIONS=       60.0      144.0  TYPE=     1  TARGET=      84.000
   78.00     8.48   858.28     .00      .00   858.52     .24     .17      .07100000.00
   2550.       0.    2550.      0.       0.    647.       0.    342.      77. 100000.00
    .96       .00     3.94     .00     .080     .032    .080     .032   849.80    60.00
 .000568     550.     533.    500.       0        0       0      .00    84.00   144.00


*SECNO 78.000

3370 NORMAL BRIDGE,NRD= 26 MIN ELTRD=  862.60 MAX ELLC=  860.40

          BRIDGE SECTION 6 - M-36 BRIDGE - D/S FACE   (W)

   78.00     8.47   858.27     .00      .00   858.53     .26     .00      .01   863.50
   2550.       0.    2550.      0.       0.    627.       0.    342.      77.   863.50
    .96       .00     4.07     .00     .024     .020    .024     .032   849.80   225.00
 .000279       1.       1.      1.       0        0       0   -21.19    84.00   309.00


*SECNO 78.005

3370 NORMAL BRIDGE,NRD= 26 MIN ELTRD=  862.60 MAX ELLC=  860.40
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        BRIDGE SECTION 6 - M-36 BRIDGE - U/S FACE   (W)

    78.00      8.48    858.28       .00       .00    858.54       .26       .01       .00    863.50
    2550.        0.     2550.        0.        0.      627.        0.      342.       77.    863.50
      .97       .00      4.07       .00      .024      .020      .024      .032    849.80    225.00
  .000279       26.       26.       26.         0         0         0    -21.24     84.00    309.00

 *SECNO 78.006

 3470 ENCROACHMENT STATIONS=      235.0      321.0  TYPE=      1  TARGET=      86.000
    78.01      8.51    858.31       .00       .00    858.54       .23       .00       .01100000.00
    2550.        0.     2550.        0.        0.      657.        0.      342.       77. 100000.00
      .97       .00      3.88       .00      .056      .032      .048      .032    849.80    235.00
  .000561        1.        1.        1.         2         0         0       .00     86.00    321.00

 *SECNO 78.045
    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=       75.0      370.0  TYPE=      1  TARGET=     295.000

        VALLEY SECTION 26   (X)

    78.05      8.87    858.57       .00       .00    858.66       .09       .07       .04    855.20
    2550.      360.     2123.       67.      442.      820.       87.      347.       78.    856.20
      .99       .81      2.59       .77      .056      .032      .048      .032    849.70     75.00
  .000219      210.      209.      210.         2         0         0       .00    295.00    370.00

 1490 NH CARD USED
 *SECNO 78.283

 3470 ENCROACHMENT STATIONS=      620.0     1110.0  TYPE=      1  TARGET=    -620.000

        VALLEY SECTION 27   (Y)

    78.28      9.34    858.84       .00       .00    858.93       .09       .28       .00    855.30
    2550.       92.     1828.      630.      106.      664.      901.      389.       87.    853.70
     1.15       .87      2.75       .70      .048      .032      .079      .032    849.50    620.00
  .000224     1270.     1260.     1120.         2         0         0       .00    363.70    983.70

 1490 NH CARD USED
 *SECNO 78.522

 3470 ENCROACHMENT STATIONS=      890.0     1380.0  TYPE=      1  TARGET=    -890.000

        VALLEY SECTION 28   (Z)

    78.52      9.11    859.11       .00       .00    859.16       .05       .22       .01    853.80
    2550.      830.     1665.       55.     1268.      760.       74.      443.       99.    854.00
     1.36       .65      2.19       .74      .066      .032      .056      .032    850.00    890.00
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 .000141    1260.    1260.    124..        1        0        0     .00   457.79  1347.79

*SECNO 78.819

3470 ENCROACHMENT STATIONS=     880.0    1210.0  TYPE=     1  TARGET=    -880.000

          VALLEY SECTION 29   (AA)

   78.82     9.37   859.37      .00      .00   859.49      .12      .30      .03   854.70
   2550.      502.    2043.       5.     552.     672.       9.     497.     110.   857.00
    1.52      .91     3.04      .50     .056     .032     .056     .032   850.00   880.00
 .000299    1270.    1570.    1650.        1        0        0     .00   297.93  1177.93

1490 NH CARD USED
*SECNO 79.018

3470 ENCROACHMENT STATIONS=         .0     350.0  TYPE=     1  TARGET=     349.999

          VALLEY SECTION 30   (AB)

   79.02     9.15   859.65      .00      .00   859.71      .06      .20      .02   855.30
   2550.      22.    2155.     373.      60.     997.     645.     532.     117.   854.40
    1.67      .36     2.16      .58     .080     .032     .080     .032   850.50    52.24
 .000137    1010.    1050.    1050.        2        0        0     .00   297.76   350.00

*SECNO 79.369
   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

          VALLEY SECTION 31   (AC)

   79.37     9.79   859.89      .00      .00   859.95      .06      .24      .00   854.90
   2550.       5.    2188.     356.      20.    1024.     782.     606.     132.   854.30
    1.94      .27     2.14      .46     .100     .032     .080     .032   850.10    32.05
 .000125    1950.    1850.    1740.        2        0        0     .00   430.81   462.86

1490 NH CARD USED
*SECNO 79.600

          VALLEY SECTION 32   (AD)

   79.60     9.44   860.04      .00      .00   860.09      .05      .14      .00   854.90
   2550.      243.    2211.      96.     561.    1140.     223.     657.     143.   854.60
    2.13      .43     1.94      .43     .080     .032     .080     .032   850.60    99.52
 .000103    1300.    1220.    1100.        0        0        0     .00   380.72   480.24

*SECNO 79.861

3470 ENCROACHMENT STATIONS=      88.0     212.0  TYPE=     1  TARGET=     124.000
   79.86     9.01   860.21      .00      .00   860.31      .10      .19      .03   855.20
   2550.       3.    2547.       0.      10.     996.       0.     704.     152. 100000.00
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      2.28       .33      2.56       .00       .080      .032      .056      .032    851.20     88.00
   .000199     1440.     1384.     1350.          0         0         0       .00    124.00    212.00

*SECNO 79.862

3370 NORMAL BRIDGE,NRD=  15 MIN ELTRD=  863.00 MAX ELLC=  863.10

          BRIDGE SECTION 7 - WINANS LAKE ROAD - D/S FACE   (AE)

          U.S.G.S. GAGING STATION LOCATED AT DOWNSTREAM FACE OF BRIDGE.

     79.86      8.98    860.18       .00       .00    860.34       .17       .00       .03    867.20
     2550.        0.     2550.        0.        0.     772.        0.      704.      152.    865.70
      2.28       .00      3.30       .00      .032      .020      .032      .032    851.20    103.00
   .000240        1.        1.        1.         2         0         0    -42.13    127.00    230.00

*SECNO 79.869

3370 NORMAL BRIDGE,NRD=  15 MIN ELTRD=  863.00 MAX ELLC=  863.10

          BRIDGE SECTION 7 - WINANS LAKE ROAD - U/S FACE   (AE)

          U.S.G.S. GAGING STATION LOCATED AT DOWNSTREAM FACE OF BRIDGE

     79.87      8.98    860.18       .00       .00    860.35       .17       .01       .00    867.20
     2550.        0.     2550.        0.        0.     773.        0.      705.      152.    865.70
      2.29       .00      3.30       .00      .032      .020      .032      .032    851.20    102.97
   .000239       35.       35.       35.         0         0         0    -42.17    127.03    230.00

*SECNO 79.870
   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=      87.0     213.0  TYPE=     1  TARGET=     126.000
     79.87      9.08    860.28       .00       .00    860.37       .10       .00       .02    855.20
     2550.       12.     2538.        0.       15.     1013.        0.      705.      152. 100000.00
      2.29       .82      2.51       .00      .040      .034      .040      .032    851.20     87.00
   .000209        1.        1.        1.         2         0         0       .00    126.00    213.00

*SECNO 79.886

3470 ENCROACHMENT STATIONS=        .0     300.0  TYPE=     1  TARGET=     299.999

          VALLEY SECTION 33   (AF)

     79.89      8.74    860.34       .00       .00    860.40       .06       .02       .01    855.60
     2550.      124.     2122.      304.      127.      989.      293.      707.      152.    855.70
      2.30       .98      2.15      1.04      .040      .034      .040      .032    851.60     43.47
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 .000153     90.     89.     90.      2      0      0     .00   256.52   300.00

*SECNO 80.145

3470 ENCROACHMENT STATIONS=     100.0     780.0  TYPE=     1  TARGET=    -100.000

          VALLEY SECTION 34   (AG)

   80.14     7.97   860.57     .00     .00   860.63     .06     .23     .00   855.50
   2510.     427.    1851.    232.    432.     813.    219.    752.    161.   856.10
    2.49      .99     2.28    1.06    .048     .034    .048    .032  852.60   132.82
 .000187    1400.   1370.   1260.       1        0       0     .00  310.06   442.87

*SECNO 80.459

3470 ENCROACHMENT STATIONS=     100.0     560.0  TYPE=     1  TARGET=     460.000

          VALLEY SECTION 35   (AH)

   80.46     8.99   860.69     .00     .00   860.70     .01     .05     .02   855.00
   2465.       0.    2465.      0.      0.    3878.      0.    853.    175. 100000.00
    3.21      .00      .64     .00    .040     .034    .040    .032  851.70   100.00
 .000012    1350.   1660.   1900.       2        0       0     .00  460.00   560.00

*SECNO 80.560
3280 CROSS SECTION     80.56 EXTENDED      1.90 FEET

3470 ENCROACHMENT STATIONS=     100.0     600.0  TYPE=     1  TARGET=     500.000

          VALLEY SECTION 36   (AI)

   80.56    11.10   860.70     .00     .00   860.71     .01     .01     .00   855.10
   2140.       0.    2140.      0.      0.    3753.      0.    899.    181. 100000.00
    3.47      .00      .57     .00    .040     .034    .080    .032  849.60   100.00
 .000012     520.    530.    570.       2        0       0     .00  500.00   600.00

*SECNO 80.925
   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=     200.0     600.0  TYPE=     1  TARGET=     400.000

          VALLEY SECTION 37   (AJ)

   80.93    10.94   860.74     .00     .00   860.75     .02     .04     .01   855.00
   2140.      66.    1197.    877.    193.     949.   1545.   1044.    201.   854.30
    4.04      .34     1.26     .57    .080     .032    .056    .032  849.80   200.00
 .000042    1330.   1930.   2160.       1        0       0     .00  400.00   600.00
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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

HURON RIVER -- PROJECT MA

SUMMARY PRINTOUT

SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	K*CHSL	TOPWID	AREA
76.798	.00	.00	845.50	1350.00	855.13	9.63	.04	.00	855.17	.00	520.00	1459.06
76.798	.00	.00	845.50	1900.00	855.82	10.32	.05	.00	855.87	.00	520.00	1817.86
76.798	.00	.00	845.50	2200.00	856.16	10.66	.06	.00	856.22	.00	520.00	1994.66
76.798	.00	.00	845.50	2850.00	856.77	11.27	.07	.00	856.84	.00	520.00	2311.86
77.030	.00	.00	847.50	1350.00	855.26	7.76	.02	.01	855.28	1.64	900.00	2514.22
77.030	.00	.00	847.50	1900.00	855.98	8.48	.02	.01	856.01	1.64	900.00	3164.81
77.030	.00	.00	847.50	2200.00	856.34	8.84	.02	.01	856.36	1.64	900.00	3483.24
77.030	.00	.00	847.50	2850.00	856.98	9.48	.03	.01	857.01	1.64	900.00	4059.74
77.232	.00	.00	848.50	1350.00	855.36	6.86	.04	.01	855.40	.93	1000.00	1843.50
77.232	.00	.00	848.50	1900.00	856.09	7.59	.04	.01	856.13	.93	1000.00	2563.66
77.232	.00	.00	848.50	2200.00	856.44	7.94	.04	.01	856.49	.93	1000.00	2916.81
77.232	.00	.00	848.50	2850.00	857.09	8.59	.04	.01	857.14	.93	1000.00	3572.17
77.353	.00	.00	849.10	1200.00	855.48	6.38	.03	.00	855.51	.94	490.00	1379.74
77.353	.00	.00	849.10	1710.00	856.21	7.11	.04	.00	856.25	.94	490.00	1737.15
77.353	.00	.00	849.10	1950.00	856.57	7.47	.05	.00	856.61	.94	490.00	1911.71
77.353	.00	.00	849.10	2550.00	857.22	8.12	.06	.01	857.28	.94	490.00	2236.90
77.499	.00	.00	846.70	1200.00	855.58	8.88	.06	.02	855.64	-3.12	190.77	713.47
77.499	.00	.00	846.70	1710.00	856.33	9.63	.10	.03	856.42	-3.12	192.26	855.90
77.499	.00	.00	846.70	1950.00	856.69	9.99	.11	.03	856.80	-3.12	192.98	924.86
77.499	.00	.00	846.70	2550.00	857.36	10.66	.15	.05	857.51	-3.12	194.30	1052.96
77.566	.00	.00	848.40	1200.00	855.64	7.24	.12	.03	855.76	4.82	64.00	423.47
77.566	.00	.00	848.40	1710.00	856.40	8.00	.20	.05	856.60	4.82	64.00	472.44
77.566	.00	.00	848.40	1950.00	856.76	8.36	.24	.07	857.00	4.82	64.00	495.37
77.566	.00	.00	848.40	2550.00	857.43	9.03	.35	.10	857.78	4.82	64.00	538.13
77.567	861.00	858.80	848.40	1200.00	855.63	7.23	.14	.01	855.77	.00	64.00	402.02
77.567	861.00	858.80	848.40	1710.00	856.39	7.99	.22	.01	856.61	.00	64.00	450.37
77.567	861.00	858.80	848.40	1950.00	856.75	8.35	.26	.01	857.01	.00	64.00	473.37
77.567	861.00	858.80	848.40	2550.00	857.42	9.02	.38	.02	857.79	.00	64.00	516.36
77.569	.00	.00	848.50	1200.00	855.63	7.13	.14	.00	855.77	6.25	64.00	395.46
77.569	.00	.00	848.50	1710.00	856.39	7.89	.23	.00	856.62	6.25	64.00	444.04
77.569	.00	.00	848.50	1950.00	856.75	8.25	.27	.00	857.02	6.25	64.00	467.04
77.569	.00	.00	848.50	2550.00	857.42	8.92	.39	.00	857.81	6.25	64.00	510.06

FORM 1411 5 66
PRINTED IN U.S.A.

SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	K*CHSL	TOPWID	AREA
77.570	.00	.00	848.50	1200.00	855.66	7.16	.12	.01	855.78	.00	66.00	428.74
77.570	.00	.00	848.50	1710.00	856.43	7.93	.20	.01	856.63	.00	66.00	479.74
77.570	.00	.00	848.50	1950.00	856.80	8.30	.23	.01	857.03	.00	66.00	503.86
77.570	.00	.00	848.50	2550.00	857.49	8.99	.33	.02	857.82	.00	66.00	549.44
77.602	.00	.00	848.40	1200.00	855.79	7.39	.04	.02	855.84	-.57	118.00	749.84
77.602	.00	.00	848.40	1710.00	856.65	8.25	.07	.04	856.71	-.57	118.00	850.36
77.602	.00	.00	848.40	1950.00	857.05	8.65	.08	.05	857.12	-.57	118.00	897.73
77.602	.00	.00	848.40	2550.00	857.84	9.44	.11	.07	857.95	-.57	118.00	991.62
77.603	860.00	857.90	848.40	1200.00	855.79	7.39	.05	.01	855.84	.00	118.00	645.31
77.603	860.00	857.90	848.40	1710.00	856.64	8.24	.08	.01	856.72	.00	118.00	738.17
77.603	860.00	857.90	848.40	1950.00	857.04	8.64	.10	.01	857.14	.00	118.00	781.39
77.603	860.00	857.90	848.40	2550.00	857.83	9.43	.14	.01	857.97	.00	118.00	862.66
77.605	860.00	857.90	848.40	1200.00	855.79	7.39	.05	.00	855.84	.00	118.00	644.81
77.605	860.00	857.90	848.40	1710.00	856.64	8.24	.08	.00	856.72	.00	118.00	737.44
77.605	860.00	857.90	848.40	1950.00	857.04	8.64	.10	.00	857.14	.00	118.00	781.10
77.605	860.00	857.90	848.40	2550.00	857.84	9.44	.14	.00	857.97	.00	118.00	862.53
77.606	.00	.00	848.40	1200.00	855.81	7.41	.04	.00	855.85	.00	120.00	756.54
77.606	.00	.00	848.40	1710.00	856.67	8.27	.06	.01	856.73	.00	120.00	860.55
77.606	.00	.00	848.40	1950.00	857.07	8.67	.07	.01	857.14	.00	120.00	909.04
77.606	.00	.00	848.40	2550.00	857.88	9.48	.10	.01	857.98	.00	120.00	1005.74
77.717	.00	.00	849.30	1200.00	855.88	6.58	.04	.00	855.92	1.53	441.86	1222.00
77.717	.00	.00	849.30	1710.00	856.78	7.48	.04	.01	856.82	1.53	445.78	1616.78
77.717	.00	.00	849.30	1950.00	857.19	7.89	.05	.01	857.24	1.53	447.62	1802.65
77.717	.00	.00	849.30	2550.00	858.04	8.74	.05	.02	858.09	1.53	451.36	2183.69
77.899	.00	.00	849.20	1200.00	856.01	6.81	.05	.01	856.06	-.10	225.35	848.17
77.899	.00	.00	849.20	1710.00	856.91	7.71	.07	.01	856.98	-.10	227.52	1050.98
77.899	.00	.00	849.20	1950.00	857.33	8.13	.07	.01	857.40	-.10	228.53	1146.35
77.899	.00	.00	849.20	2550.00	858.18	8.98	.09	.02	858.27	-.10	230.61	1343.73
77.999	.00	.00	849.80	1200.00	856.11	6.31	.10	.03	856.21	1.13	84.00	464.24
77.999	.00	.00	849.80	1710.00	857.01	7.21	.16	.04	857.17	1.13	84.00	540.58
77.999	.00	.00	849.80	1950.00	857.43	7.63	.18	.05	857.61	1.13	84.00	575.59
77.999	.00	.00	849.80	2550.00	858.28	8.48	.24	.07	858.52	1.13	84.00	647.02
78.000	862.60	860.40	849.80	1200.00	856.11	6.31	.10	.00	856.21	.00	84.00	463.83
78.000	862.60	860.40	849.80	1710.00	857.01	7.21	.16	.00	857.17	.00	84.00	534.63
78.000	862.60	860.40	849.80	1950.00	857.43	7.63	.18	.00	857.61	.00	84.00	565.72
78.000	862.60	860.40	849.80	2550.00	858.27	8.47	.26	.01	858.53	.00	84.00	626.66
78.005	862.60	860.40	849.80	1200.00	856.11	6.31	.10	.00	856.21	.00	84.00	464.35
78.005	862.60	860.40	849.80	1710.00	857.02	7.22	.16	.00	857.18	.00	84.00	535.14
78.005	862.60	860.40	849.80	1950.00	857.43	7.63	.18	.00	857.62	.00	84.00	566.16
78.005	862.60	860.40	849.80	2550.00	858.28	8.48	.26	.00	858.54	.00	84.00	626.88
78.006	.00	.00	849.80	1200.00	856.11	6.31	.10	.00	856.21	.00	86.00	467.79
78.006	.00	.00	849.80	1710.00	857.03	7.23	.15	.00	857.18	.00	86.00	545.86
78.006	.00	.00	849.80	1950.00	857.45	7.65	.17	.00	857.62	.00	86.00	582.06
78.006	.00	.00	849.80	2550.00	858.31	8.51	.23	.01	858.54	.00	86.00	656.80

SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	K*CHSL	TOPWID	AREA
78.045	.00	.00	849.70	1200.00	856.22	6.52	.07	.01	856.29	-.48	278.31	665.59
78.045	.00	.00	849.70	1710.00	857.19	7.49	.08	.02	857.27	-.48	292.85	942.41
78.045	.00	.00	849.70	1950.00	857.63	7.93	.08	.03	857.71	-.48	295.00	1073.55
78.045	.00	.00	849.70	2550.00	858.57	8.87	.09	.04	858.66	-.48	295.00	1348.55
78.283	.00	.00	849.50	1200.00	856.51	7.01	.07	.00	856.58	-.16	334.72	846.08
78.283	.00	.00	849.50	1710.00	857.48	7.98	.08	.00	857.56	-.16	352.34	1182.63
78.283	.00	.00	849.50	1950.00	857.92	8.42	.08	.00	858.00	-.16	355.98	1337.25
78.283	.00	.00	849.50	2550.00	858.84	9.34	.09	.00	858.93	-.16	363.70	1670.79
78.522	.00	.00	850.00	1200.00	856.78	6.78	.05	.01	856.83	.40	451.98	1045.06
78.522	.00	.00	850.00	1710.00	857.75	7.75	.05	.01	857.80	.40	454.41	1484.61
78.522	.00	.00	850.00	1950.00	858.19	8.19	.05	.01	858.23	.40	455.48	1680.02
78.522	.00	.00	850.00	2550.00	859.11	9.11	.05	.01	859.16	.40	457.79	2101.52
78.819	.00	.00	850.00	1200.00	857.11	7.11	.09	.02	857.20	.00	241.67	575.42
78.819	.00	.00	850.00	1710.00	858.05	8.05	.11	.03	858.16	.00	293.48	839.59
78.819	.00	.00	850.00	1950.00	858.47	8.47	.11	.03	858.58	.00	294.89	963.68
78.819	.00	.00	850.00	2550.00	859.37	9.37	.12	.03	859.49	.00	297.93	1233.86
79.018	.00	.00	850.50	1200.00	857.36	6.86	.03	.02	857.40	.48	283.12	1036.11
79.018	.00	.00	850.50	1710.00	858.33	7.83	.05	.02	858.38	.48	289.34	1315.01
79.018	.00	.00	850.50	1950.00	858.74	8.24	.05	.02	858.79	.48	291.99	1435.30
79.018	.00	.00	850.50	2550.00	859.65	9.15	.06	.02	859.71	.48	297.76	1702.03
79.369	.00	.00	850.10	1200.00	857.55	7.45	.03	.00	857.59	-.22	282.79	999.42
79.369	.00	.00	850.10	1710.00	858.55	8.45	.05	.00	858.59	-.22	341.23	1306.46
79.369	.00	.00	850.10	1950.00	858.97	8.87	.05	.00	859.02	-.22	369.29	1456.16
79.369	.00	.00	850.10	2550.00	859.89	9.79	.06	.00	859.95	-.22	430.81	1825.75
79.600	.00	.00	850.60	1200.00	857.67	7.07	.03	.00	857.70	.41	319.51	1080.65
79.600	.00	.00	850.60	1710.00	858.68	8.08	.04	.00	858.72	.41	353.76	1424.44
79.600	.00	.00	850.60	1950.00	859.11	8.51	.04	.00	859.15	.41	362.28	1576.92
79.600	.00	.00	850.60	2550.00	860.04	9.44	.05	.00	860.09	.41	380.72	1924.14
79.861	.00	.00	851.20	1200.00	857.81	6.61	.04	.01	857.86	.43	124.00	709.03
79.861	.00	.00	851.20	1710.00	858.83	7.63	.07	.01	858.90	.43	124.00	836.08
79.861	.00	.00	851.20	1950.00	859.27	8.07	.08	.02	859.34	.43	124.00	889.48
79.861	.00	.00	851.20	2550.00	860.21	9.01	.10	.03	860.31	.43	124.00	1005.91
79.862	863.00	863.10	851.20	1200.00	857.79	6.59	.09	.02	857.88	.00	106.04	500.62
79.862	863.00	863.10	851.20	1710.00	858.81	7.61	.12	.03	858.93	.00	118.02	609.63
79.862	863.00	863.10	851.20	1950.00	859.24	8.04	.14	.03	859.37	.00	123.06	659.16
79.862	863.00	863.10	851.20	2550.00	860.18	8.98	.17	.03	860.34	.00	127.00	772.18
79.869	863.00	863.10	851.20	1200.00	857.79	6.59	.09	.00	857.88	.00	106.10	501.16
79.869	863.00	863.10	851.20	1710.00	858.81	7.61	.12	.00	858.94	.00	118.10	610.36
79.869	863.00	863.10	851.20	1950.00	859.24	8.04	.14	.00	859.38	.00	123.14	659.97
79.869	863.00	863.10	851.20	2550.00	860.18	8.98	.17	.00	860.35	.00	127.03	773.12
79.870	.00	.00	851.20	1200.00	857.85	6.65	.04	.01	857.90	.00	126.00	722.29
79.870	.00	.00	851.20	1710.00	858.89	7.69	.06	.02	858.95	.00	126.00	852.93
79.870	.00	.00	851.20	1950.00	859.33	8.13	.07	.02	859.40	.00	126.00	907.71
79.870	.00	.00	851.20	2550.00	860.28	9.08	.10	.02	860.37	.00	126.00	1027.67

SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	K*CHSL	TOPWID	AREA
79.886	.00	.00	851.60	1200.00	857.87	6.27	.04	.00	857.91	4.49	233.54	795.93
79.886	.00	.00	851.60	1710.00	858.92	7.32	.05	.00	858.97	4.49	246.86	1049.84
79.886	.00	.00	851.60	1950.00	859.37	7.77	.05	.01	859.42	4.49	250.24	1161.76
79.886	.00	.00	851.60	2550.00	860.34	8.74	.06	.01	860.40	4.49	256.52	1408.87
80.145	.00	.00	852.60	1190.00	858.12	5.52	.05	.00	858.17	.73	262.44	760.71
80.145	.00	.00	852.60	1700.00	859.16	6.56	.06	.00	859.22	.73	283.28	1045.04
80.145	.00	.00	852.60	1930.00	859.60	7.00	.06	.00	859.66	.73	291.92	1169.28
80.145	.00	.00	852.60	2510.00	860.57	7.97	.06	.00	860.63	.73	310.06	1464.17
80.459	.00	.00	851.70	1180.00	858.23	6.53	.00	.01	858.23	-.54	460.00	2743.09
80.459	.00	.00	851.70	1680.00	859.28	7.58	.00	.02	859.28	-.54	460.00	3227.35
80.459	.00	.00	851.70	1905.00	859.72	8.02	.00	.02	859.72	-.54	460.00	3429.96
80.459	.00	.00	851.70	2465.00	860.69	8.99	.01	.02	860.70	-.54	460.00	3878.10
80.560	.00	.00	849.60	1020.00	858.23	8.63	.00	.00	858.23	-3.96	500.00	2518.51
80.560	.00	.00	849.60	1450.00	859.29	9.69	.00	.00	859.29	-3.96	500.00	3045.43
80.560	.00	.00	849.60	1680.00	859.73	10.13	.00	.00	859.73	-3.96	500.00	3265.81
80.560	.00	.00	849.60	2140.00	860.70	11.10	.01	.00	860.71	-3.96	500.00	3753.49
80.925	.00	.00	849.80	1020.00	858.26	8.46	.01	.00	858.27	.10	400.00	1697.80
80.925	.00	.00	849.80	1450.00	859.32	9.52	.01	.00	859.33	.10	400.00	2120.11
80.925	.00	.00	849.80	1680.00	859.76	9.96	.01	.00	859.77	.10	400.00	2297.00
80.925	.00	.00	849.80	2140.00	860.74	10.94	.02	.01	860.75	.10	400.00	2687.46

SUMMARY OF ERRORS

00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: Hamburg Twp.

3) WATERCOURSE: Huron River & Connecting Lakes

4) DOCUMENT TYPE: Hyd. Analysis
References
See No. Chart
Bridge Sketches & Calculations

00BREAK00

RECEIVED
APR 13 1981
WATER MANAGEMENT

HURON RIVER

Base Line Lake
Whitewood Lakes
Gallagher Lake
Loon Lake
Strawberry Lake
Zukey Lake
Ore Lake

Hamburg Township, Michigan
Job No. 6504-03

CAUTION
SEE
ATTACHED COMMENTS

Hydraulic Analysis

References

SECNO Chart

Bridge Sketches and Calculations

Report is from original submittal. Changes in assumptions may have been made.

Project Manager, Mow-Soung Cheng

TABLE OF CONTENTS

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BRIDGE CALCULATIONS	17

HYDRAULIC ANALYSIS

A. Introduction

The Huron River and Base Line Lake, Whitewood Lakes, Gallagher Lake, Loon Lake, Strawberry Lake, Zukey Lake, and Ore Lake are the subjects of this report. The study begins at Base Line Lake and continues upstream for approximately 8.2 miles along the Huron River through Whitewood Lakes, Gallagher Lake, Loon Lake and Strawberry Lake. Also included in this study is an island problem between Gallagher Lake and Section N (River mile 75.342). The 10-, 50-, 100- and 500-year frequency flood flows were obtained using a combination of Log-Pierson Type III and TR-20 computer programs. These discharges were approved by the Michigan Department of Natural Resources on January 8, 1981. The major floods on the Huron River occur in the late winter or early spring months. The project manager for this study is Dr. Mow-Soung Cheng.

B. Method of Analysis

The flood profiles were calculated by the HEC-2 computer program developed by the U.S. Army Corps of Engineers. An island problem analysis was required in an area upstream of Gallagher Lake. Although the 2 channels merge at the upstream end near Section N, the island problem ends at Section M due to the submergence of the area between the two channels for the 100-year flow. All of the bridges along the Huron River have been modelled for the requirements of the normal bridge routine. For those lakes studied by detailed methods, the lake elevations for each flood frequency flow are assumed to be the energy grade line elevations as determined by HEC-2 at the outlet of each lake. These lake elevations, in turn, are used as starting water surface elevations for stream segments upstream of the lakes. Due to the large differences in peak flow times, elevations on Zukey Lake are assumed to be the same as those on Strawberry Lake, and elevations on Ore Lake are assumed to be the same as those on the Huron River at the Ore Lake outlet confluence.

TABLE 1: SUMMARY OF LAKE ELEVATIONS

Pencil values are TR-20 elevations. RCS 4/20/81

	Elevation (NGVD)							
	10-Yr.		50-Yr.		100-Yr.		500 Yr.	
Base Line Lake	854.51	854.35	855.46	855.23	855.89	855.78	856.83	856.70
Whitewood Lakes	854.73	854.58	855.68	855.42	856.12	855.87	857.07	856.82
Gallagher Lake	854.78		855.73		856.18		857.12	
Loon Lake	854.78		855.73		856.18		857.12	
Strawberry Lake	855.22	855.09	856.13	856.01	856.57	856.45	857.48	857.35
Zukey Lake	855.22		856.13		856.57		857.48	
Ore Lake	858.23		859.31		859.76		860.79	

C. Variables and Coefficients

The roughness factors (Manning's "n") were established by comparing the descriptions in Open-Channel Hydraulics (Reference 1) with photographs and field descriptions taken by survey crews in 1980, and field reconnaissance trips taken in 1980. Aerial photographs of Hamburg Township taken in 1976 were also used to determine the roughness coefficients and their extent. These roughness factors were determined assuming that flooding would occur during the late winter/early spring. The Manning's "n" for the channel ranges from .032 in areas with a sandy bottom to .036 in areas with a gravelly bottom. The Manning's "n" for the overbanks ranges from .040 in areas of short grass residential areas to 0.100 in areas of heavy brush and woods. The expansion and contraction coefficients chosen for this study were 0.5 and 0.3, respectively.

D. Starting Point

Lake elevations for the 10-, 50-, 100-, and 500-year floods on Base Line Lake were obtained by a convergence trial method using HEC-2. Backwater profiles were computed from a point approximately 1/3 mile downstream of the Bell Road bridge in Dexter Township to Base Line Lake. Variable starting water surface elevations were used for each frequency flow using a slope-area method. Sections used in this analysis were field-measured, and included 7 valley sections, a bridge section at Bell Road, and a dam section just downstream of the confluence of the Portage Lake outlet channel with the Huron River. For the convergence analysis, the crest elevation on the

dam spillway was assumed to be at Elevation 851 (normal lake level for Portage Lake and Base Line Lake is Elevation 851.5). All of the convergence trial profiles converged before reaching Base Line Lake.

E. Encroachments

In most cases, the encroachments for the 100-year natural floodway were based on a 1:1 convergence into bridges and a 1:4 expansion from the downstream sides of bridges or natural constrictions. However, this method was sometimes not feasible due to the severe meandering of the river in places. In these cases, the 100-year natural floodway was based on the sweep and extent of moving floodwaters. Aerial photographs were utilized extensively in the location of encroachments for the hydraulic model of the Huron River.

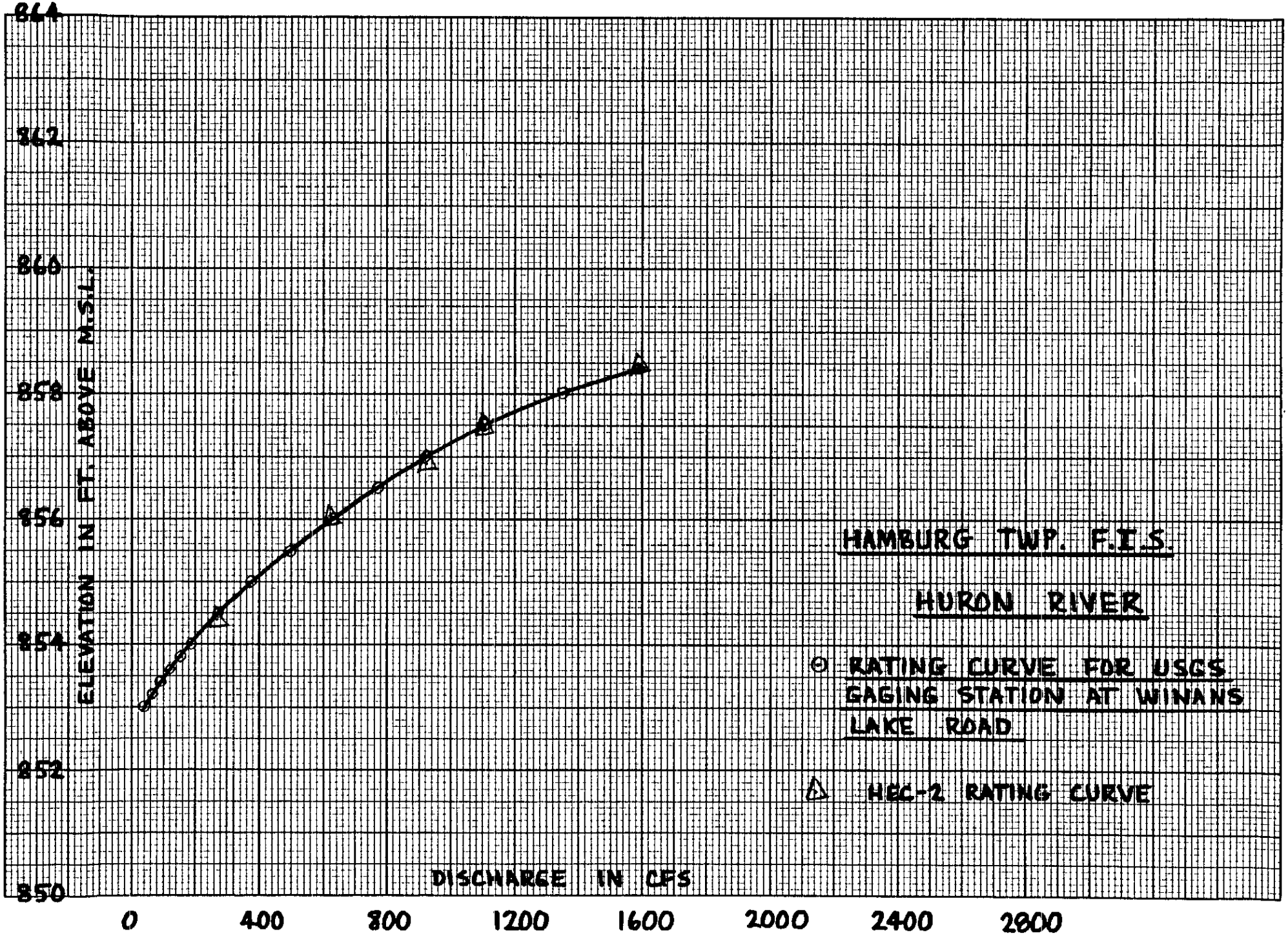
For the 100-year encroached floodway, areas of shallow ponding downstream of the Ann Arbor Railroad bridge have been encroached. These encroachments resulted in a rise of 0.1 foot or less in water surface elevation compared to the 100-year natural floodway profile.

F. High Water Mark and Gage Calibration

A U.S.G.S. water stage recorder is located within the study area on the right bank at the downstream side of the Winans Lake Road bridge in Hamburg Township. The period of record for this gage is from October 1951 to the current year. The maximum discharge observed at this gage occurred on May 15, 1956 and was estimated to be 1560 cfs.

Manning's "n" values for the channel were calibrated by computing backwater profiles for a range of flows smaller than the maximum observed discharge at the gage, and comparing the backwater profile results to the U.S.G.S. rating curve for the gage. As a result of this analysis, the original estimates for Manning's "n" have been reduced by 20%. This reduction has been accomplished by utilizing an 80% multiplier factor on the J2 card in the HEC-2 input data.

K+E 20 X 20 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.
46 1240



References

1. Chow, Ven Te, Open-Channel Hydraulics, McGraw-Hill, 1959.

Abrams Aerial Survey Corporation, Aerial Mosaic and Topographic Map of Hamburg Township, 2-Foot Contour Interval, Scale 1" = 200 ft., Photography April 1976, Mapping October 1977.

Ayres, Lewis, Norris and May, Inc., Consulting Engineers, Plans for Portage and Base Line Lakes Level Control for Washtenaw and Livingston County Drain Commissioners, 1964.

U.S. Army Corps of Engineers, Detroit District, Southeastern Michigan Water Resources Study; Gazetteer of the Huron River Basin, Technical Paper No. 7, June 1972.

U.S. Army Corps of Engineers, Hydrologic Engineering Center, Application of the HEC-2 Bridge Routines, Training Document No. 6, June 1974.

U.S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-2 Water-Surface Profile Users Manual, 1973.

U.S. Department of Agriculture, Soil Conservation Service, Technical Release No. 20, Computer Program for Project Formulation; Hydrology, May 1965.

U.S. Department of Interior, Geological Survey, Measurement of Peak Discharge at Dams by Indirect Methods, Techniques of Water Resources Investigations of the U.S. Geological Survey, Book 3, Chapter A5, 1976.

U.S. Department of Interior, Geological Survey, Water Resources Data for Michigan, Surface Water Records for Water Years 1952-1979.

U.S. Department of Transportation, Federal Highway Administration, Hydraulics of Bridge Waterways, Hydraulic Design Series No. 1, 1973.

SECNO TABLE

CROSS SECTION	SECNO	DESCRIPTION
A	72.679	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
B	73.028	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
	73.081	Manufactured section. Channel points from Section B repeated and adjusted for channel invert; overbanks taken from available 2-ft. contour maps.
C	73.278	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps, with right overbank artificially raised between stations 2210 and 2430 to model for a line of homes.
	73.747	Section E repeated
D	73.834	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
E	73.999	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
F	74.905	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
G	75.096	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.

CROSS SECTION	SECNO	DESCRIPTION
H	0	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
	720	Section I repeated.
I	1750	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
J	3280	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
	3447	Manufactured section. Channel points taken from Section K and adjusted for channel invert; overbanks repeated from Section K.
K	3448, 3460	Beach Road bridge.
	3461	Manufactured section. Channel points taken from Section K and adjusted for channel invert; overbanks repeated from Section K.
L	4460	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.

CROSS SECTION	SECNO	DESCRIPTION
G/L	75.096	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
M	75.342	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
N	75.814	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
O	76.798	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
P	77.030	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
	77.232	Manufactured section. Channel points taken from Section Q and adjusted for channel invert; overbanks taken from available 2-ft. contour maps.
Q	77.353	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
R	77.499	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
	77.566	Section R repeated and adjusted for channel invert.
S	77.567, 77.569	Ann Arbor Railroad bridge.
	77.570	Section R repeated and adjusted for channel invert.
	77.602	Section R repeated and adjusted for channel invert.

CROSS SECTION	SECNO	DESCRIPTION
T	77.603, 77.605	Abandoned Grand Trunk Western Railroad bridge.
	77.606	Section R repeated and adjusted for channel invert.
U	77.717	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
V	77.899	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
	77.999	Section W repeated and adjusted for channel invert.
W	78.000, 78.005	M-36 bridge.
	78.006	Section Y repeated Q and adjusted for channel invert.
X	78.045	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
Y	78.283	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
Z	78.522	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
AA	78.819	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
AB	79.018	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
AC	79.369	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.

CROSS SECTION	SECNO	DESCRIPTION
AD	79.600	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
	79.861	Section AG repeated and adjusted for channel invert.
AE	79.862, 79.869	Winans Lake Road. U.S.G.S. gaging station located on downstream side of bridge.
	79.870	Section AG repeated and adjusted for channel invert.
AF	79.886	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
AG	80.145	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
AH	80.459	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
AI	80.560	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
AJ	80.925	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.

BRIDGE SKETCHES
AND
CALCULATIONS

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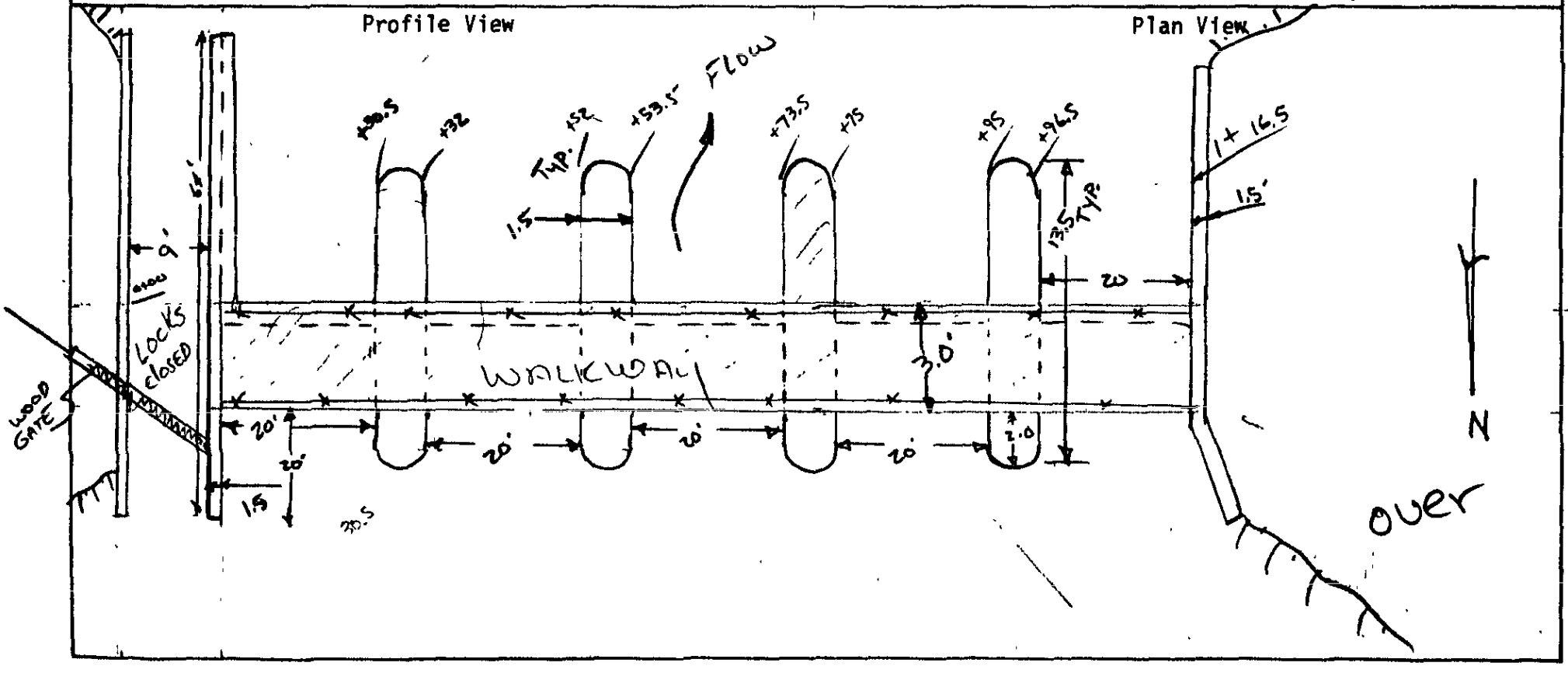
HYDRAULIC STRUCTURAL DATA

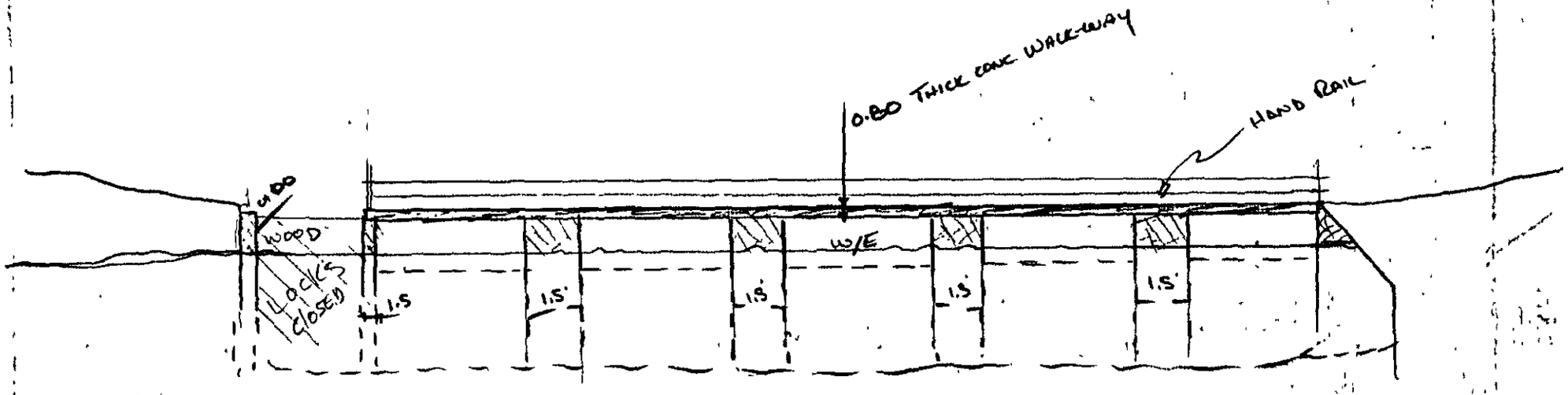
B.S. 2 DAM

Code No. 6504-03

Job Name: Hamburg Twp. F.I.S.		By: MOSES	
Date: 9-24-80	Feature: CONC. DAM	Water Course: Huron River	
Remarks: FLOOD GATES ARE ON Average OF 0.5' Below WATER ELEV.			
Access To Plans: Ayres, Lewis, Norris, May Ann Arbor, Mich			
PORTAGE & BASE LINE LAKES LEVEL CONTROL AS-BUILT 1967'			
Width of Piers: 1.5'	Pier Shape: ▯ AT BOTH END	No. of Piers: 5	Area: —
Water Elevation: UPS. 851.4 DNS. 846.7	Length: 116	Width of Deck: 3	Skew: 90°

FIELD SKETCH




0.80 THICK CONC WALK-WAY
HAND RAIL
0.80
WOOD
LOCKS CLOSED
W/E
1.5
1.5'
1.5'
1.5'
1.5'

Johnson & Anderson, Inc.
Consulting Engineers
2300 Dixie Hwy., Pontiac, MI 48055

HYDRAULIC STRUCTURAL DATA

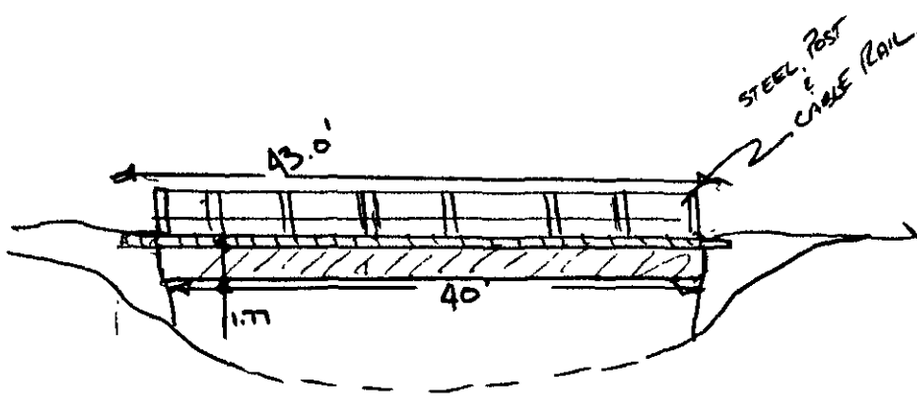
B.S. #3

Code No. 6504-03

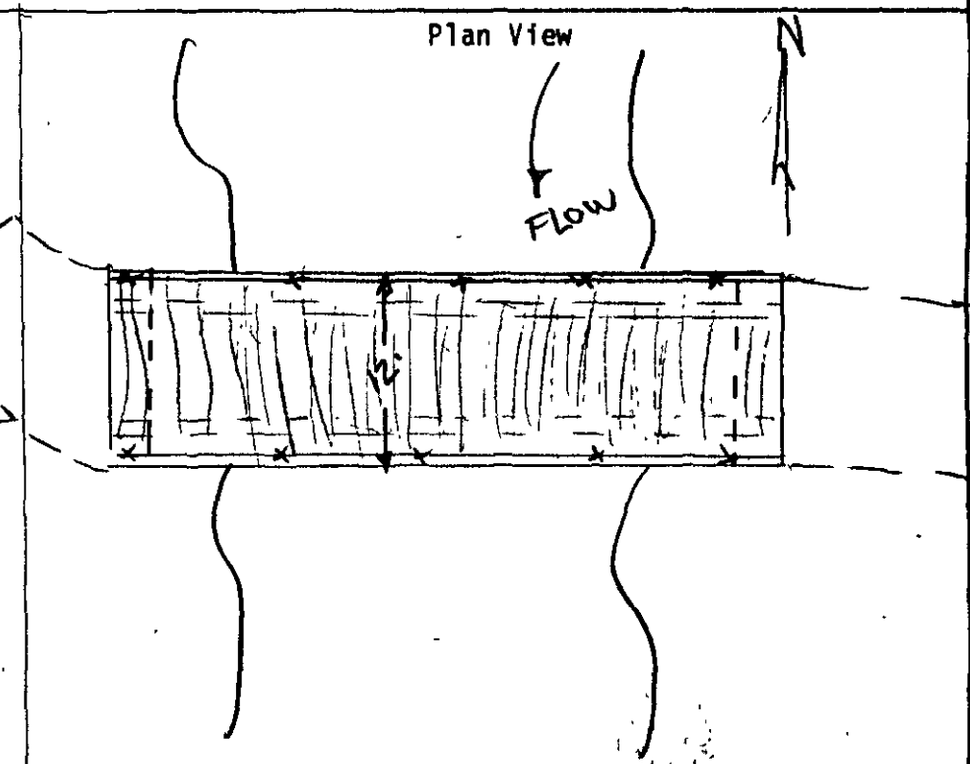
Job Name: HAMBURG TWP. F.I.S		By: R. MOSES	
Date: 9-22-80	Feature: I-BEAM W/WOOD DECK BRIDGE	Water Course: HURON RIVER	
Remarks: BRIDGE IS ON EAST RD. BRIDGE HAS STAFF GAGE THAT LOOKS IF IT doesn't work			
CHANNEL IS LOOSE SAND & GRAVEL			
LEFT BANK RISES FAST, RIGHT BANK LOW & SWAMPY			
Width of Piers: —	Pier Shape: —	No. of Piers: —	Area: —
Water Elevation: 852.0	Length: 43	Width of Deck: 12	Skew: 90°

FIELD SKETCH

Profile View



Plan View



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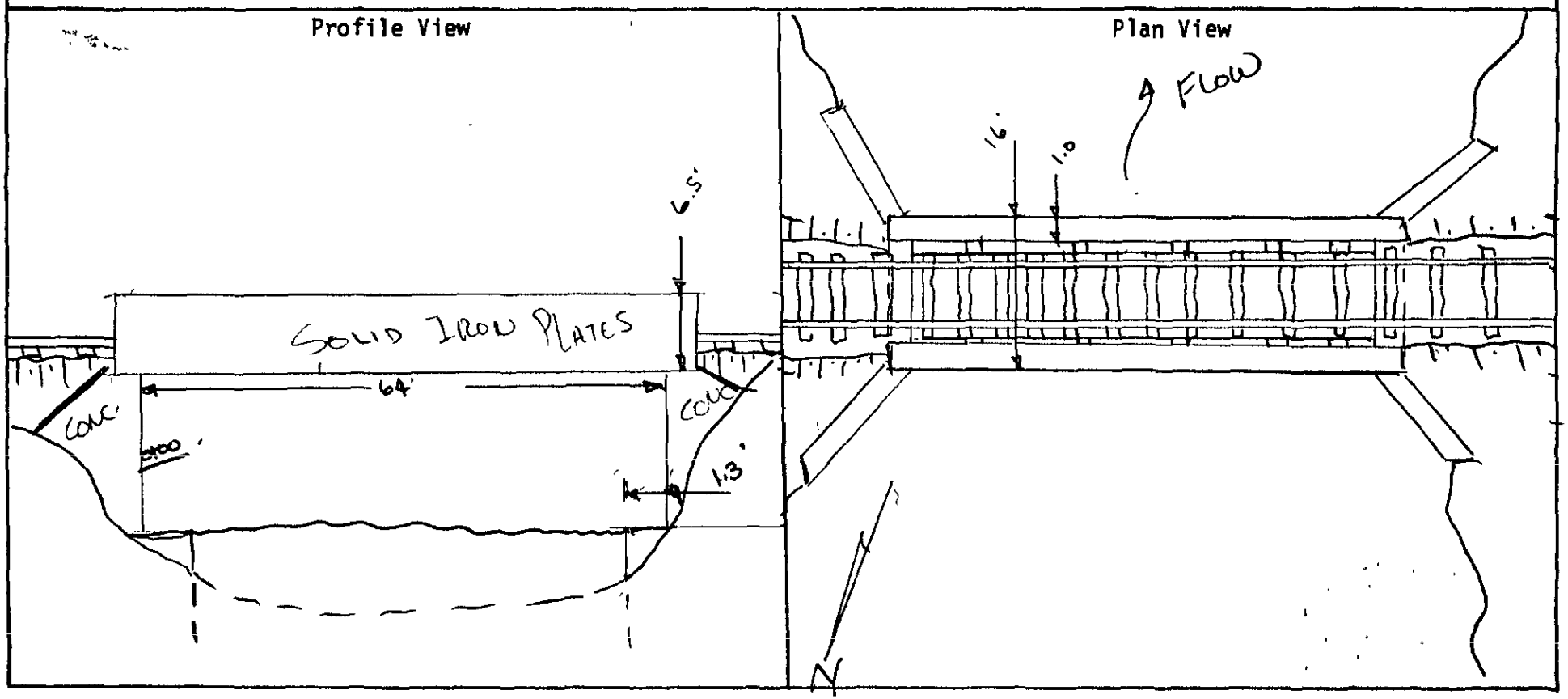
HYDRAULIC STRUCTURAL DATA

B.S. #4

Code No. 6504-03

Job Name: Hamburg Twp. F.I.S.		By: Moses	
Date: 10-1-80	Feature: Steel Bridge	Water Course: Huron River	
Remarks: Per Plan Location			
Width of Piers: —	Pier Shape: —	No. of Piers: —	Area: —
Water Elevation: 852.7	Length: 64'	Width of Deck: 16	Skew: 90°

FIELD SKETCH



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HYDRAULIC STRUCTURAL DATA

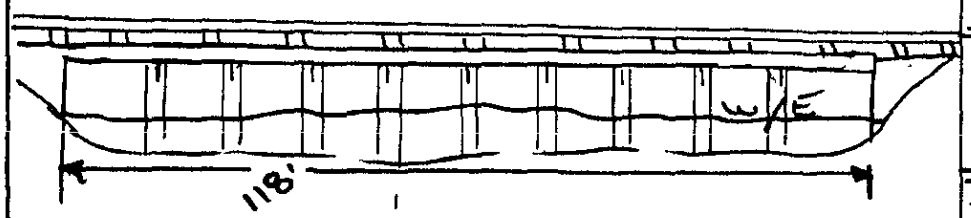
B.S. #5

Code No. 6304-03

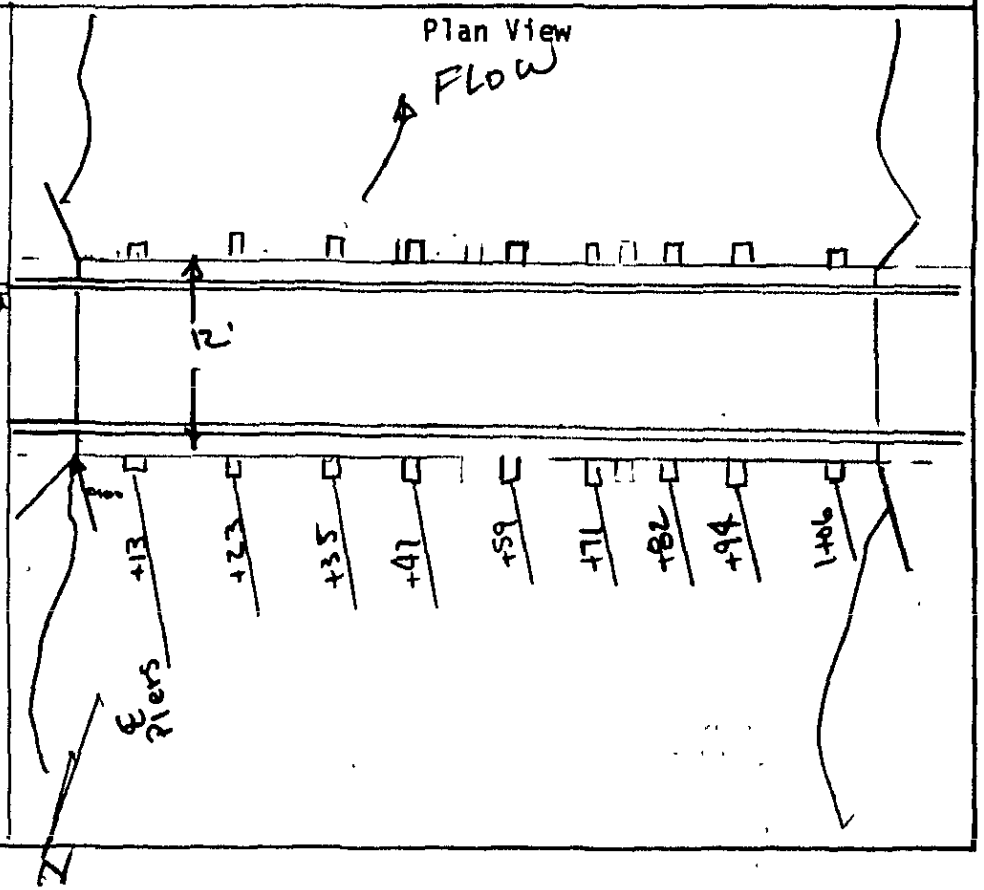
Job Name: Hamburg Twp. F.I.S.			By: R. Moses
Date: 10-1-80	Feature: Road & Rail Bridge		Water Course: Huron River
Remarks: Per Plan Upstream Face Does get Log jammed But Residents Cleaned this up Last Time it Happen (Abandon R.R Tracks)			
Width of Piers: 1.0'	Pier Shape: □ Square	No. of Piers: 9	Area: —
Water Elevation: 852.6	Length: 118	Width of Deck: 12'	Skew: —

FIELD SKETCH

Profile View



Plan View



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HYDRAULIC STRUCTURAL DATA

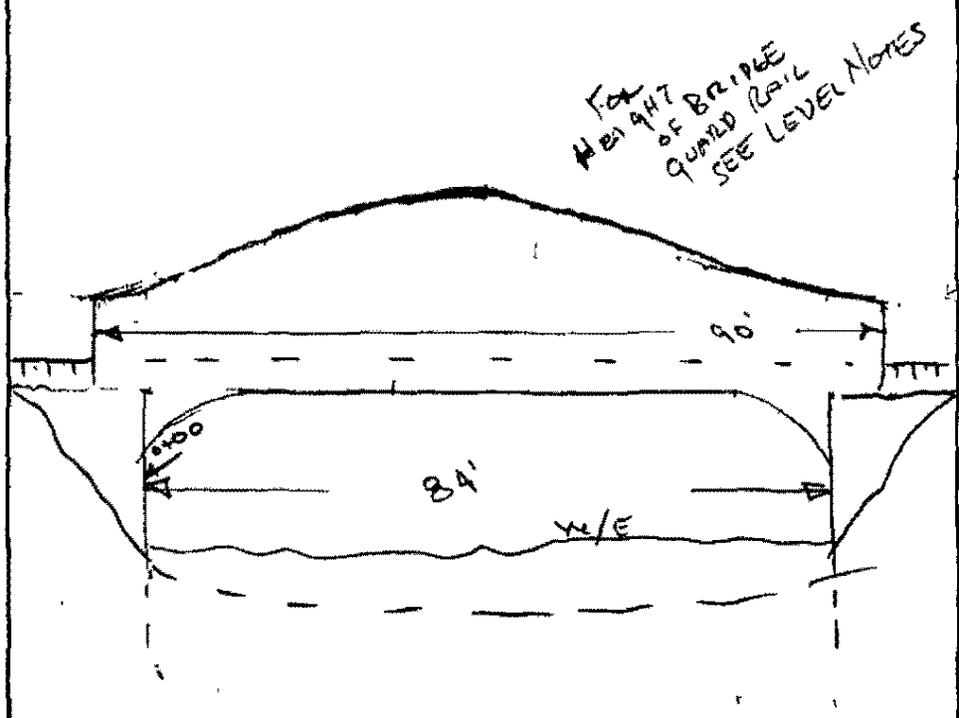
B.S. #6

Code No. 6504-03

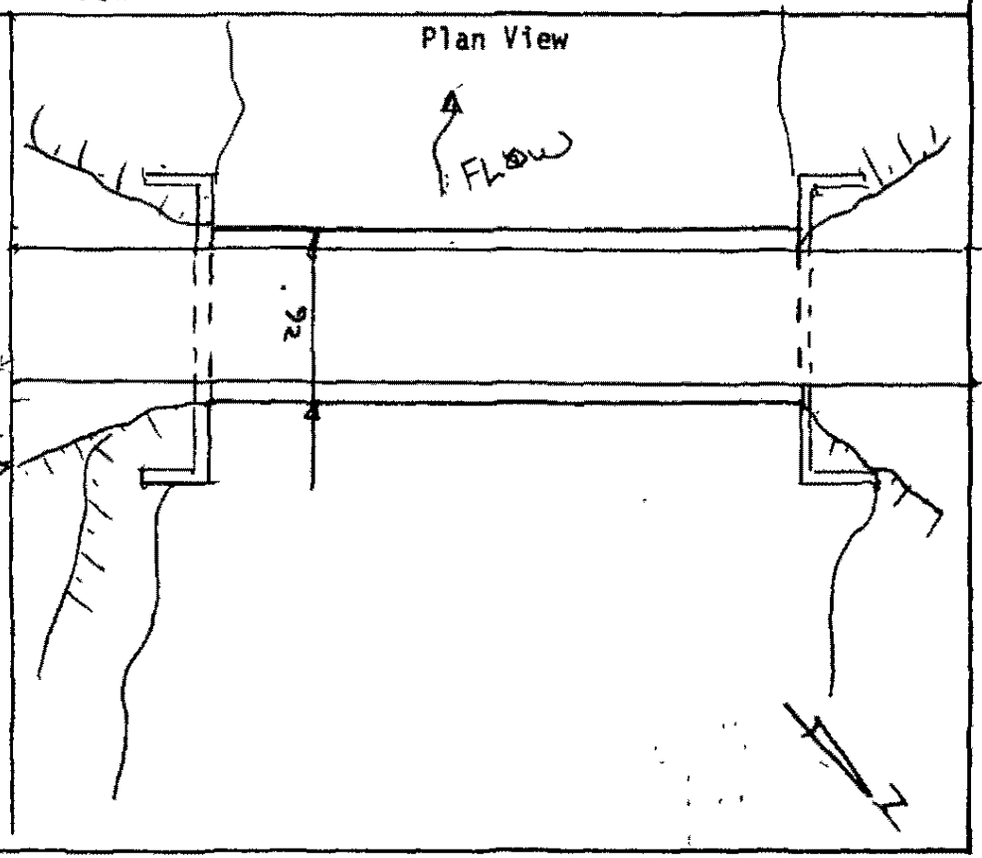
Job Name: Hamburg Twp. F.I.S.		By: R. Moses	
Date: 10-3-80	Feature: Conc Bridge	Water Course: Huron River	
Remarks: Bridge is on M-36			
Width of Piers: —	Pier Shape: —	No. of Piers: —	Area: —
Water Elevation: 853.1	Length: 84	Width of Deck: 26	Skew: 90°

FIELD SKETCH

Profile View



Plan View



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HYDRAULIC STRUCTURAL DATA

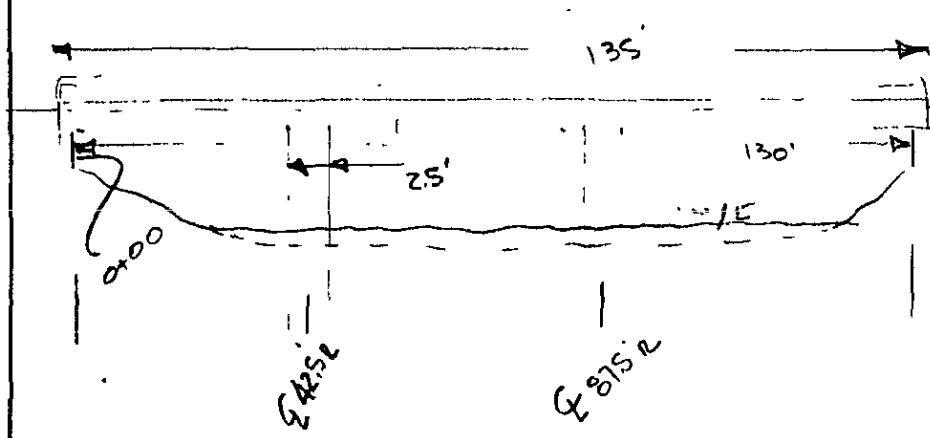
P.S. #7

Code No. 6504.03

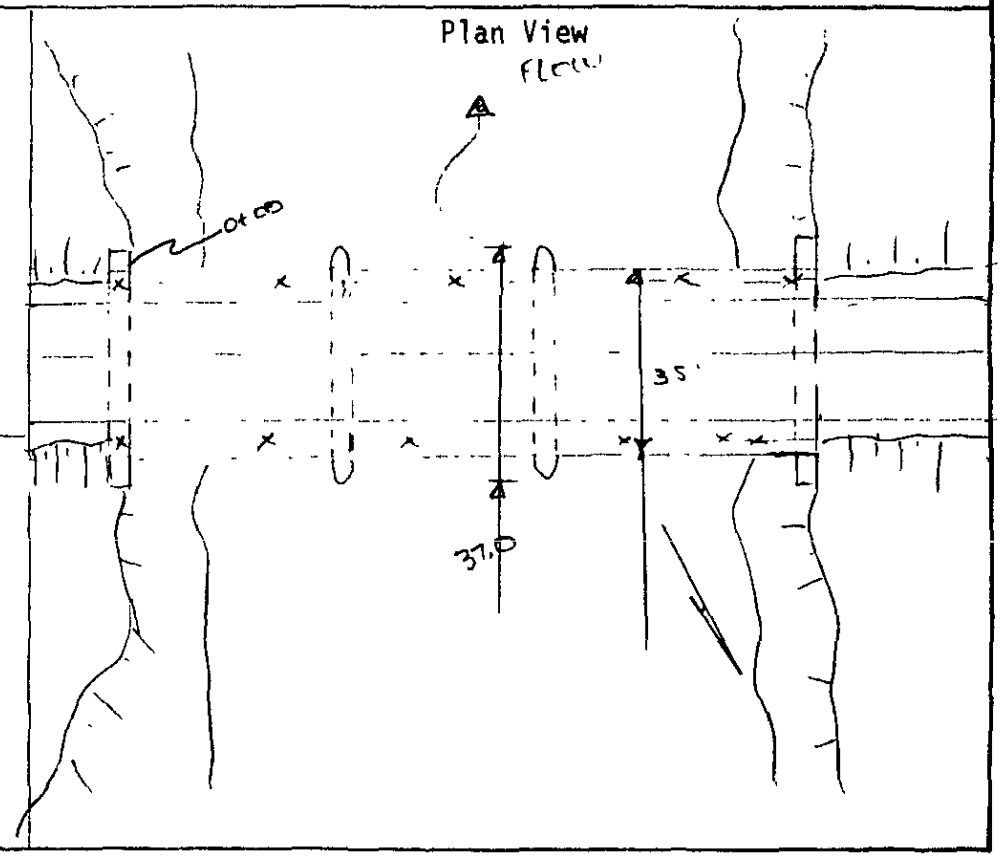
Job Name: Hamburg Twp. F.I.S.		By: R. Moses	
Date: 10-7-80	Feature: Conc. Bridge	Water Course: Huron River	
Remarks: Bridge is on Hamburg Rd			
Width of Piers: 2.5'	Pier Shape:	No. of Piers: 2	Area: —
Water Elevation: 854.4	Length: 135'	Width of Deck: 35'	Skew: 90°

FIELD SKETCH

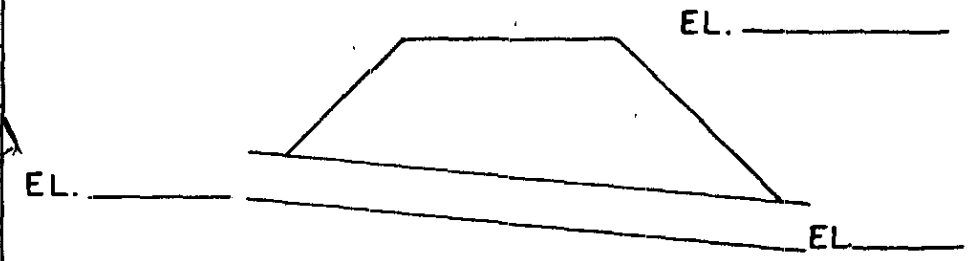
Profile View



Plan View



JOB NAME: HAMBURG TOWNSHIP FIS		JOB NO.	6504	03	0	13
WATERCOURSE: Huron River	CULVERT LOCATION: d/s of Portage Lake outlet				
CULVERT DESCRIPTION: Concrete and earth fill dam with stop log control and 5 tainter gates	BY RCD	DATE 1/15/81			
WEIR DESCRIPTION: 106 ft wide spillway divided into 5 bays; stop log level control					



A = _____ D = _____

WP = _____ Ke = _____

$\frac{29.1}{R^{4/3}}$ = _____ n = _____

So = _____

L = _____

Sta. Sta.

CALCULATIONS AND COMMENTS:

COEFFICIENT OF DISCHARGE (for Portage Lake/Base Line Lake control structure)

For sharp-crested weir,

$c = 3.33\left(1 + 0.259\frac{H^2}{d^2}\right)$ from Handbook of Hydraulics - King & Brater

where $d = H + p$ H = head above weir crest

p = crest Elev. - inv. El. on u/s side

Assume H = 4.6 ft. for 100-year flow

p = 851.0 - 843.9 = 7.1 ft.

d = 4.6 + 7.1 = 11.7 ft.

$c = 3.33\left[1 + 0.259\frac{(4.6)^2}{(11.7)^2}\right] = 3.46$

00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: Hamburg

3) WATERCOURSE: Huron River & Connecting Lakes

4) DOCUMENT TYPE: Convergence Run 10 YR. Flood

00BREAK00

```
*********************************************
*  WATER SURFACE PROFILES                   *
*  VERSION OF NOVEMBER 1976                 *
*  UPDATED JULY 1979                        *
*                                           *
*  RUN DATE MON, JUN 15, 1981, 12:50 PM     *
*********************************************
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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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JUN 02 1981
WATER MANAGEMENT

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X     X  XXXXXXX   XXXXX              XXXXX
X     X  X         X     X            X     X
X     X  X         X                  X     X
XXXXXXX  XXXXX     X         XXXXX    XXXXX
X     X  X         X                  X
X     X  X         X     X            X
X     X  XXXXXXX   XXXXX              XXXXXXX
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Convergence Run

10 - Year Flood.

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**********************************************************
HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
ERROR CORR -  01,02,03
MODIFICATION -  50,51,52,53
**********************************************************


C
T1      HANBURG TOWNSHIP F.I.S.
T2      CONVERGENCE TRIALS - RATING CURVE ANALYSIS
T3      HURON RIVER - JOB NO.6504-03-0 - PROJECT MANAGER, ANDY KUBEK

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ
      -1.      2.       0.       0.    .000000     .00      .0       0.    843.500   .000

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE
    1.000     .000    -1.000    .000     .000     .800     .000     .000     .000     .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

   38.000   40.000   41.000   42.000   43.000    1.000    8.000   10.000   12.000    3.000

   33.000    4.000   25.000    .000     .000     .000     .000     .000     .000     .000

NC     .100     .100     .042     .300     .500     .000     .000     .000     .000     .000
QT    6.000 2140.000 2140.000 2140.000 2140.000 2140.000 2140.000     .000     .000     .000


          VALLEY SECTION 1.1

X1  93120.000   19.000  268.000  440.000     .000     .000     .000     .000     .000     .000
GR    850.900     .000  851.100  100.000  848.100  200.000  845.600  255.000  841.900  268.000
GR    839.900  270.000  839.900  272.000  840.400  300.000  840.200  325.000  840.200  365.000
GR    839.200  380.000  839.200  400.000  840.700  437.000  842.700  440.000  849.600  500.000
GR    872.900  550.000  878.900  600.000  882.400  700.000  886.800  800.000     .000     .000


X1  94885.000     .000     .000     .000 1410.000 1910.000 1765.000     .000    3.000     .000
X3     .000     .000     .000  301.000     .000  400.000     .000     .000     .000     .000
NC     .030     .030     .030     .000     .000     .000     .000     .000     .000     .000


          BRIDGE SECTION 1 - BELL ST. BRIDGE - D/S FACE

X1  94886.000  17.000  600.000  699.000    1.000    1.000    1.000     .000     .000     .000
BT     11.000     .000  856.500     .000  100.000  854.100     .000  200.000  852.100     .000
BT    300.000  851.700     .000  400.000  851.900     .000  500.000  852.100     .000  600.000
BT    854.900  854.000  699.000  854.900  853.900  800.000  856.400     .000  900.000  859.300
BT       .000  925.000  860.400     .000     .000     .000     .000     .000     .000     .000
GR    856.500     .000  854.100  100.000  852.100  200.000  851.700  300.000  851.900  400.000
GR    852.100  500.000  854.900  600.000  844.200  600.000  843.200  620.000  842.200  640.000
GR    842.300  660.000  842.400  680.000  845.000  699.000  854.900  699.000  856.400  800.000
GR    859.300  900.000  860.400  925.000     .000     .000     .000     .000     .000     .000
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BRIDGE SECTION 1 - BELL ST. BRIDGE - U/S FACE

X1	94900.000	.000	.000	.000	14.000	14.000	14.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.070	.100	.042	.000	.000	.000	.000	.000	.000	.000
X1	94901.000	20.000	500.000	607.000	1.000	1.000	1.000	.000	.000	.000
X3	.000	.000	.000	505.000	.000	604.000	.000	.000	.000	.000
GR	857.300	.000	856.300	100.000	852.700	200.000	849.900	300.000	849.600	400.000
GR	848.700	500.000	845.700	505.000	842.300	515.000	842.200	525.000	842.800	568.000
GR	844.000	588.000	847.600	607.000	850.500	657.000	846.300	680.000	842.800	697.000
GR	845.000	715.000	846.100	725.000	857.000	735.000	857.200	800.000	860.000	865.000

VALLEY SECTION 1

X1	95170.000	20.000	500.000	607.000	300.000	300.000	269.000	.000	.000	.000
GR	855.700	.000	854.700	100.000	851.100	200.000	848.300	300.000	848.000	400.000
GR	847.100	500.000	844.300	505.000	840.700	515.000	840.600	525.000	841.200	568.000
GR	842.400	588.000	846.000	607.000	848.900	657.000	844.700	680.000	841.200	697.000
GR	843.400	715.000	844.500	725.000	855.400	735.000	855.600	800.000	858.400	865.000
NH	5.000	.050	600.000	.120	1100.000	.050	1255.000	.042	1400.000	.125
NH	1500.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 2

X1	97350.000	24.000	1255.000	1400.000	2020.000	2200.000	2180.000	.000	.000	.000
GR	882.000	.000	877.100	100.000	874.700	200.000	871.100	300.000	867.700	400.000
GR	864.600	500.000	862.400	600.000	861.900	700.000	859.600	800.000	859.000	900.000
GR	856.200	1000.000	852.100	1100.000	854.100	1200.000	854.100	1255.000	844.900	1281.000
GR	843.200	1290.000	842.500	1300.000	841.800	1317.000	841.700	1325.000	841.700	1350.000
GR	841.700	1376.000	844.100	1382.000	850.300	1400.000	856.900	1500.000	.000	.000
NH	4.000	.060	620.000	.040	755.000	.100	900.000	.060	1200.000	.000

VALLEY SECTION 3

X1	99000.000	21.000	620.000	755.000	1700.000	1550.000	1650.000	.000	.000	.000
GR	879.700	.000	869.500	100.000	864.200	200.000	864.600	300.000	864.900	400.000
GR	854.500	500.000	851.000	600.000	850.500	620.000	845.900	629.000	842.900	640.000
GR	841.400	660.000	842.100	690.000	842.600	720.000	845.400	739.000	847.400	745.000
GR	853.600	755.000	853.900	800.000	854.200	900.000	855.200	1000.000	858.200	1100.000
GR	858.700	1200.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	99998.000	.000	.000	.000	1150.000	850.000	998.000	.000	.600	.000
NC	.050	.050	.015	.000	.000	.000	.000	.000	.000	.000
X1	99999.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
SB	.900	1.500	3.460	.000	.010	.000	.010	.000	843.900	842.000

DAM SECTION 2 - U/S FACE

X1	100000.000	26.000	400.000	516.500	1.000	1.000	1.000	.000	.000	.000
X2	.000	.000	1.000	843.900	851.000	.000	.000	.000	.000	.000

BT	29.000	.000	854.500	.000	100.000	853.600	.000	200.000	853.500	.000
BT	300.000	854.300	.000	398.000	854.200	.000	400.000	854.700	.000	410.600
BT	854.600	.000	410.500	851.000	.000	430.500	851.000	.000	430.500	854.300
BT	.000	432.000	854.300	.000	432.000	851.000	.000	452.000	851.000	.000
BT	452.000	854.000	.000	453.500	854.000	.000	453.500	851.000	.000	473.500
BT	851.000	.000	473.500	854.000	.000	475.000	854.000	.000	475.000	851.000
BT	.000	495.000	851.000	.000	495.000	854.000	.000	496.500	854.000	.000
BT	496.500	851.000	.000	516.500	851.000	.000	516.500	854.000	.000	560.000
BT	854.400	.000	600.000	857.500	.000	700.000	859.400	.000	.000	.000
GR	854.500	.000	853.600	100.000	853.500	200.000	854.300	300.000	854.200	398.000
GR	854.700	400.000	847.400	400.000	845.600	409.000	844.100	410.500	844.100	430.500
GR	844.100	432.000	843.900	440.000	843.900	452.000	843.900	453.500	843.900	460.000
GR	843.900	473.500	843.900	475.000	843.900	480.000	844.400	495.000	844.400	496.500
GR	844.500	500.000	845.000	516.500	854.000	516.500	854.400	560.000	857.500	600.000
GR	859.400	700.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.100	.060	.040	.000	.000	.000	.000	.000	.000	.000
X1	100001.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
NH	4.000	.125	560.000	.060	670.000	.040	804.000	.060	945.000	.000
QT	6.000	1550.000	1550.000	1550.000	1550.000	1550.000	1550.000	.000	.000	.000

VALLEY SECTION 4

X1	100540.000	23.000	670.000	804.000	400.000	600.000	539.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	910.000	.000	.000	.000	.000
GR	868.000	.000	864.000	50.000	860.000	90.000	856.000	160.000	856.000	300.000
GR	857.800	360.000	856.000	480.000	856.000	560.000	857.400	620.000	855.900	670.000
GR	851.100	680.000	848.200	690.000	845.000	702.000	843.700	714.000	844.200	728.000
GR	844.700	743.000	845.500	761.000	845.100	777.000	845.800	791.000	849.100	803.000
GR	853.200	804.000	854.000	850.000	854.500	945.000	.000	.000	.000	.000
NH	4.000	.125	700.000	.060	750.000	.040	889.000	.060	1220.000	.000

VALLEY SECTION 5

X1	101800.000	23.000	750.000	889.000	1100.000	1170.000	1260.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	1050.000	.000	.000	.000	.000
GR	868.000	.000	864.000	140.000	860.000	280.000	856.000	310.000	852.000	400.000
GR	850.200	500.000	852.000	620.000	852.000	700.000	853.300	750.000	852.400	760.000
GR	851.300	761.000	846.900	780.000	845.300	804.000	845.300	820.000	844.600	840.000
GR	844.600	850.000	844.800	866.000	849.300	888.000	853.900	889.000	854.000	1010.000
GR	856.000	1190.000	858.000	1200.000	859.000	1220.000	.000	.000	.000	.000
NC	.125	.125	.040	.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 6

X1	102480.000	27.000	740.000	922.000	600.000	580.000	680.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	1310.000	.000	.000	.000	.000
GR	868.000	.000	864.000	150.000	860.000	220.000	856.000	240.000	852.000	340.000
GR	852.000	730.000	851.700	740.000	851.400	742.000	847.800	778.000	846.500	792.000
GR	846.700	803.000	845.900	820.000	845.900	840.000	846.400	855.000	847.100	870.000
GR	847.800	890.000	851.500	920.000	851.800	922.000	852.000	970.000	852.000	1090.000
GR	854.000	1200.000	856.000	1250.000	858.000	1280.000	860.000	1310.000	862.000	1330.000
GR	864.000	1350.000	866.000	1370.000	.000	.000	.000	.000	.000	.000
EJ	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

FORM 141 5 68
PRINTED IN U.S.A.

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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

HURON RIVER - JOB NO.650

SUMMARY PRINTOUT

SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	K*CHSL	TOPWID	AREA
93120.000	.00	.00	839.20	2140.00	843.50	4.30	.20	.00	843.70	.00	184.58	605.23
93120.000	.00	.00	839.20	2140.00	844.00	4.80	.15	.00	844.15	.00	190.68	699.05
93120.000	.00	.00	839.20	2140.00	844.50	5.30	.12	.00	844.62	.00	196.79	795.91
93120.000	.00	.00	839.20	2140.00	845.00	5.80	.09	.00	845.09	.00	202.89	895.83
93120.000	.00	.00	839.20	2140.00	846.00	6.80	.06	.00	846.06	.00	222.50	1106.31
93120.000	.00	.00	839.20	2140.00	846.50	7.30	.05	.00	846.55	.00	237.84	1221.39
94885.000	.00	.00	842.20	2140.00	846.69	4.49	.51	.16	847.21	1.70	99.00	371.76
94885.000	.00	.00	842.20	2140.00	846.47	4.27	.59	.22	847.05	1.70	99.00	348.59
94885.000	.00	.00	842.20	2140.00	846.33	4.13	.63	.26	846.96	1.70	99.00	335.23
94885.000	.00	.00	842.20	2140.00	846.32	4.12	.64	.27	846.96	1.70	99.00	334.41
94885.000	.00	.00	842.20	2140.00	846.68	4.48	.52	.23	847.20	1.70	99.00	370.31
94885.000	.00	.00	842.20	2140.00	847.00	4.80	.44	.19	847.44	1.70	99.00	401.38
94886.000	851.70	854.00	842.20	2140.00	846.70	4.50	.51	.00	847.21	.00	99.00	372.70
94886.000	851.70	854.00	842.20	2140.00	846.48	4.28	.58	.00	847.06	.00	99.00	350.13
94886.000	851.70	854.00	842.20	2140.00	846.34	4.14	.63	.00	846.97	.00	99.00	336.83
94886.000	851.70	854.00	842.20	2140.00	846.33	4.13	.63	.00	846.96	.00	99.00	336.02
94886.000	851.70	854.00	842.20	2140.00	846.69	4.49	.52	.00	847.20	.00	99.00	371.43
94886.000	851.70	854.00	842.20	2140.00	847.00	4.80	.44	.00	847.44	.00	99.00	402.70
94900.000	851.70	854.00	842.20	2140.00	846.73	4.53	.50	.00	847.24	.00	99.00	376.34
94900.000	851.70	854.00	842.20	2140.00	846.52	4.32	.56	.00	847.09	.00	99.00	354.89
94900.000	851.70	854.00	842.20	2140.00	846.40	4.20	.61	.01	847.01	.00	99.00	342.26
94900.000	851.70	854.00	842.20	2140.00	846.39	4.19	.61	.01	847.00	.00	99.00	341.50
94900.000	851.70	854.00	842.20	2140.00	846.72	4.52	.51	.00	847.23	.00	99.00	375.22
94900.000	851.70	854.00	842.20	2140.00	847.03	4.83	.43	.00	847.46	.00	99.00	405.68
94901.000	.00	.00	842.20	2140.00	846.67	4.47	.64	.07	847.31	.00	97.09	334.44
94901.000	.00	.00	842.20	2140.00	846.44	4.24	.73	.08	847.17	.00	95.90	312.59
94901.000	.00	.00	842.20	2140.00	846.31	4.11	.79	.09	847.10	.00	95.19	299.78
94901.000	.00	.00	842.20	2140.00	846.30	4.10	.80	.09	847.10	.00	95.15	299.01
94901.000	.00	.00	842.20	2140.00	846.66	4.46	.64	.07	847.30	.00	97.03	333.35
94901.000	.00	.00	842.20	2140.00	846.98	4.78	.53	.05	847.51	.00	98.73	364.76

SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	K*CHSL	TOPWID	AREA
95170.000	.00	.00	840.60	2140.00	847.82	7.02	.13	.15	847.76	-5.95	257.09	879.15
95170.000	.00	.00	840.60	2140.00	847.54	6.94	.14	.18	847.68	-5.95	245.72	857.95
95170.000	.00	.00	840.60	2140.00	847.50	6.90	.14	.20	847.64	-5.95	240.61	848.72
95170.000	.00	.00	840.60	2140.00	847.50	6.90	.14	.20	847.64	-5.95	240.35	848.25
95170.000	.00	.00	840.60	2140.00	847.62	7.02	.13	.15	847.75	-5.95	256.45	877.93
95170.000	.00	.00	840.60	2140.00	847.77	7.17	.12	.12	847.90	-5.95	277.25	919.13
97350.000	.00	.00	841.70	2140.00	848.68	6.98	.14	.00	848.82	.50	125.03	708.83
97350.000	.00	.00	841.70	2140.00	848.64	6.94	.14	.00	848.78	.50	124.75	702.81
97350.000	.00	.00	841.70	2140.00	848.62	6.92	.14	.00	848.77	.50	124.65	700.52
97350.000	.00	.00	841.70	2140.00	848.62	6.92	.14	.00	848.77	.50	124.64	700.40
97350.000	.00	.00	841.70	2140.00	848.68	6.98	.14	.00	848.82	.50	125.02	708.55
97350.000	.00	.00	841.70	2140.00	848.76	7.06	.14	.01	848.90	.50	125.46	718.12
99000.000	.00	.00	841.40	2140.00	849.35	7.95	.12	.01	849.47	-.18	125.90	770.75
99000.000	.00	.00	841.40	2140.00	849.33	7.93	.12	.01	849.45	-.18	125.81	767.42
99000.000	.00	.00	841.40	2140.00	849.31	7.91	.12	.01	849.43	-.18	125.76	765.82
99000.000	.00	.00	841.40	2140.00	849.31	7.91	.12	.01	849.43	-.18	125.76	765.74
99000.000	.00	.00	841.40	2140.00	849.35	7.95	.12	.01	849.47	-.18	125.90	770.53
99000.000	.00	.00	841.40	2140.00	849.41	8.01	.12	.01	849.53	-.18	126.10	777.82
99998.000	.00	.00	842.00	2140.00	849.70	7.70	.13	.01	849.83	.60	124.99	738.53
99998.000	.00	.00	842.00	2140.00	849.67	7.67	.13	.01	849.80	.60	124.91	735.78
99998.000	.00	.00	842.00	2140.00	849.66	7.66	.13	.01	849.79	.60	124.87	734.46
99998.000	.00	.00	842.00	2140.00	849.66	7.66	.13	.01	849.79	.60	124.87	734.39
99998.000	.00	.00	842.00	2140.00	849.69	7.69	.13	.01	849.82	.60	124.98	738.35
99998.000	.00	.00	842.00	2140.00	849.74	7.74	.13	.01	849.87	.60	125.15	744.41
99999.000	.00	.00	842.00	2140.00	849.70	7.70	.13	.00	849.83	.00	124.99	738.58
99999.000	.00	.00	842.00	2140.00	849.67	7.67	.13	.00	849.80	.00	124.91	735.83
99999.000	.00	.00	842.00	2140.00	849.66	7.66	.13	.00	849.79	.00	124.87	734.51
99999.000	.00	.00	842.00	2140.00	849.66	7.66	.13	.00	849.79	.00	124.87	734.44
99999.000	.00	.00	842.00	2140.00	849.69	7.69	.13	.00	849.82	.00	124.98	738.39
99999.000	.00	.00	842.00	2140.00	849.74	7.74	.13	.00	849.87	.00	125.15	744.45
100000.000	851.00	843.90	843.90	2140.00	854.07	10.17	.05	.00	854.13	1900.00	348.22	1219.92
100000.000	851.00	843.90	843.90	2140.00	854.07	10.17	.05	.00	854.13	1900.00	348.22	1219.92
100000.000	851.00	843.90	843.90	2140.00	854.07	10.17	.05	.00	854.13	1900.00	348.22	1219.92
100000.000	851.00	843.90	843.90	2140.00	854.07	10.17	.05	.00	854.13	1900.00	348.22	1219.92
100000.000	851.00	843.90	843.90	2140.00	854.07	10.17	.05	.00	854.13	1900.00	348.22	1219.92
100000.000	851.00	843.90	843.90	2140.00	854.07	10.17	.05	.00	854.13	1900.00	348.22	1219.92
100001.000	.00	.00	843.90	2140.00	854.07	10.17	.05	.00	854.13	.00	348.23	1219.93
100001.000	.00	.00	843.90	2140.00	854.07	10.17	.05	.00	854.13	.00	348.23	1219.93
100001.000	.00	.00	843.90	2140.00	854.07	10.17	.05	.00	854.13	.00	348.23	1219.93
100001.000	.00	.00	843.90	2140.00	854.07	10.17	.05	.00	854.13	.00	348.23	1219.93
100001.000	.00	.00	843.90	2140.00	854.07	10.17	.05	.00	854.13	.00	348.23	1219.93
100001.000	.00	.00	843.90	2140.00	854.07	10.17	.05	.00	854.13	.00	348.23	1219.93
100540.000	.00	.00	843.70	1550.00	854.14	10.44	.03	.01	854.18	-.37	203.46	1086.85
100540.000	.00	.00	843.70	1550.00	854.14	10.44	.03	.01	854.18	-.37	203.46	1086.85
100540.000	.00	.00	843.70	1550.00	854.14	10.44	.03	.01	854.18	-.37	203.46	1086.85
100540.000	.00	.00	843.70	1550.00	854.14	10.44	.03	.01	854.18	-.37	203.46	1086.85
100540.000	.00	.00	843.70	1550.00	854.14	10.44	.03	.01	854.18	-.37	203.46	1086.85
100540.000	.00	.00	843.70	1550.00	854.14	10.44	.03	.01	854.18	-.37	203.46	1086.85

SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	K*CHSL	TOPWID	AREA
101800.000	.00	.00	844.60	1550.00	854.23	9.63	.02	.00	854.25	.71	681.48	2088.50
101800.000	.00	.00	844.60	1550.00	854.23	9.63	.02	.00	854.25	.71	681.48	2088.50
101800.000	.00	.00	844.60	1550.00	854.23	9.63	.02	.00	854.25	.71	681.48	2088.50
101800.000	.00	.00	844.60	1550.00	854.23	9.63	.02	.00	854.25	.71	681.48	2088.50
101800.000	.00	.00	844.60	1550.00	854.23	9.63	.02	.00	854.25	.71	681.48	2088.50
101800.000	.00	.00	844.60	1550.00	854.23	9.63	.02	.00	854.25	.71	681.48	2088.50
102480.000	.00	.00	845.90	1550.00	854.27	8.37	.02	.00	854.29	1.91	923.30	2672.37
102480.000	.00	.00	845.90	1550.00	854.27	8.37	.02	.00	854.29	1.91	923.30	2672.37
102480.000	.00	.00	845.90	1550.00	854.27	8.37	.02	.00	854.29	1.91	923.30	2672.37
102480.000	.00	.00	845.90	1550.00	854.27	8.37	.02	.00	854.29	1.91	923.30	2672.37
102480.000	.00	.00	845.90	1550.00	854.27	8.37	.02	.00	854.29	1.91	923.30	2672.37
102480.000	.00	.00	845.90	1550.00	854.27	8.37	.02	.00	854.29	1.91	923.30	2672.37

SUMMARY OF ERRORS

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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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00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: Hamburg

3) WATERCOURSE: Huron River & Connecting Lakes

4) DOCUMENT TYPE: Convergence Run 10 YR. Flood

00BREAK00

```
*****************************************************************
*  WATER SURFACE PROFILES                                       *
*  VERSION OF NOVEMBER 1976                                     *
*  UPDATED JULY 1979                                            *
*                                                               *
*  RUN DATE MON, JUN 15, 1981, 12:50 PM                         *
*****************************************************************
```

```
*****************************************************************
*  U.S. ARMY CORPS OF ENGINEERS                                 *
*  THE HYDROLOGIC ENGINEERING CENTER                            *
*  609 SECOND STREET, SUITE D                                   *
*  DAVIS, CALIFORNIA 95616                                      *
*  (916) 440-2105 (FTS) 448-2105                                *
*****************************************************************
```

RECEIVED
JUN 02 1981
WATER MANAGEMENT

```
X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X            X     X
X     X  X        X                  X     X
XXXXXXX  XXXXX    X         XXXXX    XXXXX
X     X  X        X                  X
X     X  X        X     X            X
X     X  XXXXXXX  XXXXX              XXXXXXX
```

Convergence Run

10-Year Flood.

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**********************************************************
HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
ERROR CORR -  01,02,03
MODIFICATION -  50,51,52,53
**********************************************************


C
T1      HANBURG TOWNSHIP F.I.S.
T2      CONVERGENCE TRIALS - RATING CURVE ANALYSIS
T3      HURON RIVER - JOB NO.6504-03-0 - PROJECT MANAGER, ANDY KUBEK

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

     -1.       2.        0.        0.    .000000     .00       .0        0.     843.500    .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    1.000     .000     -1.000     .000      .000      .800      .000      .000      .000      .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

   38.000    40.000    41.000    42.000    43.000    1.000     8.000    10.000    12.000     3.000

   33.000     4.000    25.000     .000      .000      .000      .000      .000      .000      .000

NC     .100      .100      .042      .300      .500      .000      .000      .000      .000      .000
QT    6.000  2140.000  2140.000  2140.000  2140.000  2140.000  2140.000     .000      .000      .000


          VALLEY SECTION 1.1

X1  93120.000    19.000   268.000   440.000     .000      .000      .000      .000      .000      .000
GR    850.900     .000    851.100   100.000   848.100   200.000   845.600   255.000   841.900   268.000
GR    839.900   270.000   839.900   272.000   840.400   300.000   840.200   325.000   840.200   365.000
GR    839.200   380.000   839.200   400.000   840.700   437.000   842.700   440.000   849.600   500.000
GR    872.900   550.000   878.900   600.000   882.400   700.000   886.800   800.000     .000      .000


X1  94885.000     .000      .000      .000   1410.000  1910.000  1765.000     .000     3.000     .000
X3     .000      .000      .000    301.000     .000    400.000     .000      .000      .000      .000
NC     .030      .030      .030      .000      .000      .000      .000      .000      .000      .000


          BRIDGE SECTION 1 - BELL ST. BRIDGE - D/S FACE

X1  94886.000    17.000   600.000   699.000    1.000     1.000     1.000     .000      .000      .000
BT    11.000     .000     856.500     .000    100.000   854.100     .000    200.000   852.100     .000
BT   300.000   851.700     .000    400.000   851.900     .000    500.000   852.100     .000    600.000
BT   854.900   854.000   699.000   854.900   853.900   800.000   856.400     .000    900.000   859.300
BT     .000   925.000   860.400     .000      .000      .000      .000      .000      .000      .000
GR   856.500     .000    854.100   100.000   852.100   200.000   851.700   300.000   851.900   400.000
GR   852.100   500.000   854.900   600.000   844.200   600.000   843.200   620.000   842.200   640.000
GR   842.300   660.000   842.400   680.000   845.000   699.000   854.900   699.000   856.400   800.000
GR   859.300   900.000   860.400   925.000     .000      .000      .000      .000      .000      .000
```

BRIDGE SECTION 1 - BELL ST. BRIDGE - U/S FACE

X1	94900.000	.000	.000	.000	14.000	14.000	14.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.070	.100	.042	.000	.000	.000	.000	.000	.000	.000
X1	94901.000	20.000	500.000	607.000	1.000	1.000	1.000	.000	.000	.000
X3	.000	.000	.000	505.000	.000	604.000	.000	.000	.000	.000
GR	857.300	.000	856.300	100.000	852.700	200.000	849.900	300.000	849.600	400.000
GR	848.700	500.000	845.700	505.000	842.300	515.000	842.200	525.000	842.800	568.000
GR	844.000	588.000	847.600	607.000	850.500	657.000	846.300	680.000	842.800	697.000
GR	845.000	715.000	846.100	725.000	857.000	735.000	857.200	800.000	860.000	865.000

VALLEY SECTION 1

X1	95170.000	20.000	500.000	607.000	300.000	300.000	269.000	.000	.000	.000
GR	855.700	.000	854.700	100.000	851.100	200.000	848.300	300.000	848.000	400.000
GR	847.100	500.000	844.300	505.000	840.700	515.000	840.600	525.000	841.200	568.000
GR	842.400	588.000	846.000	607.000	848.900	657.000	844.700	680.000	841.200	697.000
GR	843.400	715.000	844.500	725.000	855.400	735.000	855.600	800.000	858.400	865.000
NH	5.000	.050	600.000	.120	1100.000	.050	1255.000	.042	1400.000	.125
NH	1500.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 2

X1	97350.000	24.000	1255.000	1400.000	2020.000	2200.000	2180.000	.000	.000	.000
GR	882.000	.000	877.100	100.000	874.700	200.000	871.100	300.000	867.700	400.000
GR	864.600	500.000	862.400	600.000	861.900	700.000	859.600	800.000	859.000	900.000
GR	856.200	1000.000	852.100	1100.000	854.100	1200.000	854.100	1255.000	844.900	1281.000
GR	843.200	1290.000	842.500	1300.000	841.800	1317.000	841.700	1325.000	841.700	1350.000
GR	841.700	1376.000	844.100	1382.000	850.300	1400.000	856.900	1500.000	.000	.000
NH	4.000	.060	620.000	.040	755.000	.100	900.000	.060	1200.000	.000

VALLEY SECTION 3

X1	99000.000	21.000	620.000	755.000	1700.000	1550.000	1650.000	.000	.000	.000
GR	879.700	.000	869.500	100.000	864.200	200.000	864.600	300.000	864.900	400.000
GR	854.500	500.000	851.000	600.000	850.500	620.000	845.900	629.000	842.900	640.000
GR	841.400	660.000	842.100	690.000	842.600	720.000	845.400	739.000	847.400	745.000
GR	853.600	755.000	853.900	800.000	854.200	900.000	855.200	1000.000	858.200	1100.000
GR	858.700	1200.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	99998.000	.000	.000	.000	1150.000	850.000	998.000	.000	.600	.000
NC	.050	.050	.015	.000	.000	.000	.000	.000	.000	.000
X1	99999.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
SB	.900	1.500	3.460	.000	.010	.000	.010	.000	843.900	842.000

DAM SECTION 2 - U/S FACE

X1	100000.000	26.000	400.000	516.500	1.000	1.000	1.000	.000	.000	.000
X2	.000	.000	1.000	843.900	851.000	.000	.000	.000	.000	.000

BT	29.000	.000	854.500	.000	100.000	853.600	.000	200.000	853.500	.000
BT	300.000	854.300	.000	398.000	854.200	.000	400.000	854.700	.000	410.600
BT	854.600	.000	410.500	851.000	.000	430.500	851.000	.000	430.500	854.300
BT	.000	432.000	854.300	.000	432.000	851.000	.000	452.000	851.000	.000
BT	452.000	854.000	.000	453.500	854.000	.000	453.500	851.000	.000	473.500
BT	851.000	.000	473.500	854.000	.000	475.000	854.000	.000	475.000	851.000
BT	.000	495.000	851.000	.000	495.000	854.000	.000	496.500	854.000	.000
BT	496.500	851.000	.000	516.500	851.000	.000	516.500	854.000	.000	560.000
BT	854.400	.000	600.000	857.500	.000	700.000	859.400	.000	.000	.000
GR	854.500	.000	853.600	100.000	853.500	200.000	854.300	300.000	854.200	398.000
GR	854.700	400.000	847.400	400.000	845.600	409.000	844.100	410.500	844.100	430.500
GR	844.100	432.000	843.900	440.000	843.900	452.000	843.900	453.500	843.900	460.000
GR	843.900	473.500	843.900	475.000	843.900	480.000	844.400	495.000	844.400	496.500
GR	844.500	500.000	845.000	516.500	854.000	516.500	854.400	560.000	857.500	600.000
GR	859.400	700.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.100	.060	.040	.000	.000	.000	.000	.000	.000	.000
X1	100001.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
NH	4.000	.125	560.000	.060	670.000	.040	804.000	.060	945.000	.000
GT	6.000	1550.000	1550.000	1550.000	1550.000	1550.000	1550.000	.000	.000	.000

VALLEY SECTION 4

X1	100540.000	23.000	670.000	804.000	400.000	600.000	539.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	910.000	.000	.000	.000	.000
GR	868.000	.000	864.000	50.000	860.000	90.000	856.000	160.000	856.000	300.000
GR	857.800	360.000	856.000	480.000	856.000	560.000	857.400	620.000	855.900	670.000
GR	851.100	680.000	848.200	690.000	845.000	702.000	843.700	714.000	844.200	728.000
GR	844.700	743.000	845.500	761.000	845.100	777.000	845.800	791.000	849.100	803.000
GR	853.200	804.000	854.000	850.000	854.500	945.000	.000	.000	.000	.000
NH	4.000	.125	700.000	.060	750.000	.040	889.000	.060	1220.000	.000

VALLEY SECTION 5

X1	101800.000	23.000	750.000	889.000	1100.000	1170.000	1260.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	1050.000	.000	.000	.000	.000
GR	868.000	.000	864.000	140.000	860.000	280.000	856.000	310.000	852.000	400.000
GR	850.200	500.000	852.000	620.000	852.000	700.000	853.300	750.000	852.400	760.000
GR	851.300	761.000	846.900	780.000	845.300	804.000	845.300	820.000	844.600	840.000
GR	844.600	850.000	844.800	866.000	849.300	888.000	853.900	889.000	854.000	1010.000
GR	856.000	1190.000	858.000	1200.000	859.000	1220.000	.000	.000	.000	.000
NC	.125	.125	.040	.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 6

X1	102480.000	27.000	740.000	922.000	600.000	580.000	680.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	1310.000	.000	.000	.000	.000
GR	868.000	.000	864.000	150.000	860.000	220.000	856.000	240.000	852.000	340.000
GR	852.000	730.000	851.700	740.000	851.400	742.000	847.800	778.000	846.500	792.000
GR	846.700	803.000	845.900	820.000	845.900	840.000	846.400	855.000	847.100	870.000
GR	847.800	890.000	851.500	920.000	851.800	922.000	852.000	970.000	852.000	1090.000
GR	854.000	1200.000	856.000	1250.000	858.000	1280.000	860.000	1310.000	862.000	1330.000
GR	864.000	1350.000	866.000	1370.000	.000	.000	.000	.000	.000	.000
EJ	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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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

HURON RIVER - JOB NO.650

SUMMARY PRINTOUT

SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	K*CHSL	TOPWID	AREA
93120.000	.00	.00	839.20	2140.00	843.50	4.30	.20	.00	843.70	.00	184.58	605.23
93120.000	.00	.00	839.20	2140.00	844.00	4.80	.15	.00	844.15	.00	190.68	699.05
93120.000	.00	.00	839.20	2140.00	844.50	5.30	.12	.00	844.62	.00	196.79	795.91
93120.000	.00	.00	839.20	2140.00	845.00	5.80	.09	.00	845.09	.00	202.89	895.83
93120.000	.00	.00	839.20	2140.00	846.00	6.80	.06	.00	846.06	.00	222.50	1106.31
93120.000	.00	.00	839.20	2140.00	846.50	7.30	.05	.00	846.55	.00	237.84	1221.39
94885.000	.00	.00	842.20	2140.00	846.69	4.49	.51	.16	847.21	1.70	99.00	371.76
94885.000	.00	.00	842.20	2140.00	846.47	4.27	.59	.22	847.05	1.70	99.00	348.59
94885.000	.00	.00	842.20	2140.00	846.33	4.13	.63	.26	846.96	1.70	99.00	335.23
94885.000	.00	.00	842.20	2140.00	846.32	4.12	.64	.27	846.96	1.70	99.00	334.41
94885.000	.00	.00	842.20	2140.00	846.68	4.48	.52	.23	847.20	1.70	99.00	370.31
94885.000	.00	.00	842.20	2140.00	847.00	4.80	.44	.19	847.44	1.70	99.00	401.38
94886.000	851.70	854.00	842.20	2140.00	846.70	4.50	.51	.00	847.21	.00	99.00	372.70
94886.000	851.70	854.00	842.20	2140.00	846.48	4.28	.58	.00	847.06	.00	99.00	350.13
94886.000	851.70	854.00	842.20	2140.00	846.34	4.14	.63	.00	846.97	.00	99.00	336.83
94886.000	851.70	854.00	842.20	2140.00	846.33	4.13	.63	.00	846.96	.00	99.00	336.02
94886.000	851.70	854.00	842.20	2140.00	846.69	4.49	.52	.00	847.20	.00	99.00	371.43
94886.000	851.70	854.00	842.20	2140.00	847.00	4.80	.44	.00	847.44	.00	99.00	402.70
94900.000	851.70	854.00	842.20	2140.00	846.73	4.53	.50	.00	847.24	.00	99.00	376.34
94900.000	851.70	854.00	842.20	2140.00	846.52	4.32	.56	.00	847.09	.00	99.00	354.89
94900.000	851.70	854.00	842.20	2140.00	846.40	4.20	.61	.01	847.01	.00	99.00	342.26
94900.000	851.70	854.00	842.20	2140.00	846.39	4.19	.61	.01	847.00	.00	99.00	341.50
94900.000	851.70	854.00	842.20	2140.00	846.72	4.52	.51	.00	847.23	.00	99.00	375.22
94900.000	851.70	854.00	842.20	2140.00	847.03	4.83	.43	.00	847.46	.00	99.00	405.68
94901.000	.00	.00	842.20	2140.00	846.67	4.47	.64	.07	847.31	.00	97.09	334.44
94901.000	.00	.00	842.20	2140.00	846.44	4.24	.73	.08	847.17	.00	95.90	312.59
94901.000	.00	.00	842.20	2140.00	846.31	4.11	.79	.09	847.10	.00	95.19	299.78
94901.000	.00	.00	842.20	2140.00	846.30	4.10	.80	.09	847.10	.00	95.15	299.01
94901.000	.00	.00	842.20	2140.00	846.66	4.46	.64	.07	847.30	.00	97.03	333.35
94901.000	.00	.00	842.20	2140.00	846.98	4.78	.53	.05	847.51	.00	98.73	364.76

SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	K*CHSL	TOPWID	AREA
95170.000	.00	.00	840.60	2140.00	847.82	7.02	.13	.15	847.76	-5.95	257.09	879.15
95170.000	.00	.00	840.60	2140.00	847.54	6.94	.14	.18	847.68	-5.95	245.72	857.95
95170.000	.00	.00	840.60	2140.00	847.50	6.90	.14	.20	847.64	-5.95	240.61	848.72
95170.000	.00	.00	840.60	2140.00	847.50	6.90	.14	.20	847.64	-5.95	240.35	848.25
95170.000	.00	.00	840.60	2140.00	847.62	7.02	.13	.15	847.75	-5.95	256.45	877.93
95170.000	.00	.00	840.60	2140.00	847.77	7.17	.12	.12	847.90	-5.95	277.25	919.13
97350.000	.00	.00	841.70	2140.00	848.68	6.98	.14	.00	848.82	.50	125.03	708.83
97350.000	.00	.00	841.70	2140.00	848.64	6.94	.14	.00	848.78	.50	124.75	702.81
97350.000	.00	.00	841.70	2140.00	848.62	6.92	.14	.00	848.77	.50	124.65	700.52
97350.000	.00	.00	841.70	2140.00	848.62	6.92	.14	.00	848.77	.50	124.64	700.40
97350.000	.00	.00	841.70	2140.00	848.68	6.98	.14	.00	848.82	.50	125.02	708.55
97350.000	.00	.00	841.70	2140.00	848.76	7.06	.14	.01	848.90	.50	125.46	718.12
99000.000	.00	.00	841.40	2140.00	849.35	7.95	.12	.01	849.47	-.18	125.90	770.75
99000.000	.00	.00	841.40	2140.00	849.33	7.93	.12	.01	849.45	-.18	125.81	767.42
99000.000	.00	.00	841.40	2140.00	849.31	7.91	.12	.01	849.43	-.18	125.76	765.82
99000.000	.00	.00	841.40	2140.00	849.31	7.91	.12	.01	849.43	-.18	125.76	765.74
99000.000	.00	.00	841.40	2140.00	849.35	7.95	.12	.01	849.47	-.18	125.90	770.53
99000.000	.00	.00	841.40	2140.00	849.41	8.01	.12	.01	849.53	-.18	126.10	777.82
99998.000	.00	.00	842.00	2140.00	849.70	7.70	.13	.01	849.83	.60	124.99	738.53
99998.000	.00	.00	842.00	2140.00	849.67	7.67	.13	.01	849.80	.60	124.91	735.78
99998.000	.00	.00	842.00	2140.00	849.66	7.66	.13	.01	849.79	.60	124.87	734.46
99998.000	.00	.00	842.00	2140.00	849.66	7.66	.13	.01	849.79	.60	124.87	734.39
99998.000	.00	.00	842.00	2140.00	849.69	7.69	.13	.01	849.82	.60	124.98	738.35
99998.000	.00	.00	842.00	2140.00	849.74	7.74	.13	.01	849.87	.60	125.15	744.41
99999.000	.00	.00	842.00	2140.00	849.70	7.70	.13	.00	849.83	.00	124.99	738.58
99999.000	.00	.00	842.00	2140.00	849.67	7.67	.13	.00	849.80	.00	124.91	735.83
99999.000	.00	.00	842.00	2140.00	849.66	7.66	.13	.00	849.79	.00	124.87	734.51
99999.000	.00	.00	842.00	2140.00	849.66	7.66	.13	.00	849.79	.00	124.87	734.44
99999.000	.00	.00	842.00	2140.00	849.69	7.69	.13	.00	849.82	.00	124.98	738.39
99999.000	.00	.00	842.00	2140.00	849.74	7.74	.13	.00	849.87	.00	125.15	744.45
100000.000	851.00	843.90	843.90	2140.00	854.07	10.17	.05	.00	854.13	1900.00	348.22	1219.92
100000.000	851.00	843.90	843.90	2140.00	854.07	10.17	.05	.00	854.13	1900.00	348.22	1219.92
100000.000	851.00	843.90	843.90	2140.00	854.07	10.17	.05	.00	854.13	1900.00	348.22	1219.92
100000.000	851.00	843.90	843.90	2140.00	854.07	10.17	.05	.00	854.13	1900.00	348.22	1219.92
100000.000	851.00	843.90	843.90	2140.00	854.07	10.17	.05	.00	854.13	1900.00	348.22	1219.92
100000.000	851.00	843.90	843.90	2140.00	854.07	10.17	.05	.00	854.13	1900.00	348.22	1219.92
100001.000	.00	.00	843.90	2140.00	854.07	10.17	.05	.00	854.13	.00	348.23	1219.93
100001.000	.00	.00	843.90	2140.00	854.07	10.17	.05	.00	854.13	.00	348.23	1219.93
100001.000	.00	.00	843.90	2140.00	854.07	10.17	.05	.00	854.13	.00	348.23	1219.93
100001.000	.00	.00	843.90	2140.00	854.07	10.17	.05	.00	854.13	.00	348.23	1219.93
100001.000	.00	.00	843.90	2140.00	854.07	10.17	.05	.00	854.13	.00	348.23	1219.93
100001.000	.00	.00	843.90	2140.00	854.07	10.17	.05	.00	854.13	.00	348.23	1219.93
100540.000	.00	.00	843.70	1550.00	854.14	10.44	.03	.01	854.18	-.37	203.46	1086.85
100540.000	.00	.00	843.70	1550.00	854.14	10.44	.03	.01	854.18	-.37	203.46	1086.85
100540.000	.00	.00	843.70	1550.00	854.14	10.44	.03	.01	854.18	-.37	203.46	1086.85
100540.000	.00	.00	843.70	1550.00	854.14	10.44	.03	.01	854.18	-.37	203.46	1086.85
100540.000	.00	.00	843.70	1550.00	854.14	10.44	.03	.01	854.18	-.37	203.46	1086.85
100540.000	.00	.00	843.70	1550.00	854.14	10.44	.03	.01	854.18	-.37	203.46	1086.85

SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	K*CHSL	TOPWID	AREA
101800.000	.00	.00	844.60	1550.00	854.23	9.63	.02	.00	854.25	.71	681.48	2088.50
101800.000	.00	.00	844.60	1550.00	854.23	9.63	.02	.00	854.25	.71	681.48	2088.50
101800.000	.00	.00	844.60	1550.00	854.23	9.63	.02	.00	854.25	.71	681.48	2088.50
101800.000	.00	.00	844.60	1550.00	854.23	9.63	.02	.00	854.25	.71	681.48	2088.50
101800.000	.00	.00	844.60	1550.00	854.23	9.63	.02	.00	854.25	.71	681.48	2088.50
101800.000	.00	.00	844.60	1550.00	854.23	9.63	.02	.00	854.25	.71	681.48	2088.50
102480.000	.00	.00	845.90	1550.00	854.27	8.37	.02	.00	854.29	1.91	923.30	2672.37
102480.000	.00	.00	845.90	1550.00	854.27	8.37	.02	.00	854.29	1.91	923.30	2672.37
102480.000	.00	.00	845.90	1550.00	854.27	8.37	.02	.00	854.29	1.91	923.30	2672.37
102480.000	.00	.00	845.90	1550.00	854.27	8.37	.02	.00	854.29	1.91	923.30	2672.37
102480.000	.00	.00	845.90	1550.00	854.27	8.37	.02	.00	854.29	1.91	923.30	2672.37
102480.000	.00	.00	845.90	1550.00	854.27	8.37	.02	.00	854.29	1.91	923.30	2672.37

SUMMARY OF ERRORS

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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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00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: Hamburg Twp.

3) WATERCOURSE: Huron River & CONNECTING LAKES

4) DOCUMENT TYPE: CONVERGENCE Run 50 Year Flood

00BREAK00

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*********************************************
*  WATER SURFACE PROFILES                   *
*  VERSION OF NOVEMBER 1976                 *
*  UPDATED JULY 1979                        *
*                                           *
*  RUN DATE MON, JUN 15, 1981,  1:00 PM     *
*********************************************
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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     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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Convergency Run

50 - Year Flood

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**********************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -   01,02,03
  MODIFICATION -  50,51,52,53
**********************************************


C
T1        HANBURG TOWNSHIP F.I.S.
T2        CONVERGENCE TRIALS - RATING CURVE ANALYSIS
T3        HURON RIVER - JOB NO.6504-03-0 - PROJECT MANAGER, ANDY KOBEK

J1   ICHECK     INQ       NINV      IDIR      STRT     METRIC    HVINS     Q        WSEL      FQ

      -1.        2.        0.        0.   .000000      .00       .0       0.    845.000    .000

J2   NPROF     IPLOT     PRFVS     XSECV     XSECH      FN      ALLDC     IBW     CHNIM    ITRACE

     1.000      .000    -1.000      .000      .000     .800      .000     .000      .000     .000

J3   VARIABLE CODES FOR SUMMARY PRINTOUT

     38.000   40.000   41.000   42.000   43.000    1.000    8.000   10.000   12.000    3.000

     33.000    4.000   25.000     .000     .000     .000     .000     .000     .000     .000

NC      .100     .100     .042     .300     .500     .000     .000     .000     .000     .000
QT     6.000 3105.000 3105.000 3105.000 3105.000 3105.000 3105.000     .000     .000     .000

          VALLEY SECTION 1.1

X1  93120.000   19.000  268.000  440.000     .000     .000     .000     .000     .000     .000
GR    850.900     .000  851.100  100.000  848.100  200.000  845.600  255.000  841.900  268.000
GR    839.900  270.000  839.900  272.000  840.400  300.000  840.200  325.000  840.200  365.000
GR    839.200  380.000  839.200  400.000  840.700  437.000  842.700  440.000  849.600  500.000
GR    872.900  550.000  878.900  600.000  882.400  700.000  886.800  800.000     .000     .000

X1  94885.000     .000     .000     .000 1410.000 1910.000 1765.000     .000    3.000     .000
X3      .000     .000     .000  301.000     .000  400.000     .000     .000     .000     .000
NC      .030     .030     .030     .000     .000     .000     .000     .000     .000     .000

          BRIDGE SECTION 1 - BELL ST. BRIDGE - D/S FACE

X1  94886.000   17.000  600.000  699.000    1.000    1.000    1.000     .000     .000     .000
BT     11.000     .000  856.500     .000  100.000  854.100     .000  200.000  852.100     .000
BT    300.000  851.700     .000  400.000  851.900     .000  500.000  852.100     .000  600.000
BT    854.900  854.000  699.000  854.900  853.900  800.000  856.400     .000  900.000  859.300
BT       .000  925.000  860.400     .000     .000     .000     .000     .000     .000     .000
GR    856.500     .000  854.100  100.000  852.100  200.000  851.700  300.000  851.900  400.000
GR    852.100  500.000  854.900  600.000  844.200  600.000  843.200  620.000  842.200  640.000
GR    842.300  660.000  842.400  680.000  845.000  699.000  854.900  699.000  856.400  800.000
GR    859.300  900.000  860.400  925.000     .000     .000     .000     .000     .000     .000
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BRIDGE SECTION 1 - BELL ST. BRIDGE - U/S FACE

X1	94900.000	.000	.000	.000	14.000	14.000	14.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.070	.100	.042	.000	.000	.000	.000	.000	.000	.000
X1	94901.000	20.000	500.000	607.000	1.000	1.000	1.000	.000	.000	.000
X3	.000	.000	.000	505.000	.000	604.000	.000	.000	.000	.000
GR	857.300	.000	856.300	100.000	852.700	200.000	849.900	300.000	849.600	400.000
GR	848.700	500.000	845.700	505.000	842.300	515.000	842.200	525.000	842.800	568.000
GR	844.000	588.000	847.600	607.000	850.500	657.000	846.300	680.000	842.800	697.000
GR	845.000	715.000	846.100	725.000	857.000	735.000	857.200	800.000	860.000	865.000

VALLEY SECTION 1

X1	95170.000	20.000	500.000	607.000	300.000	300.000	269.000	.000	.000	.000
GR	855.700	.000	854.700	100.000	851.100	200.000	848.300	300.000	848.000	400.000
GR	847.100	500.000	844.300	505.000	840.700	515.000	840.600	525.000	841.200	568.000
GR	842.400	588.000	846.000	607.000	848.900	657.000	844.700	680.000	841.200	697.000
GR	843.400	715.000	844.500	725.000	855.400	735.000	855.600	800.000	858.400	865.000
NH	5.000	.050	600.000	.120	1100.000	.050	1255.000	.042	1400.000	.125
NH	1500.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 2

X1	97350.000	24.000	1255.000	1400.000	2020.000	2200.000	2180.000	.000	.000	.000
GR	882.000	.000	877.100	100.000	874.700	200.000	871.100	300.000	867.700	400.000
GR	864.600	500.000	862.400	600.000	861.900	700.000	859.600	800.000	859.000	900.000
GR	856.200	1000.000	852.100	1100.000	854.100	1200.000	854.100	1255.000	844.900	1281.000
GR	843.200	1290.000	842.500	1300.000	841.800	1317.000	841.700	1325.000	841.700	1350.000
GR	841.700	1376.000	844.100	1382.000	850.300	1400.000	856.900	1500.000	.000	.000
NH	4.000	.060	620.000	.040	755.000	.100	900.000	.060	1200.000	.000

VALLEY SECTION 3

X1	99000.000	21.000	620.000	755.000	1700.000	1550.000	1650.000	.000	.000	.000
GR	879.700	.000	869.500	100.000	864.200	200.000	864.600	300.000	864.900	400.000
GR	854.500	500.000	851.000	600.000	850.500	620.000	845.900	629.000	842.900	640.000
GR	841.400	660.000	842.100	690.000	842.600	720.000	845.400	739.000	847.400	745.000
GR	853.600	755.000	853.900	800.000	854.200	900.000	855.200	1000.000	858.200	1100.000
GR	858.700	1200.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	99998.000	.000	.000	.000	1150.000	850.000	998.000	.000	.600	.000
NC	.050	.050	.015	.000	.000	.000	.000	.000	.000	.000
X1	99999.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
SB	.900	1.500	3.460	.000	.010	.000	.010	.000	843.900	842.000

DAM SECTION 2 - U/S FACE

X1	100000.000	26.000	400.000	516.500	1.000	1.000	1.000	.000	.000	.000
X2	.000	.000	1.000	843.900	851.000	.000	.000	.000	.000	.000

BT	29.000	.000	854.500	.000	100.000	853.600	.000	200.000	853.500	.000
BT	300.000	854.300	.000	398.000	854.200	.000	400.000	854.700	.000	410.500
BT	854.600	.000	410.500	851.000	.000	430.500	851.000	.000	430.500	854.300
BT	.000	432.000	854.300	.000	432.000	851.000	.000	452.000	851.000	.000
BT	452.000	854.000	.000	453.500	854.000	.000	453.500	851.000	.000	473.500
BT	851.000	.000	473.500	854.000	.000	475.000	854.000	.000	475.000	851.000
BT	.000	495.000	851.000	.000	495.000	854.000	.000	496.500	854.000	.000
BT	496.500	851.000	.000	516.500	851.000	.000	516.500	854.000	.000	560.000
BT	854.400	.000	600.000	857.500	.000	700.000	859.400	.000	.000	.000
GR	854.500	.000	853.600	100.000	853.500	200.000	854.300	300.000	854.200	398.000
GR	854.700	400.000	847.400	400.000	845.600	409.000	844.100	410.500	844.100	430.500
GR	844.100	432.000	843.900	440.000	843.900	452.000	843.900	453.500	843.900	460.000
GR	843.900	473.500	843.900	475.000	843.900	480.000	844.400	495.000	844.400	496.500
GR	844.500	500.000	845.000	516.500	854.000	516.500	854.400	560.000	857.500	600.000
GR	859.400	700.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.100	.060	.040	.000	.000	.000	.000	.000	.000	.000
X1	100001.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
NH	4.000	.125	560.000	.060	670.000	.040	804.000	.060	945.000	.000
QT	6.000	2120.000	2120.000	2120.000	2120.000	2120.000	2120.000	.000	.000	.000

VALLEY SECTION 4

X1	100540.000	23.000	670.000	804.000	400.000	600.000	539.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	910.000	.000	.000	.000	.000
GR	868.000	.000	864.000	50.000	860.000	90.000	856.000	160.000	856.000	300.000
GR	857.800	360.000	856.000	480.000	856.000	560.000	857.400	620.000	855.900	670.000
GR	851.100	680.000	848.200	690.000	845.000	702.000	843.700	714.000	844.200	728.000
GR	844.700	743.000	845.500	761.000	845.100	777.000	845.800	791.000	849.100	803.000
GR	853.200	804.000	854.000	850.000	854.500	945.000	.000	.000	.000	.000
NH	4.000	.125	700.000	.060	750.000	.040	889.000	.060	1220.000	.000

VALLEY SECTION 5

X1	101800.000	23.000	750.000	889.000	1100.000	1170.000	1260.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	1050.000	.000	.000	.000	.000
GR	868.000	.000	864.000	140.000	860.000	280.000	856.000	310.000	852.000	400.000
GR	850.200	500.000	852.000	620.000	852.000	700.000	853.300	750.000	852.400	760.000
GR	851.300	761.000	846.900	780.000	845.300	804.000	845.300	820.000	844.600	840.000
GR	844.600	850.000	844.800	866.000	849.300	888.000	853.900	889.000	854.000	1010.000
GR	856.000	1190.000	858.000	1200.000	859.000	1220.000	.000	.000	.000	.000
NC	.125	.125	.040	.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 6

X1	102480.000	27.000	740.000	922.000	600.000	580.000	680.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	1310.000	.000	.000	.000	.000
GR	868.000	.000	864.000	150.000	860.000	220.000	856.000	240.000	852.000	340.000
GR	852.000	730.000	851.700	740.000	851.400	742.000	847.800	778.000	846.500	792.000
GR	846.700	803.000	845.900	820.000	845.900	840.000	846.400	855.000	847.100	870.000
GR	847.800	890.000	851.500	920.000	851.800	922.000	852.000	970.000	852.000	1090.000
GR	854.000	1200.000	856.000	1250.000	858.000	1280.000	860.000	1310.000	862.000	1330.000
GR	864.000	1350.000	866.000	1370.000	.000	.000	.000	.000	.000	.000
EJ	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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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

HURON RIVER - JOB NO.650

SUMMARY PRINTOUT

SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	K*CHSL	TOPWID	AREA
93120.000	.00	.00	839.20	3105.00	845.00	5.80	.20	.00	845.20	.00	202.89	895.83
93120.000	.00	.00	839.20	3105.00	846.00	6.80	.14	.00	846.14	.00	222.50	1106.31
93120.000	.00	.00	839.20	3105.00	846.50	7.30	.11	.00	846.61	.00	237.84	1221.39
93120.000	.00	.00	839.20	3105.00	847.00	7.80	.10	.00	847.10	.00	253.19	1344.15
93120.000	.00	.00	839.20	3105.00	847.50	8.30	.08	.00	847.58	.00	268.54	1474.59
93120.000	.00	.00	839.20	3105.00	848.00	8.80	.07	.00	848.07	.00	283.89	1612.69
94885.000	.00	.00	842.20	3105.00	847.37	5.17	.78	.29	848.15	1.70	99.00	438.34
94885.000	.00	.00	842.20	3105.00	847.37	5.17	.78	.32	848.15	1.70	99.00	438.46
94885.000	.00	.00	842.20	3105.00	847.53	5.33	.72	.30	848.26	1.70	99.00	454.67
94885.000	.00	.00	842.20	3105.00	847.78	5.58	.65	.28	848.43	1.70	99.00	478.60
94885.000	.00	.00	842.20	3105.00	848.09	5.89	.58	.25	848.67	1.70	99.00	509.40
94885.000	.00	.00	842.20	3105.00	848.45	6.25	.50	.22	848.96	1.70	99.00	545.19
94886.000	851.70	854.00	842.20	3105.00	847.38	5.18	.77	.00	848.16	.00	99.00	439.89
94886.000	851.70	854.00	842.20	3105.00	847.38	5.18	.77	.00	848.16	.00	99.00	440.00
94886.000	851.70	854.00	842.20	3105.00	847.54	5.34	.72	.00	848.26	.00	99.00	455.54
94886.000	851.70	854.00	842.20	3105.00	847.78	5.58	.65	.00	848.43	.00	99.00	479.81
94886.000	851.70	854.00	842.20	3105.00	848.10	5.90	.57	.00	848.67	.00	99.00	510.74
94886.000	851.70	854.00	842.20	3105.00	848.46	6.26	.50	.00	848.96	.00	99.00	546.57
94900.000	851.70	854.00	842.20	3105.00	847.43	5.23	.76	.00	848.19	.00	99.00	444.70
94900.000	851.70	854.00	842.20	3105.00	847.43	5.23	.76	.01	848.19	.00	99.00	444.83
94900.000	851.70	854.00	842.20	3105.00	847.58	5.38	.71	.00	848.29	.00	99.00	459.58
94900.000	851.70	854.00	842.20	3105.00	847.82	5.62	.64	.00	848.46	.00	99.00	483.35
94900.000	851.70	854.00	842.20	3105.00	848.12	5.92	.57	.00	848.69	.00	99.00	513.68
94900.000	851.70	854.00	842.20	3105.00	848.48	6.28	.50	.00	848.97	.00	99.00	548.95
94901.000	.00	.00	842.20	3105.00	847.35	5.15	.93	.09	848.28	.00	99.00	401.16
94901.000	.00	.00	842.20	3105.00	847.35	5.15	.93	.09	848.28	.00	99.00	401.31
94901.000	.00	.00	842.20	3105.00	847.50	5.30	.86	.08	848.37	.00	99.00	416.63
94901.000	.00	.00	842.20	3105.00	847.75	5.55	.77	.06	848.52	.00	99.00	441.44
94901.000	.00	.00	842.20	3105.00	848.07	5.87	.67	.05	848.74	.00	99.00	472.79
94901.000	.00	.00	842.20	3105.00	848.44	6.24	.58	.04	849.01	.00	99.00	508.96

SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	DLOSS	EG	K*CHSL	TOPWID	AREA
95170.000	.00	.00	840.60	3105.00	848.67	8.07	.17	.23	848.84	-5.95	436.58	1249.58
95170.000	.00	.00	840.60	3105.00	848.67	8.07	.17	.23	848.84	-5.95	436.61	1249.79
95170.000	.00	.00	840.60	3105.00	848.72	8.12	.17	.21	848.89	-5.95	439.90	1274.10
95170.000	.00	.00	840.60	3105.00	848.83	8.23	.16	.18	848.99	-5.95	446.44	1322.92
95170.000	.00	.00	840.60	3105.00	849.00	8.40	.15	.16	849.15	-5.95	454.17	1399.16
95170.000	.00	.00	840.60	3105.00	849.23	8.63	.13	.13	849.36	-5.95	462.55	1503.91
97350.000	.00	.00	841.70	3105.00	849.86	8.16	.20	.01	850.06	.50	131.78	859.99
97350.000	.00	.00	841.70	3105.00	849.86	8.16	.20	.01	850.06	.50	131.78	860.02
97350.000	.00	.00	841.70	3105.00	849.88	8.18	.20	.02	850.09	.50	131.91	863.13
97350.000	.00	.00	841.70	3105.00	849.94	8.24	.20	.02	850.14	.50	132.20	869.78
97350.000	.00	.00	841.70	3105.00	850.02	8.32	.19	.02	850.22	.50	132.68	880.81
97350.000	.00	.00	841.70	3105.00	850.15	8.45	.19	.03	850.33	.50	133.38	897.09
99000.000	.00	.00	841.40	3105.00	850.65	9.25	.17	.01	850.82	-.18	136.29	937.77
99000.000	.00	.00	841.40	3105.00	850.65	9.25	.17	.01	850.82	-.18	136.29	937.79
99000.000	.00	.00	841.40	3105.00	850.67	9.27	.17	.01	850.84	-.18	137.06	940.31
99000.000	.00	.00	841.40	3105.00	850.71	9.31	.17	.01	850.87	-.18	138.61	945.45
99000.000	.00	.00	841.40	3105.00	850.77	9.37	.17	.01	850.93	-.18	141.11	953.84
99000.000	.00	.00	841.40	3105.00	850.85	9.45	.16	.01	851.01	-.18	145.11	967.61
99998.000	.00	.00	842.00	3105.00	851.04	9.04	.18	.01	851.22	.60	129.79	909.94
99998.000	.00	.00	842.00	3105.00	851.04	9.04	.18	.01	851.22	.60	129.79	909.96
99998.000	.00	.00	842.00	3105.00	851.06	9.06	.18	.01	851.24	.60	129.84	911.97
99998.000	.00	.00	842.00	3105.00	851.09	9.09	.18	.01	851.27	.60	129.96	916.03
99998.000	.00	.00	842.00	3105.00	851.14	9.14	.18	.01	851.31	.60	131.58	922.63
99998.000	.00	.00	842.00	3105.00	851.21	9.21	.17	.01	851.38	.60	134.61	932.31
99999.000	.00	.00	842.00	3105.00	851.04	9.04	.18	.00	851.22	.00	129.79	909.99
99999.000	.00	.00	842.00	3105.00	851.04	9.04	.18	.00	851.22	.00	129.79	910.01
99999.000	.00	.00	842.00	3105.00	851.06	9.06	.18	.00	851.24	.00	129.85	912.01
99999.000	.00	.00	842.00	3105.00	851.09	9.09	.18	.00	851.27	.00	129.96	916.09
99999.000	.00	.00	842.00	3105.00	851.14	9.14	.18	.00	851.31	.00	131.60	922.68
99999.000	.00	.00	842.00	3105.00	851.21	9.21	.17	.00	851.38	.00	134.63	932.36
100000.000	851.00	843.90	843.90	3105.00	854.46	10.56	.10	.00	854.57	1900.00	555.77	1401.72
100000.000	851.00	843.90	843.90	3105.00	854.46	10.56	.10	.00	854.57	1900.00	555.77	1401.72
100000.000	851.00	843.90	843.90	3105.00	854.46	10.56	.10	.00	854.57	1900.00	555.77	1401.72
100000.000	851.00	843.90	843.90	3105.00	854.46	10.56	.10	.00	854.57	1900.00	555.77	1401.72
100000.000	851.00	843.90	843.90	3105.00	854.46	10.56	.10	.00	854.57	1900.00	555.77	1401.72
100000.000	851.00	843.90	843.90	3105.00	854.46	10.56	.10	.00	854.57	1900.00	555.77	1401.72
100001.000	.00	.00	843.90	3105.00	854.46	10.56	.10	.00	854.57	.00	555.77	1401.75
100001.000	.00	.00	843.90	3105.00	854.46	10.56	.10	.00	854.57	.00	555.77	1401.75
100001.000	.00	.00	843.90	3105.00	854.46	10.56	.10	.00	854.57	.00	555.77	1401.75
100001.000	.00	.00	843.90	3105.00	854.46	10.56	.10	.00	854.57	.00	555.77	1401.75
100001.000	.00	.00	843.90	3105.00	854.46	10.56	.10	.00	854.57	.00	555.77	1401.75
100001.000	.00	.00	843.90	3105.00	854.46	10.56	.10	.00	854.57	.00	555.77	1401.75
100540.000	.00	.00	843.70	2120.00	854.60	10.90	.05	.01	854.66	-.37	237.29	1192.50
100540.000	.00	.00	843.70	2120.00	854.60	10.90	.05	.01	854.66	-.37	237.29	1192.50
100540.000	.00	.00	843.70	2120.00	854.60	10.90	.05	.01	854.66	-.37	237.29	1192.50
100540.000	.00	.00	843.70	2120.00	854.60	10.90	.05	.01	854.66	-.37	237.29	1192.50
100540.000	.00	.00	843.70	2120.00	854.60	10.90	.05	.01	854.66	-.37	237.29	1192.50
100540.000	.00	.00	843.70	2120.00	854.60	10.90	.05	.01	854.66	-.37	237.29	1192.50

SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	K*CHSL	TOPWID	AREA
101800.000	.00	.00	844.60	2120.00	854.74	10.14	.03	.01	854.77	.71	711.57	2440.18
101800.000	.00	.00	844.60	2120.00	854.74	10.14	.03	.01	854.77	.71	711.57	2440.18
101800.000	.00	.00	844.60	2120.00	854.74	10.14	.03	.01	854.77	.71	711.57	2440.18
101800.000	.00	.00	844.60	2120.00	854.74	10.14	.03	.01	854.77	.71	711.57	2440.18
101800.000	.00	.00	844.60	2120.00	854.74	10.14	.03	.01	854.77	.71	711.57	2440.18
101800.000	.00	.00	844.60	2120.00	854.74	10.14	.03	.01	854.77	.71	711.57	2440.18
102480.000	.00	.00	845.90	2120.00	854.79	8.89	.02	.00	854.82	1.91	949.49	3162.81
102480.000	.00	.00	845.90	2120.00	854.79	8.89	.02	.00	854.82	1.91	949.49	3162.81
102480.000	.00	.00	845.90	2120.00	854.79	8.89	.02	.00	854.82	1.91	949.49	3162.81
102480.000	.00	.00	845.90	2120.00	854.79	8.89	.02	.00	854.82	1.91	949.49	3162.81
102480.000	.00	.00	845.90	2120.00	854.79	8.89	.02	.00	854.82	1.91	949.49	3162.81
102480.000	.00	.00	845.90	2120.00	854.79	8.89	.02	.00	854.82	1.91	949.49	3162.81

SUMMARY OF ERRORS

00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: Hamburg Twp.

3) WATERCOURSE: Huron River & CONNECTING LAKES

4) DOCUMENT TYPE: CONVERGENCE Run 50 Year Flood

00BREAK00

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*********************************************************
*  WATER SURFACE PROFILES                               *
*  VERSION OF NOVEMBER 1976                             *
*  UPDATED JULY 1979                                    *
*                                                       *
*  RUN DATE MON, JUN 15, 1981,  1:00 PM                 *
*********************************************************
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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     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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Convergency Run

50-Year Flood

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**********************************************
HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
ERROR CORR -  01,02,03
MODIFICATION -  50,51,52,53
**********************************************


C
T1      HAMBURG TOWNSHIP F.I.S.
T2      CONVERGENCE TRIALS - RATING CURVE ANALYSIS
T3      HURON RIVER - JOB NO.6504-03-0 - PROJECT MANAGER, ANDY KOBEK

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

     -1.       2.        0.        0.    .000000     .00       .0        0.     845.000    .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    1.000     .000     -1.000     .000      .000      .800      .000      .000      .000      .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    38.000   40.000   41.000   42.000   43.000    1.000    8.000   10.000   12.000    3.000


    33.000    4.000   25.000     .000     .000     .000     .000     .000     .000     .000

NC      .100     .100     .042     .300     .500     .000     .000     .000     .000     .000
QT     6.000 3105.000 3105.000 3105.000 3105.000 3105.000 3105.000     .000     .000     .000


        VALLEY SECTION 1.1

X1  93120.000   19.000  268.000  440.000     .000     .000     .000     .000     .000     .000
GR    850.900     .000  851.100  100.000  848.100  200.000  845.600  255.000  841.900  268.000
GR    839.900  270.000  839.900  272.000  840.400  300.000  840.200  325.000  840.200  365.000
GR    839.200  380.000  839.200  400.000  840.700  437.000  842.700  440.000  849.600  500.000
GR    872.900  550.000  878.900  600.000  882.400  700.000  886.800  800.000     .000     .000


X1  94885.000     .000     .000     .000 1410.000 1910.000 1765.000     .000    3.000     .000
X3      .000     .000     .000  301.000     .000  400.000     .000     .000     .000     .000
NC      .030     .030     .030     .000     .000     .000     .000     .000     .000     .000


        BRIDGE SECTION 1 - BELL ST. BRIDGE - D/S FACE

X1  94886.000   17.000  600.000  699.000    1.000    1.000    1.000     .000     .000     .000
BT     11.000     .000  856.500     .000  100.000  854.100     .000  200.000  852.100     .000
BT    300.000  851.700     .000  400.000  851.900     .000  500.000  852.100     .000  600.000
BT    854.900  854.000  699.000  854.900  853.900  800.000  856.400     .000  900.000  859.300
BT       .000  925.000  860.400     .000     .000     .000     .000     .000     .000     .000
GR    856.500     .000  854.100  100.000  852.100  200.000  851.700  300.000  851.900  400.000
GR    852.100  500.000  854.900  600.000  844.200  600.000  843.200  620.000  842.200  640.000
GR    842.300  660.000  842.400  680.000  845.000  699.000  854.900  699.000  856.400  800.000
GR    859.300  900.000  860.400  925.000     .000     .000     .000     .000     .000     .000
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BRIDGE SECTION 1 - BELL ST. BRIDGE - U/S FACE

X1	94900.000	.000	.000	.000	14.000	14.000	14.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.070	.100	.042	.000	.000	.000	.000	.000	.000	.000
X1	94901.000	20.000	500.000	607.000	1.000	1.000	1.000	.000	.000	.000
X3	.000	.000	.000	505.000	.000	604.000	.000	.000	.000	.000
GR	857.300	.000	856.300	100.000	852.700	200.000	849.900	300.000	849.600	400.000
GR	848.700	500.000	845.700	505.000	842.300	515.000	842.200	525.000	842.800	568.000
GR	844.000	588.000	847.600	607.000	850.500	657.000	846.300	680.000	842.800	697.000
GR	845.000	715.000	846.100	725.000	857.000	735.000	857.200	800.000	860.000	865.000

VALLEY SECTION 1

X1	95170.000	20.000	500.000	607.000	300.000	300.000	269.000	.000	.000	.000
GR	855.700	.000	854.700	100.000	851.100	200.000	848.300	300.000	848.000	400.000
GR	847.100	500.000	844.300	505.000	840.700	515.000	840.600	525.000	841.200	568.000
GR	842.400	588.000	846.000	607.000	848.900	657.000	844.700	680.000	841.200	697.000
GR	843.400	715.000	844.500	725.000	855.400	735.000	855.600	800.000	858.400	865.000
NH	5.000	.050	600.000	.120	1100.000	.050	1255.000	.042	1400.000	.125
NH	1500.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 2

X1	97350.000	24.000	1255.000	1400.000	2020.000	2200.000	2180.000	.000	.000	.000
GR	882.000	.000	877.100	100.000	874.700	200.000	871.100	300.000	867.700	400.000
GR	864.600	500.000	862.400	600.000	861.900	700.000	859.600	800.000	859.000	900.000
GR	856.200	1000.000	852.100	1100.000	854.100	1200.000	854.100	1255.000	844.900	1281.000
GR	843.200	1290.000	842.500	1300.000	841.800	1317.000	841.700	1325.000	841.700	1350.000
GR	841.700	1376.000	844.100	1382.000	850.300	1400.000	856.900	1500.000	.000	.000
NH	4.000	.060	620.000	.040	755.000	.100	900.000	.060	1200.000	.000

VALLEY SECTION 3

X1	99000.000	21.000	620.000	755.000	1700.000	1550.000	1650.000	.000	.000	.000
GR	879.700	.000	869.500	100.000	864.200	200.000	864.600	300.000	864.900	400.000
GR	854.500	500.000	851.000	600.000	850.500	620.000	845.900	629.000	842.900	640.000
GR	841.400	660.000	842.100	690.000	842.600	720.000	845.400	739.000	847.400	745.000
GR	853.600	755.000	853.900	800.000	854.200	900.000	855.200	1000.000	858.200	1100.000
GR	858.700	1200.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	99998.000	.000	.000	.000	1150.000	850.000	998.000	.000	.600	.000
NC	.050	.050	.015	.000	.000	.000	.000	.000	.000	.000
X1	99999.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
SB	.900	1.500	3.460	.000	.010	.000	.010	.000	843.900	842.000

DAM SECTION 2 - U/S FACE

X1	100000.000	26.000	400.000	516.500	1.000	1.000	1.000	.000	.000	.000
X2	.000	.000	1.000	843.900	851.000	.000	.000	.000	.000	.000

BT	29.000	.000	854.500	.000	100.000	853.600	.000	200.000	853.500	.000
BT	300.000	854.300	.000	398.000	854.200	.000	400.000	854.700	.000	410.500
BT	854.600	.000	410.500	851.000	.000	430.500	851.000	.000	430.500	854.300
BT	.000	432.000	854.300	.000	432.000	851.000	.000	452.000	851.000	.000
BT	452.000	854.000	.000	453.500	854.000	.000	453.500	851.000	.000	473.500
BT	851.000	.000	473.500	854.000	.000	475.000	854.000	.000	475.000	851.000
BT	.000	495.000	851.000	.000	495.000	854.000	.000	496.500	854.000	.000
BT	496.500	851.000	.000	516.500	851.000	.000	516.500	854.000	.000	560.000
BT	854.400	.000	600.000	857.500	.000	700.000	859.400	.000	.000	.000
GR	854.500	.000	853.600	100.000	853.500	200.000	854.300	300.000	854.200	398.000
GR	854.700	400.000	847.400	400.000	845.600	409.000	844.100	410.500	844.100	430.500
GR	844.100	432.000	843.900	440.000	843.900	452.000	843.900	453.500	843.900	460.000
GR	843.900	473.500	843.900	475.000	843.900	480.000	844.400	495.000	844.400	496.500
GR	844.500	500.000	845.000	516.500	854.000	516.500	854.400	560.000	857.500	600.000
GR	859.400	700.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.100	.060	.040	.000	.000	.000	.000	.000	.000	.000
X1	100001.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
NH	4.000	.125	560.000	.060	670.000	.040	804.000	.060	945.000	.000
QT	6.000	2120.000	2120.000	2120.000	2120.000	2120.000	2120.000	.000	.000	.000

VALLEY SECTION 4

X1	100540.000	23.000	670.000	804.000	400.000	600.000	539.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	910.000	.000	.000	.000	.000
GR	868.000	.000	864.000	50.000	860.000	90.000	856.000	160.000	856.000	300.000
GR	857.800	360.000	856.000	480.000	856.000	560.000	857.400	620.000	855.900	670.000
GR	851.100	680.000	848.200	690.000	845.000	702.000	843.700	714.000	844.200	728.000
GR	844.700	743.000	845.500	761.000	845.100	777.000	845.800	791.000	849.100	803.000
GR	853.200	804.000	854.000	850.000	854.500	945.000	.000	.000	.000	.000
NH	4.000	.125	700.000	.060	750.000	.040	889.000	.060	1220.000	.000

VALLEY SECTION 5

X1	101800.000	23.000	750.000	889.000	1100.000	1170.000	1260.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	1050.000	.000	.000	.000	.000
GR	868.000	.000	864.000	140.000	860.000	280.000	856.000	310.000	852.000	400.000
GR	850.200	500.000	852.000	620.000	852.000	700.000	853.300	750.000	852.400	760.000
GR	851.300	761.000	846.900	780.000	845.300	804.000	845.300	820.000	844.600	840.000
GR	844.600	850.000	844.800	866.000	849.300	888.000	853.900	889.000	854.000	1010.000
GR	856.000	1190.000	858.000	1200.000	859.000	1220.000	.000	.000	.000	.000
NC	.125	.125	.040	.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 6

X1	102480.000	27.000	740.000	922.000	600.000	580.000	680.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	1310.000	.000	.000	.000	.000
GR	868.000	.000	864.000	150.000	860.000	220.000	856.000	240.000	852.000	340.000
GR	852.000	730.000	851.700	740.000	851.400	742.000	847.800	778.000	846.500	792.000
GR	846.700	803.000	845.900	820.000	845.900	840.000	846.400	855.000	847.100	870.000
GR	847.800	890.000	851.500	920.000	851.800	922.000	852.000	970.000	852.000	1090.000
GR	854.000	1200.000	856.000	1250.000	858.000	1280.000	860.000	1310.000	862.000	1330.000
GR	864.000	1350.000	866.000	1370.000	.000	.000	.000	.000	.000	.000
EJ	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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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

HURON RIVER - JOB NO.650

SUMMARY PRINTOUT

SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	K*CHSL	TOPWID	AREA
93120.000	.00	.00	839.20	3105.00	845.00	5.80	.20	.00	845.20	.00	202.89	895.83
93120.000	.00	.00	839.20	3105.00	846.00	6.80	.14	.00	846.14	.00	222.50	1106.31
93120.000	.00	.00	839.20	3105.00	846.50	7.30	.11	.00	846.61	.00	237.84	1221.39
93120.000	.00	.00	839.20	3105.00	847.00	7.80	.10	.00	847.10	.00	253.19	1344.15
93120.000	.00	.00	839.20	3105.00	847.50	8.30	.08	.00	847.58	.00	268.54	1474.58
93120.000	.00	.00	839.20	3105.00	848.00	8.80	.07	.00	848.07	.00	283.89	1612.69
94885.000	.00	.00	842.20	3105.00	847.37	5.17	.78	.29	848.15	1.70	99.00	438.34
94885.000	.00	.00	842.20	3105.00	847.37	5.17	.78	.32	848.15	1.70	99.00	438.46
94885.000	.00	.00	842.20	3105.00	847.53	5.33	.72	.30	848.26	1.70	99.00	454.67
94885.000	.00	.00	842.20	3105.00	847.78	5.58	.65	.28	848.43	1.70	99.00	478.60
94885.000	.00	.00	842.20	3105.00	848.09	5.89	.58	.25	848.67	1.70	99.00	509.40
94885.000	.00	.00	842.20	3105.00	848.45	6.25	.50	.22	848.96	1.70	99.00	545.19
94886.000	851.70	854.00	842.20	3105.00	847.38	5.18	.77	.00	848.16	.00	99.00	439.89
94886.000	851.70	854.00	842.20	3105.00	847.38	5.18	.77	.00	848.16	.00	99.00	440.00
94886.000	851.70	854.00	842.20	3105.00	847.54	5.34	.72	.00	848.26	.00	99.00	455.54
94886.000	851.70	854.00	842.20	3105.00	847.78	5.58	.65	.00	848.43	.00	99.00	479.81
94886.000	851.70	854.00	842.20	3105.00	848.10	5.90	.57	.00	848.67	.00	99.00	510.74
94886.000	851.70	854.00	842.20	3105.00	848.46	6.26	.50	.00	848.96	.00	99.00	546.57
94900.000	851.70	854.00	842.20	3105.00	847.43	5.23	.76	.00	848.19	.00	99.00	444.70
94900.000	851.70	854.00	842.20	3105.00	847.43	5.23	.76	.01	848.19	.00	99.00	444.83
94900.000	851.70	854.00	842.20	3105.00	847.58	5.38	.71	.00	848.29	.00	99.00	459.58
94900.000	851.70	854.00	842.20	3105.00	847.82	5.62	.64	.00	848.46	.00	99.00	483.35
94900.000	851.70	854.00	842.20	3105.00	848.12	5.92	.57	.00	848.69	.00	99.00	513.68
94900.000	851.70	854.00	842.20	3105.00	848.48	6.28	.50	.00	848.97	.00	99.00	548.95
94901.000	.00	.00	842.20	3105.00	847.35	5.15	.93	.09	848.28	.00	99.00	401.16
94901.000	.00	.00	842.20	3105.00	847.35	5.15	.93	.09	848.28	.00	99.00	401.31
94901.000	.00	.00	842.20	3105.00	847.50	5.30	.86	.08	848.37	.00	99.00	416.63
94901.000	.00	.00	842.20	3105.00	847.75	5.55	.77	.06	848.52	.00	99.00	441.44
94901.000	.00	.00	842.20	3105.00	848.07	5.87	.67	.05	848.74	.00	99.00	472.79
94901.000	.00	.00	842.20	3105.00	848.44	6.24	.58	.04	849.01	.00	99.00	508.96

SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	K*CHSL	TOPWID	AREA
95170.000	.00	.00	840.60	3105.00	848.67	8.07	.17	.23	848.84	-5.95	436.58	1249.58
95170.000	.00	.00	840.60	3105.00	848.67	8.07	.17	.23	848.84	-5.95	436.61	1249.79
95170.000	.00	.00	840.60	3105.00	848.72	8.12	.17	.21	848.89	-5.95	439.90	1274.10
95170.000	.00	.00	840.60	3105.00	848.83	8.23	.16	.18	848.99	-5.95	446.44	1322.92
95170.000	.00	.00	840.60	3105.00	849.00	8.40	.15	.16	849.15	-5.95	454.17	1399.16
95170.000	.00	.00	840.60	3105.00	849.23	8.63	.13	.13	849.36	-5.95	462.55	1503.91
97350.000	.00	.00	841.70	3105.00	849.86	8.16	.20	.01	850.06	.50	131.78	859.99
97350.000	.00	.00	841.70	3105.00	849.86	8.16	.20	.01	850.06	.50	131.78	860.02
97350.000	.00	.00	841.70	3105.00	849.88	8.18	.20	.02	850.09	.50	131.91	863.13
97350.000	.00	.00	841.70	3105.00	849.94	8.24	.20	.02	850.14	.50	132.20	869.78
97350.000	.00	.00	841.70	3105.00	850.02	8.32	.19	.02	850.22	.50	132.66	880.81
97350.000	.00	.00	841.70	3105.00	850.15	8.45	.19	.03	850.33	.50	133.38	897.09
99000.000	.00	.00	841.40	3105.00	850.65	9.25	.17	.01	850.82	-.18	136.29	937.77
99000.000	.00	.00	841.40	3105.00	850.65	9.25	.17	.01	850.82	-.18	136.29	937.79
99000.000	.00	.00	841.40	3105.00	850.67	9.27	.17	.01	850.84	-.18	137.06	940.31
99000.000	.00	.00	841.40	3105.00	850.71	9.31	.17	.01	850.87	-.18	138.61	945.45
99000.000	.00	.00	841.40	3105.00	850.77	9.37	.17	.01	850.93	-.18	141.11	953.84
99000.000	.00	.00	841.40	3105.00	850.85	9.45	.16	.01	851.01	-.18	145.11	967.61
99998.000	.00	.00	842.00	3105.00	851.04	9.04	.18	.01	851.22	.60	129.79	909.94
99998.000	.00	.00	842.00	3105.00	851.04	9.04	.18	.01	851.22	.60	129.79	909.96
99998.000	.00	.00	842.00	3105.00	851.06	9.06	.18	.01	851.24	.60	129.84	911.97
99998.000	.00	.00	842.00	3105.00	851.09	9.09	.18	.01	851.27	.60	129.96	916.03
99998.000	.00	.00	842.00	3105.00	851.14	9.14	.18	.01	851.31	.60	131.58	922.63
99998.000	.00	.00	842.00	3105.00	851.21	9.21	.17	.01	851.38	.60	134.61	932.31
99999.000	.00	.00	842.00	3105.00	851.04	9.04	.18	.00	851.22	.00	129.79	909.99
99999.000	.00	.00	842.00	3105.00	851.04	9.04	.18	.00	851.22	.00	129.79	910.01
99999.000	.00	.00	842.00	3105.00	851.06	9.06	.18	.00	851.24	.00	129.85	912.01
99999.000	.00	.00	842.00	3105.00	851.09	9.09	.18	.00	851.27	.00	129.96	916.09
99999.000	.00	.00	842.00	3105.00	851.14	9.14	.18	.00	851.31	.00	131.60	922.68
99999.000	.00	.00	842.00	3105.00	851.21	9.21	.17	.00	851.38	.00	134.63	932.36
100000.000	851.00	843.90	843.90	3105.00	854.46	10.56	.10	.00	854.57	1900.00	555.77	1401.72
100000.000	851.00	843.90	843.90	3105.00	854.46	10.56	.10	.00	854.57	1900.00	555.77	1401.72
100000.000	851.00	843.90	843.90	3105.00	854.46	10.56	.10	.00	854.57	1900.00	555.77	1401.72
100000.000	851.00	843.90	843.90	3105.00	854.46	10.56	.10	.00	854.57	1900.00	555.77	1401.72
100000.000	851.00	843.90	843.90	3105.00	854.46	10.56	.10	.00	854.57	1900.00	555.77	1401.72
100000.000	851.00	843.90	843.90	3105.00	854.46	10.56	.10	.00	854.57	1900.00	555.77	1401.72
100001.000	.00	.00	843.90	3105.00	854.46	10.56	.10	.00	854.57	.00	555.77	1401.75
100001.000	.00	.00	843.90	3105.00	854.46	10.56	.10	.00	854.57	.00	555.77	1401.75
100001.000	.00	.00	843.90	3105.00	854.46	10.56	.10	.00	854.57	.00	555.77	1401.75
100001.000	.00	.00	843.90	3105.00	854.46	10.56	.10	.00	854.57	.00	555.77	1401.75
100001.000	.00	.00	843.90	3105.00	854.46	10.56	.10	.00	854.57	.00	555.77	1401.75
100001.000	.00	.00	843.90	3105.00	854.46	10.56	.10	.00	854.57	.00	555.77	1401.75
100540.000	.00	.00	843.70	2120.00	854.60	10.90	.05	.01	854.66	-.37	237.29	1192.50
100540.000	.00	.00	843.70	2120.00	854.60	10.90	.05	.01	854.66	-.37	237.29	1192.50
100540.000	.00	.00	843.70	2120.00	854.60	10.90	.05	.01	854.66	-.37	237.29	1192.50
100540.000	.00	.00	843.70	2120.00	854.60	10.90	.05	.01	854.66	-.37	237.29	1192.50
100540.000	.00	.00	843.70	2120.00	854.60	10.90	.05	.01	854.66	-.37	237.29	1192.50
100540.000	.00	.00	843.70	2120.00	854.60	10.90	.05	.01	854.66	-.37	237.29	1192.50

PRINTED IN U.S.A.

SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	K*CHSL	TOPWID	AREA
101800.000	.00	.00	844.60	2120.00	854.74	10.14	.03	.01	854.77	.71	711.57	2440.18
101800.000	.00	.00	844.60	2120.00	854.74	10.14	.03	.01	854.77	.71	711.57	2440.18
101800.000	.00	.00	844.60	2120.00	854.74	10.14	.03	.01	854.77	.71	711.57	2440.18
101800.000	.00	.00	844.60	2120.00	854.74	10.14	.03	.01	854.77	.71	711.57	2440.18
101800.000	.00	.00	844.60	2120.00	854.74	10.14	.03	.01	854.77	.71	711.57	2440.18
101800.000	.00	.00	844.60	2120.00	854.74	10.14	.03	.01	854.77	.71	711.57	2440.18
102480.000	.00	.00	845.90	2120.00	854.79	8.89	.02	.00	854.82	1.91	949.49	3162.81
102480.000	.00	.00	845.90	2120.00	854.79	8.89	.02	.00	854.82	1.91	949.49	3162.81
102480.000	.00	.00	845.90	2120.00	854.79	8.89	.02	.00	854.82	1.91	949.49	3162.81
102480.000	.00	.00	845.90	2120.00	854.79	8.89	.02	.00	854.82	1.91	949.49	3162.81
102480.000	.00	.00	845.90	2120.00	854.79	8.89	.02	.00	854.82	1.91	949.49	3162.81
102480.000	.00	.00	845.90	2120.00	854.79	8.89	.02	.00	854.82	1.91	949.49	3162.81

SUMMARY OF ERRORS

00BREAK00

1) COUNTY: Livingston

2) STUDY NAME: Hamburg Twp.

3) WATERCOURSE: Hamburg River

4) DOCUMENT TYPE: Convergence Run
100 Year Flood

00BREAK00

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*********************************************
*  WATER SURFACE PROFILES                   *
*  VERSION OF NOVEMBER 1976                 *
*  UPDATED JULY 1979                        *
*                                           *
*  RUN DATE FRI, JUN  5, 1981, 11:05 AM     *
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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     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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Convergence Run

100-year flood

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**********************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -   01,02,03
  MODIFICATION -  50,51,52,53
**********************************************


C
T1       HAMBURG TOWNSHIP F.I.S.
T2       CONVERGENCE TRIALS - RATING CURVE ANALYSIS
T3       HURON RIVER - JOB NO.6504-03-0 - PROJECT MANAGER, ANDY KUBEK

J1  ICHECK     INQ        NINV       IDIR       STRT      METRIC     HVINS       Q         WSEL       FQ

     -1.        2.         0.         0.    .000000       .00        .0         0.    846.000     .000

J2  NPROF     IPLOT      PRFVS      XSECV      XSECH       FN       ALLDC      IBW       CHNIM     ITRACE

     1.000     .000    -1.000      .000       .000      .800       .000      .000       .000      .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    38.000   40.000   41.000   42.000   43.000    1.000    8.000   10.000   12.000    3.000


    33.000    4.000   25.000     .000     .000     .000     .000     .000     .000     .000

NC      .100     .100     .042     .300     .500     .000     .000     .000     .000     .000
QT     6.000 3545.000 3545.000 3545.000 3545.000 3545.000 3545.000     .000     .000     .000


          VALLEY SECTION 1.1

X1  93120.000   19.000  268.000  440.000     .000     .000     .000     .000     .000     .000
GR    850.900     .000  851.100  100.000  848.100  200.000  845.600  255.000  841.900  268.000
GR    839.900  270.000  839.900  272.000  840.400  300.000  840.200  325.000  840.200  365.000
GR    839.200  380.000  839.200  400.000  840.700  437.000  842.700  440.000  849.600  500.000
GR    872.900  550.000  878.900  600.000  882.400  700.000  886.800  800.000     .000     .000


X1  94885.000     .000     .000     .000 1410.000 1910.000 1765.000     .000    3.000     .000
X3      .000     .000     .000  301.000     .000  400.000     .000     .000     .000     .000
NC      .030     .030     .030     .000     .000     .000     .000     .000     .000     .000


          BRIDGE SECTION 1 - BELL ST. BRIDGE - D/S FACE

X1  94886.000   17.000  600.000  699.000    1.000    1.000    1.000     .000     .000     .000
BT     11.000     .000  856.500     .000  100.000  854.100     .000  200.000  852.100     .000
BT    300.000  851.700     .000  400.000  851.900     .000  500.000  852.100     .000  600.000
BT    854.900  854.000  699.000  854.900  853.900  800.000  856.400     .000  900.000  859.300
BT       .000  925.000  860.400     .000     .000     .000     .000     .000     .000     .000
GR    856.500     .000  854.100  100.000  852.100  200.000  851.700  300.000  851.900  400.000
GR    852.100  500.000  854.900  600.000  844.200  600.000  843.200  620.000  842.200  640.000
GR    842.300  660.000  842.400  680.000  845.000  699.000  854.900  699.000  856.400  800.000
GR    859.300  900.000  860.400  925.000     .000     .000     .000     .000     .000     .000
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BRIDGE SECTION 1 - BELL ST. BRIDGE - U/S FACE

X1	94900.000	.000	.000	.000	14.000	14.000	14.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.070	.100	.042	.000	.000	.000	.000	.000	.000	.000
X1	94901.000	20.000	500.000	607.000	1.000	1.000	1.000	.000	.000	.000
X3	.000	.000	.000	505.000	.000	604.000	.000	.000	.000	.000
GR	857.300	.000	856.300	100.000	852.700	200.000	849.900	300.000	849.600	400.000
GR	848.700	500.000	845.700	505.000	842.300	515.000	842.200	525.000	842.800	568.000
GR	844.000	588.000	847.600	607.000	850.500	657.000	846.300	680.000	842.800	697.000
GR	845.000	715.000	846.100	725.000	857.000	735.000	857.200	800.000	860.000	865.000

VALLEY SECTION 1

X1	95170.000	20.000	500.000	607.000	300.000	300.000	269.000	.000	.000	.000
GR	855.700	.000	854.700	100.000	851.100	200.000	848.300	300.000	848.000	400.000
GR	847.100	500.000	844.300	505.000	840.700	515.000	840.600	525.000	841.200	568.000
GR	842.400	588.000	846.000	607.000	848.900	657.000	844.700	680.000	841.200	697.000
GR	843.400	715.000	844.500	725.000	855.400	735.000	855.600	800.000	858.400	865.000
NH	5.000	.050	600.000	.120	1100.000	.050	1255.000	.042	1400.000	.125
NH	1500.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 2

X1	97350.000	24.000	1255.000	1400.000	2020.000	2200.000	2180.000	.000	.000	.000
GR	882.000	.000	877.100	100.000	874.700	200.000	871.100	300.000	867.700	400.000
GR	864.600	500.000	862.400	600.000	861.900	700.000	859.600	800.000	859.000	900.000
GR	856.200	1000.000	852.100	1100.000	854.100	1200.000	854.100	1255.000	844.900	1281.000
GR	843.200	1290.000	842.500	1300.000	841.800	1317.000	841.700	1325.000	841.700	1350.000
GR	841.700	1376.000	844.100	1382.000	850.300	1400.000	856.900	1500.000	.000	.000
NH	4.000	.060	620.000	.040	755.000	.100	900.000	.060	1200.000	.000

VALLEY SECTION 3

X1	99000.000	21.000	620.000	755.000	1700.000	1550.000	1650.000	.000	.000	.000
GR	879.700	.000	869.500	100.000	864.200	200.000	864.600	300.000	864.900	400.000
GR	854.500	500.000	851.000	600.000	850.500	620.000	845.900	629.000	842.900	640.000
GR	841.400	660.000	842.100	690.000	842.600	720.000	845.400	739.000	847.400	745.000
GR	853.600	755.000	853.900	800.000	854.200	900.000	855.200	1000.000	858.200	1100.000
GR	858.700	1200.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	99998.000	.000	.000	.000	1150.000	850.000	998.000	.000	.600	.000
NC	.050	.050	.015	.000	.000	.000	.000	.000	.000	.000
X1	99999.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
SB	.900	1.500	3.460	.000	.010	.000	.010	.000	843.900	842.000

DAM SECTION 2 - U/S FACE

X1	100000.000	26.000	400.000	516.500	1.000	1.000	1.000	.000	.000	.000
X2	.000	.000	1.000	843.900	851.000	.000	.000	.000	.000	.000

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BT      29.000       .000    854.500       .000    100.000    853.600       .000    200.000    853.500       .000
BT     300.000    854.300       .000    398.000    854.200       .000    400.000    854.700       .000    410.500
BT     854.600       .000    410.500    851.000       .000    430.500    851.000       .000    430.500    854.300
BT        .000    432.000    854.300       .000    432.000    851.000       .000    452.000    851.000       .000
BT     452.000    854.000       .000    453.500    854.000       .000    453.500    851.000       .000    473.500
BT     851.000       .000    473.500    854.000       .000    475.000    854.000       .000    475.000    851.000
BT        .000    495.000    851.000       .000    495.000    854.000       .000    496.500    854.000       .000
BT     496.500    851.000       .000    516.500    851.000       .000    516.500    854.000       .000    560.000
BT     854.400       .000    600.000    857.500       .000    700.000    859.400       .000       .000       .000
GR     854.500       .000    853.600    100.000    853.500    200.000    854.300    300.000    854.200    398.000
GR     854.700    400.000    847.400    400.000    845.600    409.000    844.100    410.500    844.100    430.500
GR     844.100    432.000    843.900    440.000    843.900    452.000    843.900    453.500    843.900    460.000
GR     843.900    473.500    843.900    475.000    843.900    480.000    844.400    495.000    844.400    496.500
GR     844.500    500.000    845.000    516.500    854.000    516.500    854.400    560.000    857.500    600.000
GR     859.400    700.000       .000       .000       .000       .000       .000       .000       .000       .000
NC        .100       .060       .040       .000       .000       .000       .000       .000       .000       .000

X1 100001.000       .000       .000       .000      1.000      1.000      1.000       .000       .000       .000
NH       4.000       .125    560.000       .060    670.000       .040    804.000       .060    945.000       .000
QT       6.000   2475.000   2475.000   2475.000   2475.000   2475.000   2475.000       .000       .000       .000

        VALLEY SECTION 4

X1 100540.000     23.000    670.000    804.000    400.000    600.000    539.000       .000       .000       .000
X3        .000       .000       .000       .000       .000    910.000       .000       .000       .000       .000
GR     868.000       .000    864.000     50.000    860.000     90.000    856.000    160.000    856.000    300.000
GR     857.800    360.000    856.000    480.000    856.000    560.000    857.400    620.000    855.900    670.000
GR     851.100    660.000    848.200    690.000    845.000    702.000    843.700    714.000    844.200    728.000
GR     844.700    743.000    845.500    761.000    845.100    777.000    845.800    791.000    849.100    803.000
GR     853.200    804.000    854.000    850.000    854.500    945.000       .000       .000       .000       .000
NH       4.000       .125    700.000       .060    750.000       .040    889.000       .060   1220.000       .000

        VALLEY SECTION 5

X1 101800.000     23.000    750.000    889.000   1100.000   1170.000   1260.000       .000       .000       .000
X3        .000       .000       .000       .000       .000   1050.000       .000       .000       .000       .000
GR     868.000       .000    864.000    140.000    860.000    280.000    856.000    310.000    852.000    400.000
GR     850.200    500.000    852.000    620.000    852.000    700.000    853.300    750.000    852.400    760.000
GR     851.300    761.000    846.900    780.000    845.300    804.000    845.300    820.000    844.600    840.000
GR     844.600    850.000    844.800    866.000    849.300    888.000    853.900    889.000    854.000   1010.000
GR     856.000   1190.000    858.000   1200.000    859.000   1220.000       .000       .000       .000       .000
NC        .125       .125       .040       .000       .000       .000       .000       .000       .000       .000

        VALLEY SECTION 6

X1 102480.000     27.000    740.000    922.000    600.000    580.000    680.000       .000       .000       .000
X3        .000       .000       .000       .000       .000   1310.000       .000       .000       .000       .000
GR     868.000       .000    864.000    150.000    860.000    220.000    856.000    240.000    852.000    340.000
GR     852.000    730.000    851.700    740.000    851.400    742.000    847.800    778.000    846.500    792.000
GR     846.700    803.000    845.900    820.000    845.900    840.000    846.400    855.000    847.100    870.000
GR     847.800    890.000    851.500    920.000    851.800    922.000    852.000    970.000    852.000   1090.000
GR     854.000   1200.000    856.000   1250.000    858.000   1280.000    860.000   1310.000    862.000   1330.000
GR     864.000   1350.000    866.000   1370.000       .000       .000       .000       .000       .000       .000
EJ        .000       .000       .000       .000       .000       .000       .000       .000       .000       .000
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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

HURON RIVER - JOB NO.650

SUMMARY PRINTOUT

SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	K*CHSL	TOPWID	AREA
93120.000	.00	.00	839.20	3545.00	846.00	6.80	.18	.00	846.18	.00	222.50	1106.31
93120.000	.00	.00	839.20	3545.00	847.00	7.80	.13	.00	847.13	.00	253.19	1344.15
93120.000	.00	.00	839.20	3545.00	847.50	8.30	.11	.00	847.61	.00	268.54	1474.58
93120.000	.00	.00	839.20	3545.00	848.00	8.80	.09	.00	848.09	.00	283.89	1612.69
93120.000	.00	.00	839.20	3545.00	848.50	9.30	.08	.00	848.58	.00	303.77	1759.38
93120.000	.00	.00	839.20	3545.00	849.00	9.80	.07	.00	849.07	.00	324.78	1916.52
94885.000	.00	.00	842.20	3545.00	847.73	5.53	.87	.35	848.60	1.70	99.00	473.41
94885.000	.00	.00	842.20	3545.00	848.00	5.80	.78	.32	848.78	1.70	99.00	501.30
94885.000	.00	.00	842.20	3545.00	848.27	6.07	.70	.30	848.97	1.70	99.00	527.05
94885.000	.00	.00	842.20	3545.00	848.59	6.39	.62	.27	849.21	1.70	99.00	558.88
94885.000	.00	.00	842.20	3545.00	848.96	6.76	.55	.23	849.51	1.70	99.00	595.13
94885.000	.00	.00	842.20	3545.00	849.36	7.16	.48	.21	849.84	1.70	99.00	634.65
94886.000	851.70	854.00	842.20	3545.00	847.74	5.54	.87	.00	848.60	.00	99.00	474.96
94886.000	851.70	854.00	842.20	3545.00	848.01	5.81	.77	.00	848.78	.00	99.00	502.33
94886.000	851.70	854.00	842.20	3545.00	848.27	6.07	.70	.00	848.97	.00	99.00	528.32
94886.000	851.70	854.00	842.20	3545.00	848.60	6.40	.62	.00	849.22	.00	99.00	560.24
94886.000	851.70	854.00	842.20	3545.00	848.96	6.76	.55	.00	849.51	.00	99.00	596.51
94886.000	851.70	854.00	842.20	3545.00	849.36	7.16	.48	.00	849.84	.00	99.00	636.03
94900.000	851.70	854.00	842.20	3545.00	847.79	5.59	.85	.01	848.63	.00	99.00	479.89
94900.000	851.70	854.00	842.20	3545.00	848.05	5.85	.76	.00	848.81	.00	99.00	506.24
94900.000	851.70	854.00	842.20	3545.00	848.30	6.10	.69	.00	848.99	.00	99.00	531.73
94900.000	851.70	854.00	842.20	3545.00	848.62	6.42	.62	.00	849.24	.00	99.00	563.10
94900.000	851.70	854.00	842.20	3545.00	848.98	6.78	.54	.00	849.52	.00	99.00	598.86
94900.000	851.70	854.00	842.20	3545.00	849.37	7.17	.48	.00	849.85	.00	99.00	637.95
94901.000	.00	.00	842.20	3545.00	847.70	5.50	1.03	.09	848.73	.00	99.00	436.22
94901.000	.00	.00	842.20	3545.00	847.98	5.78	.91	.07	848.89	.00	99.00	463.60
94901.000	.00	.00	842.20	3545.00	848.25	6.05	.81	.06	849.06	.00	99.00	490.04
94901.000	.00	.00	842.20	3545.00	848.57	6.37	.72	.05	849.29	.00	99.00	522.33
94901.000	.00	.00	842.20	3545.00	848.94	6.74	.62	.04	849.57	.00	99.00	558.91
94901.000	.00	.00	842.20	3545.00	849.34	7.14	.54	.03	849.89	.00	99.00	598.69

SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	K*CHSL	TOPWID	AREA
95170.000	.00	.00	840.60	3545.00	849.13	8.53	.18	.25	849.31	-5.95	458.91	1458.12
95170.000	.00	.00	840.60	3545.00	849.24	8.64	.17	.22	849.40	-5.95	462.78	1506.89
95170.000	.00	.00	840.60	3545.00	849.36	8.76	.16	.20	849.52	-5.95	467.46	1566.35
95170.000	.00	.00	840.60	3545.00	849.55	8.95	.14	.17	849.69	-5.95	474.19	1652.85
95170.000	.00	.00	840.60	3545.00	849.78	9.18	.13	.15	849.91	-5.95	482.90	1766.59
95170.000	.00	.00	840.60	3545.00	850.07	9.47	.11	.13	850.18	-5.95	493.38	1906.28
97350.000	.00	.00	841.70	3545.00	850.33	8.63	.23	.03	850.56	.50	134.88	922.32
97350.000	.00	.00	841.70	3545.00	850.38	8.68	.23	.03	850.60	.50	135.72	928.65
97350.000	.00	.00	841.70	3545.00	850.44	8.74	.22	.03	850.66	.50	136.80	936.85
97350.000	.00	.00	841.70	3545.00	850.53	8.83	.22	.04	850.75	.50	138.49	949.75
97350.000	.00	.00	841.70	3545.00	850.67	8.97	.21	.04	850.88	.50	140.86	968.22
97350.000	.00	.00	841.70	3545.00	850.84	9.14	.20	.04	851.04	.50	143.84	991.83
99000.000	.00	.00	841.40	3545.00	851.17	9.77	.19	.01	851.36	-.18	155.80	1013.19
99000.000	.00	.00	841.40	3545.00	851.20	9.80	.19	.01	851.39	-.18	156.81	1018.44
99000.000	.00	.00	841.40	3545.00	851.24	9.84	.19	.01	851.43	-.18	158.11	1025.21
99000.000	.00	.00	841.40	3545.00	851.31	9.91	.19	.01	851.49	-.18	160.27	1036.62
99000.000	.00	.00	841.40	3545.00	851.40	10.00	.18	.01	851.58	-.18	162.95	1050.98
99000.000	.00	.00	841.40	3545.00	851.53	10.13	.17	.01	851.71	-.18	166.84	1072.21
99998.000	.00	.00	842.00	3545.00	851.57	9.57	.20	.01	851.77	.60	149.55	983.32
99998.000	.00	.00	842.00	3545.00	851.60	9.60	.20	.01	851.80	.60	150.72	987.54
99998.000	.00	.00	842.00	3545.00	851.63	9.63	.20	.01	851.83	.60	151.83	993.01
99998.000	.00	.00	842.00	3545.00	851.69	9.69	.20	.01	851.89	.60	153.49	1001.39
99998.000	.00	.00	842.00	3545.00	851.77	9.77	.19	.01	851.96	.60	155.94	1013.95
99998.000	.00	.00	842.00	3545.00	851.88	9.88	.19	.01	852.07	.60	159.28	1031.36
99999.000	.00	.00	842.00	3545.00	851.57	9.57	.20	.00	851.77	.00	149.57	983.38
99999.000	.00	.00	842.00	3545.00	851.60	9.60	.20	.00	851.80	.00	150.74	987.61
99999.000	.00	.00	842.00	3545.00	851.63	9.63	.20	.00	851.83	.00	151.85	993.07
99999.000	.00	.00	842.00	3545.00	851.69	9.69	.20	.00	851.89	.00	153.50	1001.45
99999.000	.00	.00	842.00	3545.00	851.77	9.77	.19	.00	851.96	.00	155.95	1014.01
99999.000	.00	.00	842.00	3545.00	851.88	9.88	.19	.00	852.07	.00	159.29	1031.42
100000.000	851.00	843.90	843.90	3545.00	854.60	10.70	.13	.00	854.73	1900.00	562.14	1477.09
100000.000	851.00	843.90	843.90	3545.00	854.60	10.70	.13	.00	854.73	1900.00	562.15	1477.34
100000.000	851.00	843.90	843.90	3545.00	854.60	10.70	.13	.00	854.73	1900.00	562.16	1477.69
100000.000	851.00	843.90	843.90	3545.00	854.60	10.70	.13	.00	854.73	1900.00	562.17	1478.16
100000.000	851.00	843.90	843.90	3545.00	854.60	10.70	.13	.00	854.73	1900.00	562.19	1478.86
100000.000	851.00	843.90	843.90	3545.00	854.60	10.70	.13	.00	854.73	1900.00	562.22	1479.83
100001.000	.00	.00	843.90	3545.00	854.60	10.70	.13	.00	854.73	.00	562.14	1477.10
100001.000	.00	.00	843.90	3545.00	854.60	10.70	.13	.00	854.73	.00	562.15	1477.36
100001.000	.00	.00	843.90	3545.00	854.60	10.70	.13	.00	854.73	.00	562.16	1477.70
100001.000	.00	.00	843.90	3545.00	854.60	10.70	.13	.00	854.73	.00	562.17	1478.17
100001.000	.00	.00	843.90	3545.00	854.60	10.70	.13	.00	854.73	.00	562.19	1478.88
100001.000	.00	.00	843.90	3545.00	854.60	10.70	.13	.00	854.73	.00	562.22	1479.84
100540.000	.00	.00	843.70	2475.00	854.77	11.07	.07	.02	854.84	-.37	237.64	1231.98
100540.000	.00	.00	843.70	2475.00	854.77	11.07	.07	.02	854.84	-.37	237.64	1232.08
100540.000	.00	.00	843.70	2475.00	854.77	11.07	.07	.02	854.84	-.37	237.64	1232.22
100540.000	.00	.00	843.70	2475.00	854.77	11.07	.07	.02	854.84	-.37	237.64	1232.41
100540.000	.00	.00	843.70	2475.00	854.77	11.07	.07	.02	854.84	-.37	237.65	1232.69
100540.000	.00	.00	843.70	2475.00	854.77	11.07	.07	.02	854.84	-.37	237.65	1233.07

SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	K*CHSL	TOPWID	AREA
101800.000	.00	.00	844.60	2475.00	854.94	10.34	.04	.01	854.98	.71	716.14	2585.21
101800.000	.00	.00	844.60	2475.00	854.94	10.34	.04	.01	854.98	.71	716.15	2585.50
101800.000	.00	.00	844.60	2475.00	854.94	10.34	.04	.01	854.98	.71	716.16	2585.88
101800.000	.00	.00	844.60	2475.00	854.94	10.34	.04	.01	854.98	.71	716.18	2586.42
101800.000	.00	.00	844.60	2475.00	854.94	10.34	.04	.01	854.98	.71	716.20	2587.20
101800.000	.00	.00	844.60	2475.00	854.94	10.34	.04	.01	854.98	.71	716.23	2588.28
102480.000	.00	.00	845.90	2475.00	855.01	9.11	.03	.00	855.04	1.91	960.31	3369.49
102480.000	.00	.00	845.90	2475.00	855.01	9.11	.03	.00	855.04	1.91	960.33	3369.86
102480.000	.00	.00	845.90	2475.00	855.01	9.11	.03	.00	855.04	1.91	960.36	3370.36
102480.000	.00	.00	845.90	2475.00	855.01	9.11	.03	.00	855.04	1.91	960.39	3371.05
102480.000	.00	.00	845.90	2475.00	855.01	9.11	.03	.00	855.04	1.91	960.45	3372.07
102480.000	.00	.00	845.90	2475.00	855.01	9.11	.03	.00	855.04	1.91	960.52	3373.47

SUMMARY OF ERRORS

00BREAK00

1) COUNTY: Livingston

2) STUDY NAME: Hamburg Twp

3) WATERCOURSE: Huron River

4) DOCUMENT TYPE: Convergence Run
500 Year Flood

00BREAK00

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*********************************************
*  WATER SURFACE PROFILES                   *
*  VERSION OF NOVEMBER 1976                 *
*  UPDATED JULY 1979                        *
*                                           *
*  RUN DATE MON, JUN 15, 1981,  1:11 PM     *
*********************************************
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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     X
XXXXXXX  XXXX      X          XXXXX  XXXXX
X     X  X         X                 X
X     X  X         X     X           X
X     X  XXXXXXX   XXXXX              XXXXXXX
```

Convergence Run

500 - year Flood

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**********************************************************
HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
ERROR CORR -  01,02,03
MODIFICATION -  50,51,52,53
**********************************************************


C
T1       HAMBURG TOWNSHIP F.I.S.
T2       CONVERGENCE TRIALS - RATING CURVE ANALYSIS
T3       HURON RIVER - JOB NO.6504-03-0 - PROJECT MANAGER, ANDY KUBEK

J1  ICHECK     INQ       NINV      IDIR      STRT     METRIC    HVINS     Q        WSEL      FQ

      -1.       2.        0.        0.   .000000      .00       .0       0.   847.000     .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH      FN      ALLDC     IBW     CHNIM    ITRACE

     1.000     .000    -1.000     .000      .000     .800     .000     .000     .000     .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    38.000   40.000   41.000   42.000   43.000    1.000    8.000   10.000   12.000    3.000

    33.000    4.000   25.000     .000     .000     .000     .000     .000     .000     .000

NC     .100     .100     .042     .300     .500     .000     .000     .000     .000     .000
QT    6.000 4660.000 4660.000 4660.000 4660.000 4660.000 4660.000     .000     .000     .000


          VALLEY SECTION 1.1

X1  93120.000   19.000  268.000  440.000     .000     .000     .000     .000     .000     .000
GR    850.900     .000  851.100  100.000  848.100  200.000  845.600  255.000  841.900  268.000
GR    839.900  270.000  839.900  272.000  840.400  300.000  840.200  325.000  840.200  365.000
GR    839.200  380.000  839.200  400.000  840.700  437.000  842.700  440.000  849.600  500.000
GR    872.900  550.000  878.900  600.000  882.400  700.000  886.800  800.000     .000     .000


X1  94885.000     .000     .000     .000 1410.000 1910.000 1765.000     .000    3.000     .000
X3     .000     .000     .000  301.000     .000  400.000     .000     .000     .000     .000
NC     .030     .030     .030     .000     .000     .000     .000     .000     .000     .000


          BRIDGE SECTION 1 - BELL ST. BRIDGE - D/S FACE

X1  94886.000   17.000  600.000  699.000    1.000    1.000    1.000     .000     .000     .000
BT    11.000     .000  856.500     .000  100.000  854.100     .000  200.000  852.100     .000
BT   300.000  851.700     .000  400.000  851.900     .000  500.000  852.100     .000  600.000
BT   854.900  854.000  699.000  854.900  853.900  800.000  856.400     .000  900.000  859.300
BT     .000  925.000  860.400     .000     .000     .000     .000     .000     .000     .000
GR   856.500     .000  854.100  100.000  852.100  200.000  851.700  300.000  851.900  400.000
GR   852.100  500.000  854.900  600.000  844.200  600.000  843.200  620.000  842.200  640.000
GR   842.300  660.000  842.400  680.000  845.000  699.000  854.900  699.000  856.400  800.000
GR   859.300  900.000  860.400  925.000     .000     .000     .000     .000     .000     .000
```

BRIDGE SECTION 1 - BELL ST. BRIDGE - U/S FACE

X1	94900.000	.000	.000	.000	14.000	14.000	14.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.070	.100	.042	.000	.000	.000	.000	.000	.000	.000
X1	94901.000	20.000	500.000	607.000	1.000	1.000	1.000	.000	.000	.000
X3	.000	.000	.000	505.000	.000	604.000	.000	.000	.000	.000
GR	857.300	.000	856.300	100.000	852.700	200.000	849.900	300.000	849.600	400.000
GR	848.700	500.000	845.700	505.000	842.300	515.000	842.200	525.000	842.800	568.000
GR	844.000	588.000	847.600	607.000	850.500	657.000	846.300	680.000	842.800	697.000
GR	845.000	715.000	846.100	725.000	857.000	735.000	857.200	800.000	860.000	865.000

VALLEY SECTION 1

X1	95170.000	20.000	500.000	607.000	300.000	300.000	269.000	.000	.000	.000
GR	855.700	.000	854.700	100.000	851.100	200.000	848.300	300.000	848.000	400.000
GR	847.100	500.000	844.300	505.000	840.700	515.000	840.600	525.000	841.200	568.000
GR	842.400	588.000	846.000	607.000	848.900	657.000	844.700	680.000	841.200	697.000
GR	843.400	715.000	844.500	725.000	855.400	735.000	855.600	800.000	858.400	865.000
NH	5.000	.050	600.000	.120	1100.000	.050	1255.000	.042	1400.000	.125
NH	1500.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 2

X1	97350.000	24.000	1255.000	1400.000	2020.000	2200.000	2180.000	.000	.000	.000
GR	882.000	.000	877.100	100.000	874.700	200.000	871.100	300.000	867.700	400.000
GR	864.600	500.000	862.400	600.000	861.900	700.000	859.600	800.000	859.000	900.000
GR	856.200	1000.000	852.100	1100.000	854.100	1200.000	854.100	1255.000	844.900	1281.000
GR	843.200	1290.000	842.500	1300.000	841.800	1317.000	841.700	1325.000	841.700	1350.000
GR	841.700	1376.000	844.100	1382.000	850.300	1400.000	856.900	1500.000	.000	.000
NH	4.000	.060	620.000	.040	755.000	.100	900.000	.060	1200.000	.000

VALLEY SECTION 3

X1	99000.000	21.000	620.000	755.000	1700.000	1550.000	1650.000	.000	.000	.000
GR	879.700	.000	869.500	100.000	864.200	200.000	864.600	300.000	864.900	400.000
GR	854.500	500.000	851.000	600.000	850.500	620.000	845.900	629.000	842.900	640.000
GR	841.400	660.000	842.100	690.000	842.600	720.000	845.400	739.000	847.400	745.000
GR	853.600	755.000	853.900	800.000	854.200	900.000	855.200	1000.000	858.200	1100.000
GR	858.700	1200.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	99998.000	.000	.000	.000	1150.000	850.000	998.000	.000	.600	.000
NC	.050	.050	.015	.000	.000	.000	.000	.000	.000	.000
X1	99999.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
SB	.900	1.500	3.460	.000	.010	.000	.010	.000	843.900	842.000

DAM SECTION 2 - U/S FACE

X1	100000.000	26.000	400.000	516.500	1.000	1.000	1.000	.000	.000	.000
X2	.000	.000	1.000	843.900	851.000	.000	.000	.000	.000	.000

BT	29.000	.000	854.500	.000	100.000	853.600	.000	200.000	853.500	.000
BT	300.000	854.300	.000	398.000	854.200	.000	400.000	854.700	.000	410.500
BT	854.600	.000	410.500	851.000	.000	430.500	851.000	.000	430.500	854.300
BT	.000	432.000	854.300	.000	432.000	851.000	.000	452.000	851.000	.000
BT	452.000	854.000	.000	453.500	854.000	.000	453.500	851.000	.000	473.500
BT	851.000	.000	473.500	854.000	.000	475.000	854.000	.000	475.000	851.000
BT	.000	495.000	851.000	.000	495.000	854.000	.000	496.500	854.000	.000
BT	496.500	851.000	.000	516.500	851.000	.000	516.500	854.000	.000	560.000
BT	854.400	.000	600.000	857.500	.000	700.000	859.400	.000	.000	.000
GR	854.500	.000	853.600	100.000	853.500	200.000	854.300	300.000	854.200	398.000
GR	854.700	400.000	847.400	400.000	845.600	409.000	844.100	410.500	844.100	430.500
GR	844.100	432.000	843.900	440.000	843.900	452.000	843.900	453.500	843.900	460.000
GR	843.900	473.500	843.900	475.000	843.900	480.000	844.400	495.000	844.400	496.500
GR	844.500	500.000	845.000	516.500	854.000	516.500	854.400	560.000	857.500	600.000
GR	859.400	700.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.100	.060	.040	.000	.000	.000	.000	.000	.000	.000
X1	100001.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
NH	4.000	.125	560.000	.060	670.000	.040	804.000	.060	945.000	.000
QT	6.000	3195.000	3195.000	3195.000	3195.000	3195.000	3195.000	.000	.000	.000

VALLEY SECTION 4

X1	100540.000	23.000	670.000	804.000	400.000	600.000	539.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	910.000	.000	.000	.000	.000
GR	868.000	.000	864.000	50.000	860.000	90.000	856.000	160.000	856.000	300.000
GR	857.800	360.000	856.000	480.000	856.000	560.000	857.400	620.000	855.500	670.000
GR	851.100	680.000	848.200	690.000	845.000	702.000	843.700	714.000	844.200	728.000
GR	844.700	743.000	845.500	761.000	845.100	777.000	845.800	791.000	849.100	803.000
GR	853.200	804.000	854.000	850.000	854.500	945.000	.000	.000	.000	.000
NH	4.000	.125	700.000	.060	750.000	.040	889.000	.060	1220.000	.000

VALLEY SECTION 5

X1	101800.000	23.000	750.000	889.000	1100.000	1170.000	1260.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	1050.000	.000	.000	.000	.000
GR	868.000	.000	864.000	140.000	860.000	280.000	856.000	310.000	852.000	400.000
GR	850.200	500.000	852.000	620.000	852.000	700.000	853.300	750.000	852.400	760.000
GR	851.300	761.000	846.900	780.000	845.300	804.000	845.300	820.000	844.600	840.000
GR	844.600	850.000	844.800	866.000	849.300	888.000	853.900	889.000	854.000	1010.000
GR	856.000	1190.000	858.000	1200.000	859.000	1220.000	.000	.000	.000	.000
NC	.125	.125	.040	.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 6

X1	102480.000	27.000	740.000	922.000	600.000	580.000	680.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	1310.000	.000	.000	.000	.000
GR	868.000	.000	864.000	150.000	860.000	220.000	856.000	240.000	852.000	340.000
GR	852.000	730.000	851.700	740.000	851.400	742.000	847.800	778.000	846.500	792.000
GR	846.700	803.000	845.900	820.000	845.900	840.000	846.400	855.000	847.100	870.000
GR	847.800	890.000	851.500	920.000	851.800	922.000	852.000	970.000	852.000	1090.000
GR	854.000	1200.000	856.000	1250.000	858.000	1280.000	860.000	1310.000	862.000	1330.000
GR	864.000	1350.000	866.000	1370.000	.000	.000	.000	.000	.000	.000
EJ	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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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

HURON RIVER - JOB NO.650

SUMMARY PRINTOUT

SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	K*CHSL	TOPWID	AREA
93120.000	.00	.00	839.20	4660.00	847.00	7.80	.22	.00	847.22	.00	253.19	1344.15
93120.000	.00	.00	839.20	4660.00	847.50	8.30	.19	.00	847.69	.00	268.54	1474.58
93120.000	.00	.00	839.20	4660.00	848.00	8.80	.16	.00	848.16	.00	283.89	1612.69
93120.000	.00	.00	839.20	4660.00	849.00	9.80	.12	.00	849.12	.00	324.78	1916.52
93120.000	.00	.00	839.20	4660.00	849.50	10.30	.11	.00	849.61	.00	345.80	2084.16
93120.000	.00	.00	839.20	4660.00	850.00	10.80	.09	.00	850.09	.00	364.19	2261.79
94885.000	.00	.00	842.20	4660.00	848.66	6.46	1.05	.42	849.72	1.70	99.00	566.07
94885.000	.00	.00	842.20	4660.00	848.80	6.60	1.00	.41	849.80	1.70	99.00	580.13
94885.000	.00	.00	842.20	4660.00	849.01	6.81	.93	.39	849.95	1.70	99.00	601.04
94885.000	.00	.00	842.20	4660.00	849.62	7.42	.77	.32	850.39	1.70	99.00	660.76
94885.000	.00	.00	842.20	4660.00	849.99	7.79	.69	.29	850.68	1.70	99.00	697.14
94885.000	.00	.00	842.20	4660.00	850.38	8.18	.62	.26	851.01	1.70	99.00	736.41
94886.000	851.70	854.00	842.20	4660.00	848.67	6.47	1.05	.00	849.72	.00	99.00	567.61
94886.000	851.70	854.00	842.20	4660.00	848.81	6.61	1.00	.00	849.80	.00	99.00	581.05
94886.000	851.70	854.00	842.20	4660.00	849.02	6.82	.93	.00	849.95	.00	99.00	602.23
94886.000	851.70	854.00	842.20	4660.00	849.63	7.43	.77	.00	850.39	.00	99.00	662.14
94886.000	851.70	854.00	842.20	4660.00	849.99	7.79	.69	.00	850.68	.00	99.00	698.54
94886.000	851.70	854.00	842.20	4660.00	850.39	8.19	.62	.00	851.01	.00	99.00	737.80
94900.000	851.70	854.00	842.20	4660.00	848.72	6.52	1.03	.01	849.75	.00	99.00	572.44
94900.000	851.70	854.00	842.20	4660.00	848.85	6.65	.98	.00	849.83	.00	99.00	585.24
94900.000	851.70	854.00	842.20	4660.00	849.06	6.86	.92	.00	849.98	.00	99.00	606.08
94900.000	851.70	854.00	842.20	4660.00	849.65	7.45	.76	.00	850.41	.00	99.00	665.06
94900.000	851.70	854.00	842.20	4660.00	850.01	7.81	.69	.00	850.70	.00	99.00	701.01
94900.000	851.70	854.00	842.20	4660.00	850.40	8.20	.62	.00	851.02	.00	99.00	739.88
94901.000	.00	.00	842.20	4660.00	848.64	6.44	1.21	.09	849.84	.00	99.00	528.87
94901.000	.00	.00	842.20	4660.00	848.77	6.57	1.15	.08	849.92	.00	99.00	541.99
94901.000	.00	.00	842.20	4660.00	848.99	6.79	1.06	.07	850.05	.00	99.00	563.60
94901.000	.00	.00	842.20	4660.00	849.60	7.40	.87	.05	850.47	.00	99.00	624.17
94901.000	.00	.00	842.20	4660.00	849.97	7.77	.77	.04	850.74	.00	99.00	660.84
94901.000	.00	.00	842.20	4660.00	850.37	8.17	.69	.04	851.06	.00	99.00	700.34

SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	K*CHSL	TOPWID	AREA
95170.000	.00	.00	840.60	4660.00	850.27	9.67	.18	.31	850.44	-5.95	500.67	2005.08
95170.000	.00	.00	840.60	4660.00	850.32	9.72	.17	.29	850.49	-5.95	502.55	2030.92
95170.000	.00	.00	840.60	4660.00	850.42	9.82	.16	.27	850.58	-5.95	506.09	2079.69
95170.000	.00	.00	840.60	4660.00	850.75	10.15	.14	.22	850.89	-5.95	518.39	2251.59
95170.000	.00	.00	840.60	4660.00	850.99	10.39	.13	.19	851.12	-5.95	527.16	2376.78
95170.000	.00	.00	840.60	4660.00	851.27	10.67	.11	.17	851.39	-5.95	536.07	2526.36
97350.000	.00	.00	841.70	4660.00	851.40	9.70	.30	.06	851.69	.50	154.05	1076.36
97350.000	.00	.00	841.70	4660.00	851.42	9.72	.29	.06	851.72	.50	154.51	1080.31
97350.000	.00	.00	841.70	4660.00	851.48	9.78	.29	.06	851.77	.50	155.40	1088.04
97350.000	.00	.00	841.70	4660.00	851.66	9.96	.28	.07	851.94	.50	158.80	1117.71
97350.000	.00	.00	841.70	4660.00	851.81	10.11	.27	.07	852.08	.50	161.32	1140.16
97350.000	.00	.00	841.70	4660.00	852.00	10.30	.25	.07	852.25	.50	164.71	1170.85
99000.000	.00	.00	841.40	4660.00	852.32	10.92	.25	.01	852.57	-.18	190.59	1212.82
99000.000	.00	.00	841.40	4660.00	852.34	10.94	.24	.01	852.59	-.18	191.30	1217.35
99000.000	.00	.00	841.40	4660.00	852.38	10.98	.24	.01	852.62	-.18	192.35	1224.02
99000.000	.00	.00	841.40	4660.00	852.51	11.11	.23	.01	852.74	-.18	196.35	1249.76
99000.000	.00	.00	841.40	4660.00	852.62	11.22	.23	.01	852.84	-.18	199.61	1271.14
99000.000	.00	.00	841.40	4660.00	852.75	11.35	.22	.01	852.97	-.18	203.66	1298.18
99998.000	.00	.00	842.00	4660.00	852.76	10.76	.26	.01	853.02	.60	185.82	1183.11
99998.000	.00	.00	842.00	4660.00	852.77	10.77	.26	.01	853.03	.60	186.24	1185.69
99998.000	.00	.00	842.00	4660.00	852.80	10.80	.25	.01	853.06	.60	187.13	1191.16
99998.000	.00	.00	842.00	4660.00	852.92	10.92	.25	.01	853.16	.60	190.51	1212.36
99998.000	.00	.00	842.00	4660.00	853.01	11.01	.24	.01	853.25	.60	193.30	1230.07
99998.000	.00	.00	842.00	4660.00	853.12	11.12	.23	.01	853.36	.60	196.79	1252.62
99999.000	.00	.00	842.00	4660.00	852.76	10.76	.26	.00	853.02	.00	185.84	1183.19
99999.000	.00	.00	842.00	4660.00	852.77	10.77	.26	.00	853.03	.00	186.26	1185.78
99999.000	.00	.00	842.00	4660.00	852.80	10.80	.26	.00	853.06	.00	187.14	1191.24
99999.000	.00	.00	842.00	4660.00	852.91	10.91	.25	.00	853.16	.00	190.53	1212.44
99999.000	.00	.00	842.00	4660.00	853.01	11.01	.24	.00	853.25	.00	193.31	1230.15
99999.000	.00	.00	842.00	4660.00	853.12	11.12	.24	.00	853.36	.00	196.80	1252.69
100000.000	851.00	843.90	843.90	4660.00	854.87	10.97	.21	.00	855.08	1900.00	566.09	1631.76
100000.000	851.00	843.90	843.90	4660.00	854.87	10.97	.21	.00	855.08	1900.00	566.09	1631.91
100000.000	851.00	843.90	843.90	4660.00	854.87	10.97	.21	.00	855.08	1900.00	566.10	1632.24
100000.000	851.00	843.90	843.90	4660.00	854.87	10.97	.21	.00	855.08	1900.00	566.13	1633.50
100000.000	851.00	843.90	843.90	4660.00	854.88	10.98	.21	.00	855.09	1900.00	566.15	1634.53
100000.000	851.00	843.90	843.90	4660.00	854.88	10.98	.21	.00	855.09	1900.00	566.19	1636.22
100001.000	.00	.00	843.90	4660.00	854.88	10.98	.20	.00	855.08	.00	566.09	1631.70
100001.000	.00	.00	843.90	4660.00	854.88	10.98	.20	.00	855.08	.00	566.09	1631.86
100001.000	.00	.00	843.90	4660.00	854.88	10.98	.20	.00	855.08	.00	566.10	1632.19
100001.000	.00	.00	843.90	4660.00	854.88	10.98	.20	.00	855.09	.00	566.12	1633.45
100001.000	.00	.00	843.90	4660.00	854.88	10.98	.20	.00	855.09	.00	566.15	1634.48
100001.000	.00	.00	843.90	4660.00	854.89	10.99	.20	.00	855.09	.00	566.19	1636.17
100540.000	.00	.00	843.70	3195.00	855.14	11.44	.11	.03	855.25	-.37	238.42	1321.35
100540.000	.00	.00	843.70	3195.00	855.14	11.44	.11	.03	855.25	-.37	238.42	1321.41
100540.000	.00	.00	843.70	3195.00	855.14	11.44	.11	.03	855.25	-.37	238.42	1321.53
100540.000	.00	.00	843.70	3195.00	855.15	11.45	.11	.03	855.25	-.37	238.43	1322.01
100540.000	.00	.00	843.70	3195.00	855.15	11.45	.11	.03	855.25	-.37	238.43	1322.41
100540.000	.00	.00	843.70	3195.00	855.15	11.45	.11	.03	855.25	-.37	238.44	1323.05

SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	K*CHSL	TOPWID	AREA
101800.000	.00	.00	844.60	3195.00	855.39	10.79	.05	.02	855.44	.71	726.26	2909.66
101800.000	.00	.00	844.60	3195.00	855.39	10.79	.05	.02	855.44	.71	726.27	2909.82
101800.000	.00	.00	844.60	3195.00	855.39	10.79	.05	.02	855.44	.71	726.28	2910.17
101800.000	.00	.00	844.60	3195.00	855.39	10.79	.05	.02	855.44	.71	726.32	2911.50
101800.000	.00	.00	844.60	3195.00	855.39	10.79	.05	.02	855.45	.71	726.35	2912.58
101800.000	.00	.00	844.60	3195.00	855.40	10.80	.05	.02	855.45	.71	726.41	2914.37
102480.000	.00	.00	845.90	3195.00	855.48	9.58	.04	.00	855.51	1.91	984.07	3831.40
102480.000	.00	.00	845.90	3195.00	855.48	9.58	.04	.00	855.51	1.91	984.08	3831.61
102480.000	.00	.00	845.90	3195.00	855.48	9.58	.04	.00	855.52	1.91	984.10	3832.06
102480.000	.00	.00	845.90	3195.00	855.48	9.58	.04	.00	855.52	1.91	984.19	3833.78
102480.000	.00	.00	845.90	3195.00	855.48	9.58	.04	.00	855.52	1.91	984.26	3835.19
102480.000	.00	.00	845.90	3195.00	855.48	9.58	.04	.00	855.52	1.91	984.38	3837.50

SUMMARY OF ERRORS

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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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#J148; #0731  *  KUBEK.WATER; FTN06  *  MON, JUN 15, 1981,  1:42 PM
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#J148; #0731  *  KUBEK.WATER; FTN06  *  MON, JUN 15, 1981,  1:42 PM
#J148; #0731  *  KUBEK.WATER; FTN06  *  MON, JUN 15, 1981,  1:42 PM
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#J148; #0731  *  KUBEK.WATER; FTN06  *  MON, JUN 15, 1981,  1:42 PM
#J148; #0731  *  KUBEK.WATER; FTN06  *  MON, JUN 15, 1981,  1:42 PM
#J148; #0731  *  KUBEK.WATER; FTN06  *  MON, JUN 15, 1981,  1:42 PM
```

00BREAK00

1) COUNTY: Livingston County

2) STUDY NAME: Hamburg TWP

3) WATERCOURSE: Huron River

4) DOCUMENT TYPE: CLOMR

00BREAK00

McNAMEE
ENGINEERING EXCELLENCE
SINCE 1914

McNAMEE PORTER & SEELEY, INC.
[illegible] South State Street
[illegible] MI 48[illegible]

RECEIVED
MAR 1 8 1996
ENVIRONMENTAL QUALITY
LAND & WATER MANAGEMENT

March 15, 1996

Mr. Eric Berman
Federal Emergency Management Agency
Region V
175 West Jackson Blvd., 4th Floor
Chicago, IL 60604

Re: Hamburg Township
Updated Information for Floodway Delineation Adjustment

Dear Mr. Berman:

On February 1, 1996, we submitted an Application/Certificate Form and Instructions for Conditional Letters of Map Revision, Letters of Map Revision, and Physical Map Revisions for Hamburg Township, Michigan. We were requesting that the floodway boundary be moved around an elevated peninsula at Edgelake Court near Strawberry Lake.

Having also notified the Michigan Department of Environmental Quality of the floodway revision, we received the enclosed letter of approval from Bruce E. Menerey, of the Michigan Department of Environmental Quality which suggested minor clarification to the Revised flooding Map.

I have enclosed this updated map for your evaluation. If there are any questions or concerns please contact me.

Sincerely,

Thomas A. Smith, P. E.
Hydraulic Engineer

TAS:cad
1057.001.01

Enclosures

cc: Joseph McGuire, w/enclosure
Harry Bater, w/enclosure
Bruce E. Menerey, P.E., MDEQ
p:\mps\1057\00101\update.doc

STATE OF MICHIGAN

JOHN ENGLER, Governor

DEPARTMENT OF ENVIRONMENTAL QUALITY

HOLLISTER BUILDING, PO BOX 30473, LANSING MI 48909-7973

RUSSELL J. HARDING, Director

REPLY TO:
LAND & WATER MANAGEMENT DIVISION
PO BOX 30458
LANSING MI 48909-7958

February 20, 1996

Mr. Thomas A. Smith, P.E.
McNamee, Porter and Seeley, Inc.
3131 South State Street
Ann Arbor, Michigan 48108

Dear Mr. Smith:

SUBJECT: Proposed Floodway Revision, Huron River
Hamburg Township, Livingston County

We have completed our review of the floodway revision received February 2, 1996. The purpose of the analysis was to correct the floodway delineation in vicinity of Edgelake Court in Hamburg Township.

The revised flood profiles developed provide a reasonable determination the floodway in the vicinity of Edgelake Court. The Department of Environmental Quality has no objection to the floodway being revised as shown in the hydraulic analysis.

The map showing the floodway and cross section locations shows Existing Section 20 and Existing Section 21. It appears that these labels have been reversed, Section 20 should be nearest to Strawberry Lake. To aid the Federal Emergency Management Agency's review, you may want to consider including the HEC-2 "SECNO" on the cross sections on the map.

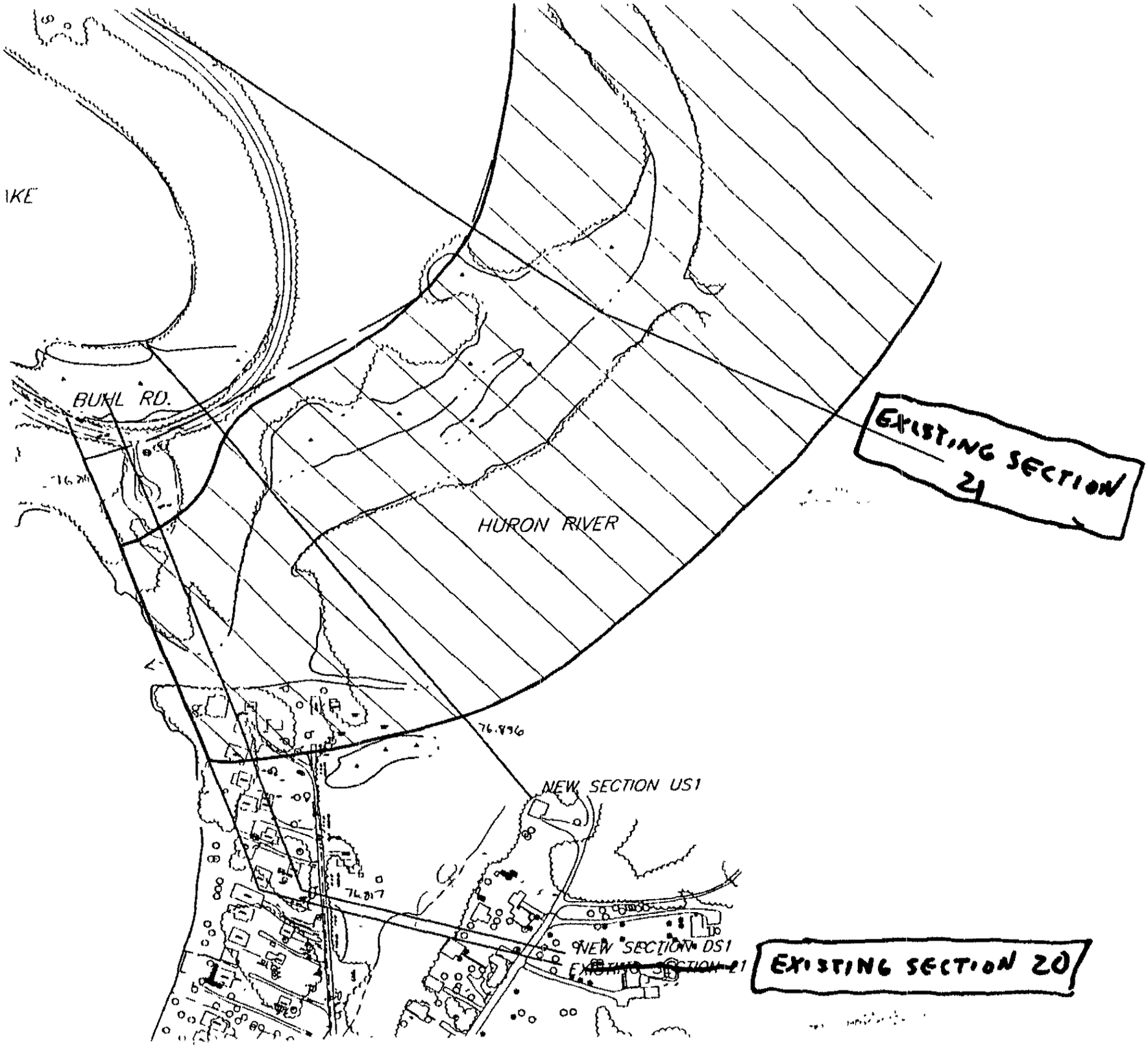
If you have any other questions, or if I can be of further assistance, please feel free to contact me.

Sincerely,

Bruce E. Menerey

Bruce E. Menerey, P.E.
Floodplain Mapping/Delineation
Land and Water Management Division
517-335-3181

BEM:cjr
Enclosure
cc: Mr. Eric Berman, FEMA, Region V, Chicago
Mr. Harry Bater, Hamburg Twp Supervisor
Mr. Daniel Morgan, LWMD, Shiawassee


IKE
BUHL RD.
HURON RIVER
EXISTING SECTION 21
76.896
NEW SECTION US1
76.817
NEW SECTION DS1
EXISTING SECTION 21
EXISTING SECTION 20

McNAMEE
ENGINEERING EXCELLENCE
SINCE 1914

3131 South State Street
Ann Arbor, MI 48108
Telephone (313) 665 6000
Fax (313) 665-2570

RECEIVED
FEB 02 1996
ENVIRONMENTAL QUALITY
LAND & WATER MANAGEMENT

February 1, 1996

Mr. Bruce Menerey
Michigan Department of Environmental Quality
P. O. Box 30028
Lansing, MI 48909-7528

Re: Hamburg Township
Request for Floodway Delineation Adjustment

Dear Mr. Menerey:

McNamee, Porter & Seeley, Inc., has been involved in construction projects in the Hamburg Township, Michigan area near Strawberry Lake. On the east side of the Lake, we have noticed that the floodway has been defined without consideration for an elevated peninsula at Edgelake Court. We have been contracted to prepare revisions to the floodway so that construction may commence on our client's property.

As required in MT-2, Form 1, Page 2 of the FEMA Revisions to National Flood Insurance Program Maps, I am notifying your agency of this revision. Enclosed is the Application/Certificate Forms and Instructions for Conditional Letters of Map Revision, Letters of Map Revision, and Physical Map Revisions. As we have discussed previously, the appropriate forms include Revision Requestor and Community Official Form (1), Professional Certification Form (2), Riverine Hydraulic Analysis Form (4), and the Riverine/Coastal Mapping Form (5).

As part of the revision request form, I am required to include a letter indicating your approval of the revised floodway. If there are any questions or concerns please contact me.

Sincerely,

Thomas A. Smith, P. E.
Hydraulic Engineer

TAS:cad
1057.001.01

Enclosures

cc: Joseph McGuire, w/enclosure
Harry Bater, w/enclosure

p:\mps\1057\00101\femacov.doc

HAMBURG TOWNSHIP

FLOODWAY REVISION REQUEST

McNAMEE
ENGINEERING EXCELLENCE
SINCE 1914

December 1995

1) COUNTY: Livingston

2) STUDY NAME: Hamburg Twp

3) WATERCOURSE: Huron River

4) DOCUMENT TYPE: CLOMR- Dupl.- Encroached

00BREAK00

DUPLICATION MODEL FOR

ENCROACHED CONDITION

```
1*******************************************
 *  HEC-2 WATER SURFACE PROFILES            *
 *                                          *
 *  Version   4.6.2;  May 1991              *
 *                                          *
 *  RUN DATE    02OCT95    TIME   09:52:43  *
 *******************************************
```

```
*****************************************
*  U.S. ARMY CORPS OF ENGINEERS         *
*  HYDROLOGIC ENGINEERING CENTER        *
*  609 SECOND STREET, SUITE D           *
*  DAVIS, CALIFORNIA 95616-4687         *
*          (916) 756-1104               *
*****************************************
```

```
X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X            X     X
X     X  X        X                        X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                  X
X     X  X        X     X            X
X     X  XXXXXXX   XXXXX             XXXXXXX
```

1

THIS RUN EXECUTED 02OCT95 09:52:43

```
*************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
*************************************
```

```
T1      HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2      100-YEAR NATURAL FLOODWAY - STRAWBERRY LAKE TO  CORPORATE LIMITS
T3      HURON RIVER - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

      -1       2                                                          855.13

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

      1                -1                         .8

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38       40       41       42       43       1        8        10       12       3
     33        4       25

NC      .06      .125      .040       .3       .5
QT        4     1350      1900     2200     2850

        VALLEY SECTION 20 (0), ENCROACHED DUE TO FILLING
```

```
X1   76.798        26        825       914
X3                                     625                  1145
GR     870                   860        15        858        25        856       255      855.2       385
GR   854.5       730      853.3       825      849.8       828      845.6       845      845.5       860
GR   846.5       875      848.1       890      849.8       900      851.3       910      852.2       914
GR   853.8      1845        854      2095      855.6      2425        856      2805      857.3      2895
GR     856      2945        856      3505      856.3      3595        856      3725        856      3965
GR     868      4045


NC    .125      .100       .040

        VALLEY SECTION 21 (P), ENCROACHED DUE TO FILLING
X1   77.030        23        770       876      1420      1180       1220
X3                                     300                  1200
GR     880                   860        50        854        70      852.6       770      850.3       773
GR   848.7       790      848.1       805      847.5       813      847.8       825      848.5       835
GR   849.1       843      850.1       853      850.8       865      851.8       875      852.2       876
GR     854      1530        856      1570      857.5      2640        856      3150        856      4010
GR     858      4020        860      4040        866      4080
1
   02OCT95      09:52:43                                                                          PAGE    2


NC    .125       .06        .04

X1   77.232        27       2080      2186       780       760       1070
X3                                     1200                 2200
GR     880                   864        60        860        80        858       110        854       150
GR     854      1650      853.7      2000      853.6      2080      851.3      2083      849.7      2100
GR   849.1      2115      848.5      2123      848.8      2135      849.5      2145      850.1      2153
GR   851.1      2163      851.8      2175      852.8      2185      853.2      2186        854      2190
GR     856      2220      857.3      2380      857.7      2560      857.8      3000        858      3300
GR     860      3340        870      3390

QT       4      1200       1710      1950      2550

        VALLEY SECTION 22 (Q)
X1   77.353        22        560       672      1060       640       640
X3                                     230                  720
GR     870                   860        60        860       110        854       150      852.9       560
GR     852       562      849.1       582      849.1       592      849.2       601      849.4       610
GR   849.9       627      849.9       642        850       656      851.3       670      853.9       672
GR     854       680      855.7       870        856      1210      857.3      1600        858      1960
GR     860      1980        870      2020

NC    .125       .06        .04

        VALLEY SECTION 23 (R)
X1   77.499        20        390       485       910       570       770
X3                                     290                  500
GR     860                   860       210        856       220        854       350      853.1       390
GR   851.9       395      850.1       410      846.9       420      847.1       432      846.7       443
GR   848.7       455      850.7       470      852.7       475      857.7       485        870       500
GR     870       560        860       680        858       720        858       980        870      1050
```

```
X1   77.566        22        560        672        400        420        353
X3                                       562                   626
GR    869.3                859.3         60      859.3        110      853.3        150      852.2        560
GR    851.3        562      848.4        582      848.4        592      848.5        601      848.7        610
GR    849.2        627      849.2        642      849.3        656      850.6        670      853.2        672
GR    853.3        680        855        870      855.3       1210      856.6       1600      857.3       1960
GR    859.3       1980      869.3       2020

NC      .04        .04       .025

        BRIDGE SECTION 4 - ANN ARBOR RAILROAD - D/S FACE (S)
X1   77.567         22        300        364          1          1          1
BT       12          0        861          0        100        861          0        200      861.9          0
BT    296.9      861.9          0        297      865.2          0        300      865.2      858.8        364
BT    865.2      858.8        367      865.2          0      367.1      862.1          0        400      862.1
BT        0        500      862.1          0        600      862.2          0
GR      861          0        861        100      861.9        200      861.9      296.9      858.8      296.9
GR    858.8        300      853.1        300      853.1      301.3      849.2      301.5      848.8        310
GR    848.8        320      848.4        330      849.2        340      849.6        350      850.9      362.5
GR    852.7      362.7      852.7        364      858.8        364      862.1      367.1      862.1        400
1
   02OCT95      09:52:43                                                                                    PAGE    3


GR    862.1        500      862.2        600

1
   02OCT95      09:52:43                                                                                    PAGE    4

    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


 *PROF 1
0

 CCHV=     .300 CEHV=     .500
 *SECNO 76.798

 3470 ENCROACHMENT STATIONS=      625.0    1145.0  TYPE=      1  TARGET=      520.000
    76.798      9.63    855.13       .00    855.13    855.17       .04       .00       .00    853.30
    1350.0      51.9    1118.5     179.6     171.8     656.3     631.0        .0        .0    852.20
       .00       .30      1.70       .28      .048      .032      .100      .000    845.50    625.00
   .000098        0.        0.        0.         0         0         0       .00    520.00   1145.00


 *SECNO 77.030

 3470 ENCROACHMENT STATIONS=      300.0    1200.0  TYPE=      1  TARGET=      900.000
    77.030      7.76    855.26       .00       .00    855.28       .02       .11       .01    852.60
    1350.0     225.0     865.0     260.0    1026.6     642.6     845.1      57.7      21.2    852.20
       .36       .22      1.35       .31      .100      .032      .080      .000    847.50    300.00
   .000077     1420.     1220.     1180.         0         0         0       .00    900.00   1200.00
```

```
*SECNO 77.232

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .65


3470 ENCROACHMENT STATIONS=     1200.0    2200.0  TYPE=      1  TARGET=     1000.000
    77.232      6.86    855.36       .00       .00    855.40       .04       .11       .01    853.60
    1350.0     327.7    1013.9       8.4    1278.3     547.9      17.3     100.5      38.8    853.20
       .54       .26      1.85       .48      .100      .032      .048      .000    848.50   1200.00
   .000180      780.     1070.      760.         2         0         0       .00   1000.00   2200.00


*SECNO 77.353

3470 ENCROACHMENT STATIONS=      230.0     720.0  TYPE=      1  TARGET=      490.000
    77.353      6.38    855.48       .00       .00    855.51       .03       .11       .00    852.90
    1200.0     192.6     981.0      26.4     702.3     613.6      63.8     133.7      55.6    853.90
       .69       .27      1.60       .41      .100      .032      .048      .000    849.10    230.00
   .000125     1060.      640.      640.         1         0         0       .00    490.00    720.00


1
   02OCT95      09:52:43                                                                                                PAGE     5

    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


*SECNO 77.499

3470 ENCROACHMENT STATIONS=      290.0     500.0  TYPE=      1  TARGET=      210.000
    77.499      8.88    855.58       .00       .00    855.64       .06       .12       .02    853.10
    1200.0     40.2     1159.8        .0     149.0     564.4        .0     153.4      62.2    857.70
       .80       .27      2.05       .00      .100      .032      .000      .000    846.70    290.00
   .000177      910.      770.      570.         1         0         0       .00    190.77    480.77


*SECNO 77.566

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .69


3470 ENCROACHMENT STATIONS=      562.0     626.0  TYPE=      1  TARGET=       64.000
    77.566      7.24    855.64       .00       .00    855.76       .12       .09       .03 100000.00
    1200.0        .0    1200.0        .0        .0     423.5        .0     158.1      63.3 100000.00
       .84       .00      2.83       .00      .000      .032      .000      .000    848.40    562.00
   .000370      400.      353.      420.         0         0         0       .00     64.00    626.00


*SECNO 77.567

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.47


3370 NORMAL BRIDGE, NRD=  12 MIN ELTRD=   861.00 MAX ELLC=   858.80
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```
    77.567      7.23    855.63       .00       .00    855.77       .14       .00       .01    858.80
    1200.0        .0    1200.0        .0        .0     402.0        .0     158.1      63.3    858.80
       .84       .00      2.98       .00      .000      .020      .000      .000    848.40    300.00
   .000172        1.        1.        1.         0         0         0       .00     64.00    364.00


1
   02OCT95      09:52:43                                                                          PAGE    6

 T1      HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
 T2      100-YEAR NATURAL FLOODWAY - STRAWBERRY LAKE TO  CORPORATE LIMITS
 T3      HURON RIVER - PROJECT MANAGER, M.S.CHENG

 J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

       -1        3                                                                   855.82

 J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

       2                  -1                            .8


1
   02OCT95      09:52:43                                                                          PAGE    7

     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

 *PROF 2
0

 CCHV=     .300 CEHV=     .500
 *SECNO 76.798

 3470 ENCROACHMENT STATIONS=      625.0    1145.0  TYPE=      1  TARGET=      520.000
    76.798     10.32    855.82       .00    855.82    855.87       .05       .00       .00    853.30
    1900.0     146.4    1460.2     293.5     309.8     717.7     790.4        .0        .0    852.20
       .00       .47      2.03       .37      .048      .032      .100      .000    845.50    625.00
   .000123        0.        0.        0.         0         0         0       .00    520.00   1145.00


 *SECNO 77.030

 3470 ENCROACHMENT STATIONS=      300.0    1200.0  TYPE=      1  TARGET=      900.000
    77.030      8.48    855.98       .00       .00    856.01       .02       .13       .01    852.60
    1900.0     382.9    1104.2     413.0    1366.3     719.2    1079.3      72.8      21.2    852.20
       .33       .28      1.54       .38      .100      .032      .080      .000    847.50    300.00
   .000086     1420.     1220.     1180.         0         0         0       .00    900.00   1200.00


 *SECNO 77.232
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```
3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .70

3470 ENCROACHMENT STATIONS=     1200.0    2200.0  TYPE=      1  TARGET=     1000.000
    77.232      7.59    856.09       .00       .00    856.13       .04       .11       .01    853.60
    1900.0     634.1    1248.9      16.9    1912.2     624.3      27.4     128.3      38.8    853.20
       .52       .33      2.00       .62      .100      .032      .048      .000    848.50   1200.00
   .000177      780.     1070.      760.         1         0         0       .00   1000.00   2200.00

*SECNO 77.353

3470 ENCROACHMENT STATIONS=      230.0     720.0  TYPE=      1  TARGET=      490.000
    77.353      7.11    856.21       .00       .00    856.25       .04       .12       .00    852.90
    1710.0     340.9    1310.4      58.7     943.0     695.3      98.8     173.6      55.6    853.90
       .66       .36      1.88       .59      .100      .032      .048      .000    849.10    230.00
   .000147     1060.      640.      640.         1         0         0       .00    490.00    720.00

1
   02OCT95      09:52:43                                                                                                PAGE     8

    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

*SECNO 77.499

3470 ENCROACHMENT STATIONS=      290.0     500.0  TYPE=      1  TARGET=      210.000
    77.499      9.63    856.33       .00       .00    856.42       .10       .15       .03    853.10
    1710.0      89.5    1620.5        .0     223.4     632.5        .0     198.2      62.2    857.70
       .74       .40      2.56       .00      .100      .032      .000      .000    846.70    290.00
   .000241      910.      770.      570.         0         0         0       .00    192.26    482.26

*SECNO 77.566

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .67

3470 ENCROACHMENT STATIONS=      562.0     626.0  TYPE=      1  TARGET=       64.000
    77.566      8.00    856.40       .00       .00    856.60       .20       .12       .05 100000.00
    1710.0        .0    1710.0        .0        .0     472.4        .0     203.7      63.3 100000.00
       .77       .00      3.62       .00      .000      .032      .000      .000    848.40    562.00
   .000537      400.      353.      420.         0         0         0       .00     64.00    626.00

*SECNO 77.567

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.48

3370 NORMAL BRIDGE, NRD=  12 MIN ELTRD=   861.00 MAX ELLC=   858.80
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```
    77.567      7.99    856.39       .00       .00    856.61       .22       .00       .01    858.80
    1710.0        .0    1710.0        .0        .0     450.4        .0     203.7      63.3    858.80
       .77       .00      3.80       .00      .000      .020      .000      .000    848.40    300.00
   .000245        1.        1.        1.         1         0         0       .00     64.00    364.00


1
   02OCT95      09:52:43                                                                          PAGE    9

 T1      HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
 T2      100-YEAR NATURAL FLOODWAY - STRAWBERRY LAKE TO  CORPORATE LIMITS
 T3      HURON RIVER - PROJECT MANAGER, M.S.CHENG

 J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

       -1        4                                                          856.16

 J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

       3                 -1                            .8


1
   02OCT95      09:52:43                                                                          PAGE   10

     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WIN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

 *PROF 3
0

 CCHV=     .300 CEHV=     .500
 *SECNO 76.798

 3470 ENCROACHMENT STATIONS=      625.0    1145.0  TYPE=      1  TARGET=      520.000
    76.798     10.66    856.16       .00    856.16    856.22       .06       .00       .00    853.30
    2200.0     210.3    1631.6     358.1     377.8     747.9     868.9        .0        .0    852.20
       .00       .56      2.18       .41      .048      .032      .100      .000    845.50    625.00
   .000134        0.        0.        0.         0         0         0       .00    520.00   1145.00


 *SECNO 77.030

 3470 ENCROACHMENT STATIONS=      300.0    1200.0  TYPE=      1  TARGET=      900.000
    77.030      8.84    856.34       .00       .00    856.36       .02       .14       .01    852.60
    2200.0     473.4    1227 8     498.8    1532.6     756.7    1193.9      80.1      21.2    852.20
       .32       .31      1.62       .42      .100      .032      .080      .000    847.50    300.00
   .000090     1420.     1220.     1180.         0         0         0       .00    900.00   1200.00


 *SECNO 77.232
```

```
3470 ENCROACHMENT STATIONS=     1200.0    2200.0  TYPE=      1  TARGET=     1000.000
    77.232      7.94    856.44       .00       .00    856.49       .04       .12       .01    853.60
    2200.0     809.8    1368.4      21.8    2222.7     661.7      32.3     141.9      38.8    853.20
       .51       .36      2.07       .67      .100      .032      .048      .000    848.50   1200.00
   .000175      780.     1070.      760.         0         0         0       .00   1000.00   2200.00

*SECNO 77.353

3470 ENCROACHMENT STATIONS=      230.0     720.0  TYPE=      1  TARGET=      490.000
    77.353      7.47    856.57       .00       .00    856.61       .05       .12       .00    852.90
    1950.0     418.9    1454.0      77.1    1060.5     735.2     115.9     193.2      55.6    853.90
       .64       .39      1.98       .67      .100      .032      .048      .000    849.10    230.00
   .000151     1060.      640.      640.         1         0         0       .00    490.00    720.00

*SECNO 77.499

3470 ENCROACHMENT STATIONS=      290.0     500.0  TYPE=      1  TARGET=      210.000
1
   02OCT95      09:52:43                                                                          PAGE   11

    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

    77.499      9.99     856.69       .00       .00     856.80       .11       .15       .03    853.10
    1950.0     118.7     1831.3       .0     259.1      665.6        .0     220.1      62.2    857.70
       .73       .46      2.75       .00      .100      .032      .000      .000    846.70    290.00
   .000263      910.      770.      570.         0         0         0       .00    192.98    482.98

*SECNO 77.566

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .66

3470 ENCROACHMENT STATIONS=      562.0     626.0  TYPE=      1  TARGET=       64.000
    77.566      8.36    856.76       .00       .00    857.00       .24       .14       .07 100000.00
    1950.0        .0    1950.0        .0        .0     495.4        .0     226.0      63.3 100000.00
       .75       .00      3.94       .00      .000      .032      .000      .000    848.40    562.00
   .000603      400.      353.      420.         1         0         0       .00     64.00    626.00

*SECNO 77.567

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.48

3370 NORMAL BRIDGE, NRD=  12 MIN ELTRD=   861.00 MAX ELLC=   858.80

    77.567      8.35    856.75       .00       .00    857.01       .26       .00       .01    858.80
    1950.0        .0    1950.0        .0        .0     473.4        .0     226.0      63.3    858.80
       .75       .00      4.12       .00      .000      .020      .000      .000    848.40    300.00
   .000274        1.        1.        1.         1         0         0       .00     64.00    364.00
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1
   02OCT95      09:52:43                                                                                                PAGE   12

 T1      HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
 T2      100-YEAR NATURAL FLOODWAY - STRAWBERRY LAKE TO  CORPORATE LIMITS
 T3      HURON RIVER - PROJECT MANAGER, M.S.CHENG

 J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      -1        5                                                                   856.77

 J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

      4                   -1                            .8


1
   02OCT95      09:52:43                                                                                                PAGE   13

     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

 *PROF 4
0

 CCHV=     .300 CEHV=     .500
 *SECNO 76.798

 3470 ENCROACHMENT STATIONS=      625.0    1145.0  TYPE=      1  TARGET=      520.000
     76.798     11.27    856.77       .00    856.77    856.84       .07       .00       .00    853.30
     2850.0     360.4    1990.9     498.6     499.8     802.2    1009.8        .0        .0    852.20
        .00       .72      2.48       .49      .048      .032      .100      .000    845.50    625.00
    .000158        0.        0.        0.         0         0         0       .00    520.00   1145.00

 *SECNO 77.030

 3470 ENCROACHMENT STATIONS=      300.0    1200.0  TYPE=      1  TARGET=      900.000
     77.030      9.48    856.98       .00       .00    857.01       .03       .15       .01    852.60
     2850.0     671.9    1492.6     685.5    1833.7     824.6    1401.5      93.5      21.2    852.20
        .30       .37      1.81       .49      .100      .032      .080      .000    847.50    300.00
    .000100     1420.     1220.     1180.         0         0         0       .00    900.00   1200.00

 *SECNO 77.232

 3470 ENCROACHMENT STATIONS=     1200.0    2200.0  TYPE=      1  TARGET=     1000.000
     77.232      8.59    857.09       .00       .00    857.14       .04       .12       .01    853.60
     2850.0    1194.1    1623.6      32.3    2799.5     731.2      41.5     166.7      38.8    853.20
        .48       .43      2.22       .78      .100      .032      .048      .000    848.50   1200.00
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   .000177      780.     1070.      760.        0        0        0      .00   1000.00   2200.00

*SECNO 77.353

3470 ENCROACHMENT STATIONS=      230.0     720.0  TYPE=      1  TARGET=      490.000
    77.353      8.12    857.22      .00      .00   857.28      .06      .14      .01    852.90
    2550.0     609.4    1818.6    122.0   1279.6    809.6    147.8    229.0     55.6    853.90
       .60       .48      2.25      .83     .100     .032     .048     .000   849.10    230.00
   .000171     1060.      640.     640.        2        0        0      .00   490.00    720.00

*SECNO 77.499

3470 ENCROACHMENT STATIONS=      290.0     500.0  TYPE=      1  TARGET=      210.000
1
   02OCT95      09:52:43                                                                          PAGE   14

    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

    77.499     10.66    857.36      .00      .00   857.51      .15      .18      .05    853.10
    2550.0     192.6    2357.4      .0    325.3    727.6       .0    260.3     62.2    857.70
       .67       .59      3.24      .00     .100     .032     .000     .000   846.70    290.00
   .000331      910.      770.     570.        0        0        0      .00   194.30    484.30

*SECNO 77.566

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .64

3470 ENCROACHMENT STATIONS=      562.0     626.0  TYPE=      1  TARGET=       64.000
    77.566      9.03    857.43      .00      .00   857.78      .35      .17      .10 100000.00
    2550.0        .0    2550.0       .0       .0    538.1       .0    266.9     63.3 100000.00
       .70       .00      4.74      .00     .000     .032     .000     .000   848.40    562.00
   .000801      400.      353.     420.        2        0        0      .00    64.00    626.00

*SECNO 77.567

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.50

3370 NORMAL BRIDGE, NRD=  12 MIN ELTRD=   861.00 MAX ELLC=   858.80

    77.567      9.02    857.42      .00      .00   857.79      .38      .00      .02    858.80
    2550.0        .0    2550.0       .0       .0    516.4       .0    266.9     63.3    858.80
       .70       .00      4.94      .00     .000     .020     .000     .000   848.40    300.00
   .000358        1.        1.       1.        1        0        0      .00    64.00    364.00

1
   02OCT95      09:52:43                                                                          PAGE   15
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THIS RUN EXECUTED 02OCT95 09:52:45

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

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

HURON RIVER - PROJECT MA

SUMMARY PRINTOUT

	SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	K*CHSL	TOPWID	AREA
	76.798	.00	.00	845.50	1350.00	855.13	9.63	.04	.00	855.17	.00	520.00	1459.06
	76.798	.00	.00	845.50	1900.00	855.82	10.32	.05	.00	855.87	.00	520.00	1817.86
	76.798	.00	.00	845.50	2200.00	856.16	10.66	.06	.00	856.22	.00	520.00	1994.64
	76.798	.00	.00	845.50	2850.00	856.77	11.27	.07	.00	856.84	.00	520.00	2311.87
	77.030	.00	.00	847.50	1350.00	855.26	7.76	.02	.01	855.28	1.64	900.00	2514.23
	77.030	.00	.00	847.50	1900.00	855.98	8.48	.02	.01	856.01	1.64	900.00	3164.84
	77.030	.00	.00	847.50	2200.00	856.34	8.84	.02	.01	856.36	1.64	900.00	3483.22
	77.030	.00	.00	847.50	2850.00	856.98	9.48	.03	.01	857.01	1.64	900.00	4059.79
*	77.232	.00	.00	848.50	1350.00	855.36	6.86	.04	.01	855.40	.93	1000.00	1843.56
*	77.232	.00	.00	848.50	1900.00	856.09	7.59	.04	.01	856.13	.93	1000.00	2563.90
	77.232	.00	.00	848.50	2200.00	856.44	7.94	.04	.01	856.49	.93	1000.00	2916.74
	77.232	.00	.00	848.50	2850.00	857.09	8.59	.04	.01	857.14	.93	1000.00	3572.20
	77.353	.00	.00	849.10	1200.00	855.48	6.38	.03	.00	855.51	.94	490.00	1379.75
	77.353	.00	.00	849.10	1710.00	856.21	7.11	.04	.00	856.25	.94	490.00	1737.14
	77.353	.00	.00	849.10	1950.00	856.57	7.47	.05	.00	856.61	.94	490.00	1911.68
	77.353	.00	.00	849.10	2550.00	857.22	8.12	.06	.01	857.28	.94	490.00	2236.92
	77.499	.00	.00	846.70	1200.00	855.58	8.88	.06	.02	855.64	-3.12	190.77	713.47
	77.499	.00	.00	846.70	1710.00	856.33	9.63	.10	.03	856.42	-3.12	192.26	855.90
	77.499	.00	.00	846.70	1950.00	856.69	9.99	.11	.03	856.80	-3.12	192.98	924.64
	77.499	.00	.00	846.70	2550.00	857.36	10.66	.15	.05	857.51	-3.12	194.30	1052.95
*	77.566	.00	.00	848.40	1200.00	855.64	7.24	.12	.03	855.76	4.82	64.00	423.48
*	77.566	.00	.00	848.40	1710.00	856.40	8.00	.20	.05	856.60	4.82	64.00	472.43
*	77.566	.00	.00	848.40	1950.00	856.76	8.36	.24	.07	857.00	4.82	64.00	495.37
*	77.566	.00	.00	848.40	2550.00	857.43	9.03	.35	.10	857.78	4.82	64.00	538.13
*	77.567	861.00	858 80	848.40	1200.00	855.63	7.23	.14	.01	855.77	.00	64.00	402.02
*	77.567	861.00	858.80	848.40	1710.00	856.39	7.99	.22	.01	856.61	.00	64.00	450.37
*	77.567	861.00	858.80	848.40	1950.00	856.75	8.35	.26	.01	857.01	.00	64.00	473.36
*	77.567	861.00	858.80	848.40	2550.00	857.42	9.02	.38	.02	857.79	.00	64.00	516.36

SUMMARY OF ERRORS AND SPECIAL NOTES

```
WARNING SECNO=     77.232  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     77.232  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     77.566  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     77.566  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     77.566  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     77.566  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     77.567  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     77.567  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     77.567  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     77.567  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
```

00BREAK00

1) COUNTY: Livingston ~~County~~

2) STUDY NAME: Hamburg Twp

3) WATERCOURSE: Huron River

4) DOCUMENT TYPE: CLOMR - Dupl. - Natural

DUPLICATION MODEL FOR

NATURAL CONDITION

```
1*******************************************
 *  HEC-2 WATER SURFACE PROFILES            *
 *                                          *
 *  Version   4.6.2;  May 1991              *
 *                                          *
 *  RUN DATE    26SEP95    TIME   09:43:56  *
 *******************************************
```

```
*****************************************
*  U.S. ARMY CORPS OF ENGINEERS         *
*  HYDROLOGIC ENGINEERING CENTER        *
*  609 SECOND STREET, SUITE D           *
*  DAVIS, CALIFORNIA 95616-4687         *
*           (916) 756-1104              *
*****************************************
```

```
X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X            X     X
X     X  X        X                        X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                  X
X     X  X        X     X            X
X     X  XXXXXXX   XXXXX             XXXXXXX
```

1

26SEP95 09:43:56 PAGE 1

THIS RUN EXECUTED 26SEP95 09:43:56

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*************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
*************************************
```

```
T1      HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2      100-YEAR NATURAL FLOODWAY - STRAWBERRY LAKE TO  CORPORATE LIMITS
T3      HURON RIVER - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      -1        2                                                                  856.09

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

      1                  -1                            .8

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38        40        41        42        43         1         8        10        12         3
     33         4        25

NC      .06      .125      .040       .3        .5
QT        1      2200

        VALLEY SECTION 20  (0), ENCROACHED DUE TO FILLING
```

```
X1   76.798        26        825        914
X3                                      625                  1145
GR     870                   860         15        858         25        856        255      855.2        385
GR   854.5        730      853.3        825      849.8        828      845.6        845      845.5        860
GR   846.5        875      848.1        890      849.8        900      851.3        910      852.2        914
GR   853.8       1845        854       2095      855.6       2425        856       2805      857.3       2895
GR     856       2945        856       3505      856.3       3595        856       3725        856       3965
GR     868       4045

NC    .125       .100       .040

        VALLEY SECTION 21  (P), ENCROACHED DUE TO FILLING
X1   77.030        23        770        876       1420       1180       1220
X3                                                          1375
GR     880                   860         50        854         70      852.6        770      850.3        773
GR   848.7        790      848.1        805      847.5        813      847.8        825      848.5        835
GR   849.1        843      850.1        853      850.8        865      851.8        875      852.2        876
GR     854       1530        856       1570      857.5       2640        856       3150        856       4010
GR     858       4020        860       4040        866       4080
1
   26SEP95      09:43:56                                                                                PAGE    2


NC    .125        .06        .04

X1   77.232        27       2080       2186        780        760       1070
X3                                      860                  2275
GR     880                   864         60        860         80        858        110        854        150
GR     854       1650      853.7       2000      853.6       2080      851.3       2083      849.7       2100
GR   849.1       2115      848.5       2123      848.8       2135      849.5       2145      850.1       2153
GR   851.1       2163      851.8       2175      852.8       2185      853.2       2186        854       2190
GR     856       2220      857.3       2380      857.7       2560      857.8       3000        858       3300
GR     860       3340        870       3390

QT       1       1950

        VALLEY SECTION 22  (Q)
X1   77.353        22        560        672       1060        640        640
X3                                      230                   720
GR     870                   860         60        860        110        854        150      852.9        560
GR     852        562      849.1        582      849.1        592      849.2        601      849.4        610
GR   849.9        627      849.9        642        850        656      851.3        670      853.9        672
GR     854        680      855.7        870        856       1210      857.3       1600        858       1960
GR     860       1980        870       2020

NC    .125        .06        .04

        VALLEY SECTION 23  (R)
X1   77.499        20        390        485        910        570        770
X3                                      290                   500
GR     860                   860        210        856        220        854        350      853.1        390
GR   851.9        395      850.1        410      846.9        420      847.1        432      846.7        443
GR   848.7        455      850.7        470      852.7        475      857.7        485        870        500
GR     870        560        860        680        858        720        858        980        870       1050


X1   77.566        22        560        672        400        420        353
```

```
X3                                      562                     626
GR    869.3                   859.3      60        859.3        110        853.3        150        852.2        560
GR    851.3        562        848.4     582        848.4        592        848.5        601        848.7        610
GR    849.2        627        849.2     642        849.3        656        850.6        670        853.2        672
GR    853.3        680         855      870        855.3       1210        856.6       1600        857.3       1960
GR    859.3       1980        869.3    2020

NC      .04        .04         .025

        BRIDGE SECTION 4 - ANN ARBOR RAILROAD - D/S FACE (S)
X1   77.567         22         300      364            1          1          1
BT       12          0         861        0          100        861          0        200        861.9          0
BT    296.9      861.9           0      297        865.2          0        300        865.2        858.8        364
BT    865.2      858.8         367    865.2            0      367.1      862.1          0          400      862.1
BT        0        500        862.1        0          600      862.2          0
GR      861          0         861      100        861.9        200      861.9      296.9        858.8      296.9
GR    858.8        300        853.1      300        853.1      301.3      849.2      301.5        848.8        310
GR    848.8        320        848.4      330        849.2        340      849.6        350        850.9      362.5
GR    852.7      362.7        852.7      364        858.8        364      862.1      367.1        862.1        400
1
   26SEP95      09:43:56                                                                                        PAGE    3

GR    862.1        500        862.2      600

        BRIDGE SECTION 4 - ANN ARBOR RAILROAD - U/S FACE (S)

X1   77.569         22         300      364           16         16         16
X2                                                                           1
GR      861          0         861      100        861.9        200      861.9      296.9        858.8      296.9
GR    858.8        300        853.2      300        853.2      301.3      849.3      301.5        848.9        310
GR    848.9        320        848.5      330        849.3        340      849.7        350          851      362.5
GR    852.8      362.7        852.8      364        858.8        364      862.1      367 1        862.1        400
GR    862.1        500        862.2      600

NC       .1        .06         .04

X1   77.570         22         560      672            1          1          1
X3                                      561                     627
GR    869.4          0        859.4       60        859.4        110        853.4        150        852.3        560
GR    851.4        562        848.5      582        848.5        592        848.6        601        848.8        610
GR    849.2        627        849.2      642        849.3        656        850.6        670        853.2        672
GR    853.3        680         855      870        855.3       1210        856.6       1600        857.3       1960
GR    859.3       1980        869.3    2020

NC      .04        .04         .025

        BRIDGE SECTION 5 - ABANDONED GRAND TRUNK RAILROAD -D/S FACE (T)
X1   77.603         29         300      418            1          1          1
BT       44                   860.6                 100      860.6                   200        860.5
BT      300      860.3        857.9      313        860.3      857.9        313      860.3        851.1        314
BT    860.3      850.6          314    860.3        857.9        323      860.3      857.9          323      860.3
BT    849.8        324        860.3    850.2          324      860.3      857.9        335        860.3      857.9
BT      335      860.3          850      336        860.3        850        336      860.3        857.9        347
BT    860.2      857.8          347    860.2        850.1        348      860.2      849.8          348      860.2
BT    857.8        359        860.2    857.8          359      860.2      849.5        360        860.2        849
BT      360      860.2        857.8      371        860.2      857.8        371      860.2        848.7        372
BT    860.2      848.8          372    860.2        857.8        382      860.2      857.8          382      860.2
```

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BT    848.8       383      860.2      848.8       383      860.2      857.8       394      860.1      857.7
BT      394     860.1      848.8        395     860.1        849        395     860.1      857.7        406
BT    860.1     857.7        406      860.1     848.4        407      860.1     849.1        407      860.1
BT    857.7       418      860.1      857.7       500        860          0       600        860          0
BT      700       860
GR    860.6         0      860.6        100     860.5        200      860.3       300      852.5        300
GR    851.1       313      850.6        314     849.5        323      850.2       324        850        335
GR      850       336      850.1        347     849.8        348      849.5       359        849        360
GR    848.7       371      848.8        372     848.8        382      848.8       383      848.8        394
GR      849       395      848.4        406     849.1        407      852.9       416      853.6        418
GR    860.1       418        860        500       860        600        860       700
```

BRIDGE SECTION 5 - ABANDONED BRAND TRUNK RAILROAD - U/S FACE (T)

1

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```
X1   77.605                                    12          12          12
X2                                                              1
```

1

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```
SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

*PROF 1
0

CCHV=     .300 CEHV=     .500
*SECNO 76.798

3470 ENCROACHMENT STATIONS=      625.0    1145.0  TYPE=      1  TARGET=      520.000
    76.798     10.59    856.09       .00    856.09    856.15       .06       .00       .00    853.30
    2200.0     202.1    1643.4     354.5     363.8     741.7     852.7        .0        .0    852.20
       .00       .56      2.22       .42      .048      .032      .100      .000    845.50    625.00
   .000140        0.        0.        0.         0         0         0       .00    520.00   1145.00

*SECNO 77.030

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.41

3470 ENCROACHMENT STATIONS=         .0    1375.0  TYPE=      1  TARGET=     1374.999
    77.030      8.76    856.26       .00       .00    856.28       .02       .12       .01    852.60
    2200.0     537.1    1071.5     591.4    2086.4     750.1    1687.4      95.2      27.4    852.20
       .41       .26      1.43       .35      .100      .032      .080      .000    847.50     62.44
   .000071     1420.     1220.     1180.         0         0         0       .00   1312.56   1375.00

*SECNO 77.232
```

```
3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .70

3470 ENCROACHMENT STATIONS=      860.0    2275.0  TYPE=      1  TARGET=     1415.000
    77.232      7.85    856.35       .00       .00    856.38       .03       .09       .01    853.60
    2200.0     953.1    1219.4      27.4    2954.8     653.4      59.5     172.8      52.3    853.20
       .62       .32      1.87       .46      .100      .032      .048      .000    848.50    860.00
   .000145      780.     1070.      760.         0         0         0       .00   1403.81   2263.81

*SECNO 77.353

3470 ENCROACHMENT STATIONS=      230.0     720.0  TYPE=      1  TARGET=      490.000
    77.353      7.36    856.46       .00       .00    856.51       .05       .12       .01    852.90
    1950.0     410.8    1464.8      74.4    1027.7     724.1     111.2     232.7      73.7    853.90
       .76       .40      2.02       .67      .100      .032      .048      .000    849.10    230.00
   .000161     1060.      640.      640.         2         0         0       .00    490.00    720.00
```



```
    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WIN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

*SECNO 77.499

3470 ENCROACHMENT STATIONS=      290.0     500.0  TYPE=      1  TARGET=      210.000
    77.499      9.89    856.59       .00       .00    856.70       .11       .16       .03    853.10
    1950.0     113.7    1836.3        .0     248.2     655.5        .0     258.9      80.3    857.70
       .84       .46      2.80       .00      .100      .032      .000      .000    846.70    290.00
   .000277      910.      770.      570.         1         0         0       .00    192.76    482.76

*SECNO 77.566

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .67

3470 ENCROACHMENT STATIONS=      562.0     626.0  TYPE=      1  TARGET=       64.000
    77.566      8.26    856.66       .00       .00    856.91       .25       .14       .07 100000.00
    1950.0        .0    1950.0        .0        .0     489.6        .0     264.7      81.4 100000.00
       .86       .00      3.98       .00      .000      .032      .000      .000    848.40    562.00
   .000625      400.      353.      420.         0         0         0       .00     64.00    626.00

*SECNO 77.567

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.48

3370 NORMAL BRIDGE, NRD=  12 MIN ELTRD=   861.00 MAX ELLC=   858.80

    77.567      8.25    856.65       .00       .00    856.92       .27       .00       .01    858.80
```

```
    1950.0        .0    1950.0        .0        .0     467.3        .0     264.7      81.4    858.80
       .86       .00      4.17       .00      .000      .020      .000      .000    848.40    300.00
   .000285        1.        1.        1.         1         0         0       .00     64.00    364.00


*SECNO 77.569
    77.569      8.15    856.65       .00       .00    856.93       .28       .00       .00    858.80
    1950.0        .0    1950.0        .0        .0     461.0        .0     264.9      81.4    858.80
       .86       .00      4.23       .00      .000      .020      .000      .000    848.50    300.00
   .000297       16.       16.       16.         0         0         0       .00     64.00    364.00


*SECNO 77.570
1
   26SEP95      09:43:56                                                                                PAGE     7

    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


3470 ENCROACHMENT STATIONS=      561.0     627.0  TYPE=      1  TARGET=       66.000
    77.570      8.20    856.70       .00       .00    856.94       .24       .00       .01 100000.00
    1950.0        .0    1950.0        .0        .0     498.6        .0     264.9      81.4 100000.00
       .86       .00      3.91       .00      .000      .032      .000      .000    848.50    561.00
   .000605        1.        1.        1.         2         0         0       .00     66.00    627.00


*SECNO 77.603

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.50


3370 NORMAL BRIDGE, NRD=  44 MIN ELTRD=   860.00 MAX ELLC=   857.90

    77.603      8.48    856.88       .00       .00    856.98       .10       .00       .04    860.30
    1950.0        .0    1950.0        .0        .0     765.4        .0     264.9      81.4    860.10
       .86       .00      2.55       .00      .000      .020      .000      .000    848.40    300.00
   .000269        1.        1.        1.         2         0         0    -66.70    118.00    418.00


*SECNO 77.605

3370 NORMAL BRIDGE, NRD=  44 MIN ELTRD=   860.00 MAX ELLC=   857.90

    77.605      8.49    856.89        00       .00    856.99       .10       .00       .00    860.30
    1950.0        .0    1950.0        .0        .0     766.0        .0     265.1      81.5    860.10
       .87       .00      2.55       .00      .000      .020      .000      .000    848.40    300.00
   .000269       12.       12.       12.         0         0         0    -66.74    118.00    418.00


1
   26SEP95      09:43:56                                                                                PAGE     8
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THIS RUN EXECUTED 26SEP95 09:43:56

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************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
************************************
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

HURON RIVER - PROJECT MA

SUMMARY PRINTOUT

	SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	K*CHSL	TOPWID	AREA
	76.798	.00	.00	845.50	2200.00	856.09	10.59	.06	.00	856.15	.00	520.00	1958.27
*	77.030	.00	.00	847.50	2200.00	856.26	8.76	.02	.01	856.28	1.64	1312.56	4523.82
*	77.232	.00	.00	848.50	2200.00	856.35	7.85	.03	.01	856.38	.93	1403.81	3667.73
	77.353	.00	.00	849.10	1950.00	856.46	7.36	.05	.01	856.51	.94	490.00	1862.99
	77.499	.00	.00	846.70	1950.00	856.59	9.89	.11	.03	856.70	-3.12	192.76	903.72
*	77.566	.00	.00	848.40	1950.00	856.66	8.26	.25	.07	856.91	4.82	64.00	489.61
*	77.567	861.00	858.80	848.40	1950.00	856.65	8.25	.27	.01	856.92	.00	64.00	467.30
	77.569	.00	.00	848.50	1950.00	856.65	8.15	.28	.00	856.93	6.25	64.00	460.98
	77.570	.00	.00	848.50	1950.00	856.70	8.20	.24	.01	856.94	.00	66.00	498.64
*	77.603	860.00	857.90	848.40	1950.00	856.88	8.48	.10	.04	856.98	-99.98	118.00	765.40
	77.605	860.00	857.90	848.40	1950.00	856.89	8.49	.10	.00	856.99	.00	118.00	765.96

1

SUMMARY OF ERRORS AND SPECIAL NOTES

```
WARNING SECNO=     77.030   PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     77.232   PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     77.566   PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     77.567   PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
```

WARNING SECNO= 77.603 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

1) COUNTY: Livingston County

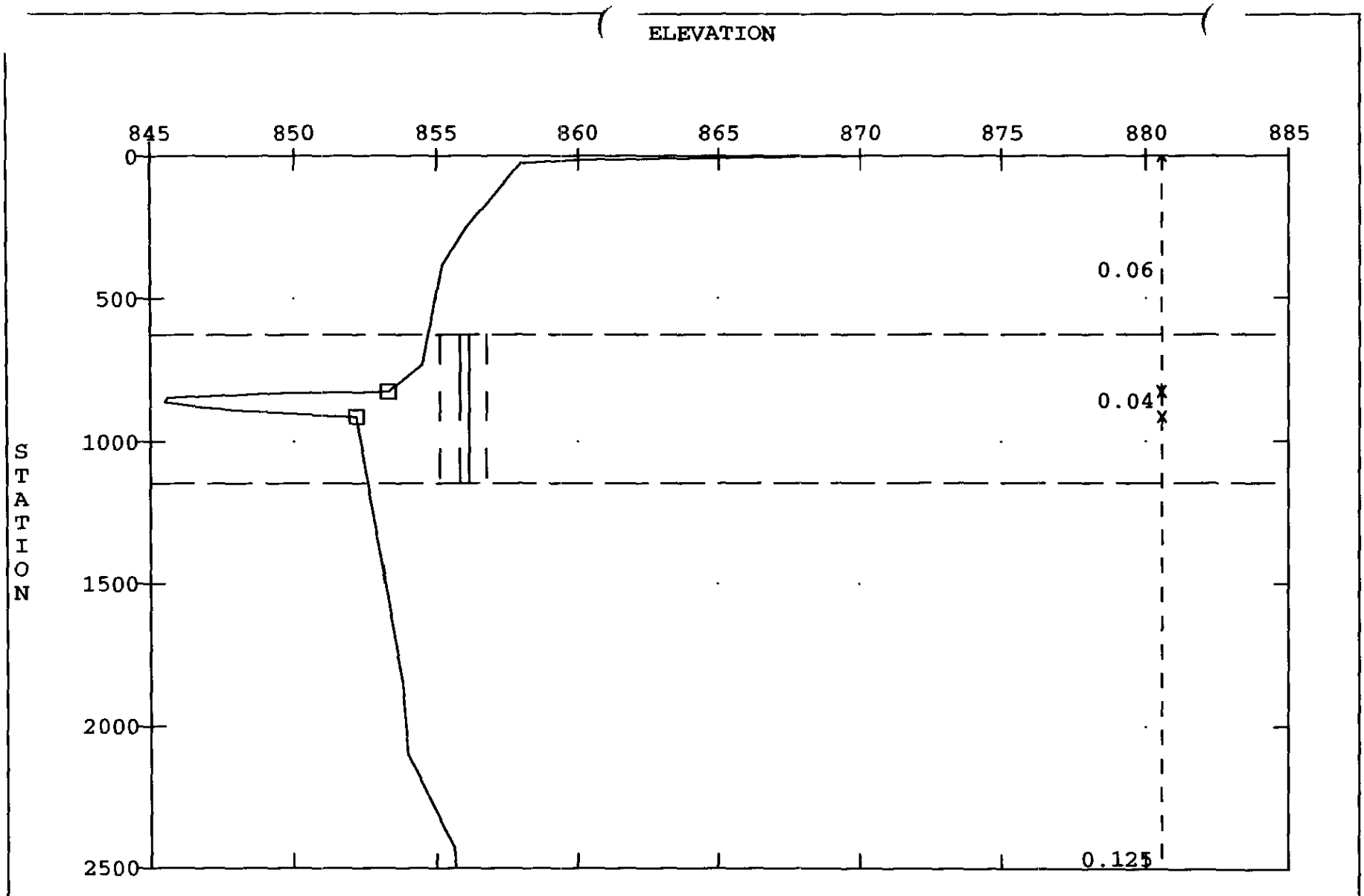
2) STUDY NAME: Hamburg Twp

3) WATERCOURSE: Huron River

4) DOCUMENT TYPE: CLOMR - Encroach. - X-Sections

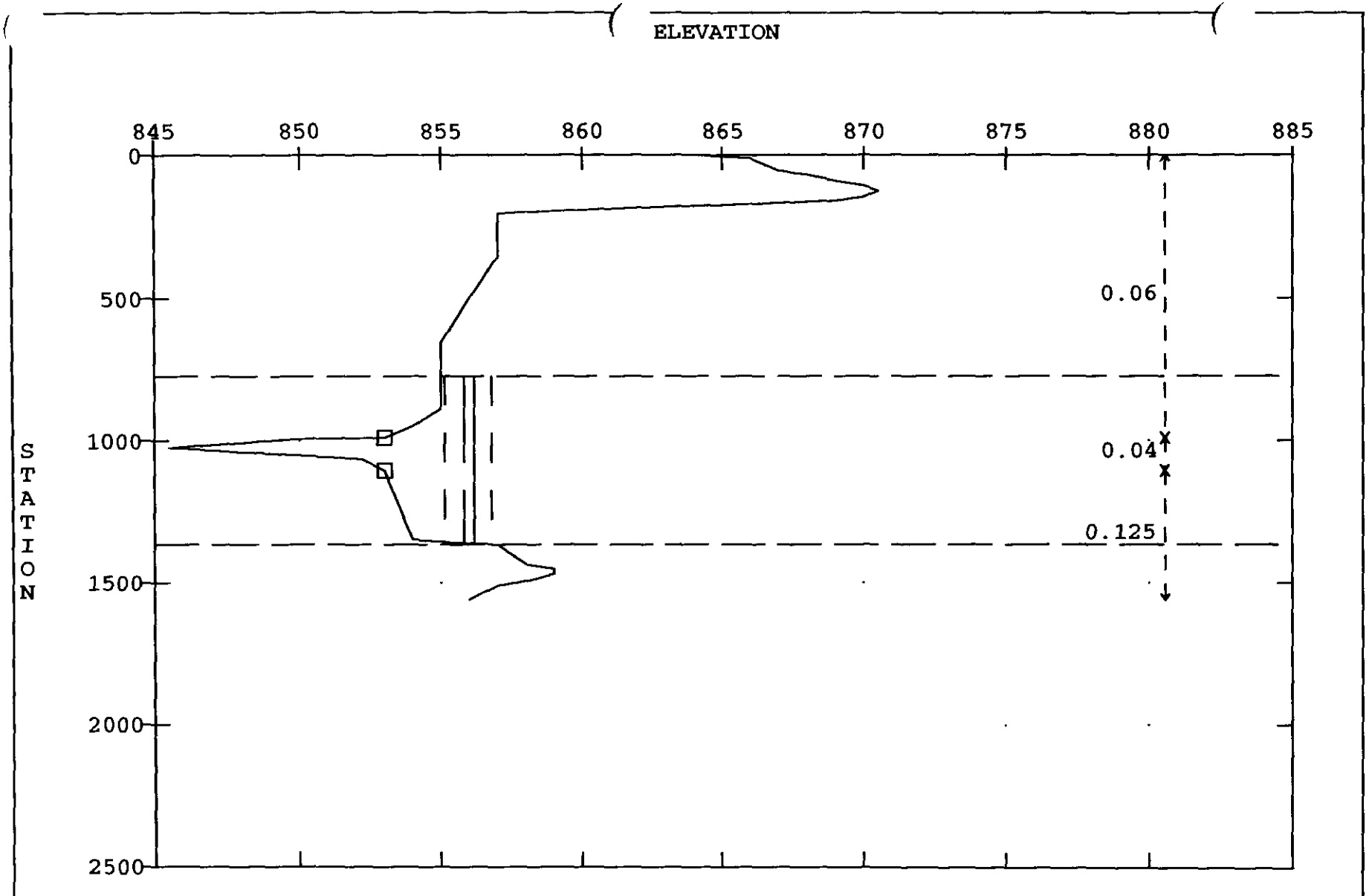
CROSS SECTIONS

ENCROACHED CONDITIONS



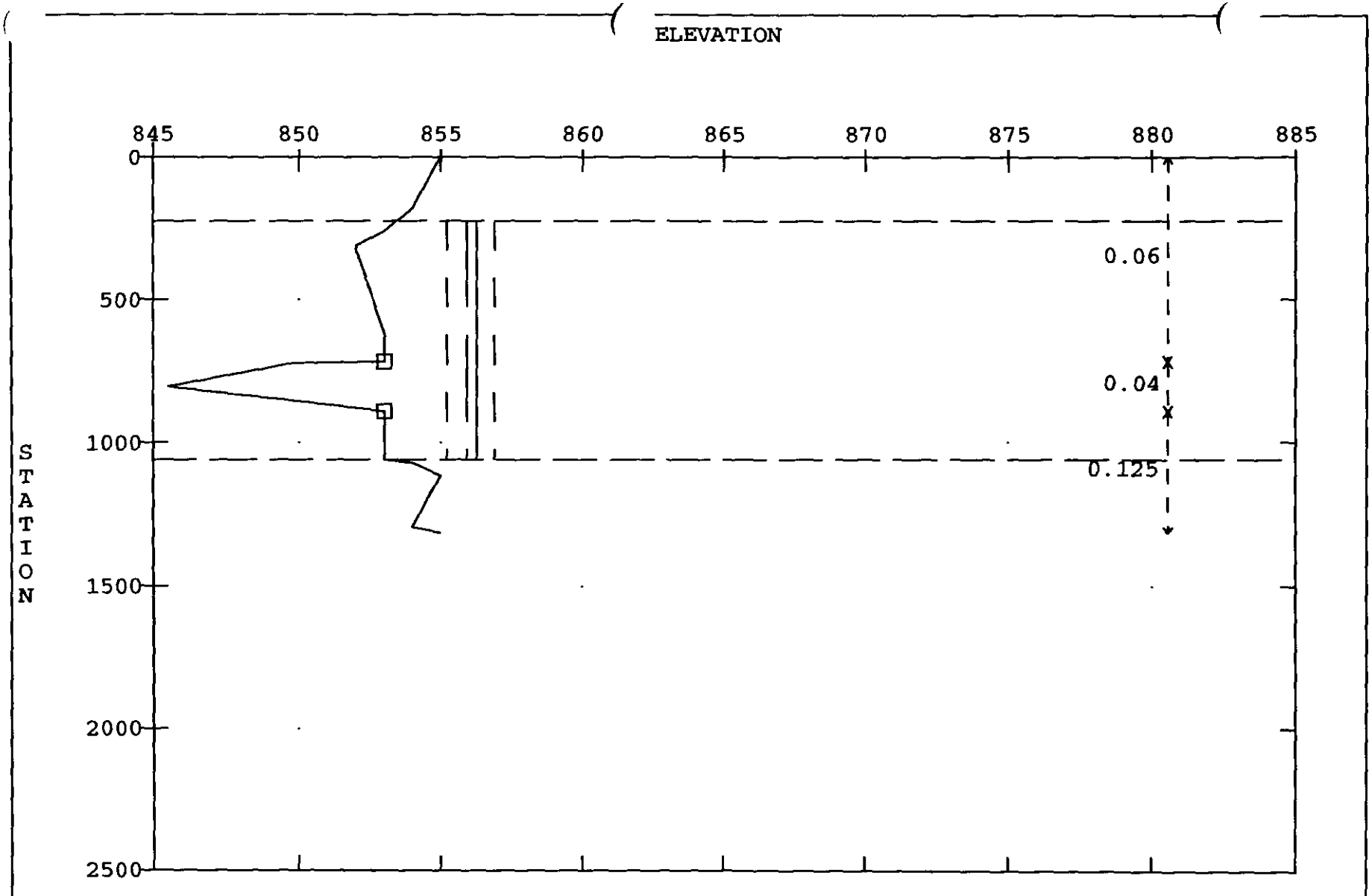
SECTION : 76.798

CROSS SECTIONS FOR ENCROACHED CONDITIONS



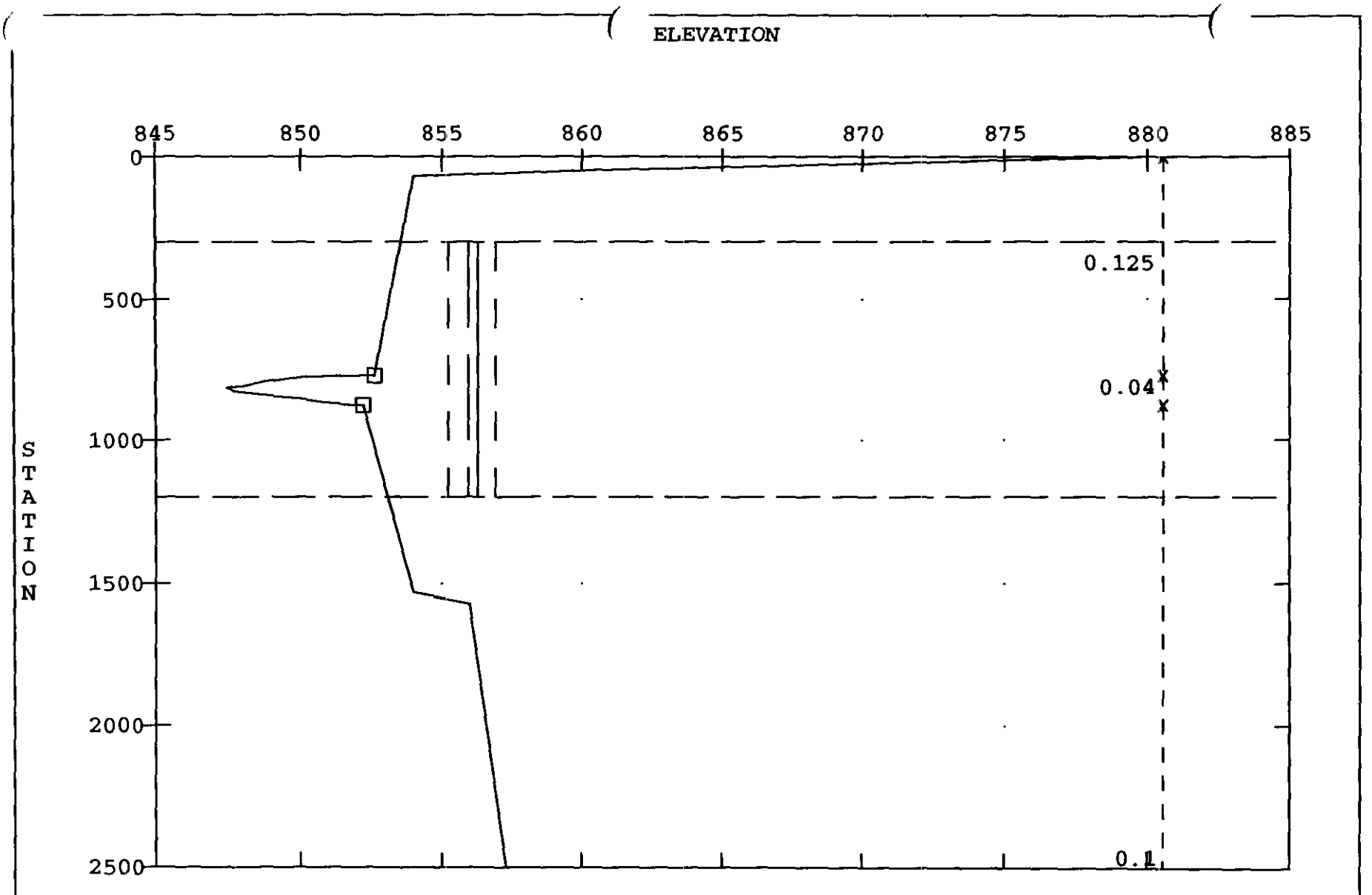
SECTION : 76.817

CROSS SECTIONS FOR ENCROACHED CONDITIONS



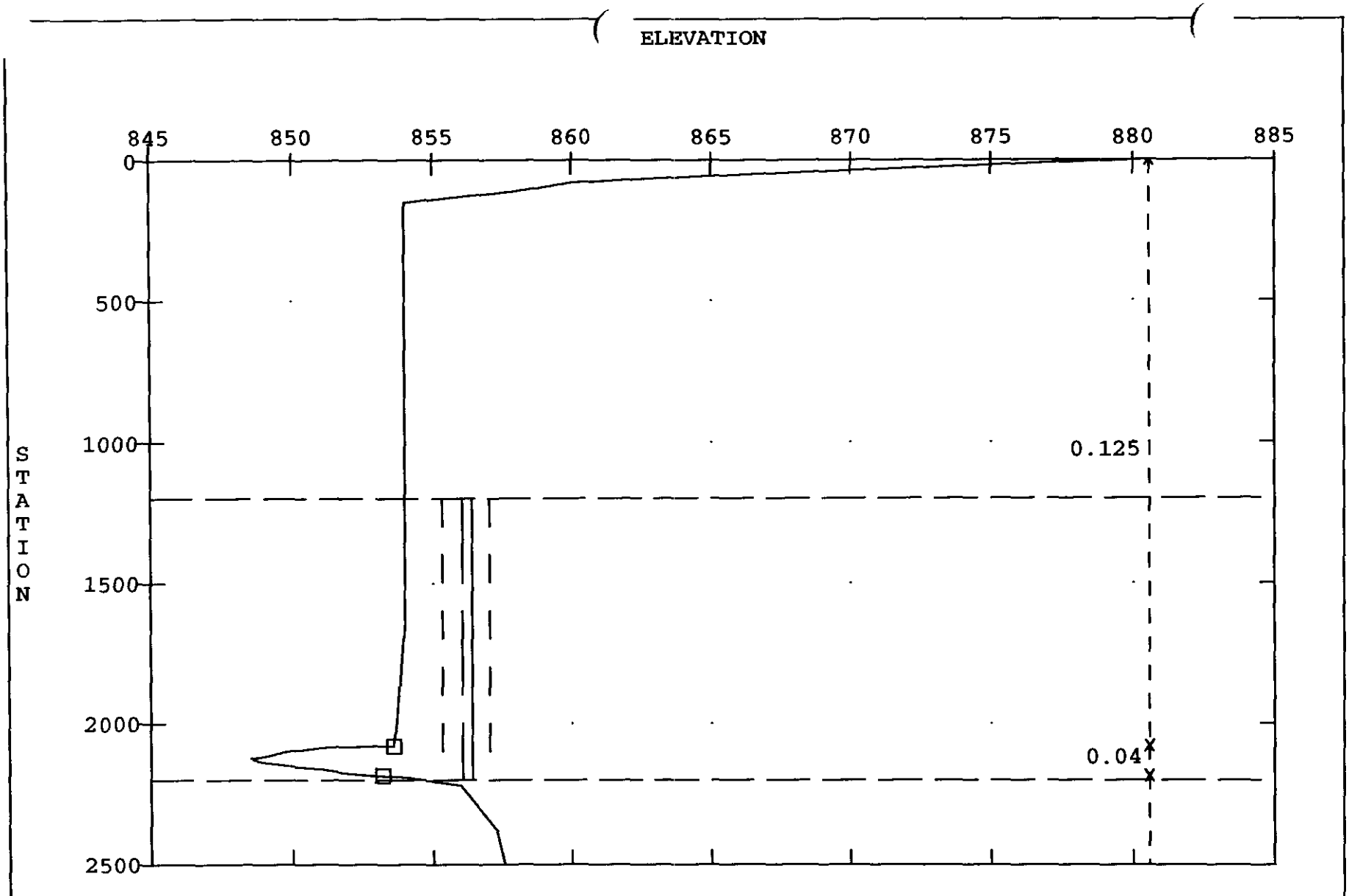
SECTION : 76.896

CROSS SECTIONS FOR ENCROACHED CONDITIONS



SECTION : 77.030

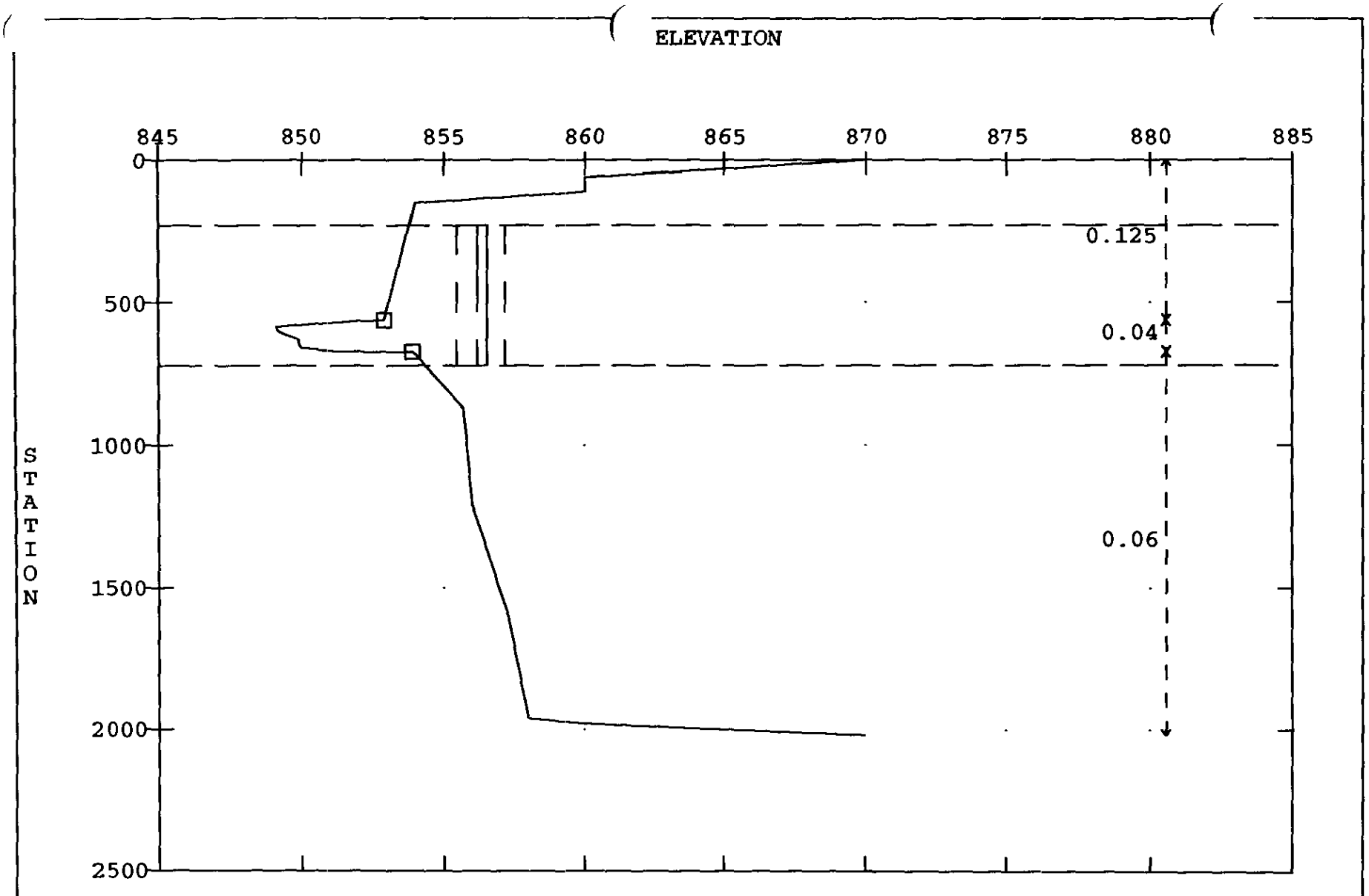
CROSS SECTIONS FOR ENCROACHED CONDITIONS



SECTION : 77.232

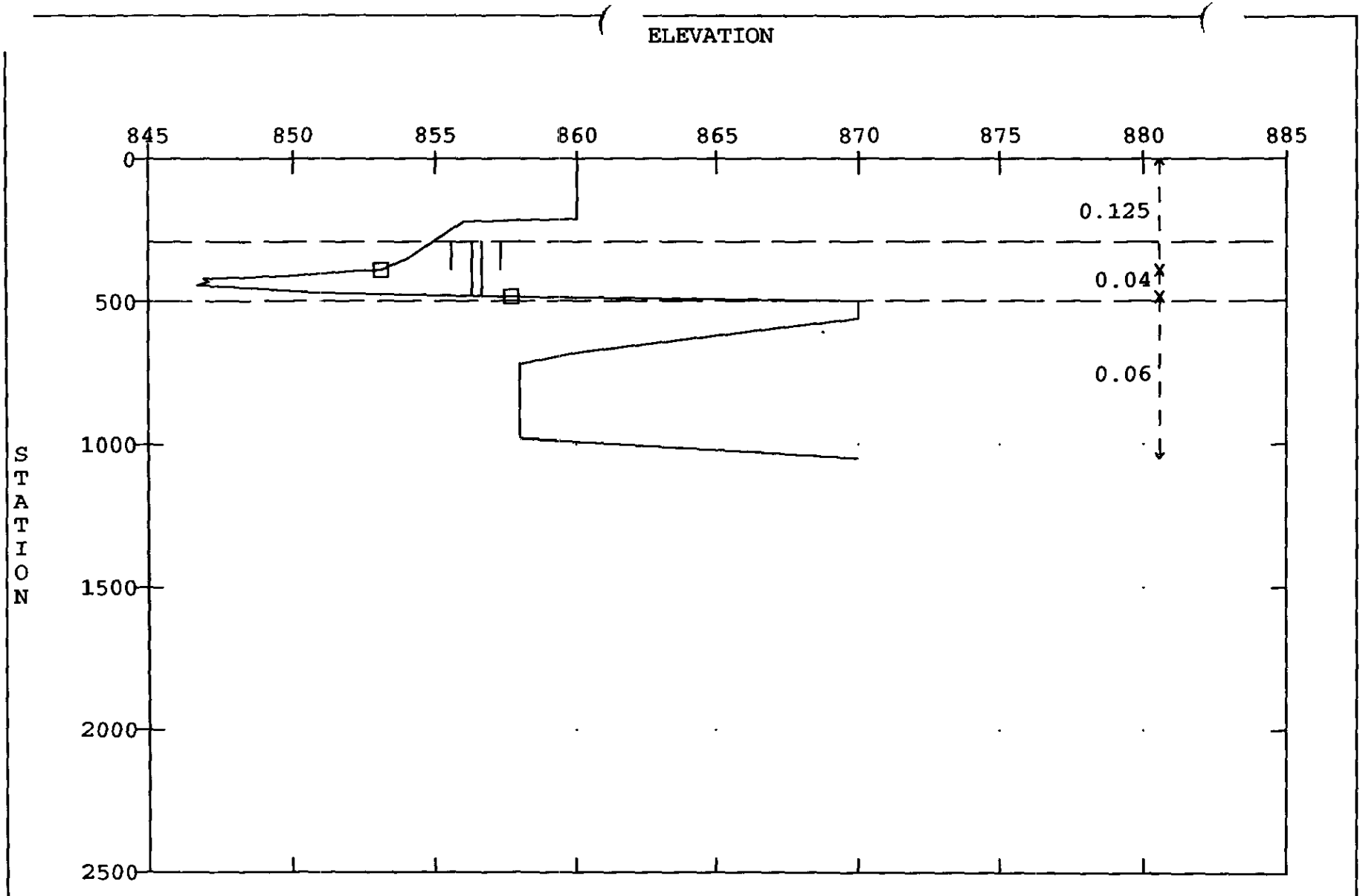
0.06

CROSS SECTIONS FOR ENCROACHED CONDITIONS



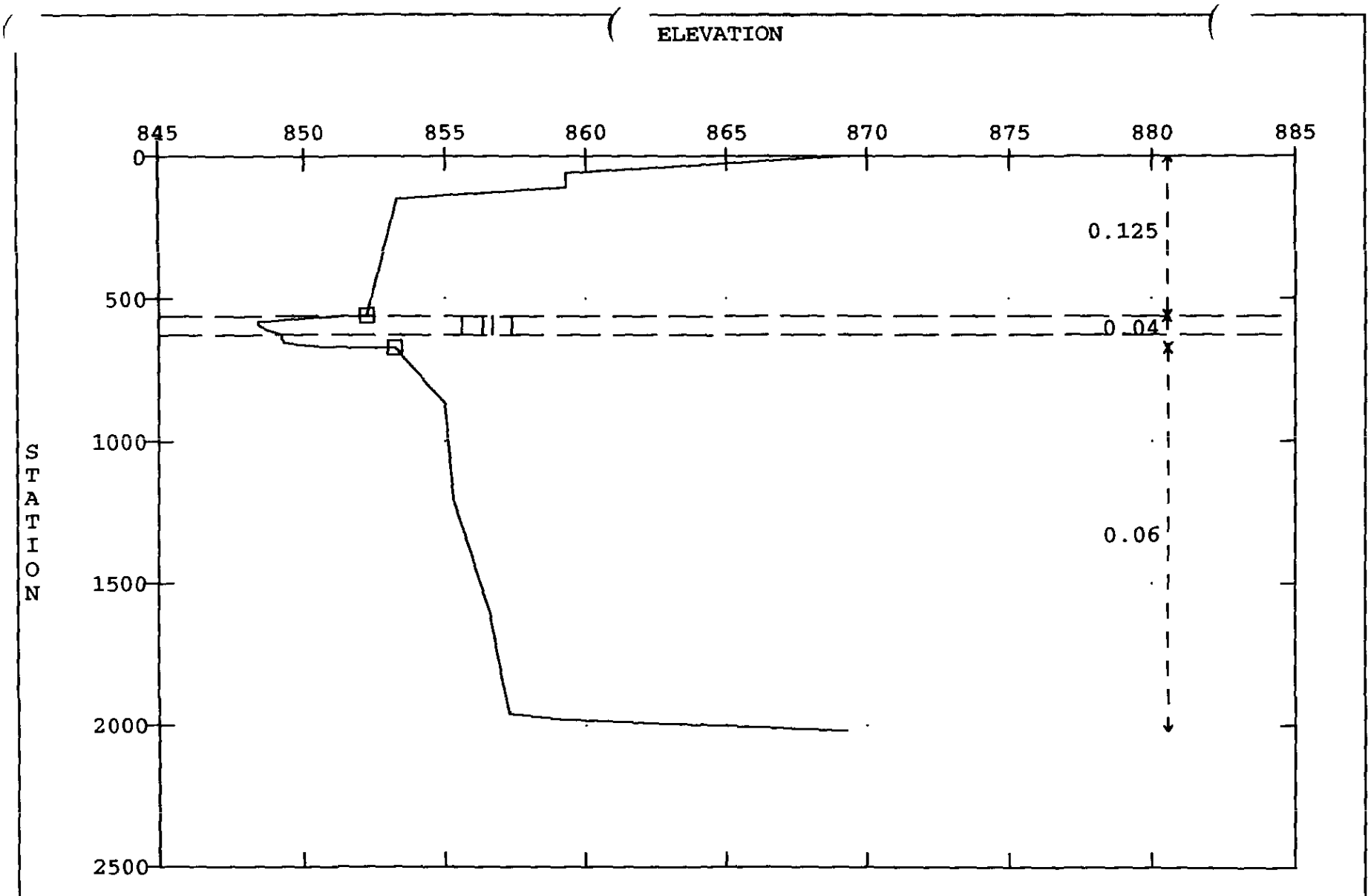
SECTION : 77.353

CROSS SECTIONS FOR ENCROACHED CONDITIONS



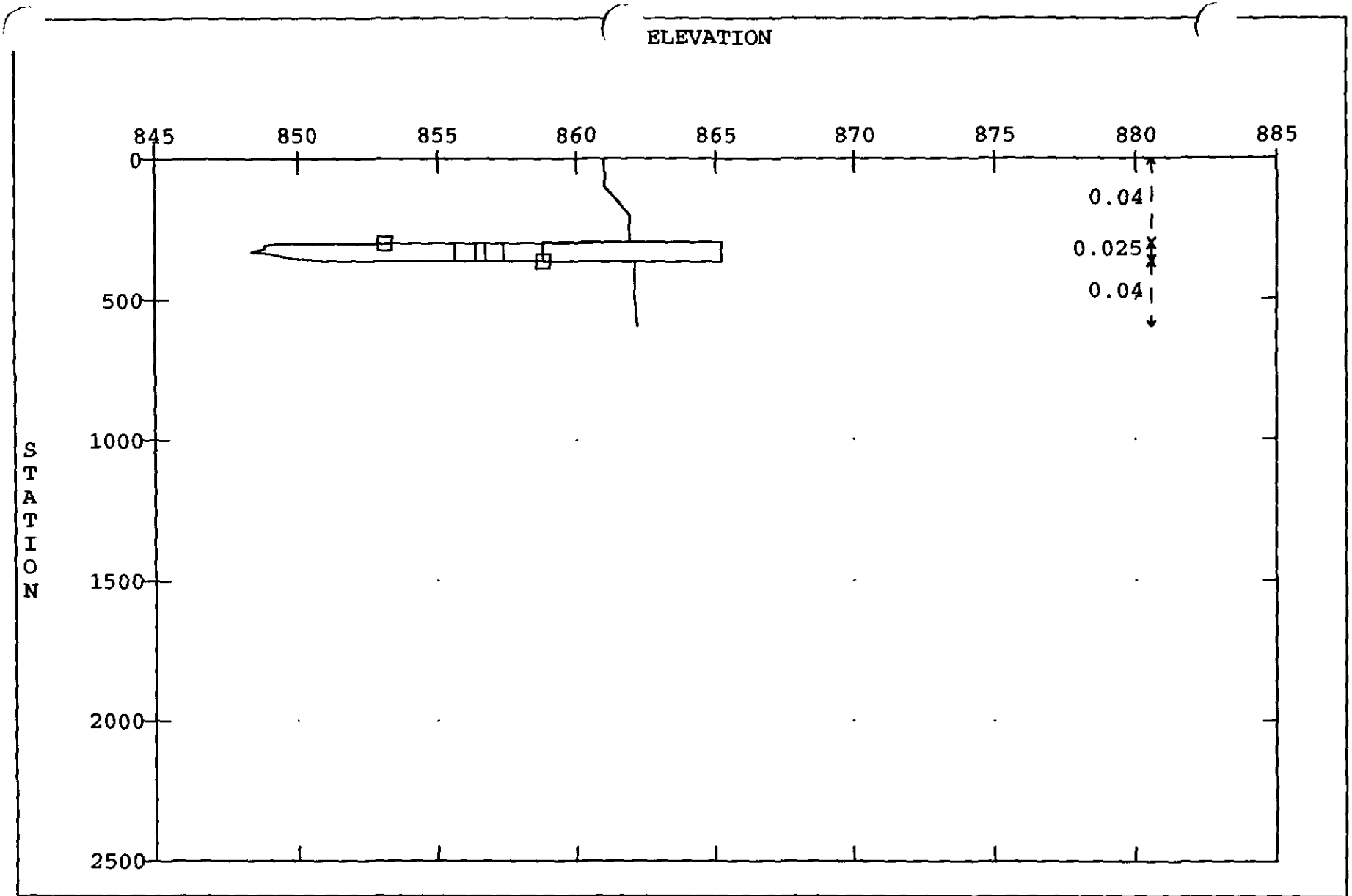
SECTION : 77.499

CROSS SECTIONS FOR ENCROACHED CONDITIONS



SECTION : 77.566

CROSS SECTIONS FOR ENCROACHED CONDITIONS



SECTION : 77.567

CROSS SECTIONS FOR ENCROACHED CONDITIONS

00BREAK00

1) COUNTY: Livingston ~~County~~

2) STUDY NAME: Hamburg Twp

3) WATERCOURSE: Huron River

4) DOCUMENT TYPE: CLOMR - Forms

00BREAK00

FEMA MT-2

Form 1:
Revision Requestor and Community Official Form

FEDERAL EMERGENCY MANAGEMENT AGENCY
REVISION REQUESTOR AND COMMUNITY OFFICIAL FORM

O M B Burden No 3067-0148
Expires July 31, 1997

FEMA USE ONLY

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 2.13 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden, to· Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington, DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503

1. OVERVIEW

1. The basis for this revision request is (are): *(check all that apply)*
   - ☐ Physical change
     - ☐ Existing
     - ☐ Proposed
   - ☐ Improved methodology
   - ☒ Improved data
   - ☒ Floodway revision
   - ☐ Other _____

   Explain _____

2. Flooding Source: Huron River
3. Project Name/Identifier Edgelake Court
4. FEMA zone designations affected: A3
   (example: A, AH, AO, A1-A30, A99, AE, V, V1-30, VE, B, C, D, X)
5. The NFIP map panel(s) affected for all impacted communities is (are).

Community No.	Community Name	County	State	Map No	Panel No.	Effective Date
EX: 480301	Katy,City	Harris, Fort Bend	TX	480301	0005D	02/08/83
480287	Harris County	Harris	TX	48201C	0220G	09/28/90
260118	Twp. of Hamburg	Livingston	MI	260118	0010	02/19/86

6. The area of revision encompasses the following types of flooding, structures, and associated disciplines *(check all that apply)*

Types of Flooding
- ☒ Riverine
- ☐ Coastal
- ☐ Alluvial Fan
- ☐ Shallow Flooding *(e g. Zones AO and AH)*
- ☐ Lakes

Affected by wind/wave action
- ☐ Yes
- ☐ No

Structures
- ☐ Channelization
- ☐ Levee/Floodwall
- ☐ Bridge/Culvert
- ☐ Dam
- ☐ Coastal
- ☐ Fill
- ☐ Pump Station
- ☐ None
- ☐ Channel Relocation
- ☐ Excavation
- ☐ Other *(describe)*

Disciplines*
- ☒ Water Resources
  - ☐ Hydrology
  - ☒ Hydraulics
  - ☐ Sediment Transport
  - ☐ Interior Drainage
- ☐ Structural
- ☐ Geotechnical
- ☐ Land Surveying
- ☐ Other *(describe)*

☐ Other(describe) _____ _____ _____

*** Attach completed "Certification by Registered Professional Engineer and/or Land Surveyor" Form for each discipline checked. (Form 2)**

2 FLOODWAY INFORMATION

7. Does the affected flooding source have a floodway designated on the effective FIRM or FBFM? ☒ Yes ☐ No
8. Does the revised floodway delineation differ from that shown on the effective FIRM or FBFM ☒ Yes ☐ No
   If yes, give reason. More detailed topography analysis indicates that floodway should be narrow.

Attach copy of either a public notice distributed by the community stating the community's intent to revise the floodway or a statement by the community that it has notified all affected property owners and affected adjacent jurisdictions.

9. Does the State have jurisdiction over the floodway or its adoption by communities participating in the NFIP? ☒ Yes ☐ No

If yes, attach a copy of a letter notifying the appropriate State agency of the floodway revision and documentation of the approval of the revised floodway by the appropriate State agency.

3. PROPOSED ENCROACHMENTS

10. With floodways:

1A. Does the revision request involve fill, new construction, substantial improvement, or other development in the floodway? ☐ Yes ☒ No

1B. If yes, does the development cause the 100-year water surface elevation to increase at any location by more than 0.000 feet? ☐ Yes ☐ No

11. Without floodways.

2A. Does the revision request involve fill, new construction, substantial improvement, or other development in the 100-year floodplain? ☐ Yes ☒ No

2B. If yes, does the cumulative effect of all development that has occurred since the effective SFHA was originally identified cause the 100-year water surface elevation to increase at any location by more than one foot (*or other surcharge limit if community or state has adopted more stringent criteria*)? ☐ Yes ☐ No

If the answer to either Items 1B or 2B is yes, please provide documentation that all requirements of Section 65 12 of the NFIP regulations have been met, regarding evaluation of alternatives, notice to individual legal property owners, concurrence of CEO, and certification that no insurable structures are impacted

4. REVISION REQUESTOR ACKNOWLEDGMENT

12. Having read NFIP Regulations, 44 CFR Ch. 1, parts 59, 60, 61, and 72, I believe that the proposed revision ☒ is ☐ is not in compliance with the requirements of the aforementioned NFIP Regulations.

5. COMMUNITY OFFICIAL ACKNOWLEDGMENT

13. Was this revision request reviewed by the community for compliance with the community's adopted floodplain management ordinances? ☒ Yes ☐ No

14. Does this revision request have the endorsement of the community? ☒ Yes ☐ No

If no to either of the above questions, please explain: _____

Please note that community acknowledgment and /or notification is required for all requests as outlined in Section 65.4 (b) of the NFIP Regulations.

6. OPERATION AND MAINTENANCE

15. Does the physical change involve a flood control structure (e.g., levees, floodwalls, channelization, basins, dams)? ☐ Yes ☒ No

If yes, please provide the following information for each of the new flood control structures:

A. Inspection of the flood control project will be conducted periodically by _____ (entity)

_____ with a maximum interval of _____ months between inspections.

B. Based on the results of scheduled periodic inspections, appropriate maintenance of the flood control facilities will be conducted by _____ (entity)

to ensure the integrity and degree of flood protection of the structure.

C. A formal plan of operation, including documentation of the flood warning system, specific actions and assignments of responsibility by individual name or title, and provisions for testing the plan at intervals not less than one year, ☐ has ☐ has not been prepared for the flood control structure.

D. The community is willing to assume responsibility for ☐ performing ☐ overseeing compliance with the maintenance and operation plans of the _____
(Name)

flood control structure. If not performed promptly by an owner other than the community, the community will provide the necessary services without cost to the Federal government.

Attach operation and maintenance plans

7. REQUESTED RESPONSE FROM FEMA

16. After examining the pertinent NFIP regulations and reviewing the document entitled "Appeals, Revisions, and Amendments to Flood Insurance Maps: A guide for Community Officials," dated January 1990, this request is for a:

_____a.	CLOMR	A letter from FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision *(LOMR or PMR)*, or proposed hydrology changes *(see 44 CFR Ch. I, Parts 60, 65, and 72)*
X b.	LOMR	A letter from FEMA officially revising the current NFIP map to show changes to floodplains, floodways, or flood elevations. LOMRs typically depict decreased flood hazards. *(See 44 CFR Ch. I Parts 60 and 65.)*
_____c.	PMR	A reprinted NFIP map incorporating changes to floodplains, floodways, or flood elevations. Because of the time and cost involved to change, reprint, and redistribute an NFIP map, a PMR is usually processed when a revision reflects increased flood hazards or large-scope changes. *(See 44 CFR Ch. I, Parts 60 and 65.)*
_____d	Other:	Describe_____

8. FORMS INCLUDED

17. Form 2 entitled, "Certification By Registered Professional Engineer and/or Land Surveyor" must be submitted.

The following forms should be included with this request if (check the included forms):

• Hydrologic analysis for flooding source differs from that used to develop FIRM	☐ Hydrologic Analysis Form (Form 3)
• Hydraulic analysis for riverine flooding differs from that used to develop FIRM	☒ Riverine Hydraulic Analysis Form (Form 4)
• The request is based on updated topographic information or a revised floodplain or floodway delineation is requested	☒ Riverine /Coastal Mapping Form (Form 5)
• The request involves any type of channel modification	☐ Channelization Form (Form 6)
• The request involves new bridge or culvert or revised analysis of an existing bridge or culvert	☐ Bridge/Culvert Form (Form 7)
• The request involves a new revised levee/floodwall system	☐ Levee/Floodwall System Analysis Form (Form 8)
• The request involves analysis of coastal flooding	☐ Coastal Analysis Form (Form 9)
• The request involves coastal structures credited as providing protection from the 100-year flood	☐ Coastal Structures (Form 10)
• The request involves an existing, proposed, or modified dam	☐ Dam Form (Form 11)
• The request involves structures credited as providing protection from the 100-year flood on an alluvial fan	☐ Alluvial Fan Flooding Form (Form 12)

9. INITIAL REVIEW FEE

18. The minimum initial review fee for the appropriate request category has been included. ☐ Yes ☒ No

Initial fee amount: $ _____

Check or money order only Make check or money order payable to : **National Flood Insurance Program.** If paying by Visa or Mastercard please refer to the credit card information form which follows this form.

or

19. This request is for a project that is for public benefit and is primarily intended for flood loss reduction to insurable structures in identified flood hazard areas which were in existence prior to the commencement of construction of the flood control project ☐ Yes ☒ No

or

20. This request is to correct map errors, to include the effects of natural changes within the areas of special flood hazard, or solely to provide more detailed data ☒ Yes ☐ No

Note: I understand that my signature indicates that all information submitted in support of this request is correct.

Thomas A Smith III

Signature of Revision Requester

Thomas A. Smith III, P.E

Printed Name and Title of Revision Requester

McNamee, Porter & Seeley, Inc.

Company Name

(313) 665-6000 10/17/95

Telephone No Date

Note: Signature indicates that the community understands, from the revision requester, the impacts of the revision on flooding conditions in the community

Harry L Bater

Signature of Community Official

Harry Bater, Hamburg Township Supervisor

Printed Name and Title of Community Official

Hamburg Township

Community Name

1/31/96

Date

Does this request impact any other communities? ☐ Yes ☒ No

If yes, attach letters from all affected jurisdictions acknowledging revision request and approving changes to floodway, if applicable.

Note: Although a photograph of physical changes is not required, it may be helpful for FEMA's review.

FEMA MT-2

Form 2:
Certificate by Registered Professioanl Engineer and/or Land Surveyor

FEDERAL EMERGENCY MANAGEMENT AGENCY **CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR FORM**	*O.M B. Burden No. 3067-0148* *Expires July 31, 1997*	*FEMA USE ONLY*

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average . 23 hour per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden, to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington, DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067- 0148), Washington, DC 20503.

1. This certification is in accordance with 44 CFR Ch. I, Section 65 2
2. I am licensed with an expertise in Hydraulics
   [example: water resources *(hydrology, hydraulics, sediment transport, interior drainage)** structural, geotechnical, land surveying.]
3. I have 6 years experience in the expertise listed above
4. I have ☒ prepared ☐ reviewed the attached supporting data and analyses related to my expertise.
5. I ☐ have ☒ have not visited and physically viewed the project.
6. In my opinion, the following analyses and /or designs, is/are being certified.
   Hydraulic analysis and floodway delineation
7. Base upon the following review, the modifications in place have been constructed in general accordance with plans and specifications.

   Basis for above statement (check all that apply)

   a. ☐ Viewed all phases of actual construction
   b. ☐ Compared plans and specifications with as-built survey information
   c. ☐ Examined plans and specifications and compared with completed projects
   d ☒ Other Surveyed topographic information was used
8. All information submitted in support of this request is correct to the best of my knowledge I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Name: Thomas A. Smith III
(please print or type)

Title: Hydraulic Engineer
(please print or type)

Registration No. 6201040603 Expiration Date: 10/31/97

State Michigan

Type of License Professional Engineer

Signature

Date

Seal
(Optional)

*Specify Subdiscipline

Note: Insert not applicable (N/A) when statement does not apply

FEMA MT-2

Form 4:
Riverine Hydraulic Analysis Form

FEDERAL EMERGENCY MANAGEMENT AGENCY **RIVERINE HYDRAULIC ANALYSIS FORM**	*O M B Burden No 3067-0148* *Expires July 31, 1997*	**FEMA USE ONLY**

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 2.25 hours per response The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden, to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington, DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503

Community Name Township of Hamburg, Michigan

Flooding Source: Huron River
(One form for each flooding source)

Project Name/Identifier: Edgelake Court

1. REACH TO BE REVISED

Downstream limit: Strawberry Lake

Upstream limit: 0.807 miles upstream of the Huron River Outlet

2. EFFECTIVE FIS

☐ Not studied

☐ Studied by approximate methods

Downstream limit of study _____

Upstream limit of study _____

☐ Studied by detailed methods

Downstream limit of study _____

Upstream limit of study _____

☒ Floodway delineated

Downstream limit of Floodway Strawberry Lake

Upstream limit of Floodway 0.807 miles upstream of Huron River Outlet

3. HYDRAULIC ANALYSIS

Why is the hydraulic analysis different from that used to develop the FIRM *(Check all that apply)*

☐ Not studied in FIS

☐ Improved hydrologic data/analysis Explain: _____

☒ Improved hydraulic analysis. Explain An elevated region at Edgelake Court on the north side of the Huron River near the outlet had not been considered in the FIS flooding delineation. Retained sections in this region were added to the model.

☐ Flood control structure. Explain: _____

☐ Other. Explain: _____

For areas which have detailed flooding:

Full input and output listings along with files on diskette (if available) for each of the models listed below (items 1, 2, 3, 4, and 5) and summary of the source of input parameters used in the models must be provided. The summary must include a complete description of any changes made from model to model (e.g. duplicate effective model to corrected effective model) At a minimum, the Duplicate Effective (item 1) and the Revised or Post-Project Conditions (item 4) models must be submitted. See instructions for directions on when other models may be required.

For areas which do not have detailed flooding:

Only the 100-year flood profile is required. A hydraulic model is not required for areas which do not have detailed flooding; however, BFEs may not be added to the revised FIRM If a hydraulic model is developed for the area, items 3 and 4 described below must be submitted.

If hydraulic models are not developed, hydraulic analyses for existing or pre-project conditions and revised or post-project conditions must be submitted. All calculations must be submitted for these analyses. (See item 6 below)

1 Duplicate Effective Model — Natural ☒ Floodway ☒

Copies of the hydraulic analysis used in the effective FIS, referred to as the effective models *(10-, 50-, 100-, and 500-year multi-profile runs and the floodway run)* must be obtained and then reproduced on the requestor's equipment to produce the duplicate effective model This is required to assure that the effective model input data has been transferred correctly to the requestor's equipment and to assure that the revised data will be integrated into the effective data to provide a continuous FIS model upstream and downstream of the revised reach.

2. Corrected Effective Model — Natural ☒ Floodway ☒

The corrected effective model is the model that corrects any errors that occur in the duplicate effective model, adds any additional cross sections to the duplicate effective model, or incorporates more detailed topographic information than that used in the currently effective model. The corrected effective model must not reflect any man-made physical changes since the date of the effective model An error could be a technical error in the modeling procedures, or any construction in the floodplain that occurred prior to the date of the effective model but was not incorporated into the effective model.

3. Existing or Pre-Project Conditions Model — Natural ☐ Floodway ☐

The duplicate effective or corrected model is modified to produce the existing or pre-project conditions model to reflect any modifications that have occurred within the floodplain since the date of the effective model but prior to the construction of the project for which the revision is being requested. If no modification has occurred since the date of the effective model, then this model would be identical to the corrected effective or duplicate effective model.

4. Revised or Post-Project Conditions Model — Natural ☐ Floodway ☐

The existing or pre-project conditions model *(or duplicate effective or corrected effective model, as appropriate)* is revised to reflect revised or post-project conditions. This model must incorporate any physical changes to the floodplain since the effective model was produced as well as the effects of the project. When the request is for proposed project this model should reflect proposed conditions.

5. Other: Please attach a sheet describing all other models submitted. — Natural ☐ Floodway ☐

6. Hydraulic Analyses (Only if Hydraulic Models are not developed)

Please attach all calculations for the existing or pre-project conditions and the revised or post-project conditions. Proceed to Form 5, "Riverine/Coastal Mapping Form".

1. Discharges:

	Upstream Limit	Downstream Limit
10-year	1200 cfs	1350 cfs
50-year	1710 cfs	1900 cfs
100-year	1950 cfs	2200 cfs
500-year	2550 cfs	2850 cfs

Attach diagram showing changes in 100-year discharge

2. Explain how the starting water surface elevations were determined Value from FIS as determined with a conveyance trial method using HEC-2.

3. Give range of friction loss coefficients (*Manning's "N"*) Channel ..... .025 - .04

Overbanks ..... .04 - .125

If friction loss coefficients are different anywhere along the revised reach from those used to develop the FIRM, give location, value used in the effective FIS, and revised values and an explanation as to how the revised values were determined

Location	FIS	Revised

Explain:

4. Describe how the cross section geometry data were determined *(e.g., field survey, topographic map, taken from previous study)* and list cross sections that were added.

Two sections were added to the HEC-2 model. Cross section geometry were taken from 1 foot contour topographic maps for the new sections (and old sections verified). Old cross section geometry used was from previous FIS.

5. Were natural channel banks selected as the location of the left and right channel banks in the model?

☒ Yes ☐ No If no, explain why not:

6. Explain how reach lengths for channel and overbanks were determined.

A section was added at Edgelake Court at a 1 to 1 (encroachment to distance) distance upstream of Edgelake Court. Otherwise reach lengths correspond to the existing model.

5. RESULTS (from model used to revise 100-year water surface elevations)

1. Do the results indicate:

a. Water surface elevations higher than end points of cross sections? ☒ Yes ☐ No

b. Supercritical depth? ☐ Yes ☒ No

c. Critical depth? ☐ Yes ☒ No

d. Other unique situations ☐ Yes ☒ No

If yes to any of the above, attach an explanation that discusses the situation and how it is presented on the profiles, tables, and maps.

2. What is the maximum change in energy gradient between cross-sections? _____

Specify location _____

3. What is the distance between the cross-sections in 2 above? _____

4. What is the maximum distance between cross-sections? 1,070 ft.

Specify location Sta. 77.03-77.232

5. Floodway determination

a. What is the maximum surcharge allowed by the community or State? _____ foot

b. What is the maximum surcharge for the revised conditions? _____ foot

Specify location _____

c. What is the maximum velocity? _____ fps

Specify location _____

d. Are there any negeative surcharge values at any cross-section? ☐ Yes ☐ No

If yes, the floodway may need to be widened If it is not widened, please explain and indicate the maximum negative surcharge.

Explain: _____

Form 4: 5 - 1a

Some calculated 100-year water surface elevations are above the endpoint elevations of cross sections. This is also the case for the original model where encroachments were added (even for natural conditions) assuming some "dead" zone areas (where essentially the water remains stagnant).

6. Is the discharge value used to determine the floodway anywhere different from that used to determine the natural 100-year flood elevations? ..... ☐ Yes ☒ No

If Yes, explain:

_____

_____

_____

7. Do 100-year water surface elevations increase at any location? ..... ☐ Yes ☒ No

If yes, please attach a list of the locations where the increases occur, state whether or not the increases are located on the requestor's property, and provide an explanation of the reason for the increases. *(For example: State if the increase is due to fill placed within the floodway fringe or placed within the currently adopted floodway limits)*

_____

_____

_____

Please attach a completed comparison table entitled: Water Surface Elevation Check (See page 6)

6. REVISED FIRM/FBFM AND FLOOD PROFILES

A. The revised water surface elevations tie into those computed by the effective FIS Model *(10-, 50-, 100-, and 500-year)*, downstream of the project at cross-section_____ within_____feet *(vertical)* and upstream of the project at cross section_____within_____feet *(vertical)*.

B. The revised floodway elevations tie into those computed by the effective FIS model, dowstream of the project at cross section 76.798 within 0.00 feet *(vertical)* and upstream of the project at cross section 77.03 within 0.04 feet *(vertical)*.

C. Attach profiles, at the same vertical and horizontal scale as the profiles in the effective FIS report, showing stream bed and profiles of all floods studied (without encroachment). Also, label all cross sections, road crossings (including low chord and top-of-road data), culverts, tributaries, corporate limits, and study limits. If channel distance has changed, the stationing should be revised for all profile sheets.

D. Attach a Floodway Data Table showing data for each cross section listed in the published Floodway Data Table in the FIS report.

Proceed to Riverine /Coastal Mapping Form

FEMA MT-2

Form 5:
Riverine / Coastal Mapping Form

FEDERAL EMERGENCY MANAGEMENT AGENCY **RIVERINE/COASTAL MAPPING FORM**	*O M B Burden No 3067-0148* *Expires July 31, 1997*	*FEMA USE ONLY*

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 1.5 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden, to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington, DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

Community Name: Township of Hamburg, Michigan

Flooding Source: Huron River

Project Name/Identifier: Edgelake Court

1. MAPPING CHANGES

1. A topographic work map of suitable scale, contour interval, and planimetric definition must be submitted showing *(indicate N/A when not applicable)*:

		Included		
A.	Revised approximate 100-year floodplain boundaries (Zone A)	☐ Yes	☒ No	☐ N/A
B.	Revised detailed 100- and 500-year floodplain boundaries	☐ Yes	☒ No	☐ N/A
C	Revised 100-year floodway boundaries	☒ Yes	☐ No	☐ N/A
D	Location and alignment of all cross sections used in the revised hydraulic model with stationing control indicated	☒ Yes	☐ No	☐ N/A
E.	Stream alignments, road and dam alignments	☐ Yes	☒ No	☐ N/A
F.	Current community boundaries	☐ Yes	☒ No	☐ N/A
G.	Effective 100- and 500-year floodplain and 100-year floodway boundaries from the FIRM/FBFM reduced or enlarged to the scale of the topographic work map	☐ Yes	☐ No	☐ N/A
H.	Tie-ins between the effective and revised 100- and 500-year floodplains and 100-year floodway boundaries	☐ Yes	☐ No	☐ N/A
I.	The requestor's property boundaries and community easements	☐ Yes	☒ No	☐ N/A
J.	The signed certification of a registered professional engineer	☒ Yes	☐ No	☐ N/A
K.	Location and description of reference marks	☒ Yes	☐ No	☐ N/A
L.	Vertical datum (example: NGVD, NAVD etc.)	☒ Yes	☐ No	☐ N/A
M.	Coastal zone designations tie into adjacent areas not being revised	☐ Yes	☐ No	☒ N/A
N.	Location and alignment of all coastal transects used to revise the coastal analyses	☐ Yes	☐ No	☒ N/A

If any of the items above are marked no or N/A, please explain:

M & N - Not a coastal zone

2. What is the source and date of the updated topographic information *(example: orthophoto maps, July 1985; field survey, May 1979, beach profiles, June 1987, etc.)*? Orthophoto maps, April 1992

3. What is the scale and contour interval of the following workmaps?
   a. Effective FIS 1" = 1000' scale unknown Contour interval
   b. Revision Request 1" = 200' scale 1' Contour interval

NOTE: Revised topographic information must be of equal or greater detail.

4. Attach an annotated FIRM and FBFM at the scale of the effective FIRM and FBFM showing the revised 100-year and 500-year floodplains and the 100-year floodway boundaries and how they tie into those shown on the effective FIRM and FBFM downstream and upstream of the revision or adjacent to the area of revision for coastal studies.

Attach additional pages if needed.

1) COUNTY: Livingston County

2) STUDY NAME: Hamburg Twp

3) WATERCOURSE: Huron River

4) DOCUMENT TYPE: CLOMR - Orig. - Natural

ORIGINAL MODEL:

NATURAL CONDITION

Natural Conditions

```
**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
**************************************************

C
T1      HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2      100-YEAR NATURAL FLOODWAY - STRAWBERRY LAKE TO CORPORATE LIMITS
T3      HURON RIVER - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    W        WSEC     FQ

     -1.      2.       0.       0.   .000000      00       0       0.    856.090   .000

J2  NPROF    IPLOT    PRFVS    XSECV    XSECH     FN     ALLDC    IBW     CHNIM    ITRACE

     1.000   .000    -1.000    .000     .000     600     .000    .000     .000     .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    39.000  40.000  41.000  42.000  43.000   1.000   8.000  10.000  12.000   3.000

    33.000   4.000  25.000    .000    .000    .000    .000    .000    .000    .000

NC      .060     .125     .040     .300     500     .000     .000     .000     .000     000
QT     1.000 2200.000     .000     .000     .000     .000     .000     .000     .000     000

          VALLEY SECTION 20   (O),  ENCROACHED DUE TO FILLING

X1    76.798   26.000  825.000  914.000     .000     000     .000     .000     .000     .000
X3      .000     .000     .000  625.000     .000 1145.000     .000     .000     .000     .000
GR    870.000     .000  860.000   15.000  858.000   25.000  856.000  255.000  855 200  305.000
GR    854.500  730.000  853 300  825.000  849.000  820.000  845.000  845.000  845.500  860 000
GR    846.500  875.000  848.100  890.000  849.000  900.000  851.300  910.000  852.200  914.000
GR    853.000 1045.000  854.000 2895.000  855.600 2425.000  856.000 2805.000  857.300 2895.000
GR    856.000 2945.000  854.000 3505.000  856.300 3595.000  856.000 3725.000  856.000 3965.000
GR    860.000 4045.000     .000     .000     .000     .000     .000     .000     .000     .000
NC      .125     .100     .040     .000     .000     .000     .000     .000     .000     000

          VALLEY SECTION 21   (P),  ENCROACHED DUE TO FILLING

X1    77.838   23.000  770.000  876.000 1420.000 1100.000 1220.000     .000     .000     .000
X3      .000     .000     .000     .000     .000 1375.000     .000     .000     .000     .000
GR    880.000     .000  860.000   50.000  854.000   70.000  852.000  770.000  850.300  773.000
GR    848.700  790.000  848.100  805.000  847.500  813.000  847.000  825.000  848.500  835.000
GR    849.100  843.000  850.100  853.000  856.000  865.000  851.000  875.000  852.200  876.000
GR    854.000 1530.000  856.000 1570.000  857.500 2640.000  856.000 3150.000  856.000 4010.000
GR    858.000 4020.000  860.000 4040.000  866.000 4000.000     .000     .000     .000     .000
NC      .125     .060     .040     .000     .000     .000     .000     .000     .000     .000

X1    77.232   27.000 2090.000 2186.000  780.000  760.000 1070.000     .000     .000     .000
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X3	.000	.000	.000	860.000	.000	2275.000	.000	.000	.000	.000
GR	880.000	.000	864.000	60.000	860.000	80.000	858.000	110.000	854.000	150.000
GR	854.000	1650.000	853.700	2000.000	853.600	2080.000	851.300	2083.000	849.700	2100.000
GR	849.100	2115.000	848.500	2123.000	848.000	2135.000	849.500	2145.000	850.100	2153.000
GR	851.100	2163.000	851.000	2175.000	852.000	2185.000	853.200	2186.000	854.000	2190.000
GR	856.000	2220.000	857.300	2380.000	857.700	2560.000	857.000	3000.000	858.000	3300.000
GR	860.000	3340.000	870.000	3390.000	.000	.000	.000	.000	.000	.000
BT	1.000	1950.000	.000	.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 22 (Q)

X1	77.353	22.000	560.000	672.000	1060.000	640.000	640.000	.000	.000	.000
X3	.000	.000	.000	238.000	.000	720.000	.000	.000	.000	.000
GR	870.000	.000	860.000	60.000	860.000	110.000	854.000	150.000	852.900	560.000
GR	852.000	562.000	849.100	582.000	849.100	592.000	849.200	601.000	849.400	610.000
GR	849.900	627.000	849.900	642.000	850.000	656.000	851.300	670.000	853.900	672.000
GR	854.000	680.000	855.700	870.000	856.000	1210.000	857.300	1600.000	858.000	1960.000
GR	860.000	1980.000	870.000	2020.000	.000	.000	.000	.000	.000	.000
HC	.125	.060	.040	.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 23 (R)

X1	77.499	20.000	390.000	485.000	910.000	570.000	770.000	.000	.000	.000
X3	.000	.000	.000	290.000	.000	500.000	.000	.000	.000	.000
GR	860.000	.000	860.000	210.000	856.000	220.000	854.000	350.000	853.100	390.000
GR	851.900	395.000	850.100	418.000	846.900	420.000	847.100	432.000	846.700	443.000
GR	849.700	455.000	850.700	470.000	852.700	475.000	857.700	485.000	870.000	500.000
GR	870.000	560.000	860.000	600.000	850.000	720.000	850.000	900.000	870.000	1050.000

X1	77.566	22.000	560.000	672.000	400.000	420.000	353.000	.000	.000	.000
X3	.000	.000	.000	562.000	.000	626.000	.000	.000	.000	.000
GR	869.300	.000	859.300	60.000	859.300	110.000	853.300	150.000	852.200	560.000
GR	851.300	562.000	848.400	582.000	848.400	592.000	848.500	601.000	848.700	610.000
GR	849.200	627.000	849.200	642.000	849.300	656.000	850.600	670.000	853.200	672.000
GR	853.300	680.000	855.000	870.000	855.300	1210.000	856.600	1600.000	857.300	1960.000
GR	859.300	1900.000	869.300	2020.000	.000	.000	.000	.000	.000	.000
HC	.040	.040	.025	.000	.000	.000	.000	.000	.000	.000

BRIDGE SECTION 4 - ANN ARBOR RAILROAD - D/S FACE (S)

X1	77.567	22.000	380.000	364.000	1.000	1.000	1.000	.000	.000	.000
BT	12.000	.000	861.000	.000	100.000	861.000	.000	200.000	861.900	.000
BT	296.900	861.900	.000	297.000	865.200	.000	300.000	865.200	850.000	364.000
BT	865.200	850.000	367.000	865.200	.000	367.100	862.100	.000	400.000	862.100
BT	.000	500.000	862.100	.000	600.000	862.200	.000	.000	.000	.000
GR	861.000	.000	861.000	100.000	861.900	200.000	861.900	296.900	850.000	296.900
GR	850.000	300.000	853.100	300.000	853.100	301.300	849.200	301.500	849.800	310.000
GR	848.000	320.000	848.400	330.000	849.200	340.000	849.600	350.000	850.500	362.500
GR	852.700	362.700	852.700	364.000	850.800	364.000	862.100	367.100	862.100	400.000
GR	862.100	500.000	862.200	600.000	.000	.000	.000	.000	.000	.000

BRIDGE SECTION 4 - ANN ARBOR RAILROAD - U/S FACE (S)

X1	77.569	22.000	380.000	364.000	16.000	16.000	16.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000

GR	861.000	.000	861.000	100.000	861.900	200.000	861.900	236.900	253.300	286.300

GR	861.000	000	861.000	100.000	861.900	200.000	861.900	296.900	858.000	296.900
GR	858 000	300.000	853.200	300.000	853.200	301 300	849 300	301 500	849 900	310 000
GR	848.900	320.000	848.500	339.000	849.300	340.000	849.700	350.000	851 000	362.500
GR	852.800	362.700	852.800	364.000	858.000	364.000	862.100	367.100	862.100	400.000
GR	862.100	500.000	862.200	600 000	.000	.000	.000	.000	.000	.000
NC	.100	.060	.040	.000	.000	.000	.000	000	.000	.000
X1	77.570	22.000	560.000	672.000	1.000	1.000	1.000	000	.000	.000
X3	.000	.000	.000	561.000	.000	627.000	.000	.000	.000	.000
GR	869.400	.000	859.400	60.000	859.400	110.000	853.400	150.000	852.300	560.000
GR	851.400	562.000	848.500	582.000	848.500	592.000	848.600	601.000	848.000	610.000
GR	849.300	627.000	849.300	642.000	849.400	656.000	850.700	670 000	853.300	672 000
GR	853.400	680.000	855.100	870.000	855.400	1210.000	856.700	1600.000	857.400	1960.000
GR	859 400	1980.000	869.400	2020.000	.000	.000	.000	.000	000	.000
X1	77.602	22.000	560.000	672 000	100.000	200.000	176.000	.000	.000	.000
X3	.000	.000	.000	554.000	.000	672.000	000	.000	.000	.000
GR	869.300	.000	859 300	60.000	859.300	110.000	853.300	150.000	852.200	560.000
GR	851.300	562 000	848.400	582.000	848.400	592.000	848.500	601.000	848 700	610.000
GR	849.200	627.000	849.200	642.000	849.300	656.000	850.600	670.000	853.200	672.000
GR	853.300	680.000	855.000	870.000	855.300	1210.000	856.600	1600.000	857.300	1960.000
GR	859.300	1980.000	869.300	2020.000	.000	.000	.000	.000	.000	.000
NC	.040	.040	.025	.000	.000	.000	.000	.000	.000	.000

BRIDGE SECTION 5 - ABANDONED GRAND TRUNK RAILROAD - D/S FACE (T)

X1	77.603	29.000	300.000	418.000	1.000	1.000	1.000	.000	.000	.000
BT	44.000	.000	860.600	.000	100.000	860.600	.000	208.000	860.500	.000
BT	300.000	860.300	857.900	313.000	860.300	857.900	313.000	860.300	851.100	314 000
BT	860.300	850.600	314.000	860.300	857.900	323.000	860.300	857.900	323.000	860.300
BT	849.800	324.000	860.300	850.200	324.000	860.300	857.900	335.000	860.300	857.900
BT	335.000	860.300	850.000	336.000	860.300	850.000	336.000	860.300	857.900	347.000
BT	860.200	857.800	347.000	860.200	850.100	348.000	860.200	849.000	348.000	860.200
BT	857.800	359.000	860.200	857.800	359.000	860.200	849.500	360.000	860.200	849.000
BT	360.000	860.200	857.800	371.000	860.200	857.800	371.000	860.200	848.700	372.000
BT	860.200	848.800	372.000	860.200	857.800	382.000	860.200	857.800	382.000	860.200
BT	848.000	383.000	860.200	848.800	383.000	860.200	857.800	394.000	860.100	857.700
BT	394.000	860.100	848.800	395.000	860.100	849.000	395.000	860.100	857.700	406.000
BT	860.100	857.700	406.000	860:100	848.400	407.000	860.100	849.100	407.000	860.100
BT	857.700	418.000	866.100	857.700	500.000	860.000	.000	600.000	860.000	.000
BT	700.000	860.000	.000	.000	.000	.000	000	.000	.000	.000
GR	860.600	.000	860.600	100.000	860.500	200.000	860.300	300.000	852.500	300.000
GR	851.100	313.000	850.600	314.000	849.800	323.000	850.200	324.000	850 000	335 000
GR	850.000	336.000	850.100	347.000	849.800	348.000	849.500	359.000	849.000	360.000
GR	848.700	371.000	848.000	372.000	848.000	382.000	848.000	383.000	848.000	394.000
GR	849 000	395.000	848.400	406.000	849.100	407.000	852 900	416.000	853.600	418.000
GR	860.100	410.000	860.000	500.000	860.000	600 000	860.000	700 000	.000	.000

BRIDGE SECTION 5 - ABANDONED GRAND TRUNK RAILROAD - U/S FACE (T)

X1	77.605	.000	.000	.000	12.000	12.000	12.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.060	.100	.040	.000	.000	.000	.000	.000	.000	.000
X1	77.606	22.000	560.000	672.000	1.000	1.000	1.000	.000	.000	.000

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*PROF 1

CCHV=    .300 CEHV=    .500
*SECNO 76.790
   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      XHL       XHCH      XHR       WTH       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

3470 ENCROACHMENT STATIONS=      625.0     1145.0  TYPE=     1  TARGET=     520.000

          VALLEY SECTION 20   (Q),  ENCROACHED DUE TO FILLING

    76.80     10.59    856.09       .00    856.09    856.15       .06       .00       .00    853.30
    2200.      202.     1643.      355.      364.      742.      853.        0.        0.    852.20
      .00       .56      2.22       .42      .040      .032      .100      .000    845.50    625.00
  .000140        0.        0.        0.         0         0         0       .00    520.00   1145.00

*SECNO 77.030

3470 ENCROACHMENT STATIONS=          0     1375.0  TYPE=     1  TARGET=    1374.999

          VALLEY SECTION 21   (P),  ENCROACHED DUE TO FILLING

    77.03      8.76    856.26       .00       .00    856.20       .02       .12       .01    852.60
    2200.      537.     1071.      591.     2086.      750.     1607.      915.       27.    852.20
      .41       .26      1.43       .35      .100      .032      .088      .031    847.50     62.44
  .000071     1420.     1220.     1180.         0         0         0       .00   1312.56   1375.00

*SECNO 77.232

3470 ENCROACHMENT STATIONS=      860.0     2275.0  TYPE=     1  TARGET=    1415.000
    77.23      7.85    856.35       .00       .00    856.30       .03       .09       .01    853.60
    2200.      953.     1219.       27.     2955.      653.       60.      173       32.    853.20
      .62       .32      1.87       .46      .100      .032      .040      .034    848.50    860.00
  .000145      780.     1070.      760.         0         0         0       .00   1403.01   2263.01

*SECNO 77.353

3470 ENCROACHMENT STATIONS=      230.0      720.0  TYPE=     1  TARGET=     490.000

          VALLEY SECTION 22   (Q)

    77.35      7.36    856.46       .00       .00    856.51       .05       .12       .01    852.90
    1950.      411.     1465.       74.     1028.      724.      111.      233.       74.    853.90
      .76       .40      2.02       .67      .100      .032      .048      .032    849.10    230.00
  .000161     1060.      640.      640.         2         0         0       .00    490.00    720.00

*SECNO 77.499
   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      XHL       XHCH      XHR       WTH       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST
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3470 ENCROACHMENT STATIONS=     290.0     500.0  TYPE=     1  TARGET=     210.000

          VALLEY SECTION 23   (R)

    77.50      9.89    856 59      .00       .00   856.70      .11       .16       .03   853.10
    1950.      114.    1836.       .0.      248.     655.       0      259.       80.    857.70
      .84       .46     2.80      .00      .100     .032     .048      .032    846.70   290.00
  .000277     910.     770.      570.         1        0        0       .00    192.76   482 76

*SECNO 77.566

3470 ENCROACHMENT STATIONS=     562.0     626.0  TYPE=     1  TARGET=      64.000
    77.57      8.26    856.66      .00       .00   856.91      .25       .14       .07100000.00
    1950.        0.    1950.       0.        0.     490.       0.      265.       81. 100000.00
      .86       .00     3.98      .00       100     .032     .048      .032    848.40   562.00
  .000625     400.     353.      420.         0        0        0       .00     64.00   626.00

*SECNO 77.567

3370 NORMAL BRIDGE,NRO= 12 MIN ELTRD=  861 00 MAX ELLC=  958.00

          BRIDGE SECTION 4 - ANN ARBOR RAILROAD - D/S FACE   (S)

    77.57      8.25    856.65      .00       .00   856.92      .27       .00       .01   858.00
    1950.        0.    1950.       0.        0.     467.       0.      265.       81.    858.00
      .86       .00     4.17      .00      .032     .020     .032      .032    848.40   380.00
  .000285        1.       1.       1.         1        0        0       .00     64.00   364.00

*SECNO 77.569

          BRIDGE SECTION 4 - ANN ARBOR RAILROAD - U/S FACE   (S)

    77.57      8.15    856.65      .00       .00   856.93      .28       .00       .00   858.00
    1950.        0.    1950.       0.        0.     461.       0.      265.       81.    858.00
      .86       .00     4.23      .00      .032     .020     .032      .032    848.50   300.00
  .000297       14.      14.      14.         0        0        0       00      64.00   364.00

*SECNO 77.570

3470 ENCROACHMENT STATIONS=     561.0     627.0  TYPE=     1  TARGET=      66.000
    77.57      8.20    856.70      .00       .00   856.94      .24       .00       .01100000.00
    1950.        0.    1950.       0.        0.     490.       0.      265.       81. 100000.00
      .86       .00     3.92      .00      .000     .032     .048      .032    848.50   561.00
  .000607        1.       1.       1.         2        0        0       .00     66.00   627.00

*SECNO 77.602
    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       WTH       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST
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3470 ENCROACHMENT STATIONS=      554.0      672.0  TYPE=      1  TARGET=      110.000
    77.60      8.56    856.96      .00       .00    857.04      .08       .05       .05    852.20
    1950.       13.     1937.       8.       29.      859.       0.      268.       82. 100000.00
      .89       .46      2.25      .00      .080      .032     .048      .032    848.40    554.00
  .000166      180.      176.     200.         2         0        0       .00    110.00    672.00

*SECNO 77.603

3370 NORMAL BRIDGE,NRD= 44 MIN ELTRD=  860.00 MAX ELLC=  857.90

          BRIDGE SECTION 5 - ABANDONED GRAND TRUNK RAILROAD - D/S FACE   (T)

    77.60      8.55    856.95      .00       .00    857.05      .10       .00       .01    860.30
    1950.        0.     1950.       0.        0.      772.       0.      268.       82.    860.10
      .89       .00      2.53      .00      .032      .020     .032      .032    848.40    300.00
  .000261        1.        1.       1.         1         0        0    -67.36    110.00    410.00

*SECNO 77.605

3370 NORMAL BRIDGE,NRD= 44 MIN ELTRD=  860.00 MAX ELLC=  857.90

          BRIDGE SECTION 5 - ABANDONED GRAND TRUNK RAILROAD - U/S FACE   (T)

    77.61      8.55    856.95      .00       .00    857.05      .10       .00       .00    860.30
    1950.        0.     1950.       0.        0.      772.       0.      268.       82.    860.10
      .89       .00      2.53      .00      .032      .020     .032      .032    848.40    300.00
  .000261       12.       12.      12.         0         0        0    -67.34    110.00    410.00

*SECNO 77.606

3470 ENCROACHMENT STATIONS=      553.0      673.0  TYPE=      1  TARGET=      120.000
    77.61      8.58    856.98      .00       .00    857.06      .08       .00       .01    852.20
    1950.       26.     1923.       1.       33.      862.       4.      268.       82.    853.20
      .09       .77      2.23      .20      .048      .032     .080      .032    848.40    553.00
  .000155        1.        1.       1.         2         0        0       .00    120.00    673.00

*SECNO 77.717

3470 ENCROACHMENT STATIONS=        .0      500.0  TYPE=      1  TARGET=      499.999

          VALLEY SECTION 24   (U)

    77.72      7.81    857.11      .00       .00    857.16      .05       .09       .01    853.20
    1950.       19.     1459.     472.       34.      730.    1002.      287.       86.    853.20
      .99       .57      2.00      .47      .040      .032     .080      .032    849.30     52.74
  .000144      560.      589.     690.         0         0        0       .00    447.26    300.00

*SECNO 77.899
    SECNO     DEPTH    CWSEL    CRIWS    WSELK     EG        HV       HL       BLOSS   BANK ELEV
    Q         QLOB     QCH      QROB     ALOB      ACH       AROB     VOL      TWA     LEFT/RIGHT
    TIME      VLOB     VCH      VROB     XNL       XNCH      XNR      WTH      ELMIN      BSTA
```

1) COUNTY: Livingston ~~County~~

2) STUDY NAME: Hamburg Twp

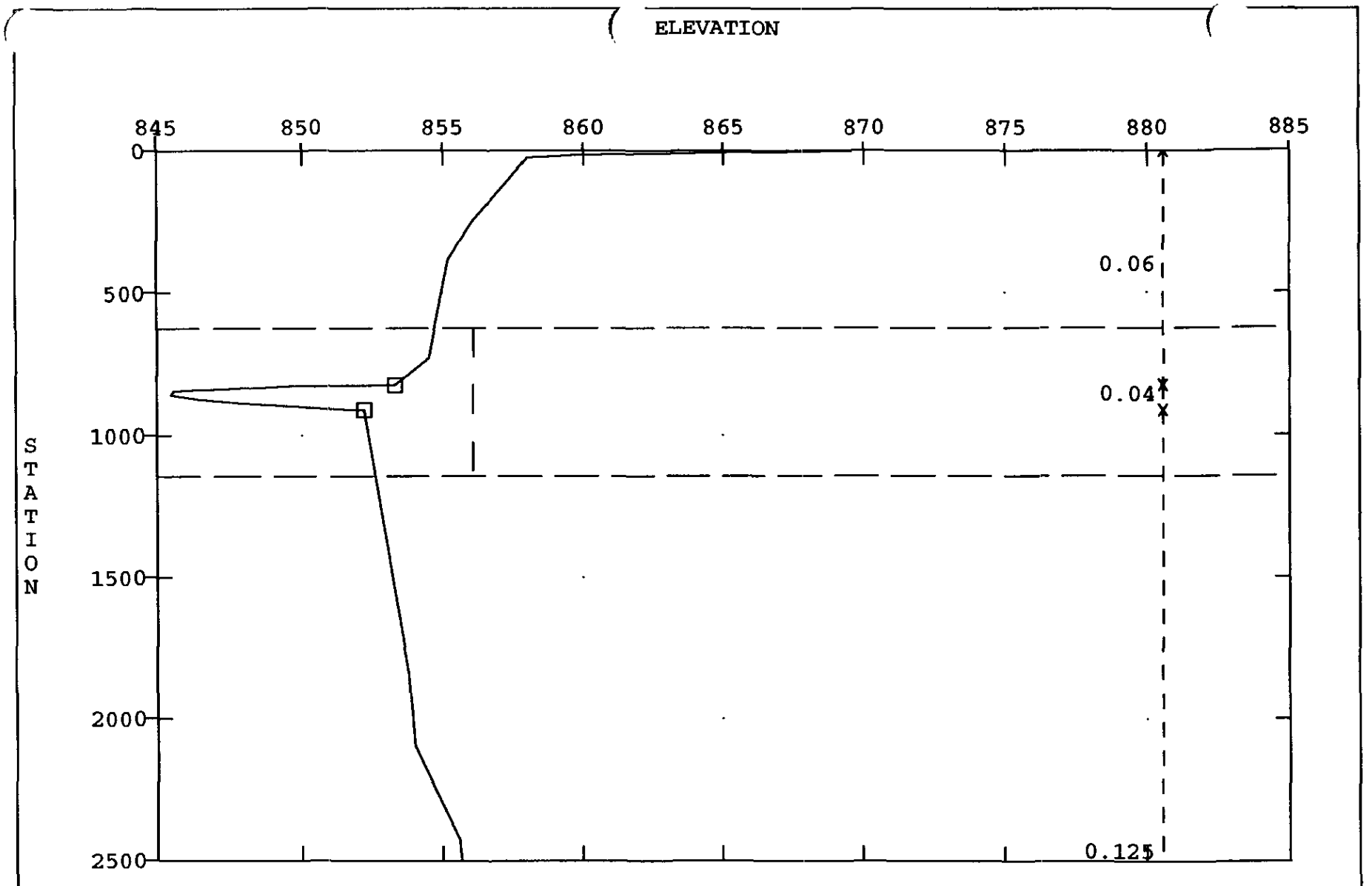
3) WATERCOURSE: Huron River

4) DOCUMENT TYPE: CLOMR - Nat. - ~~Eng~~ X-Sections

00BREAK00

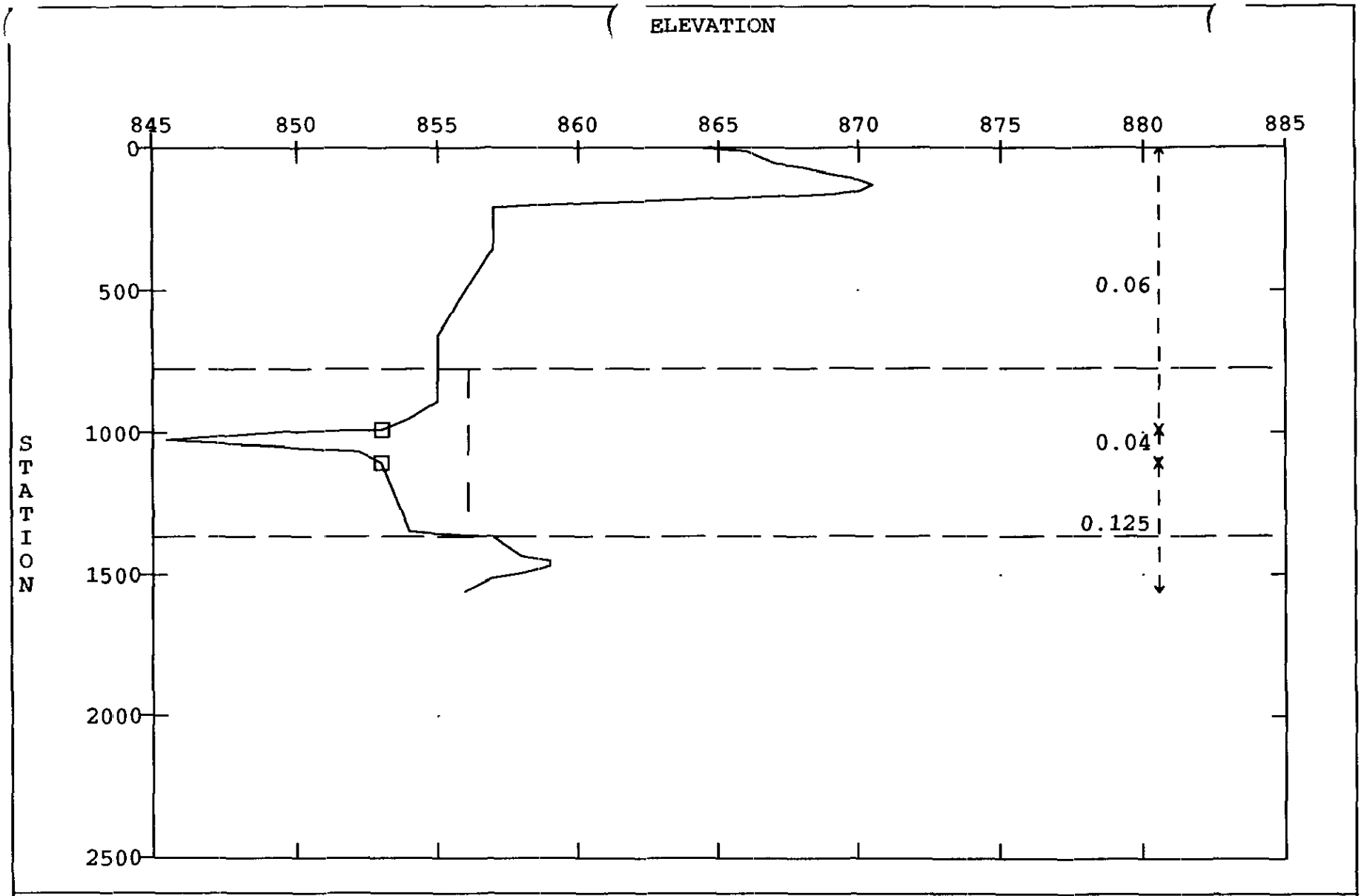
CROSS SECTIONS

NATURAL CONDITIONS



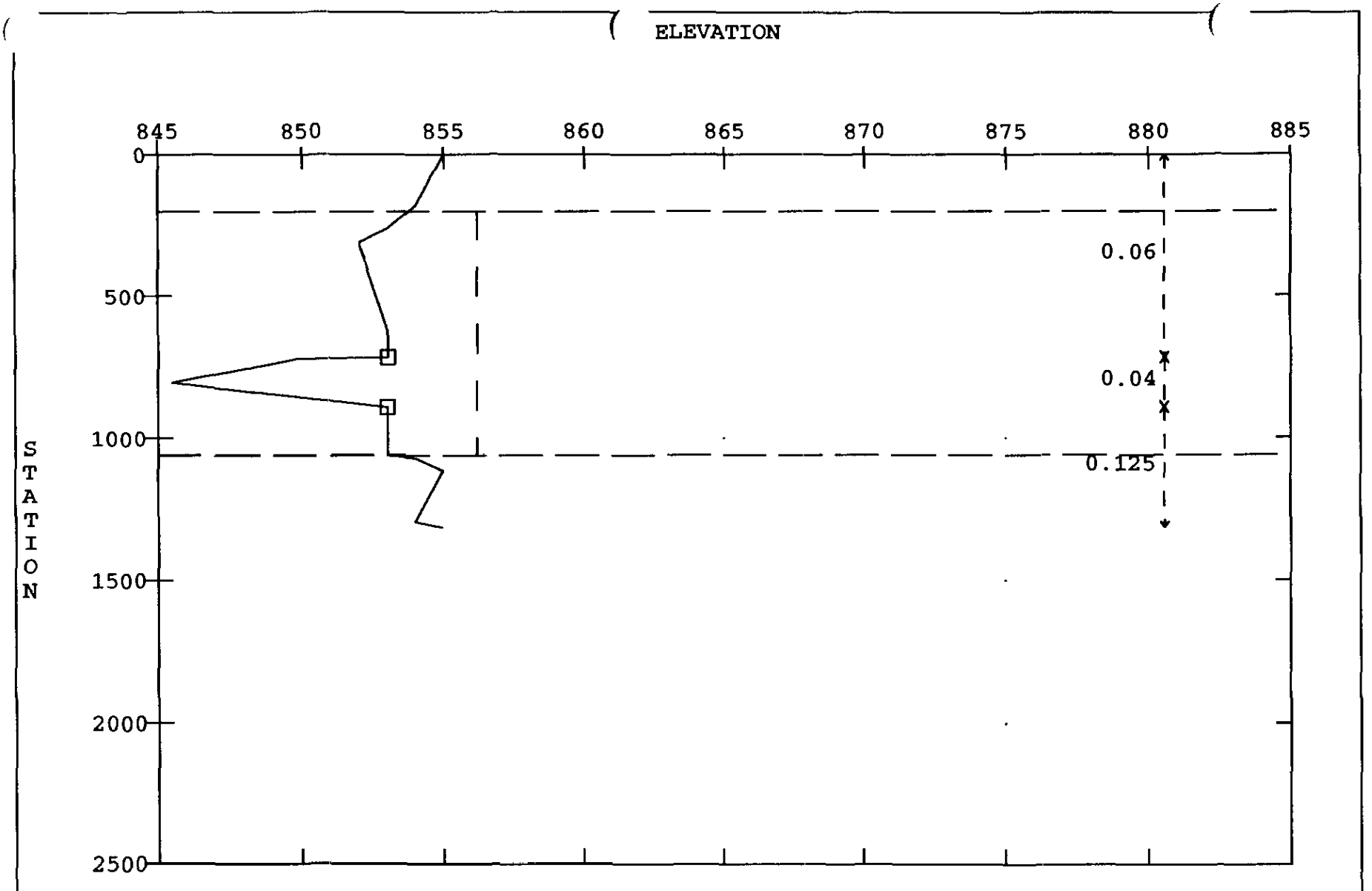
SECTION : 76.798

CROSS SECTIONS FOR NATURAL CONDITIONS



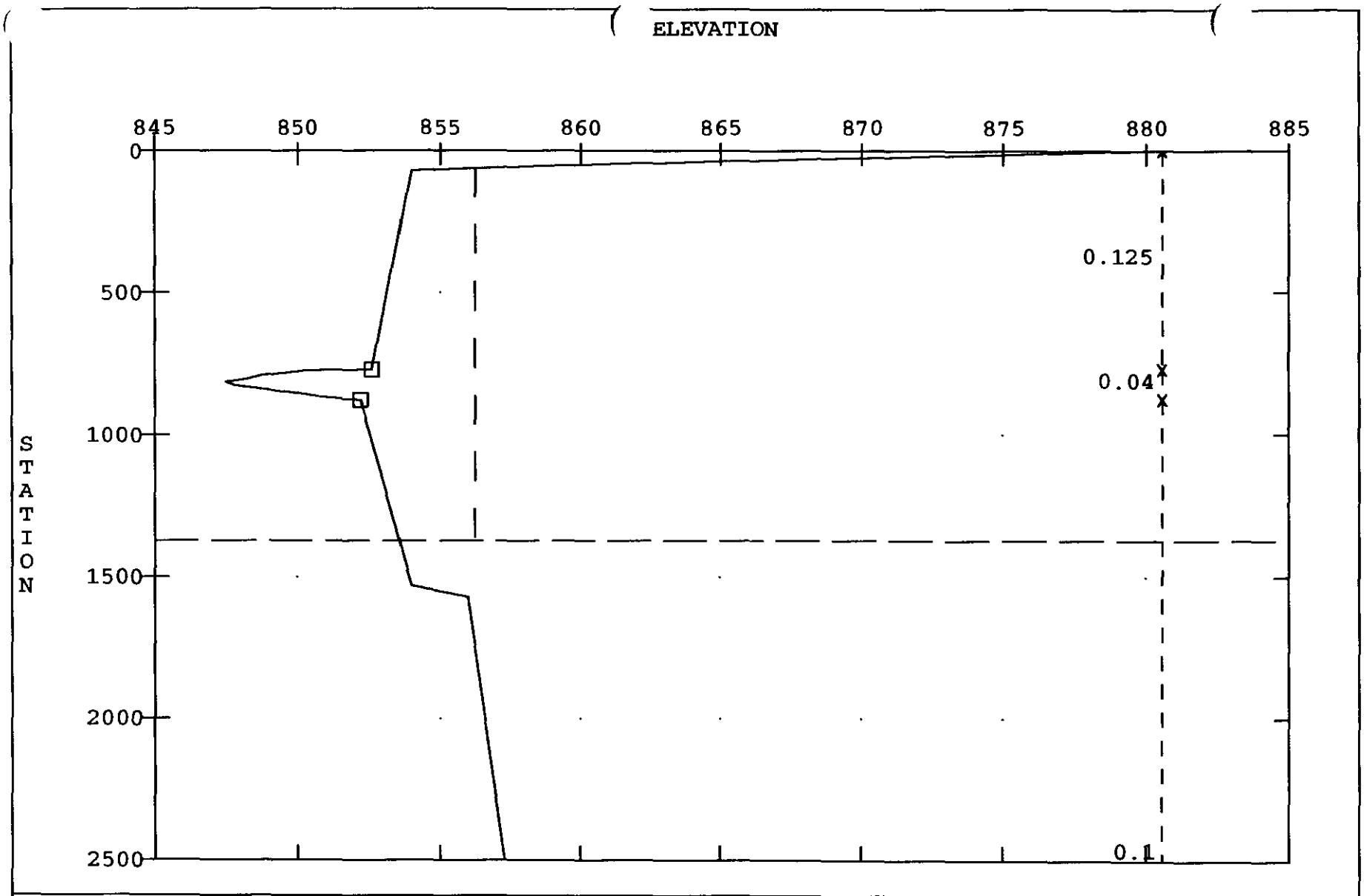
SECTION : 76.817

CROSS SECTIONS FOR NATURAL CONDITIONS



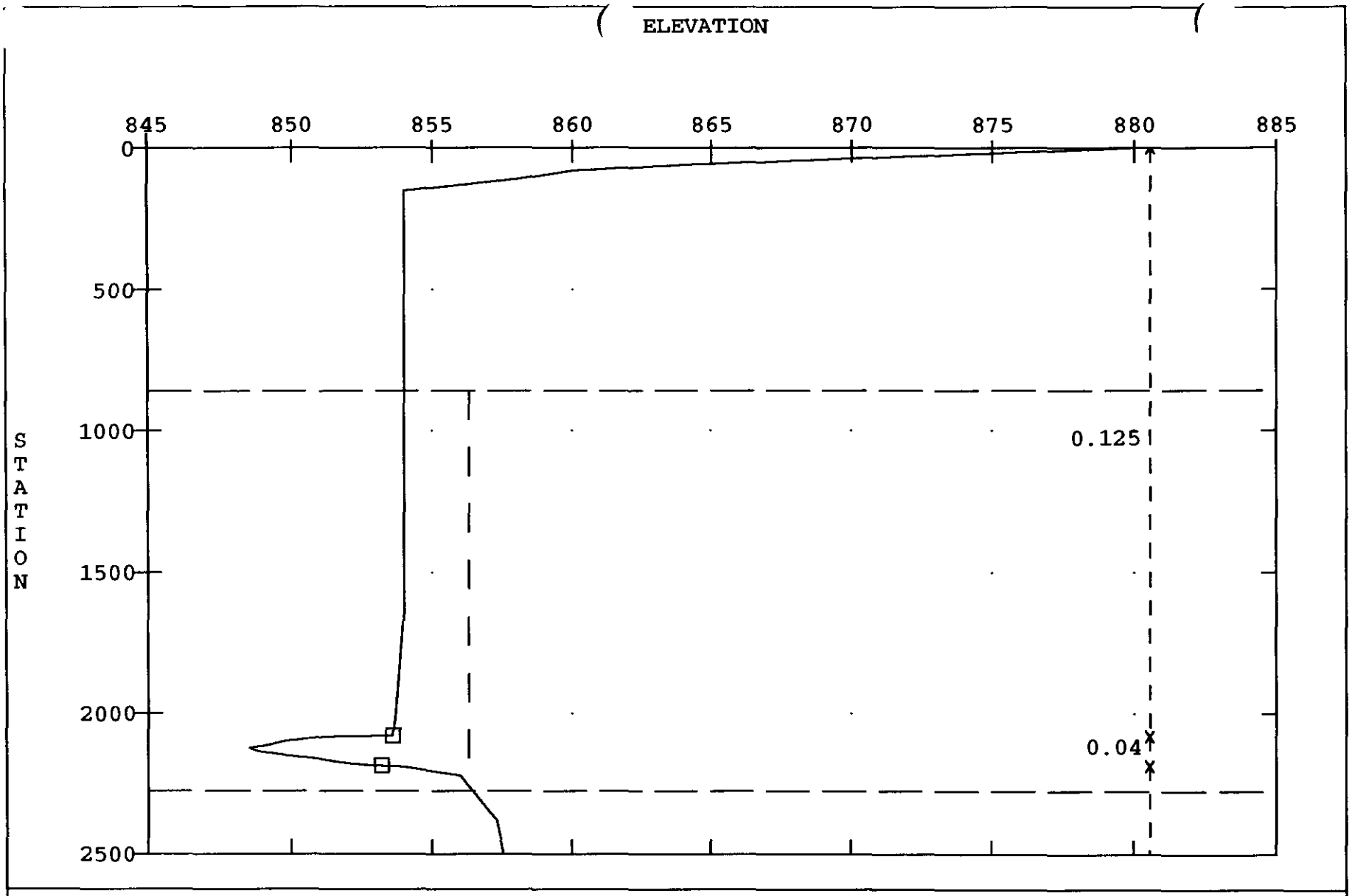
SECTION : 76.896

CROSS SECTIONS FOR NATURAL CONDITIONS



SECTION : 77.030

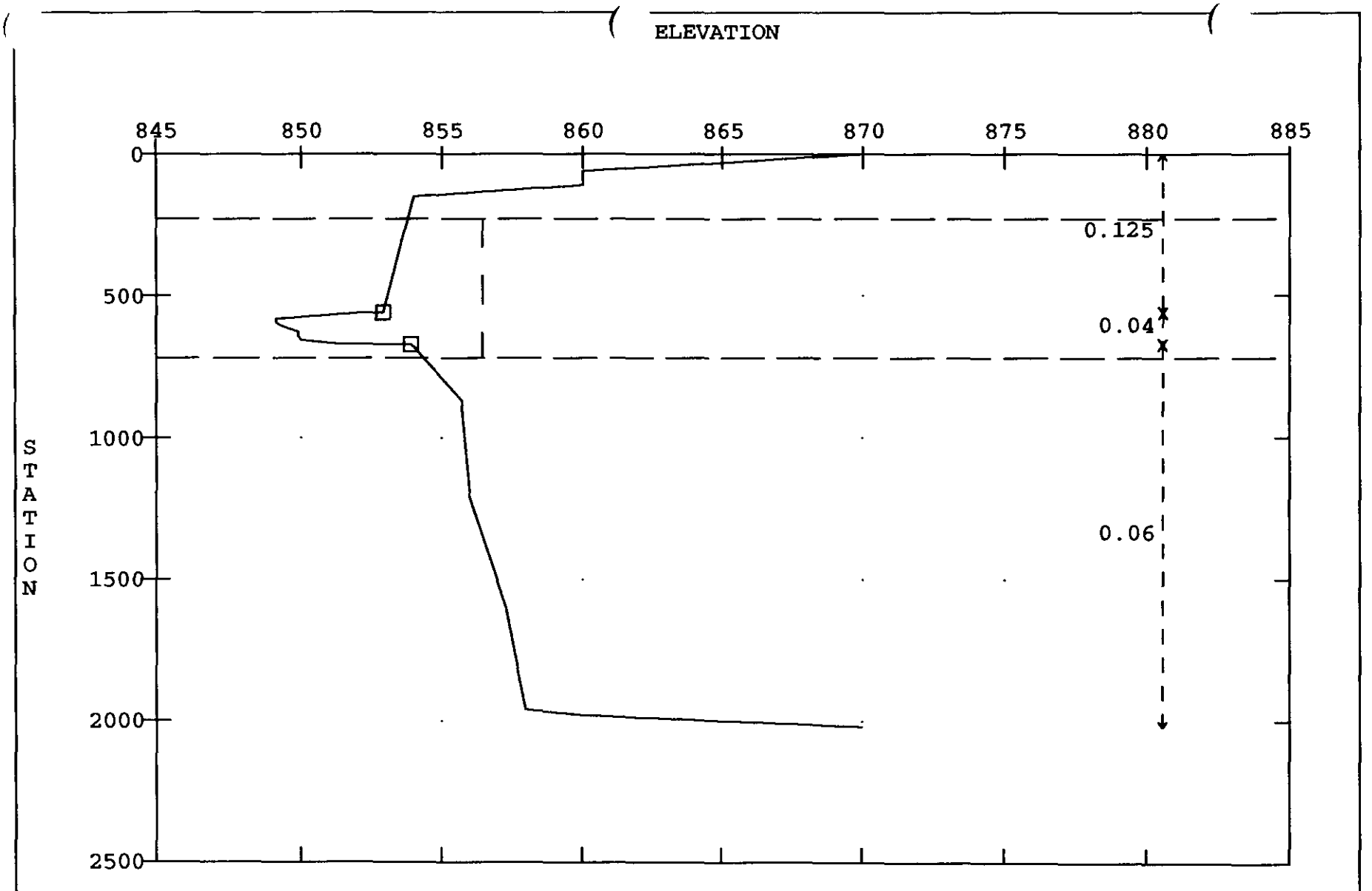
CROSS SECTIONS FOR NATURAL CONDITIONS



SECTION : 77.232

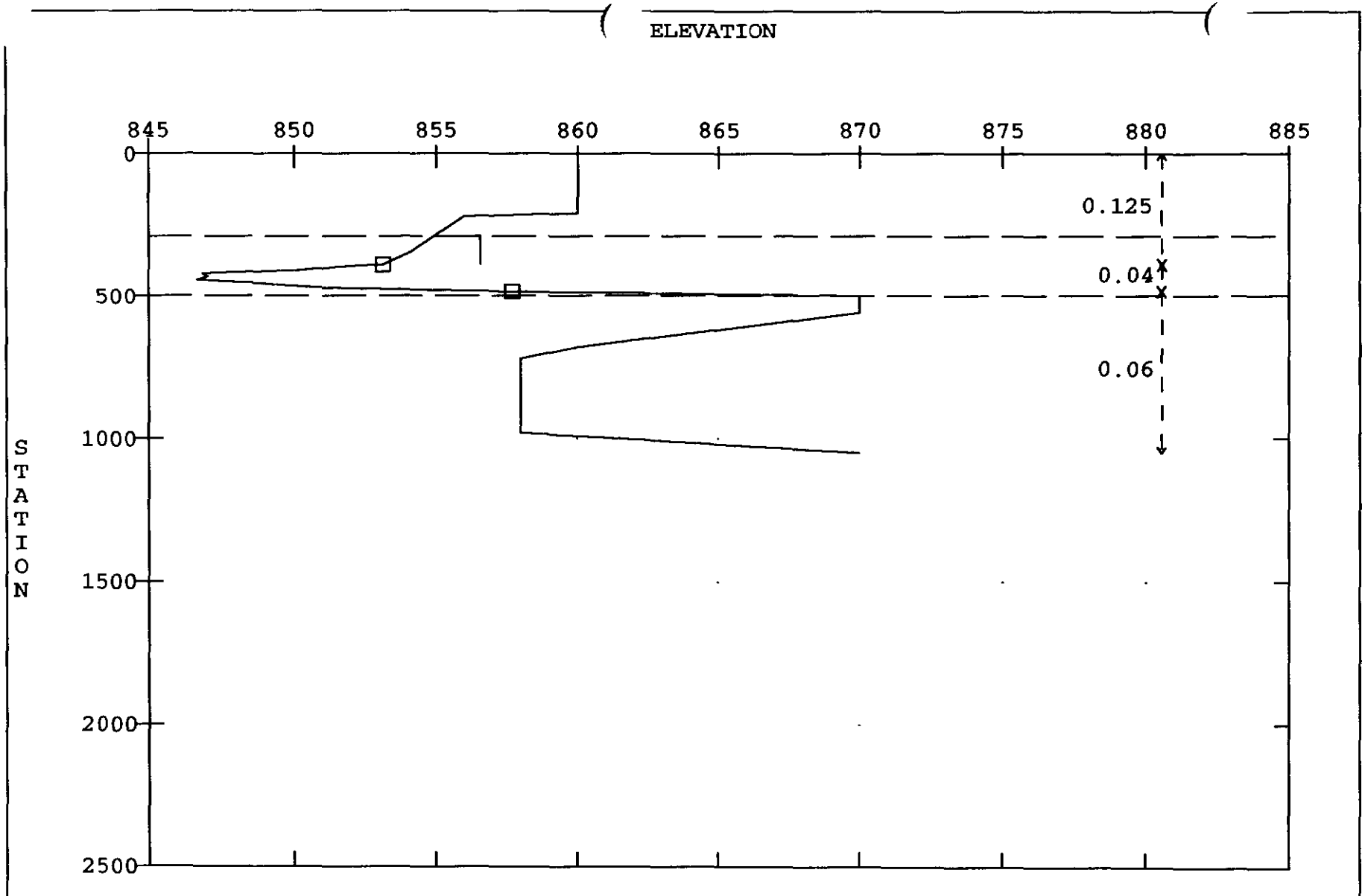
0.06

CROSS SECTIONS FOR NATURAL CONDITIONS



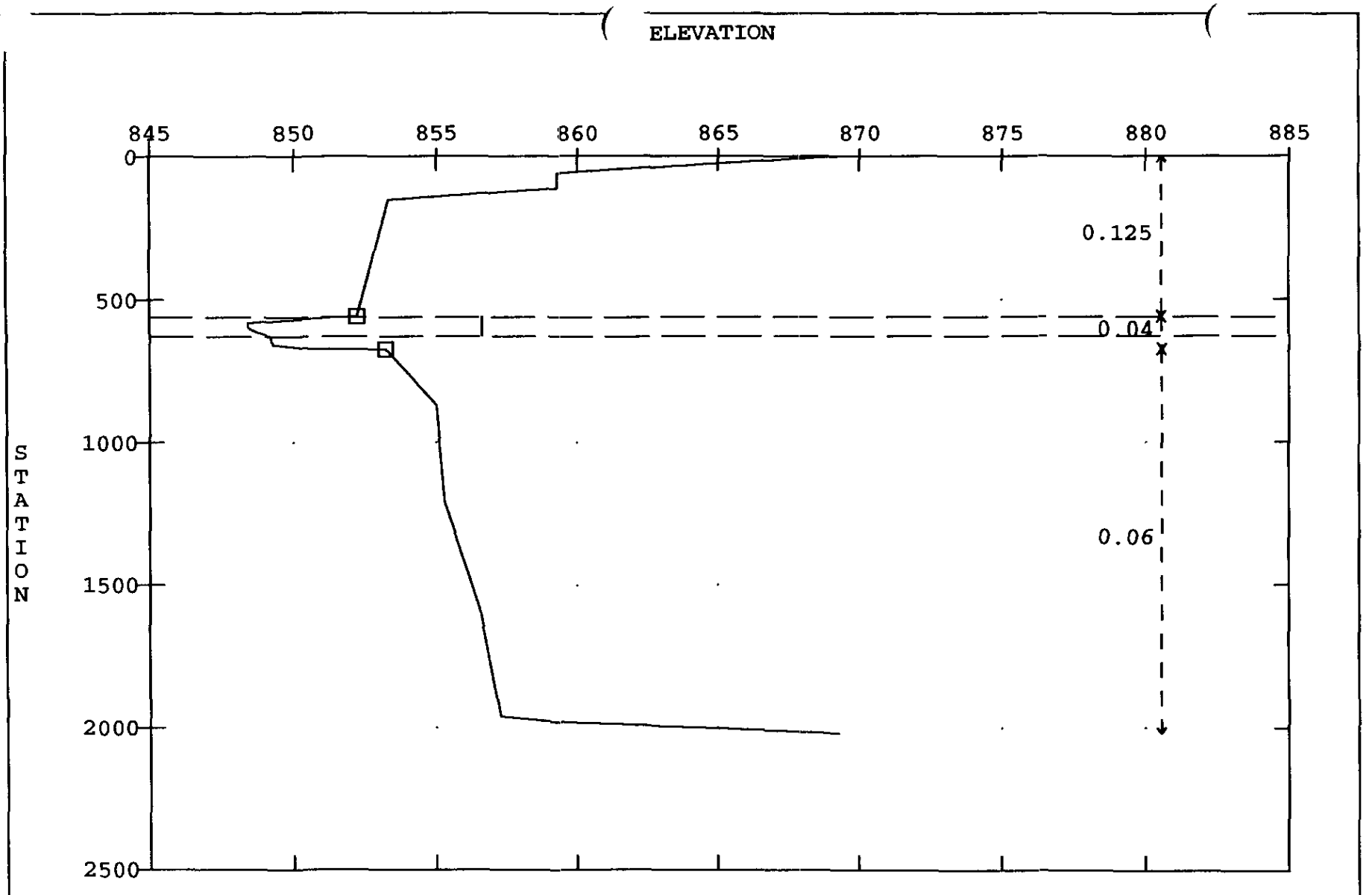
SECTION : 77.353

CROSS SECTIONS FOR NATURAL CONDITIONS



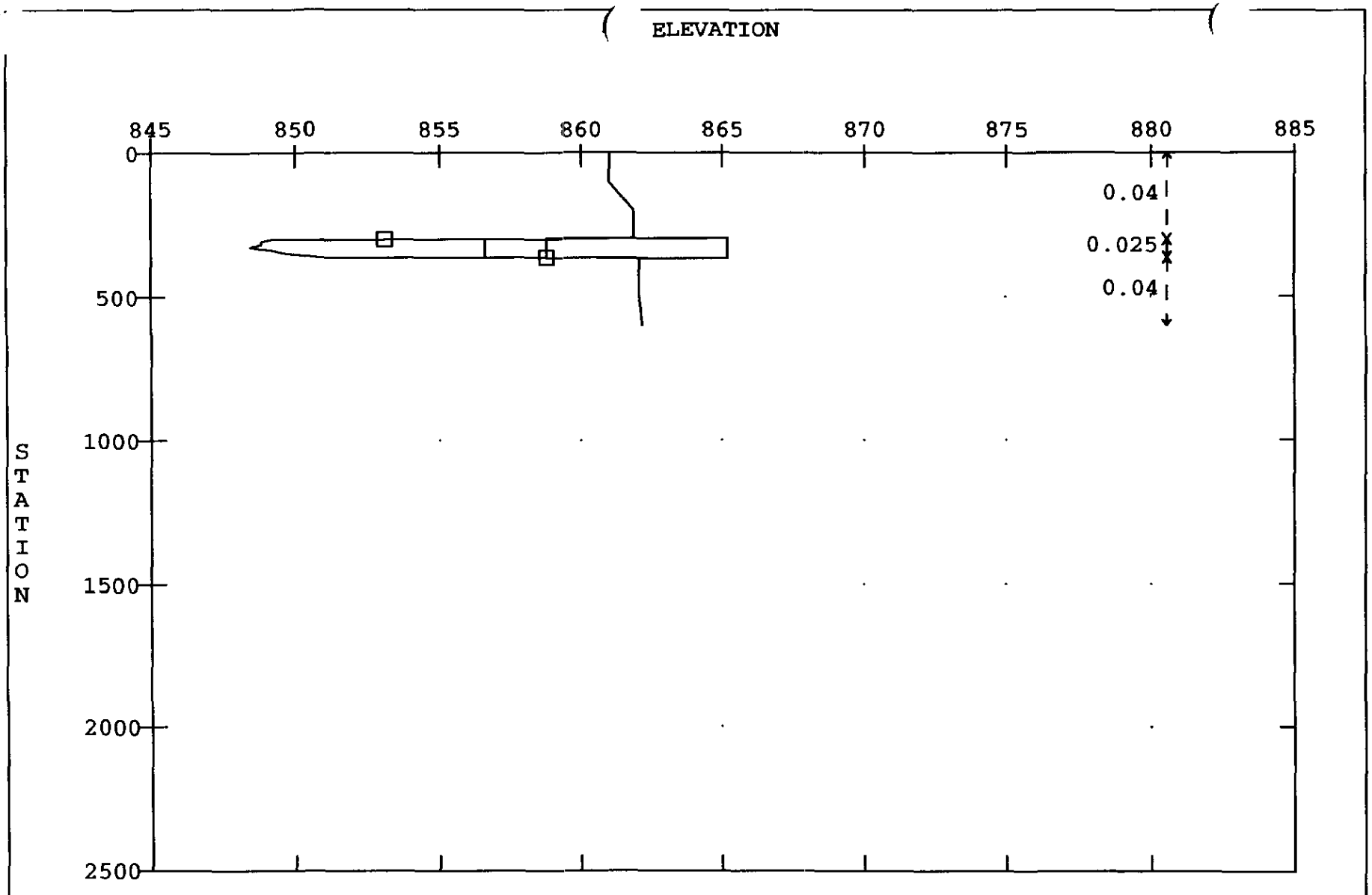
SECTION : 77.499

CROSS SECTIONS FOR NATURAL CONDITIONS



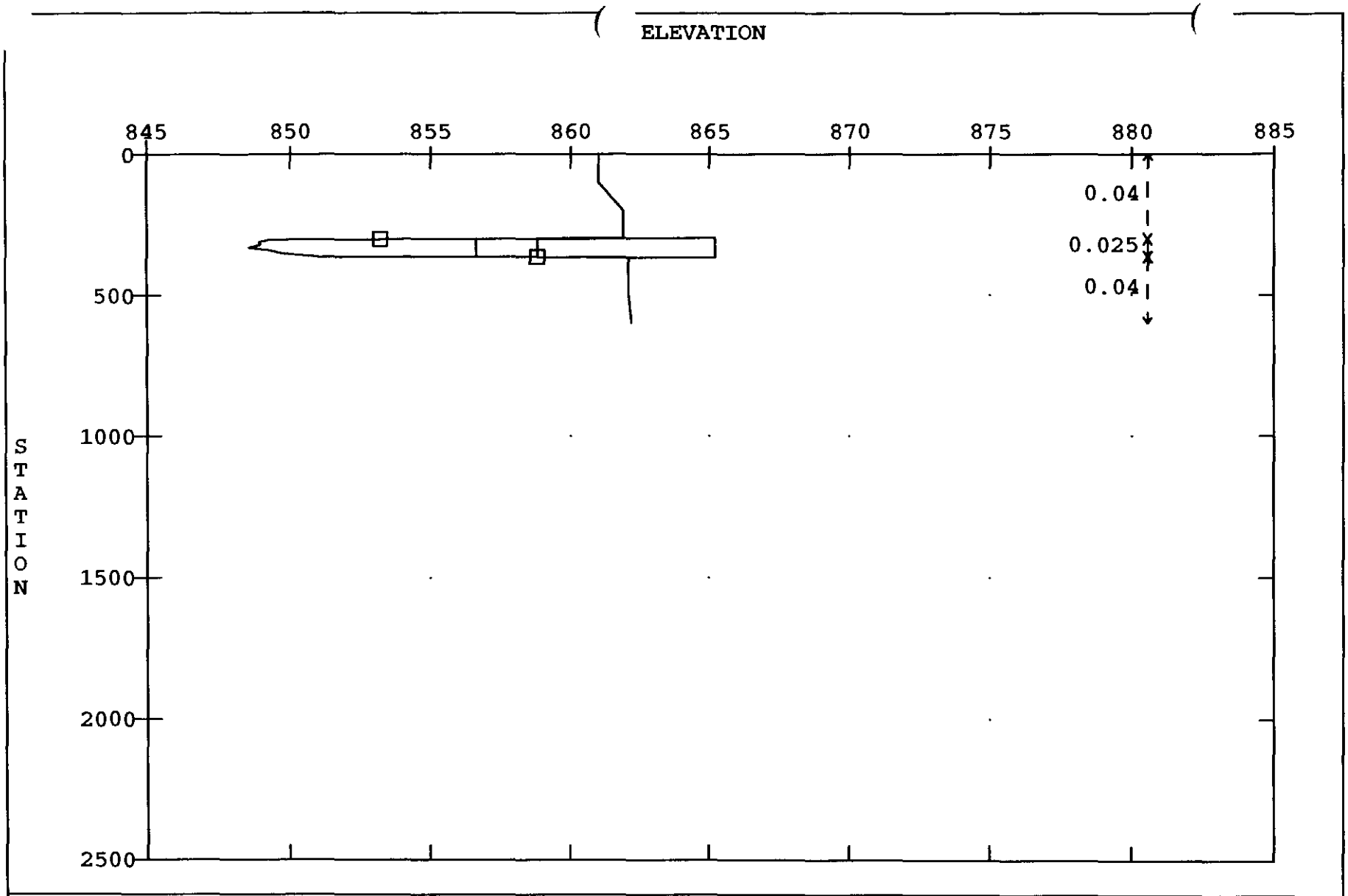
SECTION : 77.566

CROSS SECTIONS FOR NATURAL CONDITIONS



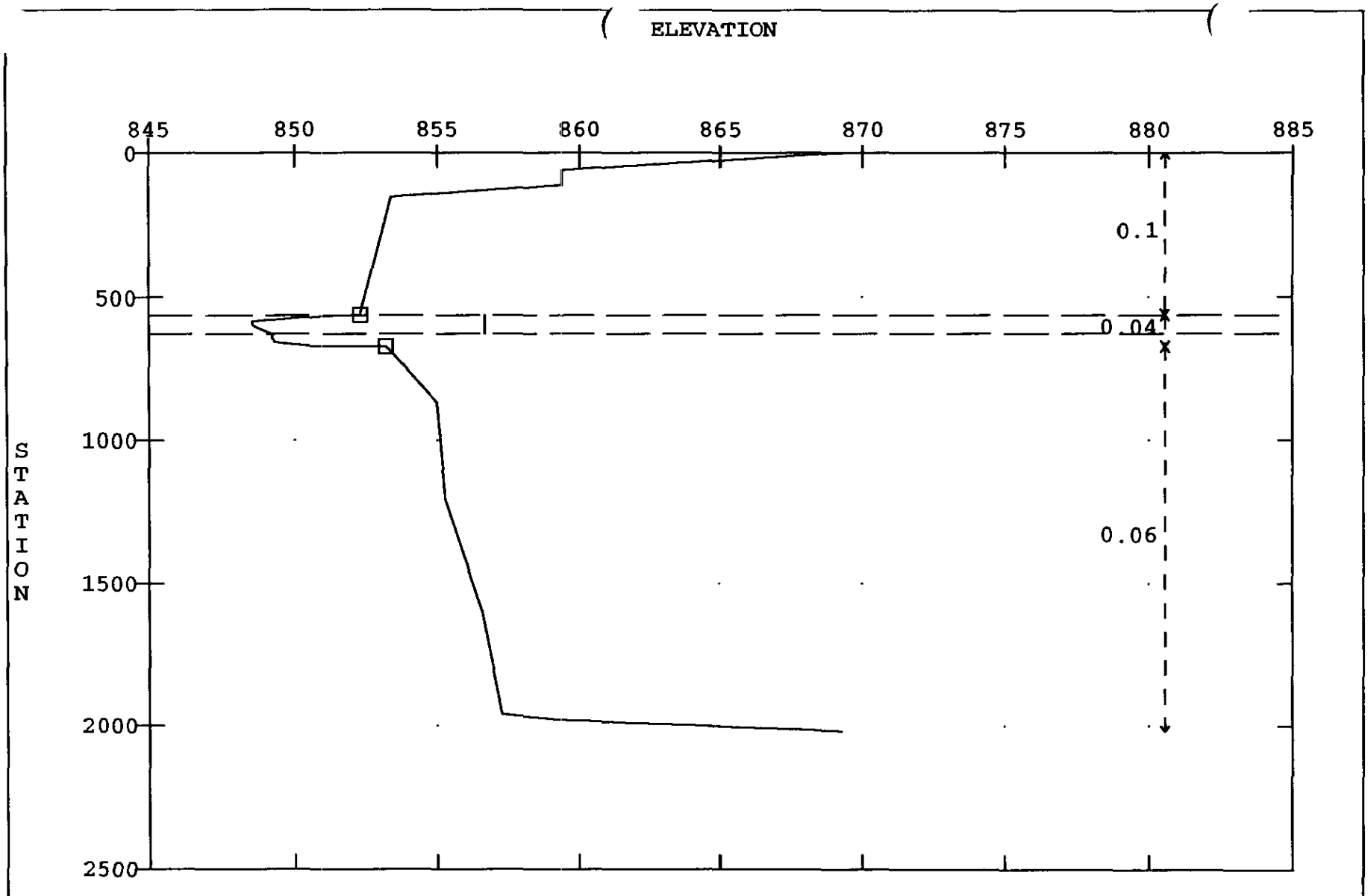
SECTION : 77.567

CROSS SECTIONS FOR NATURAL CONDITIONS



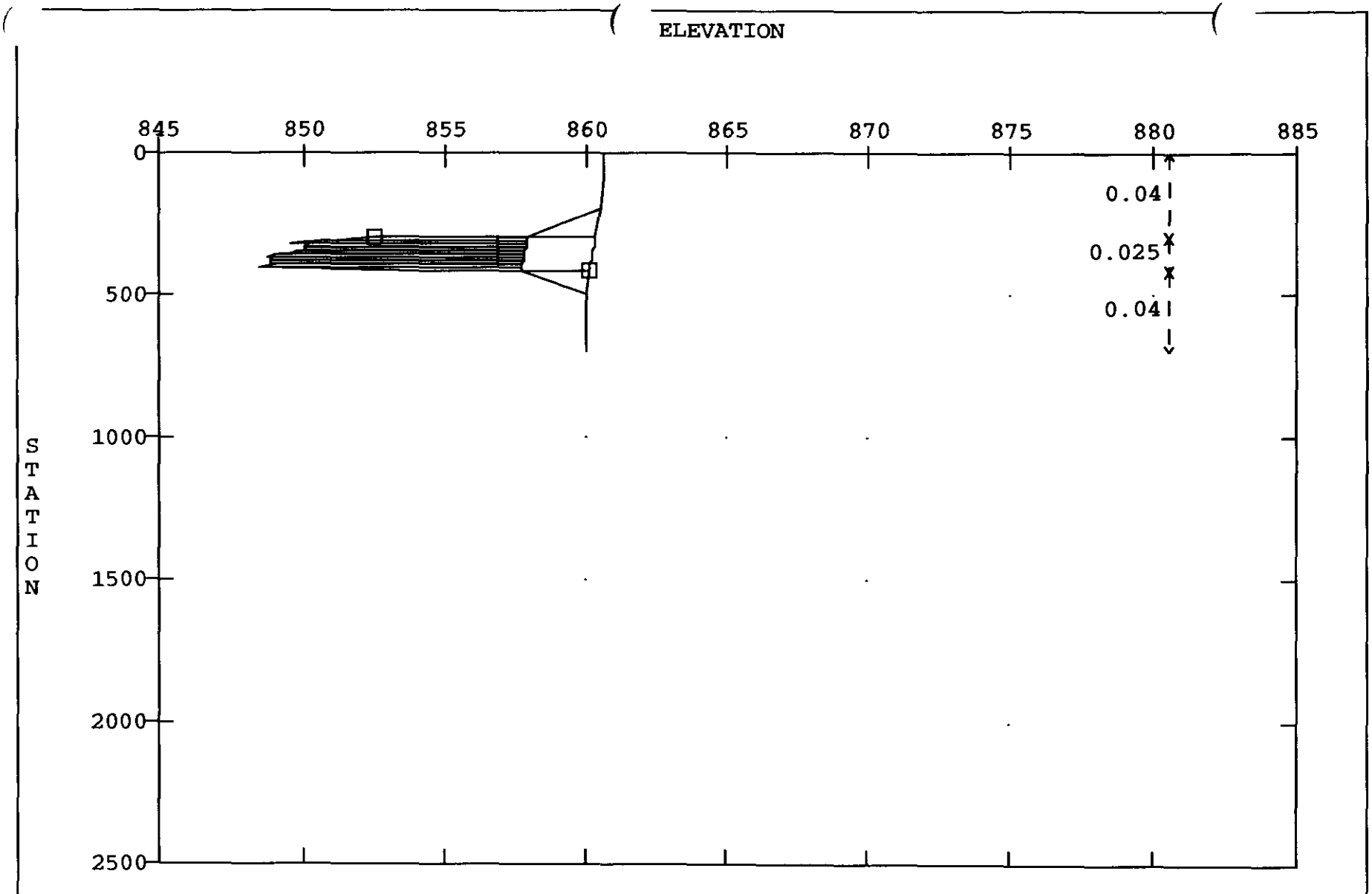
SECTION : 77.569

CROSS SECTIONS FOR NATURAL CONDITIONS



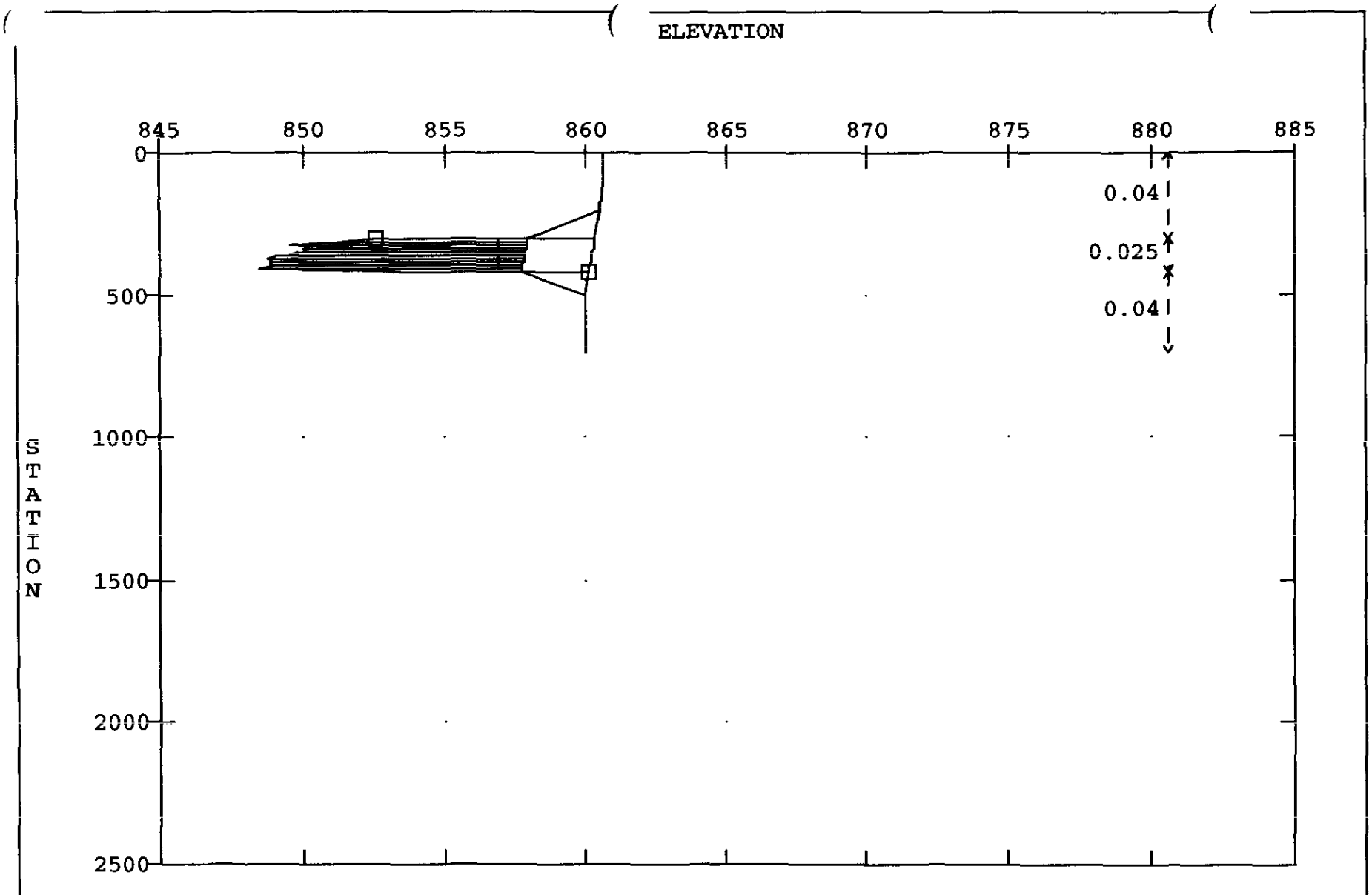
SECTION : 77.570

CROSS SECTIONS FOR NATURAL CONDITIONS



SECTION : 77.603

CROSS SECTIONS FOR NATURAL CONDITIONS



SECTION : 77.605

CROSS SECTIONS FOR NATURAL CONDITIONS

00BREAK00

1) COUNTY: Livingston County

2) STUDY NAME: Hamburg Twp

3) WATERCOURSE: Huron River

4) DOCUMENT TYPE: CLOMR - Orig - Encroached

ORIGINAL MODEL:

ENCROACHED CONDITION

Encroached Condition
(Floodway)

```
**************************************************
 HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
 ERROR CORR -  01,02,03
 MODIFICATION -  50,51,52,53
**************************************************

C
T1      HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2      10-YEAR FLOW - STRAWBERRY LAKE TO CORPORATE LIMITS
T3      HURON RIVER - PROJECT MANAGER, H.S.CHENG

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   NVINS    Q        WSEL     FQ
     -1.      2.       0.       0.    .000000     .00      0       0.     955 130    000

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE
    1.000     .000    -1.000    .000     .000     .800     .000     .000     .000     .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    30.000   40.000   41.000   42.000   43.000   1.000    8.000   10.000   12.000    3.000

    33.000    4 000   25.000      000      000     .000     .000     .000     .000     .000

NC     .068     .125     .040     .300     .500     .000     .000     .000     .000     .000
QT    4.000  1350.000 1900.000  2200.000 2050.000     .000     .000     .000     .000     .000

          VALLEY SECTION 20   (O)

X1   76.798    26.000   825.000   914.000     .000     .000     .000     .000     .000     .000
X3     .000     .000      .000   625.000     .000  1145.000     .000     .000     .000     .000
GR   870.000     .000   860.000    15.000   858.000    25.000   856.000   255.000   855.200   385.000
GR   854.500   730.000   853 300   825 000   849.000   828 000   845.600   845.000   845.500   860.000
GR   846.500   875.000   848 100   890.000   849.000   900.000   851.300   918.000   852.200   914.000
GR   853.000  1045.000   854.000  2095.000   855.600  2425.000   856.000  2805.000   857.300  2895.000
GR   856.000  2945.000 - 856.000  3505.000   856.300  3595.000   856.000  3725.000   856.000  3965.000
GR   860.000  4045.000     .000     .000     .000     .000     .000     .000     .000     .000
NC     .125     .100     .040     .000     .000     .000     .000     .000     .000     .000

          VALLEY SECTION 21   (P)

X1   77.030    23.000   778.000   876.000  1420.000  1180.000  1220.000     .000     .000     .000
X3     .000     .000     .000   300.000     .000  1205.000     .000     .000     .000     .000
GR   880.000     .000   860.000   -50.000   854.000    70.000   852.600   770.000   850.300   773.000
GR   848.700   790.000   848 100   805.000   847.500   813.000   847 800   825.000   848.500   835.000
GR   849.100   843.000   850.100   853.000   858.000   865.000   851.000   875.000   852 200   876.000
GR   854.000  1530.000   856.000  1570.000   857.500  2640.000   856.000  3150.000   856.000  4010.000
GR   858.000  4020.000   860.000  4040.000   866.000  4080.000     .000     .000     .000     .000
NC     .125     .060     .040      000      .000     .000     .000     .000     .000     .000

X1   77.232    27.000  2080.000  2186.000   780.000   760.000  1070.000     .000     .000     .000

X3     .000     .000     .000  1200.000     .000  2200 000      000     .000     .000     .000
GR   880 000     .000   864 000    60.000   860.000    80.000   858 000   110.000   854 000   150.000
GR   854 000  1650 000  853.700  2000 000   853.600  2080.000   851.300  2083 000   849.700  2100 000
GR   849 100  2115 000  849 500  2123 000   849 000  2135 000   849 500  2145 000   850 100  2153 000
```

X3	.000	.000	000	1200.000	.000	2200.000	000	.000	000	.000
GR	880 000	.000	864.000	60.000	860.000	80.000	858.000	110.000	854 000	150 000
GR	854.000	1650.000	853.700	2000.000	853.600	2080.000	851.300	2083 000	849 700	2100.000
GR	849 100	2115 000	848.500	2123.000	848.800	2135 000	849.500	2145.000	850.100	2153.000
GR	851.100	2163.000	851 000	2175 000	852 800	2185.000	853.200	2186 000	854 000	2190.000
GR	856.000	2220.000	857.300	2380.000	857.700	2560.000	857 800	3000.000	858 000	3300 000
GR	860.000	3340.000	870.000	3350.000	.000	.000	.000	000	.000	.000
BT	4.000	1280.000	1710.000	1950.000	2558.000	000	.000	.000	.000	.000

VALLEY SECTION 22 (Q)

X1	77.353	22.000	560.000	672.000	1060.000	640.000	640.000	.000	000	.000
X3	.000	.000	.000	230.000	.000	720.000	.000	.000	.000	.000
GR	870.000	.000	860.000	60.000	860.000	110.000	854.000	150.000	852.900	560.000
GR	852.000	562.000	849.100	582.000	849 100	592.000	849.200	601.000	849.400	610 000
GR	849.900	627.000	849.900	642.000	850.000	656.000	851.300	670.000	853.900	672.000
GR	854.000	680.000	855.700	870.000	856 000	1210.000	857.300	1600.000	858.000	1960.000
GR	860.000	1980.000	870.000	2020.000	.000	.000	.000	.000	.000	.000
HC	.125	.060	.040	.000	.000	.000	000	.000	.000	.000

VALLEY SECTION 23 (R)

X1	77.499	28.000	390.000	485.000	910.000	570.000	770.000	.000	.000	.000
X3	.000	.000	.000	290.000	.000	500.000	.000	.000	.000	.000
GR	860.000	.000	860.000	210.000	856.000	220.000	854.000	350.000	853.100	390.000
GR	857.900	395.000	850.100	410.000	846.900	420.000	847.100	432.000	846.700	443.000
GR	848.700	455.000	850.700	470.000	852.700	475.000	857.700	485.000	870.000	500.000
GR	870.000	560.000	860.000	680.000	850.000	720.000	858.000	980.000	870.000	1050.000

X1	77.566	22.000	560.000	672.000	400.000	420.000	353.000	.000	.000	.000
X3	.000	.000	.000	562.000	.000	626.000	.000	.000	.000	.000
GR	869.300	.000	859.300	60.000	859.300	110.000	853.300	150.000	852 200	560.000
GR	851.300	562.000	848.400	582.000	848.400	592.000	848.500	601.000	848.700	610.000
GR	849.200	627.000	849.200	642.000	849.300	656.000	850.600	670.000	853.200	672.000
GR	853.300	680.000	855.000	870.000	855.300	1210.000	856.600	1600.000	857.300	1960.000
GR	859.300	1980.000	869.300	2020.000	.000	.000	.000	.000	.000	.000
HC	.040	.040	.025	.000	.000	.000	.000	.000	.000	.000

BRIDGE SECTION 4 - ANN ARBOR RAILROAD - D/S FACE (S)

X1	77.567	22.000	300.000	364.000	1.000	1.000	1.000	.000	.000	.000
BT	12.000	.000	861.000	.000	100.000	861.000	.000	200.000	861.900	.000
BT	296.900	861 900	.000	297.000	865.200	.000	300.000	865.200	850.000	364.000
BT	865.200	850.000	367.000	865.200	.000	367 100	862.100	.000	400.000	862.100
BT	.000	500.000	862.100	.000	600.000	862.200	.000	.000	.000	.000
GR	861.000	.000	861.000	100.000	861.900	200.000	861.900	296.900	850.000	296.900
GR	858.000	300.000	853.100	300.000	853.100	301.300	849.200	301.500	848.800	310.000
GR	848.800	320.000	848.400	338.000	849.200	340.000	849.600	358.000	850.400	362.500
GR	852.700	362.700	852.700	364.000	850.000	364.000	862.100	367.100	862.100	400.000
GR	862.100	500.000	862.200	600.000	.000	.000	.000	.000	.000	.000

STA

BRIDGE SECTION 4 - ANN ARBOR RAILROAD - U/S FACE (S)

X1	77.569	22.000	300.000	364.000	16.000	16.000	16.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000

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*****************************************************
 HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
 ERROR CORR -  01,02,03
 MODIFICATION -  50,51,52,53
*****************************************************


T1       HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2       100-YEAR FLOW - STRAWBERRY LAKE TO CORPORATE LIMITS
T3       HURON RIVER - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    NVINS     Q         WSEL      FQ

    -10.       4.        0.        0.   .000000      .00        .0        0.   956.160     .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     3.000     .000    -1.000     .000      .000      .000      .000      .000      .000      .000

*PROF 3

CCHV=    .300 CEHV=    .500
*SECNO 76.790
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EC        HV        HL        OLOSS     BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA     LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTH       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST


3470 ENCROACHMENT STATIONS=     625.0    1145.0  TYPE=     1  TARGET=     520.000

          VALLEY SECTION 20   (O)

    76.80     18.66    856.16      .00    856.16    856.22      .06       .00       .00    853.30
    2200.     210.     1632.     350.     378.      740.     869.        0.        0.     852.20
      .00      .56      2.18      .41      .049      .032     .100      .000    845.50    625.00
  .000134       0.        0.       0.        0         0        0       .00    520.00   1145.00


*SECNO 77.030

3470 ENCROACHMENT STATIONS=     300.0    1200.0  TYPE=     1  TARGET=     900.000

          VALLEY SECTION 21   (P)

    77.03      8.84    856.34      .00       .00    856.36      .02       .14       .01    852.60
    2200.     473.     1220.     499.     1533.      757.    1194.       80.       21.     852.20
      .32      .31      1.62      .42      .100      .032     .080      .031    847.50    300.00
  .000090    1420.     1220.    1180.        0         0        0        00    900.00   1200.00


*SECNO 77.232

3470 ENCROACHMENT STATIONS=    1200.0    2200.0  TYPE=     1  TARGET=    1000.000
    77.23      7.94    856.44      .00       .00    856.49      .04       .12       .01    853.60
    2200.     810.     1360.      22      2223      662.      32.      142.       39.     853.20


      .51       36      2.07      .67      .100      .032      .049       033    849.50   1200.00
  .000175     780.     1070.     760.        0         0        0       .00   1000.00   2200.00
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      .51       .36      2 07       .67       .100       032       049       033    848 50   1200.00
   000175      780.     1070       760          0         0         0        00   1000 00   2290.00

 *SECNO 77.353

3470 ENCROACHMENT STATIONS=     230.0     720 0  TYPE=      1  TARGET=     490.000

          VALLEY SECTION 22   (Q)

    77.35      7 47    856.57       .00       .00    956 61        05        12       .00    852.90
    1950.       419     1454.       77.     1061.       735       116.      193.       56.    853.90
      .64       .39      1.98       .67       .100      .032      .048      .032   849.10    230.00
 .000151     1060.      640.      640.         1         0         0       .00    490.00    720.00

 *SECNO 77 499
     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       WTH       ELWIN       BSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

3470 ENCROACHMENT STATIONS=     290.0     580.0  TYPE=      1  TARGET=     210.000

          VALLEY SECTION 23   (R)

    77.50      9.99    956 69       .00       .00    856.00       .11       .15       .03    853.10
    1950.      119.     1031.       0.       259.      666.       0.       220.       62.    857.70
      .73       .46      2.75       .00       .100      .032      .048      .032   846.70    290.00
 .000263      910.      770.      570.         0         0         0       .00    192.98    482.98

 *SECNO 77.566

3470 ENCROACHMENT STATIONS=     562.0     626.0  TYPE=      1  TARGET=      64.000
    77.57      8.36    856.76       .00       .00    857.00       .24       .14       .07100000.00
    1950.       0.      1950.       0.        0.       495.       0.       226.       63. 100000.00
      .75       .00      3.94       .00       .100      .032      .048      .032   849.40    562.00
 .000603      400.      353.      420.         1         0         0       .00     64.00    626.00

 *SECNO 77.567

3370 NORMAL BRIDGE,NRD= 12 MIN ELYRD=  861.00 MAX ELLC=  858 00

          BRIDGE SECTION 4 - ANN ARBOR RAILROAD - D/S FACE   (S)

    77.57      8.35    856.75       .00       .00    857.01       .26       .00       .01    859.00
    1950.       0.      1950.       0.        0.       473.       0.       226.       63.    858.00
      .75       .00      4.12       .00       .032      .020      .032      .032   849.40    300.00
 .000274        1.        1.        1.         1         0         0       .00     64.00    364.00

 *SECNO 77.569

          BRIDGE SECTION 4 - ANN ARBOR RAILROAD - U/S FACE   (S)
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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

HURON RIVER - PROJECT MA

SUMMARY PRINTOUT

SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	K*CHSL	TOPWID	AREA
76.790	.00	.00	845.50	1350.00	855.13	9.63	.04	.00	855.17	.00	520.00	1459.86
76.790	.00	.00	845.50	1900.00	855.82	10.32	.05	.00	855.87	.00	520.00	1817.06
76.790	.00	.00	845.50	2200.00	856.16	10.66	.06	.00	856.22	.00	520.00	1994.66
76.790	.00	.00	845.50	2850.00	856.77	11.27	.07	.00	856.84	.00	520.00	2311.06
77.030	.00	.00	847.50	1350.00	855.26	7.76	.02	.01	855.28	1.64	900.00	2514.22
77.030	.00	.00	847.50	1900.00	855.98	8.48	.02	.01	856.01	1.64	900.00	3164.81
77.030	.00	.00	847.50	2200.00	856.34	8.84	.02	.01	856.36	1.64	900.00	3483.24
77.030	.00	.00	847.50	2850.00	856.98	9.48	.03	.01	857.01	1.64	900.00	4059.74
77.232	.00	.00	848.50	1350.00	855.36	6.86	.04	.01	855.40	.93	1000.00	1843.59
77.232	.00	.00	848.50	1900.00	856.09	7.59	.04	.01	856.13	.93	1000.00	2563.06
77.232	.00	.00	848.50	2200.00	856.44	7.94	.04	.01	856.49	.93	1000.00	2916.01
77.232	.00	.00	848.50	2850.00	857.09	8.59	.04	.01	857.14	.93	1000.00	3572.17
77.353	.00	.00	849.10	1200.00	855.48	6.38	.03	.00	855.51	.94	490.00	1379.74
77.353	.00	.00	849.10	1710.00	856.21	7.11	.04	.00	856.25	.94	490.00	1737.15
77.353	.00	.00	849.10	1950.00	856.57	7.47	.05	.00	856.61	.94	490.00	1911.71
77.353	.00	.00	849.10	2550.00	857.22	8.12	.06	.01	857.28	.94	490.00	2236.99
77.499	.00	.00	846.70	1200.00	855.58	8.88	.06	.02	855.64	-3.12	190.77	713.47
77.499	.00	.00	846.70	1710.00	856.33	9.63	.10	.03	856.42	-3.12	192.26	855.99
77.499	.00	.00	846.70	1950.00	856.69	9.99	.11	.03	856.80	-3.12	192.98	924.66
77.499	.00	.00	846.70	2550.00	857.36	10.66	.15	.05	857.51	-3.12	194.30	1052.96
77.566	.00	.00	848.40	1200.00	855.64	7.24	.12	.03	855.76	4.82	64.00	423.47
77.566	.00	.00	848.40	1710.00	856.40	8.00	.20	.05	856.60	4.82	64.00	472.44
77.566	.00	.00	848.40	1950.00	856.76	8.36	.24	.07	857.00	4.82	64.00	495.37
77.566	.00	.00	848.40	2550.00	857.43	9.03	.35	.10	857.78	4.82	64.00	538.13
77.567	861.00	858.00	848.40	1200.00	855.63	7.23	.14	.01	855.77	.00	64.00	402.02
77.567	861.00	858.00	848.40	1710.00	856.39	7.99	.22	.01	856.61	.00	64.00	450.37
77.567	861.00	858.00	848.40	1950.00	856.75	8.35	.26	.01	857.01	.00	64.00	473.37
77.567	861.00	858.00	848.40	2550.00	857.42	9.02	.30	.02	857.79	.00	64.00	516.36
77.569	.00	.00	848.50	1200.00	855.63	7.13	.14	.00	855.77	6.25	64.00	395.46
77.569	.00	.00	848.50	1710.00	856.39	7.89	.23	.00	856.62	6.25	64.00	444.04
77.569	.00	.00	848.50	1950.00	856.75	8.25	.27	.00	857.02	6.25	64.00	467.04
77.569	.00	.00	848.50	2550.00	857.42	8.92	.39	.00	857.81	6.25	64.00	510.06

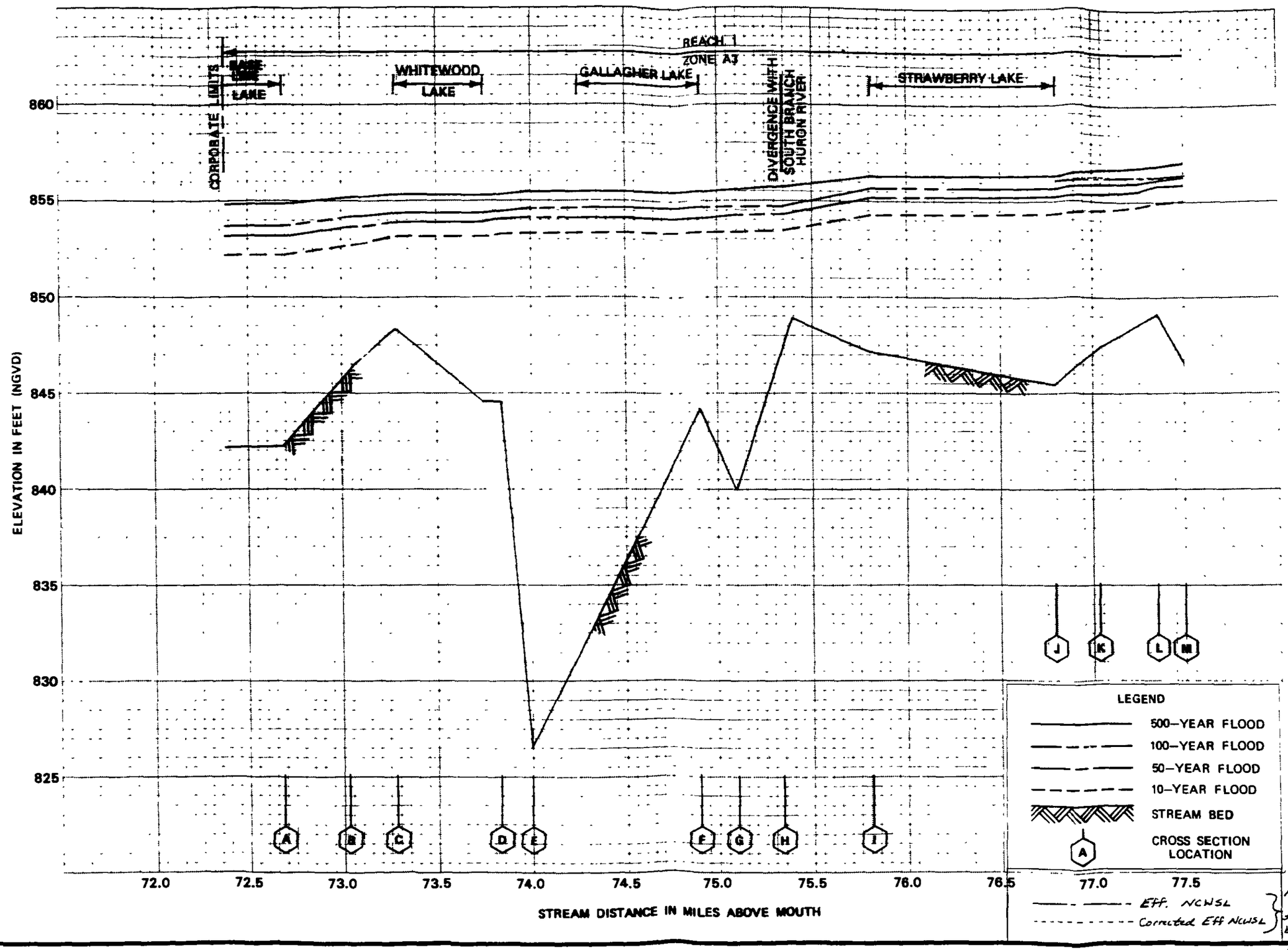
SECNO ELTRD ELLC ELMIN Q CWSEL DEPTH HV OLOSS EG K*CHSL TOPWID AREA

1) COUNTY: Livingston

2) STUDY NAME: Hamburg Twp

3) WATERCOURSE: Huron River

4) DOCUMENT TYPE: CLOMR- Profile



FLOOD PROFILES

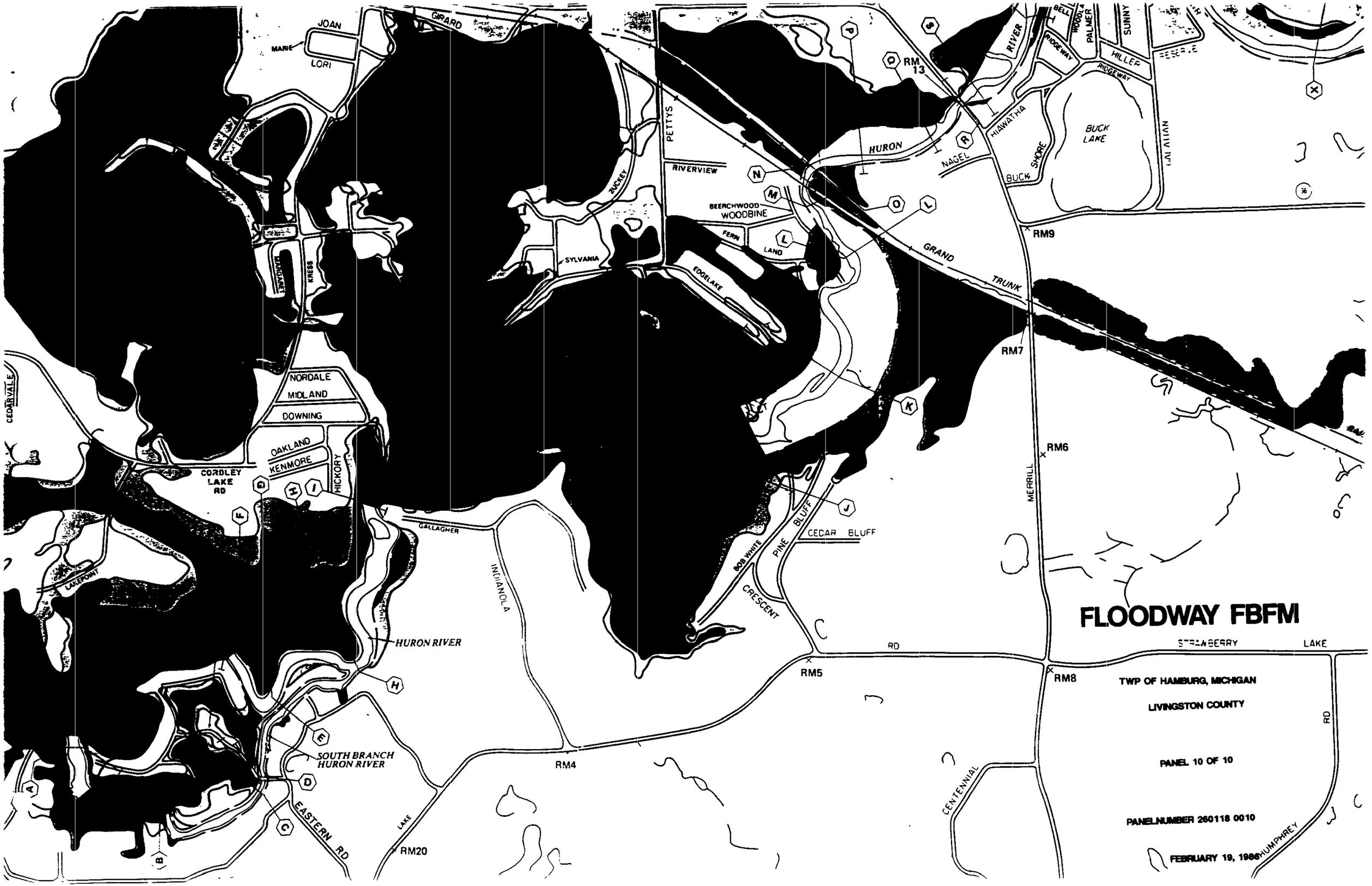
HURON RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWNSHIP OF HAMBURG, MI

(LIVINGSTON CO.)

01P


FLOODWAY FBFM
TWP OF HAMBURG, MICHIGAN
LIVINGSTON COUNTY
PANEL 10 OF 10
PANELNUMBER 260118 0010
FEBRUARY 19, 1986
JOAN
MARIE
LORI
GIRARD
PETTYS
RIVERVIEW
ZUCKEY
SYLVANIA
EDGELAKE
BEECHWOOD
WOODBINE
FERN
LAND
HURON
NAGEL
HIAWATHA
SHORE
BUCK
BUCK LAKE
RIVER
RIDGEWAY
PALMER
SUNNY
HILLER
NAVAJO
GRAND
TRUNK
RM13
RM9
RM7
RM6
RM5
RM4
RM8
RM20
MERRILL
MARGARET
KRESS
NORDALE
MIDLAND
DOWNING
OAKLAND
KENMORE
HICKORY
CORDLEY
LAKE
RD
CEDARVALE
LAKEPOINT
GALLAGHER
INDIANOLA
BOB WHITE
PINE
BLUFF
CEDAR BLUFF
CRESCENT
HURON RIVER
SOUTH BRANCH
HURON RIVER
EASTERN RD
LAKE
CENTENNIAL
STRAWBERRY
LAKE
RD
HUMPHREY
RD

00BREAK00

1) COUNTY: Livingston

2) STUDY NAME: Hamburg Twp

3) WATERCOURSE: Huron River

4) DOCUMENT TYPE: CLOMR - Revised Encroachment

00BREAK00

REVISED MODEL:

ENCROACHED CONDITION

```
1*****************************************
 *  HEC-2 WATER SURFACE PROFILES          *
 *                                        *
 *  Version   4.6.2;  May 1991            *
 *                                        *
 *  RUN DATE    16OCT95    TIME   09:11:05 *
 *****************************************
```

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*****************************************
*  U.S. ARMY CORPS OF ENGINEERS         *
*  HYDROLOGIC ENGINEERING CENTER        *
*  609 SECOND STREET, SUITE D           *
*  DAVIS, CALIFORNIA 95616-4687         *
*          (916) 756-1104               *
*****************************************
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X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X            X     X
X     X  X        X                        X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                  X
X     X  X        X     X            X
X     X  XXXXXXX   XXXXX             XXXXXXX
```

1

16OCT95 09:11:05 PAGE 1

THIS RUN EXECUTED 16OCT95 09:11:05

```
*************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
*************************************
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T1      HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2      100-YEAR NATURAL FLOODWAY - STRAWBERRY LAKE TO  CORPORATE LIMITS
T3      CROSS SECTIONS FOR ENCROACHED CONDITIONS

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

     -1        2                                                          855.13

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

     1                 -1                          .8

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    38        40        41        42        43         1         8        10        12         3
    33         4        25

NC     .06      .125      .040       .3        .5
QT       4      1350      1900     2200      2850

        VALLEY SECTION 20  (0), ENCROACHED DUE TO FILLING
```

```
X1   76.798        26        825       914
X3                                     625                  1145
GR     870                   860        15        858        25        856       255      855.2       385
GR   854.5       730      853.3       825      849.8       828      845.6       845      845.5       860
GR   846.5       875      848.1       890      849.8       900      851.3       910      852.2       914
GR   853.8      1845        854      2095      855.6      2425        856      2805      857.3      2895
GR     856      2945        856      3505      856.3      3595        856      3725        856      3965
GR     868      4045

  CROSS SECTION INSERTED BY MPS DS1

X1   76.817        33        990      1105        110       140        100
X3                                     775                  1365
GR     864         0        865         5        866        12        867        55        868        68
GR     869        90        870       107      870.5       125        870       147        869       160
GR     858       200        857       205        857       267        857       355        856       500
GR     855       660        855       890        854       950        853       990      849.8       995
GR   845.5      1025      852.2      1065        853      1105        854      1347        855      1355
GR     856      1360        857      1365        858      1435        859      1452        859      1470
GR     858      1495        857      1510        856      1560

  CROSS SECTION INSERTED BY MPS US1
1
   16OCT95      09:11:05                                                                          PAGE    2


X1   76.896        17        715       890        420       410        415
X3                                     225                  1060
GR     855         0        854       180        853       260        852       310        852       315
GR     852       320        853       620        853       715      849.8       720      845.5       803
GR   852.2       880        853       890        853      1060        854      1070        855      1115
GR     854      1295        855      1315


NC    .125      .100       .040

        VALLEY SECTION 21 (P), ENCROACHED DUE TO FILLING
X1   77.030        23        770       876        890       630        705
X3                                     300                  1200
GR     880                   860        50        854        70      852.6       770      850.3       773
GR   848.7       790      848.1       805      847.5       813      847.8       825      848.5       835
GR   849.1       843      850.1       853      850.8       865      851.8       875      852.2       876
GR     854      1530        856      1570      857.5      2640        856      3150        856      4010
GR     858      4020        860      4040        866      4080

NC    .125       .06        .04

X1   77.232        27       2080      2186        780       760       1070
X3                                    1200                  2200
GR     880                   864        60        860        80        858       110        854       150
GR     854      1650      853.7      2000      853.6      2080      851.3      2083      849.7      2100
GR   849.1      2115      848.5      2123      848.8      2135      849.5      2145      850.1      2153
GR   851.1      2163      851.8      2175      852.8      2185      853.2      2186        854      2190
GR     856      2220      857.3      2380      857.7      2560      857.8      3000        858      3300
GR     860      3340        870      3390

QT       4      1200       1710      1950       2550
```

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        VALLEY SECTION 22 (Q)
X1   77.353        22        560        672       1060        640        640
X3                                       230                   720
GR     870                   860         60        860        110        854        150      852.9        560
GR     852        562      849.1        582      849.1        592      849.2        601      849.4        610
GR   849.9        627      849.9        642        850        656      851.3        670      853.9        672
GR     854        680      855.7        870        856       1210      857.3       1600        858       1960
GR     860       1980        870       2020

NC    .125        .06        .04

        VALLEY SECTION 23 (R)
X1   77.499        20        390        485        910        570        770
X3                                       290                   500
GR     860                   860        210        856        220        854        350      853.1        390
GR   851.9        395      850.1        410      846.9        420      847.1        432      846.7        443
GR   848.7        455      850.7        470      852.7        475      857.7        485        870        500
GR     870        560        860        680        858        720        858        980        870       1050

1
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X1   77.566        22        560        672        400        420        353
X3                                       562                   626
GR   869.3                  859.3         60      859.3        110      853.3        150      852.2        560
GR   851.3        562      848.4        582      848.4        592      848.5        601      848.7        610
GR   849.2        627      849.2        642      849.3        656      850.6        670      853.2        672
GR   853.3        680        855        870      855.3       1210      856.6       1600      857.3       1960
GR   859.3       1980      869.3       2020

NC     .04        .04       .025

        BRIDGE SECTION 4 - ANN ARBOR RAILROAD - D/S FACE (S)
X1   77.567        22        300        364          1          1          1
BT      12         0        861          0        100        861          0        200      861.9          0
BT   296.9      861.9          0        297      865.2          0        300      865.2      858.8        364
BT   865.2      858.8        367      865.2          0      367.1      862.1          0        400      862.1
BT       0        500      862.1          0        600      862.2          0
GR     861          0        861        100      861.9        200      861.9      296.9      858.8      296.9
GR   858.8        300      853.1        300      853.1      301.3      849.2      301.5      848.8        310
GR   848.8        320      848.4        330      849.2        340      849.6        350      850.9      362.5
GR   852.7      362.7      852.7        364      858.8        364      862.1      367.1      862.1        400
GR   862.1        500      862.2        600

1
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    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

*PROF 1
```

```
0

 CCHV=      .300 CEHV=      .500
 *SECNO 76.798

 3470 ENCROACHMENT STATIONS=       625.0    1145.0  TYPE=       1  TARGET=       520.000
     76.798      9.63     855.13       .00     855.13     855.17       .04        .00        .00     853.30
     1350.0      51.9     1118.5     179.6      171.8      656.3     631.0         .0         .0     852.20
        .00       .30       1.70       .28       .048       .032      .100       .000     845.50     625.00
    .000098        0.         0.        0.          0          0         0        .00     520.00    1145.00


 *SECNO 76.817

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .69


 3470 ENCROACHMENT STATIONS=       775.0    1365.0  TYPE=       1  TARGET=       590.000
     76.817      9.64     855.14       .00        .00     855.19       .05        .01        .01     853.00
     1350.0      55.1     1176.5     118.4      120.4      596.8     402.4        3.5        1.5     853.00
        .02       .46       1.97       .29       .048       .032      .100       .000     845.50     775.00
    .000205      110.       100.      140.          0          0         0        .00     580.71    1355.71


 *SECNO 76.896
 3280 CROSS SECTION     76.90 EXTENDED       .21 FEET


 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.89


 3470 ENCROACHMENT STATIONS=       225.0    1060.0  TYPE=       1  TARGET=       835.000
     76.896      9.72     855.22       .00        .00     855.23       .01        .02        .01     853.00
     1350.0     364.1      939.4      46.5     1259.7     1162.2     375.5       22.2        8.3     853.00
        .20       .29        .81       .12       .048       .032      .100       .000     845.50     225.00
    .000025      420.       415.      410.          1          0         0        .00     835.00    1060.00


 *SECNO 77.030

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .56

1
    16OCT95       09:11:05                                                                                                PAGE     5

     SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
     Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
     TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
     SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


 3470 ENCROACHMENT STATIONS=       300.0    1200.0  TYPE=       1  TARGET=       900.000
     77.030      7.74     855.24       .00        .00     855.26       .02        .03        .01     852.60
     1350.0     224.1      866.6     259.4     1021.0      641.3     841.3       68.9       23.9     852.20
        .41       .22       1.35       .31       .100       .032      .080       .000     847.50     300.00
    .000078      890.       705.      630.          2          0         0        .00     900.00    1200.00
```

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*SECNO 77.232

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .65


3470 ENCROACHMENT STATIONS=      1200.0    2200.0  TYPE=       1  TARGET=      1000.000
    77.232      6.84     855.34       .00       .00     855.38       .04       .11       .01     853.60
    1350.0     324.1     1017.6       8.3    1262.5      546.0      17.1     111.4      41.6     853.20
       .59       .26       1.86       .48      .100       .032      .048      .000    848.50    1200.00
   .000184      780.      1070      760.         2          0         0       .00   1000.00    2200.00


*SECNO 77.353

3470 ENCROACHMENT STATIONS=       230.0     720.0  TYPE=       1  TARGET=       490.000
    77.353      6.36     855.46       .00       .00     855.50       .03       .11       .00     852.90
    1200.0     191.4      982.5      26.1     697.0      611.8      63.1     144.3      58.4     853.90
       .74       .27       1.61       .41      .100       .032      .048      .000    849.10     230.00
   .000127     1060.       640.      640.         1          0         0       .00    490.00     720.00


*SECNO 77.499

3470 ENCROACHMENT STATIONS=       290.0     500.0  TYPE=       1  TARGET=       210.000
    77.499      8.87     855.57       .00       .00     855.63       .06       .12       .02     853.10
    1200.0      39.7     1160.3        .0     147.6      563.2        .0     163.9      65.0     857.70
       .85       .27       2.06       .00      .100       .032      .000      .000    846.70     290.00
   .000178      910.       770.      570.         1          0         0       .00    190.75     480.75


*SECNO 77.566

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .69

1
   16OCT95      09:11:05                                                                                                PAGE     6

    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


3470 ENCROACHMENT STATIONS=       562.0     626.0  TYPE=       1  TARGET=        64.000
    77.566      7.22     855.62       .00       .00     855.75       .13       .09       .03 100000.00
    1200.0        .0     1200.0        .0        .0      422.6        .0     168.6      66.0 100000.00
       .88       .00       2.84       .00      .000       .032      .000      .000    848.40     562.00
   .000373      400.       353.      420.         0          0         0       .00     64.00     626.00


*SECNO 77.567

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.47
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3370 NORMAL BRIDGE, NRD=  12 MIN ELTRD=   861.00 MAX ELLC=   858.80

    77.567      7.22    855.62       .00       .00    855.76       .14       .00       .01    858.80
    1200.0        .0    1200.0        .0        .0     401.1        .0     168.6      66.0    858.80
       .88       .00      2.99       .00      .000      .020      .000      .000    848.40    300.00
   .000173        1.        1.        1.         0         0         0       .00     64.00    364.00


1
   16OCT95      09:11:05                                                                                PAGE    7

 T1      HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
 T2      100-YEAR NATURAL FLOODWAY - STRAWBERRY LAKE TO  CORPORATE LIMITS
 T3      HURON RIVER - PROJECT MANAGER, M.S.CHENG

 J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

       -1       3                                                                   855.82

 J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

       2                 -1                            .8


1
   16OCT95      09:11:05                                                                                PAGE    8

     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

 *PROF 2
0

 CCHV=     .300 CEHV=     .500
 *SECNO 76.798

 3470 ENCROACHMENT STATIONS=      625.0    1145.0  TYPE=      1  TARGET=      520.000
    76.798     10.32    855.82       .00    855.82    855.87       .05       .00       .00    853.30
    1900.0     146.4    1460.2     293.5     309.8     717.7     790.4        .0        .0    852.20
       .00       .47      2.03       .37      .048      .032      .100      .000    845.50    625.00
   .000123        0.        0.        0.         0         0         0       .00    520.00   1145.00


 *SECNO 76.817

 3470 ENCROACHMENT STATIONS=      775.0    1365.0  TYPE=      1  TARGET=      590.000
    76.817     10.33    855.83       .00       .00    855.89       .06       .02       .01    853.00
    1900.0     160.2    1515.7     224.1     269.4     676.5     577.3       4.5       1.5    853.00
       .02       .59      2.24       .39      .048      .032      .100      .000    845.50    775.00
   .000224      110.      100.      140.         0         0         0       .00    584.17   1359.17
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*SECNO 76.896
3280 CROSS SECTION     76.90 EXTENDED       .93 FEET

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.76

3470 ENCROACHMENT STATIONS=      225.0    1060.0  TYPE=      1  TARGET=      835.000
    76.896     10.43    855.93       .00       .00    855.94       .01       .03       .02    853.00
    1900.0     598.8    1220.1     81.1    1611.3    1287.7     497.5      28.0       8.3    853.00
       .17       .37       .95       .16      .048      .032      .100      .000    845.50    225.00
   .000029      420.      415.      410.         2         0         0       .00    835.00   1060.00

*SECNO 77.030

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .58

3470 ENCROACHMENT STATIONS=      300.0    1200.0  TYPE=      1  TARGET=      900.000
    77.030      8.46    855.96       .00       .00    855.98       .02       .04       .01    852.60
    1900.0     381.1    1107.1    411.8    1356.0     716.9    1072.2      85.9      24.0    852.20
       .37       .28      1.54       .38      .100      .032      .080      .000    847.50    300.00
   .000088      890.      705.      630.         2         0         0       .00    900.00   1200.00
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    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

*SECNO 77.232

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .70

3470 ENCROACHMENT STATIONS=     1200.0    2200.0  TYPE=      1  TARGET=     1000.000
    77.232      7.56    856.06       .00       .00    856.10       .04       .12       .01    853.60
    1900.0     630.1    1253.0     16.8    1894.8     622.2      27.1     141.0      41.6    853.20
       .56       .33      2.01       .62      .100      .032      .048      .000    848.50   1200.00
   .000180      780.     1070.      760.         2         0         0       .00   1000.00   2200.00

*SECNO 77.353

3470 ENCROACHMENT STATIONS=      230.0     720.0  TYPE=      1  TARGET=      490.000
    77.353      7.08    856.18       .00       .00    856.23       .04       .12       .00    852.90
    1710.0     338.9    1313.0     58.1     934.9     692.6      97.7     186.0      58.4    853.90
       .69       .36      1.90       .59      .100      .032      .048      .000    849.10    230.00
   .000150     1060.      640.      640.         1         0         0       .00    490.00    720.00
```

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*SECNO 77.499

3470 ENCROACHMENT STATIONS=      290.0     500.0  TYPE=      1  TARGET=      210.000
    77.499      9.61    856.31       .00       .00    856.40       .10       .15       .03    853.10
    1710.0      88.6    1621.4        .0     221.2     630.5        .0     210.5      65.0    857.70
       .78       .40      2.57       .00      .100      .032      .000      .000    846.70    290.00
   .000244      910.      770       570.         0         0         0       .00    192.22    482.22


*SECNO 77.566

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .67


3470 ENCROACHMENT STATIONS=      562.0     626.0  TYPE=      1  TARGET=       64.000
    77.566      7.98    856.38       .00       .00    856.58       .20       .12       .05 100000.00
    1710.0        .0    1710.0        .0        .0     471.1        .0     215.9      66.1 100000.00
       .81       .00      3.63       .00      .000      .032      .000      .000    848.40    562.00
   .000541      400.      353.      420.         0         0         0       .00     64.00    626.00


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    SECNO      DEPTH      CWSEL      CRIWS      WSELR      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


*SECNO 77.567

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.48


3370 NORMAL BRIDGE, NRD=  12 MIN ELTRD=   861.00 MAX ELLC=   858.80

    77.567      7.97    856.37       .00       .00    856.59       .23       .00       .01    858.80
    1710.0        .0    1710.0        .0        .0     449.0        .0     215.9      66.1    858.80
       .81       .00      3.81       .00      .000      .020      .000      .000    848.40    300.00
   .000248        1.        1.        1.         1         0         0       .00     64.00    364.00


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T1      HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2      100-YEAR NATURAL FLOODWAY - STRAWBERRY LAKE TO  CORPORATE LIMITS
T3      HURON RIVER - PROJECT MANAGER, M.S.CHENG

J1  ICHECK     INQ        NINV       IDIR       STRT       METRIC     HVINS      Q          WSEL       FQ

      -1         4                                                                          856.16

J2  NPROF      IPLOT      PRFVS      XSECV      XSECH      FN         ALLDC      IBW        CHNIM      ITRACE
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     3                  -1                                .8

1
   16OCT95      09:11:05                                                                                                PAGE   12

    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

 *PROF 3
0

 CCHV=     .300 CEHV=     .500
 *SECNO 76.798

 3470 ENCROACHMENT STATIONS=      625.0    1145.0  TYPE=      1  TARGET=      520.000
     76.798     10.66     856.16       .00     856.16     856.22       .06       .00       .00     853.30
     2200.0     210.3     1631.6     358.1      377.8      747.9     868.9        .0        .0     852.20
        .00       .56       2.18       .41       .048       .032      .100      .000    845.50     625.00
    .000134        0.         0.        0.          0          0         0       .00    520.00    1145.00

 *SECNO 76.817
 3280 CROSS SECTION     76.82 EXTENDED       .18 FEET

 3470 ENCROACHMENT STATIONS=      775.0    1365.0  TYPE=      1  TARGET=      590.000
     76.817     10.67     856.17       .00       .00     856.24       .07       .02       .01     853.00
     2200.0     232.8     1682.1     285.1     342.8      715.7     664.4       5.1       1.5     853.00
        .02       .68       2.35       .43       .048       .032      .100      .000    845.50     775.00
    .000228      110.       100.      140.          0          0         0       .00    585.88    1360.88

 *SECNO 76.896
 3280 CROSS SECTION     76.90 EXTENDED      1.27 FEET

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.69

 3470 ENCROACHMENT STATIONS=      225.0    1060.0  TYPE=      1  TARGET=      835.000
     76.896     10.77     856.27       .00       .00     856.28       .01       .03       .02     853.00
     2200.0     733.0     1365.9     101.2    1781.3    1348.4     556.5      30.9       8.3     853.00
        .16       .41       1.01       .18       .048       .032      .100      .000    845.50     225.00
    .000032      420.       415.      410.          2          0         0       .00    835.00    1060.00

 *SECNO 77.030

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .59

1
   16OCT95      09:11:05                                                                                                PAGE   13
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   SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
   Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
   TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WIN        ELMIN      SSTA
   SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


3470 ENCROACHMENT STATIONS=      300.0    1200.0  TYPE=      1  TARGET=      900.000
   77.030      8.80     856.30       .00        .00     856.33       .02        .04        .01     852.60
   2200.0     471.3    1231.3     497.4     1520.0      753.9    1185.2       94.2       24.0     852.20
      .36       .31      1.63       .42       .100       .032      .080       .000     847.50     300.00
  .000092      890.      705.      630.          2          0         0        .00     900.00    1200.00


*SECNO 77.232

3470 ENCROACHMENT STATIONS=     1200.0    2200.0  TYPE=      1  TARGET=     1000.000
   77.232      7.91     856.41       .00        .00     856.46       .04        .12        .01     853.60
   2200.0     805.6    1372.7      21.7     2203.9      659.4      32.0      155.5       41.6     853.20
      .54       .37      2.08       .68       .100       .032      .048       .000     848.50    1200.00
  .000178      780.     1070.      760.          2          0         0        .00    1000.00    2200.00


*SECNO 77.353

3470 ENCROACHMENT STATIONS=      230.0     720.0  TYPE=      1  TARGET=      490.000
   77.353      7.44     856.54       .00        .00     856.58       .05        .13        .00     852.90
   1950.0     416.6    1457.1      76.3     1051.1      732.0     114.6      206.4       58.4     853.90
      .67       .40      1.99       .67       .100       .032      .048       .000     849.10     230.00
  .000153     1060.      640.      640.          1          0         0        .00     490.00     720.00


*SECNO 77.499

3470 ENCROACHMENT STATIONS=      290.0     500.0  TYPE=      1  TARGET=      210.000
   77.499      9.96     856.66       .00        .00     856.77       .11        .16        .03     853.10
   1950.0     117.5    1832.5        .0      256.5      663.1        .0      233.2       65.0     857.70
      .76       .46      2.76       .00       .100       .032      .000       .000     846.70     290.00
  .000267      910.      770.      570.          0          0         0        .00     192.92     482.92


*SECNO 77.566

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .66


3470 ENCROACHMENT STATIONS=      562.0     626.0  TYPE=      1  TARGET=       64.000
   77.566      8.33     856.73       .00        .00     856.97       .24        .14        .07 100000.00
   1950.0        .0    1950.0        .0         .0      493.8        .0      239.0       66.1 100000.00
      .78       .00      3.95       .00       .000       .032      .000       .000     848.40     562.00
  .000609      400.      353.      420.          1          0         0        .00      64.00     626.00
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    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

*SECNO 77.567

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.48

3370 NORMAL BRIDGE, NRD=  12 MIN ELTRD=   861.00 MAX ELLC=   858.80

    77.567      8.32     856.72       .00        .00     856.99       .27        .00        .01     858.80
    1950.0        .0     1950.0        .0        .0      471.8        .0      239.0       66.1     858.80
       .78       .00       4.13       .00       .000       .020      .000       .000     848.40     300.00
   .000276        1.         1.        1.         1          0         0        .00      64.00     364.00
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1


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T1      HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2      100-YEAR NATURAL FLOODWAY - STRAWBERRY LAKE TO  CORPORATE LIMITS
T3      HURON RIVER - PROJECT MANAGER, M.S.CHENG

J1  ICHECK     INQ        NINV       IDIR       STRT       METRIC     HVINS      Q          WSEL       FQ

      -1         5                                                                          856.77

J2  NPROF      IPLOT      PRFVS      XSECV      KSECH      FN         ALLDC      IBW        CHNIM      ITRACE

      4                     -1                               .8
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    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

*PROF 4
0

CCHV=     .300 CEHV=     .500
*SECNO 76.798

3470 ENCROACHMENT STATIONS=      625.0    1145.0  TYPE=      1  TARGET=      520.000
    76.798     11.27     856.77       .00     856.77     856.84       .07       .00        .00     853.30
    2850.0     360.4     1990.9     498.6      499.8      802.2     1009.8        .0         .0     852.20
       .00       .72       2.48       .49       .048       .032      .100      .000     845.50     625.00
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   .000158        0.        0.        0.        0        0        0      .00   520.00   1145.00

*SECNO 76.817
3280 CROSS SECTION     76.82 EXTENDED       .79 FEET

3470 ENCROACHMENT STATIONS=      775.0    1365.0  TYPE=      1  TARGET=      590.000
    76.817     11.29    856.79      .00       .00    856.86      .08       .02       .00    853.00
    2850.0     400.7    2031.7    417.5     474.5     786.2    822.1       6.0       1.5    853.00
       .01       .84      2.58      .51      .048      .032     .100      .000    845.50    775.00
   .000244      110.      100.     140.         0         0        0       .00    588.94   1363.94

*SECNO 76.896
3280 CROSS SECTION     76.90 EXTENDED      1.90 FEET

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.58

3470 ENCROACHMENT STATIONS=      225.0    1060.0  TYPE=      1  TARGET=      835.000
    76.896     11.40    856.90      .00       .00    856.91      .01       .03       .02    853.00
    2850.0    1027.9    1676.5    145.6    2088.4    1458.1    663.0      36.0       8.3    853.00
       .15       .49      1.15      .22      .048      .032     .100      .000    845.50    225.00
   .000037      420.      415.     410.         2         0        0       .00    835.00   1060.00

*SECNO 77.030

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .60

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    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

3470 ENCROACHMENT STATIONS=      300.0    1200.0  TYPE=      1  TARGET=      900.000
    77.030      9.44    856.94      .00       .00    856.96      .03       .04       .01    852.60
    2850.0     669.0    1497.4    683.6    1816.8     820.8   1389.8     109.2      24.0    852.20
       .33       .37      1.82      .49      .100      .032     .080      .000    847.50    300.00
   .000102      890.      705.     630.         2         0        0       .00    900.00   1200.00

*SECNO 77.232

3470 ENCROACHMENT STATIONS=     1200.0    2200.0  TYPE=      1  TARGET=     1000.000
    77.232      8.55    857.05      .00       .00    857.10      .05       .12       .01    853.60
    2850.0    1186.8    1631.1     32.1    2766.3     727.2    41.0     181.7      41.6    853.20
       .50       .43      2.24      .78      .100      .032     .048      .000    848.50   1200.00
   .000182      780.     1070.     760.         2         0        0       .00   1000.00   2200.00
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```
*SECNO 77.353

3470 ENCROACHMENT STATIONS=      230.0     720.0  TYPE=      1  TARGET=      490.000
    77.353      8.08    857.18       .00       .00    857.24       .06       .14       .01    852.90
    2550.0     606.4    1822.6     121.0    1267.7     805.5     146.1     243.5      58.4    853.90
       .63       .48      2.26       .83      .100      .032      .048      .000    849.10    230.00
   .000175     1060.      640.      640.         2         0         0       .00    490.00    720.00


*SECNO 77.499

3470 ENCROACHMENT STATIONS=      290.0     500.0  TYPE=      1  TARGET=      210.000
    77.499     10.62    857.32       .00       .00    857.48       .15       .19       .05    853.10
    2550.0     190.8    2359.2        .0     322.1     724.5        .0     274.5      65.0    857.70
       .70       .59      3.26       .00      .100      .032      .000      .000    846.70    290.00
   .000336      910.      770.      570.         0         0         0       .00    194.24    484.24


*SECNO 77.566

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .64


3470 ENCROACHMENT STATIONS=      562.0     626.0  TYPE=      1  TARGET=       64.000
    77.566      9.00    857.40       .00       .00    857.75       .35       .18       .10 100000.00
    2550.0        .0    2550.0        .0        .0     536.2        .0     281.1      66.1 100000.00
       .72       .00      4.76       .00      .000      .032      .000      .000    848.40    562.00
   .000810      400.      353.      420.         2         0         0       .00     64.00    626.00


1
   16OCT95      09:11:05                                                                                                PAGE    18

    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


*SECNO 77.567

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.49


3370 NORMAL BRIDGE, NRD=  12 MIN ELTRD=   861.00 MAX ELLC=   858.80

    77.567      8.98    857.38       .00       .00    857.77       .38       .00       .02    858.80
    2550.0        .0    2550.0        .0        .0     514.4        .0     281.1      66.1    858.80
       .72       .00      4.96       .00      .000      .020      .000      .000    848.40    300.00
   .000363        1.        1.        1.         1         0         0       .00     64.00    364.00


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   16OCT95      09:11:05                                                                                                PAGE    19
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THIS RUN EXECUTED 16OCT95 09:11:06

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************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

CROSS SECTIONS FOR ENCRO

SUMMARY PRINTOUT

	SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	K*CHSL	TOPWID	AREA
	76.798	.00	.00	845.50	1350.00	855.13	9.63	.04	.00	855.17	.00	520.00	1459.06
	76.798	.00	.00	845.50	1900.00	855.82	10.32	.05	.00	855.87	.00	520.00	1817.86
	76.798	.00	.00	845.50	2200.00	856.16	10.66	.06	.00	856.22	.00	520.00	1994.64
	76.798	.00	.00	845.50	2850.00	856.77	11.27	.07	.00	856.84	.00	520.00	2311.87
*	76.817	.00	.00	845.50	1350.00	855.14	9.64	.05	.01	855.19	.00	580.71	1119.54
	76.817	.00	.00	845.50	1900.00	855.83	10.33	.06	.01	855.89	.00	584.17	1523.20
	76.817	.00	.00	845.50	2200.00	856.17	10.67	.07	.01	856.24	.00	585.88	1722.80
	76.817	.00	.00	845.50	2850.00	856.79	11.29	.08	.00	856.86	.00	588.94	2082.80
*	76.896	.00	.00	845.50	1350.00	855.22	9.72	.01	.01	855.23	.00	835.00	2797.39
*	76.896	.00	.00	845.50	1900.00	855.93	10.43	.01	.02	855.94	.00	835.00	3396.48
*	76.896	.00	.00	845.50	2200.00	856.27	10.77	.01	.02	856.28	.00	835.00	3686.16
*	76.896	.00	.00	845.50	2850.00	856.90	11.40	.01	.02	856.91	.00	835.00	4209.61
*	77.030	.00	.00	847.50	1350.00	855.24	7.74	.02	.01	855.26	2.84	900.00	2503.63
*	77.030	.00	.00	847.50	1900.00	855.96	8.46	.02	.01	855.98	2.84	900.00	3145.07
*	77.030	.00	.00	847.50	2200.00	856.30	8.80	.02	.01	856.33	2.84	900.00	3459.11
*	77.030	.00	.00	847.50	2850.00	856.94	9.44	.03	.01	856.96	2.84	900.00	4027.49
*	77.232	.00	.00	848.50	1350.00	855.34	6.84	.04	.01	855.38	.93	1000.00	1825.62
*	77.232	.00	.00	848.50	1900.00	856.06	7.56	.04	.01	856.10	.93	1000.00	2544.12
	77.232	.00	.00	848.50	2200.00	856.41	7.91	.04	.01	856.46	.93	1000.00	2895.32
	77.232	.00	.00	848.50	2850.00	857.05	8.55	.05	.01	857.10	.93	1000.00	3534.42
	77.353	.00	.00	849.10	1200.00	855.46	6.36	.03	.00	855.50	.94	490.00	1371.91
	77.353	.00	.00	849.10	1710.00	856.18	7.08	.04	.00	856.23	.94	490.00	1725.12
	77.353	.00	.00	849.10	1950.00	856.54	7.44	.05	.00	856.58	.94	490.00	1897.68
	77.353	.00	.00	849.10	2550.00	857.18	8.08	.06	.01	857.24	.94	490.00	2219.36
	77.499	.00	.00	846.70	1200.00	855.57	8.87	.06	.02	855.63	-3.12	190.75	710.77
	77.499	.00	.00	846.70	1710.00	856.31	9.61	.10	.03	856.40	-3.12	192.22	851.64
	77.499	.00	.00	846.70	1950.00	856.66	9.96	.11	.03	856.77	-3.12	192.92	919.59
	77.499	.00	.00	846.70	2550.00	857.32	10.62	.15	.05	857.48	-3.12	194.24	1046.64

	SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	K*CHSL	TOPWID	AREA
*	77.566	.00	.00	848.40	1200.00	855.62	7.22	.13	.03	855.75	4.82	64.00	422.58
*	77.566	.00	.00	848.40	1710.00	856.38	7.98	.20	.05	856.58	4.82	64.00	471.07
*	77.566	.00	.00	848.40	1950.00	856.73	8.33	.24	.07	856.97	4.82	64.00	493.78
*	77.566	.00	.00	848.40	2550.00	857.40	9.00	.35	.10	857.75	4.82	64.00	536.15
*	77.567	861.00	858.80	848.40	1200.00	855.62	7.22	.14	.01	855.76	.00	64.00	401.12
*	77.567	861.00	858.80	848.40	1710.00	856.37	7.97	.23	.01	856.59	.00	64.00	449.01
*	77.567	861.00	858.80	848.40	1950.00	856.72	8.32	.27	.01	856.99	.00	64.00	471.77
*	77.567	861.00	858.80	848.40	2550.00	857.38	8.98	.38	.02	857.77	.00	64.00	514.38

1

SUMMARY OF ERRORS AND SPECIAL NOTES

```
WARNING SECNO=     76.817  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     76.896  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     76.896  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     76.896  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     76.896  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     77.030  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     77.030  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     77.030  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     77.030  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     77.232  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     77.232  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     77.566  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     77.566  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     77.566  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     77.566  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     77.567  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     77.567  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     77.567  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     77.567  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
```

00BREAK00

1) COUNTY: Livingston ~~County~~

2) STUDY NAME: Hamburg Twp

3) WATERCOURSE: Huron River

4) DOCUMENT TYPE: CLOMR- Revised - Natural

REVISED MODEL:

NATURAL CONDITION

```
1*****************************************
 *  HEC-2 WATER SURFACE PROFILES          *
 *                                        *
 *  Version   4.6.2;  May 1991            *
 *                                        *
 *  RUN DATE    16OCT95    TIME   09:09:07 *
 *****************************************
```

```
*************************************
*  U.S. ARMY CORPS OF ENGINEERS     *
*  HYDROLOGIC ENGINEERING CENTER    *
*  609 SECOND STREET, SUITE D       *
*  DAVIS, CALIFORNIA 95616-4687     *
*          (916) 756-1104           *
*************************************
```

```
X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X            X     X
X     X  X        X                        X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                  X
X     X  X        X     X            X
X     X  XXXXXXX   XXXXX             XXXXXXX
```

1

16OCT95 09:09:07 PAGE 1

THIS RUN EXECUTED 16OCT95 09:09:07

```
*************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
*************************************
```

```
T1      HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2      100-YEAR NATURAL FLOODWAY - STRAWBERRY LAKE TO  CORPORATE LIMITS
T3      CROSS SECTIONS FOR NATURAL CONDITIONS

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

      -1       2                                                          856.09

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

      1                -1                          .8

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38       40       41       42       43       1        8        10       12       3
     33        4       25

NC      .06      .125      .040       .3       .5
QT        1      2200

        VALLEY SECTION 20 (0), ENCROACHED DUE TO FILLING
```

```
X1   76.798        26       825       914
X3                                    625                  1145
GR     870                  860        15       858        25       856       255     855.2       385
GR   854.5        730     853.3       825     849.8       828     845.6       845     845.5       860
GR   846.5        875     848.1       890     849.8       900     851.3       910     852.2       914
GR   853.8       1845       854      2095     855.6      2425       856      2805     857.3      2895
GR     856       2945       856      3505     856.3      3595       856      3725       856      3965
GR     868       4045

  CROSS SECTION INSERTED BY MPS DS1

X1   76.817        33       990      1105       110       140       100
X3                                    775                  1365
GR     864          0       865         5       866        12       867        55       868        68
GR     869         90       870       107     870.5       125       870       147       869       160
GR     858        200       857       205       857       267       857       355       856       500
GR     855        660       855       890       854       950       853       990     849.8       995
GR   845.5       1025     852.2      1065       853      1105       854      1347       855      1355
GR     856       1360       857      1365       858      1435       859      1452       859      1470
GR     858       1495       857      1510       856      1560

  CROSS SECTION INSERTED BY MPS US1
1
   16OCT95      09:09:07                                                                          PAGE    2


X1   76.896        17       715       890       420       410       415
X3                                    200                  1060
GR     855          0       854       180       853       260       852       310       852       315
GR     852       320       853       620       853       715     849.8       720     845.5       803
GR   852.2       880       853       890       853      1060       854      1070       855      1115
GR     854      1295       855      1315


NC    .125      .100      .040

        VALLEY SECTION 21 (P), ENCROACHED DUE TO FILLING
X1   77.030        23       770       876       890       630       705
X3                                                         1375
GR     880                  860        50       854        70     852.6       770     850.3       773
GR   848.7       790     848.1       805     847.5       813     847.8       825     848.5       835
GR   849.1       843     850.1       853     850.8       865     851.8       875     852.2       876
GR     854      1530       856      1570     857.5      2640       856      3150       856      4010
GR     858      4020       860      4040       866      4080

NC    .125       .06       .04

X1   77.232        27      2080      2186       780       760      1070
X3                                    860                  2275
GR     880                  864        60       860        80       858       110       854       150
GR     854      1650     853.7      2000     853.6      2080     851.3      2083     849.7      2100
GR   849.1      2115     848.5      2123     848.8      2135     849.5      2145     850.1      2153
GR   851.1      2163     851.8      2175     852.8      2185     853.2      2186       854      2190
GR     856      2220     857.3      2380     857.7      2560     857.8      3000       858      3300
GR     860      3340       870      3390

QT       1      1950
```

```
3470 ENCROACHMENT STATIONS=      625.0    1145.0  TYPE=      1  TARGET=      520.000
    76.798     10.59    856.09       .00    856.09    856.15       .06       .00       .00    853.30
    2200.0     202.1    1643.4     354.5     363.8     741.7     852.7        .0        .0    852.20
       .00       .56      2.22       .42      .048      .032      .100      .000    845.50    625.00
   .000140        0.        0.        0.         0         0         0       .00    520.00   1145.00

*SECNO 76.817
3280 CROSS SECTION     76.82 EXTENDED       .11 FEET

3470 ENCROACHMENT STATIONS=      775.0    1365.0  TYPE=      1  TARGET=      590.000
    76.817     10.60    856.10       .00       .00    856.17       .07       .02       .01    853.00
    2200.0     223.5    1696.3     280.2     327.9     707.7     646.7       4.9       1.5    853.00
       .02       .68      2.40       .43      .048      .032      .100      .000    845.50    775.00
   .000241      110.      100.      140.         0         0         0       .00    585.53   1360.53

*SECNO 76.896
3280 CROSS SECTION     76.90 EXTENDED      1.21 FEET

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.74

3470 ENCROACHMENT STATIONS=      200.0    1060.0  TYPE=      1  TARGET=      860.000
    76.896     10.71    856.21       .00       .00    856.22       .01       .03       .02    853.00
    2200.0     740.7    1360.4      98.9    1815.0    1337.1     545.5      30.6       8.4    853.00
       .16       .41      1.02       .18      .048      .032      .100      .000    845.50    200.00
   .000032      420.      415.      410.         2         0         0       .00    860.00   1060.00

*SECNO 77.030

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .67
```



```
    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WIN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

3470 ENCROACHMENT STATIONS=         .0    1375.0  TYPE=      1  TARGET=     1374.999
    77.030      8.74    856.24        00       .00    856.26       .02       .03       .00    852.60
    2200.0     534.5    1075.9     589.6    2066.7     747.1    1673.5     103.2      28.0    852.20
       .40       .26      1.44       .35      .100      .032      .080      .000    847.50     62.53
   .000072      890.      705.      630.         2         0         0       .00   1312.47   1375.00

*SECNO 77.232

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .70
```

```
3470 ENCROACHMENT STATIONS=      860.0    2275.0  TYPE=      1  TARGET=     1415.000
    77.232      7.83    856.33       .00       .00    856.36       .03       .09       .01    853.60
    2200.0     946.7    1226.5      26.8    2918.4     650.2      57.2     180.1      52.9    853.20
       .62       .32      1.89       .47      .100      .032      .048      .000    848.50    860.00
   .000149      780.     1070.      760.         2         0         0       .00   1400.13   2260.13

*SECNO 77.353

3470 ENCROACHMENT STATIONS=      230.0     720.0  TYPE=      1  TARGET=      490.000
    77.353      7.34    856.44       .00       .00    856.49       .05       .12       .01    852.90
    1950.0     409.3    1466.9      73.9    1021.4     721.9     110.3     239.3      74.3    853.90
       .75       .40      2.03       .67      .100      .032      .048      .000    849.10    230.00
   .000163     1060.      640.      640.         2         0         0       .00    490.00    720.00

*SECNO 77.499

3470 ENCROACHMENT STATIONS=      290.0     500.0  TYPE=      1  TARGET=      210.000
    77.499      9.87    856.57       .00       .00    856.68       .12       .16       .03    853.10
    1950.0     112.9    1837.1        .0     246.5     653.9        .0     265.5      80.9    857.70
       .83       .46      2.81       .00      .100      .032      .000      .000    846.70    290.00
   .000280      910.      770.      570.         1         0         0       .00    192.72    482.72

*SECNO 77.566

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .67

1
   16OCT95      09:09:07                                                                                                PAGE     7

    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


3470 ENCROACHMENT STATIONS=      562.0     626.0  TYPE=      1  TARGET=       64.000
    77.566      8.25    856.65       .00       .00    856.89       .25       .14       .07 100000.00
    1950.0        .0    1950.0        .0        .0     488.5        .0     271.2      82.0 100000.00
       .86       .00      3.99       .00      .000      .032      .000      .000    848.40    562.00
   .000630      400.      353.      420.         0         0         0       .00     64.00    626.00

*SECNO 77.567

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.48


3370 NORMAL BRIDGE, NRD=  12 MIN ELTRD=   861.00 MAX ELLC=   858.80

    77.567      8.23    856.63       .00       .00    856.91       .27       .00       .01    858.80
    1950.0        .0    1950.0        .0        .0     466.2        .0     271.2      82.0    858.80
```

```
      .86       .00      4.18       .00      .000      .020      .000      .000    848.40    300.00
   .000287       1.        1.        1.         1         0         0       .00     64.00    364.00


*SECNO 77.569
    77.569      8.14    856.64       .00       .00    856.91       .28       .00       .00    858.80
    1950.0        .0    1950.0        .0        .0     459.9        .0     271.4      82.0    858.80
      .86       .00      4.24       .00      .000      .020      .000      .000    848.50    300.00
   .000299       16.       16.       16.         0         0         0       .00     64.00    364.00


*SECNO 77.570

3470 ENCROACHMENT STATIONS=      561.0     627.0  TYPE=      1  TARGET=       66.000
    77.570      8.19    856.69       .00       .00    856.93       .24       .00       .01 100000.00
    1950.0        .0    1950.0        .0        .0     497.5        .0     271.4      82.0 100000.00
      .86       .00      3.92       .00      .000      .032      .000      .000    848.50    561.00
   .000609       1.        1.        1.         2         0         0       .00     66.00    627.00


*SECNO 77.603

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.50

1
   16OCT95      09:09:07                                                                                PAGE     8

    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


3370 NORMAL BRIDGE, NRD=  44 MIN ELTRD=   860.00 MAX ELLC=   857.90

    77.603      8.47    856.87       .00       .00    856.97       .10       .00       .04    860.30
    1950.0        .0    1950.0        .0        .0     763.7        .0     271.4      82.0    860.10
      .86       .00      2.55       .00      .000      .020      .000      .000    848.40    300.00
   .000271       1.        1.        1.         2         0         0    -66.56    118.00    418.00


*SECNO 77.605

3370 NORMAL BRIDGE, NRD=  44 MIN ELTRD=   860.00 MAX ELLC=   857.90

    77.605      8.47    856.87        00       .00    856.97       .10       .00       .00    860.30
    1950.0        .0    1950.0        .0        .0     764.2        .0     271.6      82.0    860.10
      .86       .00      2.55       .00      .000      .020      .000      .000    848.40    300.00
   .000270       12.       12.       12.         0         0         0    -66.60    118.00    418.00


1
   16OCT95      09:09:07                                                                                PAGE     9
```

THIS RUN EXECUTED 16OCT95 09:09:08

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

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

CROSS SECTIONS FOR NATUR

SUMMARY PRINTOUT

	SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	K*CHSL	TOPWID	AREA
	76.798	.00	.00	845.50	2200.00	856.09	10.59	.06	.00	856.15	.00	520.00	1958.27
	76.817	.00	.00	845.50	2200.00	856.10	10.60	.07	.01	856.17	.00	585.53	1682.26
*	76.896	.00	.00	845.50	2200.00	856.21	10.71	.01	.02	856.22	.00	860.00	3697.61
*	77.030	.00	.00	847.50	2200.00	856.24	8.74	.02	.00	856.26	2.84	1312.47	4487.37
*	77.232	.00	.00	848.50	2200.00	856.33	7.83	.03	.01	856.36	.93	1400.13	3625.80
	77.353	.00	.00	849.10	1950.00	856.44	7.34	.05	.01	856.49	.94	490.00	1853.57
	77.499	.00	.00	846.70	1950.00	856.57	9.87	.12	.03	856.68	-3.12	192.72	900.37
*	77.566	.00	.00	848.40	1950.00	856.65	8.25	.25	.07	856.89	4.82	64.00	488.53
*	77.567	861.00	858.80	848.40	1950.00	856.63	8.23	.27	.01	856.91	.00	64.00	466.23
	77.569	.00	.00	848.50	1950.00	856.64	8.14	.28	.00	856.91	6.25	64.00	459.90
	77.570	.00	.00	848.50	1950.00	856.69	8.19	.24	.01	856.93	.00	66.00	497.55
*	77.603	860.00	857.90	848.40	1950.00	856.87	8.47	.10	.04	856.97	-99.98	118.00	763.69
	77.605	860.00	857.90	848.40	1950.00	856.87	8.47	.10	.00	856.97	.00	118.00	764.25

SUMMARY OF ERRORS AND SPECIAL NOTES

WARNING SECNO= 76.896 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 77.030 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

```
WARNING SECNO=     77.232  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     77.566  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     77.567  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     77.603  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
```

00BREAK00

1) COUNTY: Livingston

2) STUDY NAME: Hamburg Twp.

3) WATERCOURSE: Huron River

4) DOCUMENT TYPE: Convergence Run
100 Year Flood

00BREAK00

```
*********************************************
*  WATER SURFACE PROFILES                   *
*  VERSION OF NOVEMBER 1976                 *
*  UPDATED JULY 1979                        *
*                                           *
*  RUN DATE FRI, JUN  5, 1981, 11:05 AM     *
*********************************************
```

```
*****************************************
*  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
```

Convergence Run

100-year flood

```
**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
**************************************************

C
T1      HAMBURG TOWNSHIP F.I.S.
T2      CONVERGENCE TRIALS - RATING CURVE ANALYSIS
T3      HURON RIVER - JOB NO.6504-03-0 - PROJECT MANAGER, ANDY KUBEK

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      -1.       2.        0.        0.   .000000       .00       .0        0.   846.000     .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     1.000     .000    -1.000     .000      .000      .800      .000      .000      .000      .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    38.000   40.000   41.000   42.000   43.000    1.000    8.000   10.000   12.000    3.000

    33.000    4.000   25.000     .000     .000     .000     .000     .000     .000     .000

NC      .100     .100     .042     .300     .500     .000     .000     .000     .000     .000
QT     6.000 3545.000 3545.000 3545.000 3545.000 3545.000 3545.000     .000     .000     .000

        VALLEY SECTION 1.1

X1  93120.000   19.000  268.000  440.000     .000     .000     .000     .000     .000     .000
GR    850.900     .000  851.100  100.000  848.100  200.000  845.600  255.000  841.900  268.000
GR    839.900  270.000  839.900  272.000  840.400  300.000  840.200  325.000  840.200  365.000
GR    839.200  380.000  839.200  400.000  840.700  437.000  842.700  440.000  849.600  500.000
GR    872.900  550.000  878.900  600.000  882.400  700.000  886.800  800.000     .000     .000

X1  94885.000     .000     .000     .000 1410.000 1910.000 1765.000     .000    3.000     .000
X3      .000     .000     .000  301.000     .000  400.000     .000     .000     .000     .000
NC      .030     .030     .030     .000     .000     .000     .000     .000     .000     .000

        BRIDGE SECTION 1 - BELL ST. BRIDGE - D/S FACE

X1  94886.000   17.000  600.000  699.000    1.000    1.000    1.000     .000     .000     .000
BT     11.000     .000  856.500     .000  100.000  854.100     .000  200.000  852.100     .000
BT    300.000  851.700     .000  400.000  851.900     .000  500.000  852.100     .000  600.000
BT    854.900  854.000  699.000  854.900  853.900  800.000  856.400     .000  900.000  859.300
BT       .000  925.000  860.400     .000     .000     .000     .000     .000     .000     .000
GR    856.500     .000  854.100  100.000  852.100  200.000  851.700  300.000  851.900  400.000
GR    852.100  500.000  854.900  600.000  844.200  600.000  843.200  620.000  842.200  640.000
GR    842.300  660.000  842.400  680.000  845.000  699.000  854.900  699.000  856.400  800.000
GR    859.300  900.000  860.400  925.000     .000     .000     .000     .000     .000     .000
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BRIDGE SECTION 1 - BELL ST. BRIDGE - U/S FACE

X1	94900.000	.000	.000	.000	14.000	14.000	14.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.070	.100	.042	.000	.000	.000	.000	.000	.000	.000
X1	94901.000	20.000	500.000	607.000	1.000	1.000	1.000	.000	.000	.000
X3	.000	.000	.000	505.000	.000	604.000	.000	.000	.000	.000
GR	857.300	.000	856.300	100.000	852.700	200.000	849.900	300.000	849.600	400.000
GR	848.700	500.000	845.700	505.000	842.300	515.000	842.200	525.000	842.800	568.000
GR	844.000	588.000	847.600	607.000	850.500	657.000	846.300	680.000	842.800	697.000
GR	845.000	715.000	846.100	725.000	857.000	735.000	857.200	800.000	860.000	865.000

VALLEY SECTION 1

X1	95170.000	20.000	500.000	607.000	300.000	300.000	269.000	.000	.000	.000
GR	855.700	.000	854.700	100.000	851.100	200.000	848.300	300.000	848.000	400.000
GR	847.100	500.000	844.300	505.000	840.700	515.000	840.600	525.000	841.200	568.000
GR	842.400	588.000	846.000	607.000	848.900	657.000	844.700	680.000	841.200	697.000
GR	843.400	715.000	844.500	725.000	855.400	735.000	855.600	800.000	858.400	865.000
NH	5.000	.050	600.000	.120	1100.000	.050	1255.000	.042	1400.000	.125
NH	1500.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 2

X1	97350.000	24.000	1255.000	1400.000	2020.000	2200.000	2180.000	.000	.000	.000
GR	882.000	.000	877.100	100.000	874.700	200.000	871.100	300.000	867.700	400.000
GR	864.600	500.000	862.400	600.000	861.900	700.000	859.600	800.000	859.000	900.000
GR	856.200	1000.000	852.100	1100.000	854.100	1200.000	854.100	1255.000	844.900	1281.000
GR	843.200	1290.000	842.500	1300.000	841.800	1317.000	841.700	1325.000	841.700	1350.000
GR	841.700	1376.000	844.100	1382.000	850.300	1400.000	856.900	1500.000	.000	.000
NH	4.000	.060	620.000	.040	755.000	.100	900.000	.060	1200.000	.000

VALLEY SECTION 3

X1	99000.000	21.000	620.000	755.000	1700.000	1550.000	1650.000	.000	.000	.000
GR	879.700	.000	869.500	100.000	864.200	200.000	864.600	300.000	864.900	400.000
GR	854.500	500.000	851.000	600.000	850.500	620.000	845.900	629.000	842.900	640.000
GR	841.400	660.000	842.100	690.000	842.600	720.000	845.400	739.000	847.400	745.000
GR	853.600	755.000	853.900	800.000	854.200	900.000	855.200	1000.000	858.200	1100.000
GR	858.700	1200.000	.000	.000	.000	.000	.000	.000	.000	.000

X1	99998.000	.000	.000	.000	1150.000	850.000	998.000	.000	.600	.000
NC	.050	.050	.015	.000	.000	.000	.000	.000	.000	.000
X1	99999.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
SB	.900	1.500	3.460	.000	.010	.000	.010	.000	843.900	842.000

DAM SECTION 2 - U/S FACE

X1	100000.000	26.000	400.000	516.500	1.000	1.000	1.000	.000	.000	.000
X2	.000	.000	1.000	843.900	851.000	.000	.000	.000	.000	.000

BT	29.000	.000	854.500	.000	100.000	853.600	.000	200.000	853.500	.000
BT	300.000	854.300	.000	398.000	854.200	.000	400.000	854.700	.000	410.500
BT	854.600	.000	410.500	851.000	.000	430.500	851.000	.000	430.500	854.300
BT	.000	432.000	854.300	.000	432.000	851.000	.000	452.000	851.000	.000
BT	452.000	854.000	.000	453.500	854.000	.000	453.500	851.000	.000	473.500
BT	851.000	.000	473.500	854.000	.000	475.000	854.000	.000	475.000	851.000
BT	.000	495.000	851.000	.000	495.000	854.000	.000	496.500	854.000	.000
BT	496.500	851.000	.000	516.500	851.000	.000	516.500	854.000	.000	560.000
BT	854.400	.000	600.000	857.500	.000	700.000	859.400	.000	.000	.000
GR	854.500	.000	853.600	100.000	853.500	200.000	854.300	300.000	854.200	398.000
GR	854.700	400.000	847.400	400.000	845.600	409.000	844.100	410.500	844.100	430.500
GR	844.100	432.000	843.900	440.000	843.900	452.000	843.900	453.500	843.900	460.000
GR	843.900	473.500	843.900	475.000	843.900	480.000	844.400	495.000	844.400	496.500
GR	844.500	500.000	845.000	516.500	854.000	516.500	854.400	560.000	857.500	600.000
GR	859.400	700.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.100	.060	.040	.000	.000	.000	.000	.000	.000	.000
X1	100001.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
NH	4.000	.125	560.000	.060	670.000	.040	804.000	.060	945.000	.000
QT	6.000	2475.000	2475.000	2475.000	2475.000	2475.000	2475.000	.000	.000	.000

VALLEY SECTION 4

X1	100540.000	23.000	670.000	804.000	400.000	600.000	539.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	910.000	.000	.000	.000	.000
GR	868.000	.000	864.000	50.000	860.000	90.000	856.000	160.000	856.000	300.000
GR	857.800	360.000	856.000	480.000	856.000	560.000	857.400	620.000	855.900	670.000
GR	851.100	680.000	848.200	690.000	845.000	702.000	843.700	714.000	844.200	728.000
GR	844.700	743.000	845.500	761.000	845.100	777.000	845.800	791.000	849.100	803.000
GR	853.200	804.000	854.000	850.000	854.500	945.000	.000	.000	.000	.000
NH	4.000	.125	700.000	.060	750.000	.040	889.000	.060	1220.000	.000

VALLEY SECTION 5

X1	101800.000	23.000	750.000	889.000	1100.000	1170.000	1260.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	1050.000	.000	.000	.000	.000
GR	868.000	.000	864.000	140.000	860.000	280.000	856.000	310.000	852.000	400.000
GR	850.200	500.000	852.000	620.000	852.000	700.000	853.300	750.000	852.400	760.000
GR	851.300	761.000	846.900	780.000	845.300	804.000	845.300	820.000	844.600	840.000
GR	844.600	850.000	844.800	866.000	849.300	888.000	853.900	889.000	854.000	1010.000
GR	856.000	1190.000	858.000	1200.000	859.000	1220.000	.000	.000	.000	.000
NC	.125	.125	.040	.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 6

X1	102480.000	27.000	740.000	922.000	600.000	580.000	680.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	1310.000	.000	.000	.000	.000
GR	868.000	.000	864.000	150.000	860.000	220.000	856.000	240.000	852.000	340.000
GR	852.000	730.000	851.700	740.000	851.400	742.000	847.800	778.000	846.500	792.000
GR	846.700	803.000	845.900	820.000	845.900	840.000	846.400	855.000	847.100	870.000
GR	847.800	890.000	851.500	920.000	851.800	922.000	852.000	970.000	852.000	1090.000
GR	854.000	1200.000	856.000	1250.000	858.000	1280.000	860.000	1310.000	862.000	1330.000
GR	864.000	1350.000	866.000	1370.000	.000	.000	.000	.000	.000	.000
EJ	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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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

HURON RIVER - JOB NO.650

SUMMARY PRINTOUT

SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	K*CHSL	TOPWID	AREA
93120.000	.00	.00	839.20	3545.00	846.00	6.80	.18	.00	846.18	.00	222.50	1106.31
93120.000	.00	.00	839.20	3545.00	847.00	7.80	.13	.00	847.13	.00	253.19	1344.15
93120.000	.00	.00	839.20	3545.00	847.50	8.30	.11	.00	847.61	.00	268.54	1474.58
93120.000	.00	.00	839.20	3545.00	848.00	8.80	.09	.00	848.09	.00	283.89	1612.69
93120.000	.00	.00	839.20	3545.00	848.50	9.30	.08	.00	848.58	.00	303.77	1759.38
93120.000	.00	.00	839.20	3545.00	849.00	9.80	.07	.00	849.07	.00	324.78	1916.52
94885.000	.00	.00	842.20	3545.00	847.73	5.53	.87	.35	848.60	1.70	99.00	473.41
94885.000	.00	.00	842.20	3545.00	848.00	5.80	.78	.32	848.78	1.70	99.00	501.30
94885.000	.00	.00	842.20	3545.00	848.27	6.07	.70	.30	848.97	1.70	99.00	527.05
94885.000	.00	.00	842.20	3545.00	848.59	6.39	.62	.27	849.21	1.70	99.00	558.88
94885.000	.00	.00	842.20	3545.00	848.96	6.76	.55	.23	849.51	1.70	99.00	595.13
94885.000	.00	.00	842.20	3545.00	849.36	7.16	.48	.21	849.84	1.70	99.00	634.65
94886.000	851.70	854.00	842.20	3545.00	847.74	5.54	.87	.00	848.60	.00	99.00	474.96
94886.000	851.70	854.00	842.20	3545.00	848.01	5.81	.77	.00	848.78	.00	99.00	502.33
94886.000	851.70	854.00	842.20	3545.00	848.27	6.07	.70	.00	848.97	.00	99.00	528.32
94886.000	851.70	854.00	842.20	3545.00	848.60	6.40	.62	.00	849.22	.00	99.00	560.24
94886.000	851.70	854.00	842.20	3545.00	848.96	6.76	.55	.00	849.51	.00	99.00	596.51
94886.000	851.70	854.00	842.20	3545.00	849.36	7.16	.48	.00	849.84	.00	99.00	636.03
94900.000	851.70	854.00	842.20	3545.00	847.79	5.59	.85	.01	848.63	.00	99.00	479.89
94900.000	851.70	854.00	842.20	3545.00	848.05	5.85	.76	.00	848.81	.00	99.00	506.24
94900.000	851.70	854.00	842.20	3545.00	848.30	6.10	.69	.00	848.99	.00	99.00	531.73
94900.000	851.70	854.00	842.20	3545.00	848.62	6.42	.62	.00	849.24	.00	99.00	563.10
94900.000	851.70	854.00	842.20	3545.00	848.98	6.78	.54	.00	849.52	.00	99.00	598.86
94900.000	851.70	854.00	842.20	3545.00	849.37	7.17	.48	.00	849.85	.00	99.00	637.95
94901.000	.00	.00	842.20	3545.00	847.70	5.50	1.03	.09	848.73	.00	99.00	436.22
94901.000	.00	.00	842.20	3545.00	847.98	5.78	.91	.07	848.89	.00	99.00	463.60
94901.000	.00	.00	842.20	3545.00	848.25	6.05	.81	.06	849.06	.00	99.00	490.04
94901.000	.00	.00	842.20	3545.00	848.57	6.37	.72	.05	849.29	.00	99.00	522.33
94901.000	.00	.00	842.20	3545.00	848.94	6.74	.62	.04	849.57	.00	99.00	558.91
94901.000	.00	.00	842.20	3545.00	849.34	7.14	.54	.03	849.89	.00	99.00	598.69

SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	K*CHSL	TOPWID	AREA
95170.000	.00	.00	840.60	3545.00	849.13	8.53	.18	.25	849.31	-5.95	458.91	1458.12
95170.000	.00	.00	840.60	3545.00	849.24	8.64	.17	.22	849.40	-5.95	462.78	1506.89
95170.000	.00	.00	840.60	3545.00	849.36	8.76	.16	.20	849.52	-5.95	467.46	1566.35
95170.000	.00	.00	840.60	3545.00	849.55	8.95	.14	.17	849.69	-5.95	474.19	1652.85
95170.000	.00	.00	840.60	3545.00	849.78	9.18	.13	.15	849.91	-5.95	482.90	1766.59
95170.000	.00	.00	840.60	3545.00	850.07	9.47	.11	.13	850.18	-5.95	493.38	1906.28
97350.000	.00	.00	841.70	3545.00	850.33	8.63	.23	.03	850.56	.50	134.88	922.32
97350.000	.00	.00	841.70	3545.00	850.38	8.68	.23	.03	850.60	.50	135.72	928.65
97350.000	.00	.00	841.70	3545.00	850.44	8.74	.22	.03	850.66	.50	136.80	936.85
97350.000	.00	.00	841.70	3545.00	850.53	8.83	.22	.04	850.75	.50	138.49	949.75
97350.000	.00	.00	841.70	3545.00	850.67	8.97	.21	.04	850.88	.50	140.86	968.22
97350.000	.00	.00	841.70	3545.00	850.84	9.14	.20	.04	851.04	.50	143.84	991.63
99000.000	.00	.00	841.40	3545.00	851.17	9.77	.19	.01	851.36	-.18	155.80	1013.19
99000.000	.00	.00	841.40	3545.00	851.20	9.80	.19	.01	851.39	-.18	156.81	1018.44
99000.000	.00	.00	841.40	3545.00	851.24	9.84	.19	.01	851.43	-.18	158.11	1025.21
99000.000	.00	.00	841.40	3545.00	851.31	9.91	.19	.01	851.49	-.18	160.27	1036.62
99000.000	.00	.00	841.40	3545.00	851.40	10.00	.18	.01	851.58	-.18	162.95	1050.98
99000.000	.00	.00	841.40	3545.00	851.53	10.13	.17	.01	851.71	-.18	166.84	1072.21
99998.000	.00	.00	842.00	3545.00	851.57	9.57	.20	.01	851.77	.60	149.55	983.32
99998.000	.00	.00	842.00	3545.00	851.60	9.60	.20	.01	851.80	.60	150.72	987.54
99998.000	.00	.00	842.00	3545.00	851.63	9.63	.20	.01	851.83	.60	151.83	993.01
99998.000	.00	.00	842.00	3545.00	851.69	9.69	.20	.01	851.89	.60	153.49	1001.39
99998.000	.00	.00	842.00	3545.00	851.77	9.77	.19	.01	851.96	.60	155.94	1013.95
99998.000	.00	.00	842.00	3545.00	851.88	9.88	.19	.01	852.07	.60	159.28	1031.36
99999.000	.00	.00	842.00	3545.00	851.57	9.57	.20	.00	851.77	.00	149.57	983.38
99999.000	.00	.00	842.00	3545.00	851.60	9.60	.20	.00	851.80	.00	150.74	987.61
99999.000	.00	.00	842.00	3545.00	851.63	9.63	.20	.00	851.83	.00	151.85	993.07
99999.000	.00	.00	842.00	3545.00	851.69	9.69	.20	.00	851.89	.00	153.50	1001.45
99999.000	.00	.00	842.00	3545.00	851.77	9.77	.19	.00	851.96	.00	155.95	1014.01
99999.000	.00	.00	842.00	3545.00	851.88	9.88	.19	.00	852.07	.00	159.29	1031.42
100000.000	851.00	843.90	843.90	3545.00	854.60	10.70	.13	.00	854.73	1900.00	562.14	1477.09
100000.000	851.00	843.90	843.90	3545.00	854.60	10.70	.13	.00	854.73	1900.00	562.15	1477.34
100000.000	851.00	843.90	843.90	3545.00	854.60	10.70	.13	.00	854.73	1900.00	562.16	1477.69
100000.000	851.00	843.90	843.90	3545.00	854.60	10.70	.13	.00	854.73	1900.00	562.17	1478.16
100000.000	851.00	843.90	843.90	3545.00	854.60	10.70	.13	.00	854.73	1900.00	562.19	1478.86
100000.000	851.00	843.90	843.90	3545.00	854.60	10.70	.13	.00	854.73	1900.00	562.22	1479.83
100001.000	.00	.00	843.90	3545.00	854.60	10.70	.13	.00	854.73	.00	562.14	1477.10
100001.000	.00	.00	843.90	3545.00	854.60	10.70	.13	.00	854.73	.00	562.15	1477.36
100001.000	.00	.00	843.90	3545.00	854.60	10.70	.13	.00	854.73	.00	562.16	1477.70
100001.000	.00	.00	843.90	3545.00	854.60	10.70	.13	.00	854.73	.00	562.17	1478.17
100001.000	.00	.00	843.90	3545.00	854.60	10.70	.13	.00	854.73	.00	562.19	1478.88
100001.000	.00	.00	843.90	3545.00	854.60	10.70	.13	.00	854.73	.00	562.22	1479.84
100540.000	.00	.00	843.70	2475.00	854.77	11.07	.07	.02	854.84	-.37	237.64	1231.98
100540.000	.00	.00	843.70	2475.00	854.77	11.07	.07	.02	854.84	-.37	237.64	1232.08
100540.000	.00	.00	843.70	2475.00	854.77	11.07	.07	.02	854.84	-.37	237.64	1232.22
100540.000	.00	.00	843.70	2475.00	854.77	11.07	.07	.02	854.84	-.37	237.64	1232.41
100540.000	.00	.00	843.70	2475.00	854.77	11.07	.07	.02	854.84	-.37	237.65	1232.69
100540.000	.00	.00	843.70	2475.00	854.77	11.07	.07	.02	854.84	-.37	237.65	1233.07

SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	K*CHSL	TOPWID	AREA
101800.000	.00	.00	844.60	2475.00	854.94	10.34	.04	.01	854.98	.71	716.14	2585.21
101800.000	.00	.00	844.60	2475.00	854.94	10.34	.04	.01	854.98	.71	716.15	2585.50
101800.000	.00	.00	844.60	2475.00	854.94	10.34	.04	.01	854.98	.71	716.16	2585.88
101800.000	.00	.00	844.60	2475.00	854.94	10.34	.04	.01	854.98	.71	716.18	2586.42
101800.000	.00	.00	844.60	2475.00	854.94	10.34	.04	.01	854.98	.71	716.20	2587.20
101800.000	.00	.00	844.60	2475.00	854.94	10.34	.04	.01	854.98	.71	716.23	2588.28
102480.000	.00	.00	845.90	2475.00	855.01	9.11	.03	.00	855.04	1.91	960.31	3369.49
102480.000	.00	.00	845.90	2475.00	855.01	9.11	.03	.00	855.04	1.91	960.33	3369.86
102480.000	.00	.00	845.90	2475.00	855.01	9.11	.03	.00	855.04	1.91	960.36	3370.36
102480.000	.00	.00	845.90	2475.00	855.01	9.11	.03	.00	855.04	1.91	960.39	3371.05
102480.000	.00	.00	845.90	2475.00	855.01	9.11	.03	.00	855.04	1.91	960.45	3372.07
102480.000	.00	.00	845.90	2475.00	855.01	9.11	.03	.00	855.04	1.91	960.52	3373.47

SUMMARY OF ERRORS

FORM 141 7 68
PRINTED IN U.S.A.

00BREAK00

1) COUNTY: Livingston

2) STUDY NAME: Hamburg Twp

3) WATERCOURSE: Huron River

4) DOCUMENT TYPE: Convergence Run
500 Year Flood

00BREAK00

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*****************************************************
*  WATER SURFACE PROFILES                           *
*  VERSION OF NOVEMBER 1976                         *
*  UPDATED JULY 1979                                *
*                                                   *
*  RUN DATE MON, JUN 15, 1981,  1:11 PM             *
*****************************************************
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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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Convergence Run

500 - year Stored

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**********************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
**********************************************************


C
T1       HAMBURG TOWNSHIP F.I.S.
T2       CONVERGENCE TRIALS - RATING CURVE ANALYSIS
T3       HURON RIVER - JOB NO.6504-03-0 - PROJECT MANAGER, ANDY KUBEK

J1  ICHECK     INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      -1.       2.        0.        0.   .000000       .00       .0        0.    847.000     .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    1.000      .000    -1.000      .000      .000      .800      .000      .000      .000      .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

   38.000    40.000    41.000    42.000    43.000     1.000     8.000    10.000    12.000     3.000

   33.000     4.000    25.000      .000      .000      .000      .000      .000      .000      .000

NC      .100      .100      .042      .300      .500      .000      .000      .000      .000      .000
QT     6.000  4660.000  4660.000  4660.000  4660.000  4660.000  4660.000      .000      .000      .000


          VALLEY SECTION 1.1

X1  93120.000    19.000   268.000   440.000      .000      .000      .000      .000      .000      .000
GR    850.900      .000   851.100   100.000   848.100   200.000   845.600   255.000   841.900   268.000
GR    839.900   270.000   839.900   272.000   840.400   300.000   840.200   325.000   840.200   365.000
GR    839.200   380.000   839.200   400.000   840.700   437.000   842.700   440.000   849.600   500.000
GR    872.900   550.000   878.900   600.000   882.400   700.000   886.800   800.000      .000      .000


X1  94885.000      .000      .000      .000  1410.000  1910.000  1765.000      .000     3.000      .000
X3      .000      .000      .000   301.000      .000   400.000      .000      .000      .000      .000
NC      .030      .030      .030      .000      .000      .000      .000      .000      .000      .000


          BRIDGE SECTION 1 - BELL ST. BRIDGE - D/S FACE

X1  94886.000    17.000   600.000   699.000     1.000     1.000     1.000      .000      .000      .000
BT     11.000      .000   856.500      .000   100.000   854.100      .000   200.000   852.100      .000
BT    300.000   851.700      .000   400.000   851.900      .000   500.000   852.100      .000   600.000
BT    854.900   854.000   699.000   854.900   853.900   800.000   856.400      .000   900.000   859.300
BT       .000   925.000   860.400      .000      .000      .000      .000      .000      .000      .000
GR    856.500      .000   854.100   100.000   852.100   200.000   851.700   300.000   851.900   400.000
GR    852.100   500.000   854.900   600.000   844.200   600.000   843.200   620.000   842.200   640.000
GR    842.300   660.000   842.400   680.000   845.000   699.000   854.900   699.000   856.400   800.000
GR    859.300   900.000   860.400   925.000      .000      .000      .000      .000      .000      .000
```

BRIDGE SECTION 1 - BELL ST. BRIDGE - U/S FACE

X1	94900.000	.000	.000	.000	14.000	14.000	14.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.070	.100	.042	.000	.000	.000	.000	.000	.000	.000
X1	94901.000	20.000	500.000	607.000	1.000	1.000	1.000	.000	.000	.000
X3	.000	.000	.000	505.000	.000	604.000	.000	.000	.000	.000
GR	857.300	.000	856.300	100.000	852.700	200.000	849.900	300.000	849.600	400.000
GR	848.700	500.000	845.700	505.000	842.300	515.000	842.200	525.000	842.800	568.000
GR	844.000	588.000	847.600	607.000	850.500	657.000	846.300	680.000	842.800	697.000
GR	845.000	715.000	846.100	725.000	857.000	735.000	857.200	800.000	860.000	865.000

VALLEY SECTION 1

X1	95170.000	20.000	500.000	607.000	300.000	300.000	269.000	.000	.000	.000
GR	855.700	.000	854.700	100.000	851.100	200.000	848.300	300.000	848.000	400.000
GR	847.100	500.000	844.300	505.000	840.700	515.000	840.600	525.000	841.200	568.000
GR	842.400	588.000	846.000	607.000	848.900	657.000	844.700	680.000	841.200	697.000
GR	843.400	715.000	844.500	725.000	855.400	735.000	855.600	800.000	858.400	865.000
NH	5.000	.050	600.000	.120	1100.000	.050	1255.000	.042	1400.000	.125
NH	1500.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 2

X1	97350.000	24.000	1255.000	1400.000	2020.000	2200.000	2180.000	.000	.000	.000
GR	882.000	.000	877.100	100.000	874.700	200.000	871.100	300.000	867.700	400.000
GR	864.600	500.000	862.400	600.000	861.900	700.000	859.600	800.000	859.000	900.000
GR	856.200	1000.000	852.100	1100.000	854.100	1200.000	854.100	1255.000	844.900	1281.000
GR	843.200	1290.000	842.500	1300.000	841.800	1317.000	841.700	1325.000	841.700	1350.000
GR	841.700	1376.000	844.100	1382.000	850.300	1400.000	856.900	1500.000	.000	.000
NH	4.000	.060	620.000	.040	755.000	.100	900.000	.060	1200.000	.000

VALLEY SECTION 3

X1	99000.000	21.000	620.000	755.000	1700.000	1550.000	1650.000	.000	.000	.000
GR	879.700	.000	869.500	100.000	864.200	200.000	864.600	300.000	864.900	400.000
GR	854.500	500.000	851.000	600.000	850.500	620.000	845.900	629.000	842.900	640.000
GR	841.400	660.000	842.100	690.000	842.600	720.000	845.400	739.000	847.400	745.000
GR	853.600	755.000	853.900	800.000	854.200	900.000	855.200	1000.000	858.200	1100.000
GR	858.700	1200.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	99998.000	.000	.000	.000	1150.000	850.000	998.000	.000	.600	.000
NC	.050	.050	.015	.000	.000	.000	.000	.000	.000	.000
X1	99999.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
SB	.900	1.500	3.460	.000	.010	.000	.010	.000	843.900	842.000

DAM SECTION 2 - U/S FACE

X1	100000.000	26.000	400.000	516.500	1.000	1.000	1.000	.000	.000	.000
X2	.000	.000	1.000	843.900	851.000	.000	.000	.000	.000	.000

BT	29.000	.000	854.500	.000	100.000	853.600	.000	200.000	853.500	.000
BT	300.000	854.300	.000	398.000	854.200	.000	400.000	854.700	.000	410.500
BT	854.600	.000	410.500	851.000	.000	430.500	851.000	.000	430.500	854.300
BT	.000	432.000	854.300	.000	432.000	851.000	.000	452.000	851.000	.000
BT	452.000	854.000	.000	453.500	854.000	.000	453.500	851.000	.000	473.500
BT	851.000	.000	473.500	854.000	.000	475.000	854.000	.000	475.000	851.000
BT	.000	495.000	851.000	.000	495.000	854.000	.000	496.500	854.000	.000
BT	496.500	851.000	.000	516.500	851.000	.000	516.500	854.000	.000	560.000
BT	854.400	.000	600.000	857.500	.000	700.000	859.400	.000	.000	.000
GR	854.500	.000	853.600	100.000	853.500	200.000	854.300	300.000	854.200	398.000
GR	854.700	400.000	847.400	400.000	845.600	409.000	844.100	410.500	844.100	430.500
GR	844.100	432.000	843.900	440.000	843.900	452.000	843.900	453.500	843.900	460.000
GR	843.900	473.500	843.900	475.000	843.900	480.000	844.400	495.000	844.400	496.500
GR	844.500	500.000	845.000	516.500	854.000	516.500	854.400	560.000	857.500	600.000
GR	859.400	700.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.100	.060	.040	.000	.000	.000	.000	.000	.000	.000
X1	100001.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
NH	4.000	.125	560.000	.060	670.000	.040	804.000	.060	945.000	.000
QT	6.000	3195.000	3195.000	3195.000	3195.000	3195.000	3195.000	.000	.000	.000

VALLEY SECTION 4

X1	100540.000	23.000	670.000	804.000	400.000	600.000	539.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	910.000	.000	.000	.000	.000
GR	868.000	.000	864.000	50.000	860.000	90.000	856.000	160.000	856.000	300.000
GR	857.800	360.000	856.000	480.000	856.000	560.000	857.400	620.000	855.900	670.000
GR	851.100	680.000	848.200	690.000	845.000	702.000	843.700	714.000	844.200	728.000
GR	844.700	743.000	845.500	761.000	845.100	777.000	845.800	791.000	849.100	803.000
GR	853.200	804.000	854.000	850.000	854.500	945.000	.000	.000	.000	.000
NH	4.000	.125	700.000	.060	750.000	.040	889.000	.060	1220.000	.000

VALLEY SECTION 5

X1	101800.000	23.000	750.000	889.000	1100.000	1170.000	1260.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	1050.000	.000	.000	.000	.000
GR	868.000	.000	864.000	140.000	860.000	280.000	856.000	310.000	852.000	400.000
GR	850.200	500.000	852.000	620.000	852.000	700.000	853.300	750.000	852.400	760.000
GR	851.300	761.000	846.900	780.000	845.300	804.000	845.300	820.000	844.600	840.000
GR	844.600	850.000	844.800	866.000	849.300	888.000	853.900	889.000	854.000	1010.000
GR	856.000	1190.000	858.000	1200.000	859.000	1220.000	.000	.000	.000	.000
NC	.125	.125	.040	.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 6

X1	102480.000	27.000	740.000	922.000	600.000	580.000	680.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	1310.000	.000	.000	.000	.000
GR	868.000	.000	864.000	150.000	860.000	220.000	856.000	240.000	852.000	340.000
GR	852.000	730.000	851.700	740.000	851.400	742.000	847.800	778.000	846.500	792.000
GR	846.700	803.000	845.900	820.000	845.900	840.000	846.400	855.000	847.100	870.000
GR	847.800	890.000	851.500	920.000	851.800	922.000	852.000	970.000	852.000	1090.000
GR	854.000	1200.000	856.000	1250.000	858.000	1280.000	860.000	1310.000	862.000	1330.000
GR	864.000	1350.000	866.000	1370.000	.000	.000	.000	.000	.000	.000
EJ	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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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

HURON RIVER - JOB NO.650

SUMMARY PRINTOUT

SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	K*CHSL	TOPWID	AREA
93120.000	.00	.00	839.20	4660.00	847.00	7.80	.22	.00	847.22	.00	253.19	1344.15
93120.000	.00	.00	839.20	4660.00	847.50	8.30	.19	.00	847.69	.00	268.54	1474.58
93120.000	.00	.00	839.20	4660.00	848.00	8.80	.16	.00	848.16	.00	283.89	1612.69
93120.000	.00	.00	839.20	4660.00	849.00	9.80	.12	.00	849.12	.00	324.78	1916.52
93120.000	.00	.00	839.20	4660.00	849.50	10.30	.11	.00	849.61	.00	345.80	2084.16
93120.000	.00	.00	839.20	4660.00	850.00	10.80	.09	.00	850.09	.00	364.19	2261.79
94885.000	.00	.00	842.20	4660.00	848.66	6.46	1.05	.42	849.72	1.70	99.00	566.07
94885.000	.00	.00	842.20	4660.00	848.80	6.60	1.00	.41	849.80	1.70	99.00	580.13
94885.000	.00	.00	842.20	4660.00	849.01	6.81	.93	.39	849.95	1.70	99.00	601.04
94885.000	.00	.00	842.20	4660.00	849.62	7.42	.77	.32	850.39	1.70	99.00	660.76
94885.000	.00	.00	842.20	4660.00	849.99	7.79	.69	.29	850.68	1.70	99.00	697.14
94885.000	.00	.00	842.20	4660.00	850.38	8.18	.62	.26	851.01	1.70	99.00	736.41
94886.000	851.70	854.00	842.20	4660.00	848.67	6.47	1.05	.00	849.72	.00	99.00	567.61
94886.000	851.70	854.00	842.20	4660.00	848.81	6.61	1.00	.00	849.80	.00	99.00	581.05
94886.000	851.70	854.00	842.20	4660.00	849.02	6.82	.93	.00	849.95	.00	99.00	602.23
94886.000	851.70	854.00	842.20	4660.00	849.63	7.43	.77	.00	850.39	.00	99.00	662.14
94886.000	851.70	854.00	842.20	4660.00	849.99	7.79	.69	.00	850.68	.00	99.00	698.54
94886.000	851.70	854.00	842.20	4660.00	850.39	8.19	.62	.00	851.01	.00	99.00	737.80
94900.000	851.70	854.00	842.20	4660.00	848.72	6.52	1.03	.01	849.75	.00	99.00	572.44
94900.000	851.70	854.00	842.20	4660.00	848.85	6.65	.98	.00	849.83	.00	99.00	585.24
94900.000	851.70	854.00	842.20	4660.00	849.06	6.86	.92	.00	849.98	.00	99.00	606.08
94900.000	851.70	854.00	842.20	4660.00	849.65	7.45	.76	.00	850.41	.00	99.00	665.06
94900.000	851.70	854.00	842.20	4660.00	850.01	7.81	.69	.00	850.70	.00	99.00	701.01
94900.000	851.70	854.00	842.20	4660.00	850.40	8.20	.62	.00	851.02	.00	99.00	739.88
94901.000	.00	.00	842.20	4660.00	848.64	6.44	1.21	.09	849.84	.00	99.00	528.87
94901.000	.00	.00	842.20	4660.00	848.77	6.57	1.15	.08	849.92	.00	99.00	541.99
94901.000	.00	.00	842.20	4660.00	848.99	6.79	1.06	.07	850.05	.00	99.00	563.60
94901.000	.00	.00	842.20	4660.00	849.60	7.40	.87	.05	850.47	.00	99.00	624.17
94901.000	.00	.00	842.20	4660.00	849.97	7.77	.77	.04	850.74	.00	99.00	660.84
94901.000	.00	.00	842.20	4660.00	850.37	8.17	.69	.04	851.06	.00	99.00	700.34

SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	K*CHSL	TOPWID	AREA
95170.000	.00	.00	840.60	4660.00	850.27	9.67	.18	.31	850.44	-5.95	500.67	2005.08
95170.000	.00	.00	840.60	4660.00	850.32	9.72	.17	.29	850.49	-5.95	502.55	2030.92
95170.000	.00	.00	840.60	4660.00	850.42	9.82	.16	.27	850.58	-5.95	506.09	2079.69
95170.000	.00	.00	840.60	4660.00	850.75	10.15	.14	.22	850.89	-5.95	518.39	2251.59
95170.000	.00	.00	840.60	4660.00	850.99	10.39	.13	.19	851.12	-5.95	527.16	2376.78
95170.000	.00	.00	840.60	4660.00	851.27	10.67	.11	.17	851.39	-5.95	536.07	2526.36
97350.000	.00	.00	841.70	4660.00	851.40	9.70	.30	.06	851.69	.50	154.05	1076.36
97350.000	.00	.00	841.70	4660.00	851.42	9.72	.29	.06	851.72	.50	154.51	1080.31
97350.000	.00	.00	841.70	4660.00	851.48	9.78	.29	.06	851.77	.50	155.40	1088.04
97350.000	.00	.00	841.70	4660.00	851.66	9.96	.28	.07	851.94	.50	158.80	1117.71
97350.000	.00	.00	841.70	4660.00	851.81	10.11	.27	.07	852.08	.50	161.32	1140.16
97350.000	.00	.00	841.70	4660.00	852.00	10.30	.25	.07	852.25	.50	164.71	1170.85
99000.000	.00	.00	841.40	4660.00	852.32	10.92	.25	.01	852.57	-.18	190.59	1212.82
99000.000	.00	.00	841.40	4660.00	852.34	10.94	.24	.01	852.59	-.18	191.30	1217.35
99000.000	.00	.00	841.40	4660.00	852.38	10.98	.24	.01	852.62	-.18	192.35	1224.02
99000.000	.00	.00	841.40	4660.00	852.51	11.11	.23	.01	852.74	-.18	196.35	1249.76
99000.000	.00	.00	841.40	4660.00	852.62	11.22	.23	.01	852.84	-.18	199.61	1271.14
99000.000	.00	.00	841.40	4660.00	852.75	11.35	.22	.01	852.97	-.18	203.66	1298.18
99998.000	.00	.00	842.00	4660.00	852.76	10.76	.26	.01	853.02	.60	185.82	1183.11
99998.000	.00	.00	842.00	4660.00	852.77	10.77	.26	.01	853.03	.60	186.24	1185.69
99998.000	.00	.00	842.00	4660.00	852.80	10.80	.25	.01	853.06	.60	187.13	1191.16
99998.000	.00	.00	842.00	4660.00	852.92	10.92	.25	.01	853.16	.60	190.51	1212.36
99998.000	.00	.00	842.00	4660.00	853.01	11.01	.24	.01	853.25	.60	193.30	1230.07
99998.000	.00	.00	842.00	4660.00	853.12	11.12	.23	.01	853.36	.60	196.79	1252.62
99999.000	.00	.00	842.00	4660.00	852.76	10.76	.26	.00	853.02	.00	185.84	1183.19
99999.000	.00	.00	842.00	4660.00	852.77	10.77	.26	.00	853.03	.00	186.26	1185.78
99999.000	.00	.00	842.00	4660.00	852.80	10.80	.26	.00	853.06	.00	187.14	1191.24
99999.000	.00	.00	842.00	4660.00	852.91	10.91	.25	.00	853.16	.00	190.53	1212.44
99999.000	.00	.00	842.00	4660.00	853.01	11.01	.24	.00	853.25	.00	193.31	1230.15
99999.000	.00	.00	842.00	4660.00	853.12	11.12	.24	.00	853.36	.00	196.80	1252.69
100000.000	851.00	843.90	843.90	4660.00	854.87	10.97	.21	.00	855.08	1900.00	566.09	1631.76
100000.000	851.00	843.90	843.90	4660.00	854.87	10.97	.21	.00	855.08	1900.00	566.09	1631.91
100000.000	851.00	843.90	843.90	4660.00	854.87	10.97	.21	.00	855.08	1900.00	566.10	1632.24
100000.000	851.00	843.90	843.90	4660.00	854.87	10.97	.21	.00	855.08	1900.00	566.13	1633.50
100000.000	851.00	843.90	843.90	4660.00	854.88	10.98	.21	.00	855.09	1900.00	566.15	1634.53
100000.000	851.00	843.90	843.90	4660.00	854.88	10.98	.21	.00	855.09	1900.00	566.19	1636.22
100001.000	.00	.00	843.90	4660.00	854.88	10.98	.20	.00	855.08	.00	566.09	1631.70
100001.000	.00	.00	843.90	4660.00	854.88	10.98	.20	.00	855.08	.00	566.09	1631.86
100001.000	.00	.00	843.90	4660.00	854.88	10.98	.20	.00	855.08	.00	566.10	1632.19
100001.000	.00	.00	843.90	4660.00	854.88	10.98	.20	.00	855.09	.00	566.12	1633.45
100001.000	.00	.00	843.90	4660.00	854.88	10.98	.20	.00	855.09	.00	566.15	1634.48
100001.000	.00	.00	843.90	4660.00	854.89	10.99	.20	.00	855.09	.00	566.19	1636.17
100540.000	.00	.00	843.70	3195.00	855.14	11.44	.11	.03	855.25	-.37	238.42	1321.35
100540.000	.00	.00	843.70	3195.00	855.14	11.44	.11	.03	855.25	-.37	238.42	1321.41
100540.000	.00	.00	843.70	3195.00	855.14	11.44	.11	.03	855.25	-.37	238.42	1321.53
100540.000	.00	.00	843.70	3195.00	855.15	11.45	.11	.03	855.25	-.37	238.43	1322.01
100540.000	.00	.00	843.70	3195.00	855.15	11.45	.11	.03	855.25	-.37	238.43	1322.41
100540.000	.00	.00	843.70	3195.00	855.15	11.45	.11	.03	855.25	-.37	238.44	1323.05

FORM 1411 3 CB
PRINTED IN U.S.A.

SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	K*CHSL	TOPWID	AREA
101800.000	.00	.00	844.60	3195.00	855.39	10.79	.05	.02	855.44	.71	726.26	2909.66
101800.000	.00	.00	844.60	3195.00	855.39	10.79	.05	.02	855.44	.71	726.27	2909.83
101800.000	.00	.00	844.60	3195.00	855.39	10.79	.05	.02	855.44	.71	726.28	2910.17
101800.000	.00	.00	844.60	3195.00	855.39	10.79	.05	.02	855.44	.71	726.32	2911.50
101800.000	.00	.00	844.60	3195.00	855.39	10.79	.05	.02	855.45	.71	726.35	2912.58
101800.000	.00	.00	844.60	3195.00	855.40	10.80	.05	.02	855.45	.71	726.41	2914.37
102480.000	.00	.00	845.90	3195.00	855.48	9.58	.04	.00	855.51	1.91	984.07	3831.40
102480.000	.00	.00	845.90	3195.00	855.48	9.58	.04	.00	855.51	1.91	984.08	3831.61
102480.000	.00	.00	845.90	3195.00	855.48	9.58	.04	.00	855.52	1.91	984.10	3832.06
102480.000	.00	.00	845.90	3195.00	855.48	9.58	.04	.00	855.52	1.91	984.19	3833.78
102480.000	.00	.00	845.90	3195.00	855.48	9.58	.04	.00	855.52	1.91	984.26	3835.19
102480.000	.00	.00	845.90	3195.00	855.48	9.58	.04	.00	855.52	1.91	984.38	3837.50

SUMMARY OF ERRORS

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**********************************************************
HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
ERROR CORR -  01,02,03
MODIFICATION -  50,51,52,53
**********************************************************
```

```
#J148; #0731  *  KUBEK.WATER; FTN06  *  MON, JUN 15, 1981,  1:42 PM
#J148; #0731  *  KUBEK.WATER; FTN06  *  MON, JUN 15, 1981,  1:42 PM
#J148; #0731  *  KUBEK.WATER; FTN06  *  MON, JUN 15, 1981,  1:42 PM
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#J148; #0731  *  KUBEK.WATER; FTN06  *  MON, JUN 15, 1981,  1:42 PM
#J148; #0731  *  KUBEK.WATER; FTN06  *  MON, JUN 15, 1981,  1:42 PM
#J148; #0731  *  KUBEK.WATER; FTN06  *  MON, JUN 15, 1981,  1:42 PM
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#J148; #0731  *  KUBEK.WATER; FTN06  *  MON, JUN 15, 1981,  1:42 PM
#J148; #0731  *  KUBEK.WATER; FTN06  *  MON, JUN 15, 1981,  1:42 PM
#J148; #0731  *  KUBEK.WATER; FTN06  *  MON, JUN 15, 1981,  1:42 PM
```

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#J148; #0731  *  KUBEK.WATER; FTN06  *  MON, JUN 15, 1981,  1:42 PM
#J148; #0731  *  KUBEK.WATER; FTN06  *  MON, JUN 15, 1981,  1:42 PM
#J148; #0731  *  KUBEK.WATER; FTN06  *  MON, JUN 15, 1981,  1:42 PM
```

00BREAK00

1) COUNTY: Livingston

2) STUDY NAME: Hamburg Twp

3) WATERCOURSE: Huron River

4) DOCUMENT TYPE: Encroached Run

Base Line Lk to Whitewood Lk.

00BREAK00

```
*****************************************************************
*  WATER SURFACE PROFILES                                       *
*  VERSION OF NOVEMBER 1976                                     *
*  UPDATED JULY 1979                                            *
*                                                               *
*  RUN DATE TUE, JUL 21, 1981,  4:45 PM                         *
*****************************************************************
```

```
*****************************************
*  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             X
XXXXXXX  XXXX    X       XXXXX   XXXXX
X     X  X       X
X     X  X       X     X         X
X     X  XXXXXXX   XXXXX          XXXXXXX
```

"Baseline Lake to Whitewood Lake"

(Encroached Run)

Note:
See M.CROFT.CHE
Data has been revised

```
**********************************************
 HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
 ERROR CORR -  01,02,03
 MODIFICATION -  50,51,52,53
**********************************************

C
T1      HAMBURG TOWNSHIP FIS - JOB NO. 6504-03  FILE:  WHDMUL
T2      10-YEAR FLOW - BASE LINE LAKE TO WHITEWOOD LAKES
T3      HURON RIVER - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ
      -1.      2.       0.       0.   .000000     .00      .0       0.    854.290   .000

J2  NPROF    IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE
     1.000    .000   -1.000    .000     .000     .800     .000     .000     .000     .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    38.000   40.000   41.000   42.000   43.000   1.000    8.000   10.000   12.000    3.000

    33.000    4.000   25.000    .000     .000     .000     .000     .000     .000     .000

NC    .100     .050     .040     .300     .500     .000     .000     .000     .000     .000
QT   4.000 1555.000 2130.000 2485.000 3205.000     .000     .000     .000     .000     .000

        VALLEY SECTION 7   (A)

X1  72.679   21.000 1800.000 1896.000     .000     .000     .000     .000     .000     .000
X3    .000     .000    .000 1500.000     .000 1930.000     .000     .000     .000     .000
GR 868.000     .000  860.000  100.000  856.000  130.000  852.000  240.000  852.000  750.000
GR 853.300  950.000  852.000 1580.000  851.800 1800.000  850.900 1801.000  850.200 1808.000
GR 846.200 1824.000  844.700 1839.000  842.200 1861.000  847.000 1880.000  851.200 1894.000
GR 854.200 1896.000  854.000 2240.000  854.000 2310.000  856.000 2350.000  858.000 2540.000
GR 868.000 2600.000    .000    .000     .000     .000     .000     .000     .000     .000
NC    .100    .100     .040    .000     .000     .000     .000     .000     .000     .000
QT   4.000 1455.000 1990.000 2335.000 3015.000     .000     .000     .000     .000     .000

        VALLEY SECTION 8   (B)

X1  73.028   23.000 1550.000 1725.000 2140.000 1700.000 1840.000     .000     .000     .000
X3    .000     .000    .000 1100.000     .000 2100.000     .000     .000     .000     .000
GR 866.000     .000  864.000   20.000  862.000   50.000  860.000  100.000  858.000  150.000
GR 856.000  250.000  855.500  480.000  854.000  770.000  852.000 1550.000  851.000 1551.000
GR 850.100 1570.000  849.100 1590.000  846.000 1620.000  847.500 1650.000  847.900 1675.000
GR 848.900 1700.000  850.900 1715.000  852.100 1725.000  851.300 2150.000  852.000 2900.000
GR 854.000 2940.000  856.000 3030.000  858.000 3110.000     .000     .000     .000     .000
NC    .100    .100     .040    .000     .000     .000     .000     .000     .000     .000

        MANUFACTURED SECTION - CHANNEL POINTS FROM SECTION 8 WITH OVERBANKS
```

FROM 2-FT. CONTOUR MAP

X1	73.081	25.000	1590.000	1765.000	170.000	280.000	280.000	.000	.000	.000
X3	.000	.000	.000	1100.000	.000	2100.000	.000	.000	.000	.000
GR	866.000	.000	860.000	100.000	858.000	140.000	856.000	330.000	854.000	530.000
GR	852.000	1370.000	852.800	1590.000	851.600	1591.000	850.700	1610.000	849.700	1630.000
GR	846.600	1660.000	848.100	1690.000	848.500	1715.000	849.500	1740.000	851.500	1755.000
GR	852.700	1765.000	852.000	2070.000	854.000	2270.000	856.000	2510.000	856.400	2570.000
GR	856.000	2600.000	854.000	2740.000	854.000	2890.000	856.000	3170.000	856.300	3340.000
NH	6.000	.125	1890.000	.070	2040.000	.040	2250.000	.125	2930.000	.050
NH	3630.000	.125	4250.000	.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 9 - GR POINTS MODIFIED BETWEEN STA'S 2210 AND 2430 TO

REMOVE LINE OF HOMES FROM NATURAL FLOODWAY. (C)

X1	73.278	53.000	2040.000	2250.000	1080.000	980.000	1040.000	.000	.000	.000
X3	.000	.000	.000	1450.000	.000	2450.000	.000	.000	.000	.000
GR	870.000	.000	870.000	50.000	864.000	90.000	860.000	150.000	858.000	260.000
GR	857.000	470.000	858.000	680.000	860.000	740.000	862.000	780.000	870.000	880.000
GR	872.000	940.000	874.000	960.000	876.000	1000.000	876.000	1130.000	870.000	1200.000
GR	866.000	1230.000	860.000	1290.000	858.000	1315.000	854.000	1440.000	854.000	1890.000
GR	854.300	1940.000	852.700	2040.000	850.900	2043.000	848.400	2070.000	849.100	2095.000
GR	849.100	2120.000	849.300	2145.000	849.700	2175.000	850.500	2190.000	850.700	2246.000
GR	851.900	2250.000	854.000	2520.000	855.300	2550.000	855.300	2550.000	854.000	2610.000
GR	853.000	2750.000	854.000	2890.000	856.000	2930.000	858.000	3000.000	859.300	3100.000
GR	858.000	3230.000	856.000	3280.000	854.000	3340.000	854.300	3410.000	865.000	3410.000
GR	865.000	3630.000	854.000	3630.000	853.400	3730.000	854.000	3960.000	856.000	4050.000
GR	858.000	4110.000	864.000	4170.000	866.000	4250.000	.000	.000	.000	.000
EJ	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

FORM 1411 ½ G8
PRINTED IN U.S.A.

```
*PROF 1

CCHV=   1.300 CEHV=   1.500
*SECNO 72.679
   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=     1500.0     1930.0  TYPE=      1  TARGET=     430.000

          VALLEY SECTION 7   (A)

    72.68     12.09    854.29       .00    854.29    854.33       .04       .00       .00    851.80
    1555.     225.     1330.       0.      702.      758.       3.        0.        0.     854.20
      .00       .32      1.76       .08      .080      .032      .040      .000    842.20   1500.00
  .000096       0.        0.        0.        0         0         0       .00    430.00   1930.00

*SECNO 73.028
3470 ENCROACHMENT STATIONS=     1100.0     2100.0  TYPE=      1  TARGET=    1000.000

          VALLEY SECTION 8   (B)

    73.03      8.45    854.45       .00       .00    854.46       .01       .12       .01    852.00
    1455.     160.     1049.     245.      842.      1030.     1013.     96.       32.     852.10
      .65       .19      1.02       .24      .080      .032      .080      .032    846.00   1100.00
  .000046    2140.     1840.     1700.        2         0         0       .00   1000.00   2100.00

*SECNO 73.081
3470 ENCROACHMENT STATIONS=     1100.0     2100.0  TYPE=      1  TARGET=    1000.000

          MANUFACTURED SECTION - CHANNEL POINTS FROM SECTION 8 WITH OVERBANKS

          FROM 2-FT. CONTOUR MAP

    73.08      7.86    854.46       .00       .00    854.48       .01       .01       .00    852.60
    1455.     257.     1026.     172.     1056.      928.     715.     111.       37.     852.70
      .74       .24      1.11       .24      .080      .032      .080      .032    846.60   1100.00
  .000062     170.      280.     280.        0         0         0       .00   1000.00   2100.00

1490 NH CARD USED
*SECNO 73.278
3470 ENCROACHMENT STATIONS=     1450.0     2450.0  TYPE=      1  TARGET=    1000.000

          VALLEY SECTION 9 - GR POINTS MODIFIED BETWEEN STA'S 2210 AND 2430 TO

          REMOVE LINE OF HOMES FROM NATURAL FLOODWAY.   (C)

    73.28      6.14    854.54       .00       .00    854.56       .02       .08       .01    852.70
```

1455.	53.	1319.	83.	354.	1003.	370.	164.	61.	851.90
.98	.15	1.32	.22	.075	.032	.100	.032	848.40	1450.00
.000100	1080.	1040.	980.	1	0	0	.00	10000.00	2450.00

See Microfiche data reuse

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*****************************************************
 HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
 ERROR CORR -  01,02,03
 MODIFICATION -  50,51,52,53
*****************************************************

T1      HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2      50-YEAR FLOW - BASE LINE LAKE TO WHITEWOOD LAKES
T3      HURON RIVER - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

   -10.       3.       0.       0.    .000000     .00      .0      0.    854.820    .000

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

     2.000     .000   -1.000     .000     .000     .800     .000     .000     .000     .000

*PROF 2

CCHV=     .300 CEHV=     .500
*SECNO 72.679
   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=    1500.0    1930.0  TYPE=     1  TARGET=     430.000

          VALLEY SECTION 7   (A)

    72.68     12.62    854.82       .00    854.82    854.88       .06       .00       .00    851.80
    2130.      372.     1751.        7.     861.      808.       21.        0.        0.    854.20
      .00       .43      2.17       .31      .080      .032      .040      .000    842.20   1500.00
  .000134        0.        0.        0.         0         0         0       .00    430.00   1930.00

*SECNO 73.028

3470 ENCROACHMENT STATIONS=    1100.0    2100.0  TYPE=     1  TARGET=    1000.000

          VALLEY SECTION 8   (B)

    73.03      9.03    855.03       .00       .00    855.05       .02       .15       .01    852.00
    1990.      275.     1343.      371.     1105.     1132.     1232.      114.       32.    852.10
      .58       .25      1.19       .30      .080      .032      .080      .031    846.00   1100.00
  .000055     2140.     1840.     1700.         2         0         0       .00   1000.00   2100.00

*SECNO 73.081

3470 ENCROACHMENT STATIONS=    1100.0    2100.0  TYPE=     1  TARGET=    1000.000

          MANUFACTURED SECTION - CHANNEL POINTS FROM SECTION 8 WITH OVERBANKS
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          FROM 2-FT. CONTOUR MAP

    73.08     8.45   855.05      .00      .00   855.07      .02      .02      .00   852.60
     1990.     409.    1305.     276.    1345.    1031.     913.     132.      37.   852.70
      .66      .30     1.27      .30     .080     .032     .080     .032   846.60  1100.00
  .000070     170.     280.     280.        0        0        0      .00  1000.00  2100.00

1490 NH CARD USED
*SECNO 73.278

3470 ENCROACHMENT STATIONS=     1450.0     2450.0  TYPE=     1  TARGET=     1000.000

          VALLEY SECTION 9 - GR POINTS MODIFIED BETWEEN STA'S 2210 AND 2430 TO

          REMOVE LINE OF HOMES FROM NATURAL FLOODWAY.    (C)

    73.28     6.73   855.13      .00      .00   855.16      .03      .09      .01   852.70
     1990.     160.    1692.     138.     705.    1128.     489.     199.      61.   851.90
      .88      .23     1.50      .28     .079     .032     .100     .032   848.40  1450.00
  .000111    1080.    1040.     980.        1        0        0      .00  1000.00  2450.00
```

FORM 1411 5 68
PRINTED IN U.S.A.

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**********************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -   01,02,03
  MODIFICATION -   50,51,52,53
**********************************************

T1       HANBURG TOWNSHIP FIS - JOB NO. 6504-03
T2       100-YEAR FLOW - BASE LINE LAKE TO WHITEWOOD LAKES
T3       HURON RIVER - PROJECT MANAGER,M.S.CHENG

J1   ICHECK     INQ      NINV      IDIR      STRT     METRIC    HVINS      Q       WSEL      FQ

     -10.        4.        0.        0.   .000000     .00       .0        0.    855.040    .000

J2   NPROF    IPLOT     PRFVS     XSECV     XSECH      FN      ALLDC     IBW     CHNIM    ITRACE

     3.000     .000    -1.000     .000      .000     .800     .000     .000     .000     .000

*PROF 3

CCHV=     .300 CEHV=     .500
*SECNO 72.679
   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=    1500.0    1930.0  TYPE=     1  TARGET=     430.000

          VALLEY SECTION 7   (A)

   72.68     12.84    855.04      .00    855.04    855.11      .07       .00       .00    851.80
   2485.      463.     2010.      12.      927.      830.      29.        0.        0.    854.20
     .00       .50      2.42      .42      .080      .032     .040      .000    842.20   1500.00
 .000162       0.        0.       0.         0         0        0       .00    430.00   1930.00

*SECNO 73.028

3470 ENCROACHMENT STATIONS=    1100.0    2100.0  TYPE=     1  TARGET=    1000.000

          VALLEY SECTION 8   (B)

   73.03      9.29    855.29      .00       .00    855.31      .02       .18       .02    852.00
   2335.      349.     1535.     451.     1223.     1178.    1330.      122.       32.    852.10
     .54       .28      1.30      .34      .080      .032     .080      .031    846.00   1100.00
 .000062     2140.     1840.    1700.         2         0        0       .00   1000.00   2100.00

*SECNO 73.081

3470 ENCROACHMENT STATIONS=    1100.0    2100.0  TYPE=     1  TARGET=    1000.000

          MANUFACTURED SECTION - CHANNEL POINTS FROM SECTION 8 WITH OVERBANKS
```

```
        FROM 2-FT. CONTOUR MAP

   73.08      8.71    855.31      .00       .00    855.33       .02       .02       .00    852.60
   2335.      506.    1488.      341.      1475.    1077.      1002.      142.       37.    852.70
     .61       .34     1.38.      .34      .080     .032      .080      .032    846.60   1100.00
 .000079      170.     280.      280.         0        0         0       .00   1000.00   2100.00

1490 NH CARD USED
*SECNO 73.278

3470 ENCROACHMENT STATIONS=     1450.0     2450.0  TYPE=     1  TARGET=     1000.000

        VALLEY SECTION 9 - GR POINTS MODIFIED BETWEEN STA'S 2210 AND 2430 TO

        REMOVE LINE OF HOMES FROM NATURAL FLOODWAY.   (C)

   73.28      7.01    855.41      .00       .00    855.44       .03       .10       .01    852.70
   2335.      234.    1927.      174.      872.    1188.      546.      215.       61.    851.90
     .82       .27     1.62      .32      .080     .032      .100      .032    848.40   1450.00
 .000122     1080.    1040.      980.         2        0         0       .00   1000.00   2450.00
```

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*****************************************
 HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
 ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
*****************************************

T1      HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2      500-YEAR FLOW - BASE LINE LAKE TO WHITEWOOD LAKES
T3      HURON RIVER - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

    -10.      5.       0.       0.     .000000    .00      .0       0.     855.520    .000

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

    15.000    .000    -1.000    .000     .000     .800     .000     .000     .000     .000

*PROF 4

CCHV=    .300 CEHV=    .500
*SECNO 72.679
   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=    1500.0    1930.0  TYPE=     1  TARGET=     430.000

          VALLEY SECTION 7   (A)

    72.68     13.32    855.52      .00    855.52    855.62      .10      .00      .00    851.80
    3205.     670.     2506.     29.     1071.     876.      45.       0.       0.     854.20
      .00      .63      2.86      .63      .080      .032     .040     .000   842.20   1500.00
  .000210      0.        0.       0.        0         0        0       .00   430.00   1930.00

*SECNO 73.028

3470 ENCROACHMENT STATIONS=    1100.0    2100.0  TYPE=     1  TARGET=    1000.000

          VALLEY SECTION 8   (B)

    73.03      9.84    855.84      .00       .00    855.86      .02      .22      .02    852.00
    3015.     510.     1887.     618.     1470.     1274.    1536.     139.      32.     852.10
      .49      .35      1.48      .40      .080      .032     .080     .031   846.00   1100.00
  .000073    2140.     1840.    1700.        2         0        0       .00  1000.00   2100.00

*SECNO 73.081

3470 ENCROACHMENT STATIONS=    1100.0    2100.0  TYPE=     1  TARGET=    1000.000

          MANUFACTURED SECTION - CHANNEL POINTS FROM SECTION 8 WITH OVERBANKS
```

```
        FROM 2-FT. CONTOUR MAP
   73.08     9.26   855.86      .00      .00   855.89      .02      .02      .00   852.60
   3015.     710.    1825.     480.    1743.    1173.    1185.     162.      37.   852.70
     .55      .41     1.56      .40     .080     .032     .080     .032   846.60  1100.00
 .000089     170.     280.     280.        1        0        0      .00  1000.00  2100.00

1490 NH CARD USED
*SECNO 73.278

3470 ENCROACHMENT STATIONS=    1450.0    2450.0  TYPE=     1  TARGET=    1000.000

        VALLEY SECTION 9 - GR POINTS MODIFIED BETWEEN STA'S 2210 AND 2430 TO

        REMOVE LINE OF HOMES FROM NATURAL FLOODWAY.   (C)

   73.28     7.57   855.97      .00      .00   856.01      .04      .11      .01   852.70
   3015.     411.    2357.     247.    1203.    1306.     658.     248.      61.   851.90
     .75      .34     1.81      .38     .081     .032     .100     .032   848.40  1450.00
 .000133    1080.    1040.     980.        2        0        0      .00  1000.00  2450.00
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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

HURON RIVER - PROJECT MA

SUMMARY PRINTOUT

SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	K*CHSL	TOPWID	AREA
72.679	.00	.00	842.20	1555.00	854.29	12.09	.04	.00	854.33	.00	430.00	1463.38
72.679	.00	.00	842.20	2130.00	854.82	12.62	.06	.00	854.88	.00	430.00	1691.28
72.679	.00	.00	842.20	2485.00	855.04	12.84	.07	.00	855.11	.00	430.00	1785.88
72.679	.00	.00	842.20	3205.00	855.52	13.32	.10	.00	855.62	.00	430.00	1992.28
73.028	.00	.00	846.00	1455.00	854.45	8.45	.01	.01	854.46	2.07	1000.00	2885.24
73.028	.00	.00	846.00	1990.00	855.03	9.03	.02	.01	855.05	2.07	1000.00	3469.73
73.028	.00	.00	846.00	2335.00	855.29	9.29	.02	.02	855.31	2.07	1000.00	3730.87
73.028	.00	.00	846.00	3015.00	855.84	9.84	.02	.02	855.86	2.07	1000.00	4278.91
73.081	.00	.00	846.60	1455.00	854.46	7.86	.01	.00	854.48	2.14	1000.00	2698.20
73.081	.00	.00	846.60	1990.00	855.05	8.45	.02	.00	855.07	2.14	1000.00	3288.39
73.081	.00	.00	846.60	2335.00	855.31	8.71	.02	.00	855.33	2.14	1000.00	3553.91
73.081	.00	.00	846.60	3015.00	855.86	9.26	.02	.00	855.89	2.14	1000.00	4101.84
73.278	.00	.00	848.40	1455.00	854.54	6.14	.02	.01	854.56	1.73	1000.00	1726.92
73.278	.00	.00	848.40	1990.00	855.13	6.73	.03	.01	855.16	1.73	1000.00	2322.67
73.278	.00	.00	848.40	2335.00	855.41	7.01	.03	.01	855.44	1.73	1000.00	2604.95
73.278	.00	.00	848.40	3015.00	855.97	7.57	.04	.01	856.01	1.73	1000.00	3166.13

SUMMARY OF ERRORS

FORM 1411 ½ GB
PRINTED IN U.S.A.

00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: Hamburg Twp

3) WATERCOURSE: Huron River

4) DOCUMENT TYPE: ENCROACHED Run
Gallagher LAKE TO SECTION 9

00BREAK00

```
*********************************************************
*  WATER SURFACE PROFILES                               *
*  VERSION OF NOVEMBER 1976                             *
*  UPDATED JULY 1979                                    *
*                                                       *
*  RUN DATE TUE, JUL 21, 1981,  4:50 PM                 *
*********************************************************
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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
```

"Gallagher Lake to Section G"

(Encroached Run)

RECEIVED
JUL 27 1981
WATER MANAGEMENT

FORM 1411 5 68
PRINTED IN U.S.A.

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*****************************************************
HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
ERROR CORR -  01,02,03
MODIFICATION -  50,51,52,53
*****************************************************

C
T1      HAMBURG TOWNSHIP FIS - JOB NO. 6504-03  FILE:  MUL18N
T2      10-YEAR FLOW - GALLAGHER LAKE TO SECTION G
T3      HURON RIVER - NORTHERN ROUTE - PROJECT MANAGER, N.S.CHENG

J1  ICHECK    INQ     NINV    IDIR    STRT    METRIC  HVINS   Q       WSEL    FQ
      -1.      2.      0.      0.   .000000    .00     .0      0.   854.620   .000

J2  NPROF   IPLOT   PRFVS   XSECV   XSECH   FN      ALLDC   IBW     CHNIM   ITRACE
     1.000    .000   -1.000    .000    .000    .800    .000    .000    .000    .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    38.000  40.000  41.000  42.000  43.000   1.000   8.000  10.000  12.000   3.000

    33.000   4.000  25.000    .000    .000    .000    .000    .000    .000    .000

NC    .050    .100    .040    .300    .500    .000    .000    .000    .000    .000
QT   4.000 1300.000 1765.000 2050.000 2640.000 .000    .000    .000    .000    .000

        VALLEY SECTION 16   (F)

X1  74.905  19.000 850.000 981.000    .000    .000    .000    .000    .000    .000
X3    .000    .000    .000 840.000    .000 1600.000    .000    .000    .000    .000
GR 862.600    .000 856.000  50.000 856.000 840.000 853.300 850.000 851.600 853.000
GR 846.800 872.000 845.100 884.000 844.500 900.000 844.200 922.000 847.700 945.000
GR 849.100 960.000 849.700 970.000 851.600 980.000 851.900 981.000 854.000 1150.000
GR 856.000 2360.000 859.000 2450.000 860.000 2950.000 870.000 3000.000    .000    .000
NC    .125    .125    .045    .000    .000    .000    .000    .000    .000    .000

        VALLEY SECTION 17   (G)

X1  75.096  19.000 250.000 425.000 1250.000 380.000 1010.000    .000    .000    .000
X3    .000    .000    .000    .000    .000 1650.000    .000    .000    .000    .000
GR 855.300 170.000 853.100 235.000 850.300 237.000 848.700 250.000 842.700 261.000
GR 839.900 289.000 839.900 309.000 843.900 325.000 847.100 342.000 849.000 385.000
GR 852.000 420.000 852.500 425.000 854.000 435.000 856.000 2350.000 856.000 2750.000
GR 858.000 2790.000 860.000 2940.000 862.000 2970.000 870.000 3030.000    .000    .000
EJ    .000    .000    .000    .000    .000    .000    .000    .000    .000    .000
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*PROF 1

CCHV=     .300 CEHV=     .500
*SECNO 74.905
  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=      840.0     1600.0  TYPE=      1  TARGET=      760.000

        VALLEY SECTION 16   (F)

   74.91     10.42    854.62       .00    854.62    854.64       .02       .00       .00    853.30
   1300.        1.     1240.       60.        3.     984.      399.        0.        0.    851.90
     .00       .20      1.26       .15      .040      .032      .080      .000    844.20    845.11
 .000051        0.        0.        0.         0         0         0       .00    679.99   1525.10

*SECNO 75.096

3470 ENCROACHMENT STATIONS=         .0     1650.0  TYPE=      1  TARGET=     1649.999

        VALLEY SECTION 17   (G)

   75.10     14.77    854.67       .00       .00    854.68       .01       .03       .00    848.70
   1300.       16.     1276.        8.      109.     1570.      226.       34.       10.    852.50
     .35       .15       .81       .04      .100      .036      .100      .037    839.90    188.77
 .000021     1250.     1010.      380.         0         0         0       .00    882.77   1071.54
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*************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
*************************************************

T1      HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2      50-YEAR FLOW - GALLAGHER LAKE TO SECTION G
T3      HURON RIVER - NORTHERN ROUTE - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

    -10.      3.        0.        0.     .000000      .00       .0        0.     855.240    .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     2.000     .000    -1.000     .000      .000      .800      .000      .000      .000      .000

*PROF 2

CCHV=     .300 CEHV=     .500
*SECNO 74.905
   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=     840.0    1600.0  TYPE=     1  TARGET=     760.000

          VALLEY SECTION 16   (F)

    74.91     11.04    855.24      .00    855.24    855.27      .03       .00       .00    853.30
    1765.       2.      1608.     155.       7.     1065.     778.       0.        0.     851.90
      .00      .29      1.51      .20      .040      .032      .080      .000    844.20    842.81
  .000066      0.        0.        0.        0         0         0       .00    757.16   1600.00

*SECNO 75.096

3470 ENCROACHMENT STATIONS=       .0    1650.0  TYPE=     1  TARGET=    1649.999

          VALLEY SECTION 17   (G)

    75.10     15.40    855.30      .00       .00    855.32      .01       .04       .01    848.70
    1765.       27.      1686.     52.      154.     1681.     827.       41.       13.     852.50
      .28      .17      1.00      .06      .100      .036      .100      .037    839.90    170.06
  .000029    1250.      1010.     380.        0         0         0       .00   1479.94   1650.00
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*****************************************
 HEC2 RELEASE DATED NOV 76 UPDATED JULY,1979
 ERROR CORR -  01,02,03
 MODIFICATION -  50,51,52,53
*****************************************

T1      HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2      100-YEAR FLOW - GALLAGHER LAKE TO SECTION G
T3      HURON RIVER - NORTHERN ROUTE - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

    -10.       4,       0.       0.   ,000000     ,00       ,0       0.    855.530   ,000

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIm    ITRACE

     3,000    ,000    -1,000    ,000     ,000     ,800     ,000     ,000     ,000     ,000

*PROF 3

CCHV=    ,300 CEHV=    ,500
*SECNO 74,905
   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=     840.0    1600.0  TYPE=     1  TARGET=     760.000

         VALLEY SECTION 16   (F)

    74.91    11.33   855.53     ,00   855.53   855.57     ,04     ,00     ,00   853.30
    2050.       3.    1822.    225.      9.    1103.    957.      0.      0.    851.90
      ,00     ,34     1.65     ,23    ,040     ,032     ,080    ,000   844.20   841.74
  ,000075      0.       0.      0.       0        0        0     ,00   758.26  1600.00

*SECNO 75,096

3470 ENCROACHMENT STATIONS=        ,0    1650.0  TYPE=     1  TARGET=    1649.999

         VALLEY SECTION 17   (G)

    75.10    15.70   855.60     ,00     ,00   855.62     ,02     ,05     ,01   848.70
    2050.      34.    1913.    103.    178.    1733.   1192.     45.     13.    852.50
      ,26     ,19     1.10     ,09    ,100     ,036    ,100    ,038   839.90   170.00
  ,000034   1250.    1010.    380.       0        0        0     ,00  1480.00  1650.00
```

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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -   01,02,03
  MODIFICATION -   50,51,52,53
*****************************************************

T1       HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2       500-YEAR FLOW - GALLAGHER LAKE TO SECTION G
T3       HURON RIVER - NORTHERN ROUTE - PROJECT MANAGER, M.S.CHENG

J1  ICHECK     INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

    -10.        5.        0.        0.   .000000       .00       .0        0.     856.120    .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH      FN       ALLDC     IBW      CHNIM     ITRACE

    15.000     .000    -1.000     .000      .000      .800      .000      .000      .000      .000

*PROF 4

CCHV=     .300 CEHV=     .500
*SECNO 74.905
   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=     840.0    1600.0  TYPE=     1  TARGET=     760.000

          VALLEY SECTION 16   (F)

    74.91     11.92    856.12      .00    856.12    856.17      .05      .00      .00    853.30
    2640.        6.     2230.     404.       15.     1181.    1322.       0.       0.    851.90
      .00       .44      1.89      .31      .040      .032     .080     .000   844.20    840.00
  .000090        0.        0.       0.         0         0        0      .00   760.00   1600.00

*SECNO 75.096

3470 ENCROACHMENT STATIONS=        .0    1650.0  TYPE=     1  TARGET=    1649.999

          VALLEY SECTION 17   (G)

    75.10     16.31    856.21      .00       .00    856.23      .02      .06      .01    848.70
    2640.       51.     2337.     252.      226.     1839.    1930.      53.      13.    852.50
      .23       .23      1.27      .13      .100      .036     .100     .039   839.90    170.00
  .000042     1250.     1010.     380.         0         0        0      .00  1480.00   1650.00
```

```
*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  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

HURON RIVER - NORTHERN R

SUMMARY PRINTOUT

SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	K*CHSL	TOPWID	AREA
74.905	.00	.00	844.20	1300.00	854.62	10.42	.02	.00	854.64	.00	679.99	1385.81
74.905	.00	.00	844.20	1765.00	855.24	11.04	.03	.00	855.27	.00	757.18	1849.91
74.905	.00	.00	844.20	2050.00	855.53	11.33	.04	.00	855.57	.00	758.26	2069.65
74.905	.00	.00	844.20	2640.00	856.12	11.92	.05	.00	856.17	.00	760.00	2517.64
75.096	.00	.00	839.90	1300.00	854.67	14.77	.01	.00	854.68	-4.26	882.77	1905.41
75.096	.00	.00	839.90	1765.00	855.30	15.40	.01	.01	855.32	-4.26	1479.94	2661.68
75.096	.00	.00	839.90	2050.00	855.60	15.70	.02	.01	855.62	-4.26	1480.00	3103.08
75.096	.00	.00	839.90	2640.00	856.21	16.31	.02	.01	856.23	-4.26	1480.00	3995.31

SUMMARY OF ERRORS

00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: Hamburg Twp

3) WATERCOURSE: Huron River

4) DOCUMENT TYPE: Encroached Run

Gallagher Lk to Loon Lk

00BREAK00

```
*****************************************************
*  WATER SURFACE PROFILES                           *
*  VERSION OF NOVEMBER 1976                         *
*  UPDATED JULY 1979                                *
*                                                   *
*  RUN DATE TUE, JUL 21, 1981,  4:52 PM             *
*****************************************************
```

```
*****************************************
*  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     X
XXXXXXX  XXXXX    X       XXXXX  XXXXX
X     X  X        X
X     X  X        X     X        X
X     X  XXXXXXX  XXXXX          XXXXXXX
```

"Gallagher Lake to Lower Lake"

(Encroached Run)

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*****************************************
 HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
 ERROR CORR -  01,02,03
 MODIFICATION -  50,51,52,53
*****************************************

C
T1      HAMBURG TOWNSHIP FIS - JOB NO.6504-03
T2      10-YEAR FLOW - GALLAGHER LAKE TO LOON LAKE
T3      HURON RIVER - SOUTHERN ROUTE - PROJECT MANAGER, N.S.CHENG

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

     -1.      2.       0.       0.    .000000     .00      .0       0.    854.620   .000

J2  NPROF    IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

     1.000    .000   -1.000    .000     .000     .800     .000     .000     .000     .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    38.000  40.000  41.000  42.000  43.000   1.000   8.000  10.000  12.000   3.000

    33.000   4.000  25.000    .000    .000    .000    .000    .000    .000    .000

NC     .070    .060    .040    .300    .500    .000    .000    .000    .000    .000
QT    4.000 130.000 190.000 250.000 345.000    .000    .000    .000    .000    .000

        VALLEY SECTION 13   (H)

X1     .000  22.000 430.000 563.000    .000    .000    .000    .000    .000    .000
X3     .000    .000 430.000    .000 563.000    .000    .000    .000    .000    .000
GR   859.600    .000 858.000  50.000 854.000 100.000 854.000 360.000 853.600 430.000
GR   851.400 432.000 849.800 445.000 849.100 460.000 848.200 480.000 847.900 495.000
GR   847.300 510.000 847.500 530.000 850.700 562.000 853.500 563.000 854.000 590.000
GR   854.800 700.000 856.000 1000.000 856.100 1130.000 856.200 1480.000 856.000 1750.000
GR   856.000 2230.000 862.600 2330.000    .000    .000    .000    .000    .000    .000

X1   720.000    .000    .000    .000 800.000 600.000 720.000    .000    .000    .000
X3     .000    .000    .000 400.000    .000 610.000    .000    .000    .000    .000
EJ     .000    .000    .000    .000    .000    .000    .000    .000    .000    .000
```

```
*PROF 1

CCHV=    .300 CEHV=    1.500
*SECNO .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=     430.0     563.0  TYPE=     1  TARGET=     133.000

         VALLEY SECTION 13   (H)

     .00      7.32    854.62       .00    854.62    854.62       .00       .00       .00    853.60
    130.        0.     130.        0.        0.     781.        0.        0.        0. 100000.00
     .00       .00       .17       .00      .056      .032      .048      .000    847.30    430.00
  .000001       0.        0.        0.         0         0         0       .00    133.00    563.00

*SECNO 720.000

3470 ENCROACHMENT STATIONS=     400.0     610.0  TYPE=     1  TARGET=     210.000
   720.00      7.32    854.62       .00       .00    854.62       .00       .00       .00    853.60
    130.        1.     128.        1.       28.     781.       34.        13        3.     853.50
    1.23       .03       .16       .03      .056      .032      .048      .032    847.30    400.00
  .000001      800.      720.      600.        0.         0         0       .00    210.00    610.00
```

```
*****************************************
HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
ERROR CORR -   01,02,03
 MODIFICATION -  50,51,52,53
*****************************************

T1       HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2       50-YEAR FLOW - GALLAGHER LAKE TO LOON LAKE
T3       HURON RIVER - SOUTHERN ROUTE - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

    -10.       3.       0.       0.    .000000     .00      .0       0.    855.240    .000

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

     2.000     .000   -1.000     .000     .000     .800     .000     .000     .000     .000

*PROF 2

CCHV=     .300 CEHV=     .500
*SECNO .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=     430.0     563.0  TYPE=     1  TARGET=     133.000
      .00      7.94   855.24      .00   855.24   855.24      .00      .00      .00   853.60
     190.        0.     190.       0.       0.     863.       0.       0.       0. 100000.00
      .00      .00      .22      .00     .056     .032     .048     .000   847.30   430.00
  .000002        0.       0.       0.        0        0        0      .00   133.00   563.00

*SECNO 720.000

3470 ENCROACHMENT STATIONS=     400.0     610.0  TYPE=     1  TARGET=     210.000
   720.00      7.94   855.24      .00      .00   855.24      .00      .00      .00   853.60
     190.        2.     185.       3.      47.     864.      64.      15.       3.   853.50
      .96      .05      .21      .05     .056     .032     .048     .032   847.30   400.00
  .000002     800.     720.     600.        0        0        0      .00   210.00   610.00
```

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*****************************************
 HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
 ERROR CORR -  01,02,03
 MODIFICATION -  50,51,52,53
*****************************************

T1      HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2      100-YEAR FLOW - GALLAGHER LAKE TO LOON LAKE
T3      HURON RIVER - SOUTHERN ROUTE - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

   -10.       4.       0.       0.    .000000     .00      .0       0     855.530    .000

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

     3.000     .000    -1.000    .000     .000     .800     .000     .000     .000     .000

*PROF 3

CCHV=     .300 CEHV=     .500
*SECNO .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=     430.0     563.0  TYPE=     1  TARGET=     133.000
      .00      8.23    855.53     .00    855.53    855.53     .00       .00       .00    853.60
     250.        0.     250.       0.       0.     902.       0.        0.        0.  100000.00
      .00       .00      .28     .00      .056     .032     .048      .000    847.30    430.00
  .000003        0.       0.       0.        0        0        0       .00    133.00    563.00

*SECNO 720.000

3470 ENCROACHMENT STATIONS=     400.0     610.0  TYPE=     1  TARGET=     210.000
   720.00      8.23    855.53     .00       .00    855.53     .00       .00       .00    853.60
     250.        3.     241.       5.       55.     902.      77.       16.        3.    853.50
      .77       .06      .27     .07      .056     .032     .048      .032    847.30    400.00
  .000003      800.     720.     600.        0        0        0       .00    210.00    610.00
```

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*****************************************************
 HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
 ERROR CORR -  01,02,03
 MODIFICATION -  50,51,52,53
*****************************************************

T1       HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2       500-YEAR FLOW - GALLAGHER LAKE TO LOON LAKE
T3       HURON RIVER - SOUTHERN ROUTE - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

   -10.       5.        0.        0.     .000000      .00       .0        .0      856.120     .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    15.000     .000    -1.000     .000      .000      .800      .000      .000      .000      .000

*PROF 4

CCHV=     .300 CEHV=     .500
*SECNO .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=      430.0     563.0  TYPE=     1  TARGET=     133.000
      .00      8.82    856.12     .00    856.12    856.12     .00       .00       .00    853.60
     345.        0.     345.       0.       0.      980.       0.        0.        0.  100000.00
      .00       .00      .35      .00      .056      .032     .048      .000    847.30    430.00
  .000004        0.       0.       0.        0         0        0       .00    133.00    563.00

*SECNO 720.000

3470 ENCROACHMENT STATIONS=      400.0     610.0  TYPE=     1  TARGET=     210.000
   720.00      8.82    856.12     .00       .00    856.12     .00       .00       .00    853.60
     345.        6.     328.      11.       73.      981.    105.       18.        3.    853.50
      .62       .09      .33      .10      .056      .032     .048      .032    847.30    400.00
  .000004      800.     720.     600.        0         0        0       .00    210.00    610.00
```

```
*****************************************
 HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
 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

HURON RIVER - SOUTHERN R

SUMMARY PRINTOUT

SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	K*CHSL	TOPWID	AREA
.000	.00	.00	847.30	130.00	854.62	7.32	.00	.00	854.62	.00	133.00	780.86
.000	.00	.00	847.30	190.00	855.24	7.94	.00	.00	855.24	.00	133.00	863.32
.000	.00	.00	847.30	250.00	855.53	8.23	.00	.00	855.53	.00	133.00	901.89
.000	.00	.00	847.30	345.00	856.12	8.82	.00	.00	856.12	.00	133.00	980.36
720.000	.00	.00	847.30	130.00	854.62	7.32	.00	.00	854.62	.00	210.00	843.51
720.000	.00	.00	847.30	190.00	855.24	7.94	.00	.00	855.24	.00	210.00	973.82
720.000	.00	.00	847.30	250.00	855.53	8.23	.00	.00	855.53	.00	210.00	1034.86
720.000	.00	.00	847.30	345.00	856.12	8.82	.00	.00	856.12	.00	210.00	1158.97

SUMMARY OF ERRORS

00BREAK00

1) COUNTY: Livingston

2) STUDY NAME: Hamburg Twp

3) WATERCOURSE: Huron River

4) DOCUMENT TYPE: Natural Floodway

Gallagher Lk to Loon Lake

00BREAK00

```
*********************************************************
*  WATER SURFACE PROFILES                               *
*  VERSION OF NOVEMBER 1976                             *
*  UPDATED JULY 1979                                    *
*                                                       *
*  RUN DATE TUE, JUL 21, 1981,  4:35 PM                 *
*********************************************************
```

```
*********************************************************
*  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          X    X
XXXXXXX  XXXX      X         XXXXX  XXXXX
X     X  X         X
X     X  X         X    X          X
X     X  XXXXXXX   XXXXX            XXXXXXX
```

Gallagher Lake to Loon Lake
(Natural Floodway)

RECEIVED
JUL 27 1981
WATER MANAGEMENT

FORM 1411 ½ G8
PRINTED IN U.S.A.

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*****************************************
 HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
 ERROR CORR -  01,02,03
 MODIFICATION -  50,51,52,53
*****************************************

C
T1      HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2      100-YEAR NATURAL FLOODWAY - GALLAGHER LAKE TO LOON LAKE
T3      HURON RIVER - SOUTHERN ROUTE - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ     NINV    IDIR    STRT    METRIC  HVINS   Q       WSEL    FQ
      -1.      2.      0.      0.   .000000    .00     .0      0.    855.420   .000

J2  NPROF   IPLOT   PRFVS   XSECV   XSECH   FN      ALLDC   IBW     CHNIM   ITRACE
     1.000    .000   -1.000    .000    .000    .800    .000    .000    .000    .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    38.000  40.000  41.000  42.000  43.000   1.000   8.000  10.000  12.000   3.000

    33.000   4.000  25.000    .000    .000    .000    .000    .000    .000    .000

NC     .070    .060    .040    .300    .500    .000    .000    .000    .000    .000
QT    1.000 250.000    .000    .000    .000    .000    .000    .000    .000    .000

        VALLEY SECTION 13   (H)

X1     .000  22.000 430.000 563.000    .000    .000    .000    .000    .000    .000
X3     .000    .000    .000 190.000    .000 660.000    .000    .000    .000    .000
GR   859.600    .000 858.000  50.000 854.000 100.000 854.000 360.000 853.600 430.000
GR   851.400 432.000 849.800 445.000 849.100 460.000 848.200 480.000 847.900 495.000
GR   847.300 510.000 847.500 530.000 850.700 562.000 853.500 563.000 854.000 590.000
GR   854.800 700.000 856.000 1000.000 856.100 1130.000 856.200 1480.000 856.000 1750.000
GR   856.000 2230.000 862.600 2330.000    .000    .000    .000    .000    .000    .000

X1   720.000    .000    .000    .000 800.000 600.000 720.000    .000    .000    .000
X3     .000    .000    .000 260.000    .000 660.000    .000    .000    .000    .000
EJ     .000    .000    .000    .000    .000    .000    .000    .000    .000    .000
```

```
*PROF 1

CCHV=    .300 CEHV=    .500
*SECNO  .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=     190.0     660.0  TYPE=     1  TARGET=     470.000

          VALLEY SECTION 13   (H)

     .00      8.12    855.42      .00    855.42    855.42      .00       .00       .00    853.60
    250.       19.      224.       7.      355.      887.     127.        0.        0.    853.50
     .00       .05       .25      .06      .056      .032     .048      .000    847.30    190.00
  .000002       0.        0.       0.         0         0        0       .00    470.00    660.00

*SECNO 720.000

3470 ENCROACHMENT STATIONS=     260.0     660.0  TYPE=     1  TARGET=     400.000
   720.00      8.12    855.42      .00       .00    855.42      .00       .00       .00    853.60
    250.       14.      228.       8.      256.      887.     127.       22.        7.    853.50
     .84       .06       .26      .06      .056      .032     .048      .032    847.30    260.00
  .000003      800.      720.     600.         0         0        0       .00    400.00    660.00
```

FORM 1411 5 68
PRINTED IN U.S.A.

00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: Hamburg Twp

3) WATERCOURSE: Huron River

4) DOCUMENT TYPE: ENCROACHES Run
LOON LAKE TO SECTION C

00BREAK00

```
*********************************************************
*  WATER SURFACE PROFILES                               *
*  VERSION OF NOVEMBER 1976                             *
*  UPDATED JULY 1979                                    *
*                                                       *
*  RUN DATE TUE, JUL 21, 1981,  4:54 PM                 *
*********************************************************
```

```
*********************************************
*  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                      X
XXXXXXX  XXXXX     X         XXXXXX  XXXXXX
X     X  X         X                X
X     X  X         X    X           X
X     X  XXXXXXX   XXXXX            XXXXXXX
```

"Loon Lake to Section L"

(Encroached Run)

FORM 1411 ½ GB
PRINTED IN U.S.A.

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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
*****************************************************

C
T1      HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2      10-YEAR FLOW - LOON LAKE TO SECTION L
T3      HURON RIVER - SOUTHERN ROUTE - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ     NINV     IDIR     STRT    METRIC    HVINS      Q     WSEL      FQ
      -1.      2.      0.       0.   .000000     .00       .0       0.   854.620   .000

J2  NPROF    IPLOT   PRFVS   XSECV   XSECH    FN      ALLDC   IBW     CHNIM   ITRACE
     1.000    .000   -1.000   .000    .000   .800     .000   .000    .000    .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    38.000   40.000   41.000   42.000   43.000   1.000   8.000   10.000   12.000   3.000

    33.000    4.000   25.000    .000     .000    .000    .000    .000     .000    .000
NC    .050     .125     .045     .300     .500    .000    .000    .000     .000    .000
QT   4.000  130.000  190.000  250.000  345.000    .000    .000    .000     .000    .000

        VALLEY SECTION 14   (I)

X1 1750.000   22.000  620.000  687.000    .000    .000    .000    .000     .000    .000
X3    .000     .000    .000  600.000    .000  1180.000  .000    .000     .000    .000
GR  870.000    .000  868.000   20.000  862.000  100.000  860.000 130.000  858.000 220.000
GR  856.000  350.000 855.500  510.000  858.300  620.000  853.900 621.000  851.900 633.000
GR  851.100  652.000 852.100  660.000  854.900  674.000  856.200 686.000  859.600 687.000
GR  856.000  710.000 854.800  920.000  854.700 1190.000  856.000 1790.000 858.000 1840.000
GR  860.000 1860.000 862.500 1890.000    .000    .000    .000    .000     .000    .000
NC    .050     .125     .045     .000     .000    .000    .000    .000     .000    .000

        VALLEY SECTION 15   (J)

X1 3280.000   18.000  130.000  191.000 1750.000 1360.000 1530.000  .000     .000    .000
X3    .000     .000    .000     .000    .000   680.000    .000    .000     .000    .000
GR  870.000    .000  860.000   60.000  858.000   70.000  856.000  80.000  854.000 100.000
GR  854.000  130.000 850.000  131.000  846.600  145.000  845.200 155.000  847.500 167.000
GR  849.600  177.000 851.100  189.000  854.800  191.000  856.000 840.000  858.000 890.000
GR  856.000 1050.000 856.000 1170.000  862.000 1190.000    .000    .000     .000    .000

        MANUFACTURED SECTION, CHANNEL POINTS FROM SECTION 15 AND ADJUSTED FOR

        CHANNEL INVERT WITH OVERBANKS REPEATED FROM SECTION 15.
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X1    3447.000      18.000     130.000     191.000     190.000     110.000     167.000        .000        .000        .000
X3       .000        .000        .000        .000        .000     560.000        .000        .000        .000        .000
GR     870.000        .000     860.000      60.000     858.000      70.000     856.000      80.000     854.000     100.000
GR     854.000     130.000     852.600     131.000     849.200     145.000     847.800     155.000     850.100     167.000
GR     852.200     177.000     853.700     189.000     854.800     191.000     856.000     840.000     858.000     890.000
GR     856.000    1050.000     856.000    1170.000     862.000    1190.000        .000        .000        .000        .000
NC        .040        .040        .028        .000        .000        .000        .000        .000        .000        .000

          BRIDGE SECTION 3 - BEACH RD. BRIDGE - D/S FACE   (K)

X1    3448.000      21.000     230.000     270.000       1.000       1.000       1.000        .000        .000        .000
X3       .000        .000        .000        .000        .000     710.000        .000        .000        .000        .000
BT      10.000        .000     863.900        .000      30.000     862.300        .000     130.000     858.100        .000
BT     230.000     856.900     855.200     270.000     856.800     854.900     330.000     855.700        .000     430.000
BT     855.700        .000     530.000     854.100        .000     630.000     854.200        .000     710.000     854.600
BT        .000        .000        .000        .000        .000        .000        .000        .000        .000        .000
GR     863.900        .000     862.300      30.000     858.100     130.000     856.900     230.000     852.500     230.000
GR     851.800     233.000     849.600     240.000     847.800     250.000     848.800     260.000     851.600     270.000
GR     856.800     270.000     855.700     330.000     855.700     430.000     854.100     530.000     854.200     630.000
GR     854.600     710.000     854.900     830.000     854.500     930.000     854.200    1030.000     853.800    1130.000
GR     854.200    1230.000        .000        .000        .000        .000        .000        .000        .000        .000

          BRIDGE SECTION 3 - BEACH RD. BRIDGE - U/S FACE   (K)

X1    3460.000      21.000     230.000     270.000      12.000      12.000      12.000        .000        .000        .000
X3       .000        .000        .000        .000        .000     710.000        .000        .000        .000        .000
BT      10.000        .000     863.900        .000      30.000     862.300        .000     130.000     858.100        .000
BT     230.000     856.900     855.200     270.000     856.800     854.900     330.000     855.700        .000     430.000
BT     855.700        .000     530.000     854.100        .000     630.000     854.200        .000     710.000     854.600
BT        .000        .000        .000        .000        .000        .000        .000        .000        .000        .000
GR     863.900        .000     862.300      30.000     858.100     130.000     856.900     230.000     852.700     230.000
GR     852.000     233.000     849.800     240.000     848.000     250.000     849.000     260.000     851.800     270.000
GR     856.800     270.000     855.700     330.000     855.700     430.000     854.100     530.000     854.200     630.000
GR     854.600     710.000     854.900     830.000     854.500     930.000     854.200    1030.000     853.800    1130.000
GR     854.200    1230.000        .000        .000        .000        .000        .000        .000        .000        .000
NC        .050        .100        .040        .000        .000        .000        .000        .000        .000        .000

          MANUFACTURED SECTION, CHANNEL POINTS FROM SECTION 15 AND ADJUSTED FOR

          CHANNEL INVERT WITH OVERBANKS REPEATED FROM SECTION 15.

X1    3461.000      18.000     130.000     191.000       1.000       1.000       1.000        .000        .000        .000
X3       .000        .000        .000        .000        .000     560.000        .000        .000        .000        .000
GR     870.000        .000     860.000      60.000     858.000      70.000     856.000      80.000     854.000     100.000
GR     854.000     130.000     852.800     131.000     849.400     145.000     848.000     155.000     850.300     167.000
GR     852.400     177.000     853.900     189.000     854.800     191.000     856.000     840.000     858.000     890.000
GR     856.000    1050.000     856.000    1170.000     862.000    1190.000        .000        .000        .000        .000
NC        .050        .125        .045        .000        .000        .000        .000        .000        .000        .000

          VALLEY SECTION 17   (L)

X1    4460.000      11.000      70.000     170.000     990.000    1090.000     999.000        .000        .000        .000
GR     866.000        .000     860.000      35.000     855.400      70.000     851.300      85.000     848.600     111.000
GR     847.900     117.000     847.800     126.000     847.000     139.000     848.100     150.000     850.300     166.000
GR     855.300     170.000        .000        .000        .000        .000        .000        .000        .000        .000
EJ        .000        .000        .000        .000        .000        .000        .000        .000        .000        .000
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*PROF 1

CCHV=      .300 CEHV=      .500
*SECNO 1750.000
  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

3470 ENCROACHMENT STATIONS=      600.0     1180.0  TYPE=      1  TARGET=      580.000

        VALLEY SECTION 14    (I)

 1750.00      3.52    854.62       .00    854.62    854.64       .02       .00       .00    858.30
    130.        0.      130.        0.        0.     120.        0.        0.        0.    859.60
     .00       .00      1.08       .00      .040      .036      .100      .000    851.10    620.84
  .000231       0.        0.        0.         0         0         0       .00     51.76    672.60

*SECNO 3280.000

3470 ENCROACHMENT STATIONS=          .0      680.0  TYPE=      1  TARGET=      679.999

        VALLEY SECTION 15    (J)

 3280.00      9.47    854.67       .00       .00    854.67       .00       .03       .00    854.00
    130.        1.      129.        0.       22.     396.        0.       10.        3.    854.80
    1.32       .07       .32       .00      .040      .036      .100      .036    845.20     93.32
  .000006     1750.     1530.     1360.         2         0         0       .00     97.61    190.93

*SECNO 3447.000

3470 ENCROACHMENT STATIONS=          .0      560.0  TYPE=      1  TARGET=      559.999

        MANUFACTURED SECTION. CHANNEL POINTS FROM SECTION 15 AND ADJUSTED FOR

        CHANNEL INVERT WITH OVERBANKS REPEATED FROM SECTION 15.

 3447.00      6.87    854.67       .00       .00    854.67       .00       .00       .00    854.00
    130.        3.      127.        0.       23.     242.        0.       11.        3.    854.80
    1.41       .14       .52       .00      .040      .036      .100      .036    847.80     93.22
  .000027     190.      167.      110.         1         0         0       .00     97.55    190.78

*SECNO 3448.000

3265 DIVIDED FLOW

3280 CROSS SECTION    3448.00 EXTENDED        .47 FEET


3370 NORMAL BRIDGE,NRD= 10 MIN ELTRD=  854.10 MAX ELLC=  855.20
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3470 ENCROACHMENT STATIONS=        .0     710.0  TYPE=     1  TARGET=     709.999

          BRIDGE SECTION 3 - BEACH RD. BRIDGE - D/S FACE   (K)

  3448.00      6.87    854.67      .00      .00    854.67      .01      .00      .00    856.90
     130.        0.      123.       7.       0.     203.      83.       1.       3.    856.80
     1.41       .00       .60      .09     .032     .022     .032     .036   847.80    230.00
 .000011        1.        1.       1.        0        0        0     -.00   255.54    710.00

*SECNO 3460.000

3265 DIVIDED FLOW

3280 CROSS SECTION   3460.00 EXTENDED        .47 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       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

3370 NORMAL BRIDGE,NRD= 10 MIN ELTRD=  854.10 MAX ELLC=  855.20

3470 ENCROACHMENT STATIONS=        .0     710.0  TYPE=     1  TARGET=     709.999

          BRIDGE SECTION 3 - BEACH RD. BRIDGE - U/S FACE   (K)

  3460.00      6.67    854.67      .00      .00    854.67      .01      .00      .00    856.90
     130.        0.      122.       8.       0.     195.      83.      11.       3.    856.80
     1.42       .00       .63      .09     .032     .022     .032     .036   848.00    230.00
 .000013       12.       12.      12.        0        0        0     -.00   255.52    710.00

*SECNO 3461.000

3470 ENCROACHMENT STATIONS=        .0     560.0  TYPE=     1  TARGET=     559.999

          MANUFACTURED SECTION. CHANNEL POINTS FROM SECTION 15 AND ADJUSTED FOR

          CHANNEL INVERT WITH OVERBANKS REPEATED FROM SECTION 15.

  3461.00      6.67    854.67      .00      .00    854.67      .00      .00      .00    854.00
     130.        3.      127.       0.      22.     229.       0.      11.       3.    854.80
     1.42       .14       .55      .00     .040     .032     .080     .036   848.00     93.32
 .000025        1.        1.       1.        0        0        0      .00    97.39    190.71

*SECNO 4460.000

          VALLEY SECTION 17   (L)

  4460.00      7.68    854.68      .00      .00    854.68      .00      .01      .00    855.40
     130.        0.      130.       0.       0.     513.       0.      20.       5.    855.30
     2.51       .00       .25      .00     .040     .036     .100     .036   847.00     72.60
 .000004      990.      999.     1090.        0        0        0      .00    96.91    169.51
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*****************************************************
 HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
 ERROR CORR -  01,02,03
 MODIFICATION -  50,51,52,53
*****************************************************

T1      HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2      50-YEAR FLOW - LOON LAKE TO SECTION L
T3      HURON RIVER - SOUTHERN ROUTE - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

   -10.       3.       0.       0.    .000000     .00      .0       0.    855.240   .000

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

    2.000     .000    -1.000    .000     .000     .800     .000     .000     .000     .000

*PROF 2

CCHV=     .300 CEHV=     .500
*SECNO 1750.000

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=     600.0     1180.0  TYPE=     1  TARGET=     580.000

          VALLEY SECTION 14    (I)

  1750.00     4.14    855.24      .00    855.24    855.26      .02      .00      .00    858.30
    190.       0.      172.      18.       0.      153.      144.       0.       0.    859.60
     .00      .00     1.12      .12      .040      .036      .100     .000   851.10    620.70
 .000202       0.        0.       0.        0         0         0      .00   393.44   1180.00

*SECNO 3280.000

3470 ENCROACHMENT STATIONS=       .0      680.0  TYPE=     1  TARGET=     679.999

          VALLEY SECTION 15    (J)

  3280.00    10.10    855.30      .00      .00    855.30      .00      .04      .00    854.00
    190.       6.      183.       1.      47.      434.      67.      15.      12.    854.80
     1.03      .12      .42      .02      .040      .036      .100     .036   845.20     87.04
 .000009     1750.     1530.    1360.        2         0         0      .00   372.19    459.23

*SECNO 3447.000
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3470 ENCROACHMENT STATIONS=        .0      560.0  TYPE=     1  TARGET=    559.999
          MANUFACTURED SECTION. CHANNEL POINTS FROM SECTION 15 AND ADJUSTED FOR

          CHANNEL INVERT WITH OVERBANKS REPEATED FROM SECTION 15.

   3447.00      7.50    855.30       .00       .00    855.30       .01       .00       .00    854.00
      190.       11.      177.       2.       48.      280.       69.       16.       13.    854.80
      1.11       .23       .63       .03      .040      .036      .100      .036    847.80    86.95
   .000032      190.      167.      110.         1         0         0       .00    377.01   463.96

*SECNO 3448.000

3265 DIVIDED FLOW

3280 CROSS SECTION   3448.00 EXTENDED      1.10 FEET


3370 NORMAL BRIDGE,NRD= 10 MIN ELTRD=  854.10 MAX ELLC=  855.20

3470 ENCROACHMENT STATIONS=        .0      710.0  TYPE=     1  TARGET=    709.999
          BRIDGE SECTION 3 - BEACH RD. BRIDGE - D/S FACE   (K)

   3448.00      7.50    855.30       .00       .00    855.30       .00       .00       .00    856.90
      190.        0.      137.       53.        0.      219.      231.       16.       13.    856.80
      1.11       .00       .63       .23      .032      .022      .032      .036    847.80    230.00
   .000026        1.        1.        1.         0         0         0     -9.88    294.81    710.00

*SECNO 3460.000

3265 DIVIDED FLOW

3280 CROSS SECTION   3460.00 EXTENDED      1.10 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= 10 MIN ELTRD=  854.10 MAX ELLC=  855.20

3470 ENCROACHMENT STATIONS=        .0      710.0  TYPE=     1  TARGET=    709.999
          BRIDGE SECTION 3 - BEACH RD. BRIDGE - U/S FACE   (K)

   3460.00      7.30    855.30       .00       .00    855.30       .00       .00       .00    856.90
      190.        0.      135.       55.        0.      211.      232.       16.       14.    856.80
      1.12       .00       .64       .24      .032      .022      .032      .036    848.00    230.00
   .000028       12.       12.       12.         0         0         0     -9.95    294.93    710.00
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*SECNO 3461.000

3470 ENCROACHMENT STATIONS=        .0     560.0  TYPE=     1  TARGET=     559.999

          MANUFACTURED SECTION. CHANNEL POINTS FROM SECTION 15 AND ADJUSTED FOR

          CHANNEL INVERT WITH OVERBANKS REPEATED FROM SECTION 15.

  3461.00     7.30   855.30     .00     .00   855.30     .01     .00     .00   854.00
     190.      11.     177.      3.     47.     268.     67.     16.     14.   854.80
     1.12      .22      .66     .04    .040     .032    .080    .036  848.00   87.01
  .000029       1.       1.      1.       0        0       0     .00  373.76  460.78

*SECNO 4460.000
3280 CROSS SECTION    4460.00 EXTENDED        .02 FEET

          VALLEY SECTION 17   (L)

  4460.00     8.32   855.32     .00     .00   855.32     .00     .01     .00   855.40
     190.       0.     190.      0.      0.     575.      0.     27.     19.   855.30
     1.96      .00      .33     .00    .040     .036    .100    .036  847.00   70.29
  .000006     990.     999.    1090.       1        0       0     .00   99.71  170.00
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FORM 1471 X GB
PRINTED IN U.S.A.

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*************************************************
 HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
 ERROR CORR -   01,02,03
  MODIFICATION -   50,51,52,53
*************************************************

T1       HANBURG TOWNSHIP FIS - JOB NO. 6504-03
T2       100-YEAR FLOW - LOON LAKE TO SECTION L
T3       HURON RIVER - SOUTHERN ROUTE - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

   -10.       4.        0.        0.      .000000     .00       .0        0.      855.530     .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    3.000     .000     -1.000     .000      .000      .800      .000      .000      .000      .000

*PROF 3

CCHV=     .300 CEHV=     .500
*SECNO 1750.000

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=      600.0     1180.0  TYPE=      1  TARGET=      580.000

          VALLEY SECTION 14    (I)

 1750.00     4.43    855.53      .00    855.53    855.55      .02      .00      .00    858.30
    250.       0.      207.      43.       0.      170.     249.       0.       0.    859.60
     .00      .00      1.22      .17     .040      .036     .100     .000   851.10    620.63
 .000221       0.        0.       0.       0         0        0      .00   446.93   1180.00

*SECNO 3280.000

3470 ENCROACHMENT STATIONS=        .0      680.0  TYPE=      1  TARGET=      679.999

          VALLEY SECTION 15    (J)

 3280.00    10.40    855.60      .00      .00    855.60      .00      .05      .00    854.00
    250.      10.      235.       5.      61.      453.     173.      19.      16.    854.80
     .85      .17       .52      .03     .040      .036     .100     .036   845.20     84.01
 .000012    1750.     1530.    1360.       2         0        0      .00   539.23    623.24

*SECNO 3447.000
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3470 ENCROACHMENT STATIONS=        .0      560.0  TYPE=     1  TARGET=     559.999
        MANUFACTURED SECTION. CHANNEL POINTS FROM SECTION 15 AND ADJUSTED FOR

        CHANNEL INVERT WITH OVERBANKS REPEATED FROM SECTION 15.

  3447.00     7.80   855.60      .00      .00   855.61      .01      .00      .00   854.00
     250.      18.     222.      10.      61.     298.     173.      21.      17.   854.80
      .92      .30      .74      .06     .040     .036     .100     .036   847.80    83.91
  .000041     190.     167.     110.        1        0        0      .00   476.09   560.00

*SECNO 3448.000

3265 DIVIDED FLOW

3280 CROSS SECTION   3448.00 EXTENDED      1.40 FEET


3370 NORMAL BRIDGE,NRD= 10 MIN ELTRD=  854.10 MAX ELLC=  855.20


3470 ENCROACHMENT STATIONS=        .0      710.0  TYPE=     1  TARGET=     709.999
        BRIDGE SECTION 3 - BEACH RD. BRIDGE - D/S FACE   (K)

  3448.00     7.80   855.60      .00      .00   855.61      .01      .00      .00   856.90
     250.       0.     155.      95.       0.     219.     312.      21.      17.   856.80
      .92      .00      .71      .30     .032     .022     .032     .036   847.80   230.00
  .000034       1.       1.       1.        0        0        0   -22.03   313.80   710.00

*SECNO 3460.000

3265 DIVIDED FLOW

3280 CROSS SECTION   3460.00 EXTENDED      1.40 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       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR    ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST


3370 NORMAL BRIDGE,NRD= 10 MIN ELTRD=  854.10 MAX ELLC=  855.20


3470 ENCROACHMENT STATIONS=        .0      710.0  TYPE=     1  TARGET=     709.999
        BRIDGE SECTION 3 - BEACH RD. BRIDGE - U/S FACE   (K)

  3460.00     7.60   855.60      .00      .00   855.61      .01      .00      .00   856.90
     250.       0.     152.      98.       0.     211.     312.      21.      17.   856.80
      .93      .00      .72      .31     .032     .022     .032     .036   848.00   230.00
  .000036      12.      12.      12.        0        0        0   -22.17   314.01   710.00
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*SECNO 3461.000

3470 ENCROACHMENT STATIONS=        .0     560.0  TYPE=     1  TARGET=     559.999

        MANUFACTURED SECTION. CHANNEL POINTS FROM SECTION 15 AND ADJUSTED FOR

        CHANNEL INVERT WITH OVERBANKS REPEATED FROM SECTION 15.

  3461.00     7.60    855.60      .00      .00    855.61      .01      .00      .00    854.00
     250.      17.      221.      11.      61.      286.     171.      21.      17.    854.80
      .93      .28       .77      .07     .040      .032     .080     .036   848.00    83.96
  .000037       1.        1.       1.        0         0        0      .00   476.04   560.00

*SECNO 4460.000
3280 CROSS SECTION    4460.00 EXTENDED        .33 FEET

        VALLEY SECTION 17   (L)

  4460.00     8.63    855.63      .00      .00    855.63      .00      .02      .00    855.40
     250.       0.      250.       0.       0.      607.       0.      34.      24.    855.30
     1.60      .03       .41      .00     .040      .036     .100     .036   847.00    68.22
  .000009     990.      999.    1090.        1         0        0      .00   101.78   170.00
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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
*****************************************************

T1       HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2       500-YEAR FLOW - LOON LAKE TO SECTION L
T3       HURON RIVER - SOUTHERN ROUTE - PROJECT MANAGER, N.S.CHENG

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

    -10.       5.        0.        0.   .000000       .00        .0        0.   856.120     .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    15.000     .000    -1.000     .000      .000      .800      .000      .000      .000      .000

*PROF 4

CCHV=     .300 CEHV=     .500
*SECNO 1750.000

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=      600.0     1180.0  TYPE=      1  TARGET=      580.000

          VALLEY SECTION 14    (I)

  1750.00      5.02    856.12       .00    856.12    856.13       .01       .00       .00    858.30
     345.        0.      236.      109.        0.      207.      507.        0.        0.    859.60
      .00       .00      1.14       .21      .040      .036      .100      .000    851.10    620.50
  .000171        0.        0.        0.         0         0         0       .00    535.53   1180.00

*SECNO 3280.000

3470 ENCROACHMENT STATIONS=          .0      680.0  TYPE=      1  TARGET=      679.999

          VALLEY SECTION 15    (J)

  3280.00     10.99    856.19       .00       .00    856.19       .01       .06       .00    854.00
     345.       20.      299.       26.       89.      488.      457.       29.       18.    854.80
      .76       .23       .61       .06      .040      .036      .100      .037    845.20     79.06
  .000016     1750.     1530.     1360.         2         0         0       .00    600.94    680.00

*SECNO 3447.000
```

```
3470 ENCROACHMENT STATIONS=        .0      560.0  TYPE=      1  TARGET=      559.999

          MANUFACTURED SECTION. CHANNEL POINTS FROM SECTION 15 AND ADJUSTED FOR

          CHANNEL INVERT WITH OVERBANKS REPEATED FROM SECTION 15.

   3447.00      8.39    856.19       .00       .00    856.20       .01       .00       .00    854.00
      345.       33.      273.       39.       90.      334.      389.       32.       20.    854.80
       .83       .37       .82       .10      .040      .036      .100      .037    847.80     79.02
   .000042      190.      167.      110.         1         0         0       .00    480.98    560.00

 *SECNO 3448.000

 3265 DIVIDED FLOW

 3280 CROSS SECTION   3448.00 EXTENDED      1.99 FEET


 3370 NORMAL BRIDGE,NRD= 10 MIN ELTRD=  854.10 MAX ELLC=  855.20

 3470 ENCROACHMENT STATIONS=        .0      710.0  TYPE=      1  TARGET=      709.999

          BRIDGE SECTION 3 - BEACH RD. BRIDGE - D/S FACE   (K)

   3448.00      8.39    856.19       .00       .00    856.20       .00       .00       .00    856.90
      345.        0.      153.      192.        0.      219.      532.       32.       20.    856.80
       .83       .00       .70       .36      .032      .022      .032      .037    847.80    230.00
   .000033        1.        1.        1.         0         0         0    -45.59    446.71    710.00

 *SECNO 3460.000

 3265 DIVIDED FLOW

 3280 CROSS SECTION   3460.00 EXTENDED      2.00 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= 10 MIN ELTRD=  854.10 MAX ELLC=  855.20

 3470 ENCROACHMENT STATIONS=        .0      710.0  TYPE=      1  TARGET=      709.999

          BRIDGE SECTION 3 - BEACH RD. BRIDGE - U/S FACE   (K)

   3460.00      8.20    856.20       .00       .00    856.20       .00       .00       .00    856.90
      345.        0.      148.      197.        0.      211.      534.       32.       20.    856.80
       .83       .00       .70       .37      .032      .022      .032      .036    848.00    230.00
   .000034       12.       12.       12.         0         0         0    -45.81    447.01    710.00
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*SECNO 3461.000

3470 ENCROACHMENT STATIONS=        .0     560.0  TYPE=     1  TARGET=     559.999

          MANUFACTURED SECTION. CHANNEL POINTS FROM SECTION 15 AND ADJUSTED FOR

          CHANNEL INVERT WITH OVERBANKS REPEATED FROM SECTION 15.

  3461.00     8.19   856.19      .00      .00   856.20      .01      .00      .00   854.00
     345.      31.      269.     45.      90.     322.     389.      32.      20.   854.80
      .83      .34      .83      .12     .040     .032     .080     .036   848.00    79.02
  .000036       1.       1.       1.        0        0        0      .00   480.98   560.00

*SECNO 4460.000
3280 CROSS SECTION   4460.00 EXTENDED        .93 FEET

          VALLEY SECTION 17   (L)

  4460.00     9.22   856.22      .00      .00   856.22      .00      .02      .00   855.40
     345.       0.     345.       0.       3.     666.       0.      50.      27.   855.30
     1.37      .07      .52      .00     .040     .036     .100     .036   847.00    63.69
  .000013     990.     999.    1090.        0        0        0      .00   106.31   170.00
```

FORM 1411 1, GB
PRINTED IN U.S.A.

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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

HURON RIVER - SOUTHERN R

SUMMARY PRINTOUT

SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	K*CHSL	TOPWID	AREA
1750.000	.00	.00	851.10	130.00	854.62	3.52	.02	.00	854.64	.00	51.76	120.01
1750.000	.00	.00	851.10	190.00	855.24	4.14	.02	.00	855.26	.00	393.44	297.22
1750.000	.00	.00	851.10	250.00	855.53	4.43	.02	.00	855.55	.00	446.93	419.07
1750.000	.00	.00	851.10	345.00	856.12	5.02	.01	.00	856.13	.00	535.53	713.65
3280.000	.00	.00	845.20	130.00	854.67	9.47	.00	.00	854.67	-3.86	97.61	418.03
3280.000	.00	.00	845.20	190.00	855.30	10.10	.00	.00	855.30	-3.86	372.19	547.84
3280.000	.00	.00	845.20	250.00	855.60	10.40	.00	.00	855.60	-3.86	539.23	686.04
3280.000	.00	.00	845.20	345.00	856.19	10.99	.01	.00	856.19	-3.86	600.94	1035.16
3447.000	.00	.00	847.80	130.00	854.67	6.87	.00	.00	854.67	15.57	97.55	264.27
3447.000	.00	.00	847.80	190.00	855.30	7.50	.01	.00	855.30	15.57	377.01	396.42
3447.000	.00	.00	847.80	250.00	855.60	7.80	.01	.00	855.61	15.57	476.09	532.35
3447.000	.00	.00	847.80	345.00	856.19	8.39	.01	.00	856.20	15.57	480.98	813.29
3448.000	854.10	855.20	847.80	130.00	854.67	6.87	.01	.00	854.67	.00	255.54	266.87
3448.000	854.10	855.20	847.80	190.00	855.30	7.50	.00	.00	855.30	.00	294.81	449.88
3448.000	854.10	855.20	847.80	250.00	855.60	7.80	.01	.00	855.61	.00	313.80	530.18
3448.000	854.10	855.20	847.80	345.00	856.19	8.39	.00	.00	856.20	.00	446.71	750.27
3460.000	854.10	855.20	848.00	130.00	854.67	6.67	.01	.00	854.67	16.67	255.52	278.78
3460.000	854.10	855.20	848.00	190.00	855.30	7.30	.00	.00	855.30	16.67	294.93	442.36
3460.000	854.10	855.20	848.00	250.00	855.60	7.60	.01	.00	855.61	16.67	314.01	523.12
3460.000	854.10	855.20	848.00	345.00	856.20	8.20	.00	.00	856.20	16.67	447.01	744.51
3461.000	.00	.00	848.00	130.00	854.67	6.67	.00	.00	854.67	.00	97.39	251.44
3461.000	.00	.00	848.00	190.00	855.30	7.30	.01	.00	855.30	.00	373.76	382.31
3461.000	.00	.00	848.00	250.00	855.60	7.60	.01	.00	855.61	.00	476.04	518.13
3461.000	.00	.00	848.00	345.00	856.19	8.19	.01	.00	856.20	.00	480.98	801.12
4460.000	.00	.00	847.00	130.00	854.68	7.68	.00	.00	854.68	-1.00	96.91	513.22
4460.000	.00	.00	847.00	190.00	855.32	8.32	.00	.00	855.32	-1.00	99.71	575.44
4460.000	.00	.00	847.00	250.00	855.63	8.63	.00	.00	855.63	-1.00	101.78	606.80
4460.000	.00	.00	847.00	345.00	856.22	9.22	.00	.00	856.22	-1.00	106.31	668.81

SUMMARY OF ERRORS

FORM 141 5 68
PRINTED IN U.S.A.

00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: Hamburg Twp

3) WATERCOURSE: Huron River

4) DOCUMENT TYPE: ENCROACHED Run
LOON LAKE TO SECTION L

00BREAK00

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*****************************************************
*  WATER SURFACE PROFILES                           *
*  VERSION OF NOVEMBER 1976                         *
*  UPDATED JULY 1979                                *
*                                                   *
*  RUN DATE TUE, JUL 21, 1981,  4:54 PM             *
*****************************************************
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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  XXXXXXX   XXXXX            XXXXXXX
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"Loon Lake to Section L"

(Encroached Run)

FORM 1411 ½ GB

PRINTED IN U.S.A.

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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -   01,02,03
  MODIFICATION -   50,51,52,53
*****************************************************

C
T1      HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2      10-YEAR FLOW - LOON LAKE TO SECTION L
T3      HURON RIVER - SOUTHERN ROUTE - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ     NINV     IDIR     STRT    METRIC   HVINS     Q     WSEL     FQ
      -1.      2.      0.       0.    .000000    .00      .0      0.   854.620   .000

J2  NPROF    IPLOT    PRFVS    XSECV    XSECH     FN     ALLDC    IBW    CHNIN   ITRACE
     1.000    .000   -1.000    .000     .000    .800    .000    .000    .000    .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    38.000   40.000   41.000   42.000   43.000   1.000   8.000  10.000  12.000   3.000

    33.000    4.000   25.000    .000     .000     .000    .000    .000    .000    .000

NC    .050     .125     .045     .300     .500     .000    .000    .000    .000    .000
QT   4.000  130.000  190.000  250.000  345.000     .000    .000    .000    .000    .000

        VALLEY SECTION 14   (I)

X1 1750.000   22.000  620.000  687.000    .000     .000    .000    .000    .000    .000
X3    .000     .000    .000  600.000    .000    1180.000  .000    .000    .000    .000
GR  870.000    .000   868.000   20.000  862.000   100.000 860.000 130.000 858.000  220.000
GR  856.000  350.000  855.500  510.000  858.300   620.000 853.900 621.000 851.900  633.000
GR  851.100  652.000  852.100  660.000  854.900   674.000 856.200 686.000 859.600  687.000
GR  856.000  710.000  854.800  920.000  854.700  1190.000 856.000 1790.000 858.000 1840.000
GR  860.000 1860.000  862.500 1890.000    .000     .000    .000    .000    .000    .000
NC    .050     .125     .045     .000     .000     .000    .000    .000    .000    .000

        VALLEY SECTION 15   (J)

X1 3280.000   18.000  130.000  191.000 1750.000  1360.000 1530.000  .000    .000    .000
X3    .000     .000    .000     .000    .000     680.000  .000    .000    .000    .000
GR  870.000    .000   860.000   60.000  858.000   70.000 856.000  80.000 854.000  100.000
GR  854.000  130.000  850.000  131.000  846.600  145.000 845.200 155.000 847.500  167.000
GR  849.600  177.000  851.100  189.000  854.800  191.000 856.000 840.000 858.000  890.000
GR  856.000 1050.000  856.000 1170.000  862.000 1190.000    .000    .000    .000    .000

        MANUFACTURED SECTION. CHANNEL POINTS FROM SECTION 15 AND ADJUSTED FOR

        CHANNEL INVERT WITH OVERBANKS REPEATED FROM SECTION 15.
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X1   3447.000   18.000  130.000  191.000  190.000  110.000  167.000     .000     .000     .000
X3      .000     .000     .000     .000     .000  560.000     .000     .000     .000     .000
GR    870.000     .000  860.000   60.000  858.000   70.000  856.000   80.000  854.000  100.000
GR    854.000  130.000  852.600  131.000  849.200  145.000  847.800  155.000  850.100  167.000
GR    852.200  177.000  853.700  189.000  854.800  191.000  856.000  840.000  858.000  890.000
GR    856.000 1050.000  856.000 1170.000  862.000 1190.000     .000     .000     .000     .000
NC       .040     .040     .028     .000     .000     .000     .000     .000     .000     .000

        BRIDGE SECTION 3 - BEACH RD. BRIDGE - D/S FACE   (K)

X1   3448.000  21.000  230.000  270.000    1.000    1.000    1.000     .000     .000     .000
X3      .000     .000     .000     .000     .000  710.000     .000     .000     .000     .000
BT    10.000     .000  863.900     .000   30.000  862.300     .000  130.000  858.100     .000
BT   230.000  856.900  855.200  270.000  856.800  854.900  330.000  855.700     .000  430.000
BT   855.700     .000  530.000  854.100     .000  630.000  854.200     .000  710.000  854.600
BT      .000     .000     .000     .000     .000     .000     .000     .000     .000     .000
GR   863.900     .000  862.300   30.000  858.100  130.000  856.900  230.000  852.500  230.000
GR   851.800  233.000  849.600  240.000  847.800  250.000  848.800  260.000  851.600  270.000
GR   856.800  270.000  855.700  330.000  855.700  430.000  854.100  530.000  854.200  630.000
GR   854.600  710.000  854.900  830.000  854.500  930.000  854.200 1030.000  853.800 1130.000
GR   854.200 1230.000     .000     .000     .000     .000     .000     .000     .000     .000

        BRIDGE SECTION 3 - BEACH RD. BRIDGE - U/S FACE   (K)

X1   3460.000  21.000  230.000  270.000   12.000   12.000   12.000     .000     .000     .000
X3      .000     .000     .000     .000     .000  710.000     .000     .000     .000     .000
BT    10.000     .000  863.900     .000   30.000  862.300     .000  130.000  858.100     .000
BT   230.000  856.900  855.200  270.000  856.800  854.900  330.000  855.700     .000  430.000
BT   855.700     .000  530.000  854.100     .000  630.000  854.200     .000  710.000  854.600
BT      .000     .000     .000     .000     .000     .000     .000     .000     .000     .000
GR   863.900     .000  862.300   30.000  858.100  130.000  856.900  230.000  852.700  230.000
GR   852.000  233.000  849.800  240.000  848.000  250.000  849.000  260.000  851.800  270.000
GR   856.800  270.000  855.700  330.000  855.700  430.000  854.100  530.000  854.200  630.000
GR   854.600  710.000  854.900  830.000  854.500  930.000  854.200 1030.000  853.800 1130.000
GR   854.200 1230.000     .000     .000     .000     .000     .000     .000     .000     .000
NC       .050     .100     .040     .000     .000     .000     .000     .000     .000     .000

        MANUFACTURED SECTION. CHANNEL POINTS FROM SECTION 15 AND ADJUSTED FOR

        CHANNEL INVERT WITH OVERBANKS REPEATED FROM SECTION 15.

X1   3461.000  18.000  130.000  191.000    1.000    1.000    1.000     .000     .000     .000
X3      .000     .000     .000     .000     .000  560.000     .000     .000     .000     .000
GR   870.000     .000  860.000   60.000  858.000   70.000  856.000   80.000  854.000  100.000
GR   854.000  130.000  852.800  131.000  849.400  145.000  848.000  155.000  850.300  167.000
GR   852.400  177.000  853.900  189.000  854.800  191.000  856.000  840.000  858.000  890.000
GR   856.000 1050.000  856.000 1170.000  862.000 1190.000     .000     .000     .000     .000
NC       .050     .125     .045     .000     .000     .000     .000     .000     .000     .000

        VALLEY SECTION 17   (L)

X1   4460.000  11.000   70.000  170.000  990.000 1090.000  999.000     .000     .000     .000
GR   866.000     .000  860.000   35.000  855.400   70.000  851.300   85.000  848.600  111.000
GR   847.900  117.000  847.800  126.000  847.000  139.000  848.100  150.000  850.300  166.000
GR   855.300  170.000     .000     .000     .000     .000     .000     .000     .000     .000
EJ      .000     .000     .000     .000     .000     .000     .000     .000     .000     .000
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*PROF 1

CCHV=     .300 CEHV=     .500
*SECNO 1750.000
  SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     BANK ELEV
  Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA     LEFT/RIGHT
  TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
  SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST


3470 ENCROACHMENT STATIONS=      600.0     1180.0  TYPE=      1  TARGET=      580.000

          VALLEY SECTION 14   (I)

 1750.00      3.52    854.62       .00    854.62    854.64       .02       .00       .00    858.30
    130.        0.      130.        0.        0.     120.        0.        0.        0.    859.60
     .00       .00      1.08       .00      .040      .036      .100      .000    851.10    620.84
 .000231        0.        0.        0.         0         0         0       .00     51.76    672.60

*SECNO 3280.000

3470 ENCROACHMENT STATIONS=          .0      680.0  TYPE=      1  TARGET=      679.999

          VALLEY SECTION 15   (J)

 3280.00      9.47    854.67       .00       .00    854.67       .00       .03       .00    854.00
    130.        1.      129.        0.       22.     396.        0.       10.        3.    854.80
    1.32       .07       .32       .00      .040      .036      .100      .036    845.20     93.32
 .000006     1750.     1530.     1360.         2         0         0       .00     97.61    190.93

*SECNO 3447.000

3470 ENCROACHMENT STATIONS=          .0      560.0  TYPE=      1  TARGET=      559.999

          MANUFACTURED SECTION. CHANNEL POINTS FROM SECTION 15 AND ADJUSTED FOR

          CHANNEL INVERT WITH OVERBANKS REPEATED FROM SECTION 15.

 3447.00      6.87    854.67       .00       .00    854.67       .00       .00       .00    854.00
    130.        3.      127.        0.       23.     242.        0.       11.        3.    854.80
    1.41       .14       .52       .00      .040      .036      .100      .036    847.80     93.22
 .000027     190.      167.      110.         1         0         0       .00     97.55    190.78

*SECNO 3448.000

3265 DIVIDED FLOW

3280 CROSS SECTION   3448.00 EXTENDED        .47 FEET


3370 NORMAL BRIDGE,NRD= 10 MIN ELTRD=  854.10 MAX ELLC=  855.20
```

```
3470 ENCROACHMENT STATIONS=        .0      710.0  TYPE=      1  TARGET=      709.999

          BRIDGE SECTION 3 - BEACH RD. BRIDGE - D/S FACE   (K)

  3448.00      6.87    854.67      .00      .00    854.67      .01      .00      .00    856.90
     130.        0.      123.       7.       0.     203.      83.      11.       3.    856.80
     1.41       .00       .60      .09     .032      .022     .032     .036   847.80   230.00
  .000011        1.        1.       1.        0         0        0     -.00   255.54   710.00

*SECNO 3460.000

3265 DIVIDED FLOW

3280 CROSS SECTION    3460.00 EXTENDED        .47 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= 10 MIN ELTRD=  854.10 MAX ELLC=  855.20

3470 ENCROACHMENT STATIONS=        .0      710.0  TYPE=      1  TARGET=      709.999

          BRIDGE SECTION 3 - BEACH RD. BRIDGE - U/S FACE   (K)

  3460.00      6.67    854.67      .00      .00    854.67      .01      .00      .00    856.90
     130.        0.      122.       8.       0.     195.      83.      11.       3.    856.80
     1.42       .00       .63      .09     .032      .022     .032     .036   848.00   230.00
  .000013       12.       12.      12.        0         0        0     -.00   255.52   710.00

*SECNO 3461.000

3470 ENCROACHMENT STATIONS=        .0      560.0  TYPE=      1  TARGET=      559.999

          MANUFACTURED SECTION. CHANNEL POINTS FROM SECTION 15 AND ADJUSTED FOR

          CHANNEL INVERT WITH OVERBANKS REPEATED FROM SECTION 15.

  3461.00      6.67    854.67      .00      .00    854.67      .00      .00      .00    854.00
     130.        3.      127.       0.      22.     229.       0.      11.       3.    854.80
     1.42       .14       .55      .00     .040      .032     .080     .036   848.00    93.32
  .000025        1.        1.       1.        0         0        0      .00    97.39   190.71

*SECNO 4460.000

          VALLEY SECTION 17   (L)

  4460.00      7.68    854.68      .00      .00    854.68      .00      .01      .00    855.40
     130.        0.      130.       0.       0.     513.       0.      20.       5.    855.30
     2.51       .00       .25      .00     .040      .036     .100     .036   847.00    72.60
  .000004      990.      999.    1090.        0         0        0      .00    96.91   169.51
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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
*****************************************************

T1       HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2       50-YEAR FLOW - LOON LAKE TO SECTION L
T3       HURON RIVER - SOUTHERN ROUTE - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

   -10.       3.        0.        0.    .000000       .00       .0        0.    855.240    .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     2.000     .000    -1.000     .000      .000      .800      .000      .000      .000      .000

*PROF 2

CCHV=     .300 CEHV=     .500
*SECNO 1750.000

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=      600.0     1180.0  TYPE=      1  TARGET=      580.000

          VALLEY SECTION 14   (I)

  1750.00      4.14    855.24       .00    855.24    855.26       .02       .00       .00    858.30
     190.        0.      172.       18.        0.      153.      144.        0.        0.    859.60
       .00       .00     1.12       .12      .040      .036      .100      .000    851.10    620.70
  .000202        0.        0.        0.         0         0         0       .00    393.44   1180.00

*SECNO 3280.000

3470 ENCROACHMENT STATIONS=          .0      680.0  TYPE=      1  TARGET=      679.999

          VALLEY SECTION 15   (J)

  3280.00     10.10    855.30       .00       .00    855.30       .00       .04       .00    854.00
     190.        6.      183.        1.       47.      434.       67.       15.       12.    854.80
      1.03       .12       .42       .02      .040      .036      .100      .036    845.20     87.04
  .000009     1750.     1530.     1360.         2         0         0       .00    372.19    459.23

*SECNO 3447.000
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```
3470 ENCROACHMENT STATIONS=        .0      560.0  TYPE=     1  TARGET=     559.999

          MANUFACTURED SECTION, CHANNEL POINTS FROM SECTION 15 AND ADJUSTED FOR

          CHANNEL INVERT WITH OVERBANKS REPEATED FROM SECTION 15.

   3447.00      7.50    855.30       .00       .00    855.30       .01       .00       .00    854.00
      190.       11.      177.       2.       48.      280.       69.       16.       13.    854.80
      1.11       .23       .63       .03      .040      .036      .100      .036    847.80    86.95
   .000032      190.      167.      110.        1         0         0       .00    377.01   463.96

*SECNO 3448.000

3265 DIVIDED FLOW

3280 CROSS SECTION   3448.00 EXTENDED       1.10 FEET


3370 NORMAL BRIDGE,NRD= 10 MIN ELTRD=  854.10 MAX ELLC=  855.20

3470 ENCROACHMENT STATIONS=        .0      710.0  TYPE=     1  TARGET=     709.999

          BRIDGE SECTION 3 - BEACH RD. BRIDGE - D/S FACE   (K)

   3448.00      7.50    855.30       .00       .00    855.30       .00       .00       .00    856.90
      190.        0.      137.      53.        0.      219.      231.       16.       13.    856.80
      1.11       .00       .63       .23      .032      .022      .032      .036    847.80    230.00
   .000026        1.        1.        1.         0         0         0     -9.88    294.81    710.00

*SECNO 3460.000

3265 DIVIDED FLOW

3280 CROSS SECTION   3460.00 EXTENDED       1.10 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= 10 MIN ELTRD=  854.10 MAX ELLC=  855.20

3470 ENCROACHMENT STATIONS=        .0      710.0  TYPE=     1  TARGET=     709.999

          BRIDGE SECTION 3 - BEACH RD. BRIDGE - U/S FACE   (K)

   3460.00      7.30    855.30       .00       .00    855.30       .00       .00       .00    856.90
      190.        0.      135.      55.        0.      211.      232.       16.       14.    856.80
      1.12       .00       .64       .24      .032      .022      .032      .036    848.00    230.00
   .000028       12.       12.       12.         0         0         0     -9.95    294.93    710.00
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*SECNO 3461.000

3470 ENCROACHMENT STATIONS=        .0     560.0  TYPE=     1  TARGET=     559.999

          MANUFACTURED SECTION. CHANNEL POINTS FROM SECTION 15 AND ADJUSTED FOR


          CHANNEL INVERT WITH OVERBANKS REPEATED FROM SECTION 15.

  3461.00     7.30   855.30      .00      .00   855.30      .01      .00      .00   854.00
     190.      11.      177.       3.      47.     268.      67.      16.      14.   854.80
     1.12      .22      .66      .04     .040     .032     .080     .036   848.00    87.01
  .000029       1.       1.       1.        0        0        0      .00   373.76   460.78

*SECNO 4460.000
3280 CROSS SECTION   4460.00 EXTENDED        .02 FEET


          VALLEY SECTION 17   (L)

  4460.00     8.32   855.32      .00      .00   855.32      .00      .01      .00   855.40
     190.       0.      190.       0.       0.     575.       0.      27.      19.   855.30
     1.96      .00      .33      .00     .040     .036     .100     .036   847.00    70.29
  .000006     990.     999.    1090.        1        0        0      .00    99.71   170.00
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*****************************************************
 HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
 ERROR CORR -  01,02,03
 MODIFICATION -  50,51,52,53
*****************************************************

T1      HANBURG TOWNSHIP FIS - JOB NO. 6504-03
T2      100-YEAR FLOW - LOON LAKE TO SECTION L
T3      HURON RIVER - SOUTHERN ROUTE - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

   -10.       4.        0.        0.   .000000      .00       .0        0.     855.530     .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    3.000     .000     -1.000     .000      .000      .800      .000      .000      .000      .000

*PROF 3

CCHV=     .300 CEHV=     .500
*SECNO 1750.000

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=     600.0     1180.0  TYPE=     1  TARGET=     580.000

          VALLEY SECTION 14   (I)

  1750.00     4.43    855.53      .00    855.53    855.55      .02       .00       .00    858.30
     250.       0.      207.      43.       0.      170.     249.        .0.       0.     859.60
      .00      .00     1.22      .17      .040      .036     .100      .000    851.10    620.63
  .000221       0.        0.       0.         0         0        0       .00    446.93   1180.00

*SECNO 3280.000

3470 ENCROACHMENT STATIONS=        .0      680.0  TYPE=     1  TARGET=     679.999

          VALLEY SECTION 15   (J)

  3280.00    10.40    855.60      .00       .00    855.60      .00       .05       .00    854.00
     250.      10.      235.       5.       61.      453.     173.       19.       16.     854.80
      .85      .17       .52      .03      .040      .036     .100      .036    845.20     84.01
  .000012     1750.     1530.    1360.         2         0        0       .00    539.23    623.24

*SECNO 3447.000
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```
3470 ENCROACHMENT STATIONS=          .0      560.0  TYPE=     1  TARGET=     559.999
          MANUFACTURED SECTION. CHANNEL POINTS FROM SECTION 15 AND ADJUSTED FOR

          CHANNEL INVERT WITH OVERBANKS REPEATED FROM SECTION 15.

  3447.00     7.80   855.60      .00      .00   855.61      .01      .00      .00   854.00
     250.      18.     222.      10.      61.     298.     173.      21.      17.   854.80
      .92      .30      .74      .06     .040     .036     .100     .036   847.80    83.91
  .000041      190.     167.     110.        1        0        0      .00   476.09   560.00

*SECNO 3448.000

3265 DIVIDED FLOW

3280 CROSS SECTION   3448.00 EXTENDED       1.40 FEET


3370 NORMAL BRIDGE,NRD= 10 MIN ELTRD=  854.10 MAX ELLC=  855.20

3470 ENCROACHMENT STATIONS=          .0      710.0  TYPE=     1  TARGET=     709.999
          BRIDGE SECTION 3 - BEACH RD. BRIDGE - D/S FACE   (K)

  3448.00     7.80   855.60      .00      .00   855.61      .01      .00      .00   856.90
     250.       0.     155.      95.       0.     219.     312.      21.      17.   856.80
      .92      .00      .71      .30     .032     .022     .032     .036   847.80   230.00
  .000034       1.       1.       1.        0        0        0   -22.03   313.80   710.00

*SECNO 3460.000

3265 DIVIDED FLOW

3280 CROSS SECTION   3460.00 EXTENDED       1.40 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       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST


3370 NORMAL BRIDGE,NRD= 10 MIN ELTRD=  854.10 MAX ELLC=  855.20

3470 ENCROACHMENT STATIONS=          .0      710.0  TYPE=     1  TARGET=     709.999
          BRIDGE SECTION 3 - BEACH RD. BRIDGE - U/S FACE   (K)

  3460.00     7.60   855.60      .00      .00   855.61      .01      .00      .00   856.90
     250.       0.     152.      98.       0.     211.     312.      21.      17.   856.80
      .93      .00      .72      .31     .032     .022     .032     .036   848.00   230.00
  .000036      12.      12.      12.        0        0        0   -22.17   314.01   710.00
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```
*SECNO 3461.000

3470 ENCROACHMENT STATIONS=        .0     560.0  TYPE=     1  TARGET=     559.999

          MANUFACTURED SECTION. CHANNEL POINTS FROM SECTION 15 AND ADJUSTED FOR

          CHANNEL INVERT WITH OVERBANKS REPEATED FROM SECTION 15.

  3461.00     7.60    855.60      .00      .00    855.61      .01      .00      .00    854.00
     250.      17.      221.      11.      61.     286.     171.      21.      17.    854.80
      .93      .28       .77      .07     .040     .032     .080     .036   848.00    83.96
  .000037       1.        1.       1.        0        0        0      .00   476.04   560.00

*SECNO 4460.000
3280 CROSS SECTION    4460.00 EXTENDED        .33 FEET

          VALLEY SECTION 17   (L)

  4460.00     8.63    855.63      .00      .00    855.63      .00      .02      .00    855.40
     250.       0.      250.       0.       0.     607.       0.      34.      24.    855.30
     1.60      .03       .41      .00     .040     .036     .100     .036   847.00    68.22
  .000009     990.      999.    1090.        1        0        0      .00   101.78   170.00
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FORM 1411 ½ G8
PRINTED IN U.S.A.

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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
*****************************************************

T1       HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2       500-YEAR FLOW - LOON LAKE TO SECTION L
T3       HURON RIVER - SOUTHERN ROUTE - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

    -10.       5.        0.        0.   .000000       .00        .0        0.   856.120     .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    15.000     .000    -1.000     .000      .000      .800      .000      .000      .000      .000

*PROF 4

CCHV=     .300 CEHV=     .500
*SECNO 1750.000

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=     600.0    1180.0  TYPE=     1  TARGET=     580.000

          VALLEY SECTION 14   (I)

  1750.00     5.02   856.12      .00   856.12   856.13      .01      .00      .00   858.30
     345.       0.      236.     109.       0.     207.     507.       0.       0.   859.60
      .00      .00     1.14      .21     .040     .036     .100     .000   851.10   620.50
  .000171       0.       0.       0.        0        0        0      .00   535.53  1180.00

*SECNO 3280.000

3470 ENCROACHMENT STATIONS=       .0     680.0  TYPE=     1  TARGET=     679.999

          VALLEY SECTION 15   (J)

  3280.00    10.99   856.19      .00      .00   856.19      .01      .06      .00   854.00
     345.      20.      299.     26.      89.     488.     457.      29.      18.   854.80
      .76      .23      .61      .06     .040     .036     .100     .037   845.20    79.06
  .000016    1750.     1530.   1360.        2        0        0      .00   600.94   680.00

*SECNO 3447.000
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```
3470 ENCROACHMENT STATIONS=          .0      560.0  TYPE=      1  TARGET=      559.999

          MANUFACTURED SECTION. CHANNEL POINTS FROM SECTION 15 AND ADJUSTED FOR

          CHANNEL INVERT WITH OVERBANKS REPEATED FROM SECTION 15.

  3447.00      8.39    856.19       .00       .00    856.20       .01       .00       .00    854.00
     345.       33.      273.       39.       90.      334.      389.       32.       20.    854.80
      .83       .37       .82       .10      .040      .036      .100      .037    847.80    79.02
  .000042      190.      167.      110.         1         0         0       .00    480.98    560.00

*SECNO 3448.000

3265 DIVIDED FLOW

3280 CROSS SECTION    3448.00 EXTENDED       1.99 FEET


3370 NORMAL BRIDGE,NRD= 10 MIN ELTRD=  854.10 MAX ELLC=  855.20

3470 ENCROACHMENT STATIONS=          .0      710.0  TYPE=      1  TARGET=      709.999

          BRIDGE SECTION 3 - BEACH RD. BRIDGE - D/S FACE   (K)

  3448.00      8.39    856.19       .00       .00    856.20       .00       .00       .00    856.90
     345.        0.      153.      192.        0.      219.      532.       32.       20.    856.80
      .83       .00       .70       .36      .032      .022      .032      .037    847.80    230.00
  .000033        1.        1.        1.         0         0         0    -45.59    446.71    710.00

*SECNO 3460.000

3265 DIVIDED FLOW

3280 CROSS SECTION    3460.00 EXTENDED       2.00 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= 10 MIN ELTRD=  854.10 MAX ELLC=  855.20

3470 ENCROACHMENT STATIONS=          .0      710.0  TYPE=      1  TARGET=      709.999

          BRIDGE SECTION 3 - BEACH RD. BRIDGE - U/S FACE   (K)

  3460.00      8.20    856.20       .00       .00    856.20       .00       .00       .00    856.90
     345.        0.      148.      197.        0.      211.      534.       32.       20.    856.80
      .83       .00       .70       .37      .032      .022      .032      .036    848.00    230.00
  .000034       12.       12.       12.         0         0         0    -45.81    447.01    710.00
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```
*SECNO 3461.000

3470 ENCROACHMENT STATIONS=      .0     560.0  TYPE=     1  TARGET=     559.999

          MANUFACTURED SECTION. CHANNEL POINTS FROM SECTION 15 AND ADJUSTED FOR

          CHANNEL INVERT WITH OVERBANKS REPEATED FROM SECTION 15.

  3461.00     8.19   856.19      .00      .00   856.20      .01      .00      .00   854.00
     345.      31.     269.      45.      90.     322.     389.      32.      20.   854.80
      .83      .34      .83      .12     .040     .032     .080     .036   848.00    79.02
  .000036       1.       1.       1.        0        0        0      .00   480.98   560.00

*SECNO 4460.000
3280 CROSS SECTION   4460.00 EXTENDED        .93 FEET

          VALLEY SECTION 17   (L)

  4460.00     9.22   856.22      .00      .00   856.22      .00      .02      .00   855.40
     345.       0.     345.       0.       3.     666.       0.      50.      27.   855.30
     1.37      .07      .52      .00     .040     .036     .100     .036   847.00    63.69
  .000013     990.     999.    1090.        0        0        0      .00   106.31   170.00
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FORM HH 1, Gs
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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

HURON RIVER - SOUTHERN R

SUMMARY PRINTOUT

SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	DLOSS	EG	K*CHSL	TOPWID	AREA
1750.000	.00	.00	851.10	130.00	854.62	3.52	.02	.00	854.64	.00	51.76	120.01
1750.000	.00	.00	851.10	190.00	855.24	4.14	.02	.00	855.26	.00	393.44	297.22
1750.000	.00	.00	851.10	250.00	855.53	4.43	.02	.00	855.55	.00	446.93	419.07
1750.000	.00	.00	851.10	345.00	856.12	5.02	.01	.00	856.13	.00	535.53	713.65
3280.000	.00	.00	845.20	130.00	854.67	9.47	.00	.00	854.67	-3.86	97.61	418.03
3280.000	.00	.00	845.20	190.00	855.30	10.10	.00	.00	855.30	-3.86	372.19	547.84
3280.000	.00	.00	845.20	250.00	855.60	10.40	.00	.00	855.60	-3.86	539.23	686.04
3280.000	.00	.00	845.20	345.00	856.19	10.99	.01	.00	856.19	-3.86	600.94	1035.16
3447.000	.00	.00	847.80	130.00	854.67	6.87	.00	.00	854.67	15.57	97.55	264.27
3447.000	.00	.00	847.80	190.00	855.30	7.50	.01	.00	855.30	15.57	377.01	396.42
3447.000	.00	.00	847.80	250.00	855.60	7.80	.01	.00	855.61	15.57	476.09	532.35
3447.000	.00	.00	847.80	345.00	856.19	8.39	.01	.00	856.20	15.57	480.98	813.29
3448.000	854.10	855.20	847.80	130.00	854.67	6.87	.01	.00	854.67	.00	255.54	286.87
3448.000	854.10	855.20	847.80	190.00	855.30	7.50	.00	.00	855.30	.00	294.81	449.88
3448.000	854.10	855.20	847.80	250.00	855.60	7.80	.01	.00	855.61	.00	313.80	530.18
3448.000	854.10	855.20	847.80	345.00	856.19	8.39	.00	.00	856.20	.00	446.71	750.27
3460.000	854.10	855.20	848.00	130.00	854.67	6.67	.01	.00	854.67	16.67	255.52	278.78
3460.000	854.10	855.20	848.00	190.00	855.30	7.30	.00	.00	855.30	16.67	294.93	442.36
3460.000	854.10	855.20	848.00	250.00	855.60	7.60	.01	.00	855.61	16.67	314.01	523.12
3460.000	854.10	855.20	848.00	345.00	856.20	8.20	.00	.00	856.20	16.67	447.01	744.51
3461.000	.00	.00	848.00	130.00	854.67	6.67	.00	.00	854.67	.00	97.39	251.44
3461.000	.00	.00	848.00	190.00	855.30	7.30	.01	.00	855.30	.00	373.76	382.31
3461.000	.00	.00	848.00	250.00	855.60	7.60	.01	.00	855.61	.00	476.04	518.13
3461.000	.00	.00	848.00	345.00	856.19	8.19	.01	.00	856.20	.00	480.98	801.12
4460.000	.00	.00	847.00	130.00	854.68	7.68	.00	.00	854.68	-1.00	96.91	513.22
4460.000	.00	.00	847.00	190.00	855.32	8.32	.00	.00	855.32	-1.00	99.71	575.44
4460.000	.00	.00	847.00	250.00	855.63	8.63	.00	.00	855.63	-1.00	101.78	606.80
4460.000	.00	.00	847.00	345.00	856.22	9.22	.00	.00	856.22	-1.00	106.31	668.81

SUMMARY OF ERRORS

FORM 1411 - GB
PRINTED IN U.S.A.

00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: Hamburg

3) WATERCOURSE: Huron River

4) DOCUMENT TYPE: Encroached Run
Strawberry Lk to
Corporate Limit

00BREAK00

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*********************************************
*  WATER SURFACE PROFILES                   *
*  VERSION OF NOVEMBER 1976                 *
*  UPDATED JULY 1979                        *
*                                           *
*  RUN DATE TUE, JUL 21, 1981,  5:03 PM     *
*********************************************
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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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"Strawberry Lake to Corporate Limit"

(Encroached Run)

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**********************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
**********************************************

C
T1       HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2       10-YEAR FLOW - STRAWBERRY LAKE TO CORPORATE LIMITS
T3       HURON RIVER - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

     -1.       2.        0.        0.    .000000     .00       .0        0.     855.130    .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     1.000     .000    -1.000     .000      .000      .800      .000      .000      .000      .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    38.000   40.000   41.000   42.000   43.000    1.000    8.000   10.000   12.000    3.000

    33.000    4.000   25.000     .000     .000     .000     .000     .000     .000     .000

NC      .060     .125     .040     .300     .500     .000     .000     .000     .000     .000
QT     4.000 1350.000 1900.000 2200.000 2850.000     .000     .000     .000     .000     .000

          VALLEY SECTION 20   (O)

X1    76.798   26.000  825.000  914.000     .000     .000     .000     .000     .000     .000
X3      .000     .000     .000  625.000     .000 1145.000     .000     .000     .000     .000
GR   870.000     .000  860.000   15.000  858.000   25.000  856.000  255.000  855.200  385.000
GR   854.500  730.000  853.300  825.000  849.800  828.000  845.600  845.000  845.500  860.000
GR   846.500  875.000  848.100  890.000  849.800  900.000  851.300  910.000  852.200  914.000
GR   853.800 1845.000  854.000 2095.000  855.600 2425.000  856.000 2805.000  857.300 2895.000
GR   856.000 2945.000  856.000 3505.000  856.300 3595.000  856.000 3725.000  856.000 3965.000
GR   868.000 4045.000     .000     .000     .000     .000     .000     .000     .000     .000
NC      .125     .100     .040     .000     .000     .000     .000     .000     .000     .000

          VALLEY SECTION 21   (P)

X1    77.030   23.000  770.000  876.000 1420.000 1180.000 1220.000     .000     .000     .000
X3      .000     .000     .000  300.000     .000 1200.000     .000     .000     .000     .000
GR   860.000     .000  860.000   50.000  854.000   70.000  852.600  770.000  850.300  773.000
GR   848.700  790.000  848.100  805.000  847.500  813.000  847.800  825.000  848.500  835.000
GR   849.100  843.000  850.100  853.000  850.800  865.000  851.800  875.000  852.200  876.000
GR   854.000 1530.000  856.000 1570.000  857.500 2640.000  856.000 3150.000  856.000 4010.000
GR   858.000 4020.000  860.000 4040.000  866.000 4080.000     .000     .000     .000     .000
NC      .125     .060     .040     .000     .000     .000     .000     .000     .000     .000

X1    77.232   27.000 2080.000 2186.000  780.000  760.000 1070.000     .000     .000     .000
```

X3	.000	.000	.000	1200.000	.000	2200.000	.000	.000	.000	.000
GR	880.000	.000	864.000	60.000	860.000	80.000	858.000	110.000	854.000	150.000
GR	854.000	1650.000	853.700	2000.000	853.600	2080.000	851.300	2083.000	849.700	2100.000
GR	849.100	2115.000	848.500	2123.000	848.800	2135.000	849.500	2145.000	850.100	2153.000
GR	851.100	2163.000	851.800	2175.000	852.800	2185.000	853.200	2186.000	854.000	2190.000
GR	856.000	2220.000	857.300	2380.000	857.700	2560.000	857.800	3000.000	858.000	3300.000
GR	860.000	3340.000	870.000	3390.000	.000	.000	.000	.000	.000	.000
QT	4.000	1200.000	1710.000	1950.000	2550.000	.000	.000	.000	.000	.000

VALLEY SECTION 22 (Q)

X1	77.353	22.000	560.000	672.000	1060.000	640.000	640.000	.000	.000	.000
X3	.000	.000	.000	230.000	.000	720.000	.000	.000	.000	.000
GR	870.000	.000	860.000	60.000	860.000	110.000	854.000	150.000	852.900	560.000
GR	852.000	562.000	849.100	582.000	849.100	592.000	849.200	601.000	849.400	610.000
GR	849.900	627.000	849.900	642.000	850.000	656.000	851.300	670.000	853.900	672.000
GR	854.000	680.000	855.700	870.000	856.000	1210.000	857.300	1600.000	858.000	1960.000
GR	860.000	1980.000	870.000	2020.000	.000	.000	.000	.000	.000	.000
NC	.125	.060	.040	.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 23 (R)

X1	77.499	20.000	390.000	485.000	910.000	570.000	770.000	.000	.000	.000
X3	.000	.000	.000	290.000	.000	500.000	.000	.000	.000	.000
GR	860.000	.000	860.000	210.000	856.000	220.000	854.000	350.000	853.100	390.000
GR	851.900	395.000	850.100	410.000	846.900	420.000	847.100	432.000	846.700	443.000
GR	848.700	455.000	850.700	470.000	852.700	475.000	857.700	485.000	870.000	500.000
GR	870.000	560.000	860.000	680.000	858.000	720.000	858.000	980.000	870.000	1050.000

X1	77.566	22.000	560.000	672.000	400.000	420.000	353.000	.000	.000	.000
X3	.000	.000	.000	562.000	.000	626.000	.000	.000	.000	.000
GR	869.300	.000	859.300	60.000	859.300	110.000	853.300	150.000	852.200	560.000
GR	851.300	562.000	848.400	582.000	848.400	592.000	848.500	601.000	848.700	610.000
GR	849.200	627.000	849.200	642.000	849.300	656.000	850.600	670.000	853.200	672.000
GR	853.300	680.000	855.000	870.000	855.300	1210.000	856.600	1600.000	857.300	1960.000
GR	859.300	1980.000	869.300	2020.000	.000	.000	.000	.000	.000	.000
NC	.040	.040	.025	.000	.000	.000	.000	.000	.000	.000

BRIDGE SECTION 4 - ANN ARBOR RAILROAD - D/S FACE (S)

X1	77.567	22.000	300.000	364.000	1.000	1.000	1.000	.000	.000	.000
BT	12.000	.000	861.000	.000	100.000	861.000	.000	200.000	861.900	.000
BT	296.900	861.900	.000	297.000	865.200	.000	300.000	865.200	858.800	364.000
BT	865.200	858.800	367.000	865.200	.000	367.100	862.100	.000	400.000	862.100
BT	.000	500.000	862.100	.000	600.000	862.200	.000	.000	.000	.000
GR	861.000	.000	861.000	100.000	861.900	200.000	861.900	296.900	858.800	296.900
GR	858.800	300.000	853.100	300.000	853.100	301.300	849.200	301.500	848.800	310.000
GR	848.800	320.000	848.400	330.000	849.200	340.000	849.600	350.000	850.900	362.500
GR	852.700	362.700	852.700	364.000	858.800	364.000	862.100	367.100	862.100	400.000
GR	862.100	500.000	862.200	600.000	.000	.000	.000	.000	.000	.000

BRIDGE SECTION 4 - ANN ARBOR RAILROAD - U/S FACE (S)

X1	77.569	22.000	300.000	364.000	16.000	16.000	16.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000

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GR	861.000	.000	861.000	100.000	861.900	200.000	861.900	296.900	858.800	296.900
GR	858.800	300.000	853.200	300.000	853.200	301.300	849.300	301.500	848.900	310.000
GR	848.900	320.000	848.500	330.000	849.300	340.000	849.700	350.000	851.000	362.500
GR	852.800	362.700	852.800	364.000	858.800	364.000	862.100	367.100	862.100	400.000
GR	862.100	500.000	862.200	600.000	.000	.000	.000	.000	.000	.000
NC	.100	.060	.040	.000	.000	.000	.000	.000	.000	.000
X1	77.570	22.000	560.000	672.000	1.000	1.000	1.000	.000	.000	.000
X3	.000	.000	.000	561.000	.000	627.000	.000	.000	.000	.000
GR	869.400	.000	859.400	60.000	859.400	110.000	853.400	150.000	852.300	560.000
GR	851.400	562.000	848.500	582.000	848.500	592.000	848.600	601.000	848.800	610.000
GR	849.300	627.000	849.300	642.000	849.400	656.000	850.700	670.000	853.300	672.000
GR	853.400	680.000	855.100	870.000	855.400	1210.000	856.700	1600.000	857.400	1960.000
GR	859.400	1980.000	869.400	2020.000	.000	.000	.000	.000	.000	.000
X1	77.602	22.000	560.000	672.000	180.000	200.000	176.000	.000	.000	.000
X3	.000	.000	.000	554.000	.000	672.000	.000	.000	.000	.000
GR	869.300	.000	859.300	60.000	859.300	110.000	853.300	150.000	852.200	560.000
GR	851.300	562.000	848.400	582.000	848.400	592.000	848.500	601.000	848.700	610.000
GR	849.200	627.000	849.200	642.000	849.300	656.000	850.600	670.000	853.200	672.000
GR	853.300	680.000	855.000	870.000	855.300	1210.000	856.600	1600.000	857.300	1960.000
GR	859.300	1980.000	869.300	2020.000	.000	.000	.000	.000	.000	.000
NC	.040	.040	.025	.000	.000	.000	.000	.000	.000	.000

BRIDGE SECTION 5 - ABANDONED GRAND TRUNK RAILROAD - D/S FACE (T)

X1	77.603	29.000	300.000	418.000	1.000	1.000	1.000	.000	.000	.000
BT	44.000	.000	860.600	.000	100.000	860.600	.000	200.000	860.500	.000
BT	300.000	860.300	857.900	313.000	860.300	857.900	313.000	860.300	851.100	314.000
BT	860.300	850.600	314.000	860.300	857.900	323.000	860.300	857.900	323.000	860.300
BT	849.800	324.000	860.300	850.200	324.000	860.300	857.900	335.000	860.300	857.900
BT	335.000	860.300	850.000	336.000	860.300	850.000	336.000	860.300	857.900	347.000
BT	860.200	857.800	347.000	860.200	850.100	348.000	860.200	849.800	348.000	860.200
BT	857.800	359.000	860.200	857.800	359.000	860.200	849.500	360.000	860.200	849.000
BT	360.000	860.200	857.800	371.000	860.200	857.800	371.000	860.200	848.700	372.000
BT	860.200	848.800	372.000	860.200	857.800	382.000	860.200	857.800	382.000	860.200
BT	848.800	383.000	860.200	848.800	383.000	860.200	857.800	394.000	860.100	857.700
BT	394.000	860.100	848.800	395.000	860.100	849.000	395.000	860.100	857.700	406.000
BT	860.100	857.700	406.000	860.100	848.400	407.000	860.100	849.100	407.000	860.100
BT	857.700	418.000	860.100	857.700	500.000	860.000	.000	600.000	860.000	.000
BT	700.000	860.000	.000	.000	.000	.000	.000	.000	.000	.000
GR	860.600	.000	860.600	100.000	860.500	200.000	860.300	300.000	852.500	300.000
GR	851.100	313.000	850.600	314.000	849.800	323.000	850.200	324.000	850.000	335.000
GR	850.000	336.000	850.100	347.000	849.800	348.000	849.500	359.000	849.000	360.000
GR	848.700	371.000	848.800	372.000	848.800	382.000	848.800	383.000	848.800	394.000
GR	849.000	395.000	848.400	406.000	849.100	407.000	852.900	416.000	853.600	418.000
GR	860.100	418.000	860.000	500.000	860.000	600.000	860.000	700.000	.000	.000

BRIDGE SECTION 5 - ABANDONED GRAND TRUNK RAILROAD - U/S FACE (T)

X1	77.605	.000	.000	.000	12.000	12.000	12.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.060	.100	.040	.000	.000	.000	.000	.000	.000	.000
X1	77.606	22.000	560.000	672.000	1.000	1.000	1.000	.000	.000	.000

X3	.000	.000	.000	553.000	.000	673.000	.000	.000	.000	.000
GR	869.300	.000	859.300	60.000	859.300	110.000	853.300	150.000	852.200	560.000
GR	851.300	562.000	848.400	582.000	848.400	592.000	848.500	601.000	848.700	610.000
GR	849.200	627.000	849.200	642.000	849.300	656.000	850.600	670.000	853.200	672.000
GR	853.300	680.000	855.000	870.000	855.300	1210.000	856.600	1600.000	857.300	1960.000
GR	859.300	1980.000	869.300	2020.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 24 (U)

X1	77.717	19.000	70.000	176.000	560.000	690.000	589.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	500.000	.000	.000	.000	.000
GR	870.000	.000	860.000	40.000	853.200	70.000	850.200	80.000	850.200	92.000
GR	850.200	107.000	850.200	118.000	850.200	130.000	850.200	140.000	849.300	153.000
GR	849.500	170.000	853.200	176.000	856.000	730.000	858.000	1100.000	860.000	1120.000
GR	860.000	1230.000	860.000	1500.000	866.000	1580.000	870.000	1660.000	.000	.000
NC	.100	.100	.040	.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 25 (V)

X1	77.899	15.000	55.000	166.000	980.000	820.000	960.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	275.000	.000	.000	.000	.000
GR	880.000	.000	860.000	40.000	853.800	55.000	852.000	60.000	849.400	80.000
GR	849.200	95.000	849.200	110.000	850.000	125.000	851.000	140.000	852.600	164.000
GR	853.700	166.000	856.000	845.000	862.000	925.000	864.000	1055.000	866.000	1185.000

X1	77.999	.000	.000	.000	550.000	500.000	533.000	.000	.600	.000
X3	.000	.000	.000	60.000	.000	144.000	.000	.000	.000	.000
NC	.030	.030	.025	.000	.000	.000	.000	.000	.000	.000

BRIDGE SECTION 6 - M-36 BRIDGE - D/S FACE (W)

X1	78.000	29.000	225.000	309.000	1.000	1.000	1.000	.000	.000	.000
BT	26.000	.000	868.300	.000	25.000	866.800	.000	125.000	863.500	.000
BT	222.000	863.500	.000	222.000	867.300	.000	225.000	867.300	855.300	233.000
BT	868.100	858.600	237.000	869.100	860.400	252.000	872.900	860.400	267.000	874.200
BT	860.400	282.000	872.800	860.400	297.000	868.900	860.400	301.000	867.500	858.600
BT	309.000	867.200	855.300	312.000	867.200	.000	312.000	863.500	.000	425.000
BT	863.000	.000	525.000	863.200	.000	625.000	863.200	.000	725.000	862.800
BT	.000	825.000	862.600	.000	925.000	863.500	.000	1025.000	864.200	.000
BT	1125.000	864.900	.000	1225.000	866.100	.000	1325.000	867.400	.000	.000
GR	868.300	.000	866.800	25.000	863.500	125.000	863.500	222.000	863.500	225.000
GR	852.200	225.000	851.200	233.000	850.800	237.000	850.000	244.000	849.800	252.000
GR	849.800	257.000	850.100	267.000	849.800	280.000	850.000	282.000	851.000	295.000
GR	851.200	297.000	852.400	309.000	863.500	309.000	863.500	312.000	863.000	425.000
GR	863.200	525.000	863.200	625.000	862.800	725.000	862.600	825.000	863.500	925.000
GR	864.200	1025.000	864.900	1125.000	866.100	1225.000	867.400	1325.000	.000	.000

BRIDGE SECTION 6 - M-36 BRIDGE - U/S FACE (W)

X1	78.005	.000	.000	.000	26.000	26.000	26.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.070	.060	.040	.000	.000	.000	.000	.000	.000	.000

X1	78.006	24.000	220.000	330.000	1.000	1.000	1.000	.000	.000	.000

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X3	,000	,000	,000	235,000	,000	321,000	,000	,000	,000	,000
GR	870,100	,000	860,100	10,000	856,100	40,000	855,300	220,000	851,900	230,000
GR	851,600	245,000	850,300	265,000	850,300	280,000	849,800	295,000	850,300	305,000
GR	851,400	318,000	852,500	325,000	856,300	330,000	856,100	350,000	858,100	380,000
GR	859,100	480,000	858,100	610,000	856,100	640,000	855,100	770,000	856,100	880,000
GR	864,100	950,000	866,100	1090,000	868,100	1130,000	870,100	1170,000	,000	,000

VALLEY SECTION 26 (X)

X1	78,045	24,000	220,000	330,000	210,000	210,000	209,000	,000	,000	,000
X3	,000	,000	,000	75,000	,000	370,000	,000	,000	,000	,000
GR	870,000	,000	860,000	10,000	856,000	40,000	855,200	220,000	851,800	230,000
GR	851,500	245,000	850,200	265,000	850,200	280,000	849,700	295,000	850,200	305,000
GR	851,300	318,000	852,400	325,000	856,200	330,000	856,000	350,000	858,000	380,000
GR	859,000	480,000	858,000	610,000	856,000	640,000	855,000	770,000	856,000	880,000
GR	864,000	950,000	866,000	1090,000	868,000	1130,000	870,000	1170,000	,000	,000
NH	4,000	,060	660,000	,040	743,000	,100	960,000	,050	1110,000	,000

VALLEY SECTION 27 (Y)

X1	78,283	24,000	660,000	743,000	1270,000	1120,000	1260,000	,000	,000	,000
X3	,000	,000	,000	620,000	,000	,000	,000	,000	,000	,000
GR	870,000	,000	868,000	90,000	864,000	130,000	862,000	250,000	860,500	300,000
GR	862,000	370,000	863,000	450,000	862,000	480,000	860,000	510,000	858,000	570,000
GR	856,000	650,000	855,300	660,000	852,400	665,000	850,200	683,000	849,500	694,000
GR	849,600	708,000	850,400	720,000	851,500	735,000	852,900	740,000	853,700	743,000
GR	856,000	960,000	862,000	1010,000	864,000	1040,000	870,000	1110,000	,000	,000
NH	4,000	,050	1010,000	,100	1230,000	,040	1325,000	,070	1380,000	,000

VALLEY SECTION 28 (Z)

	Section	# Sta	Sta Left OB	Sta Rob	Length LOB					
X1	78,522	23,000	1230,000	1325,000	1260,000	1240,000	1260,000	,000	,000	,000
X3	Elev,000	Sta,000	,000	890,000	,000	,000	,000	,000	,000	,000
GR	870,000	,000	868,000	70,000	866,000	260,000	864,000	370,000	862,000	410,000
GR	860,000	440,000	860,000	510,000	858,000	580,000	856,000	1010,000	853,800	1230,000
GR	852,500	1235,000	851,200	1250,000	850,900	1260,000	850,500	1271,000	850,000	1280,000
GR	850,200	1296,000	850,500	1310,000	852,500	1317,000	853,500	1323,000	854,000	1325,000
GR	856,000	1340,000	860,000	1350,000	870,000	1380,000	,000	,000	,000	,000
NC	,070	,070	,040	,000	,000	,000	,000	,000	,000	,000

VALLEY SECTION 29 (AA)

X1	78,819	22,000	1080,000	1170,000	1270,000	1650,000	1570,000	,000	,000	,000
X3	,000	,000	,000	880,000	,000	,000	,000	,000	,000	,000
GR	870,000	,000	868,000	80,000	866,000	290,000	864,000	380,000	862,000	450,000
GR	860,000	510,000	858,000	645,000	856,000	655,000	856,000	740,000	857,600	870,000
GR	856,000	1060,000	854,700	1080,000	853,500	1090,000	853,000	1095,000	851,000	1101,000
GR	850,000	1116,000	850,300	1130,000	850,600	1140,000	852,100	1155,000	857,000	1170,000
GR	860,000	1180,000	870,000	1210,000	,000	,000	,000	,000	,000	,000
NH	4,000	,040	50,000	,100	80,000	,040	205,000	,100	1160,000	,000

VALLEY SECTION 30 (AB)

X1	79,018	22,000	80,000	205,000	1010,000	1050,000	1050,000	,000	,000	,000
X3	,000	,000	,000	,000	,000	350,000	,000	,000	,000	,000

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GR     850.500     110.000     850.800     130.000     851.200     140.000     851.400     150.000     851.600     160.000
GR     851.700     170.000     851.400     180.000     851.500     185.000     853.200     200.000     854.400     205.000
GR     858.000     530.000     860.000     620.000     862.000     770.000     864.000     820.000     866.000     890.000
GR     868.000    1040.000     870.000    1160.000        .000        .000        .000        .000        .000        .000
NC        .125        .100        .040        .000        .000        .000        .000        .000        .000        .000

        VALLEY SECTION 31   (AC)

X1      79.369      19.000      40.000     162.000    1950.000    1740.000    1850.000        .000        .000        .000
GR     880.000        .000     854.900      40.000     854.100      45.000     853.400      50.000     850.700      70.000
GR     850.100      90.000     850.100     106.000     851.100     120.000     851.400     134.000     851.900     150.000
GR     854.100     160.000     854.300     162.000     858.000     340.000     860.000     470.000     862.000     660.000
GR     864.000     820.000     866.000     910.000     868.000    1000.000     870.000    1110.000        .000        .000
NH       4.000        .100     270.000        .040     406.000        .100     530.000        .060     610.000        .000

        VALLEY SECTION 32   (AD)

X1      79.600      22.000     270.000     406.000    1300.000    1100.000    1220.000        .000        .000        .000
GR     870.000        .000     860.000     100.000     858.000     120.000     854.900     270.000     854.200     274.000
GR     852.700     288.000     850.600     305.000     850.600     315.000     850.600     325.000     851.200     338.000
GR     851.400     348.000     851.200     360.000     851.200     370.000     851.200     380.000     851.800     395.000
GR     852.700     400.000     854.600     406.000     858.000     460.000     860.000     480.000     862.000     490.000
GR     868.000     530.000     870.000     610.000        .000        .000        .000        .000        .000        .000
NC        .100        .070        .040        .000        .000        .000        .000        .000        .000        .000

X1      79.861      18.000      90.000     216.000    1440.000    1350.000    1384.000        .000        .000        .000
X3        .000        .000        .000      88.000        .000     212.000        .000        .000        .000        .000
GR     869.600        .000     859.600      45.000     857.600      60.000     855.200      90.000     853.600     100.000
GR     851.700     117.000     851.500     135.000     851.300     147.000     851.200     157.000     851.200     175.000
GR     852.000     190.000     852.700     205.000     853.200     214.000     855.300     216.000     857.600     300.000
GR     859.600     330.000     861.600     360.000     869.600     490.000        .000        .000        .000        .000
NC        .040        .040        .025        .000        .000        .000        .000        .000        .000        .000

        BRIDGE SECTION 7 - WINANS LAKE ROAD - D/S FACE   (AE)

        U.S.G.S. GAGING STATION LOCATED AT DOWNSTREAM FACE OF BRIDGE.

X1      79.862      20.000     100.000     230.000       1.000       1.000       1.000        .000        .000        .000
BT      15.000        .000     867.600        .000     100.000     867.200     863.100     141.000     866.700     862.400
BT     141.000     866.700     852.000     143.500     866.700     851.700     143.500     866.700     862.400     186.000
BT     866.200     861.500     186.000     866.200     851.600     188.500     866.200     851.700     188.500     866.200
BT     861.500     230.000     865.700     861.700     300.000     863.000        .000     400.000     863.300        .000
BT     500.000     865.600        .000     600.000     869.200        .000        .000        .000        .000        .000
GR     867.600        .000     867.200     100.000     861.000     100.000     854.400     124.000     852.000     141.000
GR     851.700     143.500     851.200     154.000     851.200     164.000     851.700     174.000     851.600     186.000
GR     851.700     188.500     852.100     201.000     854.400     212.000     857.700     217.000     859.300     230.000
GR     865.700     230.000     863.000     300.000     863.300     400.000     865.600     500.000     869.200     600.000

        BRIDGE SECTION 7 - WINANS LAKE ROAD - U/S FACE   (AE)

        U.S.G.S. GAGING STATION LOCATED AT DOWNSTREAM FACE OF BRIDGE

X1      79.869        .000        .000        .000      35.000      35.000      35.000        .000        .000        .000
X2        .000        .000        .000        .000        .000        .000       1.000        .000        .000        .000
```

NC	.050	.050	.042	.000	.000	.000	.000	.000	.000	.000
X1	79.870	18.000	90.000	216.000	1.000	1.000	1.000	.000	.000	.000
X3	.000	.000	.000	87.000	.000	213.000	.000	.000	.000	.000
GR	869.600	.000	859.600	45.000	857.600	60.000	855.200	90.000	853.600	100.000
GR	851.700	117.000	851.500	135.000	851.300	147.000	851.200	157.000	851.200	175.000
GR	852.000	190.000	852.700	205.000	853.200	214.000	855.300	216.000	857.600	300.000
GR	859.600	330.000	861.600	360.000	869.600	480.000	.000	.000	.000	.000

VALLEY SECTION 33 (AF)

X1	79.886	18.000	90.000	216.000	90.000	90.000	89.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	300.000	.000	.000	.000	.000
GR	870.000	.000	860.000	45.000	858.000	60.000	855.600	90.000	854.000	100.000
GR	852.100	117.000	851.900	135.000	851.700	147.000	851.600	157.000	851.600	175.000
GR	852.400	190.000	853.100	205.000	853.600	214.000	855.700	216.000	858.000	300.000
GR	860.000	330.000	862.000	360.000	870.000	480.000	.000	.000	.000	.000
NC	.060	.060	.042	.000	.000	.000	.000	.000	.000	.000
QT	4.000	1190.000	1700.000	1930.000	2510.000	.000	.000	.000	.000	.000

VALLEY SECTION 34 (AG)

X1	80.145	22.000	270.000	381.000	1400.000	1260.000	1370.000	.000	.000	.000
X3	.000	.000	.000	100.000	.000	.000	.000	.000	.000	.000
GR	870.000	.000	864.000	90.000	860.000	140.000	858.000	170.000	856.000	250.000
GR	855.500	270.000	853.600	280.000	853.100	290.000	852.700	300.000	852.700	310.000
GR	852.600	330.000	852.900	350.000	853.100	360.000	853.800	370.000	854.400	374.000
GR	856.100	381.000	856.000	410.000	858.000	430.000	860.000	440.000	866.000	470.000
GR	868.000	640.000	870.000	780.000	.000	.000	.000	.000	.000	.000
NC	.050	.050	.042	.000	.000	.000	.000	.000	.000	.000
QT	4.000	1180.000	1680.000	1905.000	2465.000	.000	.000	.000	.000	.000

VALLEY SECTION 35 (AH)

X1	80.459	17.000	100.000	560.000	1350.000	1800.000	1660.000	.000	.000	.000
X3	.000	.000	.000	100.000	.000	560.000	.000	.000	.000	.000
GR	870.000	.000	860.000	50.000	856.000	70.000	855.000	100.000	852.300	110.000
GR	851.700	190.000	852.700	310.000	852.400	380.000	851.700	450.000	852.000	505.000
GR	853.300	553.000	854.200	557.000	855.700	560.000	856.000	570.000	860.000	580.000
GR	862.000	810.000	870.000	840.000	.000	.000	.000	.000	.000	.000
NC	.050	.100	.042	.000	.000	.000	.000	.000	.000	.000
QT	4.000	1020.000	1450.000	1680.000	2140.000	.000	.000	.000	.000	.000

VALLEY SECTION 36 (AI)

X1	80.560	19.000	100.000	600.000	520.000	570.000	530.000	.000	.000	.000
X3	.000	.000	.000	100.000	.000	600.000	.000	.000	.000	.000
GR	870.000	.000	860.000	50.000	856.000	90.000	855.100	100.000	854.800	128.000
GR	852.900	160.000	852.600	175.000	852.900	190.000	853.100	250.000	853.800	415.000
GR	853.500	492.000	853.600	516.000	852.600	529.000	851.300	544.000	850.600	559.000
GR	849.600	575.000	854.600	600.000	856.200	670.000	858.800	770.000	.000	.000
NC	.100	.070	.040	.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 37 (AJ)

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XI	80.925	18.000	235.000	345.000	1330.000	2160.000	1930.000	.000	.000	.000
X3	.000	.000	.000	200.000	.000	600.000	.000	.000	.000	.000
GR	868.600	.000	862.600	10.000	860.000	35.000	856.200	135.000	855.000	235.000
GR	849.800	247.000	851.300	262.000	851.800	285.000	852.100	301.000	852.800	323.000
GR	853.300	333.000	853.800	344.000	854.300	345.000	854.400	445.000	856.000	705.000
GR	858.000	825.000	860.000	865.000	860.800	945.000	.000	.000	.000	.000
EJ	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

FORM 1411 1, C8
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*PROF 1

CCHV=     .300 CEHV=     .500
*SECNO 76.798
   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=     625.0     1145.0  TYPE=     1  TARGET=     520.000

          VALLEY SECTION 20   (O)

    76.80      9.63    855.13       .00    855.13    855.17       .04       .00       .00    853.30
    1350.       52.     1118.      180.      172.      656.      631.        0.        0.    852.20
      .00       .30      1.70       .28      .048      .032      .100      .000    845.50    625.00
  .000098        0.        0.        0.         0         0         0       .00    520.00   1145.00

*SECNO 77.030

3470 ENCROACHMENT STATIONS=     300.0     1200.0  TYPE=     1  TARGET=     900.000

          VALLEY SECTION 21   (P)

    77.03      7.76    855.26       .00       .00    855.28       .02       .11       .01    852.60
    1350.      225.      865.      260.     1027.      643.      845.       58.       21.    852.20
      .36       .22      1.35       .31      .100      .032      .080      .032    847.50    300.00
  .000077     1420.     1220.     1180.         0         0         0       .00    900.00   1200.00

*SECNO 77.232

3470 ENCROACHMENT STATIONS=    1200.0     2200.0  TYPE=     1  TARGET=    1000.000
    77.23      6.86    855.36       .00       .00    855.40       .04       .11       .01    853.60
    1350.      328.     1014.        8.     1278.      548.       17.      100.       39.    853.20
      .54       .26      1.85       .48      .100      .032      .048      .033    848.50   1200.00
  .000180      780.     1070.      760.         2         0         0       .00   1000.00   2200.00

*SECNO 77.353

3470 ENCROACHMENT STATIONS=     230.0      720.0  TYPE=     1  TARGET=     490.000

          VALLEY SECTION 22   (Q)

    77.35      6.38    855.48       .00       .00    855.51       .03       .11       .00    852.90
    1200.      193.      981.       26.     702.      614.       64.      134.       56.    853.90
      .69       .27      1.60       .41      .100      .032      .048      .032    849.10    230.00
  .000125     1060.      640.      640.         1         0         0       .00    490.00    720.00

*SECNO 77.499
   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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3470 ENCROACHMENT STATIONS=     290.0     500.0  TYPE=     1  TARGET=     210.000

          VALLEY SECTION 23   (R)

    77.50      8.88   855.58      .00       .00   855.64      .06       .12       .02   853.10
    1200.       40.    1160.       0.      149.    564.       0.      153.       62.   857.70
      .80       .27     2.05      .00      .100    .032     .048      .032   846.70   290.00
  .000177      910.     770.     570.         1       0        0       .00   190.77   480.77

*SECNO 77.566

3470 ENCROACHMENT STATIONS=     562.0     626.0  TYPE=     1  TARGET=      64.000
    77.57      7.24   855.64      .00       .00   855.76      .12       .09       .03100000.00
    1200.       0.    1200.       0.        0.    423.       0.      158.       63. 100000.00
      .84       .00     2.83      .00      .100    .032     .048      .032   848.40   562.00
  .000370      400.     353.     420.         0       0        0       .00    64.00   626.00

*SECNO 77.567

3370 NORMAL BRIDGE,NRD= 12 MIN ELTRD=  861.00 MAX ELLC=  858.80

          BRIDGE SECTION 4 - ANN ARBOR RAILROAD - D/S FACE   (S)

    77.57      7.23   855.63      .00       .00   855.77      .14       .00       .01   858.80
    1200.       0.    1200.       0.        0.    402.       0.      158.       63.   858.80
      .84       .00     2.98      .00      .032    .020     .032      .032   848.40   300.00
  .000172        1.       1.       1.         0       0        0       .00    64.00   364.00

*SECNO 77.569

          BRIDGE SECTION 4 - ANN ARBOR RAILROAD - U/S FACE   (S)

    77.57      7.13   855.63      .00       .00   855.77      .14       .00       .00   858.80
    1200.       0.    1200.       0.        0.    395.       0.      158.       63.   858.80
      .84       .00     3.03      .00      .032    .020     .032      .032   848.50   300.00
  .000181       16.      16.      16.         0       0        0       .00    64.00   364.00

*SECNO 77.570

3470 ENCROACHMENT STATIONS=     561.0     627.0  TYPE=     1  TARGET=      66.000
    77.57      7.16   855.66      .00       .00   855.78      .12       .00       .01100000.00
    1200.       0.    1200.       0.        0.    429.       0.      158.       63. 100000.00
      .84       .00     2.80      .00      .080    .032     .048      .032   848.50   561.00
  .000365        1.       1.       1.         2       0        0       .00    66.00   627.00

*SECNO 77.602
   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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3470 ENCROACHMENT STATIONS=      554.0      672.0  TYPE=      1  TARGET=      118.000
    77.60      7.39    855.79      .00       .00    855.84      .04       .03       .02    852.20
    1200.        7.     1193.       0.       22.      728.       0.      161.       64. 100000.00
      .87       .33      1.64      .00      .080      .032     .048      .032    848.40    554.00
  .000108      180.      176.     200.         2         0        0       .00    118.00    672.00


*SECNO 77.603

3370 NORMAL BRIDGE,NRD= 44 MIN ELTRD=  860.00 MAX ELLC=  857.90


          BRIDGE SECTION 5 - ABANDONED GRAND TRUNK RAILROAD - D/S FACE   (T)

    77.60      7.39    855.79      .00       .00    855.84      .05       .00       .01    860.30
    1200.        0.     1200.       0.        0.      645.       0.      161.       64.    860.10
      .87       .00      1.86      .00      .032      .020     .032      .032    848.40    300.00
  .000158        1.        1.       1.         0         0        0    -56.91    118.00    418.00


*SECNO 77.605

3370 NORMAL BRIDGE,NRD= 44 MIN ELTRD=  860.00 MAX ELLC=  857.90


          BRIDGE SECTION 5 - ABANDONED GRAND TRUNK RAILROAD - U/S FACE   (T)

    77.61      7.39    855.79      .00       .00    855.84      .05       .00       .00    860.30
    1200.        0.     1200.       0.        0.      645.       0.      161.       64.    860.10
      .87       .00      1.86      .00      .032      .020     .032      .032    848.40    300.00
  .000158       12.       12.      12.         0         0        0    -56.86    118.00    418.00


*SECNO 77.606

3470 ENCROACHMENT STATIONS=      553.0      673.0  TYPE=      1  TARGET=      120.000
    77.61      7.41    855.81      .00       .00    855.85      .04       .00       .00    852.20
    1200.       14.     1186.       0.       25.      729.       3.      161.       64.    853.20
      .87       .56      1.63      .15      .048      .032     .080      .032    848.40    553.00
  .000103        1.        1.       1.         1         0        0       .00    120.00    673.00


*SECNO 77.717

3470 ENCROACHMENT STATIONS=          .0      500.0  TYPE=      1  TARGET=      499.999

          VALLEY SECTION 24   (U)

    77.72      6.58    855.88      .00       .00    855.92      .04       .07       .00    853.20
    1200.        7.      999.     194.       16.      600.     606.      175.       68.    853.20
      .99       .42      1.66      .32      .048      .032     .080      .032    849.30     58.14
  .000130      560.      589.     690.         0         0        0       .00    441.86    500.00


*SECNO 77.899
    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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                    ALOBR    IPMIHL   IDC     ICONT   CORAR   TOPWID   ENDST

3470 ENCROACHMENT STATIONS=        .0    275.0  TYPE=     1  TARGET=     274.999

          VALLEY SECTION 25   (V)

    77.90     6.81   856.01      .00      .00   856.06      .05      .14      .01   853.80
    1200.       1.    1110.      89.       6.     610.     232.     196.      75.   853.70
     1.14      .24.    1.82      .38     .080     .032     .080     .032   849.20    49.65
  .000160     980.     960.     820.        2        0        0      .00   225.35   275.00

*SECNO 77.999

3470 ENCROACHMENT STATIONS=      60.0     144.0  TYPE=     1  TARGET=      84.000
    78.00     6.31   856.11      .00      .00   856.21      .10      .12      .03100000.00
    1200.       0.    1200.       0.       0.     464.       0.     204.      76. 100000.00
     1.20      .00     2.58      .00     .080     .032     .080     .032   849.80    60.00
  .000358     550.     533.     500.        1        0        0      .00    84.00   144.00

*SECNO 78.000

3370 NORMAL BRIDGE,NRD= 26 MIN ELTRD=  862.60 MAX ELLC=  860.40

          BRIDGE SECTION 6 - M-36 BRIDGE - D/S FACE   (W)

    78.00     6.31   856.11      .00      .00   856.21      .10      .00      .00   863.50
    1200.       0.    1200.       0.       0.     464.       0.     204.      76.   863.50
     1.20      .00     2.59      .00     .024     .020     .024     .032   849.80   225.00
  .000145       1.       1.       1.        0        0        0    -1.55    84.00   309.00

*SECNO 78.005

3370 NORMAL BRIDGE,NRD= 26 MIN ELTRD=  862.60 MAX ELLC=  860.40

          BRIDGE SECTION 6 - M-36 BRIDGE - U/S FACE   (W)

    78.00     6.31   856.11      .00      .00   856.21      .10      .00      .00   863.50
    1200.       0.    1200.       0.       0.     464.       0.     205.      76.   863.50
     1.20      .00     2.58      .00     .024     .020     .024     .032   849.80   225.00
  .000145      26.      26.      26.        0        0        0    -1.58    84.00   309.00

*SECNO 78.006

3470 ENCROACHMENT STATIONS=     235.0     321.0  TYPE=     1  TARGET=      86.000
    78.01     6.31   856.11      .00      .00   856.21      .10      .00      .00100000.00
    1200.       0.    1200.       0.       0.     468.       0.     205.      76. 100000.00
     1.20      .00     2.57      .00     .056     .032     .048     .032   849.80   235.00
  .000363       1.       1.       1.        0        0        0      .00    86.00   321.00

*SECNO 78.045
   SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS    BANK ELEV
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 Z        QLOB     QCH      WROB     ALOB     ACH      HROB     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=      75.0     370.0  TYPE=      1  TARGET=     295.000

          VALLEY SECTION 26   (X)

    78.05     6.52   856.22      .00      .00   856.29      .07      .06      .01   855.20
    1200.      32.    1167.       0.     101.     562.       3.     207.      77.   856.20
     1.23      .32     2.08      .11     .056     .032     .048     .032   849.70    75.00
  .000234     210.     209.     210.        2        0        0      .00   278.31   353.31


1490 NH CARD USED
*SECNO 78.283

3470 ENCROACHMENT STATIONS=     620.0    1110.0  TYPE=      1  TARGET=    -620.000

          VALLEY SECTION 27   (Y)

    78.28     7.01   856.51      .00      .00   856.58      .07      .29      .00   855.30
    1200.       5.    1051.     144.      14.     471.     362.     229.      86.   853.70
     1.40      .34     2.23      .40     .048     .032     .080     .032   849.50   629.54
  .000234    1270.    1260.    1120.        2        0        0      .00   334.72   964.26


1490 NH CARD USED
*SECNO 78.522

3470 ENCROACHMENT STATIONS=     890.0    1380.0  TYPE=      1  TARGET=    -890.000

          VALLEY SECTION 28   (Z)

    78.52     6.78   856.78      .00      .00   856.83      .05      .24      .01   853.80
    1200.      171.    1016.      14.     478.     539.      28.     256.      97.   854.00
     1.61      .36     1.88      .49     .076     .032     .056     .032   850.00   890.00
  .000164    1260.    1260.    1240.        1        0        0      .00   451.98  1341.98


*SECNO 78.819

3470 ENCROACHMENT STATIONS=     880.0    1210.0  TYPE=      1  TARGET=    -880.000

          VALLEY SECTION 29   (AA)

    78.82     7.11   857.11      .00      .00   857.20      .09      .34      .02   854.70
    1200.      47.    1153.       0.     108.     468.       0.     283.     108.   857.00
     1.79      .44     2.46      .00     .056     .032     .056     .032   850.00   928.68
  .000319    1270.    1570.    1650.        2        0        0      .00   241.67  1170.35


1490 NH CARD USED
*SECNO 79.018

3470 ENCROACHMENT STATIONS=        .0     350.0  TYPE=      1  TARGET=     349.999

          VALLEY SECTION 30   (AB)
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    79.02      6.86    857.36       .00       .00    857.40       .03       .18       .02    855.30
    1200.        3.    1097.      101.       13.      710.      312.      303.      114.    854.40
     1.99       .20      1.54       .32      .080      .032      .080      .032    850.50     66.87
  .000110     1010.    1050.     1050.         0         0         0       .00    283.12    350.00

*SECNO 79.369
   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


          VALLEY SECTION 31   (AC)

    79.37      7.45    857.55       .00       .00    857.59       .03       .19       .00    854.90
    1200.        1.    1134.       65.        6.      739.      255.      345.      126.    854.30
     2.34       .16      1.53       .26      .100      .032      .080      .032    850.10     35.77
  .000099     1950.    1850.     1740.         2         0         0       .00    282.79    318.56

1490 NH CARD USED
*SECNO 79.600

          VALLEY SECTION 32   (AD)

    79.60      7.07    857.67       .00       .00    857.70       .03       .11       .00    854.90
    1200.       40.    1143.       17.      187.      818.       75.      374.      134.    854.60
     2.60       .21      1.40       .23      .080      .032      .080      .032    850.60    135.43
  .000083     1300.    1220.     1100.         0         0         0       .00    319.51    454.94

*SECNO 79.861

3470 ENCROACHMENT STATIONS=       88.0      212.0  TYPE=      1  TARGET=      124.000
    79.86      6.61    857.81       .00       .00    857.86       .04       .15       .01    855.20
    1200.        1.    1199.        0.        5.      704.        0.      402.      141. 100000.00
     2.82       .24      1.70       .00      .080      .032      .056      .032    851.20     88.00
  .000137     1440.    1384.     1350.         1         0         0       .00    124.00    212.00

*SECNO 79.862

3370 NORMAL BRIDGE,NRD= 15 MIN ELTRD=  863.00 MAX ELLC=  863.10


          BRIDGE SECTION 7 - WINANS LAKE ROAD - D/S FACE   (AE)


          U.S.G.S. GAGING STATION LOCATED AT DOWNSTREAM FACE OF BRIDGE.

    79.86      6.59    857.79       .00       .00    857.88       .09       .00       .02    867.20
    1200.        0.    1200.        0.        0.      501.        0.      402.      141.    865.70
     2.82       .00      2.40       .00      .032      .020      .032      .032    851.20    111.68
  .000167        1.       1.        1.         2         0         0    -30.19    106.04    217.72


*SECNO 79.869
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3370 NORMAL BRIDGE,NRD=  15 MIN ELTRD=  863.00 MAX ELLC=  863.10

          BRIDGE SECTION 7 - WINANS LAKE ROAD - U/S FACE   (AE)

          U.S.G.S. GAGING STATION LOCATED AT DOWNSTREAM FACE OF BRIDGE

     79.87      6.59    857.79       .00       .00    857.88       .09       .01       .00    867.20
     1200.        0.    1200.        0.        0.     501.        0.      403.      141.    865.70
      2.83       .00      2.39       .00      .032      .020      .032      .032    851.20    111.66
   .000167       35.       35.       35.         0         0         0    -30.22    106.10    217.76

 *SECNO 79.870
    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=       87.0      213.0  TYPE=      1  TARGET=      126.000
     79.87      6.65    857.85       .00       .00    857.90       .04       .00       .01    855.20
     1200.        4.    1196.        0.        8.     715.        0.      403.      141. 100000.00
      2.83       .56      1.67       .00      .040      .034      .040      .032    851.20     87.00
   .000144        1.        1.        1.         2         0         0       .00    126.00    213.00

 *SECNO 79.886

 3470 ENCROACHMENT STATIONS=         .0      300.0  TYPE=      1  TARGET=      299.999

          VALLEY SECTION 33   (AF)

     79.89      6.27    857.87       .00       .00    857.91       .04       .01       .00    855.60
     1200.       16.    1142.       42.       32.     678.       86.      404.      142.    855.70
      2.84       .50      1.68       .49      .040      .034      .040      .032    851.60     61.65
   .000156       90.       89.       90.         0         0         0       .00    233.54    295.18

 *SECNO 80.145

 3470 ENCROACHMENT STATIONS=      100.0      780.0  TYPE=      1  TARGET=     -100.000

          VALLEY SECTION 34   (AG)

     80.14      5.52    858.12       .00       .00    858.17       .05       .26       .00    855.50
     1190.       86.    1047.       58.      137.     541.       83.      429.      149.    856.10
      3.05       .62      1.94       .70      .048      .034      .048      .032    852.60    168.17
   .000233     1400.     1370.     1260.         2         0         0       .00    262.44    430.61

 *SECNO 80.459

 3470 ENCROACHMENT STATIONS=      100.0      560.0  TYPE=      1  TARGET=      460.000

          VALLEY SECTION 35   (AH)
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    80.46     6.53   858.23      .00      .00   858.23      .00      .04      .01   855.00
    1180.      0.    1180.       0.       0.    2743.       0.     495.     163. 100000.00
     4.12      .00      .43      .00     .040     .034     .040     .032   851.70   100.00
  .000009    1350.    1660.    1800.        2        0        0      .00   460.00   560.00


*SECNO 80.560

3470 ENCROACHMENT STATIONS=     100.0     600.0  TYPE=     1  TARGET=     500.000

          VALLEY SECTION 36   (AI)

    80.56     8.63   858.23      .00      .00   858.23      .00      .00      .00   855.10
    1020.      0.    1020.       0.       0.    2519.       0.     527.     169. 100000.00
     4.49      .00      .41      .00     .040     .034     .080     .032   849.60   100.00
  .000010     520.     530.     570.        2        0        0      .00   500.00   600.00


*SECNO 80.925
   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=     200.0     600.0  TYPE=     1  TARGET=     400.000

          VALLEY SECTION 37   (AJ)

    80.93     8.46   858.26      .00      .00   858.27      .01      .03      .00   855.00
    1020.     24.     646.     349.     107.     677.     914.     622.     189.    854.30
     5.22      .23      .95      .38     .080     .032     .056     .032   849.80   200.00
  .000038    1330.    1930.    2160.        1        0        0      .00   400.00   600.00
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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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T1       HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2       50-YEAR FLOW - STRAWBERRY LAKE TO CORPORATE LIMITS
T3       HURON RIVER - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

    -10.       3.       0.       0.   .000000     .00       .0       0.    855.820   .000

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

     2.000     .000   -1.000     .000     .000     .800     .000     .000     .000     .000

*PROF 2

CCHV=    .300 CEHV=    .500
*SECNO 76.798
   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=     625.0    1145.0  TYPE=     1  TARGET=     520.000

          VALLEY SECTION 20   (O)

    76.80    10.32   855.82     .00   855.82   855.87     .05     .00     .00   853.30
    1900.     146.    1460.    293.     310.     718.    790.      0.      0.   852.20
      .00      .47     2.03     .37     .048     .032    .100    .000   845.50   625.00
  .000123       0.       0.      0.        0        0       0     .00   520.00  1145.00

*SECNO 77.030

3470 ENCROACHMENT STATIONS=     300.0    1200.0  TYPE=     1  TARGET=     900.000

          VALLEY SECTION 21   (P)

    77.03     8.48   855.98     .00      .00   856.01     .02     .13     .01   852.60
    1900.     383.    1104.    413.    1366.     719.   1079.     73.     21.   852.20
      .33      .28     1.54     .38     .100     .032    .080    .031   847.50   300.00
  .000086    1420.    1220.   1180.        0        0       0     .00   900.00  1200.00

*SECNO 77.232

3470 ENCROACHMENT STATIONS=    1200.0    2200.0  TYPE=     1  TARGET=    1000.000
    77.23     7.59   856.09     .00      .00   856.13     .04     .11     .01   853.60
    1900.     634.    1249.     17.    1912.     624.     27.    128.     39.   853.20
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     .52       .33      2.00       .62      .100      .032      .048      .033    848.50   1200.00
  .000177     780.     1070.      760.         1         0         0       .00   1000.00   2200.00

*SECNO 77.353

3470 ENCROACHMENT STATIONS=     230.0     720.0  TYPE=     1  TARGET=     490.000

          VALLEY SECTION 22   (Q)

    77.35      7.11    856.21       .00       .00    856.25       .04       .12       .00    852.90
    1710.      341.     1310.       59.      943.     695.       99.      174.       56.    853.90
      .66       .36      1.88       .59      .100      .032      .048      .032    849.10    230.00
  .000147     1060.      640.      640.         1         0         0       .00    490.00    720.00

*SECNO 77.499
   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=     290.0     500.0  TYPE=     1  TARGET=     210.000

          VALLEY SECTION 23   (R)

    77.50      9.63    856.33       .00       .00    856.42       .10       .15       .03    853.10
    1710.       89.     1621.        0.      223.     633.        0.      198.       62.    857.70
      .74       .40      2.56       .00      .100      .032      .048      .032    846.70    290.00
  .000241      910.      770.      570.         0         0         0       .00    192.26    482.26

*SECNO 77.566

3470 ENCROACHMENT STATIONS=     562.0     626.0  TYPE=     1  TARGET=      64.000
    77.57      8.00    856.40       .00       .00    856.60       .20       .12       .05100000.00
    1710.        0.     1710.        0.        0.     472.        0.      204.       63. 100000.00
      .77       .00      3.62       .00      .100      .032      .048      .032    848.40    562.00
  .000537      400.      353.      420.         0         0         0       .00     64.00    626.00

*SECNO 77.567

3370 NORMAL BRIDGE,NRD= 12 MIN ELTRD=  861.00 MAX ELLC=  858.80

          BRIDGE SECTION 4 - ANN ARBOR RAILROAD - D/S FACE   (S)

    77.57      7.99    856.39       .00       .00    856.61       .22       .00       .01    858.80
    1710.        0.     1710.        0.        0.     450.        0.      204.       63.    858.80
      .77       .00      3.80       .00      .032      .020      .032      .032    848.40    300.00
  .000245        1.        1.        1.         1         0         0       .00     64.00    364.00

*SECNO 77.569

          BRIDGE SECTION 4 - ANN ARBOR RAILROAD - U/S FACE   (S)
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    77.57      7.89   856.39      .00      .00   856.62      .23      .00      .00   858.80
    1710.        0.    1710.       0.       0.     444.       0.     204.      63.   858.80
      .77       .00     3.85      .00     .032     .020     .032     .032   848.50   300.00
  .000256       16.      16.      16.        0        0        0      .00    64.00   364.00


*SECNO 77.570

3470 ENCROACHMENT STATIONS=      561.0      627.0  TYPE=      1  TARGET=      66.000
    77.57      7.93   856.43      .00      .00   856.63      .20      .00      .01100000.00
    1710.        0.    1710.       0.       0.     480.       0.     204.      63. 100000.00
      .77       .00     3.56      .00     .080     .032     .048     .032   848.50   561.00
  .000523        1.       1.       1.        2        0        0      .00    66.00   627.00


*SECNO 77.602
   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=      554.0      672.0  TYPE=      1  TARGET=     118.000
    77.60      8.25   856.65      .00      .00   856.71      .07      .04      .04   852.20
    1710.       11.    1699.       0.      27.     824.       0.     207.      64. 100000.00
      .80       .42     2.06      .00     .080     .032     .048     .032   848.40   554.00
  .000146      180.     176.     200.        2        0        0      .00   118.00   672.00


*SECNO 77.603

3370 NORMAL BRIDGE,NRD= 44 MIN ELTRD=  860.00 MAX ELLC=  857.90


          BRIDGE SECTION 5 - ABANDONED GRAND TRUNK RAILROAD - D/S FACE   (T)

    77.60      8.24   856.64      .00      .00   856.72      .08      .00      .01   860.30
    1710.        0.    1710.       0.       0.     738.       0.     207.      64.   860.10
      .80       .00     2.32      .00     .032     .020     .032     .032   848.40   300.00
  .000225        1.       1.       1.        0        0        0   -64.57   118.00   418.00


*SECNO 77.605

3370 NORMAL BRIDGE,NRD= 44 MIN ELTRD=  860.00 MAX ELLC=  857.90


          BRIDGE SECTION 5 - ABANDONED GRAND TRUNK RAILROAD - U/S FACE   (T)

    77.61      8.24   856.64      .00      .00   856.72      .08      .00      .00   860.30
    1710.        0.    1710.       0.       0.     737.       0.     207.      64.   860.10
      .80       .00     2.32      .00     .032     .020     .032     .032   848.40   300.00
  .000226       12.      12.      12.        0        0        0   -64.51   118.00   418.00


*SECNO 77.606

3470 ENCROACHMENT STATIONS=      553.0      673.0  TYPE=      1  TARGET=     120.000
    77.61      8.27   856.67      .00      .00   856.73      .06      .00      .01   852.20
```

```
                                                   826.         3.       207.        64.    853.20
      .80        .71      2.04       .18       .048       .032       .080       .032    848.40    553.00
  .000138         1.        1.        1.          2          0          0        .00    120.00    673.00

*SECNO 77.717

3470 ENCROACHMENT STATIONS=          .0       500.0  TYPE=      1  TARGET=       499.999

           VALLEY SECTION 24    (U)

    77.72       7.48    856.78       .00        .00     856.82        .04        .08        .01    853.20
    1710.        15.     1313.      382.        28.       695.       894.       225.        68.    853.20
      .91        .53      1.89       .43       .048       .032       .080       .032    849.30     54.22
  .000138       560.      589.      690.          0          0          0        .00    445.78    500.00


*SECNO 77.899
   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=          .0       275.0  TYPE=      1  TARGET=       274.999

           VALLEY SECTION 25    (V)

    77.90       7.71    856.91       .00        .00     856.98        .07        .15        .01    853.80
    1710.         4.     1535.      171.        12.       710.       330.       252.        75.    853.70
     1.04        .32      2.16       .52       .080       .032       .080       .032    849.20     47.48
  .000185       980.      960.      820.          1          0          0        .00    227.52    275.00


*SECNO 77.999

3470 ENCROACHMENT STATIONS=        60.0       144.0  TYPE=      1  TARGET=        84.000
    78.00       7.21    857.01       .00        .00     857.17        .16        .15        .04100000.00
    1710.         0.     1710.        0.         0.       541.         0.       262.        77. 100000.00
     1.08        .00      3.16       .00       .080       .032       .080       .032    849.80     60.00
  .000449       550.      533.      500.          1          0          0        .00     84.00    144.00


*SECNO 78.000

3370 NORMAL BRIDGE,NRD= 26 MIN ELTRD=  862.60 MAX ELLC=  860.40

           BRIDGE SECTION 6 - M-36 BRIDGE - D/S FACE   (W)

    78.00       7.21    857.01       .00        .00     857.17        .16        .00        .00    863.50
    1710.         0.     1710.        0.         0.       535.         0.       262.        77.    863.50
     1.08        .00      3.20       .00       .024       .020       .024       .032    849.80    225.00
  .000196         1.        1.        1.          0          0          0      -7.02     84.00    309.00


*SECNO 78.005

3370 NORMAL BRIDGE,NRD= 26 MIN ELTRD=  862.60 MAX ELLC=  860.40
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BRIDGE SECTION 6 - N-36 BRIDGE - U/S FACE   (W)

    78.00      7.22    857.02       .00       .00    857.18       .16       .01       .00    863.50
    1710.        0.     1710.        0.        0.     535.        0.      262.       77.    863.50
     1.09       .00      3.20       .00      .024      .020      .024      .032    849.80    225.00
  .000195       26.       26.       26.         0         0         0     -7.07     84.00    309.00

*SECNO 78.006

3470 ENCROACHMENT STATIONS=      235.0      321.0  TYPE=      1  TARGET=      86.000
    78.01      7.23    857.03       .00       .00    857.18       .15       .00      .00100000.00
    1710.        0.     1710.        0.        0.     546.        0.      262.       77. 100000.00
     1.09       .00      3.13       .00      .056      .032      .048      .032    849.80    235.00
  .000452        1.        1.        1.         0         0         0       .00     86.00    321.00

*SECNO 78.045
   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=       75.0      370.0  TYPE=      1  TARGET=     295.000

          VALLEY SECTION 26   (X)

    78.05      7.49    857.19       .00       .00    857.27       .08       .07       .02    855.20
    1710.      137.     1559.       14.      242.      668.       32.      266.       77.    856.20
     1.11       .57      2.33       .45      .056      .032      .048      .032    849.70     75.00
  .000233      210.      209.      210.         2         0         0       .00    292.85    367.85

1490 NH CARD USED
*SECNO 78.283

3470 ENCROACHMENT STATIONS=      620.0     1110.0  TYPE=      1  TARGET=    -620.000

          VALLEY SECTION 27   (Y)

    78.28      7.98    857.48       .00       .00    857.56       .08       .29       .00    855.30
    1710.       29.     1367.      313.       51.     551.      580.      295.       86.    853.70
     1.28       .57      2.48       .54      .048      .032      .079      .032    849.50    620.00
  .000234     1270.     1260.     1120.         2         0         0       .00    352.34    972.34

1490 NH CARD USED
*SECNO 78.522

3470 ENCROACHMENT STATIONS=      890.0     1380.0  TYPE=      1  TARGET=    -890.000

          VALLEY SECTION 28   (Z)

    78.52      7.75    857.75       .00       .00    857.80       .05       .24       .01    853.80
    1710.      400.     1282.       28.      808.      631.       45.      334.       98.    854.00
     1.49       .49      2.03       .62      .069      .032      .056      .032    850.00    890.00
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                                                                  0      .00    454.41   1344.41

*SECNO 78.819

3470 ENCROACHMENT STATIONS=      880.0    1210.0  TYPE=      1  TARGET=     -880.000

          VALLEY SECTION 29   (AA)

     78.82      8.05    858.05       .00       .00    858.16       .11       .33       .03    854.70
     1710.      180.     1529.       1.      286.      552.        2.      372.      110.    857.00
      1.66       .63      2.77       .30      .056      .032      .056      .032    850.00    880.00
   .000323     1270.     1570.     1650.         0         0         0       .00    293.48   1173.48

1490 NH CARD USED
*SECNO 79.018

3470 ENCROACHMENT STATIONS=         .0     350.0  TYPE=      1  TARGET=      349.999

          VALLEY SECTION 30   (AB)

     79.02      7.83    858.33       .00       .00    858.38       .05       .20       .02    855.30
     1710.        8.     1505.      197.       29.      832.      454.      398.      117.    854.40
      1.83       .27      1.81       .43      .080      .032      .080      .032    850.50     60.65
   .000122     1010.     1050.     1050.         2         0         0       .00    289.34    350.00

*SECNO 79.369
    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

          VALLEY SECTION 31   (AC)

     79.37      8.45    858.55       .00       .00    858.59       .05       .22       .00    854.90
     1710.        2.     1556.      152.       11.      860.      436.      452.      130.    854.30
      2.14       .21      1.81       .35      .100      .032      .080      .032    850.10     34.19
   .000113     1950.     1850.     1740.         2         0         0       .00    341.23    375.42

1490 NH CARD USED
*SECNO 79.600

          VALLEY SECTION 32   (AD)

     79.60      8.08    858.68       .00       .00    858.72       .04       .12       .00    854.90
     1710.      103.     1565.       41.      338.      955.      131.      490.      139.    854.60
      2.36       .31      1.64       .32      .080      .032      .080      .032    850.60    113.12
   .000093     1300.     1220.     1100.         0         0         0       .00    353.76    466.88

*SECNO 79.861

3470 ENCROACHMENT STATIONS=       88.0     212.0  TYPE=      1  TARGET=      124.000
     79.86      7.63    858.83       .00       .00    858.90       .07       .17       .01    855.20
     1710.        2.     1708.        0.        7.      829.        0.      526.      147. 100000.00
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     2.55       .28      2.06       .00       .080      .032      .056      .032    851.20     88.00
   .000163    1440.     1384.     1350.         1         0         0       .00    124.00    212.00

*SECNO 79.862

3370.NORMAL BRIDGE,NRD= 15 MIN ELTRD=  863.00 MAX ELLC=  863.10

          BRIDGE SECTION 7 - WINANS LAKE ROAD - D/S FACE   (AE)

          U.S.G.S. GAGING STATION LOCATED AT DOWNSTREAM FACE OF BRIDGE.

    79.86      7.61    858.81       .00       .00    858.93       .12       .00       .03    867.20
    1710.        0.     1710.        0.        0.     610.        0.      526.      147.    865.70
     2.55       .00      2.80       .00      .032      .020      .032      .032    851.20    107.97
   .000207       1.        1.        1.         2         0         0    -35.28    118.02    225.99

*SECNO 79.869

3370 NORMAL BRIDGE,NRD= 15 MIN ELTRD=  863.00 MAX ELLC=  863.10

          BRIDGE SECTION 7 - WINANS LAKE ROAD - U/S FACE   (AE)

          U.S.G.S. GAGING STATION LOCATED AT DOWNSTREAM FACE OF BRIDGE

    79.87      7.61    858.81       .00       .00    858.94       .12       .01       .00    867.20
    1710.        0.     1710.        0.        0.     610.        0.      527.      147.    865.70
     2.55       .00      2.80       .00      .032      .020      .032      .032    851.20    107.95
   .000206      35.       35.       35.         0         0         0    -35.32    118.10    226.05

*SECNO 79.870
    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=      87.0      213.0  TYPE=      1  TARGET=      126.000
    79.87      7.69    858.89       .00       .00    858.95       .06       .00       .02    855.20
    1710.        7.     1703.        0.       11.     842.        0.      527.      147. 100000.00
     2.55       .68      2.02       .00      .040      .034      .040      .032    851.20     87.00
   .000171       1.        1.        1.         2         0         0       .00    126.00    213.00

*SECNO 79.886

3470 ENCROACHMENT STATIONS=        .0      300.0  TYPE=      1  TARGET=      299.999

          VALLEY SECTION 33   (AF)

    79.89      7.32    858.92       .00       .00    858.97       .05       .01       .00    855.60
    1710.       49.     1532.      129.       67.     810.      173.      529.      147.    855.70
     2.56       .74      1.89       .74      .040      .034      .040      .032    851.60     53.14
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 -.0133      30.      89.      90.       1        0        0      .00   246.86   300.00

*SECNO 80.145

3470 ENCROACHMENT STATIONS=      100.0      780.0  TYPE=      1  TARGET=     -100.000

          VALLEY SECTION 34   (AG)

    80.14     6.56   859.16      .00      .00   859.22      .06      .25      .00   855.50
    1700.     203.    1377.     120.     252.     657.     137.     561.     155.   856.10
     2.77      .81     2.10      .88     .048     .034     .048     .032   852.60   152.54
 .000211    1400.    1370.    1260.        2        0        0      .00   283.28   435.82

*SECNO 80.459

3470 ENCROACHMENT STATIONS=      100.0      560.0  TYPE=      1  TARGET=      460.000

          VALLEY SECTION 35   (AH)

    80.46     7.58   859.28      .00      .00   859.28      .00      .05      .02   855.00
    1680.       0.    1680.       0.       0.    3227.       0.     642.     169. 100000.00
     3.65      .00      .52      .00     .040     .034     .040     .032   851.70   100.00
 .000011    1350.    1660.    1800.        2        0        0      .00   460.00   560.00

*SECNO 80.560
3280 CROSS SECTION      80.56 EXTENDED        .49 FEET


3470 ENCROACHMENT STATIONS=      100.0      600.0  TYPE=      1  TARGET=      500.000

          VALLEY SECTION 36   (AI)

    80.56     9.69   859.29      .00      .00   859.29      .00      .01      .00   855.10
    1450.       0.    1450.       0.       0.    3045.       0.     680.     175. 100000.00
     3.96      .00      .48      .00     .040     .034     .080     .032   849.60   100.00
 .000011     520.     530.     570.        2        0        0      .00   500.00   600.00

*SECNO 80.925
   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=      200.0      600.0  TYPE=      1  TARGET=      400.000

          VALLEY SECTION 37   (AJ)

    80.93     9.52   859.32      .00      .00   859.33      .01      .04      .00   855.00
    1450.      40.     862.     548.     144.     793.    1184.     797.     195.   854.30
     4.61      .28     1.09      .46     .080     .032     .056     .032   849.80   200.00
 .000040    1330.    1930.    2160.        1        0        0      .00   400.00   600.00
```

00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: Hamburg

3) WATERCOURSE: Huron River

4) DOCUMENT TYPE: ENCROACHED RUN
WHITEWOOD LAKE TO GALLAGHER LK.

00BREAK00

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*****************************************************
*  WATER SURFACE PROFILES                           *
*  VERSION OF NOVEMBER 1976                         *
*  UPDATED JULY 1979                                *
*                                                   *
*  RUN DATE TUE, JUL 21, 1981, 4:48 PM              *
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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    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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"Whitewood Lake. To Gallagher Lake"

(Encroached Run)

Note: See microfiche

Data Revised

FORM 1411 ½ GB
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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
*****************************************************

C
T1      HAMBURG TOWNSHIP FIS - JOB NO. 6504-03  FILE:  GALMUL
T2      10-YEAR FLOW - WHITEWOOD LAKES TO GALLAGHER LAKE
T3      HURON RIVER - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ     NINV    IDIR    STRT    METRIC  HVINS   Q       WSEL    FQ
     -1.      2.      0.      0.    .000000   .00     .0      0.    854.560   .000

J2  NPROF     IPLOT   PRFVS   XSECV   XSECH   FN      ALLDC   IBW     CHNIN   ITRACE
    1.000     .000   -1.000   .000    .000    .800    .000    .000    .000    .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT
   38.000   40.000   41.000   42.000   43.000   1.000   8.000  10.000  12.000   3.000

   33.000    4.000   25.000    .000     .000     .000    .000    .000    .000    .000

NC     .125     .125     .040     .300     .500     .000     .000     .000     .000     .000
QT    4.000 1500.000 2050.000 2410.000 3115.000     .000     .000     .000     .000     .000

X1   73.747   31.000 2170.000 2317.000     .000     .000     .000     .000     .000     .000
X3     .000     .000     .000 1700.000     .000 2800.000     .000     .000     .000     .000
GR  870.000     .000  860.000  120.000  858.000  210.000  858.000  320.000  860.000  380.000
GR  864.000  490.000  864.400  720.000  866.000  810.000  870.000  890.000  876.000 1040.000
GR  876.000 1190.000  866.000 1370.000  864.000 1470.000  856.000 1570.000  854.000 1630.000
GR  852.100 2170.000  851.200 2173.000  850.200 2187.000  848.300 2206.000  845.200 2223.000
GR  844.600 2240.000  845.200 2255.000  846.300 2275.000  855.200 2300.000  857.100 2315.000
GR  851.900 2317.000  854.000 3010.000  854.000 3160.000  854.000 3630.000  856.000 3670.000
GR  870.000 3730.000     .000     .000     .000     .000     .000     .000     .000     .000

        VALLEY SECTION 11   (D)

X1   73.834     .000     .000     .000  500.000  460.000  460.000     .000     .000     .000
X3     .000     .000     .000 1700.000     .000 2800.000     .000     .000     .000     .000
NC     .125     .125     .040     .000     .000     .000     .000     .000     .000     .000

        VALLEY SECTION 12   (E)

X1   73.999   33.000 1600.000 1910.000  750.000  780.000  870.000     .000     .000     .000
X3     .000     .000     .000 1100.000     .000 2200.000     .000     .000     .000     .000
GR  859.500     .000  858.000   90.000  856.000  160.000  854.000  190.000  854.000  260.000
GR  863.500  370.000  856.000  450.000  855.400  500.000  856.000  530.000  858.000  580.000
GR  858.000  610.000  854.000  640.000  852.800  880.000  852.800 1500.000  852.500 1600.000
GR  851.200 1602.000  849.100 1625.000  840.500 1650.000  834.700 1675.000  826.700 1750.000
```

GR	832.500	1800.000	846.700	1850.000	848.500	1875.000	850.200	1905.000	852.000	1910.000
GR	854.000	2220.000	856.000	2320.000	856.000	2380.000	854.000	2510.000	854.000	2590.000
GR	856.000	2620.000	858.000	2640.000	860.000	2670.000	.000	.000	.000	.000
EJ	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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*PROF 1

CCHV=     .300 CEHV=     .500
*SECNO 73.747

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     CORAR     TOPWID      ENDST

3470 ENCROACHMENT STATIONS=    1700.0    2800.0  TYPE=     1  TARGET=    1100.000
    73.75      9.96    854.56       .00    854.56    854.58       .02       .00       .00    852.10
    1500.      131.     1191.      177.      768.      879.      931.       0.        0.     851.90
      .00       .17      1.36       .19      .100      .032      .100      .000    844.60   1700.00
  .000069       0.        0.        0.         0         0         0       .00   1082.22   2800.00

*SECNO 73.834

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS=    1700.0    2800.0  TYPE=     1  TARGET=    1100.000
          VALLEY SECTION 11   (D)
    73.83      9.99    854.59       .00       .00    854.61       .02       .03       .00    852.10
    1500.      134.     1186.      180.      783.      883.      947.       28.       12.     851.90
      .12       .17      1.34       .19      .100      .032      .100      .032    844.60   1700.00
  .000067      500.      460.      460.         0         0         0       .00   1082.33   2800.00

*SECNO 73.999

3470 ENCROACHMENT STATIONS=    1100.0    2200.0  TYPE=     1  TARGET=    1100.000
          VALLEY SECTION 12   (E)
    74.00     27.92    854.62       .00       .00    854.62       .00       .00       .01    852.50
    1500.      21.     1468.       11.      926.     4927.      489.      114.       32.     852.00
      .93       .02       .30       .02      .100      .032      .100      .032    826.70   1100.00
  .000001      750.      870.      780.         2         0         0       .00   1100.00   2200.00
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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
*****************************************************

T1       HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2       50-YEAR FLOW - WHITEWOOD LAKES TO GALLAGHER LAKE
T3       HURON RIVER - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

     -10.      3.       0.       0.    .000000     .00      .0       0.    855.160    .000

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

     2.000     .000    -1.000    .000     .000     .800     .000     .000     .000     .000

*PROF 2

CCHV=     .300 CEHV=     .500
*SECNO 73.747

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=    1700.0    2800.0  TYPE=     1  TARGET=    1100.000
    73.75    10.56   855.16     .00    855.16   855.19     .03      .00      .00   852.10
    2050.     244.    1499.    308.    1050.    957.    1221.      0.       0.    851.90
      .00     .23     1.57     .25     .100     .032     .100    .000   844.60  1700.00
  .000084      0.       0.      0.       0        0        0     .00  1084.14  2800.00

*SECNO 73.834

3265 DIVIDED FLOW


3470 ENCROACHMENT STATIONS=    1700.0    2800.0  TYPE=     1  TARGET=    1100.000

          VALLEY SECTION 11    (D)

    73.83    10.60   855.20     .00      .00   855.23     .03      .04      .00   852.10
    2050.     248.    1491.    312.    1068.    962.    1240.     35.      12.    851.90
      .11     .23     1.55     .25     .100     .032     .100    .032   844.60  1700.00
  .000082    500.     460.    460.       0        0        0     .00  1084.27  2800.00

*SECNO 73.999
```

3470 ENCROACHMENT STATIONS= 1100.0 2200.0 TYPE= 1 TARGET= 1100.000

VALLEY SECTION 12 (E)

74.00	28.54	855.24	.00	.00	855.24	.00	.00	.01	852.50	
2050.	43.	1984.	22.	1233.	5118.	667.	133.	32.	852.00	
.74	.04	.39	.03	.100	.032	.100	.032	826.70	1100.00	
.000002	750.	870.	780.	2	0	0	.00	1100.00	2200.00	

FORM 1411 ½ GB
PRINTED IN U.S.A.

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*****************************************************
 HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
 ERROR CORR -  01,02,03
 MODIFICATION -  50,51,52,53
*****************************************************

T1      HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2      100-YEAR FLOW - WHITEWOOD LAKES TO GALLAGHER LAKE
T3      HURON RIVER - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

   -10.       4.        0.        0.      .000000     .00       .0        0.      855.440     .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     3.000     .000    -1.000     .000      .000      .800      .000      .000      .000      .000

*PROF 3

CCHV=     .300 CEHV=     .500
*SECNO 73.747

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=     1700.0     2800.0  TYPE=     1  TARGET=     1100.000
     73.75     10.84    855.44      .00    855.44    855.47      .03       .00       .00    852.10
     2410.     319.     1697.     394.     1181.     994.     1356.       0.        0.     851.90
       .00      .27      1.71      .29      .100      .032      .100      .000    844.60   1700.00
   .000097      0.        0.        0.        0         0         0       .00   1086.26   2800.00

*SECNO 73.834

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS=     1700.0     2800.0  TYPE=     1  TARGET=     1100.000

          VALLEY SECTION 11    (D)

     73.83     10.89    855.49      .00       .00    855.52      .03       .04       .00    852.10
     2410.     324.     1687.     399.     1203.     1000.     1379.      39.       12.     851.90
       .10      .27      1.69      .29      .100      .032      .100      .032    844.60   1700.00
   .000094    500.      460.      460.        0         0         0       .00   1086.64   2800.00

*SECNO 73.999
```

See Microfiche

Data Revised

3470 ENCROACHMENT STATIONS= 1100.0 2200.0 TYPE= 1 TARGET= 1100.000

VALLEY SECTION 12 (E)

74.00	28.83	855.53	.00	.00	855.53	.00	.01	.01	852.50	
2410.	59.	2319.	31.	1379.	5208.	752.	142.	32.	852.00	
.65	.04	.45	.04	.100	.032	.100	.032	826.70	1100.00	
.000002	750.	870.	780.	2	0	0	.00	1100.00	2200.00	

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*************************************************
 HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
 ERROR CORR -  01,02,03
 MODIFICATION -  50,51,52,53
*************************************************


T1      HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2      500-YEAR FLOW - WHITEWOOD LAKES TO GALLAGHER LAKE
T3      HURON RIVER - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

    -10.       5.       0.       0.    .000000     .00       0.       0.   856.010   1.000

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLOC    IBW      CHNIM    ITRACE

    15.000     .000   -1.000     .000     .000     .800     .000     .000     .000     .000

*PROF 4

CCHV=    .300 CEHV=    .500
*SECNO 73.747

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=    1700.0    2800.0  TYPE=     1  TARGET=    1100.000
    73.75    11.41   856.01      .00   856.01   856.05      .04      .00      .00   852.10
    3115.     488.    2044.     583.    1449.    1071.    1632.       0.       0.   851.90
      .00      .34     1.91      .36     .100     .032     .100     .000   844.60  1700.00
  .000115       0.       0.       0.        0        0        0      .00  1090.97  2800.00

*SECNO 73.834

3265 DIVIDED FLOW


3470 ENCROACHMENT STATIONS=    1700.0    2800.0  TYPE=     1  TARGET=    1100.000

          VALLEY SECTION 11    (D)

    73.83    11.46   856.06      .00      .00   856.10      .04      .05      .00   852.10
    3115.     494.    2031.     590.    1475.    1079.    1658.      46.      12.   851.90
      .10      .34     1.88      .36     .100     .032     .100     .031   844.60  1700.00
  .000112     500.     460.     460.        0        0        0      .00  1091.43  2800.00

*SECNO 73.999
```

3470 ENCROACHMENT STATIONS= 1100.0 2200.0 TYPE= 1 TARGET= 1100.000

VALLEY SECTION 12 (E)

74.00	29.41	856.11	.00	.00	856.12	.00	.01	.01	852.50	
3115.	99.	2964.	53.	1672.	5390.	922.	160.	32.	852.00	
.54	.06	.55	.06	.100	.032	.100	.032	826.70	1100.00	
.000003	750.	870.	780.	2	0	0	.00	1100.00	2200.00	

FORM 1411 ½ GR
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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

HURON RIVER - PROJECT MA

SUMMARY PRINTOUT

SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	K*CHSL	TOPWID	AREA
73.747	.00	.00	844.60	1500.00	854.56	9.96	.02	.00	854.58	.00	1082.22	2577.83
73.747	.00	.00	844.60	2050.00	855.16	10.56	.03	.00	855.19	.00	1084.14	3227.73
73.747	.00	.00	844.60	2410.00	855.44	10.84	.03	.00	855.47	.00	1086.26	3531.57
73.747	.00	.00	844.60	3115.00	856.01	11.41	.04	.00	856.05	.00	1090.97	4152.08
73.834	.00	.00	844.60	1500.00	854.59	9.99	.02	.00	854.61	.00	1082.33	2613.05
73.834	.00	.00	844.60	2050.00	855.20	10.60	.03	.00	855.23	.00	1084.27	3270.79
73.834	.00	.00	844.60	2410.00	855.49	10.89	.03	.00	855.52	.00	1086.64	3581.45
73.834	.00	.00	844.60	3115.00	856.06	11.46	.04	.00	856.10	.00	1091.43	4211.51
73.999	.00	.00	826.70	1500.00	854.62	27.92	.00	.01	854.62	-20.57	1100.00	6342.48
73.999	.00	.00	826.70	2050.00	855.24	28.54	.00	.01	855.24	-20.57	1100.00	7018.19
73.999	.00	.00	826.70	2410.00	855.53	28.83	.00	.01	855.53	-20.57	1100.00	7339.06
73.999	.00	.00	826.70	3115.00	856.11	29.41	.00	.01	856.12	-20.57	1100.00	7983.43

SUMMARY OF ERRORS

FORM 1411 X GB
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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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00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: Hamburg Twp

3) WATERCOURSE: Huron River

4) DOCUMENT TYPE: ENCROACHED Run
Gallagher Lake to Section 9

00BREAK00

```
*********************************************************
*  WATER SURFACE PROFILES                               *
*  VERSION OF NOVEMBER 1976                             *
*  UPDATED JULY 1979                                    *
*                                                       *
*  RUN DATE TUE, JUL 21, 1981,  4:50 PM                 *
*********************************************************
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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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RECEIVED JUL 27 1981 WATER MANAGEMENT

```
X     X  XXXXXXX   XXXXX              XXXXX
X     X  X         X    X            X    X
X     X  X         X                 X    X
XXXXXXX  XXXX      X        XXXXX    XXXXX
X     X  X         X                 X
X     X  X         X    X            X
X     X  XXXXXXX   XXXXX              XXXXXXX
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"Gallagher Lake to Section G"

(Encroached Run)

FORM 1411 5 68
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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
*****************************************************

C
T1      HAMBURG TOWNSHIP FIS - JOB NO. 6504-03  FILE:  MUL18N
T2      10-YEAR FLOW - GALLAGHER LAKE TO SECTION G
T3      HURON RIVER - NORTHERN ROUTE - PROJECT MANAGER, N.S.CHENG

J1  ICHECK    INQ     NINV    IDIR     STRT    METRIC   HVINS     Q     WSEL     FQ
     -1.       2.      0.      0.   .000000    .00       0       0.   854.620   .000

J2  NPROF    IPLOT    PRFVS   XSECV   XSECH    FN      ALLDC    IBW    CHNIM   ITRACE
    1.000    .000    -1.000   .000    .000    .800    .000    .000    .000    .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    38.000   40.000   41.000   42.000   43.000   1.000    8.000   10.000   12.000   3.000

    33.000    4.000   25.000    .000     .000     .000     .000     .000     .000    .000
NC    .050     .100     .040     .300     .500     .000     .000     .000     .000    .000
QT   4.000  1300.000 1765.000 2050.000 2640.000    .000     .000     .000     .000    .000

          VALLEY SECTION 16   (F)

X1  74.905   19.000  850.000  981.000    .000     .000     .000     .000     .000    .000
X3    .000     .000    .000  840.000    .000  1600.000    .000     .000     .000    .000
GR 862.600     .000  856.000   50.000  856.000  840.000  853.300  850.000  851.600  853.000
GR 846.800  872.000  845.100  884.000  844.500  900.000  844.200  922.000  847.700  945.000
GR 849.100  960.000  849.700  970.000  851.600  980.000  851.900  981.000  854.000 1150.000
GR 856.000 2360.000  859.000 2450.000  860.000 2950.000  870.000 3000.000    .000    .000
NC    .125     .125    .045     .000     .000     .000     .000     .000     .000    .000

          VALLEY SECTION 17   (G)

X1  75.096   19.000  250.000  425.000 1250.000  380.000 1010.000    .000     .000    .000
X3    .000     .000    .000     .000    .000 1650.000    .000     .000     .000    .000
GR 855.300  170.000  853.100  235.000  850.300  237.000  848.700  250.000  842.700  261.000
GR 839.900  289.000  839.900  309.000  843.900  325.000  847.100  342.000  849.000  385.000
GR 852.000  420.000  852.500  425.000  854.000  435.000  856.000 2350.000  856.000 2750.000
GR 858.000 2790.000  860.000 2940.000  862.000 2970.000  870.000 3030.000    .000    .000
EJ    .000     .000    .000     .000     .000     .000     .000     .000     .000    .000
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*PROF 1

CCHV=    .300 CEHV=    .500
*SECNO 74.905
  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       WTH       ELMIN       SSTA
  SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

3470 ENCROACHMENT STATIONS=      840.0     1600.0  TYPE=      1  TARGET=      760.000

          VALLEY SECTION 16   (F)

   74.91     10.42    854.62       .00    854.62    854.64       .02       .00       .00    853.30
   1300.        1.     1240.       60.        3.      984.      399.        0.        0.    851.90
     .00       .20      1.26       .15      .040      .032      .080      .000    844.20    845.11
 .000051        0.        0.        0.         0         0         0       .00    679.99   1525.10

*SECNO 75.096

3470 ENCROACHMENT STATIONS=        .0     1650.0  TYPE=      1  TARGET=     1649.999

          VALLEY SECTION 17   (G)

   75.10     14.77    854.67       .00       .00    854.68       .01       .03       .00    848.70
   1300.       16.     1276.        8.      109.     1570.      226.       34.       10.    852.50
     .35       .15       .81       .04      .100      .036      .100      .037    839.90    188.77
 .000021     1250.     1010.      380.         0         0         0       .00    882.77   1071.54
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FORM 1171 1-63
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*****************************************************
 HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
 ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
*****************************************************

T1      HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2      50-YEAR FLOW - GALLAGHER LAKE TO SECTION G
T3      HURON RIVER - NORTHERN ROUTE - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

    -10.      3.        0.        0.      .000000     .00       .0        0.      855.240     .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     2.000     .000    -1.000     .000      .000      .800      .000      .000      .000      .000

*PROF 2

CCHV=     .300 CEHV=     .500
*SECNO 74.905
   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=     840.0     1600.0  TYPE=     1  TARGET=     760.000

          VALLEY SECTION 16   (F)

    74.91     11.04    855.24      .00    855.24    855.27      .03       .00       .00    853.30
    1765.      2.      1608.     155.       7.     1065.     778.        0.        0.     851.90
      .00      .29      1.51      .20      .040      .032      .080      .000    844.20    842.81
  .000066      0.        0.        0.        0         0         0       .00    757.18   1600.00

*SECNO 75.096

3470 ENCROACHMENT STATIONS=       .0     1650.0  TYPE=     1  TARGET=    1649.999

          VALLEY SECTION 17   (G)

    75.10     15.40    855.30      .00       .00    855.32      .01       .04       .01    848.70
    1765.      27.     1686.     52.       154.     1681.     827.       41.       13.     852.50
      .28      .17      1.00      .06      .100      .036      .100      .037    839.90    170.06
  .000029    1250.     1010.     380.        0         0         0       .00   1479.94   1650.00
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*****************************************************
 HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
 ERROR CORR -  01,02,03
 MODIFICATION -  50,51,52,53
*****************************************************

T1      HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2      100-YEAR FLOW - GALLAGHER LAKE TO SECTION G
T3      HURON RIVER - NORTHERN ROUTE - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

   -10.       4.        0.        0.     .000000      .00       .0        0.     855.530     .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     3.000     .000    -1.000     .000      .000      .800      .000      .000      .000      .000

*PROF 3

CCHV=     .300 CEHV=     .500
*SECNO 74.905
   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=     840.0     1600.0  TYPE=     1  TARGET=     760.000

          VALLEY SECTION 16   (F)

    74.91     11.33    855.53      .00    855.53    855.57      .04      .00      .00    853.30
    2050.      3.      1822.     225.       9.     1103.     957.       0.       0.     851.90
      .00      .34      1.65      .23      .040      .032     .080     .000   844.20    841.74
  .000075      0.        0.        0.        0         0        0      .00   758.26   1600.00

*SECNO 75.096

3470 ENCROACHMENT STATIONS=       .0     1650.0  TYPE=     1  TARGET=    1649.999

          VALLEY SECTION 17   (G)

    75.10     15.70    855.60      .00       .00    855.62     .02      .05      .01    848.70
    2050.      34.     1913.     103.      178.     1733.    1192.      45.      13.     852.50
      .26      .19      1.10      .09      .100      .036     .100     .038   839.90    170.00
  .000034    1250.     1010.     380.        0         0        0      .00  1480.00   1650.00
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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -   01,02,03
  MODIFICATION -  50,51,52,53
*****************************************************

T1       HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2       500-YEAR FLOW - GALLAGHER LAKE TO SECTION G
T3       HURON RIVER - NORTHERN ROUTE - PROJECT MANAGER, M.S.CHENG

J1  ICHECK     INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

   -10.        5.        0.        0.     .000000      .00       .0        0.     856.120     .000

J2  NPROF      IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    15.000     .000     -1.000     .000      .000      .800      .000      .000      .000      .000

*PROF 4

CCHV=     .300 CEHV=     .500
*SECNO 74.905
   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=      840.0     1600.0  TYPE=     1  TARGET=     760.000

         VALLEY SECTION 16   (F)

    74.91     11.92    856.12      .00    856.12    856.17      .05       .00       .00    853.30
    2640.      6.      2230.     404.      15.      1181.     1322.      0.        0.      851.90
      .00      .44      1.89      .31      .040      .032      .080      .000    844.20    840.00
  .000090      0.        0.        0.       0         0         0       .00     760.00   1600.00

*SECNO 75.096

3470 ENCROACHMENT STATIONS=        .0     1650.0  TYPE=     1  TARGET=    1649.999

         VALLEY SECTION 17   (G)

    75.10     16.31    856.21      .00       .00    856.23      .02       .06       .01    848.70
    2640.      51.     2337.     252.      226.     1839.     1930.      53.       13.      852.50
      .23      .23      1.27      .13      .100      .036      .100      .039    839.90    170.00
  .000042    1250.     1010.     380.       0         0         0       .00    1480.00   1650.00
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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  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

HURON RIVER - NORTHERN R

SUMMARY PRINTOUT

SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	DLOSS	EG	K*CHSL	TOPWID	AREA
74.905	.00	.00	844.20	1300.00	854.62	10.42	.02	.00	854.64	.00	679.99	1385.81
74.905	.00	.00	844.20	1765.00	855.24	11.04	.03	.00	855.27	.00	757.18	1849.91
74.905	.00	.00	844.20	2050.00	855.53	11.33	.04	.00	855.57	.00	758.26	2069.65
74.905	.00	.00	844.20	2640.00	856.12	11.92	.05	.00	856.17	.00	760.00	2517.64
75.096	.00	.00	839.90	1300.00	854.67	14.77	.01	.00	854.68	-4.26	882.77	1905.41
75.096	.00	.00	839.90	1765.00	855.30	15.40	.01	.01	855.32	-4.26	1479.94	2661.68
75.096	.00	.00	839.90	2050.00	855.60	15.70	.02	.01	855.62	-4.26	1480.00	3103.08
75.096	.00	.00	839.90	2640.00	856.21	16.31	.02	.01	856.23	-4.26	1480.00	3995.31

SUMMARY OF ERRORS

00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: Hamburg Twp

3) WATERCOURSE: Huron River

4) DOCUMENT TYPE: ENCROACHED Run
GALLAGHER LK to LOON LK

00BREAK00

```
*********************************************
*  WATER SURFACE PROFILES                   *
*  VERSION OF NOVEMBER 1976                 *
*  UPDATED JULY 1979                        *
*                                           *
*  RUN DATE TUE, JUL 21, 1981,  4:52 PM     *
*********************************************
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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     X
XXXXXXX  XXXX     X       XXXXX  XXXXX
X     X  X        X
X     X  X        X     X       X
X     X  XXXXXXX   XXXXX          XXXXXXX
```

"Gallagher Lake to Loon Lake"

(Encroached Run)

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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -   01,02,03
  MODIFICATION -   50,51,52,53
*****************************************************

C
T1       HAMBURG TOWNSHIP FIS - JOB NO.6504-03
T2       10-YEAR FLOW - GALLAGHER LAKE TO LOON LAKE
T3       HURON RIVER - SOUTHERN ROUTE - PROJECT MANAGER, N.S.CHENG

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ
     -1.       2.       0.       0.    .000000     .00      .0       0.    854.620   .000

J2  NPROF    IPLOT    PRFVS    XSECV    XSECH     FN      ALLDC    IBW     CHNIM    ITRACE
     1.000    .000   -1.000    .000     .000     .800     .000     .000     .000     .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    38.000   40.000   41.000   42.000   43.000   1.000    8.000   10.000   12.000    3.000

    33.000    4.000   25.000    .000     .000     .000     .000     .000     .000     .000

NC    .070     .060     .040     .300     .500     .000     .000     .000     .000     .000
QT   4.000  130.000  190.000  250.000  345.000     .000     .000     .000     .000     .000

        VALLEY SECTION 13   (H)

X1    .000   22.000  430.000  563.000     .000     .000     .000     .000     .000     .000
X3    .000     .000    .000  430.000     .000  563.000     .000     .000     .000     .000
GR  859.600    .000  858.000   50.000  854.000  100.000  854.000  360.000  853.600  430.000
GR  851.400  432.000  849.800  445.000  849.100  460.000  848.200  480.000  847.900  495.000
GR  847.300  510.000  847.500  530.000  850.700  562.000  853.500  563.000  854.000  590.000
GR  854.800  700.000  856.000 1000.000  856.100 1130.000  856.200 1480.000  856.000 1750.000
GR  856.000 2230.000  862.600 2330.000    .000     .000     .000     .000     .000     .000

X1  720.000    .000    .000    .000  800.000  600.000  720.000     .000     .000     .000
X3    .000     .000    .000  400.000    .000  610.000     .000     .000     .000     .000
EJ    .000     .000    .000    .000    .000     .000     .000     .000     .000     .000
```

*PROF 1

```
CCHV=    .300 CEHV=    .500
*SECNO .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=     430.0     563.0  TYPE=     1  TARGET=     133.000

          VALLEY SECTION 13   (H)

      .00      7.32    854.62       .00    854.62    854.62       .00       .00       .00    853.60
     130.        0.     130.        0.        0.     781.        0.        0.        0.  100000.00
      .00       .00       .17       .00      .056      .032      .048      .000    847.30    430.00
  .000001        0.        0.        0.         0         0         0       .00    133.00    563.00


*SECNO 720.000

3470 ENCROACHMENT STATIONS=     400.0     610.0  TYPE=     1  TARGET=     210.000
   720.00      7.32    854.62       .00       .00    854.62       .00       .00       .00    853.60
     130.        1.     128.        1.       28.     781.       34.       13.        3.    853.50
     1.23       .03       .16       .03      .056      .032      .048      .032    847.30    400.00
  .000001      800.      720.      600.        0.         0         0       .00    210.00    610.00
```

FORM 141 ½ GB
PRINTED IN U.S.A.

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*************************************************
 HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
 ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
*************************************************

T1       HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2       50-YEAR FLOW - GALLAGHER LAKE TO LOON LAKE
T3       HURON RIVER - SOUTHERN ROUTE - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

    -10.       3.       0.       0.    .000000     .00      .0       0.    855.240   .000

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

     2.000     .000    -1.000    .000     .000     .800     .000     .000     .000     .000

*PROF 2

CCHV=     .300 CEHV=     .500
*SECNO .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=     430.0     563.0  TYPE=     1  TARGET=     133.000
      .00      7.94   855.24     .00    855.24   855.24     .00      .00      .00    853.60
     190.       0.     190.      0.       0.     863.      0.       0.       0.  100000.00
      .00      .00      .22     .00     .056     .032     .048     .000   847.30   430.00
  .000002       0.       0.      0.       0        0        0      .00   133.00   563.00

*SECNO 720.000

3470 ENCROACHMENT STATIONS=     400.0     610.0  TYPE=     1  TARGET=     210.000
   720.00      7.94   855.24     .00      .00    855.24     .00      .00      .00    853.60
     190.       2.     185.      3.       47.     864.     64.      15.       3.     853.50
      .96      .05      .21     .05     .056     .032     .048     .032   847.30   400.00
  .000002     800.     720.    600.       0        0        0      .00   210.00   610.00
```

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*****************************************************
 HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
 ERROR CORR -   01,02,03
 MODIFICATION -   50,51,52,53
*****************************************************

T1      HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2      100-YEAR FLOW - GALLAGHER LAKE TO LOON LAKE
T3      HURON RIVER - SOUTHERN ROUTE - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

   -10.       4.        0.        0.      .000000     .00       .0        0      855.530     .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     3.000     .000    -1.000     .000      .000      .800      .000      .000      .000      .000

*PROF 3

CCHV=     .300 CEHV=     .500
*SECNO .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=     430.0     563.0  TYPE=     1  TARGET=     133.000
      .00      8.23    855.53      .00    855.53    855.53      .00       .00       .00    853.60
     250.        0.      250.       0.        0.     902.       0.        0.        0.  100000.00
      .00       .00       .28      .00      .056      .032     .048      .000    847.30    430.00
  .000003        0.        0.       0.         0         0        0       .00    133.00    563.00

*SECNO 720.000

3470 ENCROACHMENT STATIONS=     400.0     610.0  TYPE=     1  TARGET=     210.000
   720.00      8.23    855.53      .00       .00    855.53      .00       .00       .00    853.60
     250.        3.      241.       5.       55.     902.      77.       16.        3.    853.50
      .77       .06       .27      .07      .056      .032     .048      .032    847.30    400.00
  .000003      800.      720.     600.         0         0        0       .00    210.00    610.00
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*************************************************
 HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
 ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
*************************************************

T1       HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2       500-YEAR FLOW - GALLAGHER LAKE TO LOON LAKE
T3       HURON RIVER - SOUTHERN ROUTE - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

    -10.       5.       0.       0.   .000000     .00       .0       0.    856.120    .000

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

    15.000     .000   -1.000     .000     .000     .800     .000     .000     .000     .000

*PROF 4

CCHV=     .300 CEHV=     .500
*SECNO .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=     430.0     563.0  TYPE=     1  TARGET=     133.000
      .00      8.82    856.12      .00   856.12    856.12      .00       .00       .00    853.60
     345.        0.     345.        0.       0.      980.       0.        0.        0.  100000.00
      .00      .00       .35      .00      .056      .032     .048      .000    847.30    430.00
  .000004        0.        0.       0.        0         0        0       .00    133.00    563.00

*SECNO 720.000

3470 ENCROACHMENT STATIONS=     400.0     610.0  TYPE=     1  TARGET=     210.000
   720.00      8.82    856.12      .00       .00    856.12      .00       .00       .00    853.60
     345.        6.     328.       11.       73.      981.     105.        18.       3.     853.50
      .62      .09       .33      .10      .056      .032     .048      .032    847.30    400.00
  .000004     800.      720.     600.        0         0        0       .00    210.00    610.00
```

```
*****************************************************
  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

HURON RIVER - SOUTHERN R

SUMMARY PRINTOUT

SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	K*CHSL	TOPWID	AREA
.000	.00	.00	847.30	130.00	854.62	7.32	.00	.00	854.62	.00	133.00	780.86
.000	.00	.00	847.30	190.00	855.24	7.94	.00	.00	855.24	.00	133.00	863.32
.000	.00	.00	847.30	250.00	855.53	8.23	.00	.00	855.53	.00	133.00	901.89
.000	.00	.00	847.30	345.00	856.12	8.82	.00	.00	856.12	.00	133.00	980.36
720.000	.00	.00	847.30	130.00	854.62	7.32	.00	.00	854.62	.00	210.00	843.51
720.000	.00	.00	847.30	190.00	855.24	7.94	.00	.00	855.24	.00	210.00	973.82
720.000	.00	.00	847.30	250.00	855.53	8.23	.00	.00	855.53	.00	210.00	1034.86
720.000	.00	.00	847.30	345.00	856.12	8.82	.00	.00	856.12	.00	210.00	1158.97

SUMMARY OF ERRORS

00BREAK00

1) COUNTY: Livingston

2) STUDY NAME: Hamburg Twp

3) WATERCOURSE: Huron River

4) DOCUMENT TYPE: Natural Floodway
Gallagher Lk to Loon Lake

00BREAK00

```
*********************************************
* WATER SURFACE PROFILES                    *
* VERSION OF NOVEMBER 1976                  *
* UPDATED JULY 1979                         *
*                                           *
* RUN DATE TUE, JUL 21, 1981,  4:35 PM      *
*********************************************
```

```
*********************************
* 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  XXXXXXX   XXXXX            XXXXXXX
```

Gallagher Lake to Loon Lake
(Natural Floodway)

RECEIVED
JUL 27 1981
WATER MANAGEMENT

FORM 1411 5-68
PRINTED IN U.S.A.

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*****************************************
 HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
 ERROR CORR -  01,02,03
 MODIFICATION -  50,51,52,53
*****************************************

C
T1      HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2      100-YEAR NATURAL FLOODWAY - GALLAGHER LAKE TO LOON LAKE
T3      HURON RIVER - SOUTHERN ROUTE - PROJECT MANAGER, N.S.CHENG

J1  ICHECK    INQ     NINV    IDIR    STRT    METRIC  HVINS   Q       WSEL    FQ
      -1.      2.      0.      0.   .000000    .00     .0      0.    855.420   .000

J2  NPROF   IPLOT   PRFVS   XSECV   XSECH   FN      ALLDC   IBW     CHNIM   ITRACE
     1.000    .000   -1.000    .000    .000    .800    .000    .000    .000    .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    38.000  40.000  41.000  42.000  43.000   1.000   8.000  10.000  12.000   3.000

    33.000   4.000  25.000    .000    .000    .000    .000    .000    .000    .000

NC     .070    .060    .040    .300    .500    .000    .000    .000    .000    .000
QT    1.000 250.000    .000    .000    .000    .000    .000    .000    .000    .000

        VALLEY SECTION 13   (H)

X1     .000   22.000  430.000  563.000    .000    .000    .000    .000    .000    .000
X3     .000    .000    .000  190.000    .000  660.000    .000    .000    .000    .000
GR   859.600    .000  858.000   50.000  854.000  100.000  854.000  360.000  853.600  430.000
GR   851.400  432.000  849.800  445.000  849.100  460.000  848.200  480.000  847.900  495.000
GR   847.300  510.000  847.500  530.000  850.700  562.000  853.500  563.000  854.000  590.000
GR   854.800  700.000  856.000 1000.000  856.100 1130.000  856.200 1480.000  856.000 1750.000
GR   856.000 2230.000  862.600 2330.000    .000    .000    .000    .000    .000    .000

X1   720.000    .000    .000    .000  800.000  600.000  720.000    .000    .000    .000
X3     .000    .000    .000  260.000    .000  660.000    .000    .000    .000    .000
EJ     .000    .000    .000    .000    .000    .000    .000    .000    .000    .000
```

```
*PROF 1 1
CCHV=     .300 CEHV=     .500
*SECNO .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=      190.0      660.0  TYPE=      1  TARGET=      470.000

          VALLEY SECTION 13    (H)

      .00      8.12    855.42       .00    855.42    855.42       .00       .00       .00    853.60
     250.       19.      224.        7.      355.      887.      127.        0.        0.    853.50
      .00       .05       .25       .06      .056      .032      .048      .000    847.30    190.00
  .000002        0.        0.        0.         0         0         0       .00    470.00    660.00

*SECNO 720.000

3470 ENCROACHMENT STATIONS=      260.0      660.0  TYPE=      1  TARGET=      400.000
   720.00      8.12    855.42       .00       .00    855.42       .00       .00       .00    853.60
     250.       14.      228.        8.      256.      887.      127.       22.        7.    853.50
      .84       .06       .26       .06      .056      .032      .048      .032    847.30    260.00
  .000003      800.      720.      600.         0         0         0       .00    400.00    660.00
```

FORM 1411 5 68

PRINTED IN U.S.A.

00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: Hamburg

3) WATERCOURSE: Huron River

4) DOCUMENT TYPE: Encroached Run
Strawberry Lk to
Corporate Limit

00BREAK00

```
*****************************************************************
*  WATER SURFACE PROFILES                                       *
*  VERSION OF NOVEMBER 1976                                     *
*  UPDATED JULY 1979                                            *
*                                                               *
*  RUN DATE TUE, JUL 21, 1981,  5:03 PM                         *
*****************************************************************
```

```
*****************************************************************
*  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     X
XXXXXXX  XXXX      X         XXXXX    XXXXX
X     X  X         X
X     X  X         X     X           X
X     X  XXXXXXX   XXXXX              XXXXXXX
```

"Strawberry Lake to Corporate Limit"

(Encroached Run)

```
**********************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -   01,02,03
  MODIFICATION -  50,51,52,53
**********************************************

C
T1       HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2       10-YEAR FLOW - STRAWBERRY LAKE TO CORPORATE LIMITS
T3       HURON RIVER - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

     -1.       2.       0.       0.   .000000     .00      .0       0.    855.130   .000

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

     1.000     .000    -1.000    .000     .000     .800     .000     .000     .000     .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    38.000   40.000   41.000   42.000   43.000    1.000    8.000   10.000   12.000    3.000

    33.000    4.000   25.000    .000     .000     .000     .000     .000     .000     .000

NC     .060     .125     .040     .300     .500     .000     .000     .000     .000     .000
QT    4.000 1350.000 1900.000 2200.000 2850.000     .000     .000     .000     .000     .000

          VALLEY SECTION 20    (O)

X1   76.798   26.000  825.000  914.000     .000     .000     .000     .000     .000     .000
X3     .000     .000     .000  625.000     .000 1145.000     .000     .000     .000     .000
GR  870.000     .000  860.000   15.000  858.000   25.000  856.000  255.000  855.200  385.000
GR  854.500  730.000  853.300  825.000  849.800  828.000  845.600  845.000  845.500  860.000
GR  846.500  875.000  848.100  890.000  849.800  900.000  851.300  910.000  852.200  914.000
GR  853.800 1845.000  854.000 2095.000  855.600 2425.000  856.000 2805.000  857.300 2895.000
GR  856.000 2945.000  856.000 3505.000  856.300 3595.000  856.000 3725.000  856.000 3965.000
GR  868.000 4045.000     .000     .000     .000     .000     .000     .000     .000     .000
NC     .125     .100     .040     .000     .000     .000     .000     .000     .000     .000

          VALLEY SECTION 21    (P)

X1   77.030   23.000  770.000  876.000 1420.000 1180.000 1220.000     .000     .000     .000
X3     .000     .000     .000  300.000     .000 1200.000     .000     .000     .000     .000
GR  880.000     .000  860.000   50.000  854.000   70.000  852.600  770.000  850.300  773.000
GR  848.700  790.000  848.100  805.000  847.500  813.000  847.800  825.000  848.500  835.000
GR  849.100  843.000  850.100  853.000  850.800  865.000  851.800  875.000  852.200  876.000
GR  854.000 1530.000  856.000 1570.000  857.500 2640.000  856.000 3150.000  856.000 4010.000
GR  858.000 4020.000  860.000 4040.000  866.000 4080.000     .000     .000     .000     .000
NC     .125     .060     .040     .000     .000     .000     .000     .000     .000     .000

X1   77.232   27.000 2080.000 2186.000  780.000  760.000 1070.000     .000     .000     .000
```

X3	.000	.000	.000	1200.000	.000	2200.000	.000	.000	.000	.000
GR	880.000	.000	864.000	60.000	860.000	80.000	858.000	110.000	854.000	150.000
GR	854.000	1650.000	853.700	2000.000	853.600	2080.000	851.300	2083.000	849.700	2100.000
GR	849.100	2115.000	848.500	2123.000	848.800	2135.000	849.500	2145.000	850.100	2153.000
GR	851.100	2163.000	851.800	2175.000	852.800	2185.000	853.200	2186.000	854.000	2190.000
GR	856.000	2220.000	857.300	2380.000	857.700	2560.000	857.800	3000.000	858.000	3300.000
GR	860.000	3340.000	870.000	3390.000	.000	.000	.000	.000	.000	.000
QT	4.000	1200.000	1710.000	1950.000	2550.000	.000	.000	.000	.000	.000

VALLEY SECTION 22 (Q)

X1	77.353	22.000	560.000	672.000	1060.000	640.000	640.000	.000	.000	.000
X3	.000	.000	.000	230.000	.000	720.000	.000	.000	.000	.000
GR	870.000	.000	860.000	60.000	860.000	110.000	854.000	150.000	852.900	560.000
GR	852.000	562.000	849.100	582.000	849.100	592.000	849.200	601.000	849.400	610.000
GR	849.900	627.000	849.900	642.000	850.000	656.000	851.300	670.000	853.900	672.000
GR	854.000	680.000	855.700	870.000	856.000	1210.000	857.300	1600.000	858.000	1960.000
GR	860.000	1980.000	870.000	2020.000	.000	.000	.000	.000	.000	.000
NC	.125	.060	.040	.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 23 (R)

X1	77.499	20.000	390.000	485.000	910.000	570.000	770.000	.000	.000	.000
X3	.000	.000	.000	290.000	.000	500.000	.000	.000	.000	.000
GR	860.000	.000	860.000	210.000	856.000	220.000	854.000	350.000	853.100	390.000
GR	851.900	395.000	850.100	410.000	846.900	420.000	847.100	432.000	846.700	443.000
GR	848.700	455.000	850.700	470.000	852.700	475.000	857.700	485.000	870.000	500.000
GR	870.000	560.000	860.000	680.000	858.000	720.000	858.000	980.000	870.000	1050.000
X1	77.566	22.000	560.000	672.000	400.000	420.000	353.000	.000	.000	.000
X3	.000	.000	.000	562.000	.000	626.000	.000	.000	.000	.000
GR	869.300	.000	859.300	60.000	859.300	110.000	853.300	150.000	852.200	560.000
GR	851.300	562.000	848.400	582.000	848.400	592.000	848.500	601.000	848.700	610.000
GR	849.200	627.000	849.200	642.000	849.300	656.000	850.600	670.000	853.200	672.000
GR	853.300	680.000	855.000	870.000	855.300	1210.000	856.600	1600.000	857.300	1960.000
GR	859.300	1980.000	869.300	2020.000	.000	.000	.000	.000	.000	.000
NC	.040	.040	.025	.000	.000	.000	.000	.000	.000	.000

BRIDGE SECTION 4 - ANN ARBOR RAILROAD - D/S FACE (S)

X1	77.567	22.000	300.000	364.000	1.000	1.000	1.000	.000	.000	.000
BT	12.000	.000	861.000	.000	100.000	861.000	.000	200.000	861.900	.000
BT	296.900	861.900	.000	297.000	865.200	.000	300.000	865.200	858.800	364.000
BT	865.200	858.800	367.000	865.200	.000	367.100	862.100	.000	400.000	862.100
BT	.000	500.000	862.100	.000	600.000	862.200	.000	.000	.000	.000
GR	861.000	.000	861.000	100.000	861.900	200.000	861.900	296.900	858.800	296.900
GR	858.800	300.000	853.100	300.000	853.100	301.300	849.200	301.500	848.800	310.000
GR	848.800	320.000	848.400	330.000	849.200	340.000	849.600	350.000	850.900	362.500
GR	852.700	362.700	852.700	364.000	858.800	364.000	862.100	367.100	862.100	400.000
GR	862.100	500.000	862.200	600.000	.000	.000	.000	.000	.000	.000

BRIDGE SECTION 4 - ANN ARBOR RAILROAD - U/S FACE (S)

X1	77.569	22.000	300.000	364.000	16.000	16.000	16.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000

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GR	861.000	.000	861.000	100.000	861.900	200.000	861.900	296.900	858.800	296.900
GR	858.800	300.000	853.200	300.000	853.200	301.300	849.300	301.500	848.900	310.000
GR	848.900	320.000	848.500	330.000	849.300	340.000	849.700	350.000	851.000	362.500
GR	852.800	362.700	852.800	364.000	858.800	364.000	862.100	367.100	862.100	400.000
GR	862.100	500.000	862.200	600.000	.000	.000	.000	.000	.000	.000
NC	.100	.060	.040	.000	.000	.000	.000	.000	.000	.000
X1	77.570	22.000	560.000	672.000	1.000	1.000	1.000	.000	.000	.000
X3	.000	.000	.000	561.000	.000	627.000	.000	.000	.000	.000
GR	869.400	.000	859.400	60.000	859.400	110.000	853.400	150.000	852.300	560.000
GR	851.400	562.000	848.500	582.000	848.500	592.000	848.600	601.000	848.800	610.000
GR	849.300	627.000	849.300	642.000	849.400	656.000	850.700	670.000	853.300	672.000
GR	853.400	680.000	855.100	870.000	855.400	1210.000	856.700	1600.000	857.400	1960.000
GR	859.400	1980.000	869.400	2020.000	.000	.000	.000	.000	.000	.000
X1	77.602	22.000	560.000	672.000	180.000	200.000	176.000	.000	.000	.000
X3	.000	.000	.000	554.000	.000	672.000	.000	.000	.000	.000
GR	869.300	.000	859.300	60.000	859.300	110.000	853.300	150.000	852.200	560.000
GR	851.300	562.000	848.400	582.000	848.400	592.000	848.500	601.000	848.700	610.000
GR	849.200	627.000	849.200	642.000	849.300	656.000	850.600	670.000	853.200	672.000
GR	853.300	680.000	855.000	870.000	855.300	1210.000	856.600	1600.000	857.300	1960.000
GR	859.300	1980.000	869.300	2020.000	.000	.000	.000	.000	.000	.000
NC	.040	.040	.025	.000	.000	.000	.000	.000	.000	.000

BRIDGE SECTION 5 - ABANDONED GRAND TRUNK RAILROAD - D/S FACE (T)

X1	77.603	29.000	300.000	418.000	1.000	1.000	1.000	.000	.000	.000
BT	44.000	.000	860.600	.000	100.000	860.600	.000	200.000	860.500	.000
BT	300.000	860.300	857.900	313.000	860.300	857.900	313.000	860.300	851.100	314.000
BT	860.300	850.600	314.000	860.300	857.900	323.000	860.300	857.900	323.000	860.300
BT	849.800	324.000	860.300	850.200	324.000	860.300	857.900	335.000	860.300	857.900
BT	335.000	860.300	850.000	336.000	860.300	850.000	336.000	860.300	857.900	347.000
BT	860.200	857.800	347.000	860.200	850.100	348.000	860.200	849.800	348.000	860.200
BT	857.800	359.000	860.200	857.800	359.000	860.200	849.500	360.000	860.200	849.000
BT	360.000	860.200	857.800	371.000	860.200	857.800	371.000	860.200	848.700	372.000
BT	860.200	848.800	372.000	860.200	857.800	382.000	860.200	857.800	382.000	860.200
BT	848.800	383.000	860.200	848.800	383.000	860.200	857.800	394.000	860.100	857.700
BT	394.000	860.100	848.800	395.000	860.100	849.000	395.000	860.100	857.700	406.000
BT	860.100	857.700	406.000	860.100	848.400	407.000	860.100	849.100	407.000	860.100
BT	857.700	418.000	860.100	857.700	500.000	860.000	.000	600.000	860.000	.000
BT	700.000	860.000	.000	.000	.000	.000	.000	.000	.000	.000
GR	860.600	.000	860.600	100.000	860.500	200.000	860.300	300.000	852.500	300.000
GR	851.100	313.000	850.600	314.000	849.800	323.000	850.200	324.000	850.000	335.000
GR	850.000	336.000	850.100	347.000	849.800	348.000	849.500	359.000	849.000	360.000
GR	848.700	371.000	848.800	372.000	848.800	382.000	848.800	383.000	848.800	394.000
GR	849.000	395.000	848.400	406.000	849.100	407.000	852.900	416.000	853.600	418.000
GR	860.100	418.000	860.000	500.000	860.000	600.000	860.000	700.000	.000	.000

BRIDGE SECTION 5 - ABANDONED GRAND TRUNK RAILROAD - U/S FACE (T)

X1	77.605	.000	.000	.000	12.000	12.000	12.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.060	.100	.040	.000	.000	.000	.000	.000	.000	.000
X1	77.606	22.000	560.000	672.000	1.000	1.000	1.000	.000	.000	.000

X3	.000	.000	.000	553.000	.000	673.000	.000	.000	.000	.000
GR	869.300	.000	859.300	60.000	859.300	110.000	853.300	150.000	852.200	560.000
GR	851.300	562.000	848.400	582.000	848.400	592.000	848.500	601.000	848.700	610.000
GR	849.200	627.000	849.200	642.000	849.300	656.000	850.600	670.000	853.200	672.000
GR	853.300	680.000	855.000	870.000	855.300	1210.000	856.600	1600.000	857.300	1960.000
GR	859.300	1980.000	869.300	2020.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 24 (U)

X1	77.717	19.000	70.000	176.000	560.000	690.000	589.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	500.000	.000	.000	.000	.000
GR	870.000	.000	860.000	40.000	853.200	70.000	850.200	80.000	850.200	92.000
GR	850.200	107.000	850.200	118.000	850.200	130.000	850.200	140.000	849.300	153.000
GR	849.500	170.000	853.200	176.000	856.000	730.000	858.000	1100.000	860.000	1120.000
GR	860.000	1230.000	860.000	1500.000	866.000	1580.000	870.000	1660.000	.000	.000
NC	.100	.100	.040	.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 25 (V)

X1	77.899	15.000	55.000	166.000	980.000	820.000	960.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	275.000	.000	.000	.000	.000
GR	880.000	.000	860.000	40.000	853.800	55.000	852.000	60.000	849.400	80.000
GR	849.200	95.000	849.200	110.000	850.000	125.000	851.000	140.000	852.600	164.000
GR	853.700	166.000	856.000	845.000	862.000	925.000	864.000	1055.000	866.000	1185.000

X1	77.999	.000	.000	.000	550.000	500.000	533.000	.000	.600	.000
X3	.000	.000	.000	60.000	.000	144.000	.000	.000	.000	.000
NC	.030	.030	.025	.000	.000	.000	.000	.000	.000	.000

BRIDGE SECTION 6 - M-36 BRIDGE - D/S FACE (W)

X1	78.000	29.000	225.000	309.000	1.000	1.000	1.000	.000	.000	.000
BT	26.000	.000	868.300	.000	25.000	866.800	.000	125.000	863.500	.000
BT	222.000	863.500	.000	222.000	867.300	.000	225.000	867.300	855.300	233.000
BT	868.100	858.600	237.000	869.100	860.400	252.000	872.900	860.400	267.000	874.200
BT	860.400	282.000	872.800	860.400	297.000	868.900	860.400	301.000	867.500	858.600
BT	309.000	867.200	855.300	312.000	867.200	.000	312.000	863.500	.000	425.000
BT	863.000	.000	525.000	863.200	.000	625.000	863.200	.000	725.000	862.800
BT	.000	825.000	862.600	.000	925.000	863.500	.000	1025.000	864.200	.000
BT	1125.000	864.900	.000	1225.000	866.100	.000	1325.000	867.400	.000	.000
GR	868.300	.000	866.800	25.000	863.500	125.000	863.500	222.000	863.500	225.000
GR	852.200	225.000	851.200	233.000	850.800	237.000	850.000	244.000	849.800	252.000
GR	849.800	257.000	850.100	267.000	849.800	280.000	850.000	282.000	851.000	295.000
GR	851.200	297.000	852.400	309.000	863.500	309.000	863.500	312.000	863.000	425.000
GR	863.200	525.000	863.200	625.000	862.800	725.000	862.600	825.000	863.500	925.000
GR	864.200	1025.000	864.900	1125.000	866.100	1225.000	867.400	1325.000	.000	.000

BRIDGE SECTION 6 - M-36 BRIDGE - U/S FACE (W)

X1	78.005	.000	.000	.000	26.000	26.000	26.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.070	.060	.040	.000	.000	.000	.000	.000	.000	.000

X1	78.006	24.000	220.000	330.000	1.000	1.000	1.000	.000	.000	.000

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X3	.000	.000	.000	235.000	.000	321.000	.000	.000	.000	.000
GR	870.100	.000	860.100	10.000	856.100	40.000	855.300	220.000	851.900	230.000
GR	851.600	245.000	850.300	265.000	850.300	280.000	849.800	295.000	850.300	305.000
GR	851.400	318.000	852.500	325.000	856.300	330.000	856.100	350.000	858.100	380.000
GR	859.100	480.000	858.100	610.000	856.100	640.000	855.100	770.000	856.100	880.000
GR	864.100	950.000	866.100	1090.000	868.100	1130.000	870.100	1170.000	.000	.000

VALLEY SECTION 26 (X)

X1	78.045	24.000	220.000	330.000	210.000	210.000	209.000	.000	.000	.000
X3	.000	.000	.000	75.000	.000	370.000	.000	.000	.000	.000
GR	870.000	.000	860.000	10.000	856.000	40.000	855.200	220.000	851.800	230.000
GR	851.500	245.000	850.200	265.000	850.200	280.000	849.700	295.000	850.200	305.000
GR	851.300	318.000	852.400	325.000	856.200	330.000	856.000	350.000	858.000	380.000
GR	859.000	480.000	858.000	610.000	856.000	640.000	855.000	770.000	856.000	880.000
GR	864.000	950.000	866.000	1090.000	868.000	1130.000	870.000	1170.000	.000	.000
NH	4.000	.060	660.000	.040	743.000	.100	960.000	.050	1110.000	.000

VALLEY SECTION 27 (Y)

X1	78.283	24.000	660.000	743.000	1270.000	1120.000	1260.000	.000	.000	.000
X3	.000	.000	.000	620.000	.000	.000	.000	.000	.000	.000
GR	870.000	.000	868.000	90.000	864.000	130.000	862.000	250.000	860.500	300.000
GR	862.000	370.000	863.000	450.000	862.000	480.000	860.000	510.000	858.000	570.000
GR	856.000	650.000	855.300	660.000	852.400	665.000	850.200	683.000	849.500	694.000
GR	849.600	708.000	850.400	720.000	851.500	735.000	852.900	740.000	853.700	743.000
GR	856.000	960.000	862.000	1010.000	864.000	1040.000	870.000	1110.000	.000	.000
NH	4.000	.050	1010.000	.100	1230.000	.040	1325.000	.070	1380.000	.000

VALLEY SECTION 28 (Z)

	Sec No	# Sta	Sta Left OB	Sta ROB	Length LOB					
X1	78.522	23.000	1230.000	1325.000	1260.000	1240.000	1260.000	.000	.000	.000
X3	[illegible].000	[illegible].000	.000	890.000	.000	.000	.000	.000	.000	.000
GR	870.000	.000	868.000	70.000	866.000	260.000	864.000	370.000	862.000	410.000
GR	860.000	440.000	860.000	510.000	858.000	580.000	856.000	1010.000	853.800	1230.000
GR	852.500	1235.000	851.200	1250.000	850.900	1260.000	850.500	1271.000	850.000	1280.000
GR	850.200	1296.000	850.500	1310.000	852.500	1317.000	853.500	1323.000	854.000	1325.000
GR	856.000	1340.000	860.000	1350.000	870.000	1380.000	.000	.000	.000	.000
NC	.070	.070	.040	.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 29 (AA)

X1	78.819	22.000	1080.000	1170.000	1270.000	1650.000	1570.000	.000	.000	.000
X3	.000	.000	.000	880.000	.000	.000	.000	.000	.000	.000
GR	870.000	.000	868.000	80.000	866.000	290.000	864.000	380.000	862.000	450.000
GR	860.000	510.000	858.000	645.000	856.000	655.000	856.000	740.000	857.600	870.000
GR	856.000	1060.000	854.700	1080.000	853.500	1090.000	853.000	1095.000	851.000	1101.000
GR	850.000	1116.000	850.300	1130.000	850.600	1140.000	852.100	1155.000	857.000	1170.000
GR	860.000	1180.000	870.000	1210.000	.000	.000	.000	.000	.000	.000
NH	4.000	.040	50.000	.100	80.000	.040	205.000	.100	1160.000	.000

VALLEY SECTION 30 (AB)

X1	79.018	22.000	80.000	205.000	1010.000	1050.000	1050.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	350.000	.000	.000	.000	.000

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GR	850.500	110.000	850.800	130.000	851.200	140.000	851.400	150.000	851.600	160.000
GR	851.700	170.000	851.400	180.000	851.500	185.000	853.200	200.000	854.400	205.000
GR	858.000	530.000	860.000	620.000	862.000	770.000	864.000	820.000	866.000	890.000
GR	868.000	1040.000	870.000	1160.000	.000	.000	.000	.000	.000	.000
NC	.125	.100	.040	.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 31 (AC)

X1	79.369	19.000	40.000	162.000	1950.000	1740.000	1850.000	.000	.000	.000
GR	880.000	.000	854.900	40.000	854.100	45.000	853.400	50.000	850.700	70.000
GR	850.100	90.000	850.100	106.000	851.100	120.000	851.400	134.000	851.900	150.000
GR	854.100	160.000	854.300	162.000	858.000	340.000	860.000	470.000	862.000	660.000
GR	864.000	820.000	866.000	910.000	868.000	1000.000	870.000	1110.000	.000	.000
NH	4.000	.100	270.000	.040	406.000	.100	530.000	.060	610.000	.000

VALLEY SECTION 32 (AD)

X1	79.600	22.000	270.000	406.000	1300.000	1100.000	1220.000	.000	.000	.000
GR	870.000	.000	860.000	100.000	858.000	120.000	854.900	270.000	854.200	274.000
GR	852.700	288.000	850.600	305.000	850.600	315.000	850.600	325.000	851.200	338.000
GR	851.400	348.000	851.200	360.000	851.200	370.000	851.200	380.000	851.800	395.000
GR	852.700	400.000	854.600	406.000	858.000	460.000	860.000	480.000	862.000	490.000
GR	868.000	530.000	870.000	610.000	.000	.000	.000	.000	.000	.000
NC	.100	.070	.040	.000	.000	.000	.000	.000	.000	.000

X1	79.861	18.000	90.000	216.000	1440.000	1350.000	1384.000	.000	.000	.000
X3	.000	.000	.000	88.000	.000	212.000	.000	.000	.000	.000
GR	869.600	.000	859.600	45.000	857.600	60.000	855.200	90.000	853.600	100.000
GR	851.700	117.000	851.500	135.000	851.300	147.000	851.200	157.000	851.200	175.000
GR	852.000	190.000	852.700	205.000	853.200	214.000	855.300	216.000	857.600	300.000
GR	859.600	330.000	861.600	360.000	869.600	480.000	.000	.000	.000	.000
NC	.040	.040	.025	.000	.000	.000	.000	.000	.000	.000

BRIDGE SECTION 7 - WINANS LAKE ROAD - D/S FACE (AE)

U.S.G.S. GAGING STATION LOCATED AT DOWNSTREAM FACE OF BRIDGE.

X1	79.862	20.000	100.000	230.000	1.000	1.000	1.000	.000	.000	.000
BT	15.000	.000	867.600	.000	100.000	867.200	863.100	141.000	866.700	862.400
BT	141.000	866.700	852.000	143.500	866.700	851.700	143.500	866.700	862.400	186.000
BT	866.200	861.500	186.000	866.200	851.600	188.500	866.200	851.700	188.500	866.200
BT	861.500	230.000	865.700	861.700	300.000	863.000	.000	400.000	863.300	.000
BT	500.000	865.600	.000	600.000	869.200	.000	.000	.000	.000	.000
GR	867.600	.000	867.200	100.000	861.000	100.000	854.400	124.000	852.000	141.000
GR	851.700	143.500	851.200	154.000	851.200	164.000	851.700	174.000	851.600	186.000
GR	851.700	188.500	852.100	201.000	854.400	212.000	857.700	217.000	859.300	230.000
GR	865.700	230.000	863.000	300.000	863.300	400.000	865.600	500.000	869.200	600.000

BRIDGE SECTION 7 - WINANS LAKE ROAD - U/S FACE (AE)

U.S.G.S. GAGING STATION LOCATED AT DOWNSTREAM FACE OF BRIDGE

X1	79.869	.000	.000	.000	35.000	35.000	35.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000

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NC	.050	.050	.042	.000	.000	.000	.000	.000	.000	.000
X1	79.870	18.000	90.000	216.000	1.000	1.000	1.000	.000	.000	.000
X3	.000	.000	.000	87.000	.000	213.000	.000	.000	.000	.000
GR	869.600	.000	859.600	45.000	857.600	60.000	855.200	90.000	853.600	100.000
GR	851.700	117.000	851.500	135.000	851.300	147.000	851.200	157.000	851.200	175.000
GR	852.000	190.000	852.700	205.000	853.200	214.000	855.300	216.000	857.600	300.000
GR	859.600	330.000	861.600	360.000	869.600	480.000	.000	.000	.000	.000

VALLEY SECTION 33 (AF)

X1	79.886	18.000	90.000	216.000	90.000	90.000	89.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	300.000	.000	.000	.000	.000
GR	870.000	.000	860.000	45.000	858.000	60.000	855.600	90.000	854.000	100.000
GR	852.100	117.000	851.900	135.000	851.700	147.000	851.600	157.000	851.600	175.000
GR	852.400	190.000	853.100	205.000	853.600	214.000	855.700	216.000	858.000	300.000
GR	860.000	330.000	862.000	360.000	870.000	480.000	.000	.000	.000	.000
NC	.060	.060	.042	.000	.000	.000	.000	.000	.000	.000
QT	4.000	1190.000	1700.000	1930.000	2510.000	.000	.000	.000	.000	.000

VALLEY SECTION 34 (AG)

X1	80.145	22.000	270.000	381.000	1400.000	1260.000	1370.000	.000	.000	.000
X3	.000	.000	.000	100.000	.000	.000	.000	.000	.000	.000
GR	870.000	.000	864.000	90.000	860.000	140.000	858.000	170.000	856.000	250.000
GR	855.500	270.000	853.600	280.000	853.100	290.000	852.700	300.000	852.700	310.000
GR	852.600	330.000	852.900	350.000	853.100	360.000	853.800	370.000	854.400	374.000
GR	856.100	381.000	856.000	410.000	858.000	430.000	860.000	440.000	866.000	470.000
GR	868.000	640.000	870.000	780.000	.000	.000	.000	.000	.000	.000
NC	.050	.050	.042	.000	.000	.000	.000	.000	.000	.000
QT	4.000	1180.000	1680.000	1905.000	2465.000	.000	.000	.000	.000	.000

VALLEY SECTION 35 (AH)

X1	80.459	17.000	100.000	560.000	1350.000	1800.000	1660.000	.000	.000	.000
X3	.000	.000	.000	100.000	.000	560.000	.000	.000	.000	.000
GR	870.000	.000	860.000	50.000	856.000	70.000	855.000	100.000	852.300	110.000
GR	851.700	190.000	852.700	310.000	852.400	380.000	851.700	450.000	852.000	505.000
GR	853.300	553.000	854.200	557.000	855.700	560.000	856.000	570.000	860.000	580.000
GR	862.000	810.000	870.000	840.000	.000	.000	.000	.000	.000	.000
NC	.050	.100	.042	.000	.000	.000	.000	.000	.000	.000
QT	4.000	1020.000	1450.000	1680.000	2140.000	.000	.000	.000	.000	.000

VALLEY SECTION 36 (AI)

X1	80.560	19.000	100.000	600.000	520.000	570.000	530.000	.000	.000	.000
X3	.000	.000	.000	100.000	.000	600.000	.000	.000	.000	.000
GR	870.000	.000	860.000	50.000	856.000	90.000	855.100	100.000	854.800	128.000
GR	852.900	160.000	852.600	175.000	852.900	190.000	853.100	250.000	853.800	415.000
GR	853.500	492.000	853.600	516.000	852.600	529.000	851.300	544.000	850.600	559.000
GR	849.600	575.000	854.600	600.000	856.200	670.000	858.800	770.000	.000	.000
NC	.100	.070	.040	.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 37 (AJ)

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XI	80.925	18.000	235.000	345.000	1330.000	2160.000	1930.000	.000	.000	.000
X3	.000	.000	.000	200.000	.000	600.000	.000	.000	.000	.000
GR	868.600	.000	862.600	10.000	860.000	35.000	856.200	135.000	855.000	235.000
GR	849.800	247.000	851.300	262.000	851.800	285.000	852.100	301.000	852.800	323.000
GR	853.300	333.000	853.800	344.000	854.300	345.000	854.400	445.000	856.000	705.000
GR	858.000	825.000	860.000	865.000	860.800	945.000	.000	.000	.000	.000
EJ	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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*PROF 1

CCHV=     .300 CEHV=     .500
*SECNO 76.798
   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=     625.0     1145.0  TYPE=     1  TARGET=     520.000

          VALLEY SECTION 20   (O)

    76.80      9.63    855.13       .00    855.13    855.17       .04       .00       .00    853.30
    1350.       52.     1118.      180.     172.      656.      631.        0.        0.    852.20
      .00       .30      1.70       .28      .048      .032      .100      .000    845.50    625.00
  .000098        0.        0.        0.         0         0         0       .00    520.00   1145.00

*SECNO 77.030

3470 ENCROACHMENT STATIONS=     300.0     1200.0  TYPE=     1  TARGET=     900.000

          VALLEY SECTION 21   (P)

    77.03      7.76    855.26       .00       .00    855.28       .02       .11       .01    852.60
    1350.      225.      865.      260.     1027.      643.      845.       58.       21.    852.20
      .36       .22      1.35       .31      .100      .032      .080      .032    847.50    300.00
  .000077     1420.     1220.     1180.         0         0         0       .00    900.00   1200.00

*SECNO 77.232

3470 ENCROACHMENT STATIONS=    1200.0     2200.0  TYPE=     1  TARGET=    1000.000
    77.23      6.86    855.36       .00       .00    855.40       .04       .11       .01    853.60
    1350.      328.     1014.        8.     1278.      548.       17.      100.       39.    853.20
      .54       .26      1.85       .48      .100      .032      .048      .033    848.50   1200.00
  .000180      780.     1070.      760.         2         0         0       .00   1000.00   2200.00

*SECNO 77.353

3470 ENCROACHMENT STATIONS=     230.0      720.0  TYPE=     1  TARGET=     490.000

          VALLEY SECTION 22   (Q)

    77.35      6.38    855.48       .00       .00    855.51       .03       .11       .00    852.90
    1200.      193.      981.       26.     702.      614.       64.      134.       56.    853.90
      .69       .27      1.60       .41      .100      .032      .048      .032    849.10    230.00
  .000125     1060.      640.      640.         1         0         0       .00    490.00    720.00

*SECNO 77.499
   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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3470 ENCROACHMENT STATIONS=      290.0      500.0  TYPE=      1  TARGET=      210.000

          VALLEY SECTION 23    (R)

    77.50      8.88    855.58       .00       .00    855.64       .06       .12       .02    853.10
    1200.       40.    1160.        0.      149.     564.        0.      153.       62.    857.70
      .80       .27      2.05       .00      .100     .032      .048      .032    846.70    290.00
  .000177      910.      770.      570.         1        0         0       .00    190.77    480.77

*SECNO 77.566

3470 ENCROACHMENT STATIONS=      562.0      626.0  TYPE=      1  TARGET=       64.000
    77.57      7.24    855.64       .00       .00    855.76       .12       .09       .03100000.00
    1200.        0.    1200.        0.        0.     423.        0.      158.       63. 100000.00
      .84       .00      2.83       .00      .100     .032      .048      .032    848.40    562.00
  .000370      400.      353.      420.         0        0         0       .00     64.00    626.00

*SECNO 77.567

3370 NORMAL BRIDGE,NRD= 12 MIN ELTRD=  861.00 MAX ELLC=  858.80

          BRIDGE SECTION 4 - ANN ARBOR RAILROAD - D/S FACE    (S)

    77.57      7.23    855.63       .00       .00    855.77       .14       .00       .01    858.80
    1200.        0.    1200.        0.        0.     402.        0.      158.       63.    858.80
      .84       .00      2.98       .00      .032     .020      .032      .032    848.40    300.00
  .000172        1.        1.        1.         0        0         0       .00     64.00    364.00

*SECNO 77.569

          BRIDGE SECTION 4 - ANN ARBOR RAILROAD - U/S FACE    (S)

    77.57      7.13    855.63       .00       .00    855.77       .14       .00       .00    858.80
    1200.        0.    1200.        0.        0.     395.        0.      158.       63.    858.80
      .84       .00      3.03       .00      .032     .020      .032      .032    848.50    300.00
  .000181       16.       16.       16.         0        0         0       .00     64.00    364.00

*SECNO 77.570

3470 ENCROACHMENT STATIONS=      561.0      627.0  TYPE=      1  TARGET=       66.000
    77.57      7.16    855.66       .00       .00    855.78       .12       .00       .01100000.00
    1200.        0.    1200.        0.        0.     429.        0.      158.       63. 100000.00
      .84       .00      2.80       .00      .080     .032      .048      .032    848.50    561.00
  .000365        1.        1.        1.         2        0         0       .00     66.00    627.00

*SECNO 77.602
   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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3470 ENCROACHMENT STATIONS=      554.0      672.0  TYPE=      1  TARGET=      118.000
    77.60      7.39    855.79      .00       .00    855.84      .04       .03       .02    852.20
    1200.        7.      1193.       0.       22.      728.       0.      161.       64. 100000.00
      .87       .33      1.64      .00      .080      .032     .048      .032    848.40    554.00
  .000108      180.      176.     200.         2         0        0       .00    118.00    672.00


*SECNO 77.603

3370 NORMAL BRIDGE,NRD= 44 MIN ELTRD=  860.00 MAX ELLC=  857.90


          BRIDGE SECTION 5 - ABANDONED GRAND TRUNK RAILROAD - D/S FACE   (T)

    77.60      7.39    855.79      .00       .00    855.84      .05       .00       .01    860.30
    1200.        0.      1200.       0.        0.      645.       0.      161.       64.    860.10
      .87       .00      1.86      .00      .032      .020     .032      .032    848.40    300.00
  .000158        1.        1.       1.         0         0        0    -56.91    118.00    418.00


*SECNO 77.605

3370 NORMAL BRIDGE,NRD= 44 MIN ELTRD=  860.00 MAX ELLC=  857.90


          BRIDGE SECTION 5 - ABANDONED GRAND TRUNK RAILROAD - U/S FACE   (T)

    77.61      7.39    855.79      .00       .00    855.84      .05       .00       .00    860.30
    1200.        0.      1200.       0.        0.      645.       0.      161.       64.    860.10
      .87       .00      1.86      .00      .032      .020     .032      .032    848.40    300.00
  .000158       12.       12.      12.         0         0        0    -56.86    118.00    418.00


*SECNO 77.606

3470 ENCROACHMENT STATIONS=      553.0      673.0  TYPE=      1  TARGET=      120.000
    77.61      7.41    855.81      .00       .00    855.85      .04       .00       .00    852.20
    1200.       14.      1186.       0.       25.      729.       3.      161.       64.    853.20
      .87       .56      1.63      .15      .048      .032     .080      .032    848.40    553.00
  .000103        1.        1.       1.         1         0        0       .00    120.00    673.00


*SECNO 77.717

3470 ENCROACHMENT STATIONS=          .0      500.0  TYPE=      1  TARGET=      499.999

          VALLEY SECTION 24   (U)

    77.72      6.58    855.88      .00       .00    855.92      .04       .07       .00    853.20
    1200.        7.       999.     194.       16.      600.     606.      175.       68.    853.20
      .99       .42      1.66      .32      .048      .032     .080      .032    849.30     58.14
  .000130      560.      589.     690.         0         0        0       .00    441.86    500.00


*SECNO 77.899
    SECNO     DEPTH     CWSEL     CRIWS     WSELK        EG        HV        HL     OLOSS   BANK ELEV
    Q         QLOB      QCH       QROB      ALOB       ACH      AROB       VOL       TWA   LEFT/RIGHT
    TIME      VLOB      YCH       VROB      XNL       XNCH       XNR       WTN     ELMIN       SSTA
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 ELEVL   ALCHL   ALCR   ALCBR   TRIAL   IPC    ICONT   CORAR   TOPWID   ENDST

3470 ENCROACHMENT STATIONS=        .0    275.0  TYPE=     1  TARGET=     274.999

          VALLEY SECTION 25   (V)

    77.90      6.81    856.01      .00      .00    856.06      .05      .14      .01    853.80
     1200.        1.     1110.      89.       6.     610.     232.     196.      75.    853.70
     1.14       .24.      1.82      .38     .080     .032     .080     .032   849.20     49.65
  .000160      980.      960.     820.        2        0        0      .00   225.35    275.00

*SECNO 77.999

3470 ENCROACHMENT STATIONS=       60.0     144.0  TYPE=     1  TARGET=      84.000
    78.00      6.31    856.11      .00      .00    856.21      .10      .12      .03100000.00
     1200.        0.     1200.       0.       0.     464.       0.     204.      76. 100000.00
     1.20       .00      2.58      .00     .080     .032     .080     .032   849.80     60.00
  .000358      550.      533.     500.        1        0        0      .00    84.00    144.00

*SECNO 78.000

3370 NORMAL BRIDGE,NRD= 26 MIN ELTRD=  862.60 MAX ELLC=  860.40

          BRIDGE SECTION 6 - M-36 BRIDGE - D/S FACE   (W)

    78.00      6.31    856.11      .00      .00    856.21      .10      .00      .00    863.50
     1200.        0.     1200.       0.       0.     464.       0.     204.      76.    863.50
     1.20       .00      2.59      .00     .024     .020     .024     .032   849.80    225.00
  .000145        1.        1.       1.        0        0        0    -1.55    84.00    309.00

*SECNO 78.005

3370 NORMAL BRIDGE,NRD= 26 MIN ELTRD=  862.60 MAX ELLC=  860.40

          BRIDGE SECTION 6 - M-36 BRIDGE - U/S FACE   (W)

    78.00      6.31    856.11      .00      .00    856.21      .10      .00      .00    863.50
     1200.        0.     1200.       0.       0.     464.       0.     205.      76.    863.50
     1.20       .00      2.58      .00     .024     .020     .024     .032   849.80    225.00
  .000145       26.       26.      26.        0        0        0    -1.58    84.00    309.00

*SECNO 78.006

3470 ENCROACHMENT STATIONS=      235.0     321.0  TYPE=     1  TARGET=      86.000
    78.01      6.31    856.11      .00      .00    856.21      .10      .00      .00100000.00
     1200.        0.     1200.       0.       0.     468.       0.     205.      76. 100000.00
     1.20       .00      2.57      .00     .056     .032     .048     .032   849.80    235.00
  .000363        1.        1.       1.        0        0        0      .00    86.00    321.00

*SECNO 78.045
   SECNO    DEPTH    CWSEL    CRIWS    WSELK     EG       HV       HL       OLOSS    BANK ELEV
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Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA      LEFT/RIGHT
TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN    SSTA
SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID   ENDST


3470 ENCROACHMENT STATIONS=      75.0     370.0  TYPE=     1  TARGET=     295.000

          VALLEY SECTION 26   (X)

    78.05     6.52   856.22      .00      .00   856.29      .07      .06      .01   855.20
    1200.      32.    1167.       0.     101.     562.       3.     207.      77.   856.20
     1.23      .32     2.08      .11     .056     .032     .048     .032   849.70    75.00
  .000234     210.     209.     210.        2        0        0      .00   278.31   353.31


1490 NH CARD USED
*SECNO 78.283

3470 ENCROACHMENT STATIONS=     620.0    1110.0  TYPE=     1  TARGET=    -620.000

          VALLEY SECTION 27   (Y)

    78.28     7.01   856.51      .00      .00   856.58      .07      .29      .00   855.30
    1200.       5.    1051.     144.      14.     471.     362.     229.      86.   853.70
     1.40      .34     2.23      .40     .048     .032     .080     .032   849.50   629.54
  .000234    1270.    1260.    1120.        2        0        0      .00   334.72   964.26


1490 NH CARD USED
*SECNO 78.522

3470 ENCROACHMENT STATIONS=     890.0    1380.0  TYPE=     1  TARGET=    -890.000

          VALLEY SECTION 28   (Z)

    78.52     6.78   856.78      .00      .00   856.83      .05      .24      .01   853.80
    1200.     171.    1016.      14.     478.     539.      28.     256.      97.   854.00
     1.61      .36     1.88      .49     .076     .032     .056     .032   850.00   890.00
  .000164    1260.    1260.    1240.        1        0        0      .00   451.98  1341.98


*SECNO 78.819

3470 ENCROACHMENT STATIONS=     880.0    1210.0  TYPE=     1  TARGET=    -880.000

          VALLEY SECTION 29   (AA)

    78.82     7.11   857.11      .00      .00   857.20      .09      .34      .02   854.70
    1200.      47.    1153.       0.     108.     468.       0.     283.     108.   857.00
     1.79      .44     2.46      .00     .056     .032     .056     .032   850.00   928.68
  .000319    1270.    1570.    1650.        2        0        0      .00   241.67  1170.35


1490 NH CARD USED
*SECNO 79.018

3470 ENCROACHMENT STATIONS=        .0     350.0  TYPE=     1  TARGET=     349.999

          VALLEY SECTION 30   (AB)
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   79.02      6.86    857.36      .00      .00    857.40      .03      .18      .02    855.30
   1200.        3.     1097.     101.      13.     710.     312.     303.     114.    854.40
    1.99       .20      1.54      .32     .080     .032     .080     .032   850.50     66.87
 .000110     1010.     1050.    1050.        0        0        0      .00   283.12    350.00

*SECNO 79.369
   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


          VALLEY SECTION 31   (AC)

   79.37      7.45    857.55      .00      .00    857.59      .03      .19      .00    854.90
   1200.        1.     1134.      65.       6.     739.     255.     345.     126.    854.30
    2.34       .16      1.53      .26     .100     .032     .080     .032   850.10     35.77
 .000099     1950.     1850.    1740.        2        0        0      .00   282.79    318.56


1490 NH CARD USED
*SECNO 79.600

          VALLEY SECTION 32   (AD)

   79.60      7.07    857.67      .00      .00    857.70      .03      .11      .00    854.90
   1200.       40.     1143.      17.     187.     818.      75.     374.     134.    854.60
    2.60       .21      1.40      .23     .080     .032     .080     .032   850.60    135.43
 .000083     1300.     1220.    1100.        0        0        0      .00   319.51    454.94

*SECNO 79.861

3470 ENCROACHMENT STATIONS=      88.0      212.0  TYPE=      1  TARGET=      124.000
   79.86      6.61    857.81      .00      .00    857.86      .04      .15      .01    855.20
   1200.        1.     1199.       0.       5.     704.       0.     402.     141. 100000.00
    2.82       .24      1.70      .00     .080     .032     .056     .032   851.20     88.00
 .000137     1440.     1384.    1350.        1        0        0      .00   124.00    212.00

*SECNO 79.862

3370 NORMAL BRIDGE,NRD= 15 MIN ELTRD=  863.00 MAX ELLC=  863.10


          BRIDGE SECTION 7 - WINANS LAKE ROAD - D/S FACE   (AE)


          U.S.G.S. GAGING STATION LOCATED AT DOWNSTREAM FACE OF BRIDGE.

   79.86      6.59    857.79      .00      .00    857.89      .09      .00      .02    867.20
   1200.        0.     1200.       0.       0.     501.       0.     402.     141.    865.70
    2.82       .00      2.40      .00     .032     .020     .032     .032   851.20    111.68
 .000167        1.        1.       1.        2        0        0   -30.19   106.04    217.72


*SECNO 79.869
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3370 NORMAL BRIDGE,NRD= 15 MIN ELTRD=  863.00 MAX ELLC=  863.10

          BRIDGE SECTION 7 - WINANS LAKE ROAD - U/S FACE   (AE)

          U.S.G.S. GAGING STATION LOCATED AT DOWNSTREAM FACE OF BRIDGE

     79.87      6.59   857.79      .00      .00   857.88      .09      .01      .00   867.20
     1200.        0.    1200.       0.       0.     501.       0.     403.     141.   865.70
      2.83       .00     2.39      .00     .032     .020     .032     .032   851.20   111.66
   .000167       35.      35.      35.        0        0        0   -30.22   106.10   217.76

 *SECNO 79.870
    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=       87.0      213.0  TYPE=      1  TARGET=      126.000
     79.87      6.65   857.85      .00      .00   857.90      .04      .00      .01   855.20
     1200.        4.    1196.       0.       8.     715.       0.     403.     141. 100000.00
      2.83       .56     1.67      .00     .040     .034     .040     .032   851.20    87.00
   .000144        1.       1.       1.        2        0        0      .00   126.00   213.00

 *SECNO 79.886

 3470 ENCROACHMENT STATIONS=         .0      300.0  TYPE=      1  TARGET=      299.999

          VALLEY SECTION 33   (AF)

     79.89      6.27   857.87      .00      .00   857.91      .04      .01      .00   855.60
     1200.       16.    1142.      42.      32.     678.      86.     404.     142.   855.70
      2.84       .50     1.68      .49     .040     .034     .040     .032   851.60    61.65
   .000156       90.      89.      90.        0        0        0      .00   233.54   295.18

 *SECNO 80.145

 3470 ENCROACHMENT STATIONS=      100.0      780.0  TYPE=      1  TARGET=     -100.000

          VALLEY SECTION 34   (AG)

     80.14      5.52   858.12      .00      .00   858.17      .05      .26      .00   855.50
     1190.       86.    1047.      58.     137.     541.      83.     429.     149.   856.10
      3.05       .62     1.94      .70     .048     .034     .048     .032   852.60   168.17
   .000233     1400.    1370.    1260.        2        0        0      .00   262.44   430.61

 *SECNO 80.459

 3470 ENCROACHMENT STATIONS=      100.0      560.0  TYPE=      1  TARGET=      460.000

          VALLEY SECTION 35   (AH)
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    80.46     6.53    858.23      .00      .00    858.23      .00      .04      .01    855.00
    1180.       0.     1180.       0.       0.     2743.       0.     495.     163. 100000.00
     4.12      .00       .43      .00     .040      .034     .040     .032   851.70    100.00
  .000009    1350.     1660.    1800.        2         0        0      .00   460.00    560.00


*SECNO 80.560

3470 ENCROACHMENT STATIONS=     100.0     600.0  TYPE=     1  TARGET=     500.000

          VALLEY SECTION 36   (AI)

    80.56     8.63    858.23      .00      .00    858.23      .00      .00      .00    855.10
    1020.       0.     1020.       0.       0.     2519.       0.     527.     169. 100000.00
     4.49      .00       .41      .00     .040      .034     .080     .032   849.60    100.00
  .000010     520.      530.     570.        2         0        0      .00   500.00    600.00


*SECNO 80.925
   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=     200.0     600.0  TYPE=     1  TARGET=     400.000

          VALLEY SECTION 37   (AJ)

    80.93     8.46    858.26      .00      .00    858.27      .01      .03      .00    855.00
    1020.      24.      646.     349.     107.      677.     914.     622.     189.    854.30
     5.22      .23       .95      .38     .080      .032     .056     .032   849.80    200.00
  .000038    1330.     1930.    2160.        1         0        0      .00   400.00    600.00
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**************************************************
 HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
 ERROR CORR -  01,02,03
 MODIFICATION -  50,51,52,53
**************************************************

T1       HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2       50-YEAR FLOW - STRAWBERRY LAKE TO CORPORATE LIMITS
T3       HURON RIVER - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

    -10.       3.        0.       0.   .000000     .00       .0       0.    855.820   .000

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

    2.000     .000    -1.000    .000     .000     .800     .000     .000     .000     .000

*PROF 2

CCHV=    .300 CEHV=    .500
*SECNO 76.798
   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=     625.0    1145.0  TYPE=     1  TARGET=     520.000

          VALLEY SECTION 20   (O)

   76.80     10.32    855.82      .00    855.82    855.87      .05       .00       .00    853.30
   1900.     146.     1460.     293.     310.      718.      790.       0.        0.     852.20
     .00      .47      2.03      .37      .048      .032      .100      .000    845.50   625.00
 .000123      0.        0.        0.       0         0         0       .00     520.00  1145.00

*SECNO 77.030

3470 ENCROACHMENT STATIONS=     300.0    1200.0  TYPE=     1  TARGET=     900.000

          VALLEY SECTION 21   (P)

   77.03      8.48    855.98      .00       .00    856.01      .02       .13       .01    852.60
   1900.     383.     1104.     413.     1366.      719.     1079.      73.       21.     852.20
     .33      .28      1.54      .38      .100      .032      .080      .031    847.50   300.00
 .000086    1420.     1220.    1180.       0         0         0       .00     900.00  1200.00

*SECNO 77.232

3470 ENCROACHMENT STATIONS=    1200.0    2200.0  TYPE=     1  TARGET=    1000.000
   77.23      7.59    856.09      .00       .00    856.13      .04       .11       .01    853.60
   1900.     634.     1249.      17.     1912.      624.      27.      128.       39.     853.20
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      .52       .33      2.00       .62      .100      .032      .048      .033    848.50   1200.00
  .000177      780.     1070.      760.         1         0         0       .00   1000.00   2200.00


*SECNO 77.353

3470 ENCROACHMENT STATIONS=      230.0      720.0  TYPE=      1  TARGET=      490.000

          VALLEY SECTION 22   (Q)

    77.35      7.11    856.21       .00       .00    856.25       .04       .12       .00    852.90
    1710.      341.     1310.       59.      943.     695.       99.      174.       56.    853.90
      .66       .36      1.88       .59      .100      .032      .048      .032    849.10    230.00
  .000147     1060.      640.      640.         1         0         0       .00    490.00    720.00


*SECNO 77.499
   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=      290.0      500.0  TYPE=      1  TARGET=      210.000

          VALLEY SECTION 23   (R)

    77.50      9.63    856.33       .00       .00    856.42       .10       .15       .03    853.10
    1710.       89.     1621.        0.      223.     633.        0.      198.       62.    857.70
      .74       .40      2.56       .00      .100      .032      .048      .032    846.70    290.00
  .000241      910.      770.      570.         0         0         0       .00    192.26    482.26


*SECNO 77.566

3470 ENCROACHMENT STATIONS=      562.0      626.0  TYPE=      1  TARGET=       64.000
    77.57      8.00    856.40       .00       .00    856.60       .20       .12       .05100000.00
    1710.        0.     1710.        0.        0.     472.        0.      204.       63. 100000.00
      .77       .00      3.62       .00      .100      .032      .048      .032    848.40    562.00
  .000537      400.      353.      420.         0         0         0       .00     64.00    626.00


*SECNO 77.567

3370 NORMAL BRIDGE,NRD= 12 MIN ELTRD=  861.00 MAX ELLC=  858.80

          BRIDGE SECTION 4 - ANN ARBOR RAILROAD - D/S FACE   (S)

    77.57      7.99    856.39       .00       .00    856.61       .22       .00       .01    858.80
    1710.        0.     1710.        0.        0.     450.        0.      204.       63.    858.80
      .77       .00      3.80       .00      .032      .020      .032      .032    848.40    300.00
  .000245        1.        1.        1.         1         0         0       .00     64.00    364.00


*SECNO 77.569

          BRIDGE SECTION 4 - ANN ARBOR RAILROAD - U/S FACE   (S)
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    77.57      7.89   856.39      .00      .00   856.62      .23      .00      .00   858.80
    1710.        0.    1710.       0.       0.     444.       0.     204.      63.   858.80
      .77       .00     3.85      .00     .032     .020     .032     .032   848.50   300.00
  .000256       16.      16.      16.        0        0        0      .00    64.00   364.00


*SECNO 77.570

3470 ENCROACHMENT STATIONS=      561.0      627.0  TYPE=      1  TARGET=      66.000
    77.57      7.93   856.43      .00      .00   856.63      .20      .00      .01100000.00
    1710.        0.    1710.       0.       0.     480.       0.     204.      63. 100000.00
      .77       .00     3.56      .00     .080     .032     .048     .032   848.50   561.00
  .000523        1.       1.       1.        2        0        0      .00    66.00   627.00


*SECNO 77.602
   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=      554.0      672.0  TYPE=      1  TARGET=     118.000
    77.60      8.25   856.65      .00      .00   856.71      .07      .04      .04   852.20
    1710.       11.    1699.       0.      27.     824.       0.     207.      64. 100000.00
      .80       .42     2.06      .00     .080     .032     .048     .032   848.40   554.00
  .000146      180.     176.     200.        2        0        0      .00   118.00   672.00


*SECNO 77.603

3370 NORMAL BRIDGE,NRD= 44 MIN ELTRD=  860.00 MAX ELLC=  857.90


          BRIDGE SECTION 5 - ABANDONED GRAND TRUNK RAILROAD - D/S FACE   (T)

    77.60      8.24   856.64      .00      .00   856.72      .08      .00      .01   860.30
    1710.        0.    1710.       0.       0.     738.       0.     207.      64.   860.10
      .80       .00     2.32      .00     .032     .020     .032     .032   848.40   300.00
  .000225        1.       1.       1.        0        0        0   -64.57   118.00   418.00


*SECNO 77.605

3370 NORMAL BRIDGE,NRD= 44 MIN ELTRD=  860.00 MAX ELLC=  857.90


          BRIDGE SECTION 5 - ABANDONED GRAND TRUNK RAILROAD - U/S FACE   (T)

    77.61      8.24   856.64      .00      .00   856.72      .08      .00      .00   860.30
    1710.        0.    1710.       0.       0.     737.       0.     207.      64.   860.10
      .80       .00     2.32      .00     .032     .020     .032     .032   848.40   300.00
  .000226       12.      12.      12.        0        0        0   -64.51   118.00   418.00


*SECNO 77.606

3470 ENCROACHMENT STATIONS=      553.0      673.0  TYPE=      1  TARGET=     120.000
    77.61      8.27   856.67      .00      .00   856.73      .06      .00      .01   852.20
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      .80       .71      2.04       .18      .048      .032      .080      .032    848.40    553.00
  .000138        1.        1.        1.         2         0         0       .00    120.00    673.00

*SECNO 77.717

3470 ENCROACHMENT STATIONS=          .0     500.0  TYPE=      1  TARGET=     499.999

          VALLEY SECTION 24    (U)

    77.72      7.48    856.78       .00       .00    856.82       .04       .08       .01    853.20
     1710.       15.     1313.      382.       28.      695.      894.      225.       68.    853.20
      .91       .53      1.89       .43      .048      .032      .080      .032    849.30     54.22
  .000138      560.      589.      690.         0         0         0       .00    445.78    500.00

*SECNO 77.899
    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=          .0     275.0  TYPE=      1  TARGET=     274.999

          VALLEY SECTION 25    (V)

    77.90      7.71    856.91       .00       .00    856.98       .07       .15       .01    853.80
     1710.        4.     1535.      171.       12.      710.      330.      252.       75.    853.70
     1.04       .32      2.16       .52      .080      .032      .080      .032    849.20     47.48
  .000185      980.      960.      820.         1         0         0       .00    227.52    275.00

*SECNO 77.999

3470 ENCROACHMENT STATIONS=        60.0     144.0  TYPE=      1  TARGET=      84.000
    78.00      7.21    857.01       .00       .00    857.17       .16       .15       .04100000.00
     1710.        0.     1710.        0.        0.      541.        0.      262.       77. 100000.00
     1.08       .00      3.16       .00      .080      .032      .080      .032    849.80     60.00
  .000449      550.      533.      500.         1         0         0       .00     84.00    144.00

*SECNO 78.000

3370 NORMAL BRIDGE,NRD= 26 MIN ELTRD=  862.60 MAX ELLC=  860.40

          BRIDGE SECTION 6 - M-36 BRIDGE - D/S FACE    (W)

    78.00      7.21    857.01       .00       .00    857.17       .16       .00       .00    863.50
     1710.        0.     1710.        0.        0.      535.        0.      262.       77.    863.50
     1.08       .00      3.20       .00      .024      .020      .024      .032    849.80    225.00
  .000196        1.        1.        1.         0         0         0     -7.02     84.00    309.00

*SECNO 78.005

3370 NORMAL BRIDGE,NRD= 26 MIN ELTRD=  862.60 MAX ELLC=  860.40
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        BRIDGE SECTION 6 - M-36 BRIDGE - U/S FACE   (W)

     78.00      7.22    857.02      .00      .00    857.18      .16      .01      .00    863.50
     1710.        0.     1710.       0.       0.      535.       0.     262.      77.    863.50
      1.09       .00      3.20      .00     .024      .020     .024     .032   849.80    225.00
   .000195       26.       26.      26.       0         0        0    -7.07    84.00    309.00

 *SECNO 78.006

 3470 ENCROACHMENT STATIONS=      235.0      321.0  TYPE=      1  TARGET=      86.000
     78.01      7.23    857.03      .00      .00    857.18      .15      .00      .00100000.00
     1710.        0.     1710.       0.       0.      546.       0.     262.      77. 100000.00
      1.09       .00      3.13      .00     .056      .032     .048     .032   849.80    235.00
   .000452        1.        1.       1.       0         0        0      .00    86.00    321.00

 *SECNO 78.045
    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=       75.0      370.0  TYPE=      1  TARGET=     295.000

        VALLEY SECTION 26   (X)

     78.05      7.49    857.19      .00      .00    857.27      .08      .07      .02    855.20
     1710.      137.     1559.      14.     242.      668.      32.     266.      77.    856.20
      1.11       .57      2.33      .45     .056      .032     .048     .032   849.70     75.00
   .000233      210.      209.     210.        2         0        0      .00   292.85    367.85

 1490 NH CARD USED
 *SECNO 78.283

 3470 ENCROACHMENT STATIONS=      620.0     1110.0  TYPE=      1  TARGET=    -620.000

        VALLEY SECTION 27   (Y)

     78.28      7.98    857.48      .00      .00    857.56      .08      .29      .00    855.30
     1710.       29.     1367.     313.      51.      551.     580.     295.      86.    853.70
      1.28       .57      2.48      .54     .048      .032     .079     .032   849.50    620.00
   .000234     1270.     1260.    1120.        2         0        0      .00   352.34    972.34

 1490 NH CARD USED
 *SECNO 78.522

 3470 ENCROACHMENT STATIONS=      890.0     1380.0  TYPE=      1  TARGET=    -890.000

        VALLEY SECTION 28   (Z)

     78.52      7.75    857.75      .00      .00    857.80      .05      .24      .01    853.80
     1710.      400.     1282.      28.     808.      631.      45.     334.      98.    854.00
      1.49       .49      2.03      .62     .069      .032     .056     .032   850.00    890.00
```

```
*SECNO 78.819

3470 ENCROACHMENT STATIONS=      880.0     1210.0  TYPE=      1  TARGET=     -880.000

          VALLEY SECTION 29   (AA)

     78.82      8.05    858.05       .00       .00    858.16       .11       .33       .03    854.70
     1710.      180.     1529.       1.      286.      552.        2.      372.      110.    857.00
      1.66       .63      2.77       .30      .056      .032      .056      .032    850.00    880.00
   .000323     1270.     1570.     1650.         0         0         0       .00    293.48   1173.48


1490 NH CARD USED
*SECNO 79.018

3470 ENCROACHMENT STATIONS=        .0      350.0  TYPE=      1  TARGET=      349.999

          VALLEY SECTION 30   (AB)

     79.02      7.83    858.33       .00       .00    858.38       .05       .20       .02    855.30
     1710.        8.     1505.      197.       29.      832.      454.      398.      117.    854.40
      1.83       .27      1.81       .43      .080      .032      .080      .032    850.50     60.65
   .000122     1010.     1050.     1050.         2         0         0       .00    289.34    350.00


*SECNO 79.369
    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


          VALLEY SECTION 31   (AC)

     79.37      8.45    858.55       .00       .00    858.59       .05       .22       .00    854.90
     1710.        2.     1556.      152.       11.      860.      436.      452.      130.    854.30
      2.14       .21      1.81       .35      .100      .032      .080      .032    850.10     34.19
   .000113     1950.     1850.     1740.         2         0         0       .00    341.23    375.42


1490 NH CARD USED
*SECNO 79.600

          VALLEY SECTION 32   (AD)

     79.60      8.08    858.68       .00       .00    858.72       .04       .12       .00    854.90
     1710.      103.     1565.       41.      338.      955.      131.      490.      139.    854.60
      2.36       .31      1.64       .32      .080      .032      .080      .032    850.60    113.12
   .000093     1300.     1220.     1100.         0         0         0       .00    353.76    466.88


*SECNO 79.861

3470 ENCROACHMENT STATIONS=       88.0      212.0  TYPE=      1  TARGET=      124.000
     79.86      7.63    858.83       .00       .00    858.90       .07       .17       .01    855.20
     1710.        2.     1708.        0.        7.      829.        0.      526.      147. 100000.00
```

```
     2.55       .28      2.06       .00       .080       .032       .056       .032    851.20     88.00
  .000163     1440.     1384.     1350.          1          0          0        .00    124.00    212.00

*SECNO 79.862

3370 NORMAL BRIDGE,NRD= 15 MIN ELTRD=  863.00 MAX ELLC=  863.10

          BRIDGE SECTION 7 - WINANS LAKE ROAD - D/S FACE   (AE)

          U.S.G.S. GAGING STATION LOCATED AT DOWNSTREAM FACE OF BRIDGE.

    79.86      7.61    858.81       .00       .00    858.93       .12       .00       .03    867.20
    1710.        0.     1710.        0.        0.     610.        0.      526.      147.    865.70
     2.55       .00      2.80       .00      .032      .020      .032      .032    851.20    107.97
  .000207        1.        1.        1.         2         0         0    -35.28    118.02    225.99

*SECNO 79.869

3370 NORMAL BRIDGE,NRD= 15 MIN ELTRD=  863.00 MAX ELLC=  863.10

          BRIDGE SECTION 7 - WINANS LAKE ROAD - U/S FACE   (AE)

          U.S.G.S. GAGING STATION LOCATED AT DOWNSTREAM FACE OF BRIDGE

    79.87      7.61    858.81       .00       .00    858.94       .12       .01       .00    867.20
    1710.        0.     1710.        0.        0.     610.        0.      527.      147.    865.70
     2.55       .00      2.80       .00      .032      .020      .032      .032    851.20    107.95
  .000206       35.       35.       35.         0         0         0    -35.32    118.10    226.05

*SECNO 79.870
   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=      87.0      213.0  TYPE=      1  TARGET=      126.000
    79.87      7.69    858.89       .00       .00    858.95       .06       .00       .02    855.20
    1710.        7.     1703.        0.       11.     842.        0.      527.      147. 100000.00
     2.55       .68      2.02       .00      .040      .034      .040      .032    851.20     87.00
  .000171        1.        1.        1.         2         0         0       .00    126.00    213.00

*SECNO 79.886

3470 ENCROACHMENT STATIONS=        .0      300.0  TYPE=      1  TARGET=      299.999

          VALLEY SECTION 33   (AF)

    79.89      7.32    858.92       .00       .00    858.97       .05       .01       .00    855.60
    1710.       49.     1532.      129.       67.     810.      173.      529.      147.    855.70
     2.56       .74      1.89       .74      .040      .034      .040      .032    851.60     53.14
```

```
 .000139      90.      89.      90.       1        0        0      .00   246.86   300.00

*SECNO 80.145

3470 ENCROACHMENT STATIONS=      100.0      780.0  TYPE=      1  TARGET=    -100.000

          VALLEY SECTION 34   (AG)

    80.14     6.56   859.16      .00      .00   859.22      .06      .25      .00   855.50
    1700.     203.    1377.     120.     252.     657.     137.     561.     155.   856.10
     2.77      .81     2.10      .88     .048     .034     .048     .032   852.60   152.54
 .000211    1400.    1370.    1260.        2        0        0      .00   283.28   435.82

*SECNO 80.459

3470 ENCROACHMENT STATIONS=      100.0      560.0  TYPE=      1  TARGET=     460.000

          VALLEY SECTION 35   (AH)

    80.46     7.58   859.28      .00      .00   859.28      .00      .05      .02   855.00
    1680.       0.    1680.       0.       0.    3227.       0.     642.     169. 100000.00
     3.65      .00      .52      .00     .040     .034     .040     .032   851.70   100.00
 .000011    1350.    1660.    1800.        2        0        0      .00   460.00   560.00

*SECNO 80.560
3280 CROSS SECTION      80.56 EXTENDED        .49 FEET


3470 ENCROACHMENT STATIONS=      100.0      600.0  TYPE=      1  TARGET=     500.000

          VALLEY SECTION 36   (AI)

    80.56     9.69   859.29      .00      .00   859.29      .00      .01      .00   855.10
    1450.       0.    1450.       0.       0.    3045.       0.     680.     175. 100000.00
     3.96      .00      .48      .00     .040     .034     .080     .032   849.60   100.00
 .000011     520.     530.     570.        2        0        0      .00   500.00   600.00

*SECNO 80.925
   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=      200.0      600.0  TYPE=      1  TARGET=     400.000

          VALLEY SECTION 37   (AJ)

    80.93     9.52   859.32      .00      .00   859.33      .01      .04      .00   855.00
    1450.      40.     862.     548.     144.     793.    1184.     797.     195.   854.30
     4.61      .28     1.09      .46     .080     .032     .056     .032   849.80   200.00
 .000040    1330.    1930.    2160.        1        0        0      .00   400.00   600.00
```

00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: Hamburg Twp.

3) WATERCOURSE: Huron River & Connecting Lakes

4) DOCUMENT TYPE: Hyd. Analysis
References
See No. Chart
Bridge Sketches & Calculations

00BREAK00

RECEIVED
APR 1 3 1981
WATER MANAGEMENT

HURON RIVER

Base Line Lake
Whitewood Lakes
Gallagher Lake
Loon Lake
Strawberry Lake
Zukey Lake
Ore Lake

Hamburg Township, Michigan
Job No. 6504-03

CAUTION
SEE
ATTACHED COMMENTS

Hydraulic Analysis

References

SECNO Chart

Bridge Sketches and Calculations

Report is from original submittal. Changes in assumptions may have been made.

Project Manager, Mow-Soung Cheng

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HYDRAULIC ANALYSIS

A. Introduction

The Huron River and Base Line Lake, Whitewood Lakes, Gallagher Lake, Loon Lake, Strawberry Lake, Zukey Lake, and Ore Lake are the subjects of this report. The study begins at Base Line Lake and continues upstream for approximately 8.2 miles along the Huron River through Whitewood Lakes, Gallagher Lake, Loon Lake and Strawberry Lake. Also included in this study is an island problem between Gallagher Lake and Section N (River mile 75.342). The 10-, 50-, 100- and 500-year frequency flood flows were obtained using a combination of Log-Pierson Type III and TR-20 computer programs. These discharges were approved by the Michigan Department of Natural Resources on January 8, 1981. The major floods on the Huron River occur in the late winter or early spring months. The project manager for this study is Dr. Mow-Soung Cheng.

B. Method of Analysis

The flood profiles were calculated by the HEC-2 computer program developed by the U.S. Army Corps of Engineers. An island problem analysis was required in an area upstream of Gallagher Lake. Although the 2 channels merge at the upstream end near Section N, the island problem ends at Section M due to the submergence of the area between the two channels for the 100-year flow. All of the bridges along the Huron River have been modelled for the requirements of the normal bridge routine. For those lakes studied by detailed methods, the lake elevations for each flood frequency flow are assumed to be the energy grade line elevations as determined by HEC-2 at the outlet of each lake. These lake elevations, in turn, are used as starting water surface elevations for stream segments upstream of the lakes. Due to the large differences in peak flow times, elevations on Zukey Lake are assumed to be the same as those on Strawberry Lake, and elevations on Ore Lake are assumed to be the same as those on the Huron River at the Ore Lake outlet confluence.

TABLE 1: SUMMARY OF LAKE ELEVATIONS

Pencil values are TR-20 elevations. RCS 4/20/81

	Elevation (NGVD)							
	10-Yr.		50-Yr.		100-Yr.		500 Yr.	
Base Line Lake	854.51	854.35	855.46	855.23	855.89	855.78	856.83	856.70
Whitewood Lakes	854.73	854.58	855.68	855.92	856.12	855.89	857.07	856.82
Gallagher Lake	854.78		855.73		856.18		857.12	
Loon Lake	854.78		855.73		856.18		857.12	
Strawberry Lake	855.22	855.09	856.13	856.01	856.57	856.45	857.48	857.35
Zukey Lake	855.22		856.13		856.57		857.48	
Ore Lake	858.23		859.31		859.76		860.79	

C. Variables and Coefficients

The roughness factors (Manning's "n") were established by comparing the descriptions in Open-Channel Hydraulics (Reference 1) with photographs and field descriptions taken by survey crews in 1980, and field reconnaissance trips taken in 1980. Aerial photographs of Hamburg Township taken in 1976 were also used to determine the roughness coefficients and their extent. These roughness factors were determined assuming that flooding would occur during the late winter/early spring. The Manning's "n" for the channel ranges from .032 in areas with a sandy bottom to .036 in areas with a gravelly bottom. The Manning's "n" for the overbanks ranges from .040 in areas of short grass residential areas to 0.100 in areas of heavy brush and woods. The expansion and contraction coefficients chosen for this study were 0.5 and 0.3, respectively.

D. Starting Point

Lake elevations for the 10-, 50-, 100-, and 500-year floods on Base Line Lake were obtained by a convergence trial method using HEC-2. Backwater profiles were computed from a point approximately 1/3 mile downstream of the Bell Road bridge in Dexter Township to Base Line Lake. Variable starting water surface elevations were used for each frequency flow using a slope-area method. Sections used in this analysis were field-measured, and included 7 valley sections, a bridge section at Bell Road, and a dam section just downstream of the confluence of the Portage Lake outlet channel with the Huron River. For the convergence analysis, the crest elevation on the

dam spillway was assumed to be at Elevation 851 (normal lake level for Portage Lake and Base Line Lake is Elevation 851.5). All of the convergence trial profiles converged before reaching Base Line Lake.

E. Encroachments

In most cases, the encroachments for the 100-year natural floodway were based on a 1:1 convergence into bridges and a 1:4 expansion from the downstream sides of bridges or natural constrictions. However, this method was sometimes not feasible due to the severe meandering of the river in places. In these cases, the 100-year natural floodway was based on the sweep and extent of moving floodwaters. Aerial photographs were utilized extensively in the location of encroachments for the hydraulic model of the Huron River.

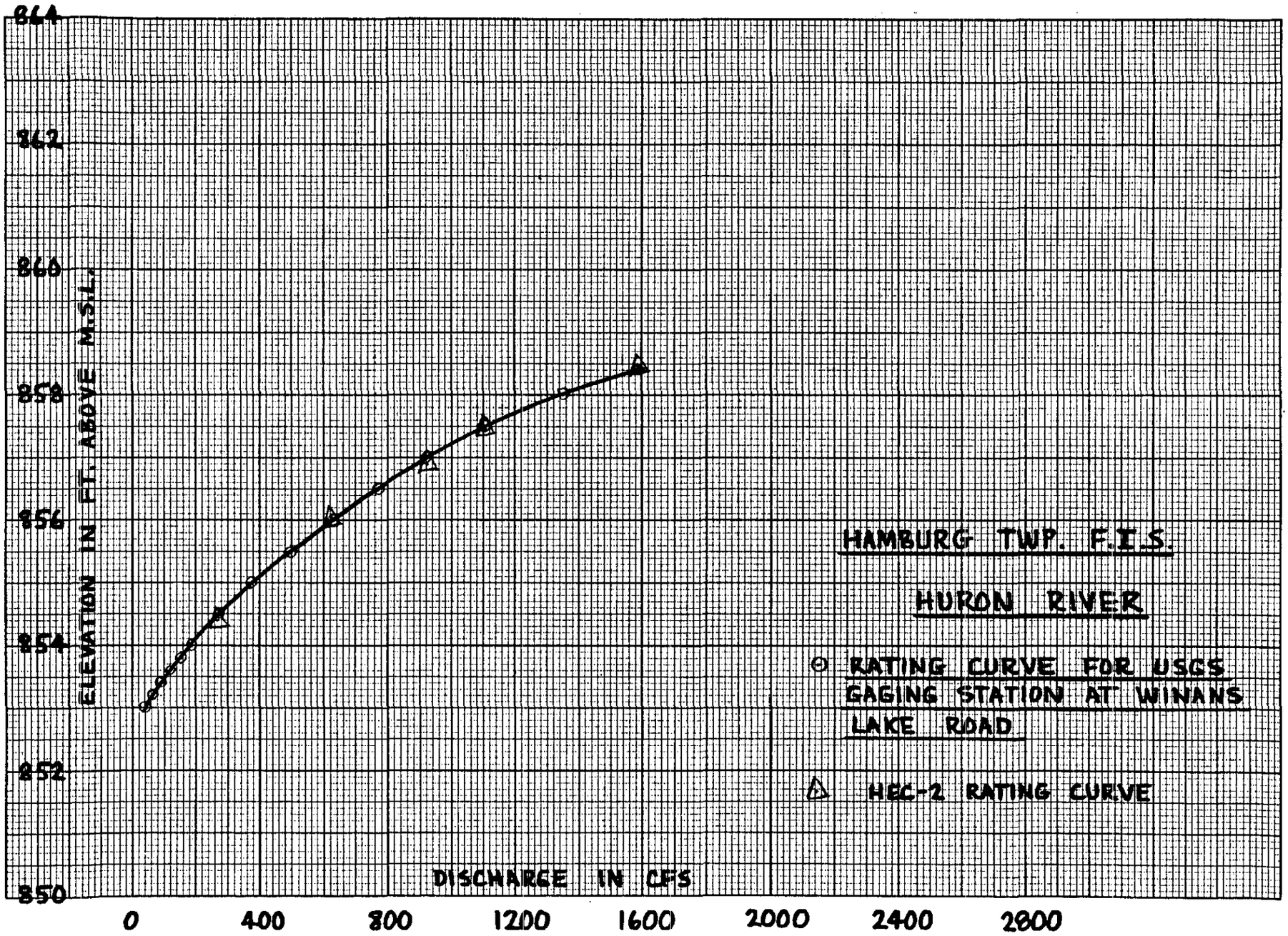
For the 100-year encroached floodway, areas of shallow ponding downstream of the Ann Arbor Railroad bridge have been encroached. These encroachments resulted in a rise of 0.1 foot or less in water surface elevation compared to the 100-year natural floodway profile.

F. High Water Mark and Gage Calibration

A U.S.G.S. water stage recorder is located within the study area on the right bank at the downstream side of the Winans Lake Road bridge in Hamburg Township. The period of record for this gage is from October 1951 to the current year. The maximum discharge observed at this gage occurred on May 15, 1956 and was estimated to be 1560 cfs.

Manning's "n" values for the channel were calibrated by computing backwater profiles for a range of flows smaller than the maximum observed discharge at the gage, and comparing the backwater profile results to the U.S.G.S. rating curve for the gage. As a result of this analysis, the original estimates for Manning's "n" have been reduced by 20%. This reduction has been accomplished by utilizing an 80% multiplier factor on the J2 card in the HEC-2 input data.

K+E 20 X 20 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.
46 1240



References

1. Chow, Ven Te, Open-Channel Hydraulics, McGraw-Hill, 1959.

Abrams Aerial Survey Corporation, Aerial Mosaic and Topographic Map of Hamburg Township, 2-Foot Contour Interval, Scale 1" = 200 ft., Photography April 1976, Mapping October 1977.

Ayres, Lewis, Norris and May, Inc., Consulting Engineers, Plans for Portage and Base Line Lakes Level Control for Washtenaw and Livingston County Drain Commissioners, 1964.

U.S. Army Corps of Engineers, Detroit District, Southeastern Michigan Water Resources Study; Gazetteer of the Huron River Basin, Technical Paper No. 7, June 1972.

U.S. Army Corps of Engineers, Hydrologic Engineering Center, Application of the HEC-2 Bridge Routines, Training Document No. 6, June 1974.

U.S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-2 Water-Surface Profile Users Manual, 1973.

U.S. Department of Agriculture, Soil Conservation Service, Technical Release No. 20, Computer Program for Project Formulation; Hydrology, May 1965.

U.S. Department of Interior, Geological Survey, Measurement of Peak Discharge at Dams by Indirect Methods, Techniques of Water Resources Investigations of the U.S. Geological Survey, Book 3, Chapter A5, 1976.

U.S. Department of Interior, Geological Survey, Water Resources Data for Michigan, Surface Water Records for Water Years 1952-1979.

U.S. Department of Transportation, Federal Highway Administration, Hydraulics of Bridge Waterways, Hydraulic Design Series No. 1, 1973.

SECNO TABLE

Huron River
Livingston County, Michigan
6504-03-0

CROSS SECTION	SECNO	DESCRIPTION
A	72.679	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
B	73.028	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
	73.081	Manufactured section. Channel points from Section B repeated and adjusted for channel invert; overbanks taken from available 2-ft. contour maps.
C	73.278	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps, with right overbank artificially raised between stations 2210 and 2430 to model for a line of homes.
	73.747	Section E repeated
D	73.834	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
E	73.999	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
F	74.905	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
G	75.096	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.

CROSS SECTION	SECNO	DESCRIPTION
H	0	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
	720	Section I repeated.
I	1750	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
J	3280	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
	3447	Manufactured section. Channel points taken from Section K and adjusted for channel invert; overbanks repeated from Section K.
K	3448, 3460	Beach Road bridge.
	3461	Manufactured section. Channel points taken from Section K and adjusted for channel invert; overbanks repeated from Section K.
L	4460	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.

Huron River
Livingston County, Michigan
6504-03-0

CROSS SECTION	SECNO	DESCRIPTION
G/L	75.096	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
M	75.342	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
N	75.814	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
O	76.798	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
P	77.030	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
	77.232	Manufactured section. Channel points taken from Section Q and adjusted for channel invert; overbanks taken from available 2-ft. contour maps.
Q	77.353	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
R	77.499	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
	77.566	Section R repeated and adjusted for channel invert.
S	77.567, 77.569	Ann Arbor Railroad bridge.
	77.570	Section R repeated and adjusted for channel invert.
	77.602	Section R repeated and adjusted for channel invert.

CROSS SECTION	SECNO	DESCRIPTION
T	77.603, 77.605	Abandoned Grand Trunk Western Railroad bridge.
	77.606	Section R repeated and adjusted for channel invert.
U	77.717	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
V	77.899	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
	77.999	Section W repeated and adjusted for channel invert.
W	78.000, 78.005	M-36 bridge.
	78.006	Section Y repeated Q and adjusted for channel invert.
X	78.045	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
Y	78.283	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
Z	78.522	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
AA	78.819	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
AB	79.018	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
AC	79.369	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.

CROSS SECTION	SECNO	DESCRIPTION
AD	79.600	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
	79.861	Section AG repeated and adjusted for channel invert.
AE	79.862, 79.869	Winans Lake Road. U.S.G.S. gaging station located on downstream side of bridge.
	79.870	Section AG repeated and adjusted for channel invert.
AF	79.886	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
AG	80.145	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
AH	80.459	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
AI	80.560	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.
AJ	80.925	Field valley section taken bank to bank only; overbanks taken from available 2-ft. contour maps.

BRIDGE SKETCHES
AND
CALCULATIONS

Johnson & Anderson, Inc.
Consulting Engineers
2300 Dixie Hwy., Pontiac, MI 48055

HYDRAULIC STRUCTURAL DATA

B.S. 2 DAM

Code No. 6504-03

Job Name: Hamburg Twp. F.I.S.		By: MOSES
Date: 9-24-80	Feature: CONC. DAM	Water Course: HURON RIVER

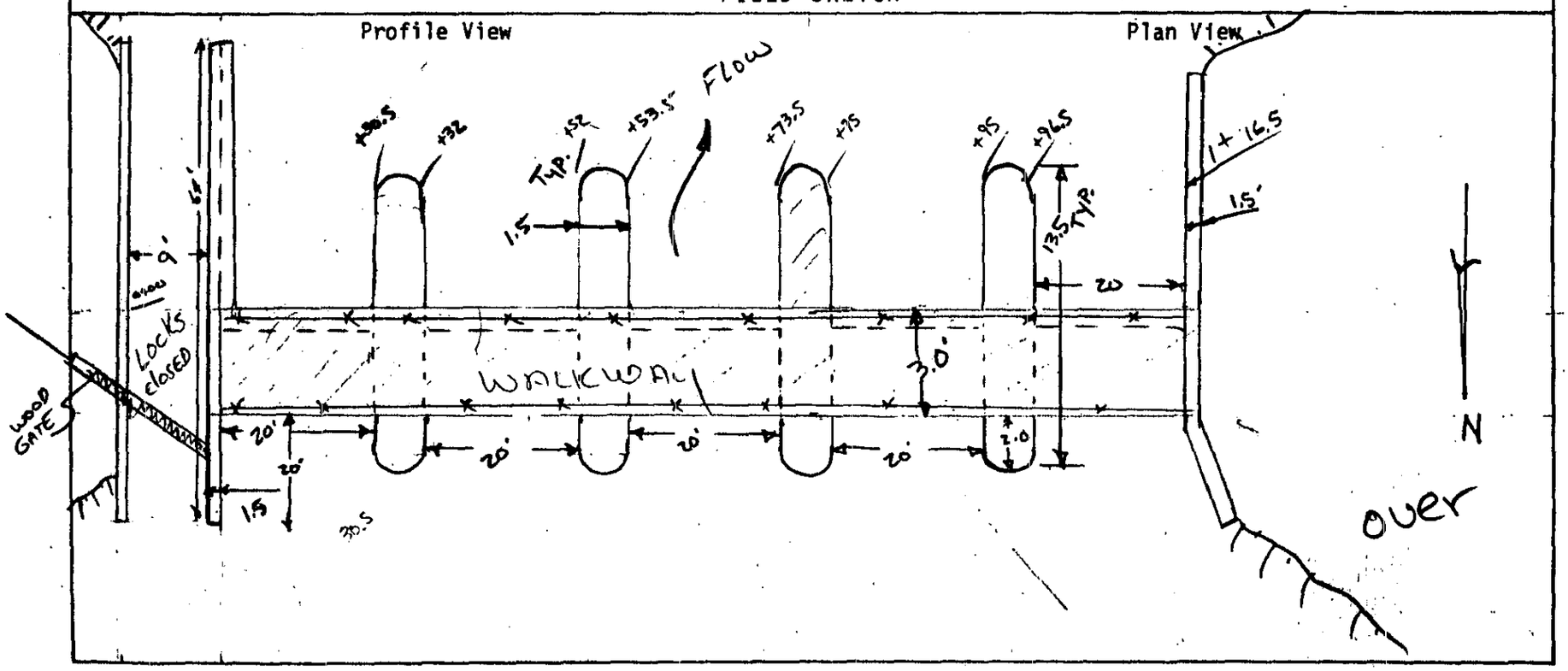
Remarks: FLOOD GATES ARE ON AVERAGE OF 0.5' BELOW WATER ELEV.

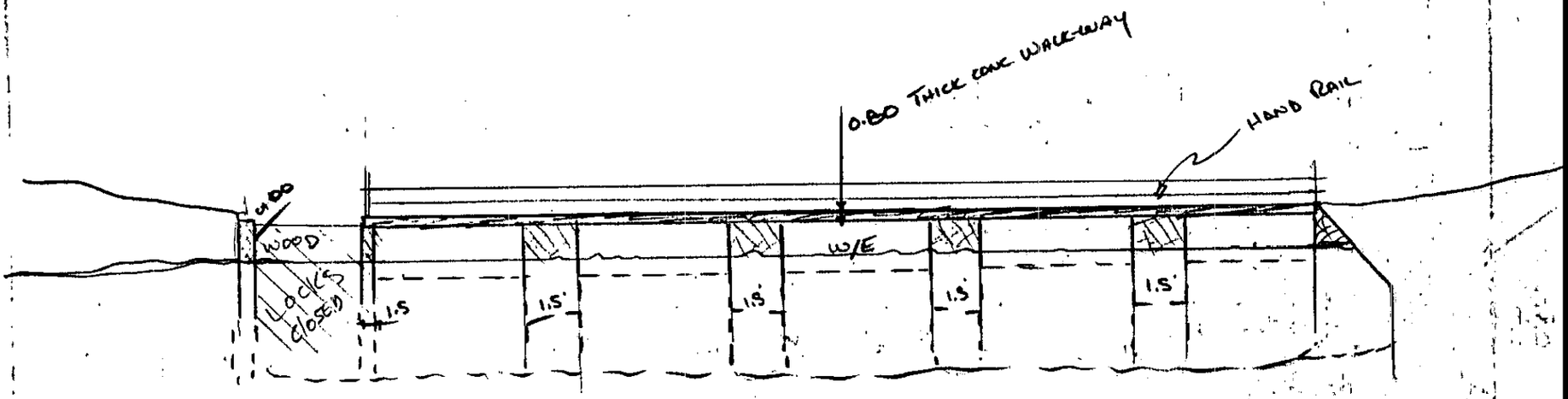
ACCESS TO PLANS: AYRES, LEWIS, NORRIS, MAY
ANN ARBOR, MICH

PORTAGE & BASE LINE LAKES LEVEL CONTROL AS-BUILT 1967'

Width of Piers: 1.5'	Pier Shape: ▯ AT BOTH END	No. of Piers: 5	Area: —
Water Elevation: UPS. 851.4 DNS. 846.7	Length: 116'	Width of Deck: 3	Skew: 90°

FIELD SKETCH




0.80 THICK CONC WALKWAY
HAND RAIL
0.80
WOOD
LOCKS CLOSED
W/E
1.5
1.5'
1.5'
1.5'
1.5'

Johnson & Anderson, Inc.
Consulting Engineers
2300 Dixie Hwy., Pontiac, MI 48055

HYDRAULIC STRUCTURAL DATA

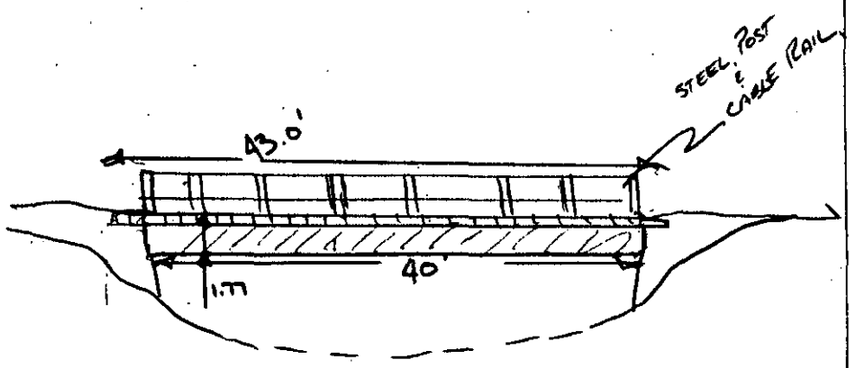
B.S. #3

Code No. 6504-03

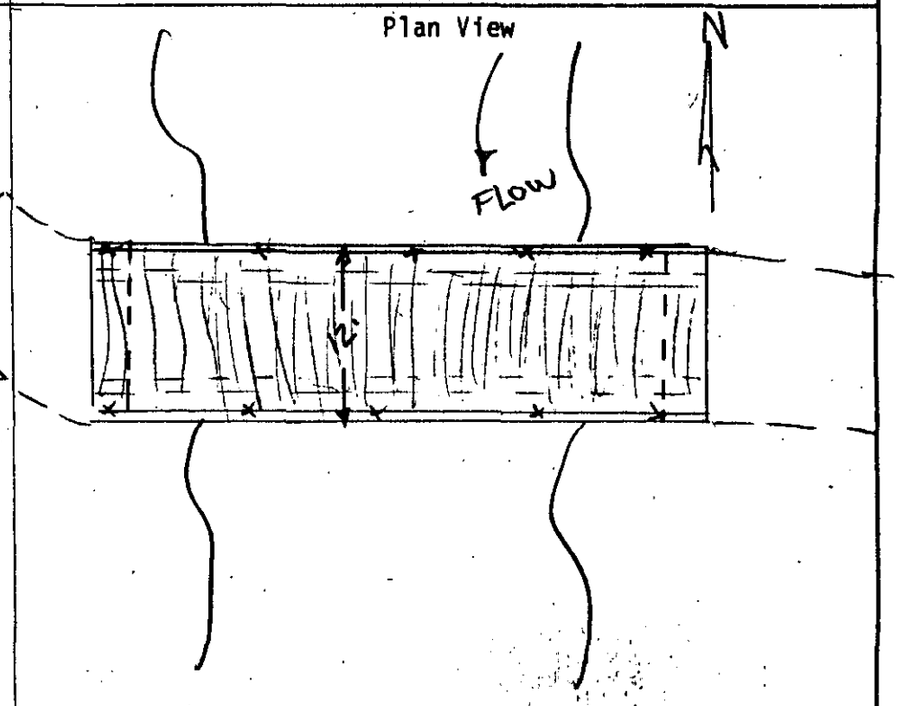
Job Name: Hamburg Twp. F.I.S		By: R. Moses	
Date: 9-22-80	Feature: I-Beam w/wood Deck BRIDGE	Water Course: Huron River	
Remarks: BRIDGE IS ON EAST RD. BRIDGE HAS STAFF GAGE THAT LOOKS IF IT doesn't WORK			
CHANNEL IS LOOSE SAND & GRAVEL			
LEFT BANK RISES FAST, RIGHT BANK LOW & SWAMPY			
Width of Piers: —	Pier Shape: —	No. of Piers: —	Area: —
Water Elevation: 852.0	Length: 43	Width of Deck: 12	Skew: 90°

FIELD SKETCH

Profile View



Plan View



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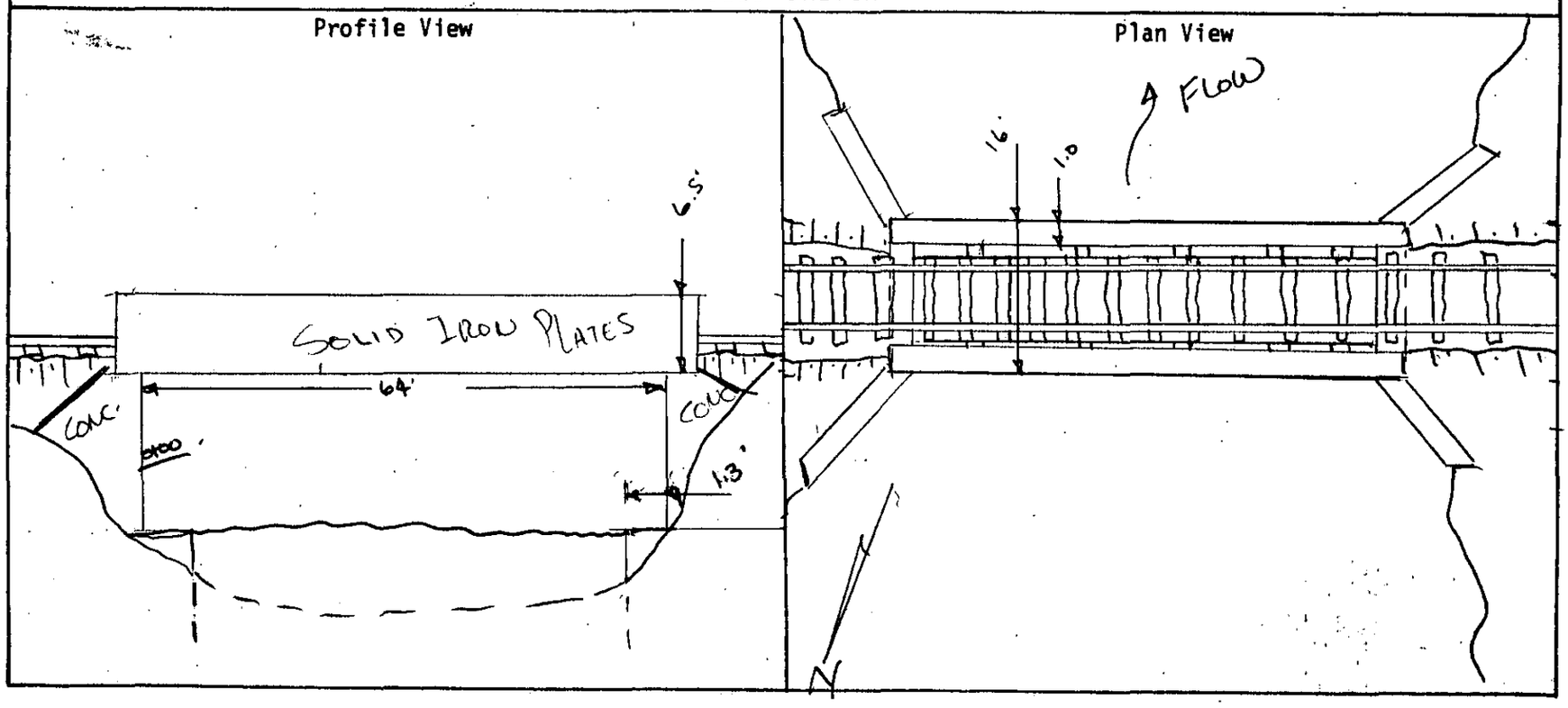
Consulting Engineers
2300 Dixie Hwy., Pontiac, MI 48055

HYDRAULIC STRUCTURAL DATA
B.S. & A

Code No. 6504-03

Job Name: Hamburg Twp. F.I.S.		By: Moses	
Date: 10-1-80	Feature: Steel Bridge	Water Course: Huron River	
Remarks: Per Plan Location			
Width of Piers: —	Pier Shape: —	No. of Piers: —	Area: —
Water Elevation: 852.7	Length: 64'	Width of Deck: 16	Skew: 90°

FIELD SKETCH



Johnson & Anderson, Inc.
Consulting Engineers
2300 Dixie Hwy., Pontiac, MI 48055

HYDRAULIC STRUCTURAL DATA

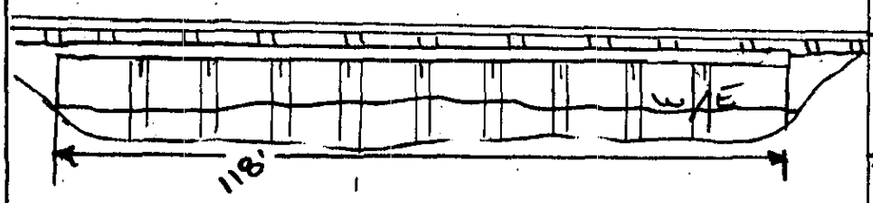
B.S. #5

Code No. 6304-03

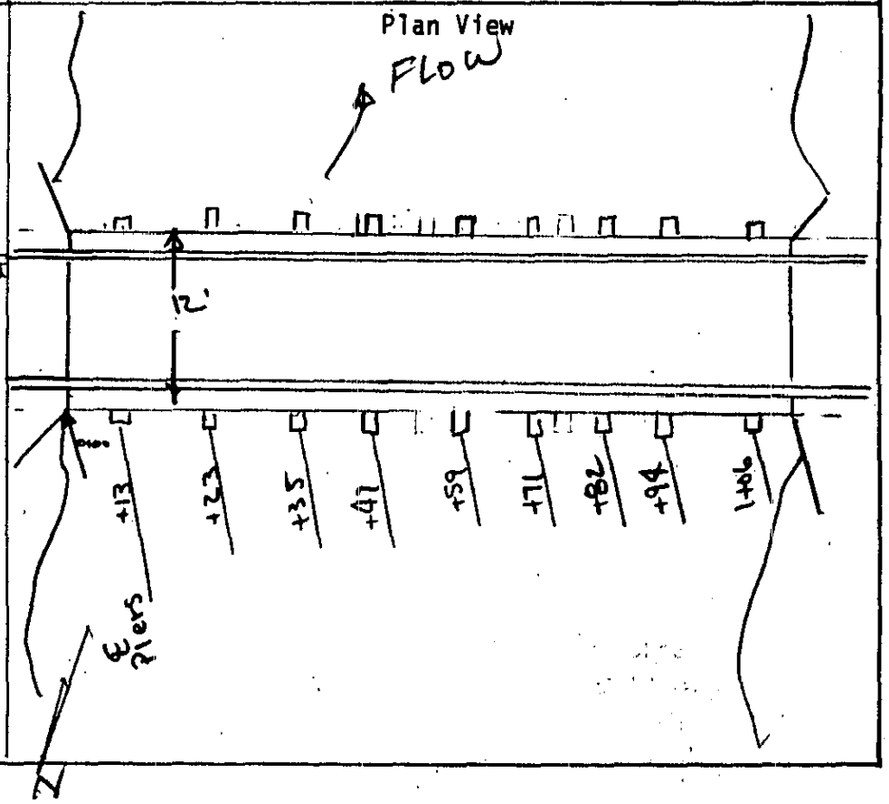
Job Name: Hamburg Twp. F.I.S.		By: R. Moses	
Date: 10-1-80	Feature: Wood & Rail Bridge	Water Course: Huron River	
Remarks: Per Plan Upstream Face Does get Log jammed But Residents Cleaned this up Last Time it Happen (Abandon R.R. Tracks)			
Width of Piers: 1.0'	Pier Shape: □ Square	No. of Piers: 9	Area: —
Water Elevation: 852.6	Length: 118	Width of Deck: 12'	Skew: —

FIELD SKETCH

Profile View



Plan View



Johnson & Anderson, Inc.
Consulting Engineers
2300 Dixie Hwy., Pontiac, MI 48055

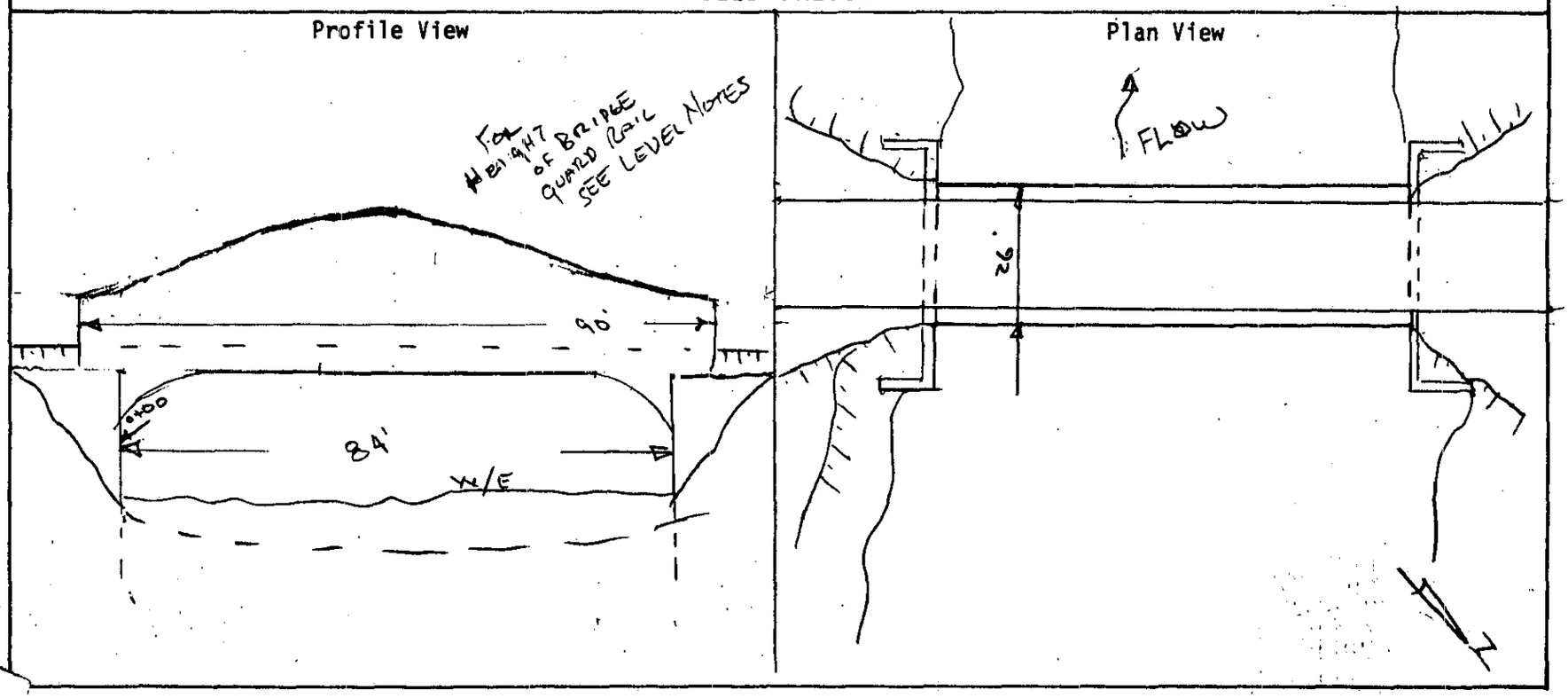
HYDRAULIC STRUCTURAL DATA

B.S. #6

Code No. 6504-03

Job Name: Hamburg Twp. F.I.S.		By: R. Moses	
Date: 10-3-80	Feature: Conc. Bridge	Water Course: Huron River	
Remarks: Bridge is on M-36			
Width of Piers: —	Pier Shape: —	No. of Piers: —	Area: —
Water Elevation: 853.1	Length: 84	Width of Deck: 26	Skew: 90°

FIELD SKETCH



Johnson & Anderson, Inc.
Consulting Engineers
2300 Dixie Hwy., Pontiac, MI 48055

HYDRAULIC STRUCTURAL DATA

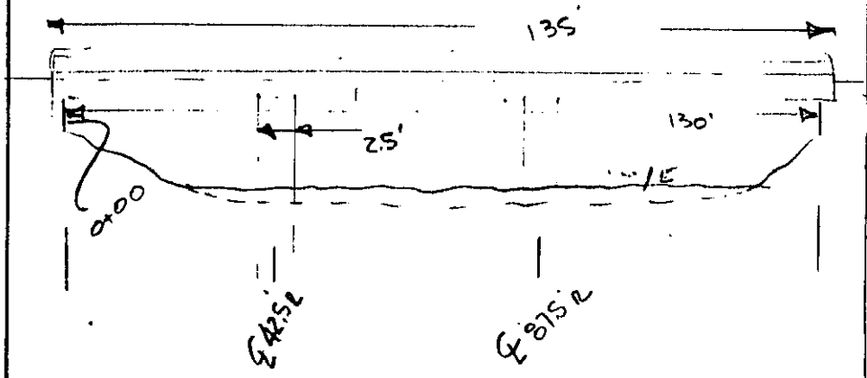
R.S. #7

Code No. 6504.03

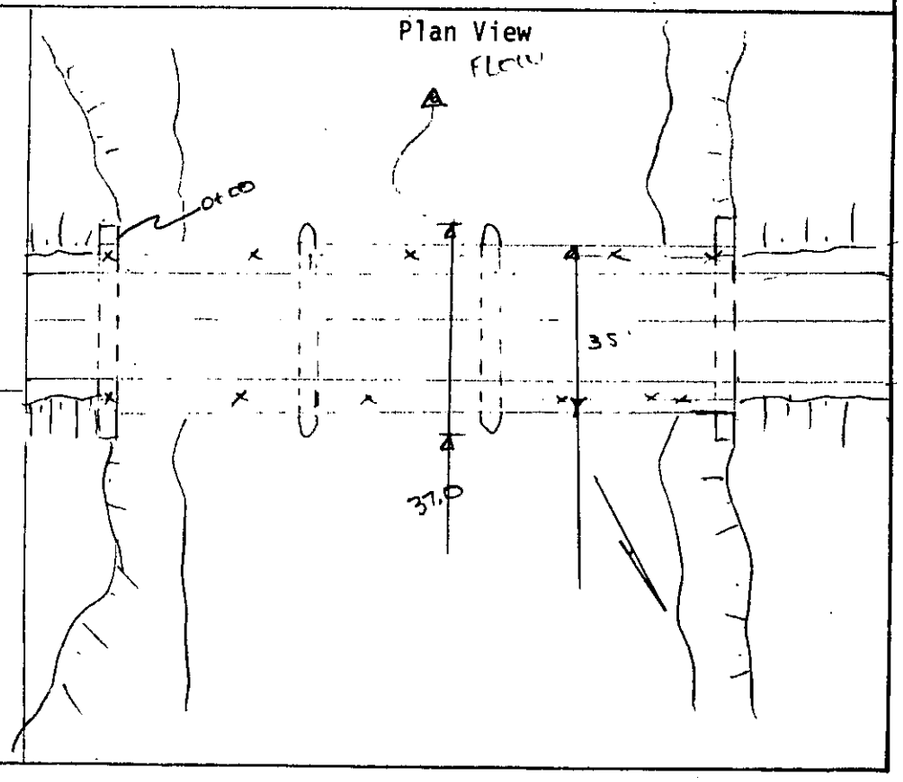
Job Name: Hamburg Twp. F.I.S.		By: R. Moses	
Date: 10-7-80	Feature: Conc. Bridge	Water Course: Huron River	
Remarks: Bridge is on Hamburg Rd			
Width of Piers: 2.5'	Pier Shape:	No. of Piers: 2	Area: —
Water Elevation: 854.4	Length: 135'	Width of Deck: 35'	Skew: 90°

FIELD SKETCH

Profile View



Plan View



JOB NAME: HAMBURG TOWNSHIP FIS	JOB NO.	6504	03	0	13

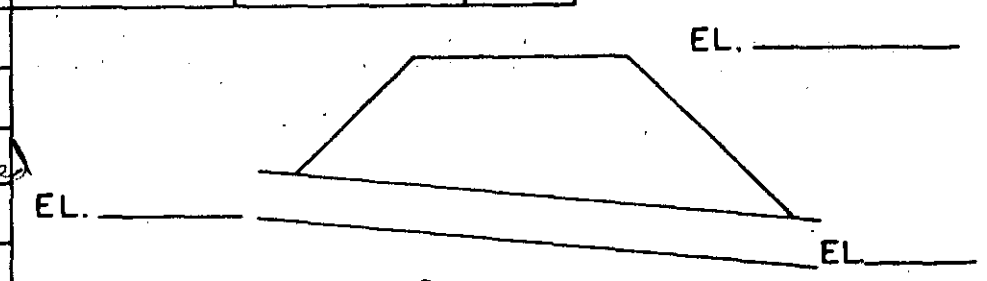
WATERCOURSE: Huron River

CULVERT LOCATION: d/s of Portage Lake outlet

CULVERT DESCRIPTION: Concrete and earth fill dam with stop log control and 5 tainter gates

BY RCD DATE 1/15/81

WEIR DESCRIPTION: 106 ft. wide spillway divided into 5 bays; stop log level control



A = _____ D = _____

WP = _____ Ke = _____

$\frac{29.1}{R^{4/3}}$ = _____ n = _____

So = _____

L = _____

Sta. Sta.

CALCULATIONS AND COMMENTS:

COEFFICIENT OF DISCHARGE (for Portage Lake/Base Line Lake control structure)

For sharp-crested weir,

$c = 3.33\left(1 + 0.259\frac{H^2}{d^2}\right)$ from Handbook of Hydraulics - King & Brater

where $d = H + p$

H = head above weir crest

p = crest Elev. - inv. El. on u/s side

Assume H = 4.6 ft. for 100-year flow

p = 851.0 - 843.9 = 7.1 ft.

d = 4.6 + 7.1 = 11.7 ft.

$c = 3.33\left[1 + 0.259\frac{(4.6)^2}{(11.7)^2}\right] = 3.46$

00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: Hamburg Twp

3) WATERCOURSE: Huron River

4) DOCUMENT TYPE: Natural Floodway

Baseline Lake to Whitewood Lk.

00BREAK00

```
*****************************************************
*  WATER SURFACE PROFILES                           *
*  VERSION OF NOVEMBER 1976                         *
*  UPDATED JULY 1979                                *
*                                                   *
*  RUN DATE TUE, JUL 21, 1981,   4:29 PM            *
*****************************************************
```

```
*****************************************
*  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    X
XXXXXXX  XXXX      X         XXXXX  XXXXX
X     X  X         X                X
X     X  X         X    X           X
X     X  XXXXXXX   XXXXX            XXXXXXX
```

"Baseline Lake to Whitewood Lakes"

(Natural Floodway)

Note: See MICROFICHE

Data Revised

RECEIVED
JUL 27 1981
WATER MANAGEMENT

FORM 1411 ½ GB
PRINTED IN U.S.A.

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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
*****************************************************

C
T1      HAMBURG TOWNSHIP FIS - JOB NO. 6504-03 FILE: RATWHD
T2      100-YEAR NATURAL FLOODWAY - BASE LINE LAKE TO WHITEWOOD LAKES
T3      HURON RIVER - PROJECT MANAGER, N.S.CHENG

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q      WSEL     FQ
      -1.      2.       0.       0.    .000000     .00      .0      0.   855.040   .000

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW    CHNIM    ITRACE
     1.000     .000   -1.000     .000     .000    .800     .000    .000    .000     .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    38.000   40.000   41.000   42.000   43.000    1.000    8.000   10.000   12.000    3.000

    33.000    4.000   25.000     .000     .000     .000     .000     .000     .000     .000

NC     .100     .050     .040     .300     .500     .000     .000     .000     .000     .000
QT    1.000 2485.000     .000     .000     .000     .000     .000     .000     .000     .000

        VALLEY SECTION 7   (A)

X1   72.679   21.000 1800.000 1896.000     .000     .000     .000     .000     .000     .000
X3     .000     .000     .000 1500.000     .000 1930.000     .000     .000     .000     .000
GR  868.000     .000  860.000  100.000  856.000  130.000  852.000  240.000  852.000  750.000
GR  853.300  950.000  852.000 1580.000  851.800 1800.000  850.900 1801.000  850.200 1808.000
GR  846.200 1824.000  844.700 1839.000  842.200 1861.000  847.000 1880.000  851.200 1894.000
GR  854.200 1896.000  854.000 2240.000  854.000 2310.000  856.000 2350.000  858.000 2540.000
GR  868.000 2600.000     .000     .000     .000     .000     .000     .000     .000     .000
NC     .100     .100     .040     .000     .000     .000     .000     .000     .000     .000
QT    1.000 2335.000     .000     .000     .000     .000     .000     .000     .000     .000

        VALLEY SECTION 8   (B)

X1   73.028   23.000 1550.000 1725.000 2140.000 1700.000 1840.000     .000     .000     .000
X3     .000     .000     .000  590.000     .000 2870.000     .000     .000     .000     .000
GR  866.000     .000  864.000   20.000  862.000   50.000  860.000  100.000  858.000  150.000
GR  856.000  250.000  855.500  480.000  854.000  770.000  852.000 1550.000  851.000 1551.000
GR  850.100 1570.000  849.100 1590.000  846.000 1620.000  847.500 1650.000  847.900 1675.000
GR  848.900 1700.000  850.900 1715.000  852.100 1725.000  851.300 2150.000  852.000 2900.000
GR  854.000 2940.000  856.000 3030.000  858.000 3110.000     .000     .000     .000     .000
NC     .100     .100     .040     .000     .000     .000     .000     .000     .000     .000

        MANUFACTURED SECTION - CHANNEL POINTS FROM SECTION 8 WITH OVERBANKS
```

FROM 2-FT. CONTOUR MAP

X1	73.081	25.000	1590.000	1765.000	170.000	280.000	280.000	.000	.000	.000
X3	.000	.000	.000	630.000	.000	3170.000	.000	.000	.000	.000
GR	866.000	.000	860.000	100.000	858.000	140.000	856.000	330.000	854.000	530.000
GR	852.000	1370.000	852.600	1590.000	851.600	1591.000	850.700	1610.000	849.700	1630.000
GR	846.600	1660.000	848.100	1690.000	848.500	1715.000	849.500	1740.000	851.500	1755.000
GR	852.700	1765.000	852.000	2070.000	854.000	2270.000	856.000	2510.000	856.400	2570.000
GR	856.000	2600.000	854.000	2740.000	854.000	2890.000	856.000	3170.000	856.300	3340.000
NH	6.000	.125	1890.000	.070	2040.000	.040	2250.000	.125	2930.000	.050
NH	3630.000	.125	4250.000	.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 9 - GR POINTS MODIFIED BETWEEN STA'S 2210 AND 2430 TO

REMOVE LINE OF HOMES FROM NATURAL FLOODWAY. (C)

X1	73.278	53.000	2040.000	2250.000	1080.000	980.000	1040.000	.000	.000	.000
GR	870.000	.000	870.000	50.000	864.000	90.000	860.000	150.000	858.000	260.000
GR	857.000	470.000	858.000	680.000	860.000	740.000	862.000	780.000	870.000	880.000
GR	872.000	940.000	874.000	960.000	876.000	1000.000	876.000	1130.000	870.000	1200.000
GR	866.000	1230.000	860.000	1290.000	858.000	1315.000	854.000	1440.000	854.000	1890.000
GR	854.300	1940.000	852.700	2040.000	850.900	2043.000	848.400	2070.000	849.100	2095.000
GR	849.100	2120.000	849.300	2145.000	849.700	2175.000	850.500	2190.000	850.700	2246.000
GR	851.900	2250.000	854.000	2520.000	855.300	2550.000	855.300	2550.000	854.000	2610.000
GR	853.000	2750.000	854.000	2890.000	856.000	2930.000	858.000	3000.000	859.300	3100.000
GR	858.000	3230.000	856.000	3280.000	854.000	3340.000	854.300	3410.000	865.000	3410.000
GR	865.000	3630.000	854.000	3630.000	853.400	3730.000	854.000	3960.000	856.000	4050.000
GR	858.000	4110.000	864.000	4170.000	866.000	4250.000	.000	.000	.000	.000
EJ	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

FORM 1411 ½ GB
PRINTED IN U.S.A.

```
*PROF 1

CCHV=     .300 CEHV=     .500
*SECNO 72.679
  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=     1500.0     1930.0  TYPE=     1  TARGET=     430.000

          VALLEY SECTION 7   (A)

   72.68     12.84    855.04       .00    855.04    855.11       .07       .00       .00    851.80
    2485.     463.     2010.      12.      927.      830.      29.        0.        0.    854.20
     .00       .50      2.42      .42      .080      .032      .040      .000    842.20   1500.00
 .000162        0.        0.       0.         0         0         0       .00    430.00   1930.00

*SECNO 73.028

3470 ENCROACHMENT STATIONS=      590.0     2870.0  TYPE=     1  TARGET=    2280.000

          VALLEY SECTION 8   (B)

   73.03      9.24    855.24       .00       .00    855.25       .01       .11       .02    852.00
    2335.     316.     1047.     972.     1887.     1168.     4100.     192.       60.    852.10
     .99       .17       .90      .24      .080      .032      .080      .032    846.00    590.00
 .000030     2140.     1840.    1700.         2         0         0       .00   2280.00   2870.00

*SECNO 73.081

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS=      630.0     3170.0  TYPE=     1  TARGET=    2540.000

          MANUFACTURED SECTION - CHANNEL POINTS FROM SECTION 8 WITH OVERBANKS

          FROM 2-FT. CONTOUR MAP

   73.08      8.65    855.25       .00       .00    855.26       .01       .01       .00    852.60
    2335.     639.     1268.     428.     2408.     1066.     1786.     226.       72.    852.70
    1.08       .27      1.19      .24      .080      .032      .080      .032    846.60    630.00
 .000059     170.      280.     280.         1         0         0       .00   2204.40   3065.80

1490 NH CARD USED
*SECNO 73.278

3265 DIVIDED FLOW

          VALLEY SECTION 9 - GR POINTS MODIFIED BETWEEN STA'S 2210 AND 2430 TO
```

REMOVE LINE OF HOMES FROM NATURAL FLOODWAY. (C)

73.28	6.92	855.32	.00	.00	855.34	.02	.08	.01	852.70	
2335.	198.	1694.	443.	862.	1170.	1909.	335.	121.	851.90	
1.34	.23	1.45	.23	.080	.032	.094	.032	848.40	1398.74	
.000099	1080.	1040.	980.	2	0	0	.00	2016.67	4019.41	

FORM 1411 5-GB
PRINTED IN U.S.A.

00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: Hamburg Twp

3) WATERCOURSE: Huron River

4) DOCUMENT TYPE: Natural Floodway

Baseline Lake to Whitewood Lk.

00BREAK00

```
*********************************************************
*  WATER SURFACE PROFILES                               *
*  VERSION OF NOVEMBER 1976                             *
*  UPDATED JULY 1979                                    *
*                                                       *
*  RUN DATE TUE, JUL 21, 1981,  4:29 PM                 *
*********************************************************
```

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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    X
XXXXXXX  XXXX      X         XXXXX  XXXXX
X     X  X         X                X
X     X  X         X    X           X
X     X  XXXXXXX   XXXXX            XXXXXXX
```

"Baseline Lake to Whitewood Lakes"

(Natural Floodway)

Note: See microfiche

Data Revised

RECEIVED
JUL 27 1981
WATER MANAGEMENT

FORM 1411 ½ GB
PRINTED IN U.S.A.

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*****************************************************
 REC2 RELEASE DATED NOV 76 UPDATED JULY,1979
 ERROR CORR -  01,02,03
 MODIFICATION -  50,51,52,53
*****************************************************

C
T1      HAMBURG TOWNSHIP FIS - JOB NO. 6504-03 FILE: RATWHD
T2      100-YEAR NATURAL FLOODWAY - BASE LINE LAKE TO WHITEWOOD LAKES
T3      HURON RIVER - PROJECT MANAGER, N.S.CHENG

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ
      -1.      2.       0.       0.    .000000     .00      .0       0.    855.040    .000

J2  NPROF    IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE
     1.000    .000   -1.000    .000     .000     .800     .000     .000     .000     .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    38.000   40.000   41.000   42.000   43.000   1.000    8.000   10.000   12.000    3.000

    33.000    4.000   25.000    .000     .000     .000     .000     .000     .000     .000

NC    .100     .050     .040     .300     .500     .000     .000     .000     .000     .000
QT   1.000    2485.000  .000     .000     .000     .000     .000     .000     .000     .000

          VALLEY SECTION 7   (A)

X1  72.679   21.000  1800.000 1896.000    .000     .000     .000     .000     .000     .000
X3    .000    .000     .000   1500.000    .000    1930.000  .000     .000     .000     .000
GR  868.000   .000    860.000  100.000   856.000   130.000  852.000  240.000  852.000  750.000
GR  853.300  950.000  852.000 1580.000   851.800  1800.000  850.900 1801.000  850.200 1809.000
GR  846.200 1824.000  844.700 1839.000   842.200  1861.000  847.000 1880.000  851.200 1894.000
GR  854.200 1896.000  854.000 2240.000   854.000  2310.000  856.000 2350.000  858.000 2540.000
GR  868.000 2600.000   .000    .000      .000     .000     .000     .000     .000     .000
NC    .100    .100     .040    .000      .000     .000     .000     .000     .000     .000
QT   1.000  2335.000   .000    .000      .000     .000     .000     .000     .000     .000

          VALLEY SECTION 8   (B)

X1  73.028   23.000  1550.000 1725.000 2140.000 1700.000 1840.000    .000     .000     .000
X3    .000    .000     .000    590.000    .000   2870.000   .000     .000     .000     .000
GR  866.000   .000    864.000   20.000  862.000   50.000  860.000  100.000  858.000  150.000
GR  856.000  250.000  855.500  480.000   854.000  770.000  852.000 1550.000  851.000 1551.000
GR  850.100 1570.000  849.100 1590.000   846.000 1620.000  847.500 1650.000  847.900 1675.000
GR  848.900 1700.000  850.900 1715.000   852.100 1725.000  851.300 2150.000  852.000 2900.000
GR  854.000 2940.000  856.000 3030.000   858.000 3110.000    .000     .000     .000     .000
NC    .100    .100     .040    .000      .000     .000     .000     .000     .000     .000

          MANUFACTURED SECTION - CHANNEL POINTS FROM SECTION 8 WITH OVERBANKS
```

FROM 2-FT. CONTOUR MAP

XI	73.081	25.000	1590.000	1765.000	170.000	280.000	280.000	.000	.000	.000
X3	.000	.000	.000	630.000	.000	3170.000	.000	.000	.000	.000
GR	866.000	.000	860.000	100.000	858.000	140.000	856.000	330.000	854.000	530.000
GR	852.000	1370.000	852.600	1590.000	851.600	1591.000	850.700	1610.000	849.700	1630.000
GR	846.600	1660.000	848.100	1690.000	848.500	1715.000	849.500	1740.000	851.500	1755.000
GR	852.700	1765.000	852.000	2070.000	854.000	2270.000	856.000	2510.000	856.400	2570.000
GR	856.000	2600.000	854.000	2740.000	854.000	2890.000	856.000	3170.000	856.300	3340.000
NH	6.000	.125	1890.000	.070	2040.000	.040	2250.000	.125	2930.000	.050
NH	3630.000	.125	4250.000	.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 9 - GR POINTS MODIFIED BETWEEN STA'S 2210 AND 2430 TO

REMOVE LINE OF HOMES FROM NATURAL FLOODWAY. (C)

XI	73.278	53.000	2040.000	2250.000	1080.000	980.000	1040.000	.000	.000	.000
GR	870.000	.000	870.000	50.000	864.000	90.000	860.000	150.000	858.000	260.000
GR	857.000	470.000	858.000	680.000	860.000	740.000	862.000	780.000	870.000	880.000
GR	872.000	940.000	874.000	960.000	876.000	1000.000	876.000	1130.000	870.000	1200.000
GR	866.000	1230.000	860.000	1290.000	858.000	1315.000	854.000	1440.000	854.000	1890.000
GR	854.300	1940.000	852.700	2040.000	850.900	2043.000	848.400	2070.000	849.100	2095.000
GR	849.100	2120.000	849.300	2145.000	849.700	2175.000	850.500	2190.000	850.700	2246.000
GR	851.900	2250.000	854.000	2520.000	855.300	2550.000	855.300	2550.000	854.000	2610.000
GR	853.000	2750.000	854.000	2890.000	856.000	2930.000	858.000	3000.000	859.300	3100.000
GR	858.000	3230.000	856.000	3280.000	854.000	3340.000	854.300	3410.000	865.000	3410.000
GR	865.000	3630.000	854.000	3630.000	853.400	3730.000	854.000	3960.000	856.000	4050.000
GR	858.000	4110.000	864.000	4170.000	866.000	4250.000	.000	.000	.000	.000
EJ	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

FORM 1411 15 C8
PRINTED IN U.S.A.

```
*PROF 1

CCHV=     .300 CEHV=     .500
*SECNO 72.679
   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=     1500.0     1930.0  TYPE=     1  TARGET=     430.000

          VALLEY SECTION 7   (A)

   72.68     12.84    855.04      .00    855.04    855.11       .07       .00       .00    851.80
   2485.      463.     2010.      12.      927.      830.       29.        0.        0.    854.20
     .00       .50      2.42      .42      .080      .032      .040      .000    842.20   1500.00
 .000162       0.        0.       0.         0         0         0       .00    430.00   1930.00

*SECNO 73.028

3470 ENCROACHMENT STATIONS=      590.0     2870.0  TYPE=     1  TARGET=    2280.000

          VALLEY SECTION 8   (B)

   73.03      9.24    855.24      .00       .00    855.25       .01       .11       .02    852.00
   2335.      316.     1047.     972.     1887.     1168.     4100.      192.       60.    852.10
     .99       .17       .90      .24      .080      .032      .080      .032    846.00    590.00
 .000030     2140.     1840.    1700.         2         0         0       .00   2280.00   2870.00

*SECNO 73.081

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS=      630.0     3170.0  TYPE=     1  TARGET=    2540.000

          MANUFACTURED SECTION - CHANNEL POINTS FROM SECTION 8 WITH OVERBANKS

          FROM 2-FT. CONTOUR MAP

   73.08      8.65    855.25      .00       .00    855.26       .01       .01       .00    852.60
   2335.      639.     1268.     428.     2408.     1066.     1786.      226.       72.    852.70
    1.08       .27      1.19      .24      .080      .032      .080      .032    846.60    630.00
 .000059      170.      280.     280.         1         0         0       .00   2204.40   3065.80

1490 NH CARD USED
*SECNO 73.278

3265 DIVIDED FLOW

          VALLEY SECTION 9 - GR POINTS MODIFIED BETWEEN STA'S 2210 AND 2430 TO
```

REMOVE LINE OF HOMES FROM NATURAL FLOODWAY. (C)

23.28	6.92	855.32	.00	.00	855.34	.02	.08	.01	852.70
2335.	198.	1694.	443.	862.	1170.	1909.	335.	121.	851.90
1.34	.23	1.45	.23	.080	.032	.094	.032	848.40	1398.74
.000099	1080.	1040.	980.	2	0	0	.00	2016.67	4019.41

FORM 1411 5-68
PRINTED IN U.S.A.

00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: Hamburg Twp

3) WATERCOURSE: Huron River

4) DOCUMENT TYPE: Natural Floodway
White Lake to
Gallagher Lake

00BREAK00

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*********************************************************
*  WATER SURFACE PROFILES                               *
*  VERSION OF NOVEMBER 1976                             *
*  UPDATED JULY 1979                                    *
*                                                       *
*  RUN DATE TUE, JUL 21, 1981,  4:32 PM                 *
*********************************************************
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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     X             X
XXXXXXX  XXXX   X           XXXXX   XXXXX
X     X  X      X           X       X
X     X  X      X     X     X       X
X     X  XXXXXXX   XXXXX            XXXXXXX
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Whitewood Lakes to Gallagher Lake

(Natural Floodway)

RECEIVED
JUL 27 1981
WATER MANAGEMENT

FORM 1411 ½ G8
PRINTED IN U.S.A.

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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -   01,02,03
  MODIFICATION -   50,51,52,53
*****************************************************

C
T1       HAMBURG TOWNSHIP FIS - JOB NO. 6504-03  FILE:  RATGAL
T2       100-YEAR NATURAL FLOODWAY - WHITEWOOD LAKES TO GALLAGHER LAKE
T3       HURON RIVER - PROJECT MANAGER, M.S.CHENG

J1  ICHECK   INQ    NINV    IDIR    STRT   METRIC   HVINS    Q    WSEL    FQ
      -1.     2.      0.      0.  .000000    .00      .0     0.  855.340  .000

J2  NPROF    IPLOT   PRFVS   XSECV   XSECH   FN      ALLDC   IBW     CHNIM  ITRACE
    1.000     .000  -1.000    .000    .000   .800    .000    .000    .000    .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

   38.000  40.000  41.000  42.000  43.000   1.000   8.000  10.000  12.000   3.000

   33.000   4.000  25.000    .000    .000    .000    .000    .000    .000    .000

NC    .125    .125    .040    .300    .500    .000    .000    .000    .000    .000
QT   1.000 2410.000    .000    .000    .000    .000    .000    .000    .000    .000

X1  73.747   31.000 2170.000 2317.000    .000    .000    .000    .000    .000    .000
X3    .000    .000    .000    .000    .000 3730.000    .000    .000    .000    .000
GR 870.000    .000  860.000  120.000  858.000  210.000  858.000  320.000  860.000  380.000
GR 864.000  490.000  864.400  720.000  866.000  810.000  870.000  890.000  876.000 1040.000
GR 876.000 1190.000  866.000 1370.000  864.000 1470.000  856.000 1570.000  854.000 1630.000
GR 852.100 2170.000  851.200 2173.000  850.200 2187.000  848.300 2206.000  845.200 2223.000
GR 844.600 2240.000  845.200 2255.000  846.300 2275.000  855.200 2300.000  857.100 2315.000
GR 851.900 2317.000  854.000 3010.000  854.000 3160.000  854.000 3630.000  856.000 3670.000
GR 870.000 3730.000    .000    .000    .000    .000    .000    .000    .000    .000


        VALLEY SECTION 11   (D)

X1  73.834    .000    .000    .000  500.000  460.000  460.000    .000    .000    .000
X3    .000    .000    .000    .000    .000 3730.000    .000    .000    .000    .000
NC    .125    .125    .040    .000    .000    .000    .000    .000    .000    .000


        VALLEY SECTION 12   (E)

X1  73.999   33.000 1600.000 1910.000  750.000  780.000  870.000    .000    .000    .000
X3    .000    .000    .000  370.000    .000    .000    .000    .000    .000    .000
GR 859.500    .000  858.000   90.000  856.000  160.000  854.000  190.000  854.000  260.000
GR 863.500  370.000  856.000  450.000  855.400  500.000  856.000  530.000  858.000  580.000
GR 858.000  610.000  854.000  640.000  852.800  880.000  852.800 1500.000  852.500 1600.000
GR 851.200 1602.000  849.100 1625.000  840.500 1650.000  834.700 1675.000  826.700 1750.000
```

GR	832.500	1800.000	846.700	1850.000	848.500	1875.000	850.200	1905.000	852.000	1910.000
GR	854.000	2220.000	856.000	2320.000	856.000	2380.000	854.000	2510.000	854.000	2590.000
GR	856.000	2620.000	858.000	2640.000	860.000	2670.000	.000	.000	.000	.000
EJ	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

```
*PROF 1

CCHV=     .300 CEHV=     .500
*SECNO 73.747

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=        .0    3730.0  TYPE=     1  TARGET=    3729.999
    73.75     10.74    855.34       .00    855.34    855.37       .03       .00       .00    852.10
    2410.      298.     1565.      547.     1264.      981.     2505.        0.        0.    851.90
      .00       .24      1.60       .22      .100      .032      .100      .000    844.60   1589.80
  .000085        0.        0.        0.         0         0         0       .00   2052.43   3656.80

*SECNO 73.834

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS=        .0    3730.0  TYPE=     1  TARGET=    3729.999

          VALLEY SECTION 11    (D)

    73.83     10.78    855.38       .00       .00    855.41       .02       .04       .00    852.10
    2410.      302.     1551.      557.     1287.      986.     2559.       52.       22.    851.90
      .12       .23      1.57       .22      .100      .032      .100      .032    844.60   1588.59
  .000083      500.      460.      460.         0         0         0       .00   2054.79   3657.61

*SECNO 73.999

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS=     370.0    2670.0  TYPE=     1  TARGET=    -370.000

          VALLEY SECTION 12    (E)

    74.00     28.71    855.41       .00       .00    855.42       .00       .01       .01    852.50
    2410.       96.     2279.       35.     2388.     5173.      992.      177.       57.    852.00
      .68       .04       .44       .04      .100      .032      .100      .032    826.70    498.79
  .000002      750.      870.      780.         2         0         0       .00   1856.44   2611.22
```

00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: Hamburg Twp.

3) WATERCOURSE: Huron River

4) DOCUMENT TYPE: Natural Floodway

Gallagher Lk to Section G

00BREAK00

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*****************************************************
*  WATER SURFACE PROFILES                           *
*  VERSION OF NOVEMBER 1976                         *
*  UPDATED JULY 1979                                *
*                                                   *
*  RUN DATE TUE, JUL 21, 1981,  4:33 PM             *
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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    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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"Gallagher Lake to Section G"

(Natural Floodway)

RECEIVED
JUL 27 1981
WATER MANAGEMENT

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**********************************************
 HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
 ERROR CORR -  01,02,03
 MODIFICATION -  50,51,52,53
**********************************************

C
T1      HAMBURG TOWNSHIP FIS - JOB NO. 6504-03  FILE:  RAT18N
T2      100-YEAR NATURAL FLOODWAY - GALLAGHER LAKE TO SECTION G
T3      HURON RIVER - NORTHERN ROUTE - PROJECT MANAGER, M.S.CHENG

J1  ICHECK   INQ     NINV    IDIR    STRT    METRIC  HVINS   Q       NSEL    FQ
       -1      2.      0.      0.  .000000     .00      .0      0.  855.420   .000

J2  NPROF    IPLOT   PRFVS   XSECV   XSECH   FN      ALLDC   IBW     CHNIM   ITRACE
     1.000    .000  -1.000    .000    .000    .800    .000    .000    .000    .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    38.000  40.000  41.000  42.000  43.000   1.000   8.000  10.000  12.000   3.000

    33.000   4.000  25.000    .000    .000    .000    .000    .000    .000    .000

NC    .050    .100    .040    .300    .500    .000    .000    .000    .000    .000
QT   1.000 2050.000    .000    .000    .000    .000    .000    .000    .000    .000

          VALLEY SECTION 16   (F)

X1  74.905  19.000 850.000 981.000    .000    .000    .000    .000    .000    .000
X3    .000    .000    .000 840.000    .000 1950.000    .000    .000    .000    .000
GR 862.600    .000 856.000  50.000 856.000 840.000 853.300 850.000 851.600 853.000
GR 846.800 872.000 845.100 884.000 844.500 900.000 844.200 922.000 847.700 945.000
GR 849.100 960.000 849.700 970.000 851.600 980.000 851.900 981.000 854.000 1150.000
GR 856.000 2360.000 858.000 2450.000 860.000 2950.000 870.000 3000.000    .000    .000
NC    .125    .125    .045    .000    .000    .000    .000    .000    .000    .000

          VALLEY SECTION 17   (G)

X1  75.096  19.000 250.000 425.000 1250.000 380.000 1010.000    .000    .000    .000
X3    .000    .000    .000    .000    .000 2020.000    .000    .000    .000    .000
GR 855.300 170.000 853.100 235.000 850.300 237.000 848.700 250.000 842.700 261.000
GR 839.900 289.000 839.900 309.000 843.900 325.000 847.100 342.000 849.000 385.000
GR 852.000 420.000 852.500 425.000 854.000 435.000 856.000 2350.000 856.000 2750.000
GR 858.000 2790.000 860.000 2940.000 862.000 2970.000 870.000 3030.000    .000    .000
EJ    .000    .000    .000    .000    .000    .000    .000    .000    .000    .000
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*PROF 1

CCHVH     300 CEHV=    .500
*SECNO 74.905
   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=      840.0     1950.0  TYPE=     1  TARGET=    1110.000

          VALLEY SECTION 16    (F)

    74.91     11.22    855.42       .00    855.42    855.46       .04       .00       .00    853.30
    2050.        3.      1837.      210.        8.      1089.     1025.        0.        0.    851.90
      .00       .34      1.69       .21      .040      .032      .080      .000    844.20    842.15
  .000080        0.        0.        0.         0         0         0       .00   1107.85   1950.00

*SECNO 75.096

3470 ENCROACHMENT STATIONS=         .0     2020.0  TYPE=     1  TARGET=    2019.999

          VALLEY SECTION 17    (G)

    75.10     15.60    855.50       .00       .00    855.52       .02       .05       .01    848.70
    2050.       33.      1935.       82.      169.     1715.     1086.       44.       15.    852.50
      .25       .19      1.13       .08      .100      .036      .100      .038    839.90    170.00
  .000036     1250.      1010.      380.         0         0         0       .00   1691.85   1861.85
```

00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: Hamburg Twp.

3) WATERCOURSE: Huron River

4) DOCUMENT TYPE: Natural Floodway

LOOK to SECTION L

00BREAK00

```
*****************************************************
*  WATER SURFACE PROFILES                           *
*  VERSION OF NOVEMBER 1976                         *
*  UPDATED JULY 1979                                *
*                                                   *
*  RUN DATE TUE, JUL 21, 1981,  4:36 PM             *
*****************************************************
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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
```

" Loon Lake to Section L "

(Natural Floodway)

RECEIVED
JUL 27 1981
WATER MANAGEMENT

```
*****************************************************
 HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
 ERROR CORR -  01,02,03
 MODIFICATION -  50,51,52,53
*****************************************************

C
T1       HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2       100-YEAR NATURAL FLOODWAY - LOON LAKE TO SECTION L
T3       HURON RIVER - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      -1.       2.        0.        0.   .000000      .00       .0        0.    855.420    .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     1.000     .000    -1.000     .000      .000      .800      .000      .000      .000      .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    38.000   40.000   41.000   42.000   43.000    1.000    8.000   10.000   12.000    3.000

    33.000    4.000   25.000     .000     .000     .000     .000     .000     .000     .000

NC      .050     .125     .045     .300     .500     .000     .000     .000     .000     .000
QT     1.000  250.000     .000     .000     .000     .000     .000     .000     .000     .000

        VALLEY SECTION 14   (I)

X1  1750.000   22.000  620.000  687.000     .000     .000     .000     .000     .000     .000
X3      .000     .000     .000  600.000     .000 1180.000     .000     .000     .000     .000
GR   870.000     .000  868.000   20.000  862.000  100.000  860.000  130.000  858.000  220.000
GR   856.000  350.000  855.500  510.000  858.300  620.000  853.900  621.000  851.900  633.000
GR   851.100  652.000  852.100  660.000  854.900  674.000  856.200  686.000  859.600  687.000
GR   856.000  710.000  854.800  920.000  854.700 1190.000  856.000 1790.000  858.000 1840.000
GR   860.000 1860.000  862.500 1890.000     .000     .000     .000     .000     .000     .000
NC      .050     .125     .045     .000     .000     .000     .000     .000     .000     .000

        VALLEY SECTION 15   (J)

X1  3280.000   18.000  130.000  191.000 1750.000 1360.000 1530.000     .000     .000     .000
X3      .000     .000     .000     .000     .000  680.000     .000     .000     .000     .000
GR   870.000     .000  860.000   60.000  858.000   70.000  856.000   80.000  854.000  100.000
GR   854.000  130.000  850.000  131.000  846.600  145.000  845.200  155.000  847.500  167.000
GR   849.600  177.000  851.100  189.000  854.800  191.000  856.000  840.000  858.000  890.000
GR   856.000 1050.000  856.000 1170.000  862.000 1190.000     .000     .000     .000     .000

        MANUFACTURED SECTION. CHANNEL POINTS FROM SECTION 15 AND ADJUSTED FOR

        CHANNEL INVERT WITH OVERBANKS REPEATED FROM SECTION 15.
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X1   3447.000     18.000    130.000    191.000    190.000    110.000    167.000       .000       .000       .000
X3       .000       .000       .000       .000       .000    560.000       .000       .000       .000       .000
GR    870.000       .000    860.000     60.000    858.000     70.000    856.000     80.000    854.000    100.000
GR    854.000    130.000    852.600    131.000    849.200    145.000    847.800    155.000    850.100    167.000
GR    852.200    177.000    853.700    189.000    854.800    191.000    856.000    840.000    858.000    890.000
GR    856.000   1050.000    856.000   1170.000    862.000   1190.000       .000       .000       .000       .000
NC       .040       .040       .028       .000       .000       .000       .000       .000       .000       .000


         BRIDGE SECTION 3 - BEACH RD. BRIDGE - D/S FACE   (K)

X1   3448.000     21.000    230.000    270.000      1.000      1.000      1.000       .000       .000       .000
X3       .000       .000       .000       .000       .000    710.000       .000       .000       .000       .000
BT     10.000       .000    863.900       .000     30.000    862.300       .000    130.000    858.100       .000
BT    230.000    856.900    855.200    270.000    856.800    854.900    330.000    855.700       .000    430.000
BT    855.700       .000    530.000    854.100       .000    630.000    854.200       .000    710.000    854.600
BT       .000       .000       .000       .000       .000       .000       .000       .000       .000       .000
GR    863.900       .000    862.300     30.000    858.100    130.000    856.900    230.000    852.500    230.000
GR    851.800    233.000    849.600    240.000    847.800    250.000    848.800    260.000    851.600    270.000
GR    856.800    270.000    855.700    330.000    855.700    430.000    854.100    530.000    854.200    630.000
GR    854.600    710.000    854.900    830.000    854.500    930.000    854.200   1030.000    853.800   1130.000
GR    854.200   1230.000       .000       .000       .000       .000       .000       .000       .000       .000


         BRIDGE SECTION 3 - BEACH RD. BRIDGE - U/S FACE   (K)

X1   3460.000     21.000    230.000    270.000     12.000     12.000     12.000       .000       .000       .000
X3       .000       .000       .000       .000       .000    710.000       .000       .000       .000       .000
BT     10.000       .000    863.900       .000     30.000    862.300       .000    130.000    858.100       .000
BT    230.000    856.900    855.200    270.000    856.800    854.900    330.000    855.700       .000    430.000
BT    855.700       .000    530.000    854.100       .000    630.000    854.200       .000    710.000    854.600
BT       .000       .000       .000       .000       .000       .000       .000       .000       .000       .000
GR    863.900       .000    862.300     30.000    858.100    130.000    856.900    230.000    852.700    230.000
GR    852.000    233.000    849.800    240.000    848.000    250.000    849.000    260.000    851.800    270.000
GR    856.800    270.000    855.700    330.000    855.700    430.000    854.100    530.000    854.200    630.000
GR    854.600    710.000    854.900    830.000    854.500    930.000    854.200   1030.000    853.800   1130.000
GR    854.200   1230.000       .000       .000       .000       .000       .000       .000       .000       .000
NC       .050       .100       .040       .000       .000       .000       .000       .000       .000       .000


         MANUFACTURED SECTION. CHANNEL POINTS FROM SECTION 15 AND ADJUSTED FOR

         CHANNEL INVERT WITH OVERBANKS REPEATED FROM SECTION 15.

X1   3461.000     18.000    130.000    191.000      1.000      1.000      1.000       .000       .000       .000
X3       .000       .000       .000       .000       .000    560.000       .000       .000       .000       .000
GR    870.000       .000    860.000     60.000    858.000     70.000    856.000     80.000    854.000    100.000
GR    854.000    130.000    852.800    131.000    849.400    145.000    848.000    155.000    850.300    167.000
GR    852.400    177.000    853.900    189.000    854.800    191.000    856.000    840.000    858.000    890.000
GR    856.000   1050.000    856.000   1170.000    862.000   1190.000       .000       .000       .000       .000
NC       .050       .125       .045       .000       .000       .000       .000       .000       .000       .000


         VALLEY SECTION 17   (L)

X1   4460.000     11.000     70.000    170.000    990.000   1090.000    999.000       .000       .000       .000
GR    866.000       .000    860.000     35.000    855.400     70.000    851.300     85.000    848.600    111.000
GR    847.900    117.000    847.800    126.000    847.000    139.000    848.100    150.000    850.300    166.000
GR    855.300    170.000       .000       .000       .000       .000       .000       .000       .000       .000
EJ       .000       .000       .000       .000       .000       .000       .000       .000       .000       .000
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*PROF 1

CCHV=     .300 CEHV=     .500
*SECNO 1750.000

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=     600.0     1180.0  TYPE=     1  TARGET=     580.000

          VALLEY SECTION 14   (I)

  1750.00      4.32    855.42       .00    855.42    855.44       .02       .00       .00    858.30
     250.        0.      214.       36.        0.      164.      207.        0.        0.    859.60
      .00       .00      1.31       .17      .040      .036      .100      .000    851.10    620.65
  .000263        0.        0.        0.         0         0         0       .00    426.64   1180.00

*SECNO 3280.000

3470 ENCROACHMENT STATIONS=        .0      680.0  TYPE=     1  TARGET=     679.999

          VALLEY SECTION 15   (J)

  3280.00     10.30    855.50       .00       .00    855.50       .00       .05       .01    854.00
     250.        9.      237.        4.       56.      446.      132.       17.       15.    854.80
      .83       .16       .53       .03      .040      .036      .100      .036    845.20     85.02
  .000013     1750.     1530.     1360.         2         0         0       .00    483.64    568.66

*SECNO 3447.000

3470 ENCROACHMENT STATIONS=        .0      560.0  TYPE=     1  TARGET=     559.999

          MANUFACTURED SECTION. CHANNEL POINTS FROM SECTION 15 AND ADJUSTED FOR


          CHANNEL INVERT WITH OVERBANKS REPEATED FROM SECTION 15.

  3447.00      7.70    855.50       .00       .00    855.51       .01       .00       .00    854.00
     250.       17.      226.        7.       57.      292.      136.       19.       16.    854.80
      .89       .30       .77       .05      .040      .036      .100      .036    847.80     84.90
  .000045      190.      167.      110.         1         0         0       .00    475.10    560.00

*SECNO 3448.000

3265 DIVIDED FLOW

3280 CROSS SECTION   3448.00 EXTENDED      1.30 FEET
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FORM 1411 1-68
PRINTED IN U.S.A.

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3370 NORMAL BRIDGE,NRD= 10 MIN ELTRD=  854.10 MAX ELLC=  855.20

3470 ENCROACHMENT STATIONS=          .0      710.0  TYPE=      1  TARGET=      709.999

          BRIDGE SECTION 3 - BEACH RD. BRIDGE - D/S FACE   (K)

  3448.00      7.70    855.50       .00       .00    855.51       .01       .00       .00    856.90
     250.        0.      163.       87.        0.     219.      284.       19.       16.    856.80
      .89       .00       .75       .30      .032      .022      .032      .036    847.80    230.00
  .000037        1.        1.        1.         0         0         0    -18.00    307.50    710.00

*SECNO 3460.000

3265 DIVIDED FLOW

3280 CROSS SECTION    3460.00 EXTENDED       1.30 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

3370 NORMAL BRIDGE,NRD= 10 MIN ELTRD=  854.10 MAX ELLC=  855.20

3470 ENCROACHMENT STATIONS=          .0      710.0  TYPE=      1  TARGET=      709.999

          BRIDGE SECTION 3 - BEACH RD. BRIDGE - U/S FACE   (K)

  3460.00      7.50    855.50       .00       .00    855.51       .01       .00       .00    856.90
     250.        0.      160.       90.        0.     211.      285.       19.       16.    856.80
      .90       .00       .76       .32      .032      .022      .032      .036    848.00    230.00
  .000040       12.       12.       12.         0         0         0    -18.14    307.71    710.00

*SECNO 3461.000

3470 ENCROACHMENT STATIONS=          .0      560.0  TYPE=      1  TARGET=      559.999

          MANUFACTURED SECTION. CHANNEL POINTS FROM SECTION 15 AND ADJUSTED FOR

          CHANNEL INVERT WITH OVERBANKS REPEATED FROM SECTION 15.

  3461.00      7.50    855.50       .00       .00    855.51       .01       .00       .00    854.00
     250.       16.      226.        8.       56.     280.      134.       19.       16.    854.80
      .90       .29       .81       .06      .040      .032      .080      .036    848.00     84.97
  .000041        1.        1.        1.         0         0         0       .00    475.03    560.00

*SECNO 4460.000
3280 CROSS SECTION    4460.00 EXTENDED        .24 FEET
```

VALLEY SECTION 17 (L)

4460.00	8.53	855.53	.00	.00	855.53	.00	.02	.00	855.40
250.	0.	250.	0.	.0.	597.	0.	32.	23.	855.30
1.56	.00	.42	.00	.040	.036	.100	.038	847.00	68.97
.000010	990.	999.	1090.	1	0	0	.00	101.03	170.00

00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: Hamburg Twp

3) WATERCOURSE: Huron River

4) DOCUMENT TYPE: Natural Floodway
Section 8/L to Strawberry Lk.

00BREAK00

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*****************************************************
*  WATER SURFACE PROFILES                           *
*  VERSION OF NOVEMBER 1976                         *
*  UPDATED JULY 1979                                *
*                                                   *
*  RUN DATE TUE, JUL 21, 1981,  4:38 PM             *
*****************************************************
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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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"Section G/L to Strawberry Lake"

(Natural Floodway)

FORM 1411 1-68
PRINTED IN U.S.A.

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*************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
*************************************************

C
T1      HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2      100-YEAR NATURAL FLOODWAY - SECTION G/L TO STRAWBERRY LAKE
T3      HURON RIVER - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

     -1.       2.       0.       0.   .000000     .00      .0       0.    855.530   .000

J2  NPROF    IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

    1.000     .000   -1.000     .000     .000    .800     .000     .000     .000     .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

   38.000   40.000   41.000   42.000   43.000    1.000    8.000   10.000   12.000    3.000

   33.000    4.000   25.000     .000     .000     .000     .000     .000     .000     .000

NC     .125     .125     .045     .300     .500     .000     .000     .000     .000     .000
NH    5.000     .050   70.000     .045  170.000     .125  250.000     .045  425.000     .125
NH 3030.000     .000     .000     .000     .000     .000     .000     .000     .000     .000
QT    1.000 2300.000     .000     .000     .000     .000     .000     .000     .000     .000


        VALLEY SECTION 17   (G/L)

X1   75.096   29.000   70.000  425.000 1250.000  380.000 1010.000     .000     .000     .000
X3     .000     .000     .000     .000     .000 2020.000     .000     .000     .000     .000
GR  866.000     .000  860.000   35.000  855.400   70.000  851.300   85.000  848.600  111.000
GR  847.900  117.000  847.800  126.000  847.000  139.000  848.100  150.000  850.300  166.000
GR  855.300  170.000  853.100  235.000  850.300  237.000  848.700  250.000  842.700  261.000
GR  839.900  289.000  839.900  309.000  843.900  325.000  847.100  342.000  849.000  385.000
GR  852.000  420.000  852.500  425.000  854.000  435.000  856.000 2350.000  856.000 2750.000
GR  858.000 2790.000  860.000 2940.000  862.000 2970.000  870.000 3030.000     .000     .000
NC     .060     .125     .040     .000     .000     .000     .000     .000     .000     .000
QT    1.000 2320.000     .000     .000     .000     .000     .000     .000     .000     .000


        VALLEY SECTION 18   (M)

X1   75.342   21.000  140.000  268.000 1120.000  900.000 1300.000     .000     .000     .000
X3     .000     .000     .000     .000     .000 1840.000     .000     .000     .000     .000
GR  868.000     .000  860.000  100.000  852.100  140.000  850.600  143.000  848.900  168.000
GR  849.200  189.000  849.400  203.000  849.700  223.000  850.400  234.000  850.100  240.000
GR  850.500  250.000  851.000  260.000  851.700  267.000  852.200  268.000  854.000  280.000
GR  855.000 2140.000  856.000 2260.000  858.000 2350.000  860.000 2720.000  862.000 2760.000
GR  870.000 2820.000     .000     .000     .000     .000     .000     .000     .000     .000
NC     .060     .060     .042     .000     .000     .000     .000     .000     .000     .000
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VALLEY SECTION 19 (N)

X1	75.814	24.000	930.000	1121.000	2270.000	1110.000	2490.000	.000	.000	.000
X3	.000	.000	.000	680.000	.000	1310.000	.000	.000	.000	.000
GR	868.000	.000	866.000	10.000	862.000	100.000	860.000	180.000	860.000	510.000
GR	859.300	710.000	858.000	850.000	854.200	930.000	851.800	935.000	849.000	960.000
GR	847.100	977.000	848.500	1002.000	848.300	1024.000	849.000	1040.000	849.600	1060.000
GR	849.900	1090.000	851.500	1114.000	853.800	1121.000	854.000	1140.000	856.000	1230.000
GR	858.000	1240.000	860.000	1420.000	862.000	1680.000	863.600	1830.000	.000	.000
EJ	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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*PROF 1

CCHV=     .300 CEHV=     .500
1490 NH CARD USED
*SECNO 75.096
   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=        .0     2020.0  TYPE=      1  TARGET=     2019.999

          VALLEY SECTION 17   (G/L)

    75.10     15.63    855.53       .00    855.53    855.54       .01       .00       .00    855.40
    2300.        0.     2221.       79.        0.     2491.     1144.        0.        0.    852.50
      .00       .00       .89       .07      .040      .048      .100      .000    839.90     69.01
  .000030     1250.     1010.      380.         0         0         0       .00   1830.96   1899.97

*SECNO 75.342

3470 ENCROACHMENT STATIONS=        .0     1840.0  TYPE=      1  TARGET=     1839.999

          VALLEY SECTION 18   (M)

    75.34      6.68    855.58       .00       .00    855.66       .07       .08       .03    852.10
    2320.       22.     1790.      507.       31.     732.     1847.       79.       39.    852.20
      .18       .73      2.45       .27      .048      .032      .100      .033    848.90    122.36
  .000273     1120.     1300.      900.         2         0         0       .00   1717.64   1840.00

*SECNO 75.814

3470 ENCROACHMENT STATIONS=      680.0     1310.0  TYPE=      1  TARGET=      630.000

          VALLEY SECTION 19   (N)

    75.81      8.94    856.04       .00       .00    856.09       .05       .43       .01    854.20
    2320.       12.     2249.       59.       36.     1260.      135.      163.       71.    853.80
      .55       .34      1.78       .44      .048      .034      .048      .035    847.10    891.19
  .000133     2270.     2490.     1110.         2         0         0       .00    339.02   1230.22
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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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00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: Hamburg Twp

3) WATERCOURSE: Huron River

4) DOCUMENT TYPE: Natural Floodway
Section 4/L to Strawberry Lk.

00BREAK00

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*****************************************************
*  WATER SURFACE PROFILES                           *
*  VERSION OF NOVEMBER 1976                         *
*  UPDATED JULY 1979                                *
*                                                   *
*  RUN DATE TUE, JUL 21, 1981,  4:38 PM             *
*****************************************************
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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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"Section G/L to Strawberry Lake"

(Natural Floodway)

FORM 1411 1-68
PRINTED IN U.S.A.

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*****************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
*****************************************

C
T1       HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2       100-YEAR NATURAL FLOODWAY - SECTION G/L TO STRAWBERRY LAKE
T3       HURON RIVER - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

     -1.       2.        0.        0.    .000000      .00       .0        0.     855.530    .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     1.000     .000    -1.000     .000      .000      .800      .000      .000      .000      .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    38.000   40.000   41.000   42.000   43.000    1.000    8.000   10.000   12.000    3.000

    33.000    4.000   25.000     .000     .000     .000     .000     .000     .000     .000

NC     .125     .125     .045     .300     .500     .000     .000     .000     .000     .000
NH    5.000     .050   70.000     .045  170.000     .125  250.000     .045  425.000     .125
NH 3030.000     .000     .000     .000     .000     .000     .000     .000     .000     .000
QT    1.000 2300.000     .000     .000     .000     .000     .000     .000     .000     .000


          VALLEY SECTION 17   (G/L)

X1   75.096   29.000   70.000  425.000 1250.000  380.000 1010.000     .000     .000     .000
X3     .000     .000     .000     .000     .000 2020.000     .000     .000     .000     .000
GR  866.000     .000  860.000   35.000  855.400   70.000  851.300   85.000  848.600  111.000
GR  847.900  117.000  847.800  126.000  847.000  139.000  848.100  150.000  850.300  166.000
GR  855.300  170.000  853.100  235.000  850.300  237.000  848.700  250.000  842.700  261.000
GR  839.900  289.000  839.900  309.000  843.900  325.000  847.100  342.000  849.000  385.000
GR  852.000  420.000  852.500  425.000  854.000  435.000  856.000 2350.000  856.000 2750.000
GR  858.000 2790.000  860.000 2940.000  862.000 2970.000  870.000 3030.000     .000     .000
NC     .060     .125     .040     .000     .000     .000     .000     .000     .000     .000
QT    1.000 2320.000     .000     .000     .000     .000     .000     .000     .000     .000


          VALLEY SECTION 18   (M)

X1   75.342   21.000  140.000  268.000 1120.000  900.000 1300.000     .000     .000     .000
X3     .000     .000     .000     .000     .000 1840.000     .000     .000     .000     .000
GR  868.000     .000  860.000  100.000  852.100  140.000  850.600  143.000  848.900  168.000
GR  849.200  189.000  849.400  203.000  849.700  223.000  850.400  234.000  850.100  240.000
GR  850.500  250.000  851.000  260.000  851.700  267.000  852.200  268.000  854.000  280.000
GR  855.000 2140.000  856.000 2260.000  858.000 2350.000  860.000 2720.000  862.000 2760.000
GR  870.000 2820.000     .000     .000     .000     .000     .000     .000     .000     .000
NC     .060     .060     .042     .000     .000     .000     .000     .000     .000     .000
```

VALLEY SECTION 19 (N)

X1	75.814	24.000	930.000	1121.000	2270.000	1110.000	2490.000	.000	.000	.000
X3	.000	.000	.000	680.000	.000	1310.000	.000	.000	.000	.000
GR	868.000	.000	866.000	10.000	862.000	100.000	860.000	180.000	860.000	510.000
GR	859.300	710.000	858.000	850.000	854.200	930.000	851.800	935.000	849.000	960.000
GR	847.100	977.000	848.500	1002.000	848.300	1024.000	849.000	1040.000	849.600	1060.000
GR	849.900	1090.000	851.500	1114.000	853.800	1121.000	854.000	1140.000	856.000	1230.000
GR	858.000	1240.000	860.000	1420.000	862.000	1680.000	863.600	1830.000	.000	.000
EJ	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

FORM 1411 ½ GB
PRINTED IN U.S.A.

*PROF 1

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CCHV=     .300 CEHV=     .500
1490 NH CARD USED
*SECNO 75.096
   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=        .0    2020.0  TYPE=     1  TARGET=    2019.999

          VALLEY SECTION 17   (G/L)

    75.10     15.63    855.53       .00    855.53    855.54       .01       .00       .00    855.40
    2300.        0.     2221.       79.        0.     2491.     1144.        0.        0.    852.50
      .00       .00       .89       .07      .040      .048      .100      .000    839.90     69.01
  .000030     1250.     1010.      380.         0         0         0       .00   1830.96   1899.97

*SECNO 75.342

3470 ENCROACHMENT STATIONS=        .0    1840.0  TYPE=     1  TARGET=    1839.999

          VALLEY SECTION 18   (M)

    75.34      6.68    855.58       .00       .00    855.66       .07       .08       .03    852.10
    2320.       22.     1790.      507.       31.     732.     1847.       79.       39.    852.20
      .18       .73      2.45       .27      .048      .032      .100      .033    848.90    122.36
  .000273     1120.     1300.      900.         2         0         0       .00   1717.64   1840.00

*SECNO 75.814

3470 ENCROACHMENT STATIONS=      680.0    1310.0  TYPE=     1  TARGET=     630.000

          VALLEY SECTION 19   (N)

    75.81      8.94    856.04       .00       .00    856.09       .05       .43       .01    854.20
    2320.       12.     2249.       59.       36.     1260.      135.      163.       71.    853.80
      .55       .34      1.78       .44      .048      .034      .048      .035    847.10    891.19
  .000133     2270.     2490.     1110.         2         0         0       .00    339.02   1230.22
```

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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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00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: Hamburg Twp

3) WATERCOURSE: Huron River

4) DOCUMENT TYPE: NATURAL FLOODWAY
STRAWBERRY LK to
CORPORATE LIMIT

00BREAK00

```
*****************************************************
*  WATER SURFACE PROFILES                           *
*  VERSION OF NOVEMBER 1976                         *
*  UPDATED JULY 1979                                *
*                                                   *
*  RUN DATE TUE, JUL 21, 1981,  4:39 PM             *
*****************************************************
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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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RECEIVED
JUL 27 1981
WATER MANAGEMENT

```
X     X  XXXXXXX   XXXXX              XXXXX
X     X  X         X     X           X     X
X     X  X         X                 X     X
XXXXXXX  XXXX      X        XXXXX    XXXXX
X     X  X         X                 X
X     X  X         X     X           X
X     X  XXXXXXX   XXXXX              XXXXXXX
```

"Strawberry Lake to Coporate Boundary"

(Natural Floodway)

FORM 1411 5 GB
PRINTED IN U.S.A.

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*************************************************
 HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
 ERROR CORR -  01,02,03
 MODIFICATION -  50,51,52,53
*************************************************

C
T1      HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2      100-YEAR NATURAL FLOODWAY - STRAWBERRY LAKE TO CORPORATE LIMITS
T3      HURON RIVER - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

     -1.       2.        0.        0.     .000000     .00       .0        0.     856.090    .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    1.000     .000     -1.000     .000      .000      .800      .000      .000      .000      .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

   38.000    40.000    41.000    42.000    43.000    1.000     8.000    10.000    12.000     3.000

   33.000     4.000    25.000     .000      .000      .000      .000      .000      .000      .000

NC     .060      .125      .040      .300      .500      .000      .000      .000      .000      .000
QT    1.000  2200.000      .000      .000      .000      .000      .000      .000      .000      .000

        VALLEY SECTION 20   (O),  ENCROACHED DUE TO FILLING

X1   76.798    26.000   825.000   914.000     .000      .000      .000      .000      .000      .000
X3     .000      .000     .000   625.000     .000     1145.000   .000      .000      .000      .000
GR   870.000     .000   860.000    15.000   858.000    25.000   856.000   255.000   855.200   385.000
GR   854.500   730.000   853.300  825.000   849.800   828.000   845.600   845.000   845.500   860.000
GR   846.500   875.000   848.100  890.000   849.800   900.000   851.300   910.000   852.200   914.000
GR   853.800  1845.000   854.000 2095.000   855.600  2425.000   856.000  2805.000   857.300  2895.000
GR   856.000  2945.000   856.000 3505.000   856.300  3595.000   856.000  3725.000   856.000  3965.000
GR   868.000  4045.000     .000     .000     .000     .000      .000      .000      .000      .000
NC     .125      .100     .040     .000     .000     .000      .000      .000      .000      .000

        VALLEY SECTION 21   (P),  ENCROACHED DUE TO FILLING

X1   77.030    23.000   770.000   876.000  1420.000  1180.000  1220.000   .000      .000      .000
X3     .000      .000     .000     .000     .000     1375.000   .000      .000      .000      .000
GR   880.000     .000   860.000    50.000   854.000    70.000   852.600   770.000   850.300   773.000
GR   848.700   790.000   848.100  805.000   847.500   813.000   847.800   825.000   848.500   835.000
GR   849.100   843.000   850.100  853.000   850.800   865.000   851.800   875.000   852.200   876.000
GR   854.000  1530.000   856.000 1570.000   857.500  2640.000   856.000  3150.000   856.000  4010.000
GR   858.000  4020.000   860.000 4040.000   866.000  4080.000     .000      .000      .000      .000
NC     .125      .060     .040     .000     .000     .000      .000      .000      .000      .000

X1   77.232    27.000  2080.000  2186.000   780.000   760.000  1070.000   .000      .000      .000
```

X3	.000	.000	.000	860.000	.000	2275.000	.000	.000	.000	.000
GR	880.000	.000	864.000	60.000	860.000	80.000	858.000	110.000	854.000	150.000
GR	854.000	1650.000	853.700	2000.000	853.600	2080.000	851.300	2083.000	849.700	2100.000
GR	849.100	2115.000	848.500	2123.000	848.800	2135.000	849.500	2145.000	850.100	2153.000
GR	851.100	2163.000	851.800	2175.000	852.800	2185.000	853.200	2186.000	854.000	2190.000
GR	856.000	2220.000	857.300	2380.000	857.700	2560.000	857.800	3000.000	858.000	3300.000
GR	860.000	3340.000	870.000	3390.000	.000	.000	.000	.000	.000	.000
QT	1.000	1950.000	.000	.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 22 (Q)

X1	77.353	22.000	560.000	672.000	1060.000	640.000	640.000	.000	.000	.000
X3	.000	.000	.000	230.000	.000	720.000	.000	.000	.000	.000
GR	870.000	.000	860.000	60.000	860.000	110.000	854.000	150.000	852.900	560.000
GR	852.000	562.000	849.100	582.000	849.100	592.000	849.200	601.000	849.400	610.000
GR	849.900	627.000	849.900	642.000	850.000	656.000	851.300	670.000	853.900	672.000
GR	854.000	680.000	855.700	870.000	856.000	1210.000	857.300	1600.000	858.000	1960.000
GR	860.000	1980.000	870.000	2020.000	.000	.000	.000	.000	.000	.000
NC	.125	.060	.040	.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 23 (R)

X1	77.499	20.000	390.000	485.000	910.000	570.000	770.000	.000	.000	.000
X3	.000	.000	.000	290.000	.000	500.000	.000	.000	.000	.000
GR	860.000	.000	860.000	210.000	856.000	220.000	854.000	350.000	853.100	390.000
GR	851.900	395.000	850.100	410.000	846.900	420.000	847.100	432.000	846.700	443.000
GR	848.700	455.000	850.700	470.000	852.700	475.000	857.700	485.000	870.000	500.000
GR	870.000	560.000	860.000	680.000	858.000	720.000	858.000	980.000	870.000	1050.000

X1	77.566	22.000	560.000	672.000	400.000	420.000	353.000	.000	.000	.000
X3	.000	.000	.000	562.000	.000	626.000	.000	.000	.000	.000
GR	869.300	.000	859.300	60.000	859.300	110.000	853.300	150.000	852.200	560.000
GR	851.300	562.000	848.400	582.000	848.400	592.000	848.500	601.000	848.700	610.000
GR	849.200	627.000	849.200	642.000	849.300	656.000	850.600	670.000	853.200	672.000
GR	853.300	680.000	855.000	870.000	855.300	1210.000	856.600	1600.000	857.300	1960.000
GR	859.300	1980.000	869.300	2020.000	.000	.000	.000	.000	.000	.000
NC	.040	.040	.025	.000	.000	.000	.000	.000	.000	.000

BRIDGE SECTION 4 - ANN ARBOR RAILROAD - D/S FACE (S)

X1	77.567	22.000	300.000	364.000	1.000	1.000	1.000	.000	.000	.000
BT	12.000	.000	861.000	.000	100.000	861.000	.000	200.000	861.900	.000
BT	296.900	861.900	.000	297.000	865.200	.000	300.000	865.200	858.800	364.000
BT	865.200	858.800	367.000	865.200	.000	367.100	862.100	.000	400.000	862.100
BT	.000	500.000	862.100	.000	600.000	862.200	.000	.000	.000	.000
GR	861.000	.000	861.000	100.000	861.900	200.000	861.900	296.900	858.800	296.900
GR	858.800	300.000	853.100	300.000	853.100	301.300	849.200	301.500	848.800	310.000
GR	848.800	320.000	848.400	330.000	849.200	340.000	849.600	350.000	850.900	362.500
GR	852.700	362.700	852.700	364.000	858.800	364.000	862.100	367.100	862.100	400.000
GR	862.100	500.000	862.200	600.000	.000	.000	.000	.000	.000	.000

BRIDGE SECTION 4 - ANN ARBOR RAILROAD - U/S FACE (S)

X1	77.569	22.000	300.000	364.000	16.000	16.000	16.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000

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GR	861.000	.000	861.000	100.000	861.900	200.000	861.900	296.900	858.800	296.900
GR	858.800	300.000	853.200	300.000	853.200	301.300	849.300	301.500	849.900	310.000
GR	848.900	320.000	848.500	330.000	849.300	340.000	849.700	350.000	851.000	362.500
GR	852.800	362.700	852.800	364.000	858.800	364.000	862.100	367.100	862.100	400.000
GR	862.100	500.000	862.200	600.000	.000	.000	.000	.000	.000	.000
NC	.100	.060	.040	.000	.000	.000	.000	.000	.000	.000
X1	77.570	22.000	560.000	672.000	1.000	1.000	1.000	.000	.000	.000
X3	.000	.000	.000	561.000	.000	627.000	.000	.000	.000	.000
GR	869.400	.000	859.400	60.000	859.400	110.000	853.400	150.000	852.300	560.000
GR	851.400	562.000	848.500	582.000	848.500	592.000	848.600	601.000	848.800	610.000
GR	849.300	627.000	849.300	642.000	849.400	656.000	850.700	670.000	853.300	672.000
GR	853.400	680.000	855.100	870.000	855.400	1210.000	856.700	1600.000	857.400	1960.000
GR	859.400	1980.000	869.400	2020.000	.000	.000	.000	.000	.000	.000
X1	77.602	22.000	560.000	672.000	180.000	200.000	176.000	.000	.000	.000
X3	.000	.000	.000	554.000	.000	672.000	.000	.000	.000	.000
GR	869.300	.000	859.300	60.000	859.300	110.000	853.300	150.000	852.200	560.000
GR	851.300	562.000	848.400	582.000	848.400	592.000	848.500	601.000	848.700	610.000
GR	849.200	627.000	849.200	642.000	849.300	656.000	850.600	670.000	853.200	672.000
GR	853.300	680.000	855.000	870.000	855.300	1210.000	856.600	1600.000	857.300	1960.000
GR	859.300	1980.000	869.300	2020.000	.000	.000	.000	.000	.000	.000
NC	.040	.040	.025	.000	.000	.000	.000	.000	.000	.000

BRIDGE SECTION 5 - ABANDONED GRAND TRUNK RAILROAD - D/S FACE (T)

X1	77.603	29.000	300.000	418.000	1.000	1.000	1.000	.000	.000	.000
BT	44.000	.000	860.600	.000	100.000	860.600	.000	200.000	860.500	.000
BT	300.000	860.300	857.900	313.000	860.300	857.900	313.000	860.300	851.100	314.000
BT	860.300	850.600	314.000	860.300	857.900	323.000	860.300	857.900	323.000	860.300
BT	849.800	324.000	860.300	850.200	324.000	860.300	857.900	335.000	860.300	857.900
BT	335.000	860.300	850.000	336.000	860.300	850.000	336.000	860.300	857.500	347.000
BT	860.200	857.800	347.000	860.200	850.100	348.000	860.200	849.800	348.000	860.200
BT	857.800	359.000	860.200	857.800	359.000	860.200	849.500	360.000	860.200	849.000
BT	360.000	860.200	857.800	371.000	860.200	857.800	371.000	860.200	848.700	372.000
BT	860.200	848.800	372.000	860.200	857.800	382.000	860.200	857.800	382.000	860.200
BT	848.800	383.000	860.200	848.800	383.000	860.200	857.800	394.000	860.100	857.700
BT	394.000	860.100	848.800	395.000	860.100	849.000	395.000	860.100	857.700	406.000
BT	860.100	857.700	406.000	860.100	848.400	407.000	860.100	849.100	407.000	860.100
BT	857.700	418.000	860.100	857.700	500.000	860.000	.000	600.000	860.000	.000
BT	700.000	860.000	.000	.000	.000	.000	.000	.000	.000	.000
GR	860.600	.000	860.600	100.000	860.500	200.000	860.300	300.000	852.500	300.000
GR	851.100	313.000	850.600	314.000	849.800	323.000	850.200	324.000	850.000	335.000
GR	850.000	336.000	850.100	347.000	849.800	348.000	849.500	359.000	849.000	360.000
GR	848.700	371.000	848.800	372.000	848.800	382.000	848.800	383.000	848.800	394.000
GR	849.000	395.000	848.400	406.000	849.100	407.000	852.900	416.000	853.600	418.000
GR	860.100	418.000	860.000	500.000	860.000	600.000	860.000	700.000	.000	.000

BRIDGE SECTION 5 - ABANDONED GRAND TRUNK RAILROAD - U/S FACE (T)

X1	77.605	.000	.000	.000	12.000	12.000	12.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.060	.100	.040	.000	.000	.000	.000	.000	.000	.000
X1	77.606	22.000	560.000	672.000	1.000	1.000	1.000	.000	.000	.000

Last

X3	.000	.000	.000	553.000	.000	673.000	.000	.000	.000	.000
GR	869.300	.000	859.300	60.000	859.300	110.000	853.300	150.000	852.200	560.000
GR	851.300	562.000	848.400	582.000	848.400	592.000	848.500	601.000	848.700	610.000
GR	849.200	627.000	849.200	642.000	849.300	656.000	850.600	670.000	853.200	672.000
GR	853.300	680.000	855.000	870.000	855.300	1210.000	856.600	1600.000	857.300	1960.000
GR	859.300	1980.000	869.300	2020.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 24 (U)

X1	77.717	19.000	70.000	176.000	560.000	690.000	589.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	500.000	.000	.000	.000	.000
GR	870.000	.000	860.000	40.000	853.200	70.000	850.200	80.000	850.200	92.000
GR	850.200	107.000	850.200	118.000	850.200	130.000	850.200	140.000	849.300	153.000
GR	849.500	170.000	853.200	176.000	856.000	730.000	858.000	1100.000	860.000	1120.000
GR	860.000	1230.000	860.000	1500.000	866.000	1580.000	870.000	1660.000	.000	.000
NC	.100	.100	.040	.000	.000	.000	.000	.000	.000*	.000

VALLEY SECTION 25 (V)

X1	77.899	15.000	55.000	166.000	980.000	820.000	960.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	275.000	.000	.000	.000	.000
GR	880.000	.000	860.000	40.000	853.800	55.000	852.000	60.000	849.400	80.000
GR	849.200	95.000	849.200	110.000	850.000	125.000	851.000	140.000	852.600	164.000
GR	853.700	166.000	856.000	845.000	862.000	925.000	864.000	1055.000	866.000	1185.000

X1	77.999	.000	.000	.000	550.000	500.000	533.000	.000	.600	.000
X3	.000	.000	.000	60.000	.000	144.000	.000	.000	.000	.000
NC	.030	.030	.025	.000	.000	.000	.000	.000	.000	.000

BRIDGE SECTION 6 - M-36 BRIDGE - D/S FACE (W)

X1	78.000	29.000	225.000	309.000	1.000	1.000	1.000	.000	.000	.000
BT	26.000	.000	868.300	.000	25.000	866.800	.000	125.000	863.500	.000
BT	222.000	863.500	.000	222.000	867.300	.000	225.000	867.300	855.300	233.000
BT	868.100	858.600	237.000	869.100	860.400	252.000	872.900	860.400	267.000	874.200
BT	860.400	282.000	872.800	860.400	297.000	868.900	860.400	301.000	867.500	858.600
BT	309.000	867.200	855.300	312.000	867.200	.000	312.000	863.500	.000	425.000
BT	863.000	.000	525.000	863.200	.000	625.000	863.200	.000	725.000	862.800
BT	.000	825.000	862.600	.000	925.000	863.500	.000	1025.000	864.200	.000
BT	1125.000	864.900	.000	1225.000	866.100	.000	1325.000	867.400	.000	.000
GR	868.300	.000	866.800	25.000	863.500	125.000	863.500	222.000	863.500	225.000
GR	852.200	225.000	851.200	233.000	850.800	237.000	850.000	244.000	849.800	252.000
GR	849.800	257.000	850.100	267.000	849.800	280.000	850.000	282.000	851.000	295.000
GR	851.200	297.000	852.400	309.000	863.500	309.000	863.500	312.000	863.000	425.000
GR	863.200	525.000	863.200	625.000	862.800	725.000	862.600	825.000	863.500	925.000
GR	864.200	1025.000	864.900	1125.000	866.100	1225.000	867.400	1325.000	.000	.000

BRIDGE SECTION 6 - M-36 BRIDGE - U/S FACE (W)

X1	78.005	.000	.000	.000	26.000	26.000	26.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.070	.060	.040	.000	.000	.000	.000	.000	.000	.000

X1	78.006	24.000	220.000	330.000	1.000	1.000	1.000	.000	.000	.000

FORM 1411 5 Gb
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X3	.000	.000	.000	235.000	.000	321.000	.000	.000	.000	.000
GR	870.100	.000	860.100	10.000	856.100	40.000	855.300	220.000	851.900	230.000
GR	851.600	245.000	850.300	265.000	850.300	280.000	849.800	295.000	850.300	305.000
GR	851.400	318.000	852.500	325.000	856.300	330.000	856.100	350.000	858.100	380.000
GR	859.100	480.000	858.100	610.000	856.100	640.000	855.100	770.000	856.100	880.000
GR	864.100	950.000	866.100	1090.000	868.100	1130.000	870.100	1170.000	.000	.000

VALLEY SECTION 26 (X)

X1	78.045	24.000	220.000	330.000	210.000	210.000	209.000	.000	.000	.000
X3	.000	.000	.000	75.000	.000	370.000	.000	.000	.000	.000
GR	870.000	.000	860.000	10.000	856.000	40.000	855.200	220.000	851.800	230.000
GR	851.500	245.000	850.200	265.000	850.200	280.000	849.700	295.000	850.200	305.000
GR	851.300	318.000	852.400	325.000	856.200	330.000	856.000	350.000	858.000	380.000
GR	859.000	480.000	858.000	610.000	856.000	640.000	855.000	770.000	856.000	880.000
GR	864.000	950.000	866.000	1090.000	868.000	1130.000	870.000	1170.000	.000	.000
NH	4.000	.060	660.000	.040	743.000	.100	960.000	.050	1110.000	.000

VALLEY SECTION 27 (Y)

X1	78.283	24.000	660.000	743.000	1270.000	1120.000	1260.000	.000	.000	.000
X3	.000	.000	.000	620.000	.000	.000	.000	.000	.000	.000
GR	870.000	.000	868.000	90.000	864.000	130.000	862.000	250.000	860.500	300.000
GR	862.000	370.000	863.000	450.000	862.000	480.000	860.000	510.000	858.000	570.000
GR	856.000	650.000	855.300	660.000	852.400	665.000	850.200	683.000	849.500	694.000
GR	849.600	708.000	850.400	720.000	851.500	735.000	852.900	740.000	853.700	743.000
GR	856.000	960.000	862.000	1010.000	864.000	1040.000	870.000	1110.000	.000	.000
NH	4.000	.050	1010.000	.100	1230.000	.040	1325.000	.070	1380.000	.000

VALLEY SECTION 28 (Z)

X1	78.522	23.000	1230.000	1325.000	1260.000	1240.000	1260.000	.000	.000	.000
X3	.000	.000	.000	890.000	.000	.000	.000	.000	.000	.000
GR	870.000	.000	868.000	70.000	866.000	260.000	864.000	370.000	862.000	410.000
GR	860.000	440.000	860.000	510.000	858.000	580.000	856.000	1010.000	853.800	1230.000
GR	852.500	1235.000	851.200	1250.000	850.900	1260.000	850.500	1271.000	850.000	1280.000
GR	850.200	1296.000	850.500	1310.000	852.500	1317.000	853.500	1323.000	854.000	1325.000
GR	856.000	1340.000	860.000	1350.000	870.000	1380.000	.000	.000	.000	.000
NC	.070	.070	.040	.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 29 (AA)

X1	78.819	22.000	1080.000	1170.000	1270.000	1650.000	1570.000	.000	.000	.000
X3	.000	.000	.000	880.000	.000	.000	.000	.000	.000	.000
GR	870.000	.000	868.000	80.000	866.000	290.000	864.000	380.000	862.000	450.000
GR	860.000	510.000	858.000	645.000	856.000	655.000	856.000	740.000	857.600	870.000
GR	856.000	1060.000	854.700	1080.000	853.500	1090.000	853.000	1095.000	851.000	1101.000
GR	850.000	1116.000	850.300	1130.000	850.600	1140.000	852.100	1155.000	857.000	1170.000
GR	860.000	1180.000	870.000	1210.000	.000	.000	.000	.000	.000	.000
NH	4.000	.040	50.000	.100	80.000	.040	205.000	.100	1160.000	.000

VALLEY SECTION 30 (AB)

X1	79.018	22.000	80.000	205.000	1010.000	1050.000	1050.000	.000	.000	.000
GR	870.000	.000	860.000	50.000	855.300	80.000	853.600	86.000	851.500	95.000

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GR	850.500	110.000	850.800	130.000	851.200	140.000	851.400	150.000	851.600	160.000
GR	851.700	170.000	851.400	180.000	851.500	185.000	853.200	200.000	854.400	205.000
GR	858.000	530.000	860.000	620.000	862.000	770.000	864.000	820.000	866.000	890.000
GR	868.000	1040.000	870.000	1160.000	.000	.000	.000	.000	.000	.000
NC	.125	.100	.040	.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 31 (AC)

X1	79.369	19.000	40.000	162.000	1950.000	1740.000	1850.000	.000	.000	.000
GR	880.000	.000	854.900	40.000	854.100	45.000	853.400	50.000	850.700	70.000
GR	850.100	90.000	850.100	106.000	851.100	120.000	851.400	134.000	851.900	150.000
GR	854.100	160.000	854.300	162.000	858.000	340.000	860.000	470.000	862.000	660.000
GR	864.000	820.000	866.000	910.000	868.000	1000.000	870.000	1110.000	.000	.000
NH	4.000	.100	270.000	.040	406.000	.100	530.000	.060	610.000	.000

VALLEY SECTION 32 (AD)

X1	79.600	22.000	270.000	406.000	1300.000	1100.000	1220.000	.000	.000	.000
GR	870.000	.000	860.000	100.000	858.000	120.000	854.900	270.000	854.200	274.000
GR	852.700	288.000	850.600	305.000	850.600	315.000	850.600	325.000	851.200	338.000
GR	851.400	348.000	851.200	360.000	851.200	370.000	851.200	380.000	851.800	395.000
GR	852.700	400.000	854.600	406.000	858.000	460.000	860.000	480.000	862.000	490.000
GR	868.000	530.000	870.000	610.000	.000	.000	.000	.000	.000	.000
NC	.100	.070	.040	.000	.000	.000	.000	.000	.000	.000

X1	79.861	18.000	90.000	216.000	1440.000	1350.000	1384.000	.000	.000	.000
X3	.000	.000	.000	88.000	.000	212.000	.000	.000	.000	.000
GR	869.600	.000	859.600	45.000	857.600	60.000	855.200	90.000	853.600	100.000
GR	851.700	117.000	851.500	135.000	851.300	147.000	851.200	157.000	851.200	175.000
GR	852.000	190.000	852.700	205.000	853.200	214.000	855.300	216.000	857.600	300.000
GR	859.600	330.000	861.600	360.000	869.600	480.000	.000	.000	.000	.000
NC	.040	.040	.025	.000	.000	.000	.000	.000	.000	.000

BRIDGE SECTION 7 - WINANS LAKE ROAD - D/S FACE (AE)

U.S.G.S. GAGING STATION LOCATED AT DOWNSTREAM FACE OF BRIDGE.

X1	79.862	20.000	100.000	230.000	1.000	1.000	1.000	.000	.000	.000
BT	15.000	.000	867.600	.000	100.000	867.200	863.100	141.000	866.700	862.400
BT	141.000	866.700	852.000	143.500	866.700	851.700	143.500	866.700	862.400	186.000
BT	866.200	861.500	186.000	866.200	851.600	188.500	866.200	851.700	188.500	866.200
BT	861.500	230.000	865.700	861.700	300.000	863.000	.000	400.000	863.300	.000
BT	500.000	865.600	.000	600.000	869.200	.000	.000	.000	.000	.000
GR	867.600	.000	867.200	100.000	861.000	100.000	854.400	124.000	852.000	141.000
GR	851.700	143.500	851.200	154.000	851.200	164.000	851.700	174.000	851.600	186.000
GR	851.700	188.500	852.100	201.000	854.400	212.000	857.700	217.000	859.300	230.000
GR	865.700	230.000	863.000	300.000	863.300	400.000	865.600	500.000	869.200	600.000

BRIDGE SECTION 7 - WINANS LAKE ROAD - U/S FACE (AE)

U.S.G.S. GAGING STATION LOCATED AT DOWNSTREAM FACE OF BRIDGE.

X1	79.869	.000	.000	.000	35.000	35.000	35.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.050	.050	.042	.000	.000	.000	.000	.000	.000	.000

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X1	79.870	18.000	90.000	216.000	1.000	1.000	1.000	.000	.000	.000
X3	.000	.000	.000	87.000	.000	213.000	.000	.000	.000	.000
GR	869.600	.000	859.600	45.000	857.600	60.000	855.200	90.000	853.600	100.000
GR	851.700	117.000	851.500	135.000	851.300	147.000	851.200	157.000	851.200	175.000
GR	852.000	190.000	852.700	205.000	853.200	214.000	855.300	216.000	857.600	300.000
GR	859.600	330.000	861.600	360.000	869.600	480.000	.000	.000	.000	.000

VALLEY SECTION 33 (AF)

X1	79.886	18.000	90.000	216.000	90.000	90.000	89.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	300.000	.000	.000	.000	.000
GR	870.000	.000	860.000	45.000	858.000	60.000	855.600	90.000	854.000	100.000
GR	852.100	117.000	851.900	135.000	851.700	147.000	851.600	157.000	851.600	175.000
GR	852.400	190.000	853.100	205.000	853.600	214.000	855.700	216.000	858.000	300.000
GR	860.000	330.000	862.000	360.000	870.000	480.000	.000	.000	.000	.000
NC	.060	.060	.042	.000	.000	.000	.000	.000	.000	.000
QT	1.000	1930.000	.000	.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 34 (AG)

X1	80.145	22.000	270.000	381.000	1400.000	1260.000	1370.000	.000	.000	.000
X3	.000	.000	.000	100.000	.000	.000	.000	.000	.000	.000
GR	870.000	.000	864.000	90.000	860.000	140.000	858.000	170.000	856.000	250.000
GR	855.500	270.000	853.600	280.000	853.100	290.000	852.700	300.000	852.700	310.000
GR	852.600	330.000	852.900	350.000	853.100	360.000	853.800	370.000	854.400	374.000
GR	856.100	381.000	856.000	410.000	858.000	430.000	860.000	440.000	866.000	470.000
GR	868.000	640.000	870.000	780.000	.000	.000	.000	.000	.000	.000
NC	.050	.050	.042	.000	.000	.000	.000	.000	.000	.000
QT	1.000	1905.000	.000	.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 35 (AH)

X1	80.459	17.000	100.000	560.000	1350.000	1800.000	1660.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	620.000	.000	.000	.000	.000
GR	870.000	.000	860.000	50.000	856.000	70.000	855.000	100.000	852.300	110.000
GR	851.700	190.000	852.700	310.000	852.400	380.000	851.700	450.000	852.000	505.000
GR	853.300	553.000	854.200	557.000	855.700	560.000	856.000	570.000	860.000	580.000
GR	862.000	810.000	870.000	840.000	.000	.000	.000	.000	.000	.000
NC	.050	.100	.042	.000	.000	.000	.000	.000	.000	.000
QT	1.000	1680.000	.000	.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 36 (AI)

X1	80.560	19.000	100.000	600.000	520.000	570.000	530.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	630.000	.000	.000	.000	.000
GR	870.000	.000	860.000	50.000	856.000	90.000	855.100	100.000	854.800	128.000
GR	852.900	160.000	852.600	175.000	852.900	190.000	853.100	250.000	853.800	415.000
GR	853.500	492.000	853.600	516.000	852.600	529.000	851.300	544.000	850.600	559.000
GR	849.600	575.000	854.600	600.000	856.200	670.000	858.800	770.000	.000	.000
NC	.100	.070	.040	.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 37 (AJ)

X1	80.925	18.000	235.000	345.000	1330.000	2160.000	1930.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	945.000	.000	.000	.000	.000
GR	868.600	.000	862.600	10.000	960.000	35.000	856.200	135.000	855.000	235.000
GR	849.800	247.000	851.300	262.000	851.800	285.000	852.100	301.000	852.800	323.000
GR	853.300	333.000	853.800	344.000	854.300	345.000	854.400	445.000	856.000	705.000
GR	858.000	825.000	860.000	865.000	860.800	945.000	.000	.000	.000	.000
EJ	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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*PROF 1

CCHV=     .300 CEHV=     .500
*SECNO 76.798
  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=     625.0     1145.0  TYPE=     1  TARGET=     520.000

          VALLEY SECTION 20   (O),  ENCROACHED DUE TO FILLING

    76.80     10.59    856.09      .00    856.09    856.15      .06      .00      .00    853.30
    2200.      202.     1643.     355.     364.      742.     853.       0.       0.    852.20
      .00       .56      2.22      .42      .048      .032     .100     .000   845.50    625.00
  .000140       0.        0.        0.        0         0        0      .00   520.00   1145.00

*SECNO 77.030

3470 ENCROACHMENT STATIONS=        .0     1375.0  TYPE=     1  TARGET=    1374.999

          VALLEY SECTION 21   (P),  ENCROACHED DUE TO FILLING

    77.03      8.76    856.26      .00       .00    856.28      .02      .12      .01    852.60
    2200.      537.     1071.     591.    2086.      750.    1687.      95.      27.    852.20
      .41       .26      1.43      .35      .100      .032     .080     .031   847.50     62.44
  .000071    1420.     1220.    1180.       0         0        0      .00  1312.56   1375.00

*SECNO 77.232

3470 ENCROACHMENT STATIONS=     860.0     2275.0  TYPE=     1  TARGET=    1415.000
    77.23      7.85    856.35      .00       .00    856.38      .03      .09      .01    853.60
    2200.      953.     1219.     27.    2955.      653.     60.     173.      52.    853.20
      .62       .32      1.87      .46      .100      .032     .048     .034   848.50    860.00
  .000145     780.     1070.     760.       0         0        0      .00  1403.81   2263.81

*SECNO 77.353

3470 ENCROACHMENT STATIONS=     230.0      720.0  TYPE=     1  TARGET=     490.000

          VALLEY SECTION 22   (Q)

    77.35      7.36    856.46      .00       .00    856.51      .05      .12      .01    852.90
    1950.      411.     1465.     74.    1028.      724.    111.     233.      74.    853.90
      .76       .40      2.02      .67      .100      .032     .048     .032   849.10    230.00
  .000161    1060.      640.     640.       2         0        0      .00   490.00    720.00

*SECNO 77.499
  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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3470 ENCROACHMENT STATIONS=     290.0     500.0 TYPE=     1  TARGET=     210.000

          VALLEY SECTION 23   (R)

    77.50      9.89    856.59      .00      .00    856.70      .11      .16      .03    853.10
    1950.      114.    1836.       0.     248.     655.       0.     259.      80.     857.70
      .84       .46     2.80      .00     .100     .032     .048     .032   846.70    290.00
  .000277      910.     770.     570.        1        0        0      .00   192.76    482.76

*SECNO 77.566

3470 ENCROACHMENT STATIONS=     562.0     626.0 TYPE=     1  TARGET=      64.000
    77.57      8.26    856.66      .00      .00    856.91      .25      .14      .07100000.00
    1950.        0.    1950.       0.       0.     490.       0.     265.      81. 100000.00
      .86       .00     3.98      .00     .100     .032     .048     .032   848.40    562.00
  .000625      400.     353.     420.        0        0        0      .00    64.00    626.00

*SECNO 77.567

3370 NORMAL BRIDGE,NRD= 12 MIN ELTRD=  861.00 MAX ELLC=  858.80

          BRIDGE SECTION 4 - ANN ARBOR RAILROAD - D/S FACE   (S)

    77.57      8.25    856.65      .00      .00    856.92      .27      .00      .01    858.80
    1950.        0.    1950.       0.       0.     467.       0.     265.      81.     858.80
      .86       .00     4.17      .00     .032     .020     .032     .032   848.40    300.00
  .000285        1.       1.       1.        1        0        0      .00    64.00    364.00

*SECNO 77.569

          BRIDGE SECTION 4 - ANN ARBOR RAILROAD - U/S FACE   (S)

    77.57      8.15    856.65      .00      .00    856.93      .28      .00      .00    858.80
    1950.        0.    1950.       0.       0.     461.       0.     265.      81.     858.80
      .86       .00     4.23      .00     .032     .020     .032     .032   848.50    300.00
  .000297       16.      16.      16.        0        0        0      .00    64.00    364.00

*SECNO 77.570

3470 ENCROACHMENT STATIONS=     561.0     627.0 TYPE=     1  TARGET=      66.000
    77.57      8.20    856.70      .00      .00    856.94      .24      .00      .01100000.00
    1950.        0.    1950.       0.       0.     498.       0.     265.      81. 100000.00
      .86       .00     3.92      .00     .080     .032     .048     .032   848.50    561.00
  .000607        1.       1.       1.        2        0        0      .00    66.00    627.00

*SECNO 77.602
   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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3470 ENCROACHMENT STATIONS=      554.0      672.0  TYPE=      1  TARGET=      118.000
    77.60      8.56    856.96       .00       .00    857.04       .08       .05       .05    852.20
    1950.       13.     1937.       0.       29.      859.       0.      268.       82.  100000.00
      .89       .46      2.25       .00      .080      .032      .048      .032    848.40    554.00
  .000166      180.      176.      200.         2         0         0       .00    118.00    672.00

*SECNO 77.603

3370 NORMAL BRIDGE,NRD= 44 MIN ELTRD=  860.00 MAX ELLC=  857.90

          BRIDGE SECTION 5 - ABANDONED GRAND TRUNK RAILROAD - D/S FACE   (T)

    77.60      8.55    856.95       .00       .00    857.05       .10       .00       .01    860.30
    1950.        0.     1950.       0.        0.      772.       0.      268.       82.     860.10
      .89       .00      2.53       .00      .032      .020      .032      .032    848.40    300.00
  .000261        1.        1.        1.         1         0         0    -67.36    118.00    418.00

*SECNO 77.605

3370 NORMAL BRIDGE,NRD= 44 MIN ELTRD=  860.00 MAX ELLC=  857.90

          BRIDGE SECTION 5 - ABANDONED GRAND TRUNK RAILROAD - U/S FACE   (T)

    77.61      8.55    856.95       .00       .00    857.05       .10       .00       .00    860.30
    1950.        0.     1950.       0.        0.      772.       0.      268.       82.     860.10
      .89       .00      2.53       .00      .032      .020      .032      .032    848.40    300.00
  .000261       12.       12.       12.         0         0         0    -67.34    118.00    418.00

*SECNO 77.606

3470 ENCROACHMENT STATIONS=      553.0      673.0  TYPE=      1  TARGET=      120.000
    77.61      8.58    856.98       .00       .00    857.06       .08       .00       .01    852.20
    1950.       26.     1923.       1.        33.      862.       4.      268.       82.     853.20
      .89       .77      2.23       .20      .048      .032      .080      .032    848.40    553.00
  .000155        1.        1.        1.         2         0         0       .00    120.00    673.00

*SECNO 77.717

3470 ENCROACHMENT STATIONS=          .0      500.0  TYPE=      1  TARGET=      499.999

          VALLEY SECTION 24   (U)

    77.72      7.81    857.11       .00       .00    857.16       .05       .09       .01    853.20
    1950.       19.     1459.      472.       34.      730.     1002.      287.       86.     853.20
      .99       .57      2.00       .47      .048      .032      .080      .032    849.30     52.74
  .000144      560.      589.      690.         0         0         0       .00    447.26    500.00

*SECNO 77.899
   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=        .0      275.0  TYPE=     1  TARGET=     274.999

          VALLEY SECTION 25   (V)

    77.90     8.06   857.26      .00      .00   857.33      .07      .16      .01   853.80
    1950.       5.    1734.     211.      14.     748.     367.     317.      93.   853.70
     1.11      .36     2.32      .58     .080     .032     .080     .032   849.20    46.65
  .000198     980.     960.     820.        0        0        0      .00   228.35   275.00

*SECNO 77.999

3470 ENCROACHMENT STATIONS=      60.0      144.0  TYPE=     1  TARGET=      84.000
    78.00     7.56   857.36      .00      .00   857.54      .18      .16      .05100000.00
    1950.       0.    1950.       0.       0.     570.       0.     327.      95. 100000.00
     1.16      .00     3.42      .00     .080     .032     .080     .032   849.80    60.00
  .000495     550.     533.     500.        1        0        0      .00    84.00   144.00

*SECNO 78.000

3370 NORMAL BRIDGE,NRD= 26 MIN ELTRD=  862.60 MAX ELLC=  860.40

          BRIDGE SECTION 6 - M-36 BRIDGE - D/S FACE   (W)

    78.00     7.56   857.36      .00      .00   857.55      .19      .00      .00   863.50
    1950.       0.    1950.       0.       0.     561.       0.     327.      95.   863.50
     1.16      .00     3.48      .00     .024     .020     .024     .032   849.80   225.00
  .000223       1.       1.       1.        0        0        0   -10.14    84.00   309.00

*SECNO 78.005

3370 NORMAL BRIDGE,NRD= 26 MIN ELTRD=  862.60 MAX ELLC=  860.40

          BRIDGE SECTION 6 - M-36 BRIDGE - U/S FACE   (W)

    78.00     7.56   857.36      .00      .00   857.55      .19      .01      .00   863.50
    1950.       0.    1950.       0.       0.     561.       0.     327.      95.   863.50
     1.16      .00     3.48      .00     .024     .020     .024     .032   849.80   225.00
  .000222      26.      26.      26.        0        0        0   -10.20    84.00   309.00

*SECNO 78.006

3470 ENCROACHMENT STATIONS=     235.0      321.0  TYPE=     1  TARGET=      86.000
    78.01     7.58   857.38      .00      .00   857.55      .18      .00      .00100000.00
    1950.       0.    1950.       0.       0.     576.       0.     327.      95. 100000.00
     1.16      .00     3.38      .00     .056     .032     .048     .032   849.80   235.00
  .000495       1.       1.       1.        1        0        0      .00    86.00   321.00

*SECNO 78.045
   SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS    BANK ELEV
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Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN     SSTA
SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID    ENDST

3470 ENCROACHMENT STATIONS=      75.0     370.0  TYPE=     1  TARGET=     295.000

          VALLEY SECTION 26   (X)

   78.05     7.87   857.57      .00      .00   857.65      .08      .07      .03   855.20
   1950.     193.    1731.     26.     297.     710.     47.     331.     96.    856.20
    1.18      .65     2.44      .55     .056     .032     .048     .032   849.70    75.00
 .000235     210.     209.     210.        2        0        0      .00   295.00   370.00

1490 NH CARD USED
*SECNO 78.283

3470 ENCROACHMENT STATIONS=     620.0    1110.0  TYPE=     1  TARGET=    -620.000

          VALLEY SECTION 27   (Y)

   78.28     8.36   857.86      .00      .00   857.95      .08      .29      .00   855.30
   1950.     45.     1508.    397.     67.     583.     668.     365.    105.    853.70
    1.35      .67     2.59      .59     .048     .032     .079     .032   849.50   620.00
 .000236    1270.    1260.    1120.        2        0        0      .00   355.53   975.53

1490 NH CARD USED
*SECNO 78.522

3470 ENCROACHMENT STATIONS=     890.0    1380.0  TYPE=     1  TARGET=    -890.000

          VALLEY SECTION 28   (Z)

   78.52     8.14   858.14      .00      .00   858.19      .05      .24      .01   853.80
   1950.     515.    1400.     35.     939.     668.     53.     407.    116.    854.00
    1.56      .55     2.10      .66     .068     .032     .056     .032   850.00   890.00
 .000153    1260.    1260.    1240.        1        0        0      .00   455.37  1345.37

*SECNO 78.819

3470 ENCROACHMENT STATIONS=     880.0    1210.0  TYPE=     1  TARGET=    -880.000

          VALLEY SECTION 29   (AA)

   78.82     8.43   858.43      .00      .00   858.54      .11      .32      .03   854.70
   1950.     263.    1686.      1.     363.     587.      3.     450.    128.    857.00
    1.72      .72     2.87      .37     .056     .032     .056     .032   850.00   880.00
 .000320    1270.    1570.    1650.        0        0        0      .00   294.77  1174.77

1490 NH CARD USED
*SECNO 79.018

          VALLEY SECTION 30   (AB)

   79.02     8.21   858.71      .00      .00   858.76      .05      .19      .02   855.30
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  1950.      11.    1632.     307.      37.     880.     828.     482.     138.    854.40
   1.90      .29     1.86      .37    .080     .032    .080     .032   850.50     58.22
 .000119   1010.    1050.    1050.       2        0        0      .00   503.82    562.04


*SECNO 79.369
   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


          VALLEY SECTION 31   (AC)

   79.37      8.83   858.93       .00       .00   858.98       .05       .22       .00   854.90
   1950.        3.    1745.      202.       13.     907.      522.      548.      155.    854.30
    2.19       .23     1.93       .39      .100     .032      .080      .032    850.10    33.58
 .000119     1950.    1850.     1740.        2        0         0       .00    366.71    400.29


1490 NH CARD USED
*SECNO 79.600

          VALLEY SECTION 32   (AD)

   79.60      8.47   859.07       .00       .00   859.11       .04       .13       .00   854.90
   1950.      138.    1757.       55.      399.    1007.      155.      590.      165.    854.60
    2.40       .35     1.74       .35      .080     .032      .080      .032    850.60   109.28
 .000098     1300.    1220.     1100.        0        0         0       .00    361.43    470.72


*SECNO 79.861

3470 ENCROACHMENT STATIONS=      88.0      212.0  TYPE=      1  TARGET=      124.000
   79.86      8.03   859.23       .00       .00   859.31       .08       .18       .02   855.20
   1950.        2.    1948.        0.        8.     877.        0.      629.      173. 100000.00
    2.57       .30     2.22       .00      .080     .032      .056      .032    851.20    88.00
 .000176     1440.    1384.     1350.        1        0         0       .00    124.00   212.00


*SECNO 79.862

3370 NORMAL BRIDGE,NRD= 15 MIN ELTRD=  863.00 MAX ELLC=  863.10

          BRIDGE SECTION 7 - WINANS LAKE ROAD - D/S FACE   (AE)

          U.S.G.S. GAGING STATION LOCATED AT DOWNSTREAM FACE OF BRIDGE.

   79.86      8.00   859.20       .00       .00   859.34       .14       .00       .03   867.20
   1950.        0.    1950.        0.        0.     655.        0.      629.      173.    865.70
    2.57       .00     2.98       .00      .032     .020      .032      .032    851.20   106.54
 .000224        1.       1.        1.        2        0         0    -37.26    122.67   229.20


*SECNO 79.869

3370 NORMAL BRIDGE,NRD= 15 MIN ELTRD=  863.00 MAX ELLC=  863.10
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BRIDGE SECTION 7 - WINANS LAKE ROAD - U/S FACE   (AE)

        U.S.G.S. GAGING STATION LOCATED AT DOWNSTREAM FACE OF BRIDGE.

    79.87      8.01    859.21       .00       .00    859.35       .14       .01       .00    867.20
    1950.        0.     1950.        0.        0.      656.        0.      630.      173.    865.70
     2.58       .00      2.97       .00      .032      .020      .032      .032    851.20    106.51
  .000223       35.       35.       35.         0         0         0    -37.29    122.75    229.26

*SECNO 79.870
   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=      87.0      213.0  TYPE=      1  TARGET=      126.000
    79.87      8.09    859.29       .00       .00    859.37       .07       .00       .02    855.20
    1950.        9.     1941.        0.       12.      892.        0.      630.      173. 100000.00
     2.58       .73      2.18       .00      .040      .034      .040      .032    851.20     87.00
  .000185        1.        1.        1.         2         0         0       .00    126.00    213.00

*SECNO 79.886

3470 ENCROACHMENT STATIONS=        .0      300.0  TYPE=      1  TARGET=      299.999

        VALLEY SECTION 33   (AF)

    79.89      7.73    859.33       .00       .00    859.39       .05       .02       .01    855.60
    1950.       68.     1707.      176.       83.      863.      209.      632.      173.    855.70
     2.59       .82      1.98       .84      .040      .034      .040      .032    851.60     50.00
  .000156       90.       89.       90.         2         0         0       .00    250.00    300.00

*SECNO 80.145

3470 ENCROACHMENT STATIONS=     100.0      780.0  TYPE=      1  TARGET=     -100.000

        VALLEY SECTION 34   (AG)

    80.14      6.97    859.57       .00       .00    859.63       .06       .24       .00    855.50
    1930.      261.     1519.      150.      300.      701.      160.      668.      182.    856.10
     2.79       .87      2.17       .94      .048      .034      .048      .032    852.60    146.48
  .000206     1400.     1370.     1260.         1         0         0       .00    291.36    437.84

*SECNO 80.459

3470 ENCROACHMENT STATIONS=        .0      620.0  TYPE=      1  TARGET=      619.999

        VALLEY SECTION 35   (AH)

    80.46      7.99    859.69       .00       .00    859.70       .00       .05       .02    855.00
    1905.       45.     1846.       14.      160.     3417.       55.      758.      197.    855.70
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     3.65       .28       .54       .26      .040      .034      .040      .032    851.70     51.54
  .000010     1350.     1660.     1800.         2         0         0       .00    527.68    579.23


*SECNO 80.560
3280 CROSS SECTION      80.56 EXTENDED        .90 FEET


3470 ENCROACHMENT STATIONS=          .0      630.0  TYPE=      1  TARGET=      629.999

          VALLEY SECTION 36    (AI)

    80.56     10.10    859.70       .00       .00    859.70       .00       .01       .00    855.10
     1680.       25.     1632.       22.      110.     3251.      143.      801.      204.    854.60
     3.94       .23       .50       .16      .040      .034      .080      .032    849.60     53.02
  .000011      520.      530.      570.         2         0         0       .00    576.98    630.00


*SECNO 80.925
   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=          .0      945.0  TYPE=      1  TARGET=      944.999

          VALLEY SECTION 37    (AJ)

    80.93      9.93    859.73       .00       .00    859.73       .01       .03       .00    855.00
     1680.      126.      784.      769.      575.      838.     2069.      957.      234.    854.30
     4.82       .22       .94       .37      .080      .032      .056      .032    849.80     42.31
  .000028     1330.     1930.     2160.         1         0         0       .00    817.13    859.44
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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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00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: Hamburg Twp

3) WATERCOURSE: Huron River

4) DOCUMENT TYPE: NATURAL FLOODWAY
STRAWBERRY LK to
CORPORATE LIMIT

00BREAK00

```
*****************************************************
*  WATER SURFACE PROFILES                           *
*  VERSION OF NOVEMBER 1976                         *
*  UPDATED JULY 1979                                *
*                                                   *
*  RUN DATE TUE, JUL 21, 1981,  4:39 PM             *
*****************************************************
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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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RECEIVED
JUL 27 1981
WATER MANAGEMENT

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X     X  XXXXXXX   XXXXX              XXXXX
X     X  X         X     X           X     X
X     X  X         X                 X     X
XXXXXXX  XXXX      X         XXXXX   XXXXX
X     X  X         X                 X
X     X  X         X     X           X
X     X  XXXXXXX   XXXXX              XXXXXXX
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"Strawberry Lake to Coporate Boundary"

(Natural Floodway)

FORM 1411 5 68
PRINTED IN U.S.A.

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*****************************************************
 HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
 ERROR CORR -  01,02,03
 MODIFICATION -  50,51,52,53
*****************************************************

C
T1       HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2       100-YEAR NATURAL FLOODWAY - STRAWBERRY LAKE TO CORPORATE LIMITS
T3       HURON RIVER - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      -1.       2.        0.        0.   .000000       .00       .0        0.    856.090    .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    1.000      .000    -1.000      .000      .000      .800      .000      .000      .000      .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

   38.000    40.000    41.000    42.000    43.000     1.000     8.000    10.000    12.000     3.000

   33.000     4.000    25.000      .000      .000      .000      .000      .000      .000      .000

NC      .060      .125      .040      .300      .500      .000      .000      .000      .000      .000
QT     1.000  2200.000      .000      .000      .000      .000      .000      .000      .000      .000

          VALLEY SECTION 20   (O),  ENCROACHED DUE TO FILLING

X1    76.798    26.000   825.000   914.000      .000      .000      .000      .000      .000      .000
X3      .000      .000      .000   625.000      .000  1145.000      .000      .000      .000      .000
GR    870.000      .000   860.000    15.000   858.000    25.000   856.000   255.000   855.200   385.000
GR    854.500   730.000   853.300   825.000   849.800   828.000   845.600   845.000   845.500   860.000
GR    846.500   875.000   848.100   890.000   849.800   900.000   851.300   910.000   852.200   914.000
GR    853.800  1845.000   854.000  2095.000   855.600  2425.000   856.000  2805.000   857.300  2895.000
GR    856.000  2945.000   856.000  3505.000   856.300  3595.000   856.000  3725.000   856.000  3965.000
GR    868.000  4045.000      .000      .000      .000      .000      .000      .000      .000      .000
NC      .125      .100      .040      .000      .000      .000      .000      .000      .000      .000

          VALLEY SECTION 21   (P),  ENCROACHED DUE TO FILLING

X1    77.030    23.000   770.000   876.000  1420.000  1180.000  1220.000      .000      .000      .000
X3      .000      .000      .000      .000      .000  1375.000      .000      .000      .000      .000
GR    880.000      .000   860.000    50.000   854.000    70.000   852.600   770.000   850.300   773.000
GR    848.700   790.000   848.100   805.000   847.500   813.000   847.800   825.000   848.500   835.000
GR    849.100   843.000   850.100   853.000   850.800   865.000   851.800   875.000   852.200   876.000
GR    854.000  1530.000   856.000  1570.000   857.500  2640.000   856.000  3150.000   856.000  4010.000
GR    858.000  4020.000   860.000  4040.000   866.000  4080.000      .000      .000      .000      .000
NC      .125      .060      .040      .000      .000      .000      .000      .000      .000      .000

X1    77.232    27.000  2080.000  2186.000   780.000   760.000  1070.000      .000      .000      .000
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X3	.000	.000	.000	860.000	.000	2275.000	.000	.000	.000	.000
GR	880.000	.000	864.000	60.000	860.000	80.000	858.000	110.000	854.000	150.000
GR	854.000	1650.000	853.700	2000.000	853.600	2080.000	851.300	2083.000	849.700	2100.000
GR	849.100	2115.000	848.500	2123.000	848.800	2135.000	849.500	2145.000	850.100	2153.000
GR	851.100	2163.000	851.800	2175.000	852.800	2185.000	853.200	2186.000	854.000	2190.000
GR	856.000	2220.000	857.300	2380.000	857.700	2560.000	857.800	3000.000	858.000	3300.000
GR	860.000	3340.000	870.000	3390.000	.000	.000	.000	.000	.000	.000
QT	1.000	1950.000	.000	.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 22 (Q)

X1	77.353	22.000	560.000	672.000	1060.000	640.000	640.000	.000	.000	.000
X3	.000	.000	.000	230.000	.000	720.000	.000	.000	.000	.000
GR	870.000	.000	860.000	60.000	860.000	110.000	854.000	150.000	852.900	560.000
GR	852.000	562.000	849.100	582.000	849.100	592.000	849.200	601.000	849.400	610.000
GR	849.900	627.000	849.900	642.000	850.000	656.000	851.300	670.000	853.900	672.000
GR	854.000	680.000	855.700	870.000	856.000	1210.000	857.300	1600.000	858.000	1960.000
GR	860.000	1980.000	870.000	2020.000	.000	.000	.000	.000	.000	.000
NC	.125	.060	.040	.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 23 (R)

X1	77.499	20.000	390.000	485.000	910.000	570.000	770.000	.000	.000	.000
X3	.000	.000	.000	290.000	.000	500.000	.000	.000	.000	.000
GR	860.000	.000	860.000	210.000	856.000	220.000	854.000	350.000	853.100	390.000
GR	851.900	395.000	850.100	410.000	846.900	420.000	847.100	432.000	846.700	443.000
GR	848.700	455.000	850.700	470.000	852.700	475.000	857.700	485.000	870.000	500.000
GR	870.000	560.000	860.000	680.000	858.000	720.000	858.000	980.000	870.000	1050.000
X1	77.566	22.000	560.000	672.000	400.000	420.000	353.000	.000	.000	.000
X3	.000	.000	.000	562.000	.000	626.000	.000	.000	.000	.000
GR	869.300	.000	859.300	60.000	859.300	110.000	853.300	150.000	852.200	560.000
GR	851.300	562.000	848.400	582.000	848.400	592.000	848.500	601.000	848.700	610.000
GR	849.200	627.000	849.200	642.000	849.300	656.000	850.600	670.000	853.200	672.000
GR	853.300	680.000	855.000	870.000	855.300	1210.000	856.600	1600.000	857.300	1960.000
GR	859.300	1980.000	869.300	2020.000	.000	.000	.000	.000	.000	.000
NC	.040	.040	.025	.000	.000	.000	.000	.000	.000	.000

BRIDGE SECTION 4 - ANN ARBOR RAILROAD - D/S FACE (S)

X1	77.567	22.000	300.000	364.000	1.000	1.000	1.000	.000	.000	.000
BT	12.000	.000	861.000	.000	100.000	861.000	.000	200.000	861.900	.000
BT	296.900	861.900	.000	297.000	865.200	.000	300.000	865.200	858.800	364.000
BT	865.200	858.800	367.000	865.200	.000	367.100	862.100	.000	400.000	862.100
BT	.000	500.000	862.100	.000	600.000	862.200	.000	.000	.000	.000
GR	861.000	.000	861.000	100.000	861.900	200.000	861.900	296.900	858.800	296.900
GR	858.800	300.000	853.100	300.000	853.100	301.300	849.200	301.500	848.800	310.000
GR	848.800	320.000	848.400	330.000	849.200	340.000	849.600	350.000	850.900	362.500
GR	852.700	362.700	852.700	364.000	858.800	364.000	862.100	367.100	862.100	400.000
GR	862.100	500.000	862.200	600.000	.000	.000	.000	.000	.000	.000

BRIDGE SECTION 4 - ANN ARBOR RAILROAD - U/S FACE (S)

X1	77.569	22.000	300.000	364.000	16.000	16.000	16.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000

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GR	861.000	.000	861.000	100.000	861.900	200.000	861.900	296.900	858.800	296.900
GR	858.800	300.000	853.200	300.000	853.200	301.300	849.300	301.500	848.900	310.000
GR	848.900	320.000	848.500	330.000	849.300	340.000	849.700	350.000	851.000	362.500
GR	852.800	362.700	852.800	364.000	858.800	364.000	862.100	367.100	862.100	400.000
GR	862.100	500.000	862.200	600.000	.000	.000	.000	.000	.000	.000
NC	.100	.060	.040	.000	.000	.000	.000	.000	.000	.000
X1	77.570	22.000	560.000	672.000	1.000	1.000	1.000	.000	.000	.000
X3	.000	.000	.000	561.000	.000	627.000	.000	.000	.000	.000
GR	869.400	.000	859.400	60.000	859.400	110.000	853.400	150.000	852.300	560.000
GR	851.400	562.000	848.500	582.000	848.500	592.000	848.600	601.000	848.800	610.000
GR	849.300	627.000	849.300	642.000	849.400	656.000	850.700	670.000	853.300	672.000
GR	853.400	680.000	855.100	870.000	855.400	1210.000	856.700	1600.000	857.400	1960.000
GR	859.400	1980.000	869.400	2020.000	.000	.000	.000	.000	.000	.000
X1	77.602	22.000	560.000	672.000	180.000	200.000	176.000	.000	.000	.000
X3	.000	.000	.000	554.000	.000	672.000	.000	.000	.000	.000
GR	869.300	.000	859.300	60.800	859.300	110.000	853.300	150.000	852.200	560.000
GR	851.300	562.000	848.400	582.000	848.400	592.000	848.500	601.000	848.700	610.000
GR	849.200	627.000	849.200	642.000	849.300	656.000	850.600	670.000	853.200	672.000
GR	853.300	680.000	855.000	870.000	855.300	1210.000	856.600	1600.000	857.300	1960.000
GR	859.300	1980.000	869.300	2020.000	.000	.000	.000	.000	.000	.000
NC	.040	.040	.025	.000	.000	.000	.000	.000	.000	.000

BRIDGE SECTION 5 - ABANDONED GRAND TRUNK RAILROAD - D/S FACE (T)

X1	77.603	29.000	300.000	418.000	1.000	1.000	1.000	.000	.000	.000
BT	44.000	.000	860.600	.000	100.000	860.600	.000	200.000	860.500	.000
BT	300.000	860.300	857.900	313.000	860.300	857.900	313.000	860.300	851.100	314.000
BT	860.300	850.600	314.000	860.300	857.900	323.000	860.300	857.900	323.000	860.300
BT	849.800	324.000	860.300	850.200	324.000	860.300	857.900	335.000	860.300	857.900
BT	335.000	860.300	850.000	336.000	860.300	850.000	336.000	860.300	857.900	347.000
BT	860.200	857.800	347.000	860.200	850.100	348.000	860.200	849.800	348.000	860.200
BT	857.800	359.000	860.200	857.800	359.000	860.200	849.500	360.000	860.200	849.000
BT	360.000	860.200	857.800	371.000	860.200	857.800	371.000	860.200	848.700	372.000
BT	860.200	848.800	372.000	860.200	857.800	382.000	860.200	857.800	382.000	860.200
BT	848.800	383.000	860.200	848.800	383.000	860.200	857.800	394.000	860.100	857.700
BT	394.000	860.100	848.600	395.000	860.100	849.000	395.000	860.100	857.700	406.000
BT	860.100	857.700	406.000	860.100	848.400	407.000	860.100	849.100	407.000	860.100
BT	857.700	418.000	860.100	857.700	500.000	860.000	.000	600.000	860.000	.000
BT	700.000	860.000	.000	.000	.000	.000	.000	.000	.000	.000
GR	860.600	.000	860.600	100.000	860.500	200.000	860.300	300.000	852.500	300.000
GR	851.100	313.000	850.600	314.000	849.800	323.000	850.200	324.000	850.000	335.000
GR	850.000	336.000	850.100	347.000	849.800	348.000	849.500	359.000	849.000	360.000
GR	848.700	371.000	848.800	372.000	848.800	382.000	848.800	383.000	848.800	394.000
GR	849.000	395.000	848.400	406.000	849.100	407.000	852.900	416.000	853.600	418.000
GR	860.100	418.000	860.000	500.000	860.000	600.000	860.000	700.000	.000	.000

BRIDGE SECTION 5 - ABANDONED GRAND TRUNK RAILROAD - U/S FACE (T)

X1	77.605	.000	.000	.000	12.000	12.000	12.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.060	.100	.040	.000	.000	.000	.000	.000	.000	.000
X1	77.606	22.000	560.000	672.000	1.000	1.000	1.000	.000	.000	.000

X3	.000	.000	.000	553.000	.000	673.000	.000	.000	.000	.000
GR	869.300	.000	859.300	60.000	859.300	110.000	853.300	150.000	852.200	560.000
GR	851.300	562.000	848.400	582.000	848.400	592.000	848.500	601.000	848.700	610.000
GR	849.200	627.000	849.200	642.000	849.300	656.000	850.600	670.000	853.200	672.000
GR	853.300	680.000	855.000	870.000	855.300	1210.000	856.600	1600.000	857.300	1960.000
GR	859.300	1980.000	869.300	2020.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 24 (U)

X1	77.717	19.000	70.000	176.000	560.000	690.000	589.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	500.000	.000	.000	.000	.000
GR	870.000	.000	860.000	40.000	853.200	70.000	850.200	80.000	850.200	92.000
GR	850.200	107.000	850.200	118.000	850.200	130.000	850.200	140.000	849.300	153.000
GR	849.500	170.000	853.200	176.000	856.000	730.000	858.000	1100.000	860.000	1120.000
GR	860.000	1230.000	860.000	1500.000	866.000	1580.000	870.000	1660.000	.000	.000
NC	.100	.100	.040	.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 25 (V)

X1	77.899	15.000	55.000	166.000	980.000	820.000	960.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	275.000	.000	.000	.000	.000
GR	880.000	.000	860.000	40.000	853.800	55.000	852.000	60.000	849.400	80.000
GR	849.200	95.000	849.200	110.000	850.000	125.000	851.000	140.000	852.600	164.000
GR	853.700	166.000	856.000	845.000	862.000	925.000	864.000	1055.000	866.000	1185.000

X1	77.999	.000	.000	.000	550.000	500.000	533.000	.000	.600	.000
X3	.000	.000	.000	60.000	.000	144.000	.000	.000	.000	.000
NC	.030	.030	.025	.000	.000	.000	.000	.000	.000	.000

BRIDGE SECTION 6 - M-36 BRIDGE - D/S FACE (W)

X1	78.000	29.000	225.000	309.000	1.000	1.000	1.000	.000	.000	.000
BT	26.000	.000	868.300	.000	25.000	866.800	.000	125.000	863.500	.000
BT	222.000	863.500	.000	222.000	867.300	.000	225.000	867.300	855.300	233.000
BT	868.100	858.600	237.000	869.100	860.400	252.000	872.900	860.400	267.000	874.200
BT	860.400	282.000	872.800	860.400	297.000	868.900	860.400	301.000	867.500	858.600
BT	309.000	867.200	855.300	312.000	867.200	.000	312.000	863.500	.000	425.000
BT	863.000	.000	525.000	863.200	.000	625.000	863.200	.000	725.000	862.800
BT	.000	825.000	862.600	.000	925.000	863.500	.000	1025.000	864.200	.000
BT	1125.000	864.900	.000	1225.000	866.100	.000	1325.000	867.400	.000	.000
GR	868.300	.000	866.800	25.000	863.500	125.000	863.500	222.000	863.500	225.000
GR	852.200	225.000	851.200	233.000	850.800	237.000	850.000	244.000	849.800	252.000
GR	849.800	257.000	850.100	267.000	849.800	280.000	850.000	282.000	851.000	295.000
GR	851.200	297.000	852.400	309.000	863.500	309.000	863.500	312.000	863.000	425.000
GR	863.200	525.000	863.200	625.000	862.800	725.000	862.600	825.000	863.500	925.000
GR	864.200	1025.000	864.900	1125.000	866.100	1225.000	867.400	1325.000	.000	.000

BRIDGE SECTION 6 - M-36 BRIDGE - U/S FACE (W)

X1	78.005	.000	.000	.000	26.000	26.000	26.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.070	.060	.040	.000	.000	.000	.000	.000	.000	.000

X1	78.006	24.000	220.000	330.000	1.000	1.000	1.000	.000	.000	.000

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X3	.000	.000	.000	235.000	.000	321.000	.000	.000	.000	.000
GR	870.100	.000	860.100	10.000	856.100	40.000	855.300	220.000	851.900	230.000
GR	851.600	245.000	850.300	265.000	850.300	280.000	849.800	295.000	850.300	305.000
GR	851.400	318.000	852.500	325.000	856.300	330.000	856.100	350.000	858.100	380.000
GR	859.100	480.000	858.100	610.000	856.100	640.000	855.100	770.000	856.100	880.000
GR	864.100	950.000	866.100	1090.000	868.100	1130.000	870.100	1170.000	.000	.000

VALLEY SECTION 26 (X)

X1	78.045	24.000	220.000	330.000	210.000	210.000	209.000	.000	.000	.000
X3	.000	.000	.000	75.000	.000	370.000	.000	.000	.000	.000
GR	870.000	.000	860.000	10.000	856.000	40.000	855.200	220.000	851.800	230.000
GR	851.500	245.000	850.200	265.000	850.200	280.000	849.700	295.000	850.200	305.000
GR	851.300	318.000	852.400	325.000	856.200	330.000	856.000	350.000	858.000	380.000
GR	859.000	480.000	858.000	610.000	856.000	640.000	855.000	770.000	856.000	880.000
GR	864.000	950.000	866.000	1090.000	868.000	1130.000	870.000	1170.000	.000	.000
NH	4.000	.060	660.000	.040	743.000	.100	960.000	.050	1110.000	.000

VALLEY SECTION 27 (Y)

X1	78.283	24.000	660.000	743.000	1270.000	1120.000	1260.000	.000	.000	.000
X3	.000	.000	.000	620.000	.000	.000	.000	.000	.000	.000
GR	870.000	.000	868.000	90.000	864.000	130.000	862.000	250.000	860.500	300.000
GR	862.000	370.000	863.000	450.000	862.000	480.000	860.000	510.000	858.000	570.000
GR	856.000	650.000	855.300	660.000	852.400	665.000	850.200	683.000	849.500	694.000
GR	849.600	708.000	850.400	720.000	851.500	735.000	852.900	740.000	853.700	743.000
GR	856.000	960.000	862.000	1010.000	864.000	1040.000	870.000	1110.000	.000	.000
NH	4.000	.050	1010.000	.100	1230.000	.040	1325.000	.070	1380.000	.000

VALLEY SECTION 28 (Z)

X1	78.522	23.000	1230.000	1325.000	1260.000	1240.000	1260.000	.000	.000	.000
X3	.000	.000	.000	890.000	.000	.000	.000	.000	.000	.000
GR	870.000	.000	868.000	70.000	866.000	260.000	864.000	370.000	862.000	410.000
GR	860.000	440.000	860.000	510.000	858.000	580.000	856.000	1010.000	853.800	1230.000
GR	852.500	1235.000	851.200	1250.000	850.900	1260.000	850.500	1271.000	850.000	1280.000
GR	850.200	1296.000	850.500	1310.000	852.500	1317.000	853.500	1323.000	854.000	1325.000
GR	856.000	1340.000	860.000	1350.000	870.000	1380.000	.000	.000	.000	.000
NC	.070	.070	.040	.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 29 (AA)

X1	78.819	22.000	1080.000	1170.000	1270.000	1650.000	1570.000	.000	.000	.000
X3	.000	.000	.000	880.000	.000	.000	.000	.000	.000	.000
GR	870.000	.000	868.000	80.000	866.000	290.000	864.000	380.000	862.000	450.000
GR	860.000	510.000	858.000	645.000	856.000	655.000	856.000	740.000	857.600	870.000
GR	856.000	1060.000	854.700	1080.000	853.500	1090.000	853.000	1095.000	851.000	1101.000
GR	850.000	1116.000	850.300	1130.000	850.600	1140.000	852.100	1155.000	857.000	1170.000
GR	860.000	1180.000	870.000	1210.000	.000	.000	.000	.000	.000	.000
NH	4.000	.040	50.000	.100	80.000	.040	205.000	.100	1160.000	.000

VALLEY SECTION 30 (AB)

X1	79.018	22.000	80.000	205.000	1010.000	1050.000	1050.000	.000	.000	.000
GR	870.000	.000	860.000	50.000	855.300	80.000	853.600	86.000	851.500	95.000

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GR	850.500	110.000	850.800	130.000	851.200	140.000	851.400	150.000	851.600	160.000
GR	851.700	170.000	851.400	180.000	851.500	185.000	853.200	200.000	854.400	205.000
GR	858.000	530.000	860.000	620.000	862.000	770.000	864.000	820.000	866.000	890.000
GR	868.000	1040.000	870.000	1160.000	.000	.000	.000	.000	.000	.000
NC	.125	.100	.040	.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 31 (AC)

X1	79.369	19.000	40.000	162.000	1950.000	1740.000	1850.000	.000	.000	.000
GR	880.000	.000	854.900	40.000	854.100	45.000	853.400	50.000	850.700	70.000
GR	850.100	90.000	850.100	106.000	851.100	120.000	851.400	134.000	851.900	150.000
GR	854.100	160.000	854.300	162.000	858.000	340.000	860.000	470.000	862.000	660.000
GR	864.000	820.000	866.000	910.000	868.000	1000.000	870.000	1110.000	.000	.000
NH	4.000	.100	270.000	.040	406.000	.100	530.000	.060	610.000	.000

VALLEY SECTION 32 (AD)

X1	79.600	22.000	270.000	406.000	1300.000	1100.000	1220.000	.000	.000	.000
GR	870.000	.000	860.000	100.000	858.000	120.000	854.900	270.000	854.200	274.000
GR	852.700	288.000	850.600	305.000	850.600	315.000	850.600	325.000	851.200	338.000
GR	851.400	348.000	851.200	360.000	851.200	370.000	851.200	380.000	851.900	395.000
GR	852.700	400.000	854.600	406.000	858.000	460.000	860.000	480.000	862.000	490.000
GR	868.000	530.000	870.000	610.000	.000	.000	.000	.000	.000	.000
NC	.100	.070	.040	.000	.000	.000	.000	.000	.000	.000

X1	79.861	18.000	90.000	216.000	1440.000	1350.000	1384.000	.000	.000	.000
X3	.000	.000	.000	88.000	.000	212.000	.000	.000	.000	.000
GR	869.600	.000	859.600	45.000	857.600	60.000	855.200	90.000	853.600	100.000
GR	851.700	117.000	851.500	135.000	851.300	147.000	851.200	157.000	851.200	175.000
GR	852.000	190.000	852.700	205.000	853.200	214.000	855.300	216.000	857.600	300.000
GR	859.600	330.000	861.600	360.000	869.600	480.000	.000	.000	.000	.000
NC	.040	.040	.025	.000	.000	.000	.000	.000	.000	.000

BRIDGE SECTION 7 - WINANS LAKE ROAD - D/S FACE (AE)

U.S.G.S. GAGING STATION LOCATED AT DOWNSTREAM FACE OF BRIDGE.

X1	79.862	20.000	100.000	230.000	1.000	1.000	1.000	.000	.000	.000
BT	15.000	.000	867.600	.000	100.000	867.200	863.100	141.000	866.700	862.400
BT	141.000	866.700	852.000	143.500	866.700	851.700	143.500	866.700	862.400	186.000
BT	866.200	861.500	186.000	866.200	851.600	188.500	866.200	851.700	188.500	866.200
BT	861.500	230.000	865.700	861.700	300.000	863.000	.000	400.000	863.300	.000
BT	500.000	865.600	.000	600.000	869.200	.000	.000	.000	.000	.000
GR	867.600	.000	867.200	100.000	861.000	100.000	854.400	124.000	852.000	141.000
GR	851.700	143.500	851.200	154.000	851.200	164.000	851.700	174.000	851.600	186.000
GR	851.700	188.500	852.100	201.000	854.400	212.000	857.700	217.000	859.300	230.000
GR	865.700	230.000	863.000	300.000	863.300	400.000	865.600	500.000	869.200	600.000

BRIDGE SECTION 7 - WINANS LAKE ROAD - U/S FACE (AE)

U.S.G.S. GAGING STATION LOCATED AT DOWNSTREAM FACE OF BRIDGE.

X1	79.869	.000	.000	.000	35.000	35.000	35.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.050	.050	.042	.000	.000	.000	.000	.000	.000	.000

X1	79.870	18.000	90.000	216.000	1.000	1.000	1.000	.000	.000	.000
X3	.000	.000	.000	87.000	.000	213.000	.000	.000	.000	.000
GR	869.600	.000	859.600	45.000	857.600	60.000	855.200	90.000	853.600	100.000
GR	851.700	117.000	851.500	135.000	851.300	147.000	851.200	157.000	851.200	175.000
GR	852.000	190.000	852.700	205.000	853.200	214.000	855.300	216.000	857.600	300.000
GR	859.600	330.000	861.600	360.000	869.600	480.000	.000	.000	.000	.000

VALLEY SECTION 33 (AF)

X1	79.886	18.000	90.000	216.000	90.000	90.000	89.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	300.000	.000	.000	.000	.000
GR	870.000	.000	860.000	45.000	858.000	60.000	855.600	90.000	854.000	100.000
GR	852.100	117.000	851.900	135.000	851.700	147.000	851.600	157.000	851.600	175.000
GR	852.400	190.000	853.100	205.000	853.600	214.000	855.700	216.000	858.000	300.000
GR	860.000	330.000	862.000	360.000	870.000	480.000	.000	.000	.000	.000
NC	.060	.060	.042	.000	.000	.000	.000	.000	.000	.000
QT	1.000	1930.000	.000	.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 34 (AG)

X1	80.145	22.000	270.000	381.000	1400.000	1260.000	1370.000	.000	.000	.000
X3	.000	.000	.000	100.000	.000	.000	.000	.000	.000	.000
GR	870.000	.000	864.000	90.000	860.000	140.000	858.000	170.000	856.000	250.000
GR	855.500	270.000	853.600	280.000	853.100	290.000	852.700	300.000	852.700	310.000
GR	852.600	330.000	852.900	350.000	853.100	360.000	853.800	370.000	854.400	374.000
GR	856.100	381.000	856.000	410.000	858.000	430.000	860.000	440.000	866.000	470.000
GR	868.000	640.000	870.000	780.000	.000	.000	.000	.000	.000	.000
NC	.050	.050	.042	.000	.000	.000	.000	.000	.000	.000
QT	1.000	1905.000	.000	.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 35 (AH)

X1	80.459	17.000	100.000	560.000	1350.000	1800.000	1660.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	620.000	.000	.000	.000	.000
GR	870.000	.000	860.000	50.000	856.000	70.000	855.000	100.000	852.300	110.000
GR	851.700	190.000	852.700	310.000	852.400	380.000	851.700	450.000	852.000	505.000
GR	853.300	553.000	854.200	557.000	855.700	560.000	856.000	570.000	860.000	580.000
GR	862.000	810.000	870.000	840.000	.000	.000	.000	.000	.000	.000
NC	.050	.100	.042	.000	.000	.000	.000	.000	.000	.000
QT	1.000	1680.000	.000	.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 36 (AI)

X1	80.560	19.000	100.000	600.000	520.000	570.000	530.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	630.000	.000	.000	.000	.000
GR	870.000	.000	860.000	50.000	856.000	90.000	855.100	100.000	854.800	128.000
GR	852.900	160.000	852.600	175.000	852.900	190.000	853.100	250.000	853.800	415.000
GR	853.500	492.000	853.600	516.000	852.600	529.000	851.300	544.000	850.600	559.000
GR	849.600	575.000	854.600	600.000	856.200	670.000	858.800	770.000	.000	.000
NC	.100	.070	.040	.000	.000	.000	.000	.000	.000	.000

VALLEY SECTION 37 (AJ)

X1	80.925	18.000	235.000	345.000	1330.000	2160.000	1930.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	945.000	.000	.000	.000	.000
GR	868.600	.000	862.600	10.000	960.000	35.000	856.200	135.000	855.000	235.000
GR	849.800	247.000	851.300	262.000	851.800	285.000	852.100	301.000	852.800	323.000
GR	853.300	333.000	853.800	344.000	854.300	345.000	854.400	445.000	856.000	705.000
GR	858.000	825.000	860.000	865.000	860.800	945.000	.000	.000	.000	.000
EJ	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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*PROF 1

CCHV=     .300 CEHV=     .500
*SECNO 76.798
  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=     625.0    1145.0  TYPE=     1  TARGET=     520.000

          VALLEY SECTION 20   (O),  ENCROACHED DUE TO FILLING

   76.80     10.59    856.09      .00    856.09    856.15      .06      .00      .00    853.30
   2200.      202.     1643.     355.      364.      742.     853.       0.       0.    852.20
     .00       .56      2.22      .42      .048      .032     .100     .000   845.50    625.00
 .000140        0.        0.       0.         0         0        0      .00   520.00   1145.00

*SECNO 77.030

3470 ENCROACHMENT STATIONS=        .0    1375.0  TYPE=     1  TARGET=    1374.999

          VALLEY SECTION 21   (P),  ENCROACHED DUE TO FILLING

   77.03      8.76    856.26      .00       .00    856.28      .02      .12      .01    852.60
   2200.      537.     1071.     591.     2086.      750.    1687.      95.      27.    852.20
     .41       .26      1.43      .35      .100      .032     .080     .031   847.50     62.44
 .000071     1420.     1220.    1180.         0         0        0      .00  1312.56   1375.00

*SECNO 77.232

3470 ENCROACHMENT STATIONS=     860.0    2275.0  TYPE=     1  TARGET=    1415.000
   77.23      7.85    856.35      .00       .00    856.38      .03      .09      .01    853.60
   2200.      953.     1219.     27.     2955.      653.     60.      173.      52.    853.20
     .62       .32      1.87      .46      .100      .032     .048     .034   848.50    860.00
 .000145      780.     1070.    760.         0         0        0      .00  1403.81   2263.81

*SECNO 77.353

3470 ENCROACHMENT STATIONS=     230.0     720.0  TYPE=     1  TARGET=     490.000

          VALLEY SECTION 22   (Q)

   77.35      7.36    856.46      .00       .00    856.51      .05      .12      .01    852.90
   1950.      411.     1465.     74.     1028.      724.    111.      233.      74.    853.90
     .76       .40      2.02      .67      .100      .032     .048     .032   849.10    230.00
 .000161     1060.      640.    640.         2         0        0      .00   490.00    720.00

*SECNO 77.499
  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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3470 ENCROACHMENT STATIONS=     290.0     500.0  TYPE=     1  TARGET=     210.000

          VALLEY SECTION 23   (R)

    77.50      9.89    856.59      .00      .00    856.70      .11      .16      .03    853.10
    1950.      114.    1836.       0.     248.     655.       0.     259.      80.     857.70
      .84      .46      2.80      .00     .100     .032     .048     .032   846.70    290.00
  .000277     910.      770.     570.        1        0        0      .00   192.76    482.76

*SECNO 77.566

3470 ENCROACHMENT STATIONS=     562.0     626.0  TYPE=     1  TARGET=      64.000
    77.57      8.26    856.66      .00      .00    856.91      .25      .14      .07100000.00
    1950.        0.    1950.       0.       0.     490.       0.     265.      81. 100000.00
      .86      .00      3.98      .00     .100     .032     .048     .032   848.40    562.00
  .000625     400.      353.     420.        0        0        0      .00    64.00    626.00

*SECNO 77.567

3370 NORMAL BRIDGE,NRD= 12 MIN ELTRD=  861.00 MAX ELLC=  858.80

          BRIDGE SECTION 4 - ANN ARBOR RAILROAD - D/S FACE   (S)

    77.57      8.25    856.65      .00      .00    856.92      .27      .00      .01    858.80
    1950.        0.    1950.       0.       0.     467.       0.     265.      81.     858.80
      .86      .00      4.17      .00     .032     .020     .032     .032   848.40    300.00
  .000285       1.        1.       1.        1        0        0      .00    64.00    364.00

*SECNO 77.569

          BRIDGE SECTION 4 - ANN ARBOR RAILROAD - U/S FACE   (S)

    77.57      8.15    856.65      .00      .00    856.93      .28      .00      .00    858.80
    1950.        0.    1950.       0.       0.     461.       0.     265.      81.     858.80
      .86      .00      4.23      .00     .032     .020     .032     .032   848.50    300.00
  .000297      16.       16.      16.        0        0        0      .00    64.00    364.00

*SECNO 77.570

3470 ENCROACHMENT STATIONS=     561.0     627.0  TYPE=     1  TARGET=      66.000
    77.57      8.20    856.70      .00      .00    856.94      .24      .00      .01100000.00
    1950.        0.    1950.       0.       0.     498.       0.     265.      81. 100000.00
      .86      .00      3.92      .00     .080     .032     .048     .032   848.50    561.00
  .000607       1.        1.       1.        2        0        0      .00    66.00    627.00

*SECNO 77.602
   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
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3470 ENCROACHMENT STATIONS=      554.0      672.0  TYPE=      1  TARGET=      118.000
    77.60      8.56    856.96       .00       .00    857.04       .08       .05       .05    852.20
    1950.       13.     1937.        0.       29.     859.         0.      268.       82.  100000.00
      .89       .46      2.25       .00      .080      .032      .048      .032    848.40    554.00
  .000166      180.      176.      200.         2         0         0       .00    118.00    672.00


*SECNO 77.603

3370 NORMAL BRIDGE,NRD= 44 MIN ELTRD=  860.00 MAX ELLC=  857.90


          BRIDGE SECTION 5 - ABANDONED GRAND TRUNK RAILROAD - D/S FACE   (T)

    77.60      8.55    856.95       .00       .00    857.05       .10       .00       .01    860.30
    1950.        0.     1950.        0.        0.     772.         0.      268.       82.    860.10
      .89       .00      2.53       .00      .032      .020      .032      .032    848.40    300.00
  .000261        1.        1.        1.         1         0         0    -67.36    118.00    418.00


*SECNO 77.605

3370 NORMAL BRIDGE,NRD= 44 MIN ELTRD=  860.00 MAX ELLC=  857.90


          BRIDGE SECTION 5 - ABANDONED GRAND TRUNK RAILROAD - U/S FACE   (T)

    77.61      8.55    856.95       .00       .00    857.05       .10       .00       .00    860.30
    1950.        0.     1950.        0.        0.     772.         0.      268.       82.    860.10
      .89       .00      2.53       .00      .032      .020      .032      .032    848.40    300.00
  .000261       12.       12.       12.         0         0         0    -67.34    118.00    418.00


*SECNO 77.606

3470 ENCROACHMENT STATIONS=      553.0      673.0  TYPE=      1  TARGET=      120.000
    77.61      8.58    856.98       .00       .00    857.06       .08       .00       .01    852.20
    1950.       26.     1923.        1.       33.     862.         4.      268.       82.    853.20
      .89       .77      2.23       .20      .048      .032      .080      .032    848.40    553.00
  .000155        1.        1.        1.         2         0         0       .00    120.00    673.00


*SECNO 77.717

3470 ENCROACHMENT STATIONS=          .0      500.0  TYPE=      1  TARGET=      499.999

          VALLEY SECTION 24   (U)

    77.72      7.81    857.11       .00       .00    857.16       .05       .09       .01    853.20
    1950.       19.     1459.      472.       34.     730.      1002.      287.       86.    853.20
      .99       .57      2.00       .47      .048      .032      .080      .032    849.30     52.74
  .000144      560.      589.      690.         0         0         0       .00    447.26    500.00


*SECNO 77.899
   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
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 SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID   ENDST

3470 ENCROACHMENT STATIONS=        .0      275.0  TYPE=      1  TARGET=     274.999

          VALLEY SECTION 25   (V)

    77.90     8.06   857.26      .00      .00   857.33      .07      .16      .01   853.80
    1950.       5.    1734.     211.      14.     748.     367.     317.      93.   853.70
     1.11      .36     2.32      .58     .080     .032     .080     .032   849.20    46.65
  .000198     980.     960.     820.        0        0        0      .00   228.35   275.00

*SECNO 77.999

3470 ENCROACHMENT STATIONS=       60.0      144.0  TYPE=      1  TARGET=      84.000
    78.00     7.56   857.36      .00      .00   857.54      .18      .16      .05100000.00
    1950.       0.    1950.       0.       0.     570.       0.     327.      95. 100000.00
     1.16      .00     3.42      .00     .080     .032     .080     .032   849.80    60.00
  .000495     550.     533.     500.        1        0        0      .00    84.00   144.00

*SECNO 78.000

3370 NORMAL BRIDGE,NRD= 26 MIN ELTRD=  862.60 MAX ELLC=  860.40

          BRIDGE SECTION 6 - M-36 BRIDGE - D/S FACE   (W)

    78.00     7.56   857.36      .00      .00   857.55      .19      .00      .00   863.50
    1950.       0.    1950.       0.       0.     561.       0.     327.      95.   863.50
     1.16      .00     3.48      .00     .024     .020     .024     .032   849.80   225.00
  .000223       1.       1.       1.        0        0        0   -10.14    84.00   309.00

*SECNO 78.005

3370 NORMAL BRIDGE,NRD= 26 MIN ELTRD=  862.60 MAX ELLC=  860.40

          BRIDGE SECTION 6 - M-36 BRIDGE - U/S FACE   (W)

    78.00     7.56   857.36      .00      .00   857.55      .19      .01      .00   863.50
    1950.       0.    1950.       0.       0.     561.       0.     327.      95.   863.50
     1.16      .00     3.48      .00     .024     .020     .024     .032   849.80   225.00
  .000222      26.      26.      26.        0        0        0   -10.20    84.00   309.00

*SECNO 78.006

3470 ENCROACHMENT STATIONS=      235.0      321.0  TYPE=      1  TARGET=      86.000
    78.01     7.58   857.38      .00      .00   857.55      .18      .00      .00100000.00
    1950.       0.    1950.       0.       0.     576.       0.     327.      95. 100000.00
     1.16      .00     3.38      .00     .056     .032     .048     .032   849.80   235.00
  .000495       1.       1.       1.        1        0        0      .00    86.00   321.00

*SECNO 78.045
   SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS    BANK ELEV
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     Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA    LEFT/RIGHT
     TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
     SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

3470 ENCROACHMENT STATIONS=       75.0      370.0  TYPE=      1  TARGET=      295.000

          VALLEY SECTION 26   (X)

    78.05      7.87     857.57       .00       .00     857.65       .08       .07       .03     855.20
    1950.      193.      1731.      26.      297.      710.       47.      331.       96.     856.20
     1.18       .65       2.44       .55       .056      .032      .048      .032    849.70      75.00
  .000235     210.      209.      210.         2         0         0       .00    295.00     370.00

1490 NH CARD USED
*SECNO 78.283

3470 ENCROACHMENT STATIONS=      620.0     1110.0  TYPE=      1  TARGET=     -620.000

          VALLEY SECTION 27   (Y)

    78.28      8.36     857.86       .00       .00     857.95       .08       .29       .00     855.30
    1950.       45.      1508.     397.       67.      583.      668.      365.      105.     853.70
     1.35       .67       2.59       .59       .048      .032      .079      .032    849.50     620.00
  .000236    1270.      1260.    1120.         2         0         0       .00    355.53     975.53

1490 NH CARD USED
*SECNO 78.522

3470 ENCROACHMENT STATIONS=      890.0     1380.0  TYPE=      1  TARGET=     -890.000

          VALLEY SECTION 28   (Z)

    78.52      8.14     858.14       .00       .00     858.19       .05       .24       .01     853.80
    1950.      515.      1400.      35.      939.      668.       53.      407.      116.     854.00
     1.56       .55       2.10       .66       .068      .032      .056      .032    850.00     890.00
  .000153    1260.      1260.    1240.         1         0         0       .00    455.37    1345.37

*SECNO 78.819

3470 ENCROACHMENT STATIONS=      880.0     1210.0  TYPE=      1  TARGET=     -880.000

          VALLEY SECTION 29   (AA)

    78.82      8.43     858.43       .00       .00     858.54       .11       .32       .03     854.70
    1950.      263.      1686.       1.      363.      587.        3.      450.      128.     857.00
     1.72       .72       2.87       .37       .056      .032      .056      .032    850.00     880.00
  .000320    1270.      1570.    1650.         0         0         0       .00    294.77    1174.77

1490 NH CARD USED
*SECNO 79.018

          VALLEY SECTION 30   (AB)

    79.02      8.21     858.71       .00       .00     858.76       .05       .19       .02     855.30
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  1950.      11.    1632.     307.      37.     880.     828.     482.     138.    854.40
   1.90      .29     1.86      .37    .080     .032    .080     .032   850.50     58.22
 .000119   1010.    1050.    1050.       2        0        0      .00   503.82    562.04


*SECNO 79.369
   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


          VALLEY SECTION 31   (AC)

   79.37      8.83   858.93       .00       .00   858.98       .05       .22       .00   854.90
   1950.        3.    1745.      202.       13.    907.      522.      548.      155.    854.30
    2.19      .23     1.93       .39      .100     .032     .080      .032    850.10    33.58
 .000119    1950.    1850.    1740.        2        0        0      .00   366.71    400.29


1490 NH CARD USED
*SECNO 79.600

          VALLEY SECTION 32   (AD)

   79.60      8.47   859.07       .00       .00   859.11       .04       .13       .00   854.90
   1950.      138.    1757.       55.      399.    1007.      155.      590.      165.    854.60
    2.40      .35     1.74       .35      .080     .032     .080      .032    850.60   109.28
 .000098    1300.    1220.    1100.        0        0        0      .00   361.43    470.72


*SECNO 79.861

3470 ENCROACHMENT STATIONS=      88.0      212.0  TYPE=      1  TARGET=      124.000
   79.86      8.03   859.23       .00       .00   859.31       .08       .18       .02   855.20
   1950.        2.    1948.        0.        8.    877.        0.      629.      173. 100000.00
    2.57      .30     2.22       .00      .080     .032     .056      .032    851.20    88.00
 .000176    1440.    1384.    1350.        1        0        0      .00   124.00    212.00


*SECNO 79.862

3370 NORMAL BRIDGE,NRD= 15 MIN ELTRD=  863.00 MAX ELLC=  863.10

          BRIDGE SECTION 7 - WINANS LAKE ROAD - D/S FACE   (AE)

          U.S.G.S. GAGING STATION LOCATED AT DOWNSTREAM FACE OF BRIDGE.

   79.86      8.00   859.20       .00       .00   859.34       .14       .00       .03   867.20
   1950.        0.    1950.        0.        0.    655.        0.      629.      173.    865.70
    2.57      .00     2.98       .00      .032     .020     .032      .032    851.20   106.54
 .000224        1.       1.        1.        2        0        0   -37.26    122.67    229.20


*SECNO 79.869

3370 NORMAL BRIDGE,NRD= 15 MIN ELTRD=  863.00 MAX ELLC=  863.10
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BRIDGE SECTION 7 - WINANS LAKE ROAD - U/S FACE   (AE)

U.S.G.S. GAGING STATION LOCATED AT DOWNSTREAM FACE OF BRIDGE.

    79.87      8.01    859.21       .00       .00    859.35       .14       .01       .00    867.20
    1950.        0.     1950.        0.        0.      656.        0.      630.      173.    865.70
     2.58       .00      2.97       .00      .032      .020      .032      .032    851.20    106.51
  .000223       35.       35.       35.         0         0         0    -37.29    122.75    229.26

*SECNO 79.870
   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=      87.0      213.0  TYPE=      1  TARGET=      126.000
    79.87      8.09    859.29       .00       .00    859.37       .07       .00       .02    855.20
    1950.        9.     1941.        0.       12.      892.        0.      630.      173. 100000.00
     2.58       .73      2.18       .00      .040      .034      .040      .032    851.20     87.00
  .000185        1.        1.        1.         2         0         0       .00    126.00    213.00

*SECNO 79.886

3470 ENCROACHMENT STATIONS=        .0      300.0  TYPE=      1  TARGET=      299.999

VALLEY SECTION 33   (AF)

    79.89      7.73    859.33       .00       .00    859.39       .05       .02       .01    855.60
    1950.       68.     1707.      176.       83.      863.      209.      632.      173.    855.70
     2.59       .82      1.98       .84      .040      .034      .040      .032    851.60     50.00
  .000156       90.       89.       90.         2         0         0       .00    250.00    300.00

*SECNO 80.145

3470 ENCROACHMENT STATIONS=     100.0      780.0  TYPE=      1  TARGET=     -100.000

VALLEY SECTION 34   (AG)

    80.14      6.97    859.57       .00       .00    859.63       .06       .24       .00    855.50
    1930.      261.     1519.      150.      300.      701.      160.      668.      182.    856.10
     2.79       .87      2.17       .94      .048      .034      .048      .032    852.60    146.48
  .000206     1400.     1370.     1260.         1         0         0       .00    291.36    437.84

*SECNO 80.459

3470 ENCROACHMENT STATIONS=        .0      620.0  TYPE=      1  TARGET=      619.999

VALLEY SECTION 35   (AH)

    80.46      7.99    859.69       .00       .00    859.70       .00       .05       .02    855.00
    1905.       45.     1846.       14.      160.     3417.       55.      758.      197.    855.70
```

```
     3.65       .28       .54       .26      .040      .034      .040      .032    851.70     51.54
  .000010     1350.     1660.     1800.         2         0         0       .00    527.68    579.23

*SECNO 80.560
3280 CROSS SECTION      80.56 EXTENDED        .90 FEET


3470 ENCROACHMENT STATIONS=          .0      630.0  TYPE=      1  TARGET=      629.999

          VALLEY SECTION 36    (AI)

    80.56     10.10    859.70       .00       .00    859.70       .00       .01       .00    855.10
    1680.       25.     1632.       22.      110.     3251.      143.      801.      204.    854.60
     3.94       .23       .50       .16      .040      .034      .080      .032    849.60     53.02
  .000011      520.      530.      570.         2         0         0       .00    576.98    630.00

*SECNO 80.925
   SECNO     DEPTH     CWSEL     CPIWS     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=          .0      945.0  TYPE=      1  TARGET=      944.999

          VALLEY SECTION 37    (AJ)

    80.93      9.93    859.73       .00       .00    859.73       .01       .03       .00    855.00
    1680.      126.      784.      769.      575.      838.     2069.      957.      234.    854.30
     4.82       .22       .94       .37      .080      .032      .056      .032    849.80     42.31
  .000028     1330.     1930.     2160.         1         0         0       .00    817.13    859.44
```

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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
*****************************************************
```

00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: Hamburg Twp

3) WATERCOURSE: Huron River

4) DOCUMENT TYPE: Natural Floodway
White Lake to
Gallagher Lake

00BREAK00

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*****************************************************
*  WATER SURFACE PROFILES                           *
*  VERSION OF NOVEMBER 1976                         *
*  UPDATED JULY 1979                                *
*                                                   *
*  RUN DATE TUE, JUL 21, 1981,  4:32 PM             *
*****************************************************
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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  XXXXX     X         XXXXX    XXXXX
X     X  X         X
X     X  X         X    X         X
X     X  XXXXXXX   XXXXX            XXXXXXX
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Whitewood Lakes to Gallagher Lake

(Natural Floodway)

RECEIVED
JUL 27 1981
WATER MANAGEMENT

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*****************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
*****************************************

C
T1      HAMBURG TOWNSHIP FIS - JOB NO. 6504-03  FILE:  RATGAL
T2      100-YEAR NATURAL FLOODWAY - WHITEWOOD LAKES TO GALLAGHER LAKE
T3      HURON RIVER - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ     NINV    IDIR    STRT    METRIC   HVINS    Q     WSEL     FQ
     -1.       2.      0.      0.   .000000    .00      .0      0.   855.340   .000

J2  NPROF    IPLOT    PRFVS   XSECV   XSECH    FN     ALLDC    IBW   CHNIM   ITRACE
    1.000     .000   -1.000    .000    .000   .800    .000    .000    .000    .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

   38.000   40.000   41.000   42.000   43.000   1.000   8.000  10.000  12.000   3.000

   33.000    4.000   25.000    .000     .000    .000    .000    .000    .000    .000

NC    .125     .125     .040     .300     .500     .000     .000     .000     .000     .000
QT   1.000 2410.000     .000     .000     .000     .000     .000     .000     .000     .000

X1  73.747   31.000 2170.000 2317.000     .000     .000     .000     .000     .000     .000
X3    .000     .000     .000     .000     .000 3730.000     .000     .000     .000     .000
GR 870.000     .000  860.000  120.000  858.000  210.000  858.000  320.000  860.000  380.000
GR 864.000  490.000  864.400  720.000  866.000  810.000  870.000  890.000  876.000 1040.000
GR 876.000 1190.000  866.000 1370.000  864.000 1470.000  856.000 1570.000  854.000 1630.000
GR 852.100 2170.000  851.200 2173.000  850.200 2187.000  848.300 2206.000  845.200 2223.000
GR 844.600 2240.000  845.200 2255.000  846.300 2275.000  855.200 2300.000  857.100 2315.000
GR 851.900 2317.000  854.000 3010.000  854.000 3160.000  854.000 3630.000  856.000 3670.000
GR 870.000 3730.000     .000     .000     .000     .000     .000     .000     .000     .000

        VALLEY SECTION 11   (D)

X1  73.834     .000     .000     .000  500.000  460.000  460.000     .000     .000     .000
X3    .000     .000     .000     .000     .000 3730.000     .000     .000     .000     .000
NC    .125     .125     .040     .000     .000     .000     .000     .000     .000     .000

        VALLEY SECTION 12   (E)

X1  73.999   33.000 1600.000 1910.000  750.000  780.000  870.000     .000     .000     .000
X3    .000     .000     .000  370.000     .000     .000     .000     .000     .000     .000
GR 859.500     .000  858.000   90.000  856.000  160.000  854.000  190.000  854.000  260.000
GR 863.500  370.000  856.000  450.000  855.400  500.000  856.000  530.000  858.000  580.000
GR 858.000  610.000  854.000  640.000  852.800  880.000  852.800 1500.000  852.500 1600.000
GR 851.200 1602.000  849.100 1625.000  840.500 1650.000  834.700 1675.000  826.700 1750.000
```

GR	832.500	1800.000	846.700	1850.000	848.500	1875.000	850.200	1905.000	852.000	1910.000
GR	854.000	2220.000	856.000	2320.000	856.000	2380.000	854.000	2510.000	854.000	2590.000
GR	856.000	2620.000	858.000	2640.000	860.000	2670.000	.000	.000	.000	.000
EJ	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

FORM 1411 5 GB

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*PROF 1

CCHV=     .300 CEHV=     .500
*SECNO 73.747

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     CORAR     TOPWID    ENDST

3470 ENCROACHMENT STATIONS=        .0    3730.0  TYPE=     1  TARGET=    3729.999
    73.75     10.74    855.34       .00    855.34    855.37       .03       .00       .00    852.10
    2410.      298.     1565.      547.     1264.      981.     2505.        0.        0.    851.90
      .00       .24      1.60       .22      .100      .032      .100      .000    844.60   1589.80
  .000085        0.        0.        0.         0         0         0       .00   2052.43   3656.80

*SECNO 73.834

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS=        .0    3730.0  TYPE=     1  TARGET=    3729.999

          VALLEY SECTION 11   (D)

    73.83     10.78    855.38       .00       .00    855.41       .02       .04       .00    852.10
    2410.      302.     1551.      557.     1287.      986.     2559.       52.       22.    851.90
      .12       .23      1.57       .22      .100      .032      .100      .032    844.60   1588.59
  .000083      500.      460.      460.         0         0         0       .00   2054.79   3657.61

*SECNO 73.999

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS=     370.0    2670.0  TYPE=     1  TARGET=    -370.000

          VALLEY SECTION 12   (E)

    74.00     28.71    855.41       .00       .00    855.42       .00       .01       .01    852.50
    2410.       96.     2279.       35.     2388.     5173.      992.      177.       57.    852.00
      .68       .04       .44       .04      .100      .032      .100      .032    826.70    498.79
  .000002      750.      870.      780.         2         0         0       .00   1856.44   2611.22
```

00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: Hamburg Twp.

3) WATERCOURSE: Huron River

4) DOCUMENT TYPE: Natural Floodway
Gallagher Lk to Section G

00BREAK00

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*****************************************************
*  WATER SURFACE PROFILES                           *
*  VERSION OF NOVEMBER 1976                         *
*  UPDATED JULY 1979                                *
*                                                   *
*  RUN DATE TUE, JUL 21, 1981,  4:33 PM             *
*****************************************************
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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     X
XXXXXXX  XXXX      X        XXXXX    XXXXXX
X     X  X         X                 X
X     X  X         X     X           X
X     X  XXXXXXX   XXXXX              XXXXXXX
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"Gallagher Lake to Section G"

(Natural Floodway)

RECEIVED
JUL 27 1981
WATER MANAGEMENT

FORM 1411 ½ GB
PRINTED IN U.S.A.

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**************************************************
 HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
 ERROR CORR -   01,02,03
 MODIFICATION -  50,51,52,53
**************************************************

C
T1      HAMBURG TOWNSHIP FIS - JOB NO. 6504-03  FILE:  RAT18N
T2      100-YEAR NATURAL FLOODWAY - GALLAGHER LAKE TO SECTION G
T3      HURON RIVER - NORTHERN ROUTE - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ     NINV    IDIR    STRT   METRIC   HVINS     Q     WSEL      FQ
       -1      2.      0.      0.  .000000     .00      .0      0.  855.420    .000

J2  NPROF    IPLOT    PRFVS    XSECV    XSECH     FN    ALLDC    IBW    CHNIM   ITRACE
     1.000     .000   -1.000     .000     .000   .800     .000   .000     .000     .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    38.000   40.000   41.000   42.000   43.000  1.000    8.000  10.000   12.000    3.000

    33.000    4.000   25.000     .000     .000   .000     .000   .000     .000     .000

NC     .050     .100     .040     .300     .500   .000     .000   .000     .000     .000
QT    1.000 2050.000     .000     .000     .000   .000     .000   .000     .000     .000

          VALLEY SECTION 16   (F)

X1   74.905   19.000  850.000  981.000     .000   .000     .000   .000     .000     .000
X3     .000     .000     .000  840.000     .000 1950.000     .000   .000     .000     .000
GR  862.600     .000  856.000   50.000  856.000  840.000  853.300  850.000  851.600  853.000
GR  846.800  872.000  845.100  884.000  844.500  900.000  844.200  922.000  847.700  945.000
GR  849.100  960.000  849.700  970.000  851.600  980.000  851.900  981.000  854.000 1150.000
GR  856.000 2360.000  858.000 2450.000  860.000 2950.000  870.000 3000.000     .000     .000
NC     .125     .125     .045     .000     .000   .000     .000   .000     .000     .000

          VALLEY SECTION 17   (G)

X1   75.096   19.000  250.000  425.000 1250.000  380.000 1010.000     .000     .000     .000
X3     .000     .000     .000     .000     .000 2020.000     .000     .000     .000     .000
GR  855.300  170.000  853.100  235.000  850.300  237.000  848.700  250.000  842.700  261.000
GR  839.900  289.000  839.900  309.000  843.900  325.000  847.100  342.000  849.000  385.000
GR  852.000  420.000  852.500  425.000  854.000  435.000  856.000 2350.000  856.000 2750.000
GR  858.000 2790.000  860.000 2940.000  862.000 2970.000  870.000 3030.000     .000     .000
EJ     .000     .000     .000     .000     .000   .000     .000   .000     .000     .000
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*PROF 1

CCHV=     .300 CEHV=     .500
*SECNO 74.905
  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=     840.0    1950.0  TYPE=     1  TARGET=    1110.000

          VALLEY SECTION 16   (F)

   74.91    11.22   855.42      .00   855.42   855.46      .04      .00      .00   853.30
   2050.       3.     1837.     210.       8.    1089.    1025.       0.       0.   851.90
     .00      .34     1.69      .21     .040     .032     .080     .000   844.20   842.15
 .000080       0.       0.       0.        0        0        0      .00  1107.85  1950.00

*SECNO 75.096

3470 ENCROACHMENT STATIONS=       .0    2020.0  TYPE=     1  TARGET=    2019.999

          VALLEY SECTION 17   (G)

   75.10    15.60   855.50      .00      .00   855.52      .02      .05      .01   848.70
   2050.      33.     1935.      82.     169.    1715.    1086.      44.      15.   852.50
     .25      .19     1.13      .08     .100     .036     .100     .038   839.90   170.00
 .000036     1250.    1010.     380.        0        0        0      .00  1691.85  1861.85
```

00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: Hamburg Twp.

3) WATERCOURSE: Huron River

4) DOCUMENT TYPE: Natural Floodway

LOOK to SECTION L

00BREAK00

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*****************************************************
*  WATER SURFACE PROFILES                           *
*  VERSION OF NOVEMBER 1976                         *
*  UPDATED JULY 1979                                *
*                                                   *
*  RUN DATE TUE, JUL 21, 1981,  4:36 PM             *
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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     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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"Loon Lake to Section L"

(Natural Floodway)

RECEIVED
JUL 27 1981
WATER MANAGEMENT

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*****************************************************
 HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
 ERROR CORR -  01,02,03
 MODIFICATION -  50,51,52,53
*****************************************************

C
T1      HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2      100-YEAR NATURAL FLOODWAY - LOON LAKE TO SECTION L
T3      HURON RIVER - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

     -1.       2.       0.       0.   .000000     .00      .0       0.    855.420   .000

J2  NPROF    IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

    1.000     .000   -1.000     .000     .000     .800     .000     .000     .000     .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

   38.000   40.000   41.000   42.000   43.000    1.000    8.000   10.000   12.000    3.000

   33.000    4.000   25.000     .000     .000     .000     .000     .000     .000     .000

NC     .050     .125     .045     .300     .500     .000     .000     .000     .000     .000
QT    1.000  250.000     .000     .000     .000     .000     .000     .000     .000     .000

        VALLEY SECTION 14   (I)

X1 1750.000   22.000  620.000  687.000     .000     .000     .000     .000     .000     .000
X3    .000     .000     .000  600.000     .000 1180.000     .000     .000     .000     .000
GR  970.000     .000  868.000   20.000  862.000  100.000  860.000  130.000  858.000  220.000
GR  856.000  350.000  855.500  510.000  858.300  620.000  853.900  621.000  851.900  633.000
GR  851.100  652.000  852.100  660.000  854.900  674.000  856.200  686.000  859.600  687.000
GR  856.000  710.000  854.800  920.000  854.700 1190.000  856.000 1790.000  858.000 1840.000
GR  860.000 1860.000  862.500 1890.000     .000     .000     .000     .000     .000     .000
NC     .050     .125     .045     .000     .000     .000     .000     .000     .000     .000

        VALLEY SECTION 15   (J)

X1 3280.000   18.000  130.000  191.000 1750.000 1360.000 1530.000     .000     .000     .000
X3    .000     .000     .000     .000     .000  680.000     .000     .000     .000     .000
GR  870.000     .000  860.000   60.000  858.000   70.000  856.000   80.000  854.000  100.000
GR  854.000  130.000  850.000  131.000  846.600  145.000  845.200  155.000  847.500  167.000
GR  849.600  177.000  851.100  189.000  854.800  191.000  856.000  840.000  858.000  890.000
GR  856.000 1050.000  856.000 1170.000  862.000 1190.000     .000     .000     .000     .000

        MANUFACTURED SECTION. CHANNEL POINTS FROM SECTION 15 AND ADJUSTED FOR

        CHANNEL INVERT WITH OVERBANKS REPEATED FROM SECTION 15.
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X1   3447.000    18.000   130.000   191.000   190.000   110.000   167.000      .000      .000      .000
X3       .000      .000      .000      .000      .000   560.000      .000      .000      .000      .000
GR    870.000      .000   860.000    60.000   858.000    70.000   856.000    80.000   854.000   100.000
GR    854.000   130.000   852.600   131.000   849.200   145.000   847.800   155.000   850.100   167.000
GR    852.200   177.000   853.700   189.000   854.800   191.000   856.000   840.000   858.000   890.000
GR    856.000  1050.000   856.000  1170.000   862.000  1190.000      .000      .000      .000      .000
NC       .040      .040      .028      .000      .000      .000      .000      .000      .000      .000

        BRIDGE SECTION 3 - BEACH RD. BRIDGE - D/S FACE   (K)

X1   3448.000    21.000   230.000   270.000     1.000     1.000     1.000      .000      .000      .000
X3       .000      .000      .000      .000      .000   710.000      .000      .000      .000      .000
BT     10.000      .000   863.900      .000    30.000   862.300      .000   130.000   858.100      .000
BT    230.000   856.900   855.200   270.000   856.800   854.900   330.000   855.700      .000   430.000
BT    855.700      .000   530.000   854.100      .000   630.000   854.200      .000   710.000   854.600
BT       .000      .000      .000      .000      .000      .000      .000      .000      .000      .000
GR    863.900      .000   862.300    30.000   858.100   130.000   856.900   230.000   852.500   230.000
GR    851.800   233.000   849.600   240.000   847.800   250.000   848.800   260.000   851.600   270.000
GR    856.800   270.000   855.700   330.000   855.700   430.000   854.100   530.000   854.200   630.000
GR    854.600   710.000   854.900   830.000   854.500   930.000   854.200  1030.000   853.800  1130.000
GR    854.200  1230.000      .000      .000      .000      .000      .000      .000      .000      .000

        BRIDGE SECTION 3 - BEACH RD. BRIDGE - U/S FACE   (K)

X1   3460.000    21.000   230.000   270.000    12.000    12.000    12.000      .000      .000      .000
X3       .000      .000      .000      .000      .000   710.000      .000      .000      .000      .000
BT     10.000      .000   863.900      .000    30.000   862.300      .000   130.000   858.100      .000
BT    230.000   856.900   855.200   270.000   856.800   854.900   330.000   855.700      .000   430.000
BT    855.700      .000   530.000   854.100      .000   630.000   854.200      .000   710.000   854.600
BT       .000      .000      .000      .000      .000      .000      .000      .000      .000      .000
GR    863.900      .000   862.300    30.000   858.100   130.000   856.900   230.000   852.700   230.000
GR    852.000   233.000   849.800   240.000   848.000   250.000   849.000   260.000   851.800   270.000
GR    856.800   270.000   855.700   330.000   855.700   430.000   854.100   530.000   854.200   630.000
GR    854.600   710.000   854.900   830.000   854.500   930.000   854.200  1030.000   853.800  1130.000
GR    854.200  1230.000      .000      .000      .000      .000      .000      .000      .000      .000
NC       .050      .100      .040      .000      .000      .000      .000      .000      .000      .000

        MANUFACTURED SECTION. CHANNEL POINTS FROM SECTION 15 AND ADJUSTED FOR

        CHANNEL INVERT WITH OVERBANKS REPEATED FROM SECTION 15.

X1   3461.000    18.000   130.000   191.000     1.000     1.000     1.000      .000      .000      .000
X3       .000      .000      .000      .000      .000   560.000      .000      .000      .000      .000
GR    870.000      .000   860.000    60.000   858.000    70.000   856.000    80.000   854.000   100.000
GR    854.000   130.000   852.800   131.000   849.400   145.000   848.000   155.000   850.300   167.000
GR    852.400   177.000   853.900   189.000   854.800   191.000   856.000   840.000   858.000   890.000
GR    856.000  1050.000   856.000  1170.000   862.000  1190.000      .000      .000      .000      .000
NC       .050      .125      .045      .000      .000      .000      .000      .000      .000      .000

        VALLEY SECTION 17   (L)

X1   4460.000    11.000    70.000   170.000   990.000  1090.000   999.000      .000      .000      .000
GR    866.000      .000   860.000    35.000   855.400    70.000   851.300    85.000   848.600   111.000
GR    847.900   117.000   847.800   126.000   847.000   139.000   848.100   150.000   850.300   166.000
GR    855.300   170.000      .000      .000      .000      .000      .000      .000      .000      .000
EJ       .000      .000      .000      .000      .000      .000      .000      .000      .000      .000
```

```
*PROF 1

CCHV=     .300 CEHV=     .500
*SECNO 1750.000

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=      600.0     1180.0  TYPE=      1  TARGET=      590.000

          VALLEY SECTION 14    (I)

  1750.00      4.32    855.42       .00    855.42    855.44       .02       .00       .00    858.30
     250.        0.      214.       36.        0.      164.      207.        0.        0.    859.60
      .00       .00      1.31       .17      .040      .036      .100      .000    851.10    620.65
  .000263        0.        0.        0.         0         0         0       .00    426.64   1180.00

*SECNO 3280.000

3470 ENCROACHMENT STATIONS=          .0      680.0  TYPE=      1  TARGET=      679.999

          VALLEY SECTION 15    (J)

  3280.00     10.30    855.50       .00       .00    855.50       .00       .05       .01    854.00
     250.        9.      237.        4.       56.      446.      132.       17.       15.    854.80
      .83       .16       .53       .03      .040      .036      .100      .036    845.20     85.02
  .000013     1750.     1530.     1360.         2         0         0       .00    483.64    568.66

*SECNO 3447.000

3470 ENCROACHMENT STATIONS=          .0      560.0  TYPE=      1  TARGET=      559.999

          MANUFACTURED SECTION, CHANNEL POINTS FROM SECTION 15 AND ADJUSTED FOR


          CHANNEL INVERT WITH OVERBANKS REPEATED FROM SECTION 15.

  3447.00      7.70    855.50       .00       .00    855.51       .01       .00       .00    854.00
     250.       17.      226.        7.       57.      292.      136.       19.       16.    854.80
      .89       .30       .77       .05      .040      .036      .100      .036    847.80     84.90
  .000045      190.      167.      110.         1         0         0       .00    475.10    560.00

*SECNO 3448.000

3265 DIVIDED FLOW

3280 CROSS SECTION    3448.00 EXTENDED       1.30 FEET
```

```
3370 NORMAL BRIDGE,NRD= 10 MIN ELTRD=  854.10 MAX ELLC=  855.20

3470 ENCROACHMENT STATIONS=          .0      710.0  TYPE=      1  TARGET=      709.999

          BRIDGE SECTION 3 - BEACH RD. BRIDGE - D/S FACE   (K)

  3448.00      7.70   855.50      .00      .00   855.51      .01      .00      .00   856.90
     250.        0.     163.      87.       0.     219.     284.      19.      16.   856.80
      .89       .00      .75      .30     .032     .022     .032     .036   847.80   230.00
  .000037        1.       1.       1.        0        0        0   -18.00   307.50   710.00

*SECNO 3460.000

3265 DIVIDED FLOW

3280 CROSS SECTION    3460.00 EXTENDED       1.30 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       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

3370 NORMAL BRIDGE,NRD= 10 MIN ELTRD=  854.10 MAX ELLC=  855.20

3470 ENCROACHMENT STATIONS=          .0      710.0  TYPE=      1  TARGET=      709.999

          BRIDGE SECTION 3 - BEACH RD. BRIDGE - U/S FACE   (K)

  3460.00      7.50   855.50      .00      .00   855.51      .01      .00      .00   856.90
     250.        0.     160.      90.       0.     211.     285.      19.      16.   856.80
      .90       .00      .76      .32     .032     .022     .032     .036   848.00   230.00
  .000040       12.      12.      12.        0        0        0   -18.14   307.71   710.00

*SECNO 3461.000

3470 ENCROACHMENT STATIONS=          .0      560.0  TYPE=      1  TARGET=      559.999

          MANUFACTURED SECTION, CHANNEL POINTS FROM SECTION 15 AND ADJUSTED FOR

          CHANNEL INVERT WITH OVERBANKS REPEATED FROM SECTION 15.

  3461.00      7.50   855.50      .00      .00   855.51      .01      .00      .00   854.00
     250.       16.     226.       8.      56.     280.     134.      19.      16.   854.80
      .90       .29      .81      .06     .040     .032     .080     .036   848.00    84.97
  .000041        1.       1.       1.        0        0        0      .00   475.03   560.00

*SECNO 4460.000
3280 CROSS SECTION    4460.00 EXTENDED        .24 FEET
```

VALLEY SECTION 17 (L)

	4460.00	8.53	855.53	.00	.00	855.53	.00	.02	.00	855.40
1	250.	0.	250.	0.	0.	597.	0.	32.	23.	855.30
2	1.56	.00	.42	.00	.040	.036	.100	.036	847.00	68.97
3	.000010	990.	999.	1090.	1	0	0	.00	101.03	170.00

FORM 1411 1/5 G8
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00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: Hamburg Twp

3) WATERCOURSE: Huron River

4) DOCUMENT TYPE: Natural Run

Section 9/L TO STRAWBERRY CK

00BREAK00

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*****************************************************
*  WATER SURFACE PROFILES                           *
*  VERSION OF NOVEMBER 1976                         *
*  UPDATED JULY 1979                                *
*                                                   *
*  RUN DATE TUE, JUL 21, 1981,  5:00 PM             *
*****************************************************
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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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RECEIVED
JUL 27 1981
WATER MANAGEMENT

```
X     X  XXXXXXX   XXXXX            XXXXX
X     X  X        X     X          X     X
X     X  X        X                X     X
XXXXXXX  XXXX     X         XXXXX  XXXXX
X     X  X        X                X
X     X  X        X     X          X
X     X  XXXXXXX  XXXXX            XXXXXXX
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"Section G/L to Strawberry Lake"

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**************************************************
 HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
 ERROR CORR -  01,02,03
 MODIFICATION -  50,51,52,53
**************************************************

C
T1      HAMBURG TOWNSHIP FIS - JOB 6504-03
T2      10-YEAR FLOW - SECTION G/L TO STRAWBERRY LAKE
T3      HURON RIVER - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

     -1.       2.       0.       0.   .000000     .00      .0       0.    854.680   .000

J2  NPROF    IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

    1.000     .000   -1.000     .000     .000     .800     .000     .000     .000     .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

   38.000   40.000   41.000   42.000   43.000    1.000    8.000   10.000   12.000    3.000

   33.000    4.000   25.000     .000     .000     .000     .000     .000     .000     .000

NC     .125     .125     .045     .300     .500     .000     .000     .000     .000     .000
NH    5.000     .050   70.000     .045  170.000     .125  250.000     .045  425.000     .125
NH 3030.000     .000     .000     .000     .000     .000     .000     .000     .000     .000
QT    4.000 1430.000 1955.000 2300.000 2985.000     .000     .000     .000     .000     .000

        VALLEY SECTION 17   (G/L)

X1   75.096   29.000   70.000  425.000 1250.000  380.000 1010.000     .000     .000     .000
X3     .000     .000     .000     .000     .000 1650.000     .000     .000     .000     .000
GR  866.000     .000  860.000   35.000  855.400   70.000  851.300   85.000  848.600  111.000
GR  847.900  117.000  847.800  126.000  847.000  139.000  848.100  150.000  850.300  166.000
GR  855.300  170.000  853.100  235.000  850.300  237.000  848.700  250.000  842.700  261.000
GR  839.900  289.000  839.900  309.000  843.900  325.000  847.100  342.000  849.000  385.000
GR  852.000  420.000  852.500  425.000  854.000  435.000  856.000 2350.000  856.000 2750.000
GR  858.000 2790.000  860.000 2940.000  862.000 2970.000  870.000 3030.000     .000     .000
NC     .060     .125     .040     .000     .000     .000     .000     .000     .000     .000

        VALLEY SECTION 18   (M)

X1   75.342   21.000  140.000  268.000 1120.000  900.000 1300.000     .000     .000     .000
X3     .000     .000     .000     .000     .000 1600.000     .000     .000     .000     .000
GR  868.000     .000  860.000  100.000  852.100  140.000  850.600  143.000  848.900  168.000
GR  849.200  189.000  849.400  203.000  849.700  223.000  850.400  234.000  850.100  240.000
GR  850.500  250.000  851.000  260.000  851.700  267.000  852.200  268.000  854.000  280.000
GR  855.000 2140.000  856.000 2260.000  858.000 2350.000  860.000 2720.000  862.000 2760.000
GR  870.000 2820.000     .000     .000     .000     .000     .000     .000     .000     .000
NC     .060     .060     .042     .000     .000     .000     .000     .000     .000     .000
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VALLEY SECTION 19 (H)

X1	75.814	24.000	930.000	1121.000	2270.000	1110.000	2490.000	.000	.000	.000
X3	.000	.000	.000	680.000	.000	1310.000	.000	.000	.000	.000
GR	868.000	.000	866.000	10.000	862.000	100.000	860.000	180.000	880.000	510.000
GR	859.300	710.000	858.000	850.000	854.200	930.000	851.800	935.000	849.000	960.000
GR	847.100	977.000	848.500	1002.000	848.300	1024.000	849.000	1040.000	849.600	1060.000
GR	849.900	1090.000	851.500	1114.000	853.800	1121.000	854.000	1140.000	856.000	1230.000
GR	858.000	1240.000	860.000	1420.000	862.000	1680.000	863.600	1830.000	.000	.000
EJ	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

```
*PROF 1

CCHV=     .300 CEHV=     .500
1490 NH CARD USED
*SECNO 75.096

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     CORAR     TOPWID     ENDST


3470 ENCROACHMENT STATIONS=        .0     1650.0  TYPE=     1  TARGET=    1649.999

          VALLEY SECTION 17   (G/L)

    75.10     14.78    854.68       .00    854.68    854.69       .01       .00       .00    855.40
    1430.        0.     1423.        7.        0.     2196.      236.        0.        0.    852.50
      .00       .00       .65       .03      .000      .046      .100      .000    839.90     72.63
  .000012     1250.     1010.      380.         0         0         0       .00    994.65   1086.10


*SECNO 75.342

3470 ENCROACHMENT STATIONS=        .0     1600.0  TYPE=     1  TARGET=    1599.999

          VALLEY SECTION 18   (M)

    75.34      5.79    854.69       .00       .00    854.76       .07       .04       .03    852.10
    1430.       10.     1359.       61.       17.      618.      467.       49.       27.    852.20
      .17       .60      2.20       .13      .048      .032      .100      .032    848.90    126.87
  .000277     1120.     1300.      900.         0         0         0       .00   1443.21   1570.08


*SECNO 75.814

3470 ENCROACHMENT STATIONS=      680.0     1310.0  TYPE=     1  TARGET=     630.000

          VALLEY SECTION 19   (N)

    75.81      8.00    855.10       .00       .00    855.13       .03       .35       .01    854.20
    1430.        1.     1416.       13.        9.     1081.       50.      105.       55.    853.80
      .70       .17      1.31       .26      .048      .034      .048      .033    847.10    911.01
  .000088     2270.     2490.     1110.         2         0         0       .00    278.57   1189.58
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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
*****************************************************

T1       HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2       50-YEAR FLOW - SECTION G/L TO STRAWBERRY LAKE
T3       HURON RIVER - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

    -10.       3.       0.       0.   .000000     .00      .0       0.    855.320   .000

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

     2.000     .000   -1.000     .000     .000     .800     .000     .000     .000     .000

*PROF 2

CCHV=     .300 CEHV=     .500
1490 NH CARD USED
*SECNO 75.096
   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=        .0     1650.0  TYPE=     1  TARGET=     1649.999

          VALLEY SECTION 17   (G/L)

    75.10     15.42    855.32      .00    855.32    855.33      .01       .00       .00    855.40
    1955.        0.     1906.      49.        0.     2416.     854.        0.        0.    852.50
      .00       .00       .79      .06      .000      .048     .100      .000    839.90     70.29
  .000024     1250.     1010.     380.         0         0        0       .00   1579.71   1650.00

*SECNO 75.342

3470 ENCROACHMENT STATIONS=        .0     1600.0  TYPE=     1  TARGET=     1599.999

          VALLEY SECTION 18   (M)

    75.34      6.46    855.36      .00       .00    855.43      .07       .07       .03    852.10
    1955.       18.     1614.     323.       27.     702.     1346.       70.       34.    852.20
      .18       .67      2.30      .24      .048      .032     .100      .033    848.90    123.52
  .000255     1120.     1300.     900.         1         0        0       .00   1476.47   1600.00

*SECNO 75.814

3470 ENCROACHMENT STATIONS=      680.0     1310.0  TYPE=     1  TARGET=      630.000
```

VALLEY SECTION 19 (N)

75.81	8.60	855.78	.00	.00	855.82	.04	.38	.01	854.20
1955.	7.	1909.	39.	26.	1210.	107.	144.	62.	853.80
.60	.28	1.58	.36	.048	.034	.048	.035	847.10	896.79
.000110	2270.	2490.	1110.	2	0	0	.00	323.21	1220.00

FORM 1411 ½ C8
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*************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -   01,02,03
  MODIFICATION -   50,51,52,53
*************************************************

T1       HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2       100-YEAR FLOW - SECTION G/L TO STRAWBERRY LAKE
T3       HURON RIVER - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

    -10.       4.       0.       0.   .000000     .00      .0       0.    855.630   .000

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

     3.000    .000    -1.000    .000     .000     .800     .000     .000     .000     .000

*PROF 3

CCHV=     .300 CEHV=     .500
1490 NH CARD USED
*SECNO 75.096
   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=        .0     1650.0  TYPE=     1  TARGET=     1649.999

          VALLEY SECTION 17   (G/L)

    75.10     15.73    855.63      .00    855.63    855.64      .01       .00       .00    855.40
    2300.        0.     2202.      98.        0.     2526.    1233.        0.        0.    852.50
      .00       .05       .87      .08      .040      .049      .100      .000    839.90     68.25
  .000028     1250.     1010.     380.         0         0         0       .00   1581.75   1650.00

*SECNO 75.342

3470 ENCROACHMENT STATIONS=        .0     1600.0  TYPE=     1  TARGET=     1599.999

          VALLEY SECTION 18   (M)

    75.34      6.78    855.68      .00       .00    855.75      .07       .08       .03    852.10
    2300.       23.     1770.     507.       32.      743.    1768.       80.       34.    852.20
      .18       .72      2.38      .29      .048      .032      .100      .033    848.90    121.92
  .000254     1120.     1300.     900.         1         0         0       .00   1478.08   1600.00

*SECNO 75.814

3470 ENCROACHMENT STATIONS=     680.0     1310.0  TYPE=     1  TARGET=     630.000
```

VALLEY SECTION 19 (N)

75.81	9.01	856.11	.00	.00	856.16	.05	.40	.01	854.20
2300.	13.	2225.	62.	38.	1273.	142.	164.	63.	853.80
.56	.34	1.75	.44	.048	.034	.048	.035	847.10	889.78
.000126	2270.	2490.	1110.	2	0	0	.00	340.78	1230.55

FORM 1411 ½ GA
PRINTED IN U.S.A.

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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
*****************************************************

T1      HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2      500-YEAR FLOW - SECTION G/L TO STRAWBERRY LAKE
T3      HURON RIVER - PROJECT MANAGER, N.S.CHENG

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

    -10.       5.        0.        0.    .000000      .00       .0        0.     856.220    .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    15.000     .000    -1.000     .000      .000      .800      .000      .000      .000      .000

*PROF 4

CCHV=     .300 CEHV=     .500
1490 NH CARD USED
*SECNO 75.096
   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=        .0     1650.0  TYPE=     1  TARGET=     1649.999

          VALLEY SECTION 17   (G/L)

   75.10     16.32    856.22      .00    856.22    856.23      .01       .00       .00    855.40
   2985.       0.     2749.     236.       3.     2736.     1956.       0.        0.     852.50
     .00      .12      1.00      .12     .040      .049      .100     .000    839.90     63.76
 .000035    1250.     1010.     380.       0         0         0      .00   1586.24   1650.00


*SECNO 75.342

3470 ENCROACHMENT STATIONS=        .0     1600.0  TYPE=     1  TARGET=     1599.999

          VALLEY SECTION 18   (M)

   75.34      7.38    856.28      .00       .00    856.35      .06       .09       .03    852.10
   2985.       34.     2027.     924.       44.     821.     2585.     101.       34.     852.20
     .19      .77      2.47      .36     .048      .032      .100     .034    848.90    118.81
 .000238    1120.     1300.     900.        2         0         0      .00   1481.19   1600.00


*SECNO 75.814

3470 ENCROACHMENT STATIONS=     680.0     1310.0  TYPE=     1  TARGET=     630.000
```

VALLEY SECTION 19 (N)

75.81	9.61	856.71	.00	.00	856.77	.06	.42	.00	854.20
2985.	30.	2830.	125.	66.	1388.	209.	202.	63.	853.80
.51	.44	2.04	.60	.048	.034	.048	.036	847.10	877.13
.000152	2270.	2490.	1110.	2	0	0	.00	356.42	1233.56

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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

HURON RIVER - PROJECT MA

SUMMARY PRINTOUT

SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	K*CHSL	TOPWID	AREA
75.096	.00	.00	839.90	1430.00	854.68	14.78	.01	.00	854.69	.00	994.65	2431.30
75.096	.00	.00	839.90	1955.00	855.32	15.42	.01	.00	855.33	.00	1579.71	3269.69
75.096	.00	.00	839.90	2300.00	855.63	15.73	.01	.00	855.64	.00	1581.75	3759.68
75.096	.00	.00	839.90	2985.00	856.22	16.32	.01	.00	856.23	.00	1586.24	4694.23
75.342	.00	.00	848.90	1430.00	854.69	5.79	.07	.03	854.76	6.92	1443.21	1101.33
75.342	.00	.00	848.90	1955.00	855.36	6.46	.07	.03	855.43	6.92	1476.47	2074.80
75.342	.00	.00	848.90	2300.00	855.68	6.78	.07	.03	855.75	6.92	1478.08	2543.18
75.342	.00	.00	848.90	2985.00	856.28	7.38	.06	.03	856.35	6.92	1481.19	3451.01
75.814	.00	.00	847.10	1430.00	855.10	8.00	.03	.01	855.13	-.72	278.57	1139.26
75.814	.00	.00	847.10	1955.00	855.78	8.68	.04	.01	855.82	-.72	323.21	1342.61
75.814	.00	.00	847.10	2300.00	856.11	9.01	.05	.01	856.16	-.72	340.78	1453.65
75.814	.00	.00	847.10	2985.00	856.71	9.61	.06	.00	856.77	-.72	356.42	1662.98

SUMMARY OF ERRORS

00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: Hamburg Twp

3) WATERCOURSE: Huron River

4) DOCUMENT TYPE: Natural Run

Section 9/L to Strawberry Lk

00BREAK00

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*****************************************************
*  WATER SURFACE PROFILES                           *
*  VERSION OF NOVEMBER 1976                         *
*  UPDATED JULY 1979                                *
*                                                   *
*  RUN DATE TUE, JUL 21, 1981,  5:00 PM             *
*****************************************************
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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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RECEIVED
JUL 27 1981
WATER MANAGEMENT

```
X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X            X     X
X     X  X        X                  X     X
XXXXXXX  XXXXX    X        XXXXX     XXXXX
X     X  X        X
X     X  X        X     X            X
X     X  XXXXXXX  XXXXX              XXXXXXX
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"Section 6/1 to Strawberry Lake"

FORM 1411-1 C
PRINTED IN U.S.A.

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*****************************************************
 HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
 ERROR CORR -  01,02,03
 MODIFICATION -  50,51,52,53
*****************************************************

C
T1       HAMBURG TOWNSHIP FIS - JOB 6504-03
T2       10-YEAR FLOW - SECTION G/L TO STRAWBERRY LAKE
T3       HURON RIVER - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      -1.       2.        0.        0.   .000000      .00       .0        0.    854.680    .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     1.000     .000    -1.000     .000      .000      .800      .000      .000      .000      .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    38.000    40.000    41.000    42.000    43.000    1.000     8.000    10.000    12.000     3.000

    33.000     4.000    25.000     .000      .000      .000      .000      .000      .000      .000

NC     .125      .125      .045      .300      .500      .000      .000      .000      .000      .000
NH    5.000      .050    70.000      .045    170.000      .125    250.000      .045    425.000      .125
NH 3030.000      .000      .000      .000      .000      .000      .000      .000      .000      .000
QT    4.000 1430.000 1955.000 2300.000 2985.000      .000      .000      .000      .000      .000


          VALLEY SECTION 17   (G/L)

X1   75.096    29.000    70.000   425.000  1250.000   380.000  1010.000      .000      .000      .000
X3     .000      .000      .000      .000      .000  1650.000      .000      .000      .000      .000
GR  866.000      .000   860.000    35.000   855.400    70.000   851.300    85.000   848.600   111.000
GR  847.900   117.000   847.800   126.000   847.000   139.000   848.100   150.000   850.300   166.000
GR  855.300   170.000   853.100   235.000   850.300   237.000   848.700   250.000   842.700   261.000
GR  839.900   289.000   839.900   309.000   843.900   325.000   847.100   342.000   849.000   385.000
GR  852.000   420.000   852.500   425.000   854.000   435.000   856.000  2350.000   856.000  2750.000
GR  858.000  2790.000   860.000  2940.000   862.000  2970.000   870.000  3030.000      .000      .000
NC     .060      .125      .040      .000      .000      .000      .000      .000      .000      .000


          VALLEY SECTION 18   (M)

X1   75.342    21.000   140.000   268.000  1120.000   900.000  1300.000      .000      .000      .000
X3     .000      .000      .000      .000      .000  1600.000      .000      .000      .000      .000
GR  868.000      .000   860.000   100.000   852.100   140.000   850.600   143.000   848.900   168.000
GR  849.200   189.000   849.400   203.000   849.700   223.000   850.400   234.000   850.100   240.000
GR  850.500   250.000   851.000   260.000   851.700   267.000   852.200   268.000   854.000   280.000
GR  855.000  2140.000   856.000  2260.000   858.000  2350.000   860.000  2720.000   862.000  2760.000
GR  870.000  2820.000      .000      .000      .000      .000      .000      .000      .000      .000
NC     .060      .060      .042      .000      .000      .000      .000      .000      .000      .000
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VALLEY SECTION 19 (H)

X1	75.814	24.000	930.000	1121.000	2270.000	1110.000	2490.000	.000	.000	.000
X3	.000	.000	.000	680.000	.000	1310.000	.000	.000	.000	.000
GR	868.000	.000	866.000	10.000	862.000	100.000	860.000	180.000	880.000	510.000
GR	859.300	710.000	858.000	850.000	854.200	930.000	851.800	935.000	849.000	960.000
GR	847.100	977.000	848.500	1002.000	848.300	1024.000	849.000	1040.000	849.600	1060.000
GR	849.900	1090.000	851.500	1114.000	853.800	1121.000	854.000	1140.000	856.000	1230.000
GR	858.000	1240.000	860.000	1420.000	862.000	1680.000	863.600	1830.000	.000	.000
EJ	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

FORM 1411 5 68
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*PROF 1

CCHV=     .300 CEHV=     .500
1490 NH CARD USED
*SECNO 75.096

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     CORAR     TOPWID    ENDST


3470 ENCROACHMENT STATIONS=        .0    1650.0  TYPE=     1  TARGET=    1649.999

          VALLEY SECTION 17   (G/L)

    75.10     14.78    854.68       .00    854.68    854.69       .01       .00       .00    855.40
    1430.        0.     1423.        7.        0.     2196.      236.        0.        0.    852.50
      .00       .00       .65       .03      .000      .046      .100      .000    839.90     72.63
  .000012     1250.     1010.      380.         0         0         0       .00    994.65   1086.10


*SECNO 75.342

3470 ENCROACHMENT STATIONS=        .0    1600.0  TYPE=     1  TARGET=    1599.999

          VALLEY SECTION 18   (M)

    75.34      5.79    854.69       .00       .00    854.76       .07       .04       .03    852.10
    1430.       10.     1359.       61.       17.      618.      467.       49.       27.    852.20
      .17       .60      2.20       .13      .048      .032      .100      .032    848.90    126.87
  .000277     1120.     1300.      900.         0         0         0       .00   1443.21   1570.08


*SECNO 75.814

3470 ENCROACHMENT STATIONS=     680.0    1310.0  TYPE=     1  TARGET=     630.000

          VALLEY SECTION 19   (N)

    75.81      8.00    855.10       .00       .00    855.13       .03       .35       .01    854.20
    1430.        1.     1416.       13.        9.     1081.       50.      105.       55.    853.80
      .70       .17      1.31       .26      .048      .034      .048      .033    847.10    911.01
  .000088     2270.     2490.     1110.         2         0         0       .00    278.57   1189.58
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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
*****************************************************

T1      HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2      50-YEAR FLOW - SECTION G/L TO STRAWBERRY LAKE
T3      HURON RIVER - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

    -10.       3.        0.        0.    .000000      .00        .0        0.    855.320    .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     2.000     .000    -1.000     .000      .000      .800      .000      .000      .000      .000

*PROF 2

CCHV=     .300 CEHV=     .500
1490 NH CARD USED
*SECNO 75.096
   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=        .0    1650.0  TYPE=     1  TARGET=    1649.999

          VALLEY SECTION 17   (G/L)

    75.10     15.42    855.32      .00    855.32    855.33      .01       .00       .00    855.40
    1955.        0.     1906.      49.        0.     2416.     854.        0.        0.    852.50
      .00       .00       .79      .06      .000      .048     .100      .000    839.90     70.29
  .000024     1250.     1010.     380.         0         0        0       .00   1579.71   1650.00

*SECNO 75.342

3470 ENCROACHMENT STATIONS=        .0    1600.0  TYPE=     1  TARGET=    1599.999

          VALLEY SECTION 18   (M)

    75.34      6.46    855.36      .00       .00    855.43      .07       .07       .03    852.10
    1955.       18.     1614.     323.       27.     702.    1346.       70.       34.    852.20
      .18       .67      2.30      .24      .048      .032     .100      .033    848.90    123.52
  .000255     1120.     1300.     900.         1         0        0       .00   1476.47   1600.00

*SECNO 75.814

3470 ENCROACHMENT STATIONS=     680.0    1310.0  TYPE=     1  TARGET=     630.000
```

VALLEY SECTION 19 (N)

75.81	8.68	855.78	.00	.00	855.82	.04	.38	.01	854.20
1955.	7.	1909.	39.	26.	1210.	107.	144.	62.	853.80
.60	.28	1.58	.36	.048	.034	.048	.035	847.10	896.79
.000110	2270.	2490.	1110.	2	0	0	.00	323.21	1220.00

FORM 1411 5-68
PRINTED IN U.S.A.

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*****************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -   01,02,03
  MODIFICATION -   50,51,52,53
*****************************************

T1       HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2       100-YEAR FLOW - SECTION G/L TO STRAWBERRY LAKE
T3       HURON RIVER - PROJECT MANAGER, M.S.CHENG

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

     -10.       4.        0.        0.   .000000       .00        .0        0.   855.630     .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     3.000     .000    -1.000     .000      .000      .800      .000      .000      .000      .000

*PROF 3

CCHV=     .300 CEHV=     .500
1490 NH CARD USED
*SECNO 75.096
   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=        .0    1650.0  TYPE=     1  TARGET=    1649.999

          VALLEY SECTION 17   (G/L)

    75.10     15.73    855.63       .00    855.63    855.64       .01       .00       .00    855.40
    2300.        0.     2202.       98.        0.     2526.     1233.        0.        0.    852.50
      .00       .05       .87       .08      .040      .049      .100      .000    839.90     68.25
  .000028     1250.     1010.      380.         0         0         0       .00   1581.75   1650.00

*SECNO 75.342

3470 ENCROACHMENT STATIONS=        .0    1600.0  TYPE=     1  TARGET=    1599.999

          VALLEY SECTION 18   (M)

    75.34      6.78    855.68       .00       .00    855.75       .07       .08       .03    852.10
    2300.       23.     1770.      507.       32.      743.     1768.       80.       34.    852.20
      .18       .72      2.38       .29      .048      .032      .100      .033    848.90    121.92
  .000254     1120.     1300.      900.         1         0         0       .00   1478.08   1600.00

*SECNO 75.814

3470 ENCROACHMENT STATIONS=      680.0    1310.0  TYPE=     1  TARGET=     630.000
```

VALLEY SECTION 19 (N)

75.81	9.01	856.11	.00	.00	856.16	.05	.40	.01	854.20
2300.	13.	2225.	62.	38.	1273.	142.	164.	63.	853.80
.56	.34	1.75	.44	.048	.034	.048	.035	847.10	889.78
.000126	2270.	2490.	1110.	2	0	0	.00	340.78	1230.55

FORM 1411 - GA
PRINTED IN U.S.A.

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*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED JULY 1979
  ERROR CORR -  01,02,03
  MODIFICATION -  50,51,52,53
*****************************************************

T1      HAMBURG TOWNSHIP FIS - JOB NO. 6504-03
T2      500-YEAR FLOW - SECTION G/L TO STRAWBERRY LAKE
T3      HURON RIVER - PROJECT MANAGER, N.S.CHENG

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

     -10.       5.        0.        0.   .000000       .00       .0        0.    856.220    .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     15.000    .000    -1.000     .000      .000      .800      .000      .000      .000      .000

*PROF 4

CCHV=     .300 CEHV=     .500
1490 NH CARD USED
*SECNO 75.096
   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=        .0    1650.0  TYPE=     1  TARGET=    1649.999

          VALLEY SECTION 17   (G/L)

    75.10     16.32    856.22       .00    856.22    856.23       .01       .00       .00    855.40
    2985.        0.     2749.      236.        3.     2736.     1956.        0.        0.    852.50
      .00       .12      1.00       .12      .040      .049      .100      .000    839.90     63.76
  .000035     1250.     1010.      380.         0         0         0       .00   1586.24   1650.00


*SECNO 75.342

3470 ENCROACHMENT STATIONS=        .0    1600.0  TYPE=     1  TARGET=    1599.999

          VALLEY SECTION 18   (M)

    75.34      7.38    856.28       .00       .00    856.35       .06       .09       .03    852.10
    2985.       34.     2027.      924.       44.      821.     2585.      101.       34.    852.20
      .19       .77      2.47       .36      .048      .032      .100      .034    848.90    118.81
  .000238     1120.     1300.      900.         2         0         0       .00   1481.19   1600.00


*SECNO 75.814

3470 ENCROACHMENT STATIONS=     680.0    1310.0  TYPE=     1  TARGET=     630.000
```

VALLEY SECTION 19 (N)

75.81	9.61	856.71	.00	.00	856.77	.06	.42	.00	854.20
2985.	30.	2830.	125.	66.	1388.	209.	202.	63.	853.80
.51	.44	2.04	.60	.048	.034	.048	.036	847.10	877.13
.000152	2270.	2490.	1110.	2	0	0	.00	356.42	1233.56

FORM 1411 ½ G8

PRINTED IN U.S.A.

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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

HURON RIVER - PROJECT MA

SUMMARY PRINTOUT

SECNO	ELTRD	ELLC	ELMIN	Q	CWSEL	DEPTH	HV	OLOSS	EG	K*CHSL	TOPWID	AREA
75.096	.00	.00	839.90	1430.00	854.68	14.78	.01	.00	854.69	.00	994.65	2431.30
75.096	.00	.00	839.90	1955.00	855.32	15.42	.01	.00	855.33	.00	1579.71	3269.69
75.096	.00	.00	839.90	2300.00	855.63	15.73	.01	.00	855.64	.00	1581.75	3759.68
75.096	.00	.00	839.90	2985.00	856.22	16.32	.01	.00	856.23	.00	1586.24	4694.23
75.342	.00	.00	848.90	1430.00	854.69	5.79	.07	.03	854.76	6.92	1443.21	1101.33
75.342	.00	.00	848.90	1955.00	855.36	6.46	.07	.03	855.43	6.92	1476.47	2074.80
75.342	.00	.00	848.90	2300.00	855.68	6.78	.07	.03	855.75	6.92	1478.08	2543.18
75.342	.00	.00	848.90	2985.00	856.28	7.38	.06	.03	856.35	6.92	1481.19	3451.01
75.814	.00	.00	847.10	1430.00	855.10	8.00	.03	.01	855.13	-.72	278.57	1139.26
75.814	.00	.00	847.10	1955.00	855.78	8.68	.04	.01	855.82	-.72	323.21	1342.61
75.814	.00	.00	847.10	2300.00	856.11	9.01	.05	.01	856.16	-.72	340.78	1453.65
75.814	.00	.00	847.10	2985.00	856.71	9.61	.06	.00	856.77	-.72	356.42	1662.98

SUMMARY OF ERRORS

00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: HOWELL, CITY OF

3) WATERCOURSE: BOGUE CREEK

4) DOCUMENT TYPE: 100-YEAR NATURAL, GOVE, DNR

00BREAK00

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

C
T1      BOGUE CREEK HOWELL, PROJECT NO. 8563
T2      BOGUE CREEK
T3      BOGUE CREEK

J1  ICHECK    INQ     NINV    IDER    STRT     METRIC   HVINS    Q        WSEL     FQ

     0.       2.      0.      0.    1.000000    0.0      0.0      0.      890.000   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

NC    0.040    0.040    0.035    0.0      0.0      0.0      0.0      0.0      0.0      0.0
QT    4.000   70.000   170.000  270.000  480.000   0.0      0.0      0.0      0.0      0.0
                                          @ Lake Outlet

      A

X1  49975.000   8.000  1315.000 1370.000   0.0      0.0      0.0      0.0      0.0      0.0
GR    902.800 1220.000  896.800 1315.000  886.400 1338.000  885.300 1345.000  886.000 1352.000
GR    893.600 1370.000  894.100 1500.000  911.900 1550.000    0.0      0.0      0.0      0.0

      B

X1  50600.000   9.000    80.000  120.000  560.000  560.000  560.000    0.0      0.0      0.0
GR    915.000   0.0     897.000   40.000  895.700   80.000  887.600   92.000  386.600  100.000
GR    887.700 196.000   894.300  120.000  896.800  165.000  903.200  200.000    0.0      0.0

      C   HIGHLAND ST. BRIDGE, TR 910.8, LC 907.3

X1  50800.000  17.000  1952.000 2048.000  200.000  200.000  200.000    0.0      0.0      0.0
GR    909.300 1930.000  910.800 1952.000  905.800 1952.000  894.500 1978.000  907.300 1978.000
GR    907.300 1979.000  894.500 1979.000  888.800 1986.000  887.800 2000.000  886.800 2009.000
GR    895.200 2022.000  907.300 2022.000  907.300 2023.000  895.200 2023.000  905.300 2048.000
GR    910.800 2048.000  912.400 2110.000    0.0      0.0      0.0      0.0      0.0      0.0

X1  50801.000   0.0      0.0      0.0     1.000    1.000    1.000    0.0      0.0      0.0
BT      6.000 1990.000  909.300  909.300 1952.000  910.800  907.300 1978.000  910.300  907.300
BT   2022.000  910.800  907.300 2048.000  910.800  907.300 2110.000  912.400  912.400    0.0

X1  50802.000   0.0      0.0      0.0    43.000   43.000   43.000    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  50803.000   0.0      0.0      0.0     1.000    1.000    1.000    0.0      0.0      0.0

      D

X1  51175.000   8.000  1456.000 1511.000  320.000  320.000  320.000    0.0      0.0      0.0
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GR     888.700    1491.000    897.900    1511.000    918.000    1625.000      0.0       0.0       0.0       0.0

       E   MANUFACTURED

X1   51450.000      11.000    510.000     540.000    250.000     250.000    250.000       0.0       0.0       0.0
GR     898.000      18.000    902.000     200.000    906.000     230.000    906.000     380.000   902.000   400.000
GR     898.000     425.000    894.000     480.000    390.000     510.000    887.800     520.000   890.000   540.000
GR     906.000     535.000      0.0         0.0        0.0         0.0        0.0         0.0       0.0       0.0

       F   CONTROL DAM, D/S WITH FIXED SLUICE GATE. GATE HEIGHT 891.0

       DAM CREST 898.8, DISTANCE FROM DAM TO SLUICE GATE 27

       DAM BOTTOM 887.6

X1   51577.000       7.000    394.000     406.000    100.000     100.000    100.000       0.0       0.0       0.0
GR     907.500     390.000    907.500     394.000    888.400     394.000    887.600     400.000   888.300   406.000
GR     907.500     406.000    907.500     500.000      0.0         0.0        0.0         0.0       0.0       0.0
SB       0.0         1.500      2.500      12.000     12.000       0.0      36.000       0.0     888.000   888.000

X1   51578.000       0.0        0.0         0.0        1.500       1.500      1.500       0.0       0.0       0.0
X2       0.0         0.0        1.000     891.000    907.500       0.0        0.0         0.0       0.0       0.0

X1   51579.000       0.0        0.0         0.0       27.000      27.000     27.000       0.0       0.0       0.0
SB       0.0         1.500      2.500      12.000      1.000       0.0       0.100       0.0     888.000   888.000

X1   51580.000       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     888.100    898.800       0.0        0.0         0.0       0.0       0.0

       G

X1   51800.000       9.000    185.000     246.000    320.000     320.000    320.000       0.0       0.0       0.0
GR     906.200     179.000    906.300     185.000    902.600     193.600    899.200     201.000   893.600   207.000
GR     899.100     213.000    900.300     225.000    906.500     246.000    907.400     256.000     0.0       0.0

       H   CONTROL DAM, DAM CREST 904.4, DAM BOTTOM 900.6

X1   51925.000       5.000    201.000     213.000    200.000     200.000    200.000       0.0       0.0       0.0
GR     906.500     201.000    899.200     201.000    898.600     207.000    899.100     213.000   905.500   213.000

       DISCHARGE, STORAGE AND ELEVATION DATA HAVE BEEN DEVELOPED FOR

       TR 20, THE ELEVATIONS ARE GIVEN FROM X5 CARD

X1   51926.000       4.000    201.000     213.000     38.000      38.000     38.000       0.0       0.0       0.0
X5       4.000     906.080    906.850     907.040    907.310       0.0        0.0         0.0       0.0       0.0
GR     906.500     201.000    904.400     201.000    904.400     213.000    906.500     213.000     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 3

*SECNO 49975.000
  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

      A

 49975.00    2.58    887.83    887.88    890.00    888.73      0.85      0.0       0.0     896.80
   270.       0.      270.       0.        0.        36.        0.        0.        0.      893.60
    0.0       0.0     7.40      0.0       0.040     0.035     0.040      0.0     835.30    1334.72
 0.016005     0.      0.        0.        0         10         0       -0.00     21.74    1356.46

*SECNO 50600.000

3301 HV CHANGED MORE THAN HVINS

      B

 50600.00    4.38    890.98     0.0       0.0      891.19      0.21      2.46      0.0     895.70
   270.       0.      270.       0.        0.        74.        0.        1.        0.      894.30
    0.04      0.0     3.65      0.0       0.040     0.035     0.040     0.035    886.60     86.99
 0.002012     560.    560.      560.       5         0         0       -0.00     25.98     112.97

*SECNO 50800.000

      C   HIGHLAND ST. BRIDGE, TR 910.8, LC 907.3

 50800.00    3.61    891.41     0.0       0.0      891.60      0.19      0.41      0.0     910.80
   270.       0.      270.       0.        0.        77.        0.        1.        0.      910.80
    0.06      0.0     3.49      0.0       0.040     0.035     0.040     0.035    887.80    1983.90
 0.002075     200.    200.      200.       2         0         0       -0.00     30.38    2014.28

*SECNO 50801.000

3370 NORMAL BRIDGE,NRD  6 MIN ELTRD  909.30 MAX ELLC  912.40

 50801.00    3.61    891.41     0.0       0.0      891.60      0.19      0.00      0.0     910.80
   270.       0.      270.       0.        0.        78.        0.        1.        0.      910.80
    0.06      0.0     3.48      0.0       0.040     0.035     0.040     0.035    887.80    1983.88
 0.002050     1.      1.        1.        0         0         0       -0.00     30.42    2014.30

*SECNO 50802.000
  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  6 MIN ELTRD  909.30 MAX ELLC  912.40

 50802.00    3.71    891.51     0.0       0.0      891.68      0.18      0.08      0.0     910.80
   270.       0.      270.       0.        0.        80.        0.        1.        0.      910.80
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      0.06       0.0       3.36       0.0       0.040     0.035     0.040     0.035    887.80   1983.74
  0.001853       43.       43.        43.        0         0         0       -0.00     30.75   2014.49

*SECNO 50803.000
 50803.00       3.71    891.51       0.0       0.0      891.69      0.17      0.00       0.0    910.80
     270.        0.      270.        0.        0.        81.        0.        1.         0.    910.80
     0.06       0.0       3.35       0.0       0.040     0.035     0.040     0.035    887.80   1983.72
 0.001833        1.        1.         1.        0         0         0       -0.00     30.78   2014.51

*SECNO 51175.000

       D

 51175.00       4.41    892.01       0.0       0.0      892.13      0.12      0.45       0.0    896.80
     270.        0.      270.        0.        0.        96.        0.        2.         1.    897.90
     0.09       0.0       2.80       0.0       0.040     0.035     0.040     0.035    887.60   1465.21
  0.001110      320.      320.       320.        2         0         0       -0.00     33.00   1498.20

*SECNO 51450.000

       E   MANUFACTURED

 51450.00       4.46    892.26       0.0       0.0      892.34      0.08      0.21       0.0    890.00
     270.       20.      243.        7.       19.       101.        7.        2.         1.    890.00
     0.12       1.02      2.41       0.99      0.040     0.035     0.040     0.035    887.80    493.05
  0.000652     250.      250.       250.        2         0         0       -0.00     53.31    546.36

*SECNO 51577.000

       F   CONTROL DAM, D/S WITH FIXED SLUICE GATE, GATE HEIGHT 891.0

           DAM CREST 898.8, DISTANCE FROM DAM TO SLUICE GATE 27

           DAM BOTTOM 887.6

 51577.00       4.40    892.00       0.0       0.0      892.49      0.48      0.14       0.0    907.50
     270.        0.      270.        0.        0.        48.        0.        3.         1.    907.50
     0.13       0.0       5.58       0.0       0.040     0.035     0.040     0.035    887.60    394.00
 0.005112       100.      100.       100.        2         0         0       -0.00     12.00    406.00

SPECIAL BRIDGE

SB   XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     0.0       1.50      2.50      12.00     12.00     0.0       36.00     0.0       888.00    888.00

*SECNO 51578.000
   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       NTN       ELMIN     SSTA
   SLOPE     XLOBL     XLCH      XLOBR     TTRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

PRESSURE FLOW

EGPRS      EGLWC      H3         QWEIR      QPR        BAREA      TRAPEZOID  ELLC       ELTRD
                                                                  AREA
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MOORE BUSINESS FORMS INC 27

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 51578.00      5.40    893.00      0.0       0.0     893.31      0.31      0.83      0.0     907.50
     270.        0.     270.       0.        0.       60.        0.        3.        1.     907.50
     0.13       0.0     4.48       0.0     0.040      0.035     0.040     0.035    837.60    394.00
 0.002791        2.       2.        2.         2          0         0     -0.00     12.00    406.00


*SECNO 51579.000
 51579.00      5.48    893.03      0.0       0.0     893.38      0.30      0.07      0.0     907.50
     270.        0.     270.       0.        0.       61.        0.        3.        1.     907.50
     0.13       0.0     4.40       0.0     0.040      0.035     0.040     0.035    887.60    394.00
 0.002672       27.      27.       27.         2          0         0     -0.00     12.00    406.00


SPECIAL BRIDGE

SB   XK        XKOR      COFQ      RDLEN      BWC       BWP      BAREA      SS       ELCHU     ELCHD
     0.0       1.50      2.50      12.00     1.00       0.0      0.10      0.0     888.00    888.00

*SECNO 51580.000
PRESSURE AND WEIR FLOW

 EGPRS       EGLWC       H3       QWEIR       QPR      BAREA   TRAPEZOID      ELLC      ELTRD
                                                                 AREA
170691.06    893.74     0.0       271.        2.        0.        0.      888.10    898.80


 51580.00     15.50    903.10      0.0       0.0     903.13      0.03      9.75      0.0     907.50
     270.        0.     270.       0.        0.      181.        0.        3.        1.     907.50
     0.13       0.0     1.49       0.0     0.040      0.035     0.040     0.035    887.60    394.00
 0.000172        1.       1.        1.         2          0         7     -0.00     12.00    406.00


*SECNO 51800.000

        G

 51800.00      4.56    903.16      0.0       0.0     903.23      0.07      0.10      0.0     906.00
     270.        0.     270.       0.        0.      125.        0.        4.        1.     906.50
     0.17       0.0     2.16       0.0     0.040      0.035     0.040     0.035    898.60    191.69
 0.000647      320.     320.      320.         2          0         0     -0.00     42.99    234.68


*SECNO 51925.000

        H   CONTROL DAM, DAM CREST 904.4, DAM BOTTOM 900.6

 51925.00      4.45    903.05      0.0       0.0     903.50      0.45      0.28      0.0     906.50
     270.        0.     270.       0.        0.       50.        0.        4.        1.     906.50
     0.18       0.0     5.38       0.0     0.040      0.035     0.040     0.035    898.60    201.00
 0.004674      200.     200.      200.         2          0         0     -0.00     12.00    213.00


*SECNO 51926.000
WATER EL X5 CARD     997.040
3280 CROSS SECTION 51926.00 EXTENDED      0.54 FEET

   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
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DISCHARGE, STORAGE AND ELEVATION DATA HAVE BEEN DEVELOPED FOR

TR=20. THE ELEVATIONS ARE GIVEN FROM X5 CARD

51926.00	2.54	907.04	0.0	0.0	908.17	1.13	0.31	0.0	906.50
270.	0.	270.	0.	0.	32.	0.	4.	1.	906.50
0.18	0.0	8.52	0.0	0.040	0.035	0.040	0.035	904.40	201.00
0.017955	38.	38.	38.	0	0	0	0.0	12.00	213.00

MOORE BUSINESS FORMS INC 27

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  HEC2 RELEASE DATED NOV 76 UPDATED AUG 1977
  ERROR CORR -  01,02
  MODIFICATION -  50,51,52,53
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T1HOWELL FLOOD INSURANCE STUDY        100 YEAR   DNR
T2BOGUE CREEK
T3DAM DOWNSTREAM OF THOMPSON LAKE          S. ELMS

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      0.        0.        0.        0.  0.000000      0.00       0.0     270.   893.080     0.000

NC    0.040     0.040     0.035     0.100     0.300     0.000     0.000     0.000     0.000     0.000

X1  51579.000   7.000   394.000   406.000     0.000     0.000     0.000     0.000     0.000     0.000
GR    907.500 390.000   907.500   394.000   888.400   394.000   887.600   400.000   888.300   406.000
GR    906.500 406.000   906.500   500.000     0.000     0.000     0.000     0.000     0.000     0.000

X1 515791.000   6.000   394.000   406.000     0.500     0.500     0.500     0.000     0.000     0.000
GR    907.500 390.000   907.500   394.000   898.800   394.000   898.800   406.000   907.500   406.000
GR    907.500 500.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
SB      0.000   1.500     2.500    12.000    12.000     0.000    81.600     0.000     0.000     0.000

X1  51580.000   0.000     0.000     0.000     1.000     1.000     1.000     0.000     0.000     0.000
X2      0.000   0.000     1.000   905.600   907.500     0.000     0.000     0.000     0.000     0.000

X1  51581.000   0.000     0.000     0.000     1.000     1.000     1.000     0.000    -1.800     0.000

X1  51631.000   9.000   185.000   246.000    50.000    50.000    50.000     0.000    -0.300     0.000
GR    906.200 179.000   906.000   185.000   902.600   193.000   899.200   201.000   898.600   207.000
GR    899.100 213.000   900.300   225.000   906.500   246.000   907.400   256.000     0.000     0.000

X1  51800.000   0.000     0.000     0.000   270.000   270.000   270.000     0.000     0.300     0.000

X1  51925.000   6.000   201.000   213.000   238.000   238.000   238.000     0.000     0.000     0.000
GR    906.500  50.000   906.500   201.000   899.200   201.000   898.600   207.000   899.100   213.000
GR    906.500 213.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

X1  51926.000   5.000   201.000   213.000     1.000     1.000     1.000     0.000     0.000     0.000
X2      0.000   0.000     0.000   905.100   906.500     0.000     0.000     0.000     0.000     0.000
BT      3.000  50.000   906.500     0.000   201.000   906.500   905.100   213.000   906.500   905.100
GR    906.500  50.000   906.500   201.000   904.400   201.000   904.400   213.000   906.500   213.000
SB      0.000   1.500     2.500   150.000    12.000     0.000     8.400     0.000     0.000     0.000

X1  51927.000   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   905.100   906.500     0.000     1.000     0.000     0.000     0.000

X1      0.000   0.000     0.000     0.000     1.000     1.000     1.000     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=   0.100 CEHV=   0.300
*SECNO 51579.000
   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       NXR        WTN        ELMIN       SSTA
   SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID      ENDST


 51579.00      5.48     893.08       0.00     893.08     893.38       0.30       0.00       0.00     907.50
     270.        0.       270.         0.         0.        61.         0.         0.         0.     906.50
     0.00      0.00       4.41       0.00      0.040      0.035      0.040      0.000     887.60     394.00
 0.002677        0.         0.         0.          0          0          0       0.00      12.00     406.00


*SECNO 515791.000

3301 HV CHANGED MORE THAN HVINS

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


3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
515791.00      2.50     901.30     901.30       0.00     902.56       1.26       0.00       0.29     907.50
     270.        0.       270.         0.         0.        30.         0.         0.         0.     907.50
     0.00      0.00       9.01       0.00      0.040      0.035      0.040      0.012     898.80     394.00
 0.021173        1.         1.         1.         20         14          0       0.00      12.00     406.00


SPECIAL BRIDGE

5070,VARIABLE ELCHU OR ELCHD ON CARD SB NOT SPECIFIED
SB  XK         XKOR       COFQ       RDLEN      BWC        BWP        BAREA      SS         ELCHU      ELCHD
     0.00       1.50       2.50      12.00      12.00       0.00      81.60       0.00     898.80     898.80

*SECNO 51580.000

6070,LOW FLOW BY NORMAL BRIDGE

EGPRS=     0.000  EGLWC=   902.558  ELLC=   905.600  PCWSE=   901.296  ELTRD=   907.500

3370 NORMAL BRIDGE,NRD=  0 MIN ELTRD=  907.50 MAX ELLC=  905.60

 51580.00      2.82     901.62       0.00       0.00     902.60       0.98       0.02       0.03     907.50
     270.        0.       270.         0.         0.        34.         0.         0.         0.     907.50
     0.00      0.00       7.95       0.00      0.040      0.035      0.040      0.015     898.80     394.00
 0.014681        1.         1.         1.          4          0          0       0.00      12.00     406.00


*SECNO 51581.000

3301 HV CHANGED MORE THAN HVINS

 51581.00      5.41     902.41       0.00       0.00     902.68       0.27       0.00       0.07     905.70
     270.        0.       270.         0.         0.        65.         0.         0.         0.     905.70
     0.00      0.00       4.16       0.00      0.040      0.035      0.040      0.016     897.00     394.00
 0.002379        1.         1.         1.          3          0          0       0.00      12.00     406.00
```

structure #2

```
*SECNO 51631.000
   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      NXR       WTN       ELMIN      SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID     ENDST

 51631.00     4.38    902.68      0.00      0.00    902.76      0.08      0.06      0.02    905.70
    270.       0.      270.       0.        0.       118.       0.        0.        0.      906.20
    0.01      0.00     2.30      0.00     0.040     0.035     0.040     0.033    898.30    192.11
 0.000771     50.      50.       50.        2         0         0       0.00      41.97    234.07

*SECNO 51800.000
 51800.00     4.29    902.89      0.00      0.00    902.98      0.09      0.22      0.00    906.00
    270.       0.      270.       0.        0.       114.       0.        1.        0.      906.50
    0.04      0.00     2.37      0.00     0.040     0.035     0.040     0.034    898.60    192.32
 0.000843     270.     270.      270.        2         0         0       0.00      41.46    233.77

*SECNO 51925.000
 51925.00     4.43    903.03      0.00      0.00    903.49      0.45      0.40      0.11    906.50
    270.       0.      270.       0.        0.        50.       0.        1.        0.      906.50
    0.05      0.00     5.41      0.00     0.040     0.035     0.040     0.035    898.60    201.00
 0.004743     238.     238.      238.        2         0         0       0.00      12.00    213.00

*SECNO 51926.000
3280 CROSS SECTION  51926.00 EXTENDED      0.38 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      NXR       WTN       ELMIN      SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID     ENDST

3370 NORMAL BRIDGE,NRD=  3 MIN ELTRD=  906.50 MAX ELLC=  905.10

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
 51926.00     2.48    906.88    906.88      0.00    907.11      0.22      0.01      0.02    906.50
    270.      220.      50.       0.       58.       13.       0.        1.        0.      906.50
    0.05      3.79     3.84      0.00     0.040     0.035     0.040     0.035    904.40     50.00
 0.037374      1.       1.        1.        20        14         0     -16.80    163.00    213.00

SPECIAL BRIDGE

5070,VARIABLE ELCHU OR ELCHD ON CARD SB NOT SPECIFIED
SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
    0.00      1.50      2.50    150.00     12.00      0.00      8.40      0.00    904.40    904.40

*SECNO 51927.000
3280 CROSS SECTION  51927.00 EXTENDED      0.49 FEET

3370 NORMAL BRIDGE,NRD=  3 MIN ELTRD=  906.50 MAX ELLC=  905.10

 51927.00     2.60    907.00      0.00      0.00    907.14      0.14      0.02      0.01    906.50
    270.      230.      40.       0.       75.       14.       0.        1.        0.      906.50
```

Thompson
LAKE
Structure

0.017581	1.	1.	1.	3	0	0	-16.80	163.00	213.00

*SECNO .000
3280 CROSS SECTION 0.00 EXTENDED 0.44 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	NXR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
0.00	2.53	906.93	0.00	0.00	907.18	0.25	0.01	0.03	906.50
270.	115.	155.	0.	67.	30.	0.	1.	0.	906.50
0.05	1.72	5.10	0.00	0.040	0.035	0.040	0.034	904.40	50.00
0.006436	1.	1.	1.	2	0	0	0.00	163.00	213.00

00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: HOWELL, CITY OF

3) WATERCOURSE: BOGUE CREEK

4) DOCUMENT TYPE: REPORT

00BREAK00

FLOOD INSURANCE STUDY

BOGUE CREEK

THROUGH THE CITY OF

HOWELL, MICHIGAN

Gove Associates Inc.
ARCHITECTS/ENGINEERS/PLANNERS/SURVEYORS

1601 PORTAGE STREET
KALAMAZOO, MICHIGAN 49001
(616) 385-0011

September 9, 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 Howell Flood Insurance Study

Dear Mr. Morgan:

Enclosed for your review is our Hydraulic Analysis of Bogue Creek through the City of Howell, 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. Topographic 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

William J. McDonough, P.E.
Associate

WJM/tk

Enclosure: as listed above

HYDRAULIC ANALYSIS

1. INTRODUCTION

The stream being studied is the Bogue Creek, located at the eastern edge of the City of Howell in Livingston County, Michigan. This creek is the outlet for Thompson Lake. The flows developed for Bogue Creek are the maximum flows for the outflow hydrographs at the outlet of Thompson Lake computed by the SCS - TR - 20 Method. The flows which have been approved by the Department of Natural Resources are as follows:

Peak Flows (cfs)			
10-year	50-year	100-year	500-year
70	170	270	480

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

Cross Sections used in the model were obtained by combining the data from aerial photographic survey for the flood plain and ground field survey for the channel portion. The locations of the cross sections are shown in Table 1.

2.2 Roughness Coefficients

The roughness coefficients were determined from field description and aerial photograph. The roughness coefficients for flood plain and channel were determined as 0.04 and 0.035 respectively.

2.3 Starting Point and Starting Elevation

The starting point of this study is 950 feet downstream from the corporate limit and the starting elevation is the critical depth. For such a small creek, the above combination will give the convergence before the corporate limit. we do not eg --

3. DISCUSSION

In the computer summary printout, it is found that all the flows are within the channel and no flooding will be expected in the area due to the regulation of the control structure at the outlet of Thompson Lake.

Reference

1. HEC-2 Water Surface Profiles, Users Manual, Hydrologic Engineering Center, U. S. Army, Corps of Engineers, August 1979.

TABLE 1

LOCATIONS OF CROSS SECTIONS

SECTION	SECNO	LOCATION AND DESCRIPTION
A	49975	950' D/S from corporate limit
B	50600	560' U/S from A
C	50800 50801 50802 50803	Highland Street Bridge TR = 910.8, LC = 907.5 Width = 43, Length = 96
D	51175	320' U/S from U/S face of Highland Street Bridge 180' U/S from corporate limit
E	51450	250' U/S from D Manufactured
F	51577 51578 51579 51580	Control Dam D/S with fixed sluice gate Gate height = 891 Dam crest = 898.8 Distance from Dam to sluice gate = 27
G	51800	320' U/S from F
H	51925 51926	Control Dam of Thompson Lake Dam crest = 904.4 Discharge, storage and elevation data have been established for TR-20, See Figure 1 Elevations were given by X5 card

Thompson Lake - Control dam 081180

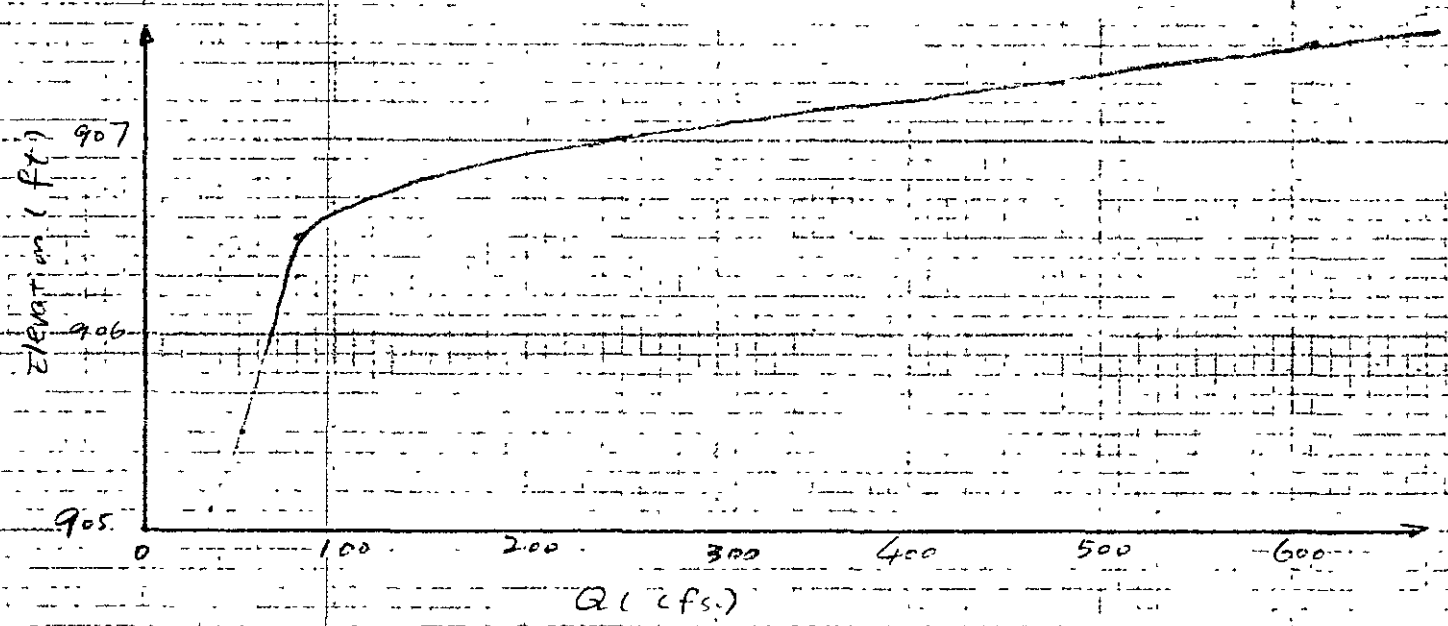


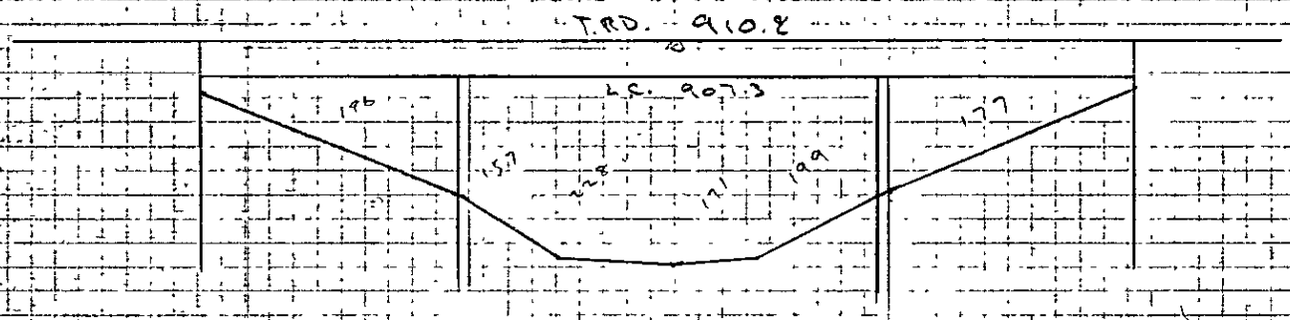
Fig. 1. Stage-discharge Curve for Control Dam at Thompson Lake

BRIDGE DATA

ROGUE CREEK, CITY OF HOWELL

8-6-80
B

508+00 HIGHLAND ST. BRIDGE (M-59)

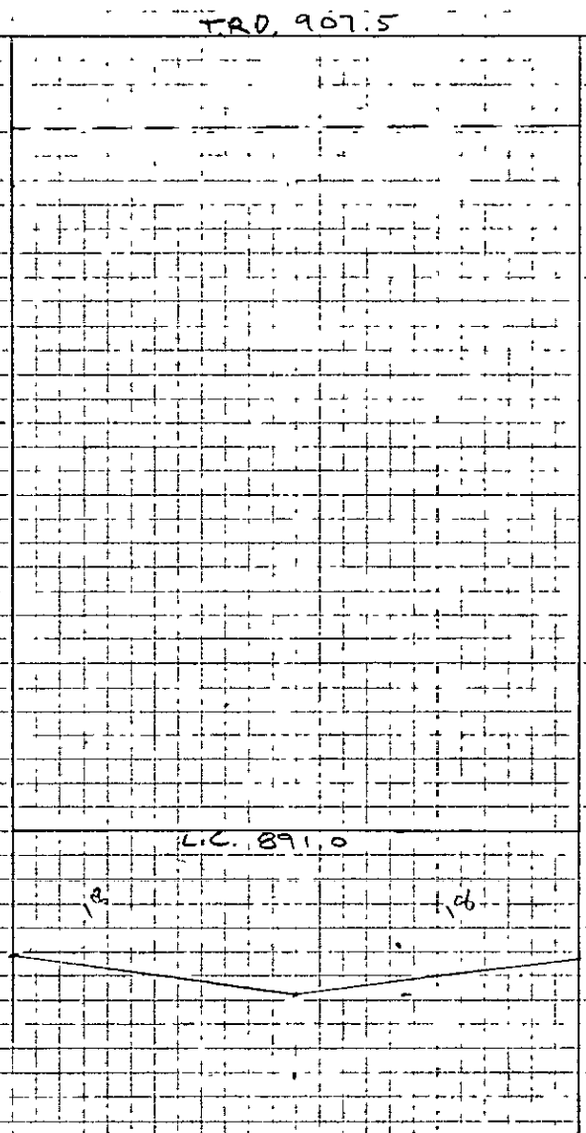


910.8						910.8
907.3	907.3	907.3	907.3	907.3	907.3	907.3
1952	1978	1988	2000	2009	2022	2048
~~862~~	~~878~~	~~880~~	~~900~~	~~909~~	~~922~~	~~948~~
905.8	894.5	888.8	887.8	888.8	895.2	905.8
1.5	26	12.8	10 18.5	12 19.5	9 18.5	13 13.1	26	1.5

A = 1117 □'

#8563
8-11-80
JB

BOGUE CREEK, CITY OF HOWELL
515+77 DOWNSTREAM VIEW OF DAM



$R = \frac{36}{29} = 1.24$

$\frac{29.1 \times 0.012^2 \times 1.5}{1.33} = 0.005$

$\times K \times R = 1.5$

907.5		907.5
891.0	891.0	891.0
394	400	406
888.4	887.6	888.3
2.6	3.4	2.7

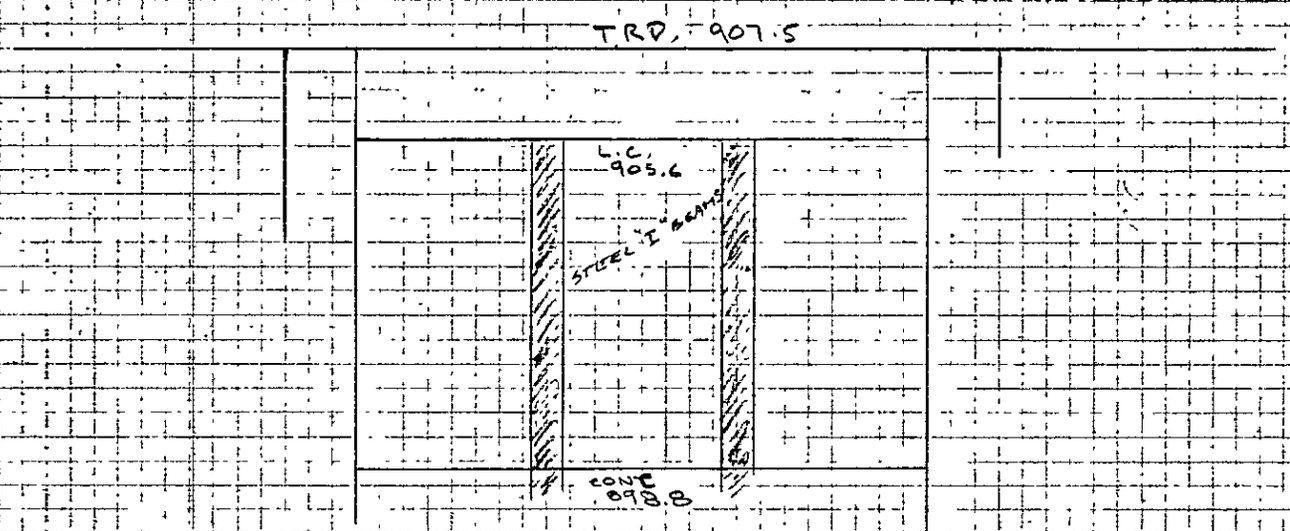
REACH DISTANCE 27' A = 36 □'

BOGUE CREEK, CITY OF HOWELL

515+50 UPSTREAM SIDE DAM

-0202
8-6-80
B

8"x10" ± STEEL "I" BEAMS DETIRMINED TO BE INEFFECTUAL



907.5
905.6
300
898.8

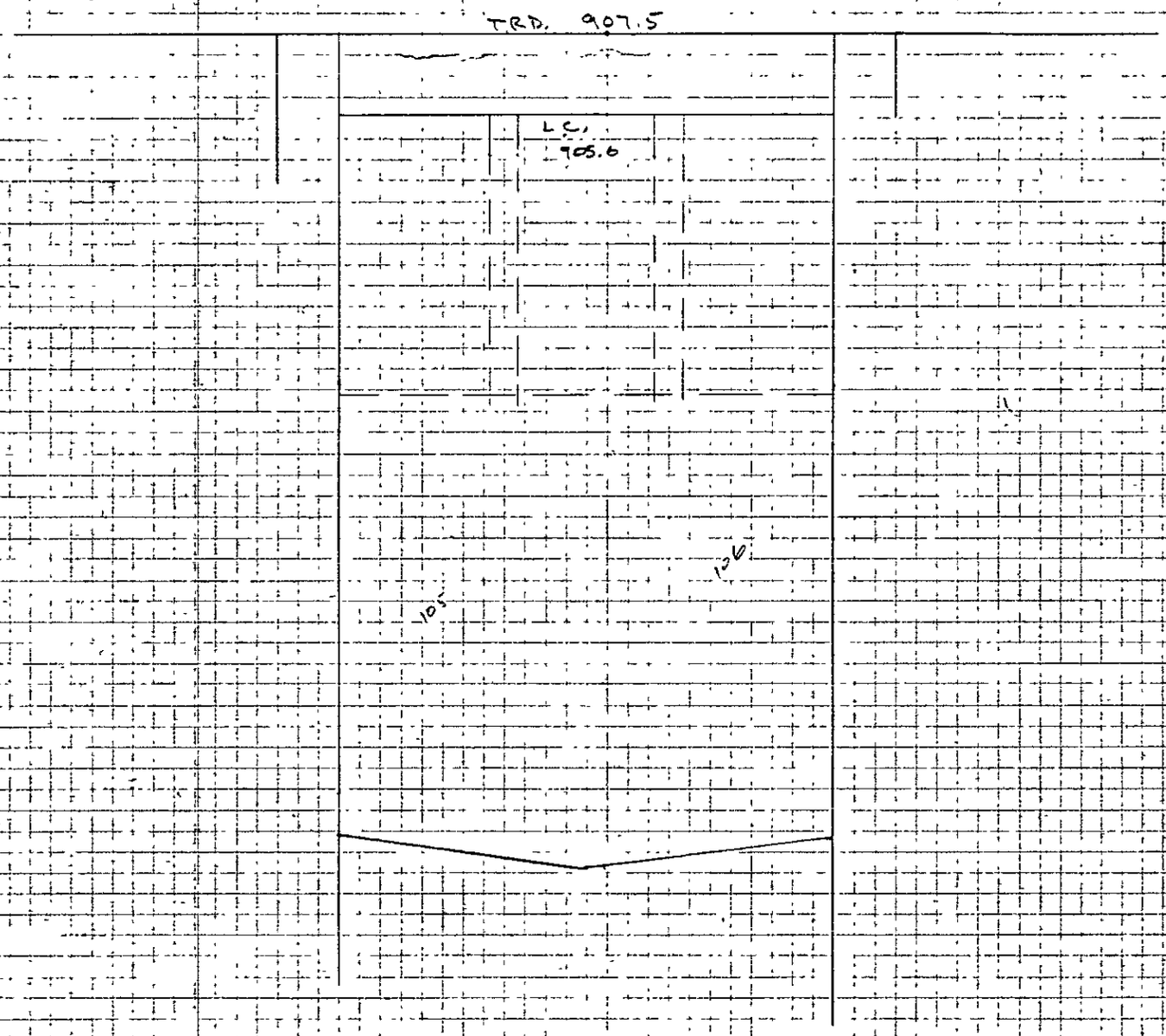
907.5
905.6
312
898.8

A = 82 SQ FT.

-2505
8-6-80
B

BOGUE CREEK, CITY OF HOWELL

515+50 DOWNSTREAM VIEW OF DAM



907.5 907.5

905.6 905.6 905.6

~~286~~ 390 ~~300~~ 394 400 ~~306~~ ~~312~~ 406 ~~316~~ 410 430

889.0 888.4 887.6 888.3 888.7 897.9

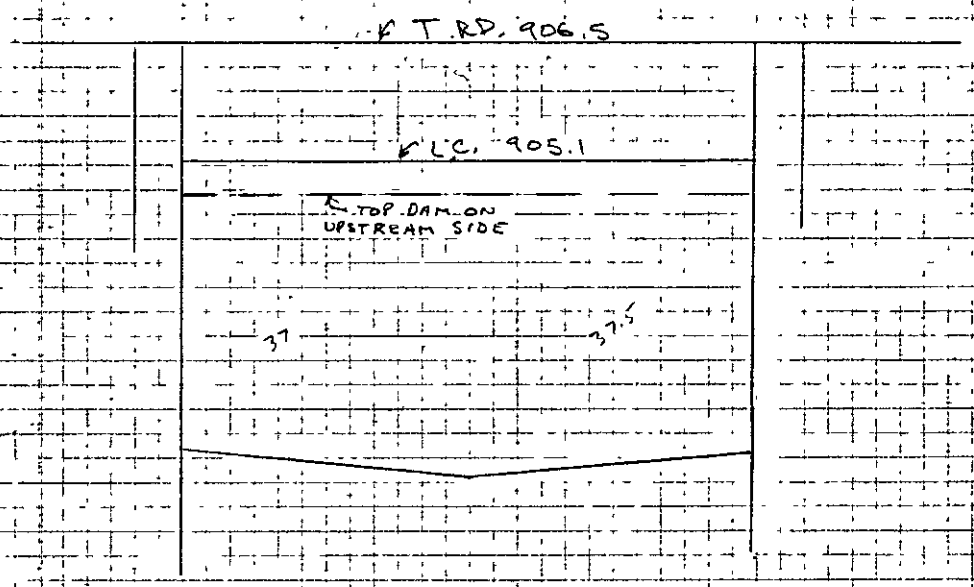
172 180 173

A = 211 0 ft

TOPS FORM 9398

BOGUE CREEK CITY OF HOWELL

519+25 DOWNSTREAM SIDE OF CONTROL DAM



906.5 905.1 200.201 899.2 5.7

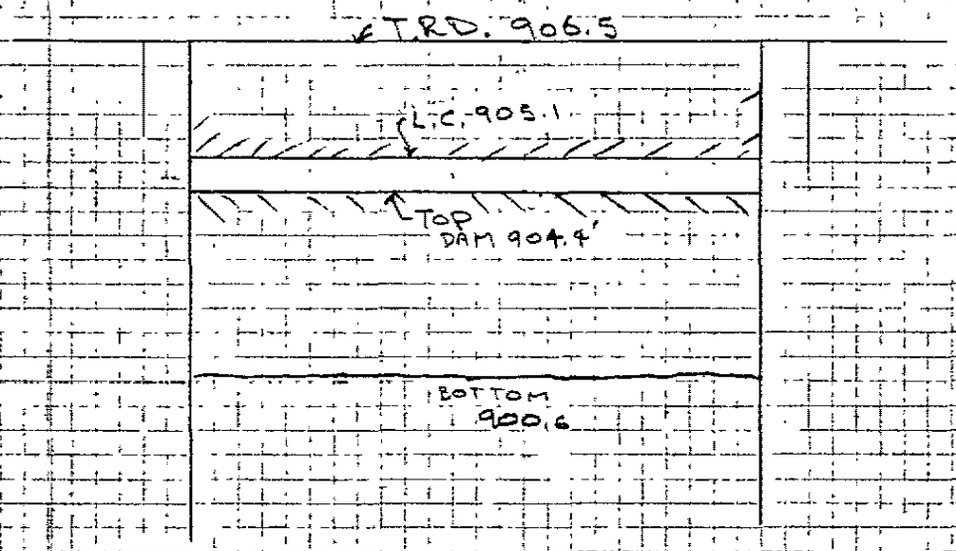
905.1 207 898.6 5.5

906.5 905.1 213.214 899.1 6.0

A = 750'

BOGUE CREEK, CITY OF HOWELL 8/5/80 B

519+25 UPSTREAM SIDE OF CONTROL DAM 1"=4'



906.5 905.1
200 201
904.4
900.6

905.1 906.5
913 914
904.4
900.6

TOP DAM – L.C. A = 8.4 □'

BOTTOM STREAM – L.C. A = 54 □'

Gove Associates Inc.
ARCHITECTS/ENGINEERS/PLANNERS/SURVEYORS

210 MILL STREET
LANSING, MICHIGAN 48933
(517) 485-0555

December 12, 1980

RECEIVED
DEC 15 1980
WATER MANAGEMENT

Suzanne Elms, Hydrologic Engineer
Technical Programs Unit
Water Management Division
Department of Natural Resources
P.O. Box 30028
Lansing, MI 48909

Dear Ms. Elms:

Enclosed is the additional information that you requested to complete your review of the hydraulics for the City of Howell FIS. The calculation sheets used to develop the rating curve at the Thompson Lake dam are attached. This data was used as input to the TR-20 routing through the structure.

If you have any questions, please feel free to contact me.

Sincerely yours,

GOVE ASSOCIATES INC.

Duane F. Ellis, P.E.
Vice President

DE/jr

Enclosures

Call to Gove on 12/17
Weir is directly beneath Footbridge.

RAL RESOURCES COMMISSION
ACOB A. HOEFER
ARL T. JOHNSON
L LAITALA
LARY F. SHELL
ARRY H. WHITELEY
AN L. WOLFE
HARLES G. YOUNGLOVE

STATE OF MICHIGAN

WILLIAM G. MILLIKEN, Governor

DEPARTMENT OF NATURAL RESOURCES

HOWARD A. TANNER, Director

STEVENS T. MASON BUILDING
BOX 30028
LANSING, MI 48909

DEC 09 1980

July 17, 1980

8563-1

THOMPSON LAKE - APPROVED

Mr. Ather Mohiuddin
Gove Associates
210 Mill Street
Lansing, Michigan 48933

Re: FIS Hydrology - City of Howell,
Livingston County

Dear Mr. Mohiuddin:

We have reviewed the revised hydrology for Bogue Creek at Thompson Lake Outlet and concur with the flood discharge estimates as listed in your transmittal dated July 2, 1980.

I have listed the final flows below for clarification.

10 YR	50 YR	100 YR	500 YR	DA (mi^2)
70 cfs	170 cfs	270 cfs	480 cfs	12.2

If you have any questions concerning the hydrology, please contact me.

Sincerely,

Hope Meyers Croskey

Hope Meyers Croskey, Engineer
Hydrologic Studies Unit
Water Management Division

HMC:cw

cc: S. Elms
F. Finch, FIHM

CHIGAN
1/79

BOGUE CREEK

CITY OF HOWELL

Bogue Creek is located at the eastern edge of the City of Howell in Livingston County. This creek is the outlet for Thompson Lake. The drainage basin area in conjunction with the Thompson Lake basin is about 12.20 square miles with land use that is primarily undeveloped and agricultural.

Lake Chemung, Euler Lake, and several other small ponding areas are located in the central portion of the drainage basin.

The flows for the 10, 50, 100, and 500 year frequency have already been approved at the outlet of Thompson Lake. The SCS-TR-20 method of routing was used to route the approved flows through the dam to develop the outflow hydrograph for Bogue Creek. Since the study reach of Bogue Creek is approximately 1,200 feet, the maximum flow for the outflow hydrograph at the outlet of Thompson Lake is recommended for use as the flow for the Bogue Creek. The computer printout for SCS-TR-20 is attached that indicates the flood routing through Thompson Lake. The final flows are as follows:

Peak Flows (cfs)

Return Interval	10 Yr.	50 Yr.	100 Yr.	500 Yr.
Maximum Outflow	70.0	168.0	273.0	482.0

THOMPSON LAKE - CITY OF HOWELL

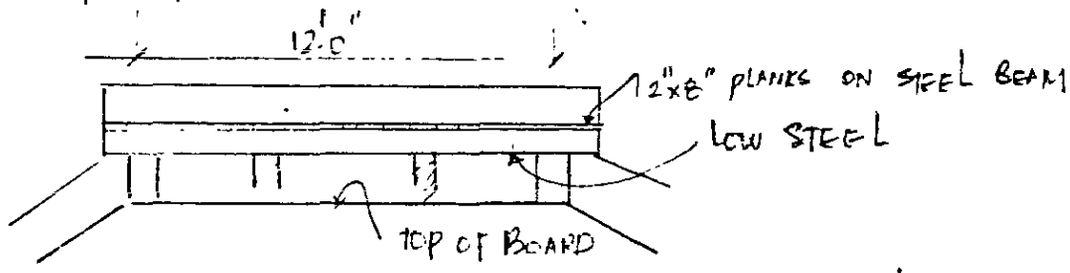
OUTFLOW DISCHARGES FOR FLOOD ROUTING

(1) WEIR OVER DAM (CROSS SECTION 519+25)

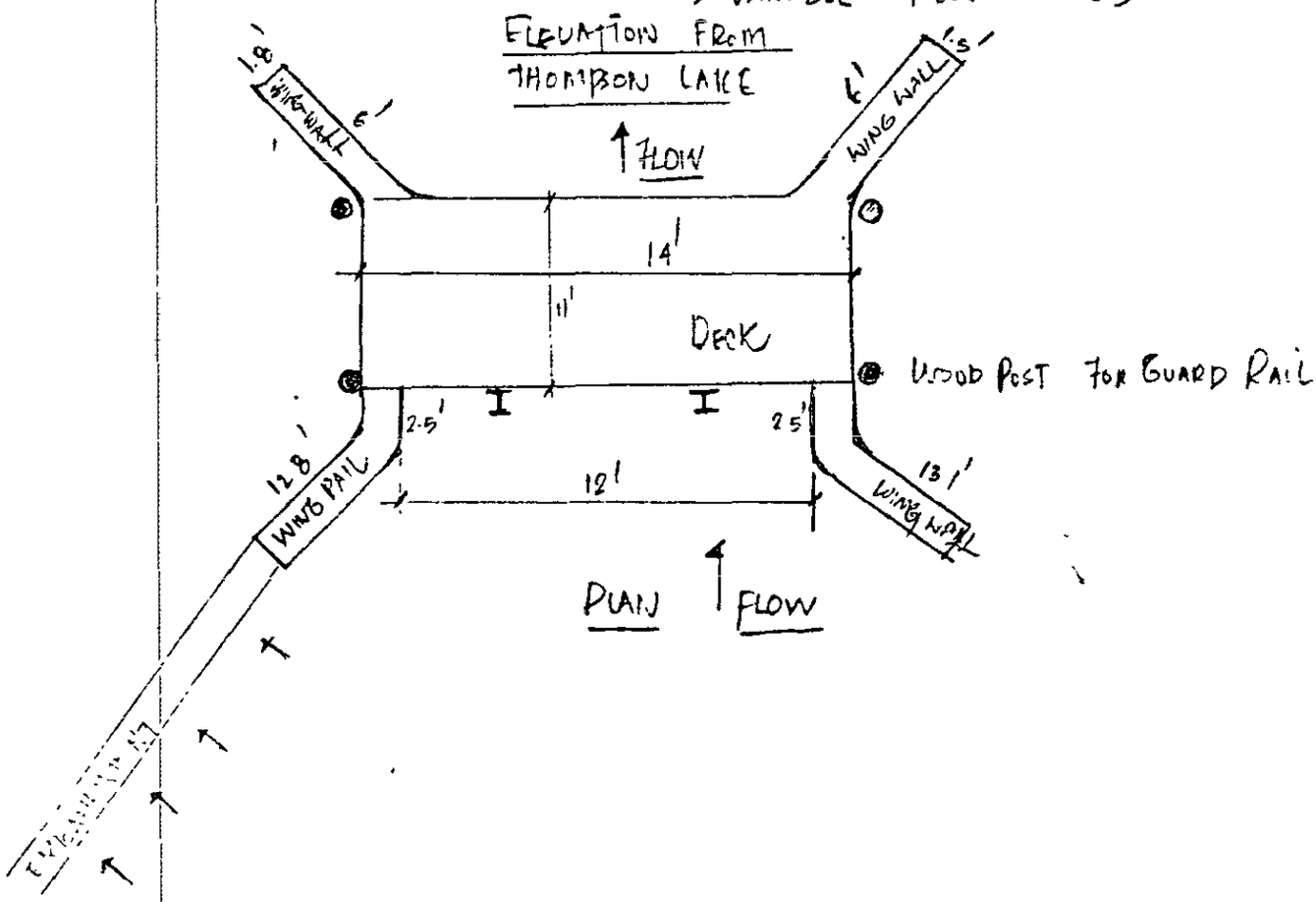
(2) PRESSURE FLOW BELOW 907.0 ELEVATION

(3) PRESSURE + ORIFICE FLOW ABOVE 907.0

LAKE ELEVATION = 904.2
TOP OF BOARD = 904.4
LOW STEEL OF BRIDGE = 905.1
TOP OF DECK = 906.5
TOP OF EMBANKMENT = 906.25 ±



AVAILABLE FLOW = 0.69'



Flood routing Thompson Lake Hawaii

Bottom of Flood Elevation = 905.1

Top of Board = 904.4

Average Height of Opening = $\frac{904.4+905.1}{2}$

= 904.75

Area of Opening = 12×0.7 = 8.4 ft²

① Outflow @ Elevation: 905.10

$= CA\sqrt{2gH}$

$= 0.9\times12\times0.70\sqrt{2\times32.2\times(905.1-904.75)}$

= 36.0 cfs

② Outflow @ Elevation = 905.50

$= CA\sqrt{2gH}$

$= 0.9\times12\times0.7\sqrt{2\times32.2\times(905.5-904.75)}$

= 53.0 cfs.

③ Outflow @ Elevation: 906.0

$= CA\sqrt{2gH}$

$= 0.9\times12\times0.70\sqrt{64.4\times(906.0-904.75)}$

= 68.0 cfs

④ Outflow @ Elevation: 906.5

$= 0.9\times12\times0.70\sqrt{64.4\times(906.5-904.75)}$

= 80.0 cfs.

⑤ Outflow @ Elevation: 907.0

$= 0.9\times12\times0.7\sqrt{64.4(907.0-904.75)}$

$+ 150\times3(907-906.5)^{3/2}$

= 91 + 159

= 250.0 cfs

(6) Outflow @ 907.5

$$= 0.9 \times 12 \times 0.70 \times \sqrt{64.4\,(907.5 - 904.75)}$$
$$+ 170 \times 3 \times (907.5 - 906.5)^{3/2}$$
$$= 101 + 510 = 611.0 \text{ cfs.}$$

Elevation	Q cfs Discharge	Sacrifl Storage	A Surface Area
904.3			262.0
905.1	36.0 cfs	212.0 acre ft	269.0 acre
905.5	53.0	347.0	271.0
906.0	68.0	483.0	274.0
906.5	80.0	621.0	278.0
907.0	250.0	762.0	285.0
907.5	611.0	906.0	290.0

1) COUNTY: LIVINGSTON

2) STUDY NAME: HOWELL, CITY OF

3) WATERCOURSE: BOGUE CREEK

4) DOCUMENT TYPE: SUMMARY

```
**************************************************
  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

BOGUE CREEK

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
*	49975.000	0.0	0.0	0.0	885.30	70.00	886.67	886.67	887.09	193.78	5.22	13.41	4.96
*	49975.000	0.0	0.0	0.0	885.30	170.00	887.36	887.36	888.04	172.90	6.61	25.70	12.93
*	49975.000	0.0	0.0	0.0	885.30	270.00	887.88	887.88	888.73	160.05	7.40	36.48	21.34
*	49975.000	0.0	0.0	0.0	885.30	480.00	888.72	888.72	889.85	148.74	8.51	56.40	39.36
	50600.000	560.00	0.0	0.0	886.60	70.00	889.10	0.0	889.13	15.19	2.23	31.43	17.96
	50600.000	560.00	0.0	0.0	886.60	170.00	890.21	0.0	890.36	18.20	3.09	55.05	39.85
	50600.000	560.00	0.0	0.0	886.60	270.00	890.98	0.0	891.19	20.12	3.65	74.00	60.19
	50600.000	560.00	0.0	0.0	886.60	480.00	892.17	0.0	892.48	22.78	4.47	107.45	100.57
	50800.000	200.00	0.0	0.0	887.80	70.00	889.51	0.0	889.62	34.73	2.66	26.33	11.88
	50800.000	200.00	0.0	0.0	887.80	170.00	890.61	0.0	890.77	22.75	3.12	54.57	35.64
	50800.000	200.00	0.0	0.0	887.80	270.00	891.41	0.0	891.60	20.75	3.49	77.29	59.27
	50800.000	200.00	0.0	0.0	887.80	480.00	892.65	0.0	892.91	19.49	4.06	118.13	108.72
	50801.000	1.00	909.30	912.40	887.80	70.00	889.51	0.0	889.62	34.88	2.66	26.29	11.85
	50801.000	1.00	909.30	912.40	887.80	170.00	890.62	0.0	890.77	22.69	3.11	54.61	35.69
	50801.000	1.00	909.30	912.40	887.80	270.00	891.41	0.0	891.60	20.50	3.48	77.62	59.63
	50801.000	1.00	909.30	912.40	887.80	480.00	892.65	0.0	892.91	19.50	4.06	118.12	108.71
	50802.000	43.00	909.30	912.40	887.80	70.00	889.66	0.0	889.74	23.58	2.34	29.87	14.41
	50802.000	43.00	909.30	912.40	887.80	170.00	890.72	0.0	890.86	19.66	2.96	57.34	38.34
	50802.000	43.00	909.30	912.40	887.80	270.00	891.51	0.0	891.68	18.53	3.36	80.38	62.73
	50802.000	43.00	909.30	912.40	887.80	480.00	892.74	0.0	892.99	18.19	3.97	121.05	112.54
	50803.000	1.00	0.0	0.0	887.80	70.00	889.66	0.0	889.74	23.58	2.34	29.87	14.41
	50803.000	1.00	0.0	0.0	887.80	170.00	890.73	0.0	890.86	19.42	2.95	57.58	38.58
	50803.000	1.00	0.0	0.0	887.80	270.00	891.51	0.0	891.69	18.33	3.35	80.67	63.06
	50803.000	1.00	0.0	0.0	887.80	480.00	892.75	0.0	892.99	18.03	3.95	121.43	113.05
	51175.000	320.00	0.0	0.0	887.60	70.00	890.13	0.0	890.17	8.59	1.69	41.31	23.89
	51175.000	320.00	0.0	0.0	887.60	170.00	891.21	0.0	891.30	10.34	2.38	71.37	52.86
	51175.000	320.00	0.0	0.0	887.60	270.00	892.01	0.0	892.13	11.10	2.80	96.42	81.04
	51175.000	320.00	0.0	0.0	887.60	480.00	893.28	0.0	893.46	12.63	3.40	141.37	138.40
	51450.000	250.00	0.0	0.0	887.80	70.00	890.35	0.0	890.39	8.88	1.61	44.06	23.49
	51450.000	250.00	0.0	0.0	887.80	170.00	891.45	0.0	891.52	7.20	2.11	87.36	63.36
	51450.000	250.00	0.0	0.0	887.80	270.00	892.26	0.0	892.34	6.52	2.41	127.16	105.73
	51450.000	250.00	0.0	0.0	887.80	480.00	893.55	0.0	893.66	5.84	2.84	204.53	198.62

MOORE BUSINESS FORMS, INC 27

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10**S	VCH	AREA	.01K
	51577.000	100.00	0.0	0.0	887.60	70.00	890.41	0.0	890.50	14.48	2.39	29.25	18.40
	51577.000	100.00	0.0	0.0	887.60	170.00	891.38	0.0	891.65	32.50	4.16	40.88	29.82
	51577.000	100.00	0.0	0.0	887.60	270.00	892.00	0.0	892.49	51.12	5.58	48.38	37.76
	51577.000	100.00	0.0	0.0	887.60	480.00	892.70	0.0	893.81	103.99	8.45	56.77	47.07
	51578.000	1.50	907.50	891.00	887.60	70.00	890.41	0.0	890.50	14.40	2.39	29.30	18.45
	51578.000	1.50	907.50	891.00	887.60	170.00	891.32	0.0	891.66	91.83	4.68	36.30	17.74
	51578.000	1.50	907.50	891.00	887.60	270.00	893.00	0.0	893.31	27.91	4.48	60.32	51.11
	51578.000	1.50	907.50	891.00	887.60	480.00	895.50	0.0	896.84	22.11	4.69	102.30	102.09
	51579.000	27.00	0.0	0.0	887.60	70.00	890.45	0.0	890.54	13.79	2.35	29.74	18.85
	51579.000	27.00	0.0	0.0	887.60	170.00	891.54	0.0	891.78	28.61	3.97	42.77	31.78
	51579.000	27.00	0.0	0.0	887.60	270.00	893.08	0.0	893.38	26.72	4.40	61.30	52.23
	51579.000	27.00	0.0	0.0	887.60	480.00	896.56	0.0	896.90	21.70	4.66	103.06	103.05
	51580.000	1.00	898.80	888.10	887.60	70.00	900.52	0.0	900.52	0.18	0.46	150.60	164.66
	51580.000	1.00	898.80	888.10	887.60	170.00	901.94	0.0	901.95	0.82	1.01	167.66	187.29
	51580.000	1.00	898.80	888.10	887.60	270.00	903.10	0.0	903.13	1.72	1.49	181.48	205.76
	51580.000	1.00	898.80	888.10	887.60	480.00	905.05	0.0	905.14	4.09	2.34	204.95	237.34
	51800.000	320.00	0.0	0.0	898.60	70.00	900.46	0.0	900.54	26.81	2.32	30.22	13.52
	51800.000	320.00	0.0	0.0	898.60	170.00	901.94	0.0	902.02	10.04	2.20	77.26	53.64
	51800.000	320.00	0.0	0.0	898.60	270.00	903.16	0.0	903.23	6.47	2.16	125.12	106.12
	51800.000	320.00	0.0	0.0	898.60	480.00	905.20	0.0	905.27	4.03	2.13	224.86	239.06
	51925.000	200.00	0.0	0.0	898.60	70.00	900.93	0.0	901.05	24.36	2.84	24.64	14.18
	51925.000	200.00	0.0	0.0	898.60	170.00	902.07	0.0	902.37	39.86	4.45	38.21	26.93
	51925.000	200.00	0.0	0.0	898.60	270.00	903.05	0.0	903.50	46.74	5.38	50.15	39.49
	51925.000	200.00	0.0	0.0	898.60	480.00	904.75	0.0	905.47	58.26	6.79	70.65	62.89
*	51926.000	38.00	0.0	0.0	904.40	70.00	906.08	0.0	906.27	46.53	3.47	20.16	10.26
*	51926.000	38.00	0.0	0.0	904.40	170.00	906.85	0.0	907.37	88.63	5.78	29.40	18.06
*	51926.000	38.00	0.0	0.0	904.40	270.00	907.04	0.0	908.17	179.55	8.52	31.68	20.15
*	51926.000	38.00	0.0	0.0	904.40	480.00	908.06	908.06	909.91	221.17	10.92	43.95	32.28

MOORE BUSINESS FORMS INC 27

00BREAK00

1) COUNTY: Livingston

2) STUDY NAME: Putnam Twp

3) WATERCOURSE: Honey Ck

4) DOCUMENT TYPE: 100 yr Encroached

00BREAK00

THIS RUN EXECUTED 06/20/86 08:05:26

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*************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55,56
  IBM-PC-XT VERSION 1.1
*************************************************

C
T1      PUTNAM TOWNSHIP FIS
T2      LIVINGSTON CO.          100YR FLOOD
T3      HONEY CREEK             ENCROACHED CONDITIONS

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

       0.       2.       0.       0.  .003000      .00       .0     350.   855.000     .000

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

     .000     .000   -1.000     .000     .000     .000     .000     .000     .000     .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

   150.000  200.000     .000     .000     .000     .000     .000     .000     .000     .000

NC      .120     .120     .040     .300     .500     .000     .000     .000     .000     .000
ET      .000     .000     .000    1.400     .000     .000     .000     .000     .000     .000
                2070FT DS OF DARWIN RD  XSEC A
X1      .000   11.000  215.000  241.000     .000     .000     .000     .000     .000     .000
GR   860.000     .000  858.000   15.000  856.000  165.000  855.800  215.000  854.100  218.000
GR   851.300  230.000  852.900  238.000  855.700  241.000  856.000  261.000  858.000  561.000
GR   862.000  581.000     .000     .000     .000     .000     .000     .000     .000     .000

NC      .000     .000     .000     .000     .000     .000     .000     .000     .000     .000
ET      .000    6.100     .000    1.400     .000  135.000  395.000     .000     .000     .000
                OB CUT FROM TOPO  CHANNEL SHAPE FROM XSEC A   XSEC B
X1    10.200   11.000  235.000  283.000  530.000  610.000 1020.000     .000     .000     .000
GR   864.000     .000  860.000   35.000  858.000   75.000  856.000  235.000  855.300  253.000
GR   852.700  262.000  854.300  270.000  856.000  283.000  858.000  450.000  860.000  480.000
GR   870.000  520.000     .000     .000     .000     .000     .000     .000     .000     .000

NC      .000     .000     .000     .000     .000     .000     .000     .000     .000     .000
ET      .000    6.100     .000    1.400     .000  260.000  520.000     .000     .000     .000
                OB CUT FROM TOPO  CHANNEL SHAPE FROM XSEC D   XSEC C
X1    16.800   12.000  368.000  385.000  520.000  550.000  660.000     .000     .000     .000
GR   862.000     .000  862.000  200.000  860.000  223.000  858.000  240.000  857.400  368.000
GR   855.800  370.000  853.800  376.000  854.300  384.000  857.600  385.000  858.000  550.000
GR   860.000  560.000  870.000  600.000     .000     .000     .000     .000     .000     .000
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                 150FT US OF DARWIN RD      XSEC F
X1      22.180       .000       .000       .000    100.000    100.000    100.000       .000       .000       .000

ET        .000      6.100       .000      6.100       .000    375.000    575.000       .000       .000       .000
                        XSEC G
X1      27.280     10.000    483.000    503.000    650.000    530.000    610.000       .000       .000       .000
GR     870.000       .000    866.000     80.000    864.000    110.000    862.000    251.000    859.500    483.000
GR     856.400    485.000    856.400    496.000    857.300    503.000    862.000    575.000    870.000    607.000

NC        .000       .000       .030       .000       .000       .000       .000       .000       .000       .000
ET        .000      6.100       .000      6.100       .000    140.000    340.000       .000       .000       .000
            DS OF IMPOUNDMENT  OUTLET TWIN 6FT RCCP WITH INLET CONTROL  XSEC H
X1      28.280     11.000    238.000    260.000     80.000     95.000    100.000       .000       .000       .000
GR     870.000       .000    864.000     58.000    862.000    148.000    859.500    238.000    857.000    240.000
GR     857.000    251.000    857.700    258.000    859.000    260.000    862.000    325.000    864.000    372.000
GR     870.000    420.000       .000       .000       .000       .000       .000       .000       .000       .000

SB        .000      2.780      2.700    200.000      5.000       .000     22.800       .000       .000       .000
ET        .000      6.100       .000      6.100       .000     90.000    290.000       .000       .000       .000
                        XSEC I   LOSS CHECKED BY HAND CALCULATIONS
X1      29.730      8.000    112.000    340.000    145.000    145.000    145.000       .000       .000       .000
X2        .000       .000      1.000    860.000    863.300       .000       .000       .000       .000       .000
GR     870.000       .000    864.000     60.000    862.000     90.000    860.700    112.000    857.000    116.000
GR     857.000    230.000    857.000    340.000    860.700    350.000    870.000    380.000       .000       .000

NC        .100       .100       .040       .000       .000       .000       .000       .000       .000       .000
ET        .000      6.100       .000      6.100       .000    130.000    320.000       .000       .000       .000
                 US OF IMPOUNDMENT     XSEC J
X1      35.530     13.000    210.000    298.000    460.000    550.000    580.000       .000       .000       .000
GR     870.000       .000    864.000     40.000    861.400    210.000    861.200    235.000    860.200    236.000
GR     858.800    245.000    857.700    252.000    858.500    258.000    861.200    298.000    864.000    378.000
GR     866.000    422.000    868.000    474.000    870.000    516.000       .000       .000       .000       .000

ET        .000       .000       .000      1.400       .000       .000       .000       .000       .000       .000
                 XSEC K
X1      40.630     14.000    235.000    293.000    500.000    500.000    510.000       .000       .000       .000
GR     870.000       .000    868.000     35.000    866.000     50.000    864.000    130.000    861.300    235.000
GR     860.900    237.000    858.500    246.000    858.400    253.000    859.200    259.000    862.000    293.000
GR     864.000    390.000    866.000    447.000    868.000    550.000    870.000    626.000       .000       .000

ET        .000       .000       .000      1.400       .000       .000       .000       .000       .000       .000
                 XSEC L
X1      47.930     11.000    197.000    221.000    510.000    460.000    730.000       .000       .000       .000
GR     870.000       .000    866.000     55.000    864.000     70.000    862.900    197.000    859.400    205.000
GR     859.300    207.000    859.400    209.000    861.900    221.000    864.000    302.000    866.000    328.000
GR     870.000    373.000       .000       .000       .000       .000       .000       .000       .000       .000

NC        .070       .070       .040       .000       .000       .000       .000       .000       .000       .000
ET        .000       .000       .000      1.400       .000       .000       .000       .000       .000       .000
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NC      .000      .000      .000      .000      .000      .000      .000      .000      .000      .000
ET      .000     6.100      .000     1.400      .000    30.000   220.000      .000      .000      .000
                XSEC R
X1    70.050    11.000   102.000   130.000   440.000   410.000   510.000      .000      .000      .000
GR   870.000      .000   866.000    60.000   864.000    90.000   863.400   102.000   862.300   104.000
GR   861.100   115.000   862.000   127.000   863.000   130.000   864.000   225.000   868.000   313.000
GR   870.000   326.000      .000      .000      .000      .000      .000      .000      .000      .000

NC      .100      .100      .040      .000      .000      .000      .000      .000      .000      .000
ET      .000     6.100      .000     1.400      .000   190.000   370.000   295.000   355.000      .000
                XSEC S
X1    74.050     7.000   310.000   349.000   430.000   310.000   400.000      .000      .000      .000
GR   866.000      .000   865.400   310.000   862.500   319.000   861.400   333.000   862.500   345.000
GR   864.100   349.000   866.000   500.000      .000      .000      .000      .000      .000      .000

ET      .000     6.100      .000     1.400      .000   190.000   370.000   308.000   342.000      .000
X1    74.550     6.000   310.000   340.000    50.000    50.000    50.000      .000      .000      .000
GR   866.000      .000   865.000   310.000   861.400   315.000   861.400   335.500   864.100   340.000
GR   866.000   500.000      .000      .000      .000      .000      .000      .000      .000      .000

ET      .000     6.100      .000     8.100      .000   190.000   370.000   195.000   365.000      .000
                DS OF PINCKNEY RD  20.3FT BRIDGE WITH CONC WINGWALLS
X1    74.560     7.000   311.000   321.500     1.000     1.000     1.000      .000      .000      .000
X2      .000      .000      .000   866.400   867.800      .000      .000      .000      .000      .000
GR   867.800      .000   867.800   300.000   861.400   301.000   861.400   311.000   861.400   321.500
GR   867.800   325.000   867.800   500.000      .000      .000      .000      .000      .000      .000

NC      .000      .000      .000      .000      .000      .000      .000      .000      .000      .000
ET      .000     6.100      .000     8.100      .000   190.000   370.000   195.000   355.000      .000
X1    75.050      .000      .000      .000    49.000    49.000    49.000      .000      .000      .000
X2      .000      .000      .000   866.400   867.800      .000      .000      .000      .000      .000

NC      .000      .000      .000      .000      .000      .000      .000      .000      .000      .000
ET      .000     6.100      .000     8.100      .000   240.000   430.000   210.000   370.000      .000
                XSEC T     US OF PINCKNEY RD
X1    75.100     6.000   310.000   340.000    10.000    10.000    10.000      .000      .000      .000
GR   866.000      .000   865.000   310.000   861.400   315.000   861.400   335.500   864.100   340.000
GR   866.000   500.000      .000      .000      .000      .000      .000      .000      .000      .000
EJ      .000      .000      .000      .000      .000      .000      .000      .000      .000      .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=     157.0     180.0  TYPE=     1  TARGET=      23.000
                DARWIN RD TWIN 9FT6IN BY 6FT5IN CMP 37LF  NO HEADWALL
    20.30     5.15   859.35      .00       .00   859.70      .34       .14       .03   857.80
     350.      3.      344.       3.        5.     73.       4.        9.        7.    858.00
      .24      .69     4.74      .65      .120    .040     .120      .000    854.20   157.00
  .002997     50.      50.       50.        2       0        0       .00     23.00   180.00

*SECNO 20.310

3370 NORMAL BRIDGE,NRD= 27 MIN ELTRD=  861.50 MAX ELLC=  860.70

3470 ENCROACHMENT STATIONS=     365.0     388.0  TYPE=     1  TARGET=      23.000
    20.31     4.54   859.34      .00       .00   859.71      .37       .00       .01   854.80
     350.      0.      350.       0.        0.     72.       0.       10.        7. 100000.00
      .24      .00     4.88      .00      .120    .040     .120      .000    854.80   365.00
  .007051      1.       1.        1.         1       0        0    -23.16     23.00   388.00

*SECNO 20.680

3370 NORMAL BRIDGE,NRD= 27 MIN ELTRD=  861.50 MAX ELLC=  860.70

3470 ENCROACHMENT STATIONS=     365.0     388.0  TYPE=     1  TARGET=      23.000
                UPSTREAM FACE OF CULVERTS
    20.68     4.78   859.58      .00       .00   859.92      .34       .20       .01   854.80
     350.      0.      350.       0.        0.     75.       0.       10.        7. 100000.00
      .24      .00     4.69      .00      .120    .032     .120      .000    854.80   365.00
  .004124     37.      37.       37.        2       0        0    -25.39     23.00   388.00

*SECNO 20.690

3470 ENCROACHMENT STATIONS=     527.0     550.0  TYPE=     1  TARGET=      23.000
    20.69     5.18   859.58      .00       .00   859.93      .35       .00       .00   858.00
     350.      3.      345.       2.        5.     72.       4.       10.        7.    858.20
      .24      .56     4.77      .52      .120    .032     .120      .000    854.40   527.00
  .001943      1.       1.        1.         0       0        0       .00     23.00   550.00
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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

SPECIAL BRIDGE

5070,VARIABLE ELCHU OR ELCHD ON CARD SB NOT SPECIFIED

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.00	2.78	2.70	200.00	5.00	.00	22.80	.00	857.00	857.00

*SECNO 29.730
3280 CROSS SECTION 29.73 EXTENDED 3.06 FEET

PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
871.17	861.00	.00	168.	183.	23.	15.	860.00	863.30

3470 ENCROACHMENT STATIONS= 90.0 290.0 TYPE= 1 TARGET= 200.000
XSEC I LOSS CHECKED BY HAND CALCULATIONS

29.73	6.76	863.76	.00	.00	863.76	.00	2.55	.00	860.70
350.	2.	348.	0.	53.	1196.	0.	18.	12.	100000.00
.49	.04	.29	.00	.120	.030	.000	.000	857.00	90.00
.000003	145.	145.	145.	0	0	6	.00	200.00	290.00

*SECNO 35.530

3470 ENCROACHMENT STATIONS= 130.0 320.0 TYPE= 1 TARGET= 190.000
US OF IMPOUNDMENT XSEC J

35.53	6.06	863.76	.00	.00	863.77	.01	.00	.01	861.40
350.	31.	307.	12.	140.	332.	48.	29.	14.	861.20
.68	.22	.93	.25	.100	.040	.100	.000	857.70	130.00
.000107	460.	580.	550.	2	0	0	.00	190.00	320.00

*SECNO 40.630
XSEC K

40.63	5.43	863.83	.00	.00	863.85	.02	.08	.01	861.30
350.	33.	300.	17.	124.	220.	81.	35.	17.	862.00
.80	.26	1.36	.21	.100	.040	.100	.000	858.40	176.69
.000230	500.	510.	500.	2	0	0	.00	244.97	381.66

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
62.73	4.38	865.58	.00	.00	865.60	.02	.01	.00	862.80
350.	0.	318.	32.	0.	264.	71.	47.	24.	862.70
1.10	.00	1.20	.46	.070	.040	.070	.000	861.20	169.00
.000174	50.	50.	50.	2	0	0	.00	100.00	269.00

SPECIAL BRIDGE

5070,VARIABLE ELCHU OR ELCHD ON CARD SB NOT SPECIFIED

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.00	3.03	2.70	.00	7.50	.00	44.18	.00	861.20	861.20

*SECNO 62.950
PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
868.53	865.60	.00	29.	323.	44.	28.	865.00	867.70

3470 ENCROACHMENT STATIONS= 169.0 269.0 TYPE= 1 TARGET= 100.000

62.95	6.49	868.09	.00	.00	868.09	.01	2.50	.00	862.80
350.	0.	306.	44.	0.	409.	156.	48.	24.	862.70
1.11	.00	.75	.28	.000	.032	.070	.000	861.60	169.00
.000025	22.	22.	22.	0	0	3	.00	100.00	269.00

*SECNO 63.450

3470 ENCROACHMENT STATIONS= 119.0 319.0 TYPE= 1 TARGET= 200.000

XSEC P

63.45	6.39	868.09	.00	.00	868.10	.00	.00	.00	862.90
350.	49.	250.	51.	221.	402.	256.	49.	25.	862.80
1.14	.22	.62	.20	.100	.045	.100	.000	861.70	119.00
.000032	50.	50.	50.	0	0	0	.00	196.92	315.92

CCHV= .100 CEHV= .300
*SECNO 64.950

XSEC Q

64.95	7.40	868.10	.00	.00	868.10	.01	.01	.00	863.00
350.	117.	170.	62.	409.	187.	211.	51.	25.	862.70
1.20	.29	.91	.30	.100	.045	.100	.000	860.70	9.52
.000062	115.	150.	90.	0	0	0	.00	210.38	219.91

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

*SECNO 75.050
3280 CROSS SECTION     75.05 EXTENDED       .56 FEET

3370 NORMAL BRIDGE,NRD=  0 MIN ELTRD=  867.80 MAX ELLC=  866.40

3470 ENCROACHMENT STATIONS=     190.0     370.0  TYPE=     1  TARGET=     180.000
    75.05     6.96   868.36      .00       .00   868.48      .12       .25       .01    861.40
     350.     120.     207.      23.      120.      58.      34.       66.       29.    861.40
     1.57     1.00     3.55      .67      .100     .040     .100      .000    861.40    190.00
  .004017      49.      49.      49.         2        0        0    -34.31    180.00    370.00

*SECNO 75.100
3280 CROSS SECTION     75.10 EXTENDED      2.49 FEET

3470 ENCROACHMENT STATIONS=     240.0     430.0  TYPE=     1  TARGET=     190.000
                XSEC T     US OF PINCKNEY RD
    75.10     7.09   868.49      .00       .00   868.49      .01       .00       .01    865.00
     350.     60.      193.      97.      236.     197.     347.       66.       29.    864.10
     1.57     .25       .98      .28      .100     .040     .100      .000    861.40    240.00
  .000061     10.      10.       10.         2        0        0       .00    190.00    430.00
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  SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
  Q         OLOB      OCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
  TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
  SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST


*PROF 2

CCHV=    .300 CEHV=    .500
*SECNO  .000
 2800 NAT Q1=      63.86  WSEL=    856.13  ENC Q1=     66.31  WSEL=    856.23  RATIO=  -.0383
 NAT Q1=     68.  RATIOS LOB,CH,ROB=   .0155   .9754   .0092  WSEL=    856.23

3470 ENCROACHMENT STATIONS=     215.0     241.0  TYPE=     4  TARGET=        .025
                2070FT DS OF DARWIN RD  XSEC A
      .00      4.93   856.23      .00   856.13   856.49      .26      .00      .00   855.80
     350.       0.     350.       0.       0.      85.       0.       0.       0.    855.70
      .00      .00     4.12      .00     .120     .040     .120     .000   851.30   215.00
  .002924       0.       0.       0.        0        0        0      .00    26.00   241.00


*SECNO 10.200
 2800 NAT Q1=    128.69  WSEL=    857.70  ENC Q1=    128.69  WSEL=    857.80  RATIO=   .0000
 NAT Q1=    138.  RATIOS LOB,CH,ROB=   .1081   .7790   .1129  WSEL=    857.80

3470 ENCROACHMENT STATIONS=     191.9     329.1  TYPE=     4  TARGET=        .065
                OB CUT FROM TOPO  CHANNEL SHAPE FROM XSEC A    XSEC B
    10.20      5.09   857.79      .00   857.70   857.84      .06     1.29      .06   856.00
     350.       29.     291.      30.      66.     141.      70.       4.       1.    856.00
      .15       .44     [illegible]  .44     .120     .040     .120     .000   852.70   191.87
  .000740      530.    1020.     610.        2        0        0      .00   137.21   329.08


*SECNO 16.800
 2800 NAT Q1=      66.95  WSEL=    858.43  ENC Q1=     66.95  WSEL=    858.53  RATIO=   .0000
 NAT Q1=     76.  RATIOS LOB,CH,ROB=   .1542   .6856   .1601  WSEL=    858.53

3470 ENCROACHMENT STATIONS=     307.3     471.6  TYPE=     4  TARGET=        .116
                OB CUT FROM TOPO  CHANNEL SHAPE FROM XSEC D    XSEC C
    16.80      4.72   858.52      .00   858.43   858.74      .22      .82      .08   857.40
     350.       38.     272.      40.      60.      65.      71.       7.       3.    857.60
      .20       .64     4.21      .57     .120     .040     .120     .000   853.80   307.30
  .002761      520.     660.     550.        2        0        0      .00   164.31   471.61


*SECNO 19.800

3470 ENCROACHMENT STATIONS=     144.0     193.0  TYPE=     1  TARGET=      49.000
                50FT DS OF DARWIN RD      XSEC D
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   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=     527.0     550.0  TYPE=     1  TARGET=      23.000
    20.69      5.24   859.64      .00   859.58   859.98      .34       .00       .00   858.00
     350.        3.     345.       2.       5.      73.       4.        8.       4.    858.20
      .23       .55     4.70      .52     .120     .032     .120      .000   854.40   527.00
  .001853        1.       1.       1.        0        0        0       .00    23.00   550.00


*SECNO 21.180

3470 ENCROACHMENT STATIONS=     477.0     600.0  TYPE=     1  TARGET=     123.000
                 50FT US OF DARWIN ROAD  CHANNEL SHAPE FROM XSEC D   XSEC E
    21.18      5.63   860.03      .00   859.98   860.14      .10       .09       .07   858.00
     350.       71.     244.      35.      96.      80.      62.        8.       4.    858.20
      .24       .74     3.05      .56     .120     .050     .120      .000   854.40   477.00
  .001691       49.      49.      49.        2        0        0       .00   123.00   600.00


*SECNO 22.180
 2800 NAT Q1=     107.83  WSEL=     860.18  ENC Q1=     107.83  WSEL=     860.28  RATIO=    .0000
 NAT Q1=     116.  RATIOS LOB,CH,ROB=   .3490   .5553   .0957  WSEL=     860.28

3470 ENCROACHMENT STATIONS=     417.6     568.7  TYPE=     4  TARGET=        .073
                 150FT US OF DARWIN RD     XSEC F
    22.18      5.82   860.22      .00   860.18   860.28      .06       .14       .01   858.00
     350.      116.     212.      22.     195.      83.      38.        9.       5.    858.20
      .25       .59     2.55      .58     .120     .050     .120      .000   854.40   417.58
  .001127      100.     100.     100.        2        0        0       .00   151.15   568.73


*SECNO 27.280

3470 ENCROACHMENT STATIONS=     375.0     575.0  TYPE=     1  TARGET=     200.000
                          XSEC G
    27.28      4.57   860.97      .00   860.93   861.06      .08       .76       .01   859.50
     350.       41.     236.      72.      96.      85.     103.       13.       7.    857.30
      .33       .43     2.77      .70     .120     .050     .120      .000   856.40   375.00
  .001410      650.     610.     530.        2        0        0       .00   184.29   559.29


*SECNO 28.280

3470 ENCROACHMENT STATIONS=     140.0     340.0  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      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO 47.930
 2800 NAT Q1=     94.54  WSEL=    864.10  ENC Q1=     94.54  WSEL=    864.20  RATIO=    .0000
 NAT Q1=    103.  RATIOS LOB,CH,ROB=   .1140   .7156   .1703  WSEL=    864.20

3470 ENCROACHMENT STATIONS=     152.3     253.8  TYPE=     4  TARGET=        .078
                XSEC L
    47.93     4.83   864.13      .00   864.10   864.26      .13      .35      .05   862.90
     350.      27.     274.      49.      46.      85.      59.      36.      14.    861.90
      .85      .58     3.24      .83     .100     .040     .100     .000   859.30   152.31
  .001493     510.     730.     460.        2        0        0      .00   101.53   253.84

*SECNO 52.230
 2800 NAT Q1=    120.15  WSEL=    864.59  ENC Q1=    120.15  WSEL=    864.69  RATIO=    .0000
 NAT Q1=    129.  RATIOS LOB,CH,ROB=   .1546   .6921   .1533  WSEL=    864.69

3470 ENCROACHMENT STATIONS=      51.4     142.0  TYPE=     4  TARGET=        .066
                XSEC M
    52.23     5.35   864.65      .00   864.59   864.74      .09      .47      .01   862.30
     350.      45.     260.      45.      55.      96.      51.      38.      14.    862.50
      .90      .82     2.71      .87     .070     .040     .070     .000   859.30    51.38
  .000879     340.     430.     420.        2        0        0      .00    90.57   141.95

*SECNO 61.230

3470 ENCROACHMENT STATIONS=      60.0     210.0  TYPE=     1  TARGET=     150.000
                XSEC N
    61.23     4.13   865.53      .00   865.47   865.59      .06      .84      .01   862.80
     350.     167.     183.       0.     169.      74.       0.      42.      17. 100000.00
     1.04      .99     2.49      .00     .070     .040     .070     .000   861.40    76.40
  .001018     850.     900.     940.        2        0        0      .00   133.60   210.00

CCHV=    .600 CEHV=    .800
*SECNO 62.230

3470 ENCROACHMENT STATIONS=     169.0     269.0  TYPE=     1  TARGET=     100.000
                XSEC O
    62.23     4.43   865.63      .00   865.57   865.65      .02      .03      .02   862.80
     350.       0.     317.      33.       0.     268.      73.      43.      17.    862.70
     1.07      .00     1.18      .45     .070     .040     .070     .000   861.20   169.00
  .000166      90.     100.     130.        0        0        0      .00   100.00   269.00
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   SECNO     DEPTH     CWSEL     CRIWS     WSELF     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=    .100 CEHV=    .300
*SECNO 64.950
 2800 NAT Q1=    444.79  WSEL=    868.10  ENC Q1=    444.79  WSEL=    868.20  RATIO=    .0000
 NAT Q1=    460.  RATIOS LOB,CH,ROB=   .3383   .4821   .1796  WSEL=    868.20

3470 ENCROACHMENT STATIONS=      37.2      201.8  TYPE=     4  TARGET=        .034
                XSEC Q
    64.95     7.40   868.10      .00   868.10   868.11      .01      .01      .00   863.00
     350.     116.     176.      59.     377.     187.     186.      47.      18.    862.70
     1.17      .31      .94      .32     .100     .045     .100     .000   860.70    37.17
  .000066     115.     150.      90.        0        0        0      .00   164.65   201.82

*SECNO 70.050
 2800 NAT Q1=    420.76  WSEL=    868.13  ENC Q1=    420.76  WSEL=    868.23  RATIO=    .0000
 NAT Q1=    499.  RATIOS LOB,CH,ROB=   .1188   .4056   .4756  WSEL=    868.23

3470 ENCROACHMENT STATIONS=      89.0      232.4  TYPE=     4  TARGET=        .158
                XSEC R
    70.05     7.03   868.13      .00   868.13   868.14      .01      .03      .00   863.40
     350.      19.     169.     162.      57.     177.     469.      54.      19.    863.00
     1.37      .33      .95      .35     .100     .045     .100     .000   861.10    88.96
  .000073     440.     510.     410.        0        0        0      .00   143.44   232.40

*SECNO 74.050
 2800 NAT Q1=    367.91  WSEL=    868.15  ENC Q1=    367.91  WSEL=    868.25  RATIO=    .0000
 NAT Q1=    633.  RATIOS LOB,CH,ROB=   .3452   .4106   .2442  WSEL=    868.25
3280 CROSS SECTION     74.05 EXTENDED      2.15 FEET

3470 ENCROACHMENT STATIONS=     201.2      364.1  TYPE=     4  TARGET=        .419
                XSEC S
    74.05     6.76   868.16      .00   868.15   868.18      .02      .03      .00   865.40
     350.      80.     251.      19.     288.     219.      60.      59.      21.    864.10
     1.49      .28     1.15      .32     .100     .040     .100     .000   861.40   201.19
  .000099     430.     400.     310.        0        0        0      .00   162.89   364.08

*SECNO 74.550
 2800 NAT Q1=    373.88  WSEL=    868.16  ENC Q1=    373.88  WSEL=    868.26  RATIO=    .0000
 NAT Q1=    646.  RATIOS LOB,CH,ROB=   .3847   .3610   .2543  WSEL=    868.26
```

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
O	OLOB	OCH	OROB	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= 210.0 370.0 TYPE= 1 TARGET= 160.000

XSEC T US OF PINCKNEY RD

75.10	7.10	868.50	.00	868.49	868.51	.01	.00	.01	865.00
350.	94.	216.	39.	333.	198.	127.	60.	21.	864.10
1.52	.28	1.09	.31	.100	.040	.100	.000	861.40	210.00
.000076	10.	10.	10.	2	0	0	.00	160.00	370.00

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
28.280	100.00	.00	.00	857.00	350.00	860.99	.00	861.21	12.46	3.95	163.40	99.16
28.280	100.00	.00	.00	857.00	350.00	861.04	.00	861.25	11.87	3.89	168.59	101.57
29.730	145.00	863.30	860.00	857.00	350.00	863.76	.00	863.76	.03	.29	1248.74	2057.57
29.730	145.00	863.30	860.00	857.00	350.00	863.76	.00	863.76	.03	.29	1249.22	2058.81
35.530	580.00	.00	.00	857.70	350.00	863.76	.00	863.77	1.07	.93	519.08	337.77
35.530	580.00	.00	.00	857.70	350.00	863.76	.00	863.77	1.07	.93	519.56	338.19
40.630	510.00	.00	.00	858.40	350.00	863.83	.00	863.85	2.30	1.36	425.47	230.79
40.630	510.00	.00	.00	858.40	350.00	863.83	.00	863.86	2.50	1.42	321.94	221.51
47.930	730.00	.00	.00	859.30	350.00	864.10	.00	864.21	13.71	3.09	260.17	94.54
47.930	730.00	.00	.00	859.30	350.00	864.13	.00	864.26	14.93	3.24	190.11	90.58
52.230	430.00	.00	.00	859.30	350.00	864.59	.00	864.66	8.49	2.63	234.90	120.15
52.230	430.00	.00	.00	859.30	350.00	864.65	.00	864.74	8.79	2.71	201.73	118.05
61.230	900.00	.00	.00	861.40	350.00	865.47	.00	865.53	11.12	2.57	233.79	104.95
61.230	900.00	.00	.00	861.40	350.00	865.53	.00	865.59	10.18	2.49	242.55	109.67
62.230	100.00	.00	.00	861.20	350.00	865.57	.00	865.59	1.75	1.20	334.55	264.44
62.230	100.00	.00	.00	861.20	350.00	865.63	.00	865.65	1.66	1.18	340.89	271.87
62.730	50.00	.00	.00	861.20	350.00	865.58	.00	865.60	1.74	1.20	335.19	265.18
62.730	50.00	.00	.00	861.20	350.00	865.63	.00	865.65	1.66	1.18	340.94	271.94
62.950	22.00	867.70	865.00	861.60	350.00	868.09	.00	868.09	.25	.75	565.23	696.40
62.950	22.00	867.70	865.00	861.60	350.00	868.09	.00	868.10	.25	.75	565.76	697.39
63.450	50.00	.00	.00	861.70	350.00	868.09	.00	868.10	.32	.62	879.67	618.77
63.450	50.00	.00	.00	861.70	350.00	868.10	.00	868.10	.34	.64	816.37	602.89
64.950	150.00	.00	.00	860.70	350.00	868.10	.00	868.10	.62	.91	807.03	444.79
64.950	150.00	.00	.00	860.70	350.00	868.10	.00	868.11	.66	.94	750.55	432.17
70.050	510.00	.00	.00	861.10	350.00	868.13	.00	868.13	.69	.93	774.75	420.76
70.050	510.00	.00	.00	861.10	350.00	868.13	.00	868.14	.73	.95	703.28	408.85
74.050	400.00	.00	.00	861.40	350.00	868.15	.00	868.17	.91	1.10	616.95	367.91
74.050	400.00	.00	.00	861.40	350.00	868.16	.00	868.18	.99	1.15	566.25	352.12
74.550	50.00	.00	.00	861.40	350.00	868.16	.00	868.17	.88	1.13	659.47	373.88
74.550	50.00	.00	.00	861.40	350.00	868.17	.00	868.18	.95	1.18	616.89	359.30
74.560	1.00	867.80	866.40	861.40	350.00	868.02	.00	868.23	64.29	4.31	151.80	43.65
74.560	1.00	867.80	866.40	861.40	350.00	868.03	.00	868.24	63.84	4.30	151.28	43.80
75.050	49.00	867.80	866.40	861.40	350.00	868.36	.00	868.48	40.17	3.55	212.32	55.22
75.050	49.00	867.80	866.40	861.40	350.00	868.36	.00	868.49	41.57	3.62	201.96	54.29

HONEY CREEK

SUMMARY PRINTOUT TABLE 150

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
.000	350.00	856.13	.00	.00	1.13	126.03	.00
.000	350.00	856.23	.10	.00	.10	26.00	.00
10.200	350.00	857.70	.00	1.56	.00	260.00	1020.00
10.200	350.00	857.79	.09	1.56	.09	137.21	1020.00
16.800	350.00	858.43	.00	.73	.00	260.00	660.00
16.800	350.00	858.52	.09	.74	.09	164.31	660.00
19.800	350.00	859.24	.00	.81	.00	49.00	300.00
19.800	350.00	859.32	.08	.79	.08	49.00	300.00
20.300	350.00	859.35	.00	.12	.00	23.00	50.00
20.300	350.00	859.42	.07	.11	.07	23.00	50.00
20.310	350.00	859.34	.00	-.01	.00	23.00	1.00
20.310	350.00	859.41	.07	-.01	.07	23.00	1.00
20.680	350.00	859.58	.00	.23	.00	23.00	37.00
20.680	350.00	859.64	.06	.23	.06	23.00	37.00
20.690	350.00	859.58	.00	.00	.00	23.00	1.00
20.690	350.00	859.64	.06	.00	.06	23.00	1.00
21.180	350.00	859.98	.00	.40	.00	123.00	49.00
21.180	350.00	860.03	.05	.39	.05	123.00	49.00
22.180	350.00	860.18	.00	.20	.00	220.00	100.00
22.180	350.00	860.22	.04	.19	.04	151.15	100.00
27.280	350.00	860.93	.00	.74	.00	183.54	610.00
27.280	350.00	860.97	.05	.75	.05	184.29	610.00
28.280	350.00	860.99	.00	.07	.00	118.95	100.00
28.280	350.00	861.04	.04	.06	.04	121.45	100.00
29.730	350.00	863.76	.00	2.76	.00	200.00	145.00
29.730	350.00	863.76	.00	2.72	.00	200.00	145.00
35.530	350.00	863.76	.00	.00	.00	190.00	580.00
35.530	350.00	863.76	.00	.00	.00	190.00	580.00
40.630	350.00	863.83	.00	.07	.00	244.97	510.00
40.630	350.00	863.83	.00	.07	.00	110.09	510.00
47.930	350.00	864.10	.00	.27	.00	234.08	730.00
47.930	350.00	864.13	.03	.30	.03	101.53	730.00

SUMMARY OF ERRORS AND SPECIAL NOTES

THIS RUN EXECUTED 06/20/86 08:18:41

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*************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55,56
  IBM-PC-XT VERSION 1.1
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ET        .000       6.100       6.100       6.100       6.100     144.000     193.000        .000        .000        .000
                 50FT DS OF DARWIN RD       XSEC D
X1      19.800      10.000     160.000     177.000     300.000     390.000     300.000        .000        .000        .000
GR     862.000        .000     858.000      45.000     857.800     160.000     856.200     162.000     854.200     167.000
GR     854.700     176.000     858.000     177.000     858.000     293.000     860.000     347.000     862.000     377.000

NC        .000        .000        .000        .000        .000        .000        .000        .000        .000        .000
ET        .000       6.100       6.100       6.100       6.100     157.000     180.000        .000        .000        .000
                 DARWIN RD TWIN 9FT6IN BY 6FT5IN CMP 37LF  NO HEADWALL
X1      20.300        .000        .000        .000      50.000      50.000      50.000        .000        .000        .000

NC        .000        .000        .000        .000        .000        .000        .000        .000        .000        .000
ET        .000       6.100       6.100       6.100       6.100     365.000     388.000        .000        .000        .000
X1      20.310      29.000     365.000     388.000       1.000       1.000       1.000        .000        .000        .000
X2        .000        .000        .000     860.700     861.500        .000        .000        .000        .000        .000
BT      27.000        .000     864.000        .000     190.000     862.000        .000     365.000     861.500     854.800
BT     365.200     861.500     857.600     366.200     861.500     859.500     367.400     861.500     860.400     369.000
BT     861.500     860.900     369.800     861.500     861.000     370.600     861.500     860.900     371.900     861.500
BT     860.400     373.200     861.500     859.500     374.200     862.500     857.900     374.400     861.500     855.200
BT     378.600     861.500     855.300     378.800     861.500     857.600     379.600     861.500     859.100     380.900
BT     861.500     860.100     382.200     861.500     860.600     383.300     861.500     860.700     384.400     861.500
BT     860.600     385.600     861.500     860.100     386.600     861.500     859.200     387.700     861.500     857.600
BT     388.000     861.500     855.700     400.000     861.500        .000     525.000     862.000        .000     583.000
BT     864.000        .000        .000        .000        .000        .000        .000        .000        .000        .000
GR     864.000        .000     862.000     190.000     861.500     360.000     854.800     365.000     854.800     365.200
GR     854.800     366.200     854.900     367.400     854.900     369.000     855.000     369.800     855.000     370.600
GR     855.100     371.900     855.100     373.200     855.100     374.200     855.200     374.400     855.300     378.600
GR     855.300     378.800     855.300     379.600     855.300     380.900     855.400     382.200     855.500     383.300
GR     855.600     384.400     855.600     385.600     855.600     386.600     855.700     387.700     855.700     388.000
GR     860.000     395.000     861.500     400.000     862.000     525.000     864.000     583.000        .000        .000

NC        .000        .000        .032        .000        .000        .000        .000        .000        .000        .000
ET        .000       6.100       6.100       6.100       6.100     365.000     388.000        .000        .000        .000
                 UPSTREAM FACE OF CULVERTS
X1      20.680        .000        .000        .000      37.000      37.000      37.000        .000        .000        .000
X2        .000        .000        .000     860.700     861.500        .000       1.000        .000        .000        .000

ET        .000       6.100       6.100       6.100       6.100     527.000     550.000        .000        .000        .000
X1      20.690       9.000     530.000     547.000       1.000       1.000       1.000        .000        .000        .000
GR     866.000        .000     862.000      70.000     858.000     530.000     856.400     532.000     854.400     538.000
GR     854.900     546.000     858.200     547.000     862.000     700.000     866.000     755.000        .000        .000

NC        .000        .000        .050        .000        .000        .000        .000        .000        .000        .000
ET        .000       6.100       6.100       6.100       6.100     477.000     600.000        .000        .000        .000
                 50FT US OF DARWIN ROAD  CHANNEL SHAPE FROM XSEC D   XSEC E
X1      21.180        .000        .000        .000      49.000      49.000      49.000        .000        .000        .000

ET        .000       6.100       6.100       6.100       6.100     330.000     600.000        .000        .000        .000
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                XSEC M
X1     52.230    12.000    88.000   112.000   340.000   420.000   430.000      .000      .000      .000
GR    870.000      .000   864.000    28.000   863.100    78.000   862.300    88.000   859.400    96.000
GR    859.300    98.000   859.400   100.000   862.500   112.000   864.000   162.000   866.000   188.000
GR    868.000   240.000   870.000   267.000      .000      .000      .000      .000      .000      .000

NC       .000      .000      .000      .000      .000      .000      .000      .000      .000      .000
ET       .000     6.100     6.100     8.100     8.100   161.000   245.000    60.000   210.000      .000
                XSEC N
X1     61.230    13.000   190.000   256.000   850.000   940.000   900.000      .000      .000      .000
GR    870.000      .000   868.000    31.000   866.000    60.000   864.000   130.000   862.800   190.000
GR    861.600   200.000   861.200   220.000   861.200   242.000   862.700   256.000   864.000   322.000
GR    866.000   340.000   868.000   358.000   870.000   382.000      .000      .000      .000      .000

NC       .000      .000      .000      .600      .800      .000      .000      .000      .000      .000
ET       .000     6.100     6.100     8.100     8.100   186.000   220.000   169.000   269.000      .000
                XSEC O
X1     62.230    12.000   169.000   235.000    90.000   130.000   100.000      .000      .000      .000
GR    870.000      .000   868.000    30.000   866.000    60.000   864.000   130.000   862.800   169.000
GR    861.600   179.000   861.200   199.000   861.200   221.000   862.700   235.000   864.000   263.000
GR    866.000   300.000   870.000   332.000      .000      .000      .000      .000      .000      .000

NC       .000      .000      .000      .600      .800      .000      .000      .000      .000      .000
ET       .000     6.100     6.100     8.100     8.100   206.000   214.000   169.000   269.000      .000
                DS OF FARM ROAD 7.5CMP  20LF NO HEADWALLS
                ELLC IS 867.5  ELTRD IS 867.7   10 YR STAGE COMP BY HAND
X1     62.730      .000      .000      .000    50.000    50.000    50.000      .000      .000      .000

NC       .000      .000      .032      .000      .000      .000      .000      .000      .000      .000
SB       .000    3.020     2.700      .000     7.500      .000    44.180      .000      .000      .000
ET       .000    6.100     6.100     8.100     8.100   206.000   214.000   169.000   269.000      .000
NC       .000      .000      .040      .000      .000      .000      .000      .000      .000      .000
X1     62.950    12.000   169.000   235.000    22.000    22.000    22.000      .000      .000      .000
X2       .000      .000     1.000   864.000   867.700      .000      .000      .000      .000      .000
BT      6.000      .000   870.000      .000   100.000   868.300      .000   150.000   868.300      .000
BT    200.000   867.700      .000   250.000   867.900      .000   300.000   870.000      .000      .000
GR    870.000      .000   868.000    30.000   866.000    60.000   864.000   130.000   862.800   169.000
GR    862.000   179.000   861.600   199.000   861.600   221.000   862.700   235.000   864.000   263.000
GR    866.000   300.000   870.000   332.000      .000      .000      .000      .000      .000      .000

NC       .100      .100      .045      .000      .000      .000      .000      .000      .000      .000
ET       .000     6.100     6.100     8.100     8.100   184.000   236.000   119.000   319.000      .000
                XSEC P
X1     63.450      .000      .000      .000    50.000    50.000    50.000      .000      .100      .000
X5      4.000   866.020   867.590      .000   868.390      .000      .000      .000      .000      .000

NC       .000      .000      .000      .100      .300      .000      .000      .000      .000      .000
ET       .000      .000      .000      .000      .000      .000      .000      .000      .000      .000
                XSEC Q
X1     64.950    13.000   131.000   159.000   115.000    90.000   150.000      .000      .000      .000
GR    870.000      .000   868.000    10.000   866.000    35.000   864.000    75.000   863.000   131.000
GR    861.900   133.000   860.700   144.000   861.600   156.000   862.700   159.000   864.000   189.000
GR    866.000   207.000   868.000   219.000   870.000   238.000      .000      .000      .000      .000
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   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

*PROF 1

CCHV=    .300 CEHV=    .500
*SECNO  .000
                 2070FT DS OF DARWIN RD  XSEC A
      .00      3.86   855.16      .00   855.00   855.35      .19      .00      .00   855.80
     200.        0.     200.       0.       0.      58.       0.       0.       0.   855.70
      .00       .00     3.47      .00     .120     .040     .120     .000   851.30   216.13
  .002999        0.       0.       0.        0        0        5      .00    24.29   240.42

*SECNO 10.200

3470 ENCROACHMENT STATIONS=     135.0     395.0  TYPE=     1  TARGET=     260.000
                 OB CUT FROM TOPO  CHANNEL SHAPE FROM XSEC A     XSEC B
    10.20      4.21   856.91      .00      .00   856.96      .05     1.58      .04   856.00
     200.        8.     184.       8.      33.      99.      35.       2.       2.   856.00
      .16       .23     1.86      .23     .120     .040     .120     .000   852.70   161.81
  .000966      530.    1020.     610.        3        0        0      .00   197.59   359.40

*SECNO 16.800

3470 ENCROACHMENT STATIONS=     260.0     520.0  TYPE=     1  TARGET=     260.000
                 OB CUT FROM TOPO  CHANNEL SHAPE FROM XSEC D     XSEC C
    16.80      4.03   857.83   856.22      .00   858.03      .20      .99      .08   857.40
     200.        5.     194.       2.      20.      53.      11.       4.       4.   857.60
      .21       .23     3.67      .15     .120     .040     .120     .000   853.80   275.65
  .002731      520.     660.     550.        4       11        0      .00   205.42   481.08

*SECNO 19.800

3470 ENCROACHMENT STATIONS=     144.0     193.0  TYPE=     1  TARGET=      49.000
                 50FT DS OF DARWIN RD      XSEC D
    19.80      4.36   858.56      .00      .00   858.71      .16      .67      .01   857.80
     200.        5.     192.       3.      12.      59.       9.       5.       5.   858.00
      .24       .42     3.25      .35     .120     .040     .120     .000   854.20   144.00
  .001851      300.     300.     390.        2        0        0      .00    49.00   193.00

*SECNO 20.300
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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

*SECNO 21.180

3470 ENCROACHMENT STATIONS=     477.0     600.0  TYPE=     1  TARGET=     123.000
                 50FT US OF DARWIN ROAD  CHANNEL SHAPE FROM XSEC D   XSEC E
    21.18     4.50   858.90      .00       .00   859.03      .12       .08       .02   858.00
     200.      16.     181.       3.       36.      61.      10.        5.        6.   858.20
      .25      .46     2.98      .30      .120     .050     .120      .000    854.40   477.00
  .002331      49.      49.      49.         2        0        0       .00     98.24   575.24

*SECNO 22.180

3470 ENCROACHMENT STATIONS=     330.0     600.0  TYPE=     1  TARGET=     270.000
                150FT US OF DARWIN RD     XSEC F
    22.18     4.74   859.14      .00       .00   859.23      .09       .19       .01   858.00
     200.      26.     169.       5.       75.      65.      18.        5.        6.   858.20
      .26      .34     2.60      .30      .120     .050     .120      .000    854.40   398.76
  .001635     100.     100.     100.         2        0        0       .00    186.14   584.90

*SECNO 27.280

3470 ENCROACHMENT STATIONS=     375.0     575.0  TYPE=     1  TARGET=     200.000
                          XSEC G
    27.28     3.69   860.09      .00       .00   860.16      .07       .93       .00   859.50
     200.       3.     162.      35.       16.      67.      60.        7.        8.   857.30
      .35      .21     2.40      .59      .120     .050     .120      .000    856.40   428.50
  .001438     650.     610.     530.         2        0        0       .00    117.20   545.70

*SECNO 28.280

3470 ENCROACHMENT STATIONS=     140.0     340.0  TYPE=     1  TARGET=     200.000
            DS OF IMPOUNDMENT  OUTLET TWIN 6FT RCCP WITH INLET CONTROL  XSEC H
    28.28     3.18   860.18      .00       .00   860.32      .15       .12       .04   859.50
     200.       2.     194.       4.        8.      62.      15.        7.        8.   859.00
      .35      .20     3.12      .29      .120     .030     .120      .000    857.00   213.68
  .001091      80.     100.      95.         2        0        0       .00     71.79   285.47
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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        QLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO 47.930
                XSEC L
    47.93     4.24   863.54      .00       .00   863.62       .08       .19       .03   862.90
     200.       5.     172.      22.       24.     71.       52.       28.       16.    861.90
     1.12      .23     2.44      .43      .100    .040      .100      .000   859.30   122.85
  .001080     510.     730.     460.         2       0         0       .00   161.49   284.34

*SECNO 52.230
                XSEC M
    52.23     4.64   863.94      .00       .00   864.00       .06       .37       .01   862.30
     200.      14.     170.      16.       32.     79.       34.       29.       17.    862.50
     1.18      .45     2.15      .46      .070    .040      .070      .000   859.30    31.50
  .000723     340.     430.     420.         2       0         0       .00   128.40   159.90

*SECNO 61.230

3470 ENCROACHMENT STATIONS=      161.0      245.0  TYPE=      1  TARGET=      84.000
                XSEC N
    61.23     3.16   864.36      .00       .00   864.38       .02       .36       .01   862.80
     200.      14.     186.       0.       37.    159.        0.       33.       19. 100000.00
     1.41      .39     1.17      .00      .070    .040      .070      .000   861.20   161.00
  .000259     850.     900.     940.         2       0         0       .00    84.00   245.00

CCHV=     .600 CEHV=     .800
*SECNO 62.230

3470 ENCROACHMENT STATIONS=      186.0      220.0  TYPE=      1  TARGET=      34.000
                XSEC O
    62.23     3.19   864.39      .00       .00   864.44       .05       .04       .03100000.00
     200.       0.     200.       0.        0.    107.        0.       33.       19. 100000.00
     1.42      .00     1.87      .00      .070    .040      .070      .000   861.20   186.00
  .000684      90.     100.     130.         1       0         0       .00    34.00   220.00

CCHV=     .600 CEHV=     .800
*SECNO 62.730

3301 HV CHANGED MORE THAN HVINS
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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

CCHV=    .100 CEHV=    .300
*SECNO 64.950
                XSEC Q
    64.95     5.34   866.04      .00       .00   866.05       .01       .02       .00   863.00
     200.      48.     124.      28.      184.     130.      100.       34.       19.   862.70
     1.50      .26      .96      .28      .100     .045      .100      .000   860.70    34.47
  .000112     115.     150.      90.         2        0         0       .00   172.79   207.26

*SECNO 70.050

3470 ENCROACHMENT STATIONS=      30.0      220.0  TYPE=      1  TARGET=      190.000
                XSEC R
    70.05     5.00   866.10      .00       .00   866.11       .01       .05       .00   863.40
     200.      14.     114.      72.       62.     120.      236.       38.       21.   863.00
     1.70      .23      .95      .31      .100     .045      .100      .000   861.10    58.51
  .000120     440.     510.     410.         0        0         0       .00   161.49   220.00

*SECNO 74.050
3280 CROSS SECTION     74.05 EXTENDED       .14 FEET

3470 ENCROACHMENT STATIONS=     295.0      355.0  TYPE=      1  TARGET=       60.000
                XSEC S
    74.05     4.75   866.15      .00       .00   866.18       .03       .07       .01   865.40
     200.       2.     194.       4.       11.     140.       12.       41.       22.   864.10
     1.77      .19     1.39      .32      .100     .040      .100      .000   861.40   295.00
  .000260     430.     400.     310.         0        0         0       .00    60.00   355.00

*SECNO 74.550
3280 CROSS SECTION     74.55 EXTENDED       .16 FEET

3470 ENCROACHMENT STATIONS=     308.0      342.0  TYPE=      1  TARGET=       34.000
    74.55     4.76   866.16      .00       .00   866.19       .04       .01       .00   865.00
     200.       0.     199.       1.        2.     128.        4.       41.       22.   864.10
     1.78      .20     1.55      .25      .100     .040      .100      .000   861.40   308.00
  .000276      50.      50.      50.         0        0         0       .00    34.00   342.00
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THIS RUN EXECUTED 06/20/86 08:28:16

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  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55,56
  IBM-PC-XT VERSION 1.1
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T1 PUTNAM TWP FIS
T2 50YR FLOWS
T3 HONEY CREEK

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0.	3.	0.	0.	.003000	.00	.0	300.	855.000	.000
J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	2.000	.000	-1.000	.000	.000	.000	.000	.000	.000	.000

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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


3470 ENCROACHMENT STATIONS=     157.0     180.0  TYPE=     1  TARGET=      23.000
              DARWIN RD TWIN 9FT6IN BY 6FT5IN CMP 37LF  NO HEADWALL
   20.30     4.95   859.15      .00   858.65   859.43      .28      .13      .02   857.80
    300.       2.     296.       2.       4.      69.       3.       8.       7.    858.00
     .24      .60     4.27      .56     .120     .040     .120     .000   854.20   157.00
 .002600      50.      50.      50.        2        0        0      .00    23.00   180.00

*SECNO 20.310

3370 NORMAL BRIDGE,NRD= 27 MIN ELTRD=  861.50 MAX ELLC=  860.70


3470 ENCROACHMENT STATIONS=     365.0     388.0  TYPE=     1  TARGET=      23.000
   20.31     4.35   859.15      .00   858.65   859.44      .29      .00      .01   854.80
    300.       0.     300.       0.       0.      69.       0.       8.       7. 100000.00
     .24      .00     4.35      .00     .120     .040     .120     .000   854.80   365.00
 .005679       1.       1.       1.        0        0        0   -21.39    23.00   388.00

*SECNO 20.680

3370 NORMAL BRIDGE,NRD= 27 MIN ELTRD=  861.50 MAX ELLC=  860.70


3470 ENCROACHMENT STATIONS=     365.0     388.0  TYPE=     1  TARGET=      23.000
              UPSTREAM FACE OF CULVERTS
   20.68     4.53   859.33      .00   858.75   859.61      .27      .16      .01   854.80
    300.       0.     300.       0.       0.      71.       0.       8.       7. 100000.00
     .24      .00     4.20      .00     .120     .032     .120     .000   854.80   365.00
 .003342      37.      37.      37.        2        0        0   -22.99    23.00   388.00

*SECNO 20.690

3470 ENCROACHMENT STATIONS=     527.0     550.0  TYPE=     1  TARGET=      23.000
   20.69     4.93   859.33      .00   858.74   859.62      .29      .00      .01   858.00
    300.       2.     297.       1.       4.      68.       3.       8.       7.    858.20
     .24      .49     4.36      .45     .120     .032     .120     .000   854.40   527.00
 .001758       1.       1.       1.        1        0        0      .00    23.00   550.00
```

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

SPECIAL BRIDGE

5070,VARIABLE ELCHU OR ELCHD ON CARD SB NOT SPECIFIED

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.00	2.78	2.70	200.00	5.00	.00	22.80	.00	857.00	857.00

*SECNO 29.730
3280 CROSS SECTION 29.73 EXTENDED 2.95 FEET

PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
868.22	860.75	.00	113.	187.	23.	15.	860.00	863.30

3470 ENCROACHMENT STATIONS= 90.0 290.0 TYPE= 1 TARGET= 200.000
XSEC I LOSS CHECKED BY HAND COMPS

29.73	6.65	863.65	.00	863.34	863.65	.00	2.71	.00	860.70
300.	2.	298.	0.	51.	1177.	0.	15.	12.	100000.00
.51	.03	.25	.00	.120	.030	.000	.000	857.00	90.00
.000002	145.	145.	145.	0	0	6	.00	200.00	290.00

*SECNO 35.530

3470 ENCROACHMENT STATIONS= 140.0 320.0 TYPE= 1 TARGET= 180.000
US OF IMPOUNDMENT XSEC J

35.53	5.95	863.65	.00	863.34	863.66	.01	.00	.00	861.40
300.	24.	266.	10.	120.	322.	45.	27.	14.	861.20
.72	.20	.83	.22	.100	.040	.100	.000	857.70	140.00
.000089	460.	580.	550.	2	0	0	.00	180.00	320.00

*SECNO 40.630
XSEC K

40.63	5.31	863.71	.00	863.38	863.73	.02	.06	.01	861.30
300.	26.	260.	13.	113.	213.	71.	32.	16.	862.00
.85	.23	1.22	.19	.100	.040	.100	.000	858.40	141.28
.000193	500.	510.	500.	2	0	0	.00	234.66	375.94

```
   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=     206.0     214.0  TYPE=     1  TARGET=       8.000
                DS OF FARM ROAD 7.5CMP  20LF NO HEADWALLS
                ELLC IS 867.5  ELTRD IS 867.7   10 YR STAGE COMP BY HAND
    62.73     3.54   864.74   864.71   864.30   866.48     1.74      .14      1.32100000.00
     300.      0.     300.      0.       0.       28.       0.       43.       23. 100000.00
     1.18     .00    10.59     .00     .070     .040      .070     .000   861.20   206.00
  .035039     50.     50.      50.        4       11        0       .00     8.00   214.00


SPECIAL BRIDGE

5070,VARIABLE ELCHU OR ELCHD ON CARD SB NOT SPECIFIED
SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     .00      3.02      2.70       .00      7.50       .00      44.18      .00     861.20    861.20

*SECNO 62.950
 PRESS FLOW BECAUSE EGLWC OF    866.96  EXCEEDS 1.5 DEPTH
PRESSURE FLOW

 EGPRS      EGLWC      H3        QWEIR      QPR       BAREA   TRAPEZOID      ELLC      ELTRD
                                                                 AREA
    866.90    866.96      .00        0.      300.       44.       21.      864.00    867.70


3470 ENCROACHMENT STATIONS=     206.0     214.0  TYPE=     1  TARGET=       8.000
    62.95     3.76   865.36     .00    864.28   866.90     1.54      .42       .00100000.00
     300.      0.     300.      0.       0.       30.       0.       43.       23. 100000.00
     1.19     .00     9.97     .00     .000     .040      .000     .000   861.60   206.00
  .029812     22.     22.      22.        5        0        0       .00     8.00   214.00


*SECNO 63.450
 WATER EL=X5 CARD=   867.590

3470 ENCROACHMENT STATIONS=     184.0     236.0  TYPE=     1  TARGET=      52.000
                XSEC P
    63.45     5.89   867.59     .00    866.02   867.61      .02      .02       .92100000.00
     300.      0.     299.      1.       0.      290.       5.       43.       23.    862.80
     1.20     .00     1.03     .14     .100     .045      .100     .000   861.70   184.00
  .000110     50.     50.      50.        0        0        0       .00    52.00   236.00
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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

*SECNO 74.560

3370 NORMAL BRIDGE,NRD=  0 MIN ELTRD=  867.80 MAX ELLC=  866.40


3470 ENCROACHMENT STATIONS=     190.0     370.0  TYPE=     1  TARGET=     180.000
                DS OF PINCKNEY RD  20.3FT BRIDGE WITH CONC WINGWALLS
    74.56     6.15   867.55      .00   866.04   867.74      .19      .00      .05   861.40
     300.      82.     213.       5.      52.      53.       7.      58.      27.    861.40
     1.63     1.58     4.05      .77     .100     .040     .100     .000   861.40   300.04
  .003510       1.       1.       1.        2        0        0   -28.11    24.83   324.86


*SEENO 75.050

3370 NORMAL BRIDGE,NRD=  0 MIN ELTRD=  867.80 MAX ELLC=  866.40


3470 ENCROACHMENT STATIONS=     190.0     370.0  TYPE=     1  TARGET=     180.000
    75.05     6.32   867.72      .00   866.11   867.91      .19      .17      .00   861.40
     300.      82.     213.       5.      52.      53.       7.      58.      27.    861.40
     1.63     1.58     4.05      .77     .100     .040     .100     .000   861.40   300.01
  .003510      49.      49.      49.        2        0        0   -32.39    24.95   324.96


*SECNO 75.100
3280 CROSS SECTION     75.10 EXTENDED      1.93 FEET


3470 ENCROACHMENT STATIONS=     240.0     430.0  TYPE=     1  TARGET=     190.000
                XSEC T     US OF PINCKNEY RD
    75.10     6.53   867.93      .00   866.30   867.94      .01      .00      .02   865.00
     300.      47.     175.      78.     197.     181.     296.      58.      27.    864.10
     1.64      .24      .97      .26     .100     .040     .100     .000   861.40   240.00
  .000067      10.      10.      10.        2        0        0      .00   190.00   430.00
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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         OLOB      OCH       OROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*PROF 3

CCHV=     .300 CEHV=     .500
*SECNO  .000
                 2070FT DS OF DARWIN RD  XSEC A
      .00      4.84    856.14       .00    856.00    856.40       .27       .00       .00    855.80
     350.        3.      345.        2.       12.       83.        7.        0.        0.    855.70
      .00       .25      4.18       .26      .120      .040      .120      .000    851.30    154.83
  .002996        0.        0.        0.         0         0         5       .00    126.51    201.34

*SECNO 10.200

3470 ENCROACHMENT STATIONS=      135.0      395.0  TYPE=      1  TARGET=      260.000
                 OB CUT FROM TOPO  CHANNEL SHAPE FROM XSEC A     XSEC B
    10.20      5.00    857.70       .00    856.91    857.75       .05      1.28       .07    856.00
     350.       37.      274.       39.      106.      136.      114.        4.        3.    856.00
      .16       .35      2.01       .34      .120      .040      .120      .000    852.70    135.00
  .000740      530.     1020.      610.         2         0         0       .00    260.00    395.00

*SECNO 16.800

3470 ENCROACHMENT STATIONS=      260.0      520.0  TYPE=      1  TARGET=      260.000
                 OB CUT FROM TOPO  CHANNEL SHAPE FROM XSEC D     XSEC C
    16.80      4.63    858.43       .00    857.83    858.63       .20       .81       .07    857.40
     350.       46.      260.       44.       84.       63.       90.        8.        6.    857.60
      .22       .55      4.12       .49      .120      .040      .120      .000    853.80    260.00
  .002734      520.      660.      550.         2         0         0       .00    260.00    520.00

*SECNO 19.800

3470 ENCROACHMENT STATIONS=      144.0      193.0  TYPE=      1  TARGET=       49.000
                 50FT DS OF DARWIN RD      XSEC D
    19.80      5.04    859.24       .00    858.56    859.52       .29       .85       .04    857.80
     350.       18.      318.       14.       23.       71.       20.        9.        7.    858.00
      .24       .78      4.50       .72      .120      .040      .120      .000    854.20    144.00
  .002807      300.      300.      390.         2         0         0       .00     49.00    193.00

*SECNO 20.300
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   SECNO     DEPTH     CWSEL     CRIWS     WSELF     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO 21.180

3470 ENCROACHMENT STATIONS=     477.0     600.0  TYPE=     1  TARGET=     123.000
                50FT US OF DARWIN ROAD  CHANNEL SHAPE FROM XSEC D   XSEC E
    21.18     5.58   859.98      .00   858.90   860.09      .11      .09      .07   858.00
     350.      70.     247.      34.      93.      79.      60.      10.       8.   858.20
      .25      .75     3.11      .56     .120     .050     .120     .000   854.40   477.00
  .001793      49.      49.      49.        2        0        0      .00   123.00   600.00

*SECNO 22.180

3470 ENCROACHMENT STATIONS=     330.0     600.0  TYPE=     1  TARGET=     270.000
                150FT US OF DARWIN RD     XSEC F
    22.18     5.79   860.19      .00   859.14   860.24      .05      .13      .02   858.00
     350.     122.     196.      32.     262.      82.      70.      10.       8.   858.20
      .27      .47     2.38      .46     .120     .050     .120     .000   854.40   330.00
  .000989     100.     100.     100.        1        0        0      .00   270.00   600.00

*SECNO 27.280

3470 ENCROACHMENT STATIONS=     375.0     575.0  TYPE=     1  TARGET=     200.000
                          XSEC G
    27.28     4.51   860.91      .00   860.09   861.00      .09      .74      .02   859.50
     350.      38.     240.      72.      89.      84.     100.      15.      11.   857.30
      .35      .43     2.87      .72     .120     .050     .120     .000   856.40   375.00
  .001538     650.     610.     530.        2        0        0      .00   183.25   558.25

*SECNO 28.280

3470 ENCROACHMENT STATIONS=     140.0     340.0  TYPE=     1  TARGET=     200.000
            DS OF IMPOUNDMENT  OUTLET TWIN 6FT RCCP WITH INLET CONTROL  XSEC H
    28.28     3.98   860.98      .00   860.18   861.20      .22      .14      .07   859.50
     350.      14.     317.      19.      39.      80.      42.      16.      12.   859.00
      .35      .36     3.97      .44     .120     .030     .120     .000   857.00   184.84
  .001269      80.     100.      95.        2        0        0      .00   117.99   302.83
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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

*SECNO 47.930
                XSEC L
    47.93      4.80    864.10      .00    863.54    864.21      .11       .32       .04    862.90
     350.       34.      259.      56.       83.       84.      93.       40.       20.     861.90
      .87       .41      3.09      .60      .100      .040     .100      .000    859.30     69.24
  .001371      510.      730.     460.         2         0        0       .00    234.08    303.32

*SECNO 52.230
                XSEC M
    52.23      5.29    864.59      .00    863.94    864.66      .08       .44       .01    862.30
     350.       51.      249.      51.       71.       94.      69.       42.       21.     862.50
      .93       .71      2.63      .73      .070      .040     .070      .000    859.30     25.27
  .000849      340.      430.     420.         2         0        0       .00    144.34    169.61

*SECNO 61.230

3470 ENCROACHMENT STATIONS=      60.0      210.0  TYPE=      1  TARGET=      150.000
                XSEC N
    61.23      4.07    865.47      .00    864.36    865.53      .06       .86       .00    862.80
     350.      164.      186.       0.      161.       72.       0.       47.       24.  100000.00
     1.06      1.01      2.57      .00      .070      .040     .070      .000    861.40     78.72
  .001112      850.      900.     940.         2         0        0       .00    131.28    210.00

CCHV=     .600 CEHV=     .800
*SECNO 62.230

3470 ENCROACHMENT STATIONS=     169.0      269.0  TYPE=      1  TARGET=      100.000
                XSEC O
    62.23      4.37    865.57      .00    864.39    865.59      .02       .04       .02    862.80
     350.        0.      318.      32.        0.      264.      71.       47.       25.     862.70
     1.09       .00      1.20      .46      .070      .040     .070      .000    861.20    169.00
  .000175       90.      100.     130.         0         0        0       .00    100.00    269.00

CCHV=     .600 CEHV=     .800
*SECNO 62.730

3470 ENCROACHMENT STATIONS=     169.0      269.0  TYPE=      1  TARGET=      100.000
                DS OF FARM ROAD 7.5CMP  20LF NO HEADWALLS
                ELLC IS 867.5  ELTRD IS 867.7   10 YR STAGE COMP BY HAND
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SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        DLOSS     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

*SECNO 70.050

3470 ENCROACHMENT STATIONS=      30.0      220.0  TYPE=     1  TARGET=     190.000
                XSEC R
   70.05      7.02    868.12      .00    866.10    868.13      .01       .03       .00    863.40
    350.       47.      164.     140.      180.      177.     418.       59.       27.    863.00
    1.41       .26       .93      .33      .100      .045     .100      .000    861.10     30.00
 .000069      440.      510.     410.         0         0        0       .00    190.00    220.00

*SECNO 74.050
3280 CROSS SECTION      74.05 EXTENDED       2.15 FEET

3470 ENCROACHMENT STATIONS=     190.0      370.0  TYPE=     1  TARGET=     180.000
                XSEC S
   74.05      6.75    868.15      .00    866.15    868.16      .01       .03       .00    865.40
    350.       84.      240.      26.      316.      218.      82.       65.       29.    864.10
    1.54       .27      1.10      .31      .100      .040     .100      .000    861.40    190.00
 .000091      430.      400.     310.         0         0        0       .00    180.00    370.00

*SECNO 74.550
3280 CROSS SECTION      74.55 EXTENDED       2.15 FEET

3470 ENCROACHMENT STATIONS=     190.0      370.0  TYPE=     1  TARGET=     180.000
   74.55      6.75    868.15      .00    866.16    868.17      .01       .00       .00    865.00
    350.      100.      213.      37.      355.      188.     116.       66.       29.    864.10
    1.56       .28      1.13      .32      .100      .040     .100      .000    861.40    190.00
 .000088       50.       50.      50.         0         0        0       .00    180.00    370.00

*SECNO 74.560
3280 CROSS SECTION      74.56 EXTENDED        .22 FEET

3370 NORMAL BRIDGE.NRD=  0 MIN ELTRD=  867.80 MAX ELLC=  866.40

3470 ENCROACHMENT STATIONS=     190.0      370.0  TYPE=     1  TARGET=     180.000
              DS OF PINCHNEY RD  20.3FT BRIDGE WITH CONC WINGWALLS
   74.56      6.62    868.02      .00    866.04    868.22      .20       .00       .06    861.40
    350.      102.      237.      11.       79.       55.      18.       66.       29.    861.40
    1.56      1.30      4.32      .63      .100      .040     .100      .000    861.40    190.00
 .006463        1.        1.       1.         2         0        0    -34.31    180.00    370.00
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THIS RUN EXECUTED 06/20/86 08:36:59

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*************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55,56
  IBM PC-XT VERSION 1.1
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```

T1 500 YR FLOWS
T2
T3

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0.	5.	0.	0.	.003000	.00	.0	490.	857.000	.000
J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	15.000	.000	-1.000	.000	.000	.000	.000	.000	.000	.000

```
   SECNO     DEPTH     CWSEL     CRIWS     WSELR     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

*SECNO 20.310

3370 NORMAL BRIDGE,NRD= 27 MIN ELTRD=  861.50 MAX ELLC=  860.70

3470 ENCROACHMENT STATIONS=     365.0     388.0  TYPE=     1  TARGET=      23.000
    20.31      4.94   859.74      .00   858.65   860.37      .64       .01       .04   854.80
     490.        0.     490.       0.       0.      77.       0.       14.       10. 100000.00
      .24       .00     6.40      .00     .120     .040     .120      .000   854.80   365.00
  .012017        1.       1.       1.        2        0        0    -27.06    23.00   388.00

*SECNO 20.680

3370 NORMAL BRIDGE,NRD= 27 MIN ELTRD=  861.50 MAX ELLC=  860.70

3470 ENCROACHMENT STATIONS=     365.0     388.0  TYPE=     1  TARGET=      23.000
                UPSTREAM FACE OF CULVERTS
    20.68      5.36   860.16      .00   858.75   860.72      .57       .33       .02   854.80
     490.        0.     490.       0.       0.      81.       0.       14.       10. 100000.00
      .24       .00     6.04      .00     .120     .032     .120      .000   854.80   365.00
  .006978       37.      37.      37.        2        0        0    -32.21    23.00   388.00

*SECNO 20.690

3470 ENCROACHMENT STATIONS=     527.0     550.0  TYPE=     1  TARGET=      23.000
    20.69      5.84   860.24      .00   858.74   860.75      .51       .00       .02   858.00
     490.        5.     481.       4.       7.      84.       6.       14.       10.    858.20
      .24       .71     5.76      .68     .120     .032     .120      .000   854.40   527.00
  .002341        1.       1.       1.        2        0        0       .00    23.00   550.00

*SECNO 21.180

3470 ENCROACHMENT STATIONS=     477.0     600.0  TYPE=     1  TARGET=     123.000
               50FT US OF DARWIN ROAD  CHANNEL SHAPE FROM XSEC D   XSEC E
    21.18      6.46   860.86      .00   858.90   860.96      .09       .09       .12   858.00
     490.      120.     292.      78.     140.      94.     107.       15.       11.    858.20
      .25       .86     3.10      .73     .120     .050     .120      .000   854.40   477.00
  .001407       49.      49.      49.        2        0        0       .00   123.00   600.00
```

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

3470 ENCROACHMENT STATIONS= 90.0 290.0 TYPE= 1 TARGET= 200.000

XSEC I LOSS CHECKED BY HAND COMPS

29.73	7.01	864.01	.00	863.34	864.01	.00	2.15	.00	860.70
490.	3.	487.	0.	59.	1241.	0.	27.	16.	100000.00
.46	.05	.39	.00	.120	.030	.000	.000	857.00	90.00
.000005	145.	145.	145.	0	0	6	.00	200.00	290.00

*SECNO 35.530

3470 ENCROACHMENT STATIONS= 140.0 320.0 TYPE= 1 TARGET= 180.000

US OF IMPOUNDMENT XSEC J

35.53	6.31	864.01	.00	863.34	864.03	.02	.01	.01	861.40
490.	45.	428.	17.	145.	354.	53.	39.	18.	861.20
.61	.31	1.21	.33	.100	.040	.100	.000	857.70	140.00
.000168	460.	580.	550.	2	0	0	.00	180.00	320.00

*SECNO 40.630

XSEC K

40.63	5.72	864.12	.00	863.38	864.15	.04	.12	.01	861.30
490.	54.	405.	31.	154.	237.	108.	45.	21.	862.00
.71	.35	1.71	.29	.100	.040	.100	.000	858.40	125.36
.000329	500.	510.	500.	2	0	0	.00	267.94	393.31

*SECNO 47.930

XSEC L

47.93	5.18	864.48	.00	863.54	864.60	.12	.40	.04	862.90
490.	76.	319.	94.	132.	93.	125.	51.	24.	861.90
.78	.58	3.43	.75	.100	.040	.100	.000	859.30	66.40
.001477	510.	730.	460.	2	0	0	.00	241.83	308.24

*SECNO 52.230

XSEC M

52.23	5.70	865.00	.00	863.94	865.10	.09	.49	.01	862.30
490.	89.	314.	87.	98.	104.	94.	54.	26.	862.50
.83	.91	3.01	.92	.070	.040	.070	.000	859.30	23.33
.000970	340.	430.	420.	2	0	0	.00	151.70	175.02

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


EGPRS       EGLWC       H3        QWEIR       QPR        BAREA   TRAPEZOID       ELLC      ELTRD
                                                                     AREA
   871.86    866.12       .00       173.       321.        44.       21.       864.00    867.70


3470 ENCROACHMENT STATIONS=      169.0      269.0  TYPE=      1  TARGET=      100.000
   62.95      6.95   868.55      .00    864.28   868.56      .01      2.44      .00    862.80
    490.        0.     412.      78.        0.     439.     172.       61.      29.     862.70
    1.00       .00      .94      .45      .000     .040     .070     .000   861.60    169.00
 .000057       22.      22.      22.         1        0        5      .00   100.00    269.00


*SECNO 63.450
 WATER EL=X5 CARD=   868.390

3470 ENCROACHMENT STATIONS=      119.0      319.0  TYPE=      1  TARGET=      200.000
                XSEC P
   63.45      6.69   868.39      .00    866.02   868.40      .01       .00      .00    862.90
    490.       69.     346.      74.      236.     422.     281.       62.      29.     862.80
    1.02       .29      .82      .26      .100     .045     .100     .000   861.70    119.00
 .000052       50.      50.      50.         0        0        0      .00   199.32    318.32


CCHV=     .100 CEHV=     .300
*SECNO 64.950
                XSEC Q
   64.95      7.70   868.40      .00    866.04   868.41      .01       .01      .00    863.00
    490.      169.     232.      89.      445.     196.     230.       64.      30.     862.70
    1.06       .38     1.19      .39      .100     .045     .100     .000   860.70      8.02
 .000099      115.     150.      90.         0        0        0      .00   214.75    222.77


*SECNO 70.050
                XSEC R
   70.05      7.34   868.44      .00    866.10   868.45      .01       .04      .00    863.40
    490.       60.     194.     236.      204.     186.     684.       74.      32.     863.00
    1.27       .29     1.05      .34      .100     .045     .100     .000   861.10     23.45
 .000082      440.     510.     410.         1        0        0      .00   292.39    315.84
```

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= 867.80 MAX ELLC= 866.40

3470 ENCROACHMENT STATIONS= 190.0 370.0 TYPE= 1 TARGET= 180.000

75.05	7.35	868.75	.00	866.11	868.88	.13	.29	.01	861.40
490.	195.	245.	50.	167.	62.	53.	83.	35.	861.40
1.39	1.17	3.92	.94	.100	.040	.100	.000	861.40	190.00
.004472	49.	49.	49.	2	0	0	-34.31	180.00	370.00

*SECNO 75.100
3280 CROSS SECTION 75.10 EXTENDED 2.88 FEET

3470 ENCROACHMENT STATIONS= 240.0 430.0 TYPE= 1 TARGET= 190.000
XSEC T US OF PINCKNEY RD

75.10	7.48	868.88	.00	866.30	868.89	.01	.00	.01	865.00
490.	88.	262.	139.	264.	209.	382.	83.	35.	864.10
1.39	.33	1.25	.37	.100	.040	.100	.000	861.40	240.00
.000093	10.	10.	10.	2	0	0	.00	190.00	430.00

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
20.690	1.00	.00	.00	854.40	200.00	858.74	.00	858.92	13.33	3.42	61.96	54.77
20.690	1.00	.00	.00	854.40	300.00	859.33	.00	859.62	17.58	4.36	75.32	71.54
20.690	1.00	.00	.00	854.40	350.00	859.58	.00	859.93	19.43	4.77	81.13	79.39
20.690	1.00	.00	.00	854.40	490.00	860.24	.00	860.75	23.41	5.76	96.23	101.28
21.180	49.00	.00	.00	854.40	200.00	858.90	.00	859.03	23.31	2.98	106.25	41.43
21.180	49.00	.00	.00	854.40	300.00	859.64	.00	859.76	19.87	3.12	190.25	67.30
21.180	49.00	.00	.00	854.40	350.00	859.98	.00	860.09	17.93	3.11	231.96	82.66
21.180	49.00	.00	.00	854.40	490.00	860.86	.00	860.96	14.07	3.10	340.77	130.63
22.180	100.00	.00	.00	854.40	200.00	859.14	.00	859.23	16.35	2.60	157.57	49.46
22.180	100.00	.00	.00	854.40	300.00	859.87	.00	859.93	11.90	2.49	329.75	86.97
22.180	100.00	.00	.00	854.40	350.00	860.19	.00	860.24	9.89	2.38	413.94	111.30
22.180	100.00	.00	.00	854.40	490.00	861.03	.00	861.07	6.28	2.11	647.78	195.57
27.280	610.00	.00	.00	856.40	200.00	860.09	.00	860.16	14.38	2.40	143.00	52.74
27.280	610.00	.00	.00	856.40	300.00	860.67	.00	860.76	15.41	2.76	229.66	76.42
27.280	610.00	.00	.00	856.40	350.00	860.91	.00	861.00	15.38	2.87	272.57	89.25
27.280	610.00	.00	.00	856.40	490.00	861.56	.00	861.64	13.97	3.01	431.79	131.08
28.280	100.00	.00	.00	857.00	200.00	860.18	.00	860.32	10.91	3.12	85.39	60.56
28.280	100.00	.00	.00	857.00	300.00	860.75	.00	860.95	12.11	3.72	136.01	86.22
28.280	100.00	.00	.00	857.00	350.00	860.98	.00	861.20	12.69	3.97	161.42	98.23
28.280	100.00	.00	.00	857.00	490.00	861.60	.00	861.86	12.82	4.44	245.95	136.85
29.730	145.00	863.30	860.00	857.00	200.00	863.34	.00	863.34	.01	.18	1165.88	1851.38
29.730	145.00	863.30	860.00	857.00	300.00	863.65	.00	863.65	.02	.25	1227.45	2003.79
29.730	145.00	863.30	860.00	857.00	350.00	863.76	.00	863.76	.03	.29	1248.54	2057.07
29.730	145.00	863.30	860.00	857.00	490.00	864.01	.00	864.01	.05	.39	1299.21	2187.27
35.530	580.00	.00	.00	857.70	200.00	863.34	.00	863.35	.55	.61	432.55	270.72
35.530	580.00	.00	.00	857.70	300.00	863.65	.00	863.66	.89	.83	487.87	318.60
35.530	580.00	.00	.00	857.70	350.00	863.76	.00	863.77	1.09	.93	506.80	335.74
35.530	580.00	.00	.00	857.70	490.00	864.01	.00	864.03	1.68	1.21	552.20	378.39
40.630	510.00	.00	.00	858.40	200.00	863.38	.00	863.39	1.25	.92	324.72	178.80
40.630	510.00	.00	.00	858.40	300.00	863.71	.00	863.73	1.93	1.22	397.18	216.21
40.630	510.00	.00	.00	858.40	350.00	863.83	.00	863.85	2.30	1.36	425.41	230.76
40.630	510.00	.00	.00	858.40	490.00	864.12	.00	864.15	3.29	1.71	499.51	270.34
47.930	730.00	.00	.00	859.30	200.00	863.54	.00	863.62	10.80	2.44	146.43	60.86
47.930	730.00	.00	.00	859.30	300.00	863.94	.00	864.05	13.02	2.92	223.88	83.14
47.930	730.00	.00	.00	859.30	350.00	864.10	.00	864.21	13.71	3.09	260.09	94.51
47.930	730.00	.00	.00	859.30	490.00	864.48	.00	864.60	14.77	3.43	350.14	127.52
52.230	430.00	.00	.00	859.30	200.00	863.94	.00	864.00	7.23	2.15	145.13	74.39
52.230	430.00	.00	.00	859.30	300.00	864.41	.00	864.48	8.02	2.48	209.36	105.97
52.230	430.00	.00	.00	859.30	350.00	864.59	.00	864.66	8.49	2.63	234.89	120.14
52.230	430.00	.00	.00	859.30	490.00	865.00	.00	865.10	9.70	3.01	296.50	157.35

SECND	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10F*S	VCH	AREA	.01F
75.050	49.00	867.80	866.40	861.40	200.00	866.11	.00	866.31	12.88	3.75	69.64	55.74
75.050	49.00	867.80	866.40	861.40	300.00	867.72	.00	867.91	35.10	4.05	111.29	50.64
75.050	49.00	867.80	866.40	861.40	350.00	868.36	.00	868.48	40.30	3.56	211.93	55.14
75.050	49.00	867.80	866.40	861.40	490.00	868.75	.00	868.88	44.72	3.92	282.65	73.28
75.100	10.00	.00	.00	861.40	200.00	866.30	.00	866.33	2.47	1.50	138.84	127.18
75.100	10.00	.00	.00	861.40	300.00	867.93	.00	867.94	.67	.97	673.94	365.69
75.100	10.00	.00	.00	861.40	350.00	868.48	.00	868.49	.61	.98	779.84	447.14
75.100	10.00	.00	.00	861.40	490.00	868.88	.00	868.89	.93	1.25	854.66	508.76

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
22.180	200.00	859.14	.00	.24	.00	186.14	100.00
22.180	300.00	859.87	.72	.22	.72	270.00	100.00
22.180	350.00	860.19	.32	.21	1.05	270.00	100.00
22.180	490.00	861.03	.85	.17	1.89	270.00	100.00
27.280	200.00	860.09	.00	.95	.00	117.20	610.00
27.280	300.00	860.67	.58	.80	.58	179.63	610.00
27.280	350.00	860.91	.24	.72	.82	183.25	610.00
27.280	490.00	861.56	.65	.52	1.47	276.01	610.00
28.280	200.00	860.18	.00	.09	.00	71.79	100.00
28.280	300.00	860.75	.57	.08	.57	104.84	100.00
28.280	350.00	860.98	.23	.07	.80	117.99	100.00
28.280	490.00	861.60	.62	.04	1.42	153.85	100.00
29.730	200.00	863.34	.00	3.17	.00	200.00	145.00
29.730	300.00	863.65	.31	2.90	.31	200.00	145.00
29.730	350.00	863.76	.11	2.78	.41	200.00	145.00
29.730	490.00	864.01	.25	2.41	.66	200.00	145.00
35.530	200.00	863.34	.00	.00	.00	180.00	580.00
35.530	300.00	863.65	.31	.00	.31	180.00	580.00
35.530	350.00	863.76	.11	.00	.41	180.00	580.00
35.530	490.00	864.01	.25	.00	.66	180.00	580.00
40.630	200.00	863.38	.00	.04	.00	205.92	510.00
40.630	300.00	863.71	.33	.06	.33	234.66	510.00
40.630	350.00	863.83	.12	.07	.45	244.95	510.00
40.630	490.00	864.12	.29	.11	.73	267.94	510.00
47.930	200.00	863.54	.00	.16	.00	161.49	730.00
47.930	300.00	863.94	.40	.23	.40	223.46	730.00
47.930	350.00	864.10	.16	.27	.56	234.08	730.00
47.930	490.00	864.48	.38	.36	.94	241.83	730.00
52.230	200.00	863.94	.00	.40	.00	128.40	430.00
52.230	300.00	864.41	.47	.46	.47	141.19	430.00
52.230	350.00	864.59	.18	.49	.65	144.34	430.00
52.230	490.00	865.00	.42	.52	1.06	151.70	430.00
61.230	200.00	864.36	.00	.42	.00	84.00	900.00
61.230	300.00	864.89	.54	.49	.54	84.00	900.00
61.230	350.00	865.47	.57	.88	1.11	131.28	900.00
61.230	490.00	865.97	.50	.97	1.61	148.97	900.00
62.230	200.00	864.39	.00	.03	.00	34.00	100.00
62.230	300.00	864.93	.54	.04	.54	34.00	100.00
62.230	350.00	865.57	.64	.10	1.18	100.00	100.00
62.230	490.00	866.08	.51	.11	1.69	100.00	100.00

SUMMARY OF ERRORS AND SPECIAL NOTES

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CAUTION  SECNO=    62.950  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    62.950  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL

NOTE     SECNO=    63.450  PROFILE= 1  WSEL BASED ON X5 CARD
NOTE     SECNO=    63.450  PROFILE= 2  WSEL BASED ON X5 CARD
NOTE     SECNO=    63.450  PROFILE= 4  WSEL BASED ON X5 CARD
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CONTINUOUS FLOOD HAZARD FACTORS BY EVEN INCREMENTS

INC NO.	TOTAL LENGTH	AVG ELEVATION DATA 10	1	DIFF.	WTD. AVG.	FHF	PERCENT WITHIN
	0.				SEC.		.000
1	100.	855.24	856.21	-.97	-.97	010	100.
2	200.	855.42	856.37	-.95	-.96	010	100.
3	300.	855.59	856.52	-.93	-.95	010	100.
4	400.	855.76	856.67	-.91	-.94	010	100.
5	500.	855.93	856.82	-.89	-.93	010	100.
6	600.	856.10	856.98	-.88	-.92	010	100.
7	700.	856.28	857.13	-.85	-.91	010	100.
8	800.	856.45	857.28	-.83	-.90	010	100.
9	900.	856.62	857.44	-.82	-.89	010	100.
10	1000.	856.79	857.59	-.80	-.88	010	100.
	1020.				SEC.		10.200
11	1100.	856.95	857.73	-.78	-.87	010	100.
12	1200.	857.09	857.84	-.75	-.86	010	100.
13	1300.	857.23	857.95	-.72	-.85	010	100.
14	1400.	857.37	858.06	-.69	-.84	010	100.
15	1500.	857.51	858.17	-.66	-.83	010	100.
16	1600.	857.65	858.29	-.64	-.82	010	100.
	1680.				SEC.		16.800
17	1700.	857.80	858.41	-.61	-.80	010	100.
18	1800.	858.00	858.62	-.62	-.79	010	100.
19	1900.	858.24	858.89	-.65	-.79	010	100.
	1980.				SEC.		19.800
20	2000.	858.48	859.15	-.67	-.78	010	100.
	2030.				SEC.		20.300
	2031.				SEC.		20.310
	2068.				SEC.		20.680
	2069.				SEC.		20.690
21	2100.	858.72	859.56	-.84	-.78	010	100.
	2118.				SEC.		21.180
22	2200.	858.97	859.99	-1.02	-.79	010	100.
	2218.				SEC.		22.180
23	2300.	859.18	860.22	-1.04	-.81	010	100.
24	2400.	859.35	860.34	-.99	-.81	010	100.
25	2500.	859.50	860.46	-.96	-.82	010	100.
26	2600.	859.66	860.58	-.92	-.82	010	100.
27	2700.	859.81	860.70	-.89	-.83	010	100.
28	2800.	859.97	860.81	-.84	-.83	010	100.
	2828.				SEC.		27.280
29	2900.	860.10	860.92	-.82	-.83	010	100.
	2928.				SEC.		28.280
30	3000.	860.95	861.66	-.71	-.82	010	100.
	3073.				SEC.		29.730
31	3100.	862.55	863.06	-.51	-.81	010	100.
32	3200.	863.34	863.76	-.42	-.80	010	100.
33	3300.	863.34	863.76	-.42	-.79	010	100.
34	3400.	863.34	863.76	-.42	-.78	010	100.

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        7556.                                   SEC.      74.560
 76     7600.  866.13  868.24   -2.11        -.95    010         70.
        7605.                                   SEC.      75.050
        7615.                                   SEC.      75.100
```

THIS REACH CAN BE SUBDIVIDED BY INC NO. TO MEET FIA REQUIREMENTS
INPUT 20N WHERE N IS THE NUMBER OF REACHES AND THEN INPUT THE END
OF EACH REACH BY INC NO. FOR EXAMPLE 202 74 76
A NEGATIVE INC NO. WILL SUPPRESS INTERMEDIATE INC OUTPUT.

CONTINUOUS FLOOD HAZARD FACTORS BY EVEN INCREMENTS

INC NO.	TOTAL LENGTH	WEIGHTED AVG DIFFERENCE BETWEEN 10	BASE 2	FLOOD AND 0.2
74	7400.	-.92	-.29	.43

FHF FOR REACH 1 = 010 WITH 84. PERCENT OF THE REACH WITHIN .5 FEET
ZONE FOR THE REACH = A 2
==========

76	7600.	-2.06	-.52	.33

FHF FOR REACH 2 = 020 WITH 100. PERCENT OF THE REACH WITHIN 1.0 FEET
ZONE FOR THE REACH = A 4
==========

00BREAK00

1) COUNTY: Livingston

2) STUDY NAME: Putnam Twp

3) WATERCOURSE: Portage Creek

4) DOCUMENT TYPE: 100 yr Natural & Encroached

00BREAK00

THIS RUN EXECUTED 06/20/86 08:49:05

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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55,56
  IBM-PC-XT VERSION 1.1
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C
T1              PUTNAM TWP FIS
T2      NATURAL CONDITIONS     100 YR FLOW
T3      PORTAGE CREEK

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

       0.       3.        0.        0.   .000600       .00        .0      570.   870.000      .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

      .000      .000    -1.000      .000      .000      .000      .000      .000      .000      .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    150.000   200.000      .000      .000      .000      .000      .000      .000      .000      .000


NC      .100      .100      .045      .300      .500      .000      .000      .000      .000      .000
                50FT DS OF PATTERSON LAKE RD.   XSEC A
X1      .000     7.000    88.000   120.000      .000      .000      .000      .000      .000      .000
X3      .000      .000      .000    81.000      .000   128.000      .000      .000      .000      .000
GR    876.000      .000   866.100    88.000   864.500    92.000   864.000   105.000   864.200   115.000
GR    866.900   120.000   876.900   332.000      .000      .000      .000      .000      .000      .000

NC      .000      .000      .000      .000      .000      .000      .000      .000      .000      .000
X1      .500      .000      .000      .000    50.000    50.000    50.000      .000      .000      .000
X3      .000      .000      .000    94.000      .000   116.000      .000      .000      .000      .000

                DS PATTERSON LAKE RD CONCRETE BRIDGE 20FT LONG 20 FT WIDE
X1      .510     4.000      .000    20.000     1.000     1.000     1.000      .000      .000      .000
X2      .000      .000      .000   871.500   874.600      .000      .000      .000      .000      .000
GR    875.000      .000   864.200      .000   864.200    20.000   875.000    20.000      .000      .000

                US OF BRIDGE     XSEC C
X1      .710      .000      .000      .000    20.000    20.000    20.000      .000      .000      .000
X2      .000      .000      .000   871.500   874.600      .000      .000      .000      .000      .000

NC      .000      .000      .000      .000      .000      .000      .000      .000      .000      .000
X1      .720     7.000    88.000   120.000     1.000     1.000     1.000      .000      .000      .000
X3      .000      .000      .000    94.000      .000   116.000      .000      .000      .000      .000
GR    876.000      .000   866.100    88.000   864.500    92.000   864.000   105.000   864.200   115.000
GR    866.900   120.000   876.900   332.000      .000      .000      .000      .000      .000      .000
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NC	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	37.360	7.000	88.000	136.000	1.000	1.000	1.000	.000	.000	.000
X3	.000	.000	.000	88.000	.000	136.000	.000	.000	.000	.000
GR	876.000	.000	867.500	88.000	865.000	101.000	864.600	111.000	865.500	119.000
GR	867.500	136.000	880.000	350.000	.000	.000	.000	.000	.000	.000
		50 FT US OF PRIVATE RD			XSEC J					
X1	37.860	.000	.000	.000	50.000	50.000	50.000	.000	.000	.000
X3	.000	.000	.000	38.000	.000	186.000	.000	.000	.000	.000
NC	.000	.000	.000	.100	.300	.000	.000	.000	.000	.000
ET	.000	.000	6.100	1.400	.000	390.000	620.000	.000	.000	.000
		830 FT US OF PRIVATE RD			XSEC K					
X1	45.660	15.000	490.000	527.000	770.000	650.000	780.000	.000	.000	.000
GR	880.000	.000	870.000	80.000	868.000	120.000	868.000	255.000	870.000	303.000
GR	873.000	353.000	868.000	448.000	867.000	490.000	866.000	493.000	864.600	505.000
GR	866.300	516.000	867.000	527.000	868.000	587.000	870.000	667.000	900.000	697.000
NC	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
		50 FT DS OF PRIVATE WALKWAY			XSEC L					
X1	50.660	13.000	130.000	172.000	500.000	540.000	500.000	.000	.000	.000
X3	.000	.000	.000	126.000	.000	176.000	.000	.000	.000	.000
GR	880.000	.000	870.000	100.000	868.000	120.000	867.300	130.000	866.700	135.000
GR	865.700	138.000	863.900	150.000	865.500	161.000	866.700	172.000	868.000	184.000
GR	870.000	276.000	872.000	300.000	880.000	360.000	.000	.000	.000	.000
X1	51.160	.000	.000	.000	50.000	50.000	50.000	.000	.000	.000
X3	.000	.000	.000	139.000	.000	163.000	.000	.000	.000	.000
X1	51.170	9.000	120.000	143.000	1.000	1.000	1.000	.000	.000	.000
X2	.000	.000	.000	870.700	871.300	.000	.000	.000	.000	.000
X3	.000	.000	.000	120.000	.000	143.000	.000	.000	.000	.000
BT	6.000	.000	880.000	.000	90.000	872.000	.000	120.000	871.300	870.700
BT	143.000	871.300	870.700	208.000	872.000	.000	318.000	880.000	.000	.000
GR	880.000	.000	872.000	90.000	871.300	120.000	866.200	120.100	865.000	132.000
GR	865.600	142.900	870.700	143.000	872.000	208.000	880.000	318.000	.000	.000
NC	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	51.250	.000	.000	.000	8.000	8.000	8.000	.000	.000	.000
X2	.000	.000	.000	870.700	871.300	.000	1.000	.000	.000	.000
X3	.000	.000	.000	120.000	.000	143.000	.000	.000	.000	.000
NC	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	51.260	12.000	130.000	184.000	1.000	1.000	1.000	.000	.000	.000
X3	.000	.000	.000	139.000	.000	163.000	.000	.000	.000	.000
GR	880.000	.000	870.000	90.000	868.000	120.000	867.300	130.000	866.700	135.000
GR	865.700	138.000	865.700	150.000	865.500	161.000	866.700	172.000	868.000	184.000
GR	870.000	228.000	880.000	302.000	.000	.000	.000	.000	.000	.000

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X1      92.490      .000      .000      .000    27.000    27.000    27.000      .000      .000      .000
X2        .000      .000      .000   876.100   876.400      .000     1.000      .000      .000      .000

                US OF PATTERSON LAKE RD
X1      92.500      .000      .000      .000     1.000     1.000     1.000      .000      .000      .000

                XSEC S
X1      92.700     9.000    93.000   128.000    20.000    20.000    20.000      .000      .000      .000
GR     876.400      .000   876.000    50.000   872.000    90.000   871.000    93.000   867.100    96.000
GR     867.500   110.000   866.700   125.000   872.000   128.000   880.000   148.000      .000      .000

NC       .000      .000      .000      .000      .000      .000      .000      .000      .000      .000
ET       .000      .000      .000     1.400      .000      .000      .000      .000      .000      .000
                DS OF HI-LAND LAKE DAM     XSEC T
X1      96.300     8.000    30.000   125.000   330.000   380.000   360.000      .000      .000      .000
GR     882.000      .000   880.000    10.000   871.000    30.000   867.100    33.000   867.500    37.000
GR     867.000   120.000   871.000   125.000   880.000   148.000      .000      .000      .000      .000
EJ       .000      .000      .000      .000      .000      .000      .000      .000      .000      .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

*SECNO  .720

3470 ENCROACHMENT STATIONS=      94.0      116.0  TYPE=      1  TARGET=      22.000
      .72      6.82    870.82      .00       .00    871.06      .24       .00       .02100000.00
     570.        0.      570.       0.        0.      146.       0.        0.        0. 100000.00
      .00       .00      3.90      .00      .100      .045     .100      .000    864.00     94.00
  .002038        1.        1.       1.         2         0        0       .00     22.00    116.00

*SECNO 1.220

3470 ENCROACHMENT STATIONS=      44.0      166.0  TYPE=      1  TARGET=     122.000
                50FT US OF BRIDGE        XSEC D
     1.22      7.10    871.10      .00       .00    871.15      .05       .03       .06    866.10
     570.       55.      434.      80.      111.      210.     143.        1.        0.     866.90
      .01       .50      2.07      .56      .100      .045     .100      .000    864.00     44.00
  .000333       50.       50.      50.         2         0        0       .00    122.00    166.00

CCHV=    .100 CEHV=    .300
*SECNO 11.320
                XSEC CUT FROM TOPO       XSEC E
    11.32      8.08    871.28      .00       .00    871.30      .01       .14       .00    868.00
     570.        2.      484.      84.       13.      492.     267.       14.        3.     867.00
      .32       .15       .98      .32      .100      .045     .100      .000    863.20     68.02
  .000082     1095.     1010.     835.         2         0        0       .00    172.07    240.09

*SECNO 19.120

3470 ENCROACHMENT STATIONS=     145.0      320.0  TYPE=      1  TARGET=     175.000
                XSEC F
    19.12      8.13    871.33      .00       .00    871.34      .01       .04       .00    867.00
     570.       43.      498.      28.      207.      612.     126.       29.        6.     867.00
      .61       .21       .81      .23      .100      .045     .100      .000    863.20    145.00
  .000041      925.      780.     550.         2         0        0       .00    175.00    320.00

*SECNO 25.120

3470 ENCROACHMENT STATIONS=     145.0      320.0  TYPE=      1  TARGET=     175.000
                XSEC G
    25.12      8.16    871.36      .00       .00    871.36      .01       .02       .00    867.00
     570.       44.      498.      29.      209.      615.     127.       42.        9.     867.00
      .84       .21       .81      .22      .100      .045     .100      .000    863.20    145.00
  .000041      615.      600.     490.         1         0        0       .00    175.00    320.00
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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

*SECNO 37.350

3265 DIVIDED FLOW

3370 NORMAL BRIDGE,NRD=  0 MIN ELTRD=  879.10 MAX ELLC=  877.40

    37.35      6.87    871.47       .00       .00    871.55       .08       .01       .00    867.50
     570.       3.      566.        2.        9.      244.        7.       61.       13.    867.50
     1.12      .29      2.31       .26      .100      .045      .100      .000    864.60     58.48
  .000475      12.       12.        12.         0         0         0       .00     49.77    116.49

*SECNO 37.360

3470 ENCROACHMENT STATIONS=      88.0      136.0  TYPE=      1  TARGET=      48.000
    37.36      6.89    871.49       .00       .00    871.56       .07       .00       .00    867.50
     570.       0.      570.        0.        0.      271.        0.       61.       13. 100000.00
     1.12      .00      2.10       .00      .100      .045      .100      .000    864.60     88.00
  .000501       1.        1.        1.         1         0         0       .00     48.00    136.00

*SECNO 37.860

3470 ENCROACHMENT STATIONS=      38.0      186.0  TYPE=      1  TARGET=     148.000
                50 FT US OF PRIVATE RD            XSEC J
    37.86      6.94    871.54       .00       .00    871.58       .04       .02       .01    867.50
     570.       33.      478.       59.       85.      274.      129.       62.       13.    867.50
     1.13      .39      1.74       .46      .100      .045      .100      .000    864.60     46.13
  .000276       50.       50.       50.         2         0         0       .00    139.87    186.00

CCHV=     .100 CEHV=     .300
*SECNO 45.660

3470 ENCROACHMENT STATIONS=     390.0      620.0  TYPE=      1  TARGET=     230.000
               830 FT US OF PRIVATE RD            XSEC K
    45.66      7.12    871.72       .00       .00    871.74       .01       .15       .00    867.00
     570.      123.      285.      162.      305.      218.      363.       73.       16.    867.00
     1.37      .40      1.31       .45      .100      .045      .100      .000    864.60    390.00
  .000150      770.      780.      650.         2         0         0       .00    230.00    620.00
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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

*SECNO 51.260

3470 ENCROACHMENT STATIONS=      139.0      163.0  TYPE=      1  TARGET=       24.000
    51.26      6.32    871.82       .00       .00    872.05       .23       .00       .01100000.00
     570.        0.      570.        0.        0.     148.        0.       80.       18. 100000.00
     1.44       .00      3.84       .00      .100      .045      .100      .000    865.50    139.00
  .002071        1.        1.        1.         2         0         0       .00     24.00    163.00

*SECNO 51.760

3470 ENCROACHMENT STATIONS=       92.0      225.0  TYPE=      1  TARGET=      133.000
                 50 FT US OF PRIVATE WALKWAY      XSEC M
    51.76      6.57    872.07       .00       .00    872.10       .03       .02       .02    867.30
     570.       61.      455.       54.      132.      313.      129.       81.       18.     868.00
     1.45       .46      1.45       .42      .100      .045      .100      .000    865.50     92.00
  .000188       50.       50.       50.         2         0         0       .00    133.00    225.00

*SECNO 57.760
                 650FT US OF WALKWAY              XSEC N
    57.76      6.30    872.20       .00       .00    872.30       .10       .19       .02    868.00
     570.       51.      519.        0.       73.      196.        0.       86.       19.     868.00
     1.52       .70      2.65       .00      .100      .045      .100      .000    865.90    137.95
  .000618      550.      600.      570.         2         0         0       .00     67.06    205.01

*SECNO 66.110

3470 ENCROACHMENT STATIONS=      115.0      345.0  TYPE=      1  TARGET=      230.000
                 XSEC O
    66.11      6.08    872.48       .00       .00    872.49       .01       .18       .01    868.00
     570.      335.      215.       20.      789.      191.       58.       98.       21.     868.00
     1.84       .42      1.13       .34      .100      .045      .100      .000    866.40    115.00
  .000114      730.      835.      650.         2         0         0       .00    228.96    343.96

*SECNO 74.710
                 XSEC P
    74.71      6.16    872.56       .00       .00    872.57       .01       .08       .00    869.30
     570.        4.      563.        3.       20.      606.       15.      113.       25.     868.90
     2.09       .18       .93       .19      .100      .045      .100      .000    866.40     27.82
  .000082      720.      860.      730.         2         0         0       .00    130.57    158.39
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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


3370 NORMAL BRIDGE,NRD=  6 MIN ELTRD=  876.40 MAX ELLC=  876.10

    92.49     6.10   873.20       .00       .00   873.45       .25       .07       .00   878.60
     570.       0.     570.        0.        0.     143.        0.      137.       32.    878.60
     2.42      .00     3.98       .00      .100     .045      .100      .000   867.10   223.00
  .002384      27.      27.       27.         2        0         0       .00    26.00   249.00

*SECNO 92.500
              US OF PATTERSON LAKE RD
    92.50     6.11   873.21       .00       .00   873.45       .25       .00       .00   878.60
     570.       0.     570.        0.        0.     143.        0.      137.       32.    878.60
     2.42      .00     3.98       .00      .100     .045      .100      .000   867.10   223.00
  .002381       1.       1.        1.         0        0         0       .00    26.00   249.00

*SECNO 92.700
              XSEC S
    92.70     6.67   873.37       .00       .00   873.49       .12       .03       .01   871.00
     570.       7.     563.        1.       15.     204.        2.      137.       32.    872.00
     2.43      .43     2.76       .31      .100     .045      .100      .000   866.70    76.26
  .000793      20.      20.       20.         2        0         0       .00    55.18   131.44

*SECNO 96.300
              DS OF HI-LAND LAKE DAM     XSEC T
    96.30     6.55   873.55       .00       .00   873.57       .01       .07       .01   871.00
     570.       1.     568.        1.        7.     584.        8.      141.       32.    871.00
     2.53      .15      .97       .15      .100     .045      .100      .000   867.00    24.33
  .000080     330.     360.      380.         2        0         0       .00   107.19   131.52
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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     TTRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*PROF 2

CCHV=     .300 CEHV=     .500
*SECNO  .000

3470 ENCROACHMENT STATIONS=      81.0      128.0  TYPE=      1  TARGET=      47.000
                 50FT DS OF PATTERSON LAKE RD.   XSEC A
      .00      6.82   870.82      .00    870.82    870.92      .10       .00       .00    866.10
     570.       21.     529.      20.      30.      201.      30.        0.        0.     866.90
      .00       .70     2.63      .67     .100      .045     .100      .000    864.00     81.00
  .000570        0.       0.       0.        0         0        0       .00     47.00    128.00

*SECNO  .500

3470 ENCROACHMENT STATIONS=      94.0      116.0  TYPE=      1  TARGET=      22.000
      .50      6.80   870.80      .00       .00   871.04      .24       .05       .07100000.00
     570.        0.     570.       0.        0.     146.       0.        0.        0.  100000.00
      .00       .00     3.91      .00     .100      .045     .100      .000    864.00     94.00
  .002057       50.      50.      50.         2         0        0       .00     22.00    116.00

*SECNO  .510

3370 NORMAL BRIDGE,NRD=  0 MIN ELTRD=  874.60 MAX ELLC=  871.50

                 DS PATTERSON LAKE RD CONCRETE BRIDGE 20FT LONG 20 FT WIDE
      .51      6.58   870.78      .00       .00   871.07      .29       .00       .03    875.00
     570.        0.     570.       0.        0.     132.       0.        0.        0.     875.00
      .00       .00     4.33      .00     .100      .045     .100      .000    864.20       .00
  .002743        1.       1.       1.         2         0        0       .00     20.00     20.00

*SECNO  .710

3370 NORMAL BRIDGE,NRD=  0 MIN ELTRD=  874.60 MAX ELLC=  871.50

                 US OF BRIDGE     XSEC C
      .71      6.64   870.84      .00       .00   871.12      .29       .05       .00    875.00
     570.        0.     570.       0.        0.     133.       0.        0.        0.     875.00
      .00       .00     4.30      .00     .100      .045     .100      .000    864.20       .00
  .002681       20.      20.      20.         1         0        0       .00     20.00     20.00
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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

*SECNO 25.120
 2800 NAT Q1=    894.85  WSEL=    871.36  ENC Q1=    894.85  WSEL=    871.46  RATIO=    .0000
 NAT Q1=    974.  RATIOS LOB,CH,ROB=   .0861   .8189   .0950  WSEL=    871.46

3470 ENCROACHMENT STATIONS=     178.5     324.6  TYPE=     4  TARGET=        .082
                XSEC G
    25.12     8.24   871.44      .00   871.36   871.45      .01      .02      .00   867.00
     570.      28.     509.      34.     119.     621.     147.      39.       7.   867.00
      .81      .23      .82      .23     .100     .045     .100     .000   863.20   178.53
  .000041     615.     600.     490.        0        0        0      .00   146.08   324.62


*SECNO 30.420
 2800 NAT Q1=    580.08  WSEL=    871.38  ENC Q1=    580.08  WSEL=    871.48  RATIO=    .0000
 NAT Q1=    840.  RATIOS LOB,CH,ROB=   .2016   .3525   .4459  WSEL=    871.48

3470 ENCROACHMENT STATIONS=     152.7     374.9  TYPE=     4  TARGET=        .309
                XSEC H
    30.42     7.27   871.47      .00   871.38   871.48      .01      .03      .00   867.00
     570.      37.     292.     241.     105.     266.     643.      49.       9.   867.00
      .99      .35     1.10      .37     .100     .045     .100     .000   864.20   152.70
  .000099     430.     500.     430.        0        0        0      .00   222.21   374.91


CCHV=    .300 CEHV=    .500
*SECNO 36.720

3470 ENCROACHMENT STATIONS=      75.0     148.0  TYPE=     1  TARGET=      73.000
                XSEC I 50 FT DS OF PRIVATE RD BRIDGE
    36.72     6.65   871.55      .00   871.46   871.60      .05      .10      .02   867.50
     570.      24.     521.      25.      44.     271.      44.      58.      11.   867.50
     1.09      .54     1.92      .55     .100     .045     .100     .000   864.90    75.00
  .000339     270.     630.     590.        2        0        0      .00    73.00   148.00


*SECNO 37.220

3470 ENCROACHMENT STATIONS=      88.0     136.0  TYPE=     1  TARGET=      48.000
    37.22     6.66   871.56      .00   871.47   871.63      .07      .02      .01   867.50
     570.       0.     570.       0.       0.     272.       0.      59.      11. 100000.00
     1.09      .00     2.10      .00     .100     .045     .100     .000   864.90    88.00
  .000496      50.      50.      50.        0        0        0      .00    48.00   136.00
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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

CCHV=    .100 CEHV=    .300
*SECNO 45.660
 2800 NAT Q1=    465.29  WSEL=    871.72  ENC Q1=    465.29  WSEL=    871.82  RATIO=   .0000
 NAT Q1=    779.  RATIOS LOB,CH,ROB=   .4754   .3069   .2176  WSEL=    871.82

3265 DIVIDED FLOW


3470 ENCROACHMENT STATIONS=     205.3     534.2  TYPE=     4  TARGET=        .402
                830 FT US OF PRIVATE RD          XSEC K
    45.66     7.21   871.81      .00   871.72   871.83      .02      .15      .00   867.00
     570.     262.     295.      13.     670.     221.      34.      72.      15.    867.00
     1.35      .39     1.34      .37     .100     .045     .100     .000   864.60   205.33
  .000153     770.     780.     650.        2        0        0      .00   286.48   534.24


*SECNO 50.660

3470 ENCROACHMENT STATIONS=     126.0     176.0  TYPE=     1  TARGET=      50.000
                50 FT DS OF PRIVATE WALKWAY      XSEC L
    50.66     7.99   871.89      .00   871.80   871.95      .06      .11      .01   867.30
     570.       8.     553.       9.      18.     269.      20.      79.      17.    866.70
     1.41      .45     2.05      .47     .100     .045     .100     .000   863.90   126.00
  .000330     500.     500.     540.        2        0        0      .00    50.00   176.00


*SECNO 51.160

3470 ENCROACHMENT STATIONS=     139.0     163.0  TYPE=     1  TARGET=      24.000
    51.16     7.94   871.84      .00   871.75   872.01      .18      .03      .03100000.00
     570.       0.     570.       0.       0.     169.       0.      79.      17. 100000.00
     1.42      .00     3.37      .00     .100     .045     .100     .000   863.90   139.00
  .001355      50.      50.      50.        2        0        0      .00    24.00   163.00


*SECNO 51.170

3370 NORMAL BRIDGE,NRD=  6 MIN ELTRD=  871.30 MAX ELLC=  870.70


3470 ENCROACHMENT STATIONS=     120.0     143.0  TYPE=     1  TARGET=      23.000
    51.17     6.75   871.75      .00   871.66   872.05      .30      .00      .04   871.30
     570.       0.     570.       0.       0.     130.       0.      79.      17. 100000.00
     1.42      .00     4.37      .00     .100     .045     .100     .000   865.00   120.00
  .009025       1.       1.       1.        2        0        0   -13.80    23.00   143.00
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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

*SECNO 66.110
 2800 NAT Q1=     533.74  WSEL=     872.48  ENC Q1=     533.74  WSEL=     872.58  RATIO=    .0000
 NAT Q1=     594.  RATIOS LOB,CH,ROB=    .6172    .3496    .0331  WSEL=     872.58

3470 ENCROACHMENT STATIONS=      114.3      324.0  TYPE=      4  TARGET=         .101
                XSEC Q
    66.11      6.19   872.59      .00   872.48   872.60      .01      .20      .01   868.00
     570.      360.     210.       0.     811.     195.       0.      96.      20.    868.00
     1.82       .44     1.08      .00     .100     .045     .100     .000   866.40   114.27
  .000121      730.     835.     650.        0        0        0      .00   209.73   324.00

*SECNO 74.710
 2800 NAT Q1=     629.71  WSEL=     872.56  ENC Q1=     641.46  WSEL=     872.66  RATIO=  -.0187
 NAT Q1=     649.  RATIOS LOB,CH,ROB=    .0067    .9880    .0053  WSEL=     872.66

3470 ENCROACHMENT STATIONS=       40.0      150.0  TYPE=      4  TARGET=         .012
                XSEC P
    74.71      6.27   872.67      .00   872.56   872.68      .01      .08      .00   869.30
     570.        0.     570.       0.       0.     618.       0.     111.      23.    868.90
     2.07       .00      .92      .00     .100     .045     .100     .000   866.40    40.00
  .000086      720.     860.     730.        0        0        0      .00   110.00   150.00

*SECNO 84.410
 2800 NAT Q1=     400.79  WSEL=     872.67  ENC Q1=     400.79  WSEL=     872.77  RATIO=    .0000
 NAT Q1=    1006.  RATIOS LOB,CH,ROB=    .0937    .2082    .6981  WSEL=     872.77

3470 ENCROACHMENT STATIONS=      255.0      461.1  TYPE=      4  TARGET=         .602
                XSEC Q
    84.41      5.68   872.78      .00   872.67   872.79      .02      .11      .00   869.60
     570.        0.     292.     278.       0.     218.     568.     124.      26.    869.20
     2.33       .00     1.34      .49     .100     .045     .100     .000   867.10   255.00
  .000212      970.     970.     650.        2        0        0      .00   206.10   461.10

*SECNO 91.710

3470 ENCROACHMENT STATIONS=      200.0      251.0  TYPE=      1  TARGET=       51.000
                XSEC R
    91.71      4.47   872.97      .00   872.85   873.25      .28      .38      .08   871.00
     570.       21.     542.       7.      19.     124.      10.     132.      28.    871.30
     2.38      1.10     4.37      .72     .100     .045     .100     .000   868.50   200.00
  .002861      830.     730.     700.        2        0        0      .00    51.00   251.00
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                US OF PATTERSON LAKE RD
    92.50      6.20   873.30      .00   873.21   873.53      .24      .00      .00   878.60
     570.        0.     570.       0.       0.     145.       0.     132.      28.    878.60
     2.39      .00     3.92      .00     .100     .045     .100     .000   867.10   223.00
  .002271       1.       1.       1.        0        0        0      .00    26.00   249.00


*SECNO 92.700
 2800 NAT Q1=     202.39  WSEL=    873.37  ENC Q1=     205.54  WSEL=    873.47  RATIO=  -.0156
 NAT Q1=     209.  RATIOS LOB,CH,ROB=   .0127   .9858   .0015  WSEL=    873.47

3470 ENCROACHMENT STATIONS=       93.0      128.0  TYPE=      4  TARGET=         .014
                XSEC S
    92.70      6.76   873.46      .00   873.37   873.57      .12      .03      .01   871.00
     570.        0.     570.       0.       0.     207.       0.     132.      28.    872.00
     2.39      .00     2.75      .00     .100     .045     .100     .000   866.70    93.00
  .000880      20.      20.      20.        2        0        0      .00    35.00   128.00


*SECNO 96.300
 2800 NAT Q1=     635.69  WSEL=    873.55  ENC Q1=     650.43  WSEL=    873.65  RATIO=  -.0232
 NAT Q1=     653.  RATIOS LOB,CH,ROB=   .0020   .9956   .0024  WSEL=    873.65

3470 ENCROACHMENT STATIONS=       30.0      125.0  TYPE=      4  TARGET=         .004
                DS OF HI-LAND LAKE DAM      XSEC T
    96.30      6.64   873.64      .00   873.55   873.65      .01      .07      .01   871.00
     570.        0.     570.       0.       0.     592.       0.     136.      29.    871.00
     2.49      .00      .96      .00     .100     .045     .100     .000   867.00    30.00
  .000083     330.     360.     380.        1        0        0      .00    95.00   125.00
```

SECND	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
37.220	50.00	.00	.00	864.90	570.00	871.47	.00	871.54	5.21	2.13	267.63	249.82
37.220	50.00	.00	.00	864.90	570.00	871.56	.00	871.63	4.96	2.10	271.90	255.97
37.230	1.00	879.10	877.40	864.60	570.00	871.46	.00	871.55	4.75	2.31	260.15	261.61
37.230	1.00	879.10	877.40	864.60	570.00	871.55	.00	871.63	5.79	2.30	248.05	236.82
37.350	12.00	879.10	877.40	864.60	570.00	871.47	.00	871.55	4.75	2.31	260.15	261.61
37.350	12.00	879.10	877.40	864.60	570.00	871.56	.00	871.64	5.79	2.30	248.03	236.78
37.360	1.00	.00	.00	864.60	570.00	871.49	.00	871.56	5.01	2.10	270.88	254.74
37.360	1.00	.00	.00	864.60	570.00	871.58	.00	871.65	4.74	2.07	275.72	261.73
37.860	50.00	.00	.00	864.60	570.00	871.54	.00	871.58	2.76	1.74	487.90	343.01
37.860	50.00	.00	.00	864.60	570.00	871.63	.00	871.67	2.60	1.71	500.50	353.83
45.660	780.00	.00	.00	864.60	570.00	871.72	.00	871.74	1.50	1.31	884.79	465.29
45.660	780.00	.00	.00	864.60	570.00	871.81	.00	871.83	1.53	1.34	925.60	460.23
50.660	500.00	.00	.00	863.90	570.00	871.80	.00	871.86	3.46	2.08	302.43	306.55
50.660	500.00	.00	.00	863.90	570.00	871.89	.00	871.95	3.30	2.05	306.82	313.71
51.160	50.00	.00	.00	863.90	570.00	871.75	.00	871.93	14.04	3.41	167.04	152.12
51.160	50.00	.00	.00	863.90	570.00	871.84	.00	872.01	13.55	3.37	169.16	154.85
51.170	1.00	871.30	870.70	865.00	570.00	871.66	.00	871.97	95.02	4.44	128.34	58.47
51.170	1.00	871.30	870.70	865.00	570.00	871.75	.00	872.05	90.25	4.37	130.46	60.00
51.250	8.00	871.30	870.70	865.00	570.00	871.75	.00	872.04	90.65	4.38	130.27	59.87
51.250	8.00	871.30	870.70	865.00	570.00	871.83	.00	872.12	86.38	4.31	132.29	61.33
51.260	1.00	.00	.00	865.50	570.00	871.82	.00	872.05	20.71	3.84	148.27	125.25
51.260	1.00	.00	.00	865.50	570.00	871.91	.00	872.13	19.92	3.79	150.30	127.72
51.760	50.00	.00	.00	865.50	570.00	872.07	.00	872.10	1.88	1.45	573.57	415.72
51.760	50.00	.00	.00	865.50	570.00	872.15	.00	872.17	1.79	1.43	583.90	426.33
57.760	600.00	.00	.00	865.90	570.00	872.20	.00	872.30	6.18	2.65	268.84	229.33
57.760	600.00	.00	.00	865.90	570.00	872.28	.00	872.39	7.44	2.71	237.95	208.98
66.110	835.00	.00	.00	866.40	570.00	872.48	.00	872.49	1.14	1.13	1038.38	533.74
66.110	835.00	.00	.00	866.40	570.00	872.59	.00	872.60	1.21	1.08	1006.05	518.32
74.710	860.00	.00	.00	866.40	570.00	872.56	.00	872.57	.82	.93	641.37	629.71
74.710	860.00	.00	.00	866.40	570.00	872.67	.00	872.68	.86	.92	617.83	616.33
84.410	970.00	.00	.00	867.10	570.00	872.67	.00	872.68	2.02	1.35	869.34	400.79
84.410	970.00	.00	.00	867.10	570.00	872.78	.00	872.79	2.12	1.34	785.65	391.86
91.710	730.00	.00	.00	868.50	570.00	872.85	.00	873.15	31.92	4.52	146.66	100.90
91.710	730.00	.00	.00	868.50	570.00	872.97	.00	873.25	28.61	4.37	152.97	106.56

PORTAGE CREEK

SUMMARY PRINTOUT TABLE 150

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
.000	570.00	870.72	.00	.00	.72	47.00	.00
.000	570.00	870.82	.10	.00	.00	47.00	.00
.500	570.00	870.71	.00	-.02	.00	22.00	50.00
.500	570.00	870.80	.09	-.02	.00	22.00	50.00
.510	570.00	870.68	.00	-.03	.00	20.00	1.00
.510	570.00	870.78	.10	-.02	.00	20.00	1.00
.710	570.00	870.74	.00	.06	.00	20.00	20.00
.710	570.00	870.84	.09	.06	.00	20.00	20.00
.720	570.00	870.82	.00	.08	.00	22.00	1.00
.720	570.00	870.91	.09	.08	.00	22.00	1.00
1.220	570.00	871.10	.00	.27	.00	122.00	50.00
1.220	570.00	871.18	.08	.27	.00	122.00	50.00
11.320	570.00	871.28	.00	.19	.00	172.07	1010.00
11.320	570.00	871.37	.08	.19	.08	138.37	1010.00
19.120	570.00	871.33	.00	.05	.00	175.00	780.00
19.120	570.00	871.41	.08	.05	.08	144.87	780.00
25.120	570.00	871.36	.00	.02	.00	175.00	600.00
25.120	570.00	871.44	.08	.02	.08	146.08	600.00
30.420	570.00	871.38	.00	.03	.00	240.00	500.00
30.420	570.00	871.47	.08	.03	.08	222.21	500.00
36.720	570.00	871.46	.00	.07	.00	73.00	630.00
36.720	570.00	871.55	.09	.08	.09	73.00	630.00
37.220	570.00	871.47	.00	.01	.00	48.00	50.00
37.220	570.00	871.56	.09	.01	.09	48.00	50.00
37.230	570.00	871.46	.00	-.01	.00	49.77	1.00
37.230	570.00	871.55	.09	-.01	.09	41.80	1.00
37.350	570.00	871.47	.00	.01	.00	49.77	12.00
37.350	570.00	871.56	.09	.01	.09	41.80	12.00
37.360	570.00	871.49	.00	.02	.00	48.00	1.00
37.360	570.00	871.58	.09	.02	.09	48.00	1.00
37.860	570.00	871.54	.00	.06	.00	139.87	50.00
37.860	570.00	871.63	.09	.05	.09	140.80	50.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
96.300	570.00	873.55	.00	.18	.00	107.19	360.00
96.300	570.00	873.64	.09	.18	.09	95.00	360.00

FLOODWAY DATA, PORTAGE CREEK
PROFILE NO. 2

STATION	FLOODWAY WIDTH	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WITHOUT FLOODWAY	DIFFERENCE
.000	47.	261.	2.2	870.8	870.7	.1
.500	22.	146.	3.9	870.8	870.7	.1
.510	20.	132.	4.3	870.8	870.7	.1
.710	20.	133.	4.3	870.8	870.7	.1
.720	22.	148.	3.8	870.9	870.8	.1
1.220	122.	474.	1.2	871.2	871.1	.1
11.320	138.	724.	.8	871.4	871.3	.1
19.120	145.	880.	.6	871.4	871.3	.1
25.120	146.	887.	.6	871.5	871.4	.1
30.420	222.	1014.	.6	871.5	871.4	.1
36.720	73.	360.	1.6	871.6	871.5	.1
37.220	48.	272.	2.1	871.6	871.5	.1
37.230	42.	248.	2.3	871.6	871.5	.1
37.350	42.	248.	2.3	871.6	871.5	.1
37.360	48.	276.	2.1	871.6	871.5	.1
37.860	141.	500.	1.1	871.6	871.5	.1
45.660	329.	926.	.6	871.8	871.7	.1
50.660	50.	307.	1.9	871.9	871.8	.1
51.160	24.	169.	3.4	871.8	871.7	.1
51.170	23.	130.	4.4	871.8	871.7	.1
51.250	23.	132.	4.3	871.8	871.7	.1
51.260	24.	150.	3.8	871.9	871.8	.1
51.760	133.	584.	1.0	872.2	872.1	.1
57.760	42.	238.	2.4	872.3	872.2	.1
66.110	210.	1006.	.6	872.6	872.5	.1
74.710	110.	618.	.9	872.7	872.6	.1
84.410	206.	786.	.7	872.8	872.7	.1
91.710	51.	153.	3.7	872.9	872.8	.1
92.220	26.	116.	4.9	873.1	873.0	.1
92.220	26.	144.	4.0	873.2	873.1	.1
92.490	26.	145.	3.9	873.3	873.2	.1
92.500	26.	145.	3.9	873.3	873.2	.1
92.700	35.	207.	2.8	873.5	873.4	.1
96.300	95.	592.	1.0	873.7	873.6	.1

THIS RUN EXECUTED 06/20/86 09:12:12

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  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55,56
  IBM-PC-XT VERSION 1.1
**************************************************
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C
T1              PUTNAM TWP FIS
T2      MULTIPLE RUN            10 YR FLOW
T3      PORTAGE CREEK

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

       0.        3.        0.        0.   .000600       .00        .0      310.   868.000      .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

      .000      .000    -1.000      .000      .000      .000      .000      .000      .000      .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    150.000   201.000      .000      .000      .000      .000      .000      .000      .000      .000

NC       .100      .100      .045      .300      .500      .000      .000      .000      .000      .000
                50FT DS OF PATTERSON LAKE RD.   XSEC A
X1       .000     7.000    88.000   120.000      .000      .000      .000      .000      .000      .000
X3       .000      .000      .000    81.000      .000   128.000      .000      .000      .000      .000
GR    876.000      .000   866.100    88.000   864.500    92.000   864.000   105.000   864.200   115.000
GR    866.900   120.000   876.900   332.000      .000      .000      .000      .000      .000      .000

NC       .000      .000      .000      .000      .000      .000      .000      .000      .000      .000
X1       .500      .000      .000      .000    50.000    50.000    50.000      .000      .000      .000
X3       .000      .000      .000    94.000      .000   116.000      .000      .000      .000      .000

                DS PATTERSON LAKE RD CONCRETE BRIDGE 20FT LONG 20 FT WIDE
X1       .510     4.000      .000    20.000     1.000     1.000     1.000      .000      .000      .000
X2       .000      .000      .000   871.500   874.600      .000      .000      .000      .000      .000
GR    875.000      .000   864.200      .000   864.200    20.000   875.000    20.000      .000      .000

                US OF BRIDGE    XSEC C
X1       .710      .000      .000      .000    20.000    20.000    20.000      .000      .000      .000
X2       .000      .000      .000   871.500   874.600      .000      .000      .000      .000      .000

NC       .000      .000      .000      .000      .000      .000      .000      .000      .000      .000
X1       .720     7.000    88.000   120.000     1.000     1.000     1.000      .000      .000      .000
X3       .000      .000      .000    94.000      .000   116.000      .000      .000      .000      .000
GR    876.000      .000   866.100    88.000   864.500    92.000   864.000   105.000   864.200   115.000
GR    866.900   120.000   876.900   332.000      .000      .000      .000      .000      .000      .000
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NC	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	37.360	7.000	88.000	136.000	1.000	1.000	1.000	.000	.000	.000
X3	.000	.000	.000	88.000	.000	136.000	.000	.000	.000	.000
GR	876.000	.000	867.500	88.000	865.000	101.000	864.600	111.000	865.500	119.000
GR	867.500	136.000	800.000	350.000	.000	.000	.000	.000	.000	.000
		50 FT US OF PRIVATE RD			XSEC J					
X1	37.860	.000	.000	.000	50.000	50.000	50.000	.000	.000	.000
X3	.000	.000	.000	38.000	.000	186.000	.000	.000	.000	.000
NC	.000	.000	.000	.100	.300	.000	.000	.000	.000	.000
ET	.000	.000	6.100	.000	.000	390.000	620.000	.000	.000	.000
		830 FT US OF PRIVATE RD			XSEC K					
X1	45.660	15.000	490.000	527.000	770.000	650.000	780.000	.000	.000	.000
X3	.000	.000	.000	353.000	873.000	.000	.000	.000	.000	.000
GR	880.000	.000	870.000	80.000	868.000	120.000	868.000	255.000	870.000	303.000
GR	873.000	353.000	868.000	448.000	867.000	490.000	866.000	493.000	864.600	505.000
GR	866.300	516.000	867.000	527.000	868.000	587.000	870.000	667.000	900.000	697.000
NC	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
		50 FT DS OF PRIVATE WALKWAY			XSEC L					
X1	50.660	13.000	130.000	172.000	500.000	540.000	500.000	.000	.000	.000
X3	.000	.000	.000	126.000	.000	176.000	.000	.000	.000	.000
GR	880.000	.000	870.000	100.000	868.000	120.000	867.300	130.000	866.700	135.000
GR	865.700	138.000	863.900	150.000	865.500	161.000	866.700	172.000	868.000	184.000
GR	870.000	276.000	872.000	300.000	880.000	360.000	.000	.000	.000	.000
X1	51.160	.000	.000	.000	50.000	50.000	50.000	.000	.000	.000
X3	.000	.000	.000	139.000	.000	163.000	.000	.000	.000	.000
X1	51.170	9.000	120.000	143.000	1.000	1.000	1.000	.000	.000	.000
X2	.000	.000	.000	870.700	871.300	.000	.000	.000	.000	.000
X3	.000	.000	.000	120.000	.000	143.000	.000	.000	.000	.000
BT	6.000	.000	880.000	.000	90.000	872.000	.000	120.000	871.300	870.700
BT	143.000	871.300	870.700	208.000	872.000	.000	318.000	880.000	.000	.000
GR	880.000	.000	872.000	90.000	871.300	120.000	866.200	120.100	865.000	132.000
GR	865.600	142.900	870.700	143.000	872.000	208.000	880.000	318.000	.000	.000
NC	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	51.250	.000	.000	.000	8.000	8.000	8.000	.000	.000	.000
X2	.000	.000	.000	870.700	871.300	.000	1.000	.000	.000	.000
X3	.000	.000	.000	120.000	.000	143.000	.000	.000	.000	.000
NC	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	51.260	12.000	130.000	184.000	1.000	1.000	1.000	.000	.000	.000
X3	.000	.000	.000	139.000	.000	163.000	.000	.000	.000	.000
GR	880.000	.000	870.000	90.000	868.000	120.000	867.300	130.000	866.700	135.000
GR	865.700	138.000	865.700	150.000	865.500	161.000	866.700	172.000	868.000	184.000
GR	870.000	228.000	880.000	302.000	.000	.000	.000	.000	.000	.000

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X1      92.490      .000      .000      .000    27.000    27.000    27.000      .000      .000      .000
X2        .000      .000      .000   876.100   876.400      .000     1.000      .000      .000      .000

                US OF PATTERSON LAKE RD
X1      92.500      .000      .000      .000     1.000     1.000     1.000      .000      .000      .000

                XSEC S
X1      92.700     9.000    93.000   128.000    20.000    20.000    20.000      .000      .000      .000
GR     876.400      .000   876.000    50.000   872.000    90.000   871.000    93.000   867.100    96.000
GR     867.500   110.000   866.700   125.000   872.000   128.000   880.000   148.000      .000      .000

NC        .000      .000      .000      .000      .000      .000      .000      .000      .000      .000
                DS OF HI-LAND LAKE DAM     XSEC T
X1      96.300     8.000    30.000   125.000   330.000   380.000   360.000      .000      .000      .000
GR     882.000      .000   880.000    10.000   871.000    30.000   867.100    33.000   867.500    37.000
GR     867.000   120.000   871.000   125.000   880.000   148.000      .000      .000      .000      .000
EJ        .000      .000      .000      .000      .000      .000      .000      .000      .000      .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

*SECNO  .720

3470 ENCROACHMENT STATIONS=      94.0      116.0  TYPE=      1  TARGET=      22.000
      .72      4.97    868.97      .00       .00    869.10      .13       .00       .01100000.00
     310.        0.     310.        0.        0.      106.        0.        0.        0. 100000.00
      .01       .00      2.94      .00      .100      .045      .100      .000    864.00     94.00
  .001541        1.        1.       1.         2         0         0       .00     22.00    116.00

*SECNO 1.220

3470 ENCROACHMENT STATIONS=      44.0      166.0  TYPE=      1  TARGET=     122.000
                50FT US OF BRIDGE        XSEC D
     1.22      5.12    869.12      .00       .00    869.17      .05       .04       .03    866.10
     310.       17.      276.       18.       40.      147.       52.        0.        0.    866.90
      .01       .41      1.88      .34      .100      .045      .100      .000    864.00     61.19
  .000445       50.       50.       50.         2         0         0       .00    104.81    166.00

CCHV=     .100 CEHV=     .300
*SECNO 11.320
                XSEC CUT FROM TOPO       XSEC E
    11.32      6.15    869.35      .00       .00    869.36      .01       .19       .00    868.00
     310.        0.      283.       27.        1.      334.      122.        8.        3.    867.00
      .37       .10       .85      .22      .100      .045      .100      .000    863.20     78.99
  .000101     1095.     1010.      835.         2         0         0       .00    153.69    232.69

*SECNO 19.120

3470 ENCROACHMENT STATIONS=     145.0      320.0  TYPE=      1  TARGET=     175.000
                XSEC F
    19.12      6.19    869.39      .00       .00    869.40      .01       .04       .00    867.00
     310.       10.      291.       10.       83.      458.       66.       17.        6.    867.00
      .72       .12       .64      .14      .100      .045      .100      .000    863.20    145.00
  .000037      925.      780.      550.         2         0         0       .00    175.00    320.00

*SECNO 25.120

3470 ENCROACHMENT STATIONS=     145.0      320.0  TYPE=      1  TARGET=     175.000
                XSEC G
    25.12      6.22    869.42      .00       .00    869.42      .01       .02       .00    867.00
     310.       10.      290.       10.       85.      460.       67.       26.        8.    867.00
     1.00       .12       .63      .14      .100      .045      .100      .000    863.20    145.00
  .000036      615.      600.      490.         1         0         0       .00    175.00    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    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO 37.350

3265 DIVIDED FLOW


3370 NORMAL BRIDGE,NRD=  0 MIN ELTRD=  879.10 MAX ELLC=  877.40

    37.35      5.00    869.60      .00       .00    869.65      .05       .01       .00    867.50
     310.        0.      309.       0.        2.     166.       2.       37.       12.     867.50
     1.29       .20      1.86      .17      .100      .045     .100      .000    864.60     60.57
  .000514       12.       12.      12.         0         0        0       .00     46.01    114.89

*SECNO 37.360

3470 ENCROACHMENT STATIONS=      88.0      136.0  TYPE=      1  TARGET=      48.000
    37.36      5.01    869.61      .00       .00    869.65      .05       .00       .00    867.50
     310.        0.      310.       0.        0.     181.       0.       37.       12. 100000.00
     1.29       .00      1.71      .00      .100      .045     .100      .000    864.60     88.00
  .000520        1.        1.       1.         1         0        0       .00     48.00    136.00

*SECNO 37.860

3470 ENCROACHMENT STATIONS=      38.0      186.0  TYPE=      1  TARGET=     148.000
                50 FT US OF PRIVATE RD          XSEC J
    37.86      5.04    869.64      .00       .00    869.68      .04       .02       .00    867.50
     310.        7.      291.      12.       24.     182.      39.       37.       12.     867.50
     1.30       .31      1.59      .31      .100      .045     .100      .000    864.60     65.90
  .000398       50.       50.      50.         0         0        0       .00    106.64    172.54


CCHV=     .100 CEHV=     .300
*SECNO 45.660

3470 ENCROACHMENT STATIONS=     353.0      697.0  TYPE=      1  TARGET=    -353.000
 ELENCL=     873.00  ELENCR= 100000.00
                830 FT US OF PRIVATE RD          XSEC K
    45.66      5.29    869.89      .00       .00    869.91      .02       .23       .00    867.00
     310.       48.      189.      73.      134.     150.     215.       44.       15.     867.00
     1.53       .36      1.26      .34      .100      .045     .100      .000    864.60    412.07
  .000229      770.      780.     650.         2         0        0       .00    250.59    662.65
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  SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        QLOSS    BANK ELEV
  Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
  TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
  SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO 51.260

3470 ENCROACHMENT STATIONS=      139.0      163.0  TYPE=      1  TARGET=      24.000
    51.26      4.48    869.98      .00       .00    870.12      .14       .00       .00100000.00
     310.        0.      310.       0.        0.      104.       0.       48.       17. 100000.00
     1.63       .00      2.98      .00      .100      .045     .100      .000    865.50    139.00
  .001731        1.        1.       1.         0         0        0       .00     24.00    163.00

*SECNO 51.760

3470 ENCROACHMENT STATIONS=       92.0      225.0  TYPE=      1  TARGET=     133.000
                50 FT US OF PRIVATE WALKWAY      XSEC M
    51.76      4.64    870.14      .00       .00    870.16      .02       .03       .01    867.30
     310.       20.      276.      14.       58.      208.      49.       48.       17.    868.00
     1.64       .35      1.33      .27      .100      .045     .100      .000    865.50     92.00
  .000268       50.       50.      50.         2         0        0       .00    133.00    225.00

*SECNO 57.760
                650FT US OF WALKWAY              XSEC N
    57.76      4.45    870.35      .00       .00    870.42      .07       .25       .01    868.00
     310.       11.      299.       0.       23.      135.       0.       52.       18.    868.00
     1.72       .48      2.22      .48      .100      .045     .100      .000    865.90    152.40
  .000716      550.      600.     570.         2         0        0       .00     52.60    205.00

*SECNO 66.110

3470 ENCROACHMENT STATIONS=      115.0      345.0  TYPE=      1  TARGET=     230.000
                XSEC O
    66.11      4.26    870.66      .00       .00    870.66      .01       .24       .01    868.00
     310.      167.      136.       7.      468.      131.      25.       58.       21.    868.00
     2.06       .36      1.04      .26      .100      .045     .100      .000    866.40    115.00
  .000161      730.      835.     650.         2         0        0       .00    225.31    340.31

*SECNO 74.710
                XSEC P
    74.71      4.35    870.75      .00       .00    870.76      .01       .10       .00    869.30
     310.        0.      309.       1.        4.      408.       4.       68.       24.    868.90
     2.36       .11       .76      .13      .100      .045     .100      .000    866.40     34.57
  .000092      720.      860.     730.         2         0        0       .00    119.69    154.25
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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


3370 NORMAL BRIDGE,NRD=  6 MIN ELTRD=  876.40 MAX ELLC=  876.10

    92.49     4.66    871.76      .00       .00    871.90       .13       .05       .00    878.60
     310.       0.      310.       0.        0.     106.        0.      82.       32.     878.60
     2.70      .00      2.94      .00      .100      .045      .100      .000    867.10    223.00
  .001741      27.       27.      27.         2         0         0       .00     26.00    249.00

*SECNO 92.500
              US OF PATTERSON LAKE RD
    92.50     4.66    871.76      .00       .00    871.90       .13       .00       .00    878.60
     310.       0.      310.       0.        0.     106.        0.      82.       32.     878.60
     2.70      .00      2.93      .00      .100      .045      .100      .000    867.10    223.00
  .001739       1.        1.       1.         0         0         0       .00     26.00    249.00

*SECNO 92.700
              XSEC S
    92.70     5.16    871.86      .00       .00    871.92       .07       .02       .01    871.00
     310.       0.      310.       0.        1.     151.        0.      82.       32.     872.00
     2.70      .21      2.05      .00      .100      .045      .100      .000    866.70     90.42
  .000651      20.       20.      20.         2         0         0       .00     37.50    127.92

*SECNO 96.300
              DS OF HI-LAND LAKE DAM      XSEC T
    96.30     4.98    871.98      .00       .00    871.98       .01       .05       .01    871.00
     310.       0.      310.       0.        1.     435.        1.      85.       32.     871.00
     2.84      .07       .71      .07      .100      .045      .100      .000    867.00     27.83
  .000064     330.      360.     380.         2         0         0       .00     99.66    127.49
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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*PROF 2

CCHV=     .300 CEHV=     .500
*SECNO  .000

3470 ENCROACHMENT STATIONS=      81.0      128.0  TYPE=      1  TARGET=      47.000
                 50FT DS OF PATTERSON LAKE RD.   XSEC A
      .00      5.86    869.86      .00    869.00    869.94      .09       .00       .00    866.10
     440.       15.      412.      13.       24.      170.      22.        0.        0.    866.90
      .00       .64      2.42      .60      .100      .045     .100      .000    864.00     81.00
  .000602        0.        0.       0.         0         0        4       .00     47.00    128.00

*SECNO  .500

3470 ENCROACHMENT STATIONS=      94.0      116.0  TYPE=      1  TARGET=      22.000        .
      .50      5.85    869.85      .00       .00    870.05      .19       .05       .05100000.00
     440.        0.      440.       0.        0.      125.       0.        0.        0. 100000.00
      .00       .00      3.52      .00      .100      .045     .100      .000    864.00     94.00
  .001902       50.       50.      50.         2         0        0       .00     22.00    116.00

*SECNO  .510

3370 NORMAL BRIDGE,NRD=  0 MIN ELTRD=  874.60 MAX ELLC=  871.50

                 DS PATTERSON LAKE RD CONCRETE BRIDGE 20FT LONG 20 FT WIDE
      .51      5.63    869.83      .00       .00    870.07      .24       .00       .02    875.00
     440.        0.      440.       0.        0.      113.       0.        0.        0.    875.00
      .00       .00      3.91      .00      .100      .045     .100      .000    864.20       .00
  .002532        1.        1.       1.         2         0        0       .00     20.00     20.00

*SECNO  .710

3370 NORMAL BRIDGE,NRD=  0 MIN ELTRD=  874.60 MAX ELLC=  871.50

                 US OF BRIDGE     XSEC C
      .71      5.69    869.89      .00       .00    870.12      .23       .05       .00    875.00
     440.        0.      440.       0.        0.      114.       0.        0.        0.    875.00
      .01       .00      3.87      .00      .100      .045     .100      .000    864.20       .00
  .002469       20.       20.      20.         1         0        0       .00     20.00     20.00
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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

*SECNO 30.420

3470 ENCROACHMENT STATIONS=      80.0      320.0  TYPE=      1  TARGET=      240.000
                XSEC H
    30.42      6.27   870.47      .00   869.44   870.48      .01      .03      .00   867.00
     440.       94.     235.     112.     290.     223.     326.      43.      10.   867.00
     1.09       .32     1.05      .34     .100     .045     .100     .000   864.20    80.00
  .000114      430.     500.     430.        1        0        0      .00   240.00   320.00

CCHV=     .300 CEHV=     .500
*SECNO 36.720

3470 ENCROACHMENT STATIONS=      75.0      148.0  TYPE=      1  TARGET=       73.000
                XSEC I 50 FT DS OF PRIVATE RD BRIDGE
    36.72      5.66   870.56      .00   869.57   870.61      .05      .11      .02   867.50
     440.       15.     408.      17.      32.     224.      33.      49.      12.   867.50
     1.18       .49     1.82      .51     .100     .045     .100     .000   864.90    75.00
  .000394      270.     630.     590.        2        0        0      .00    73.00   148.00

*SECNO 37.220

3470 ENCROACHMENT STATIONS=      88.0      136.0  TYPE=      1  TARGET=       48.000
    37.22      5.68   870.58      .00   869.59   870.64      .06      .02      .01   867.50
     440.        0.     440.       0.       0.     225.       0.      50.      12. 100000.00
     1.19       .00     1.96      .00     .100     .045     .100     .000   864.90    88.00
  .000533       50.      50.      50.        0        0        0      .00    48.00   136.00

*SECNO 37.230

3265 DIVIDED FLOW

3370 NORMAL BRIDGE,NRD=  8 MIN ELTRD=  879.10 MAX ELLC=  877.40

    37.23      5.97   870.57      .00   869.59   870.64      .07      .00      .00   867.50
     440.        1.     438.       1.       5.     207.       4.      50.      12.   867.50
     1.19       .25     2.11      .22     .100     .045     .100     .000   864.60    59.48
  .000494        1.       1.       1.        0        0        0      .00    47.97   115.73
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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

*SECNO 50.660

3470 ENCROACHMENT STATIONS=     126.0     176.0  TYPE=     1  TARGET=      50.000
                50 FT DS OF PRIVATE WALKWAY      XSEC L
    50.66     7.03    870.93      .00    870.01    870.98      .05       .12       .01    867.30
     440.      6.      427.       7.       14.      229.      16.       65.       18.    866.70
     1.53      .42      1.86      .44      .100      .045     .100      .000    863.90    126.00
  .000337     500.      500.     540.         2         0        0       .00     50.00    176.00

*SECNO 51.160

3470 ENCROACHMENT STATIONS=     139.0     163.0  TYPE=     1  TARGET=      24.000
    51.16     7.00    870.90      .00    869.99    871.04      .14       .03       .03100000.00
     440.      0.      440.       0.        0.      147.       0.       66.       18. 100000.00
     1.53      .00      3.00      .00      .100      .045     .100      .000    863.90    139.00
  .001211      50.       50.      50.         2         0        0       .00     24.00    163.00

*SECNO 51.170

3370 NORMAL BRIDGE,NRD=  6 MIN ELTRD=  871.30 MAX ELLC=  870.70

3470 ENCROACHMENT STATIONS=     120.0     143.0  TYPE=     1  TARGET=      23.000
    51.17     5.85    870.85      .00    869.96    871.06      .21       .00       .02    871.30
     440.      0.      440.       0.        0.      120.       0.       66.       18. 100000.00
     1.53      .00      3.67      .00      .100      .045     .100      .000    865.00    120.01
  .004406       1.        1.       1.         2         0        0     -3.50     22.99    143.00

*SECNO 51.250

3370 NORMAL BRIDGE,NRD=  6 MIN ELTRD=  871.30 MAX ELLC=  870.70

3470 ENCROACHMENT STATIONS=     120.0     143.0  TYPE=     1  TARGET=      23.000
    51.25     5.89    870.89      .00    869.98    871.10      .21       .04       .00    871.30
     440.      0.      440.       0.        0.      120.       0.       66.       18. 100000.00
     1.53      .00      3.67      .00      .100      .045     .100      .000    865.00    120.01
  .004406       8.        8.       8.         1         0        0     -4.17     22.99    143.00
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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

*SECNO 84.410

3470 ENCROACHMENT STATIONS=      55.0      500.0  TYPE=      1  TARGET=      445.000
                XSEC Q
    84.41      4.68    871.78      .00    870.89    871.80      .01       .12       .00    869.60
     440.       45.      206.     189.      202.      174.     496.      105.       30.    869.20
     2.55       .22      1.18      .38      .100      .045     .100      .000    867.10     69.27
  .000201      970.      970.     650.         1         0        0       .00    430.73    500.00

*SECNO 91.710

3470 ENCROACHMENT STATIONS=     200.0      251.0  TYPE=      1  TARGET=       51.000
                XSEC R
    91.71      3.47    871.97      .00    871.34    872.29      .32       .40       .09    871.00
     440.        9.      431.       1.        9.       94.       2.      114.       34.    871.30
     2.59       .91      4.59      .48      .100      .045     .100      .000    868.50    200.00
  .004566      830.      730.     700.         2         0        0       .00     44.61    244.61

*SECNO 92.220

3470 ENCROACHMENT STATIONS=     212.0      238.0  TYPE=      1  TARGET=       26.000
                DS OF PATTERSON LAKE RD  DS OF HI-LAND LAKE
    92.22      3.69    872.19      .00    871.58    872.53      .35       .24       .01100000.00
     440.        0.      440.       0.        0.       93.       0.      114.       34. 100000.00
     2.59       .00      4.74      .00      .100      .045     .100      .000    868.50    212.00
  .004967       50.       50.      50.         2         0        0       .00     26.00    238.00

*SECNO 92.220

3370 NORMAL BRIDGE,NRD=  6 MIN ELTRD=  876.40 MAX ELLC=  876.10

    92.22      5.25    872.35      .00    871.71    872.55      .21       .00       .01    878.60
     440.        0.      440.       0.        0.      121.       0.      114.       34.    878.60
     2.59       .00      3.64      .00      .100      .045     .100      .000    867.10    223.00
  .002343        1.        1.       1.         2         0        0       .00     26.00    249.00

*SECNO 92.490
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THIS RUN EXECUTED 06/20/86 09:22:21

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*************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55,56
  IBM-PC-XT VERSION 1.1
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T1 100 YEAR FLOW
T2
T3

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0.	3.	0.	0.	.000600	.00	.0	570.	870.000	.000

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	3.000	.000	-1.000	.000	.000	.000	.000	.000	.000	.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

*SECNO  .720

3470 ENCROACHMENT STATIONS=      94.0      116.0  TYPE=      1  TARGET=      22.000
      .72      6.82   870.82      .00       .00   871.06      .24       .00       .02100000.00
     570.        0.     570.       0.        0.     146.       0.        0.        0. 100000.00
      .00       .00     3.90      .00      .100     .045     .100      .000    864.00     94.00
  .002038        1.       1.       1.         2        0         0       .00     22.00    116.00

*SECNO 1.220

3470 ENCROACHMENT STATIONS=      44.0      166.0  TYPE=      1  TARGET=     122.000
                 50FT US OF BRIDGE        XSEC D
     1.22      7.10   871.10      .00       .00   871.15      .05       .03       .06    866.10
     570.       55.     434.       80.      111.     210.     143.        1.        0.     866.90
      .01       .50     2.07      .56      .100     .045     .100      .000    864.00     44.00
  .000333       50.      50.      50.         2        0         0       .00    122.00    166.00

CCHV=     .100 CEHV=     .300
*SECNO 11.320
                 XSEC CUT FROM TOPO       XSEC E
    11.32      8.08   871.28      .00       .00   871.30      .01       .14       .00    868.00
     570.        2.     404.       84.       13.     492.     267.       14.        3.     867.00
      .32       .15      .98      .32      .100     .045     .100      .000    863.20     68.02
  .000082     1095.    1010.     835.         2        0         0       .00    172.07    240.09

*SECNO 19.120

3470 ENCROACHMENT STATIONS=     145.0      320.0  TYPE=      1  TARGET=     175.000
                 XSEC F
    19.12      8.13   871.33      .00   869.39   871.34      .01       .04       .00    867.00
     570.       43.     498.       28.      207.     612.     126.       29.        6.     867.00
      .61       .21      .81      .23      .100     .045     .100      .000    863.20    145.00
  .000041      925.     780.     550.         2        0         0       .00    175.00    320.00

*SECNO 25.120

3470 ENCROACHMENT STATIONS=     145.0      320.0  TYPE=      1  TARGET=     175.000
                 XSEC G
    25.12      8.16   871.36      .00   869.42   871.36      .01       .02       .00    867.00
     570.       44.     498.       29.      209.     615.     127.       42.        9.     867.00
      .84       .21      .81      .22      .100     .045     .100      .000    863.20    145.00
  .000041      615.     600.     490.         1        0         0       .00    175.00    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       WIN       ELMIN       SSTA
  SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO 37.350

3265 DIVIDED FLOW

3370 NORMAL BRIDGE,NRD=  0 MIN ELTRD=  879.10 MAX ELLC=  877.40

   37.35     6.87   871.47      .00   869.60   871.55      .08      .01      .00   867.50
    570.       3.     566.       2.       9.     244.       7.      61.      13.    867.50
    1.12     .29     2.31      .26     .100     .045     .100     .000   864.60    58.48
 .000475      12.      12.      12.        0        0        0      .00    49.77   116.49

*SECNO 37.360

3470 ENCROACHMENT STATIONS=      88.0      136.0  TYPE=      1  TARGET=      48.000
   37.36     6.89   871.49      .00   869.61   871.56      .07      .00      .00   867.50
    570.       0.     570.       0.       0.     271.       0.      61.      13. 100000.00
    1.12     .00     2.10      .00     .100     .045     .100     .000   864.60    88.00
 .000501       1.       1.       1.        1        0        0      .00    48.00   136.00

*SECNO 37.860

3470 ENCROACHMENT STATIONS=      38.0      186.0  TYPE=      1  TARGET=     148.000
                50 FT US OF PRIVATE RD            XSEC J
   37.86     6.94   871.54      .00   869.64   871.58      .04      .02      .01   867.50
    570.      33.     478.      59.      85.     274.     129.      62.      13.    867.50
    1.13     .39     1.74      .46     .100     .045     .100     .000   864.60    46.13
 .000276      50.      50.      50.        2        0        0      .00   139.87   186.00

CCHV=    .100 CEHV=    .300
*SECNO 45.660

3470 ENCROACHMENT STATIONS=     353.0      697.0  TYPE=      1  TARGET=    -353.000
 ELENCL=    873.00  ELENCR= 100000.00
                830 FT US OF PRIVATE RD            XSEC K
   45.66     7.12   871.72      .00   869.89   871.73      .01      .14      .00   867.00
    570.     114.     269.     187.     308.     217.     472.      74.      16.    867.00
    1.39     .37     1.24      .40     .100     .045     .100     .000   864.60   377.41
 .000135     770.     780.     650.        2        0        0      .00   291.30   668.71
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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

*SECNO 51.260

3470 ENCROACHMENT STATIONS=      139.0      163.0  TYPE=      1  TARGET=      24.000
    51.26      6.31    871.81      .00    869.98    872.04      .23       .00       .01100000.00
     570.        0.      570.       0.        0.      148.       0.       82.        18. 100000.00
     1.46       .00      3.85      .00      .100      .045     .100      .000    865.50    139.00
  .002085        1.        1.       1.         2         0        0       .00     24.00    163.00

*SECNO 51.760

3470 ENCROACHMENT STATIONS=       92.0      225.0  TYPE=      1  TARGET=     133.000
                50 FT US OF PRIVATE WALKWAY      XSEC M
    51.76      6.56    872.06      .00    870.14    872.08      .03       .02       .02    867.30
     570.       61.      455.      54.      132.      312.     128.       82.       18.     868.00
     1.48       .46      1.46      .42      .100      .045     .100      .000    865.50     92.00
  .000190       50.       50.      50.         2         0        0       .00    133.00    225.00

*SECNO 57.760
                650FT US OF WALKWAY              XSEC N
    57.76      6.29    872.19      .00    870.35    872.29      .10       .19       .02    868.00
     570.       51.      519.       0.       72.      196.       0.       88.       20.     868.00
     1.54       .70      2.65      .00      .100      .045     .100      .000    865.90    138.07
  .000623      550.      600.     570.         2         0        0       .00     66.93    205.01

*SECNO 66.110

3470 ENCROACHMENT STATIONS=      115.0      345.0  TYPE=      1  TARGET=     230.000
                XSEC O
    66.11      6.07    872.47      .00    870.66    872.48      .01       .18       .01    868.00
     570.      335.      216.      20.      787.      191.      58.       99.       22.     868.00
     1.86       .43      1.13      .34      .100      .045     .100      .000    866.40    115.00
  .000115      730.      835.     650.         2         0        0       .00    228.94    343.94

*SECNO 74.710
                XSEC P
    74.71      6.15    872.55      .00    870.75    872.56      .01       .08       .00    869.30
     570.        4.      564.       3.       20.      605.      15.      114.       26.     868.90
     2.11       .18       .93      .19      .100      .045     .100      .000    866.40     27.86
  .000082      720.      860.     730.         2         0        0       .00    130.51    158.37
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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


3370 NORMAL BRIDGE,NRD=  6 MIN ELTRD=  876.40 MAX ELLC=  876.10

   92.49     5.99   873.09      .00   871.76   873.35      .26      .07      .00   878.60
    570.       0.     570.       0.       0.     140.       0.     145.      36.    878.60
    2.55     .00     4.07      .00     .100     .045     .100     .000   867.10   223.00
 .002535     27.      27.      27.        2        0        0      .00    26.00   249.00

*SECNO 92.500
              US OF PATTERSON LAKE RD
   92.50     5.99   873.09      .00   871.76   873.35      .26      .00      .00   878.60
    570.       0.     570.       0.       0.     140.       0.     145.      36.    878.60
    2.55     .00     4.07      .00     .100     .045     .100     .000   867.10   223.00
 .002532      1.       1.       1.        0        0        0      .00    26.00   249.00

*SECNO 92.700
              XSEC S
   92.70     6.57   873.27      .00   871.86   873.39      .12      .03      .01   871.00
    570.       6.     564.       1.      13.     200.       2.     145.      36.    872.00
    2.56     .43     2.81      .30     .100     .045     .100     .000   866.70    77.32
 .000846     20.      20.      20.        2        0        0      .00    53.85   131.17

*SECNO 96.300
              DS OF HI-LAND LAKE DAM     XSEC T
   96.30     6.46   873.46      .00   871.98   873.47      .02      .07      .01   871.00
    570.       1.     568.       1.       7.     575.       8.     149.      36.    871.00
    2.66     .15      .99      .15     .100     .045     .100     .000   867.00    24.54
 .000085    330.     360.     380.        2        0        0      .00   106.73   131.27
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   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

*PROF 4

CCHV=     .300 CEHV=     .500
*SECNO  .000

3470 ENCROACHMENT STATIONS=      81.0      128.0  TYPE=      1  TARGET=      47.000
                 50FT DS OF PATTERSON LAKE RD.   XSEC A
      .00      7.15   871.15      .00   871.00   871.26      .11      .00      .00   866.10
     640.       24.     593.      23.      33.     212.      32.       0.       0.    866.90
      .00       .74     2.80      .71     .100     .045     .100     .000   864.00    81.00
  .000604        0.       0.       0.        0        0        3      .00    47.00   128.00

*SECNO  .500

3470 ENCROACHMENT STATIONS=      94.0      116.0  TYPE=      1  TARGET=      22.000
      .50      7.12   871.12      .00      .00   871.39      .27      .05      .08100000.00
     640.        0.     640.       0.       0.     153.       0.       0.       0. 100000.00
      .00       .00     4.19      .00     .100     .045     .100     .000   864.00    94.00
  .002269       50.      50.      50.        2        0        0      .00    22.00   116.00

*SECNO  .510

3370 NORMAL BRIDGE,NRD=  0 MIN ELTRD=  874.60 MAX ELLC=  871.50

                 DS PATTERSON LAKE RD CONCRETE BRIDGE 20FT LONG 20 FT WIDE
      .51      6.89   871.09      .00      .00   871.43      .33      .00      .03   875.00
     640.        0.     640.       0.       0.     138.       0.       0.       0.    875.00
      .00       .00     4.64      .00     .100     .045     .100     .000   864.20      .00
  .003029        1.       1.       1.        2        0        0      .00    20.00    20.00

*SECNO  .710

3370 NORMAL BRIDGE,NRD=  0 MIN ELTRD=  874.60 MAX ELLC=  871.50

                 US OF BRIDGE     XSEC C
      .71      6.96   871.16      .00      .00   871.49      .33      .06      .00   875.00
     640.        0.     640.       0.       0.     139.       0.       0.       0.    875.00
      .00       .00     4.60      .00     .100     .045     .100     .000   864.20      .00
  .002957      20.      20.      20.        1        0        0      .00    20.00    20.00
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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

*SECNO 30.420

3470 ENCROACHMENT STATIONS=      80.0      320.0  TYPE=      1  TARGET=      240.000
                XSEC H
    30.42      7.64    871.84      .00    869.44    871.85      .01       .03       .00    867.00
     640.      155.      308.     177.      422.      282.     463.       57.       11.    867.00
      .99       .37      1.09      .38      .100      .045     .100      .000    864.20     80.00
  .000091      430.      500.     430.         0         0        0       .00    240.00    320.00

CCHV=     .300 CEHV=     .500
*SECNO 36.720

3470 ENCROACHMENT STATIONS=      75.0      148.0  TYPE=      1  TARGET=       73.000
                XSEC I 50 FT DS OF PRIVATE RD BRIDGE
    36.72      7.00    871.90      .00    869.57    871.96      .06       .09       .02    867.50
     640.       28.      583.      29.       49.      289.      49.       66.       13.    867.50
     1.08       .58     2.02       .59      .100      .045     .100      .000    864.90     75.00
  .000346      270.      630.     590.         2         0        0       .00     73.00    148.00

*SECNO 37.220

3470 ENCROACHMENT STATIONS=      88.0      136.0  TYPE=      1  TARGET=       48.000
    37.22      7.02    871.92      .00    869.59    871.99      .08       .02       .01    867.50
     640.        0.      640.       0.        0.      289.       0.       67.       13. 100000.00
     1.08       .00     2.21       .00      .100      .045     .100      .000    864.90     88.00
  .000519       50.       50.      50.         0         0        0       .00     48.00    136.00

*SECNO 37.230

3265 DIVIDED FLOW

3370 NORMAL BRIDGE,NRD=  8 MIN ELTRD=  879.10 MAX ELLC=  877.40

    37.23      7.31    871.91      .00    869.59    872.00      .09       .00       .01    867.50
     640.        3.      634.       2.       11.      263.       9.       67.       13.    867.50
     1.08       .31     2.41       .27      .100      .045     .100      .000    864.60     57.99
  .000467        1.        1.       1.         0         0        0       .00     50.66    116.87
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  SECNO     DEPTH     CWSEL     CRIWS     WSELR     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

*SECNO 50.660

3470 ENCROACHMENT STATIONS=     126.0     176.0  TYPE=     1  TARGET=      50.000
                50 FT DS OF PRIVATE WALKWAY      XSEC L
    50.66     8.31   872.21      .00   870.01   872.28      .07      .10      .02   867.30
     640.       9.     621.      10.      19.     283.      21.      90.      19.   866.70
     1.43      .47     2.19      .49     .100     .045     .100     .000   863.90   126.00
  .000353     500.     500.     540.        2        0        0      .00    50.00   176.00

*SECNO 51.160

3470 ENCROACHMENT STATIONS=     139.0     163.0  TYPE=     1  TARGET=      24.000
    51.16     8.25   872.15      .00   869.99   872.36      .20      .03      .04100000.00
     640.       0.     640.       0.       0.     177.       0.      90.      19. 100000.00
     1.43      .00     3.62      .00     .100     .045     .100     .000   863.90   139.00
  .001509      50.      50.      50.        2        0        0      .00    24.00   163.00

*SECNO 51.170

3370 NORMAL BRIDGE,NRD=  6 MIN ELTRD=  871.30 MAX ELLC=  870.70

3470 ENCROACHMENT STATIONS=     120.0     143.0  TYPE=     1  TARGET=      23.000
    51.17     7.06   872.06      .00   869.96   872.40      .34      .00      .04   871.30
     640.       0.     640.       0.       0.     138.       0.      90.      19. 100000.00
     1.43      .00     4.65      .00     .100     .045     .100     .000   865.00   120.00
  .009638       1.       1.       1.        2        0        0   -13.80    23.00   143.00

*SECNO 51.250

3370 NORMAL BRIDGE,NRD=  6 MIN ELTRD=  871.30 MAX ELLC=  870.70

3470 ENCROACHMENT STATIONS=     120.0     143.0  TYPE=     1  TARGET=      23.000
    51.25     7.15   872.15      .00   869.98   872.48      .33      .08      .00   871.30
     640.       0.     640.       0.       0.     140.       0.      90.      19. 100000.00
     1.43      .00     4.59      .00     .100     .045     .100     .000   865.00   120.00
  .009218       8.       8.       8.        2        0        0   -13.80    23.00   143.00
```

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

*SECNO 84.410

3470 ENCROACHMENT STATIONS=      55.0      500.0  TYPE=      1  TARGET=      445.000
                XSEC Q
    84.41      5.97   873.07      .00   870.89   873.07      .01      .08      .00   869.60
     640.      122.     239.     278.     457.     230.     755.     147.      32.    869.20
     2.48       .27     1.04      .37     .100     .045     .100     .000   867.10    55.00
  .000108      970.     970.     650.        0        0        0      .00   445.00   500.00

*SECNO 91.710

3470 ENCROACHMENT STATIONS=     200.0      251.0  TYPE=      1  TARGET=       51.000
                XSEC R
    91.71      4.56   873.06      .00   871.34   873.40      .34      .23      .10   871.00
     640.       25.     606.       9.      20.     127.      11.     161.      36.    871.30
     2.52      1.22     4.79      .82     .100     .045     .100     .000   868.50   200.00
  .003328      830.     730.     700.        2        0        0      .00    51.00   251.00

*SECNO 92.220

3470 ENCROACHMENT STATIONS=     212.0      238.0  TYPE=      1  TARGET=       26.000
                DS OF PATTERSON LAKE RD  DS OF HI-LAND LAKE
    92.22      4.69   873.19      .00   871.58   873.64      .45      .20      .03100000.00
     640.        0.     640.       0.       0.     119.       0.     161.      36. 100000.00
     2.52       .00     5.38      .00     .100     .045     .100     .000   868.50   212.00
  .005004       50.      50.      50.        2        0        0      .00    26.00   238.00

*SECNO 92.220

3370 NORMAL BRIDGE,NRD=  6 MIN ELTRD=  876.40 MAX ELLC=  876.10

    92.22      6.26   873.36      .00   871.71   873.66      .29      .00      .02   878.60
     640.        0.     640.       0.       0.     147.       0.     161.      36.    878.60
     2.52       .00     4.35      .00     .100     .045     .100     .000   867.10   223.00
  .002763        1.       1.       1.        2        0        0      .00    26.00   249.00

*SECNO 92.490
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THIS RUN EXECUTED 06/20/86 09:29:52

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  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55,56
  IBM-PC-XT VERSION 1.1
*************************************************
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

PORTAGE CREEK

SUMMARY PRINTOUT TABLE 150

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
.000	.00	.00	.00	864.00	310.00	868.88	.00	868.95	6.03	.11	170.06	126.25
.000	.00	.00	.00	864.00	440.00	869.86	.00	869.94	6.02	2.42	215.92	179.40
.000	.00	.00	.00	864.00	570.00	870.72	.00	870.83	6.01	2.67	256.70	232.52
.000	.00	.00	.00	864.00	640.00	871.15	.00	871.26	6.04	2.80	276.66	260.40
.500	50.00	.00	.00	864.00	310.00	868.89	.00	869.03	16.05	2.98	104.04	77.37
.500	50.00	.00	.00	864.00	440.00	869.85	.00	870.05	19.02	3.52	124.96	100.89
.500	50.00	.00	.00	864.00	570.00	870.71	.00	870.95	21.43	3.97	143.73	123.14
.500	50.00	.00	.00	864.00	640.00	871.12	.00	871.39	22.69	4.19	152.90	134.35
.510	1.00	874.60	871.50	864.20	310.00	868.88	.00	869.05	21.36	3.31	93.71	67.07
.510	1.00	874.60	871.50	864.20	440.00	869.83	.00	870.07	25.32	3.91	112.66	87.44
.510	1.00	874.60	871.50	864.20	570.00	870.68	.00	870.98	28.58	4.40	129.61	106.63
.510	1.00	874.60	871.50	864.20	640.00	871.09	.00	871.43	30.29	4.64	137.88	116.28
.710	20.00	874.60	871.50	864.20	310.00	868.92	.00	869.09	20.98	3.29	94.30	67.69
.710	20.00	874.60	871.50	864.20	440.00	869.89	.00	870.12	24.69	3.87	113.65	88.54
.710	20.00	874.60	871.50	864.20	570.00	870.74	.00	871.04	27.89	4.36	130.73	107.93
.710	20.00	874.60	871.50	864.20	640.00	871.16	.00	871.49	29.57	4.60	139.08	117.69
.720	1.00	.00	.00	864.00	310.00	868.97	.00	869.10	15.41	2.94	105.51	78.97
.720	1.00	.00	.00	864.00	440.00	869.95	.00	870.14	18.11	3.46	127.12	103.41
.720	1.00	.00	.00	864.00	570.00	870.82	.00	871.06	20.38	3.90	146.31	126.27
.720	1.00	.00	.00	864.00	640.00	871.25	.00	871.51	21.56	4.11	155.71	137.83
1.220	50.00	.00	.00	864.00	310.00	869.12	.00	869.17	4.45	1.88	239.03	146.98
1.220	50.00	.00	.00	864.00	440.00	870.16	.00	870.21	3.78	1.99	353.56	226.23
1.220	50.00	.00	.00	864.00	570.00	871.10	.00	871.15	3.33	2.07	463.93	312.32
1.220	50.00	.00	.00	864.00	640.00	871.56	.00	871.61	3.14	2.10	520.17	361.41
11.320	1010.00	.00	.00	863.20	310.00	869.35	.00	869.36	1.01	.85	457.86	307.85
11.320	1010.00	.00	.00	863.20	440.00	870.37	.00	870.38	.90	.92	618.88	464.43
11.320	1010.00	.00	.00	863.20	570.00	871.28	.00	871.30	.82	.98	772.19	629.68
11.320	1010.00	.00	.00	863.20	640.00	871.74	.00	871.75	.79	1.01	851.50	719.95

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
50.660	500.00	.00	.00	863.90	310.00	870.01	.00	870.05	3.11	1.58	213.07	175.67
50.660	500.00	.00	.00	863.90	440.00	870.93	.00	870.98	3.37	1.86	259.11	239.57
50.660	500.00	.00	.00	863.90	570.00	871.78	.00	871.85	3.49	2.09	301.66	305.31
50.660	500.00	.00	.00	863.90	640.00	872.21	.00	872.28	3.53	2.19	323.17	340.87
51.160	50.00	.00	.00	863.90	310.00	869.99	.00	870.09	9.54	2.48	124.98	100.34
51.160	50.00	.00	.00	863.90	440.00	870.90	.00	871.04	12.11	3.00	146.67	126.42
51.160	50.00	.00	.00	863.90	570.00	871.73	.00	871.91	14.13	3.42	166.66	151.63
51.160	50.00	.00	.00	863.90	640.00	872.15	.00	872.36	15.09	3.62	176.76	164.73
51.170	1.00	871.30	870.70	865.00	310.00	869.96	.00	870.11	16.70	3.01	103.11	75.86
51.170	1.00	871.30	870.70	865.00	440.00	870.85	.00	871.06	44.06	3.67	120.00	66.29
51.170	1.00	871.30	870.70	865.00	570.00	871.65	.00	871.95	95.89	4.45	127.97	58.21
51.170	1.00	871.30	870.70	865.00	640.00	872.06	.00	872.40	96.38	4.65	137.54	65.19
51.250	8.00	871.30	870.70	865.00	310.00	869.98	.00	870.12	16.58	3.00	103.35	76.13
51.250	8.00	871.30	870.70	865.00	440.00	870.89	.00	871.10	44.06	3.67	120.00	66.29
51.250	8.00	871.30	870.70	865.00	570.00	871.73	.00	872.03	91.43	4.39	129.92	59.61
51.250	8.00	871.30	870.70	865.00	640.00	872.15	.00	872.48	92.18	4.59	139.51	66.66
51.260	1.00	.00	.00	865.50	310.00	869.98	.00	870.12	17.31	2.98	104.01	74.51
51.260	1.00	.00	.00	865.50	440.00	870.91	.00	871.10	19.62	3.48	126.39	99.34
51.260	1.00	.00	.00	865.50	570.00	871.81	.00	872.04	20.85	3.85	147.93	124.83
51.260	1.00	.00	.00	865.50	640.00	872.23	.00	872.49	21.75	4.05	158.03	137.24
51.760	50.00	.00	.00	865.50	310.00	870.14	.00	870.16	2.68	1.33	316.22	189.24
51.760	50.00	.00	.00	865.50	440.00	871.12	.00	871.14	2.23	1.41	446.74	294.54
51.760	50.00	.00	.00	865.50	570.00	872.06	.00	872.08	1.90	1.46	571.79	413.90
51.760	50.00	.00	.00	865.50	640.00	872.50	.00	872.53	1.80	1.49	632.04	477.27
57.760	600.00	.00	.00	865.90	310.00	870.35	.00	870.42	7.16	2.22	158.09	115.89
57.760	600.00	.00	.00	865.90	440.00	871.29	.00	871.38	6.82	2.49	210.84	168.47
57.760	600.00	.00	.00	865.90	570.00	872.19	.00	872.29	6.23	2.65	268.02	228.45
57.760	600.00	.00	.00	865.90	640.00	872.63	.00	872.73	6.02	2.74	298.08	260.78
66.110	835.00	.00	.00	866.40	310.00	870.66	.00	870.66	1.61	1.04	623.76	244.44
66.110	835.00	.00	.00	866.40	440.00	871.58	.00	871.59	1.34	1.09	833.12	379.66
66.110	835.00	.00	.00	866.40	570.00	872.47	.00	872.48	1.15	1.13	1036.02	531.86
66.110	835.00	.00	.00	866.40	640.00	872.90	.00	872.91	1.09	1.15	1136.36	614.18
74.710	860.00	.00	.00	866.40	310.00	870.75	.00	870.76	.92	.76	415.71	322.52
74.710	860.00	.00	.00	866.40	440.00	871.67	.00	871.68	.89	.86	527.67	467.53
74.710	860.00	.00	.00	866.40	570.00	872.55	.00	872.56	.82	.93	640.07	627.78
74.710	860.00	.00	.00	866.40	640.00	872.97	.00	872.99	.81	.97	696.45	712.92
84.410	970.00	.00	.00	867.10	310.00	870.89	.00	870.91	3.38	1.30	526.67	168.50
84.410	970.00	.00	.00	867.10	440.00	871.78	.00	871.80	2.01	1.18	872.70	310.42
84.410	970.00	.00	.00	867.10	570.00	872.64	.00	872.65	1.28	1.07	1256.05	504.25
84.410	970.00	.00	.00	867.10	640.00	873.07	.00	873.07	1.08	1.04	1442.10	614.54

PORTAGE CREEK

SUMMARY PRINTOUT TABLE 150

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
.000	310.00	868.88	.00	.00	.88	47.00	.00
.000	440.00	869.86	.98	.00	.86	47.00	.00
.000	570.00	870.72	.87	.00	.72	47.00	.00
.000	640.00	871.15	.42	.00	.15	47.00	.00
.500	310.00	868.89	.00	.01	.00	22.00	50.00
.500	440.00	869.85	.96	.00	.00	22.00	50.00
.500	570.00	870.71	.85	-.02	.00	22.00	50.00
.500	640.00	871.12	.42	-.03	.00	22.00	50.00
.510	310.00	868.88	.00	-.01	.00	20.00	1.00
.510	440.00	869.83	.96	-.02	.00	20.00	1.00
.510	570.00	870.68	.85	-.03	.00	20.00	1.00
.510	640.00	871.09	.41	-.03	.00	20.00	1.00
.710	310.00	868.92	.00	.05	.00	20.00	20.00
.710	440.00	869.89	.97	.06	.00	20.00	20.00
.710	570.00	870.74	.86	.06	.00	20.00	20.00
.710	640.00	871.16	.42	.07	.00	20.00	20.00
.720	310.00	868.97	.00	.05	.00	22.00	1.00
.720	440.00	869.95	.98	.06	.00	22.00	1.00
.720	570.00	870.82	.87	.08	.00	22.00	1.00
.720	640.00	871.25	.43	.09	.00	22.00	1.00
1.220	310.00	869.12	.00	.15	.00	104.81	50.00
1.220	440.00	870.16	1.05	.21	.00	114.11	50.00
1.220	570.00	871.10	.93	.27	.00	122.00	50.00
1.220	640.00	871.56	.46	.31	.00	122.00	50.00
11.320	310.00	869.35	.00	.23	.00	153.69	1010.00
11.320	440.00	870.37	1.02	.20	.00	161.97	1010.00
11.320	570.00	871.28	.92	.19	.00	172.07	1010.00
11.320	640.00	871.74	.45	.18	.00	177.07	1010.00
19.120	310.00	869.39	.00	.05	.00	175.00	780.00
19.120	440.00	870.42	1.02	.05	1.02	175.00	780.00
19.120	570.00	871.33	.92	.05	1.94	175.00	780.00
19.120	640.00	871.78	.45	.05	2.39	175.00	780.00
25.120	310.00	869.42	.00	.02	.00	175.00	600.00
25.120	440.00	870.44	1.02	.02	1.02	175.00	600.00
25.120	570.00	871.36	.92	.02	1.94	175.00	600.00
25.120	640.00	871.81	.45	.02	2.39	175.00	600.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
51.170	310.00	869.96	.00	-.03	.00	22.96	1.00
51.170	440.00	870.85	.89	-.05	.89	22.99	1.00
51.170	570.00	871.65	.79	-.09	1.68	23.00	1.00
51.170	640.00	872.06	.42	-.09	2.10	23.00	1.00
51.250	310.00	869.98	.00	.01	.00	22.96	8.00
51.250	440.00	870.89	.91	.04	.91	22.99	8.00
51.250	570.00	871.73	.84	.09	1.75	23.00	8.00
51.250	640.00	872.15	.42	.09	2.17	23.00	8.00
51.260	310.00	869.98	.00	.00	.00	24.00	1.00
51.260	440.00	870.91	.93	.03	.93	24.00	1.00
51.260	570.00	871.81	.90	.08	1.83	24.00	1.00
51.260	640.00	872.23	.42	.08	2.25	24.00	1.00
51.760	310.00	870.14	.00	.15	.00	133.00	50.00
51.760	440.00	871.12	.98	.20	.98	133.00	50.00
51.760	570.00	872.06	.94	.25	1.92	133.00	50.00
51.760	640.00	872.50	.45	.27	2.37	133.00	50.00
57.760	310.00	870.35	.00	.21	.00	52.60	600.00
57.760	440.00	871.29	.94	.17	.94	59.65	600.00
57.760	570.00	872.19	.91	.14	1.85	66.93	600.00
57.760	640.00	872.63	.43	.12	2.28	71.28	600.00
66.110	310.00	870.66	.00	.31	.00	225.31	835.00
66.110	440.00	871.58	.93	.30	.93	227.16	835.00
66.110	570.00	872.47	.89	.28	1.82	228.94	835.00
66.110	640.00	872.90	.43	.28	2.25	229.82	835.00
74.710	310.00	870.75	.00	.10	.00	119.69	860.00
74.710	440.00	871.67	.91	.09	.91	125.21	860.00
74.710	570.00	872.55	.88	.08	1.79	130.51	860.00
74.710	640.00	872.97	.43	.07	2.22	133.09	860.00
84.410	310.00	870.89	.00	.14	.00	355.55	970.00
84.410	440.00	871.78	.89	.12	.89	430.73	970.00
84.410	570.00	872.64	.86	.10	1.75	445.00	970.00
84.410	640.00	873.07	.42	.09	2.17	445.00	970.00
91.710	310.00	871.34	.00	.45	.00	40.31	730.00
91.710	440.00	871.97	.63	.18	.63	44.61	730.00
91.710	570.00	872.68	.71	.04	1.34	49.53	730.00
91.710	640.00	873.06	.38	.00	1.72	51.00	730.00
92.220	310.00	871.58	.00	.24	.00	26.00	50.00
92.220	440.00	872.19	.60	.22	.60	26.00	50.00
92.220	570.00	872.84	.65	.16	1.26	26.00	50.00
92.220	640.00	873.19	.35	.12	1.61	26.00	50.00

SUMMARY OF ERRORS AND SPECIAL NOTES

THIS RUN EXECUTED 06/20/86 09:33:39

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  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55,56
  IBM-PC-XT VERSION 1.1
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00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: PUTNAM

3) WATERCOURSE: PORTAGE RIVER PATTERSON LK.
HONEY CK HI-LAND LK

4) DOCUMENT TYPE: DOCUMENTATION - ANALYSIS

00BREAK00

TOWNSHIP OF PUTNAM FLOOD INSURANCE STUDY

Prepared For:

Federal Emergency Management Agency
Contract No.: EMW-84-C-1592

Prepared By:

Michigan Department of Natural Resources
Engineering-Water Management Division
Lansing, Michigan

June, 1986

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HYDRAULIC ANALYSIS
Township of Putnam
Livingston County

Introduction

Hydraulic analyses were prepared for Honey Creek and the Portage River to develop the 10-, 50-, 100-, and 500-year flood profiles and delineations for Putnam Township. A floodway was computed, assuming a maximum surcharge of .1 foot. The analysis for Honey Creek begins downstream of Darwin Road and continues to the upstream corporate limit, a total length of about 5500 feet. The detailed study limits for the Portage River begins about 2,400 feet downstream of the Hi-Land Lake Dam and continues up to the dam.

The 10-, 50-, 100-, and 500-year flood levels will also be developed for Hi-Land Lake and Patterson Lake.

Background

The U. S. Army Corps of Engineers HEC-2 computer program (Reference #1) was used in developing the water surface profiles for Honey Creek and the Portage River.

The bridge and cross sectional information was obtained by the Survey Branch of the Engineering-Water Management Division of the Michigan Department of Natural Resources. The survey information was supplemented with 2-foot contour interval topography flown in March 1985, and obtained from Abrams Aerial Survey Corporation. (Reference #2)

Table 1 provides a cross reference between the HEC-2 model and the FIS mapping.

The channel and overbank distances between cross sections and structures were obtained from the topography which has a scale of 1" = 400 feet. Downstream of the detailed study limits of the Portage River, the distances were obtained from the Pinckney, Michigan U.S.G.S. Quadrangle. (Reference #3).

Honey Creek
Hydraulic Analysis

Starting Conditions

The profiles were begun about 2,000 feet downstream of Darwin Road. Convergence profiles were developed, which indicated that errors in the starting water surface elevation would be eliminated downstream of Darwin Road. As a result, the slope-area method of beginning the profiles provides a reasonable starting water surface elevation.

A plot of the convergence profiles is provided in Appendix D.

Coefficients

Based upon field inspections of the reaches analyzed, the following coefficients have been selected.

Manning's roughness coefficients (References #5 & #6) for the stream channel ranged from .03 to .05, and from .03 to .12 in the overbanks. These values were based upon late spring/early summer conditions.

Contraction and expansion coefficients (Reference #1) of .1 and .3, respectively, were used for smooth transitions. In the vicinity of obstructions, these values were increased to .3 and .5, respectively. At the farm lane culvert the values were increased to .6 and .8 to better define the loss occurring at this restriction.

Bridge Losses

The energy losses due to bridges and dams were computed using HEC-2 Special Bridge and Normal Bridge Routines (Reference #1). The results were verified by hand calculations.

In the vicinity of bridges and other obstructions, flow was considered to contract at a 1:1 ratio and expand at a rate of 4:1.

The farm lane culvert (Section 62.73-62.94) was determined to be functioning under inlet control. To obtain reasonable losses at the structure, it was necessary to increase the expansion and contraction coefficients to .8 and .6, respectively.

Farm Lane Crossing (Section 62.73-62.95)

The crossing consists of a 7.5 foot CMP, without a headwall. Due to the inlet configuration, the short culvert length, and the low tailwater, the culvert is functioning under inlet control. (References 7 & 8). A rating curve at the structure was computed by hand, and the special bridge coefficients input into HEC-2 were adjusted so results would compare with hand calculations. (See Appendix E).

For the 10-,50-, and 500-year flows, the water surface elevation upstream of the structure was calculated by hand and input at cross section 63-45, using the X5 card.

Impoundment Structure (Section 28.28-29.73)

The small impoundment upstream of Darwin Road has an outlet consisting of twin 6 foot diameter concrete pipes with plates on the upstream ends which control the impoundment level. The plates result in the pipes operating under inlet control (the pipe capacity being greater than the inlet capacity). The Special Bridge Routine was used to model the structure. A rating curve was developed by hand calculations, and the Special Bridge variables were adjusted to provide HEC-2 results matching the rating curve.

Appendix F contains the hand calculations used in analyzing the structure.

Past Flooding

There is currently little flood-prone development along Honey Creek, as a result, past flood damage has been minimal.

In June 1986, a severe thunderstorm front moved through Mid-Michigan. Lansing received 5 to 6 inches of rain in a 24-hour period, while portions of Macomb and Oakland county receive 3½ to 4 inches of rain. However, Hamburg about 8 miles east of Putnam Township, reported .48 inches of rain. Rainfall information was not available for Putnam Township. A field investigation of the area indicated minimal flows on Honey Creek, estimated to be about 30 to 40 cfs. It appears the intense storm system did not hit the Honey Creek basin.

Hydrology

The peak discharge-frequency relationships were established by hydrologic analyses using the Soil Conservation Service's method for computing flood discharges (Reference 10). In addition, the regional regression method (Reference 11) was used as a comparison.

Following are the discharges used in the hydraulic analysis.

Flooding Source and Location	Drainage Area (Sq Miles)	Peak Discharges (CFS) 10-yr	50-yr	100-yr	500-yr
Honey Creek d/s of Darwin Rd.	27.3	200	300	350	490

Structural Measures for Reducing Flood Stages

The culvert at the farm lane crossing of Honey Creek results in head loss of about 2½ feet during the 100-year flow of 350 cfs. If the road is ever improved or the culvert replaced, it would be advisable to replace the culvert with a structure that provides greater waterway area at relatively shallow depths of flow.

Table 1
Putnam Township Flood Insurance Study
Honey Creek
Cross Section Reference Table

HEC-2 Input	FIS Map Designation	Description
0	A	2070 ft. d/s of Darwin Rd.
10.2	B	Channel shape from XSEC A overbanks obtained from topo
16.8	C	350 ft. d/s of Darwin Rd., channel shape from XSEC D
19.8	D	50 ft. d/s of Darwin Road d/s limit of detailed study
20.3	-	Darwin Rd., twin 9 ft. 6 in. by 6 ft. 5 in. CMP, 37 ft. long
21.18	E	50 ft. u/s of Darwin Rd.
22.18	F	150 ft. u/s of Darwin Rd.
27.28	G	
28.28	H	d/s of impoundment structure twin 6 ft. RCCP, weirs at u/s end of pipes control outlet
29.73	I	u/s of impoundment structure
35.53	J	
40.63	K	
47.93	L	
52.23	M	
61.23	N	150 ft. d/s of Farm Lane
62.23	O	50 ft. d/s of Farm Lane
62.73	-	Farm Lane 7.5 ft. CMP 20 ft. long
63.45	P	50 ft. u/s of Farm Lane
64.95	Q	960 ft. d/s of Pinckney Rd.
70.05	R	450 ft. d/s of Pinckney Rd.
74.05	S	50 ft. d/s of Pinckney Rd.
75.1	T	u/s of Pinckey Rd., u/s limit of detailed study

Table 2
Summary of Flood Elevations
Township of Putnam Flood Insurance Study
Honey Creek

Cross Section Designation	Location	Flood Elevations, Feet Above NGVD 10-year	50-year	100-year	500-year
	DISCHARGE (cfs)	200	300	350	490
A	2070 ft. d/s of Darwin Rd.	855.2	855.9	856.1	856.7
B	960 ft. d/s of Darwin Rd.	856.9	857.5	857.7	858.2
D	50 ft. d/s of Darwin Rd.	858.6	859.0	859.2	859.6
E	50 ft. u/s of Darwin Rd.	858.9	859.6	860.0	860.9
G	710 ft. u/s of Darwin Rd.	860.1	860.7	860.9	861.6
H	d/s of Impoundment	860.2	860.8	861.0	861.6
I	u/s of Impoundment	863.3	863.7	863.8	864.0
K		863.4	863.7	863.8	864.1
M	1050 ft. d/s of Farm Lane	863.9	864.4	864.6	865.0
N	150 ft. d/s of Farm Lane	864.4	864.9	865.5	866.0
O	50 ft. d/s of Farm Lane	864.4	864.9	865.6	866.1
P	50 ft. u/s of Farm Lane	866.0	867.6	868.1	868.4
R	660 ft. u/s of Farm Lane	866.1	867.6	868.1	868.4
S	50 ft. d/s of Pinckney Rd.	866.2	867.7	868.2	868.5
T	u/s of Pinckney Rd.	866.3	867.9	868.5	868.9

Portage River
Hydraulic Analysis

Starting Conditions

The profiles were begun about 50 feet downstream of Patterson Lake Road, about 9,600 feet downstream of the Hi-Land Lake Dam. The starting water surface elevations were estimated using the slope-area method. The slope was estimated using the slope of the water-surface at the time of the survey.

Coefficients

Based upon field inspections of the reaches analyzed, the following coefficients have been selected.

Manning's roughness coefficients (References #5 & #6) for the stream channel was estimated to be .045, and .1 in the overbanks. These values were based upon late spring/early summer conditions.

Contraction and expansion coefficients (Reference #1) of .1 and .3, respectively, were used for smooth transitions. In the vicinity of obstructions, these values were increased to .3 and .5, respectively.

Bridge Losses

The energy losses due to bridges were computed using the HEC-2 Normal Bridge Routing (Reference #1).

In the vicinity of bridges and other obstructions, flow was considered to contract at a 1:1 ratio, and expand at a rate of 4:1.

Hi-Land Lake Dam

A rating curve was developed at the dam using the information obtained from the County Drain Commissioner. Since there is a legal lake level on Hi-Land Lake, the operator tries to maintain the level. From November 2 to March 14, the legal lake level is established as 882.2, from March 15 to November 1, the legal lake level is 883.0. The rating curve assumes an initial stop-log setting of 881.4 (NGVD) which maintains a water level of 882.2. When the water level reaches 882.7, one stoplog is removed from each of the three bays, which effectively lowers the crest of the dam .5 feet. For each .5 foot increase in the lake level, a stoplog (.5 feet wide) is removed from each bay.

The flood elevations for Hi-Land Lake were computed by two methods. First the rating curve was developed as noted above. Next, lake levels from the lake gage (Reference 13) were analyzed and a stage/frequency relationship was developed. For the 10-year flood elevation on Hi-Land Lake, the value obtained from the lake gage analysis was considered to be most reasonable. It is felt that the gage analysis best reflects how the lake has been regulated for the more frequent floods. The rating curve and the gage analysis are within .1 foot for the 50-, 100-, and 500-year flood elevations. The values from the rating curve have been selected for use.

In March 1982, the old dam at this site failed causing flooding problems downstream. The current dam was constructed with greater hydraulic capacity than the previous dam. The maximum lake level of 883.8 occurred in February 1968, before the construction of the new dam.

Past Flooding

As indicated above, the failure of the Hi-Land Lake Dam resulted in flooding problems downstream. The failure of the dam forced the evacuation of the trailer park immediately downstream of the dam. About 3.1 miles downstream a U.S.G.S. gaging station recorded the flood of record as a result of the failure. The rating curve for the gage indicated a discharge of about 600 cfs. Immediately downstream of the dam, the flood wave would have likely produced a discharge greater than the 100-year discharge.

In 1947, the maximum lake level was recorded on Patterson Lake. The flood produced a discharge of 529 cfs at the gage about 3.1 miles downstream of the dam. (The 100-year discharge has been estimated to be 570 cfs).

Hydrology

The peak discharge-frequency relationships for the Portage River were estimated using the gage analysis of gage #1725.

Following are the discharges used in the hydraulic analysis.

Flooding Source and Location	Drainage Area (Sq Miles)	Peak Discharges (CFS) 10-yr	50-yr	100-yr	500-yr
Portage River d/s of Hi-Land Lake Dam	77	310	440	570	640

Putnam Township Flood Insurance Study
Portage River
Cross Section Reference Table

HEC-2 Input	FIS Map Designation	Description
0.00	A	50 ft. d/s of Patterson Lake Rd.
.51	B	Patterson Lake Rd. Bridge, 20 ft. concrete slab
.71	C	u/s of Patterson Lake Rd. Bridge
1.22	D	50 ft. u/s of bridge
11.32	E	Cross Section cut from topography
19.12	F	
25.12	G	Repeat of F
30.42	H	
36.75	I	50 ft. d/s of private road bridge
37.86	J	50 ft. u/s of private road
45.66	K	830 ft. u/s of private road
50.66	L	50 ft. d/s of private walkway
51.76	M	50 ft. u/s of private walkway
57.76	N	650 ft. u/s of private walkway
66.11	O	d/s limit of detailed study
74.71	P	
84.41	Q	
91.71	R	50 ft. d/s of Patterson Lake Rd.
92.70	S	20 ft. u/s of Patterson Lake Rd.
96.30	T	d/s of Hi-Land Lake Dam

Table 4
Summary of Flood Elevations
Township of Putnam Flood Insurance Study
Portage River

Cross Section Designation	Location	Flood Elevations, Feet Above NGVD 10-year	50-year	100-year	500-year
A	d/s Patterson Lk. Rd.	868.9	869.9	870.7	871.2
D	50 ft. u/s Patterson Lake Rd.	869.1	870.2	871.1	871.6
F	1790 ft. u/s Patterson Lake Rd.	869.4	870.4	871.3	871.8
I	50 ft. d/s of private Rd.	869.6	870.6	871.5	871.9
J	50 ft. u/s of private Rd.	869.6	870.6	871.5	872.0
L	50 ft. d/s of private walkway	870.0	870.9	871.8	872.2
M	50 ft. u/s of private walkway	870.1	871.1	872.1	872.5
P		870.8	871.7	872.6	873.0
R	50 ft. d/s of Patterson Lake Rd.	871.3	872.0	872.7	873.1
S	20 ft. u/s of Patterson Lake Rd.	871.9	872.6	873.3	873.6
T	d/s of Hi-Land Lake Dam	872.0	872.7	873.5	873.8

Patterson Lake

The flood elevations for Patterson Lake were determined from analysis of 24-years of lake level records. (Reference 13). The record high on Patterson Lake occurred in April 1947, with a stage of 886.4. The 100-year floodplain elevation of the lake was computed to be 886.7.

Floodway Development

The floodway for Honey Creek and the Portage River was determined using the HEC-2 encroachment method #4 (Reference #1). This encroachment option eliminates conveyance from each side of the floodplain until a surcharge of no more than .1 foot is obtained. In some areas, due to manmade and natural restrictions, the floodway has been determined by delineating smooth curvilinear lines with 4:1 expansion of flow and a 1:1 contraction of flow.

Results

The hydraulic analysis has computed the 10-, 50-, 100-, and 500-year flood elevations for Honey Creek and the Portage River. When the 100-year and 500-year floodplain limits coincide, only the 100-year floodplain boundary has been delineated on the work maps in Appendix A. The floodway portion of the 100-year floodplain was developed and is also plotted on the work maps in Appendix A.

Tables 2 and 4 contain summaries of 10-, 50-, 100-, and 500-year flood elevations at selected cross-sections. The resulting flood profiles are plotted in Appendix B, and are based on unobstructed flow. The flood elevations on the profiles are considered valid only if hydraulic structures remain unobstructed, operate properly and do not fail.

The summary of the lake elevations are shown on Table 5.

Table 5 = Summary of Lake Elevations

Flooding Source and Location	Drainage Area (Sq Miles)	Peak Elevation (FEET NGVD[1]) 10-yr	50-yr-	100-yr	500-yr
Hi-Land Lake	77	883.6	883.7	883.8	884.0
Portage Lake[2]	522	851.5	852.0	852.5	853.6
Silver Lake[2]	1.1	875.3	875.4	875.5	875.6
Halfmoon Lake[2]	72	884.6	885.2	885.4	886.0
Patterson Lake	69	885.7	886.4	886.7	887.0

[1] National Geodetic Vertical Datum of 1929

[2] Peak Elevations from Dexter Township FIS (Reference 12)

Appenxix C

Elevation Reference Marks
Note: All Elevations Referenced to National Geodetic Vertical Datum of 1929

Elevation Reference Mark	Elevation (FEET, NGVD)	Description
#12	886.52	PK nail and tag in west face of power pole east side of Pinckney Road, 3/16 mile south of bridge over creek at village limits (first pole south of gravel drive to east).
#13	893.76	PK nail and tag in east face of power pole, west side of Darwood Road, 250 feet south of intersection of Darwood and Darwin.
#14	860.68	Top of nut and bolt of east twin culvert, south side of Darwin Road.
#15	867.65	120d spike with tag in north face 14-inch Oak, 100 feet west of centerline of driveway to house #1360 Darwin Road.
#16	867.81	Chiseled "X" on south end of corrugated metal pipe, Farm Lane.

Appenxix C

Elevation Reference Marks
Note: All Elevations Referenced to National Geodetic Vertical Datum of 1929

Elevation Reference Mark	Elevation (FEET, NGVD)	Description
#1	880.30	Chiseled "X" on top of eye bolt at west end of concrete bridge rail south side Patterson Lake Road.
#2	884.89	Chiseled square on northwest corner of southwest wingwall of Hi-Land Lake Dam.
#3	877.61	120D spike in north side of first power pole east of the intersection of Kelly Road and Patterson Lake Road, south side of the road.
#4	895.72	PK nail, nut and tag in north root of 12-inch Oak at the intersection of Patterson Lake Road and West Shore Drive.
#5	903.39	PK nail and tag in east side of campground sign on the west side of Glenbrook Road.
#6	892.35	Top bolt on west side of road at south end of steel guard rail at Glenbrook Road.
#7	886.10	PK nail and tag in west face of power pole, south of house at 12101 Max Drive.
#8	889.98	Chiseled "X" top-most northerly bolt on south end of corrugated metal pipe at Albert Street crossing of outlet to Patterson Lake.
#9	900.12	Top pipe in one-foot diameter cement post on Patterson Drive at house at #11106.
#10	926.86	Railroad spike in 16-inch Walnut at Patterson Drive and Patterson Lake Road.
#11	924.18	120d spike in west side of 40-inch Oak, 500 feet west of entrance to Fralicks Tree Farm, north side of Patterson Lake Road, east of Hell.

References and Bibliography

1. U. S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-2 Water Surface Profiles; Davis, California, September 1982

2. Abrams Aerial Survey Corporation, Aerial topographic Map: Pinckney, Michigan; Scale 1:4800, Contour Interval 2 feet, March 1985

3. U. S. Geological Survey, 7.5 Minute Series Topographic Maps, Contour Interval 10 feet, Pinckney, Michigan, 1965, photo-revised

4. U. S. Geological Survey, 7.5 Minute Series topographic Maps, Contour Interval 10 feet, Gregory, Michigan, 1973

5. Chow, Ven Te, Open-Channel Hydraulics, McGraw-Hill Book Company, New York, 1959

6. U. S. Department of Agriculture, Soil Conservation Service, Guide for Selecting Roughness Coefficient 'n' Values for Channels, Lincoln, Nebraska, December 1963

7. Bureau of Public Roads, Capacity Charts for the Hydraulic Design of Highway Culverts, Hydraulic Engineering Circular No. 10, Washington, D. C., March 1965

8. Bureau of Public Roads, Hydraulic Charts for the Selection of Highway Culverts, by L. A. Herr, Hydraulic Engineering Circular No. 5, Washington, D. C., U. S. Government Printing Office, December 1965

9. U. S. Geological Survey, Techniques of Water Resources Investigations of the United States, Measurement of Peak Discharge at Culverts by Indirect Methods, Book 3, Chapter A3, Washington, D. C., 1969

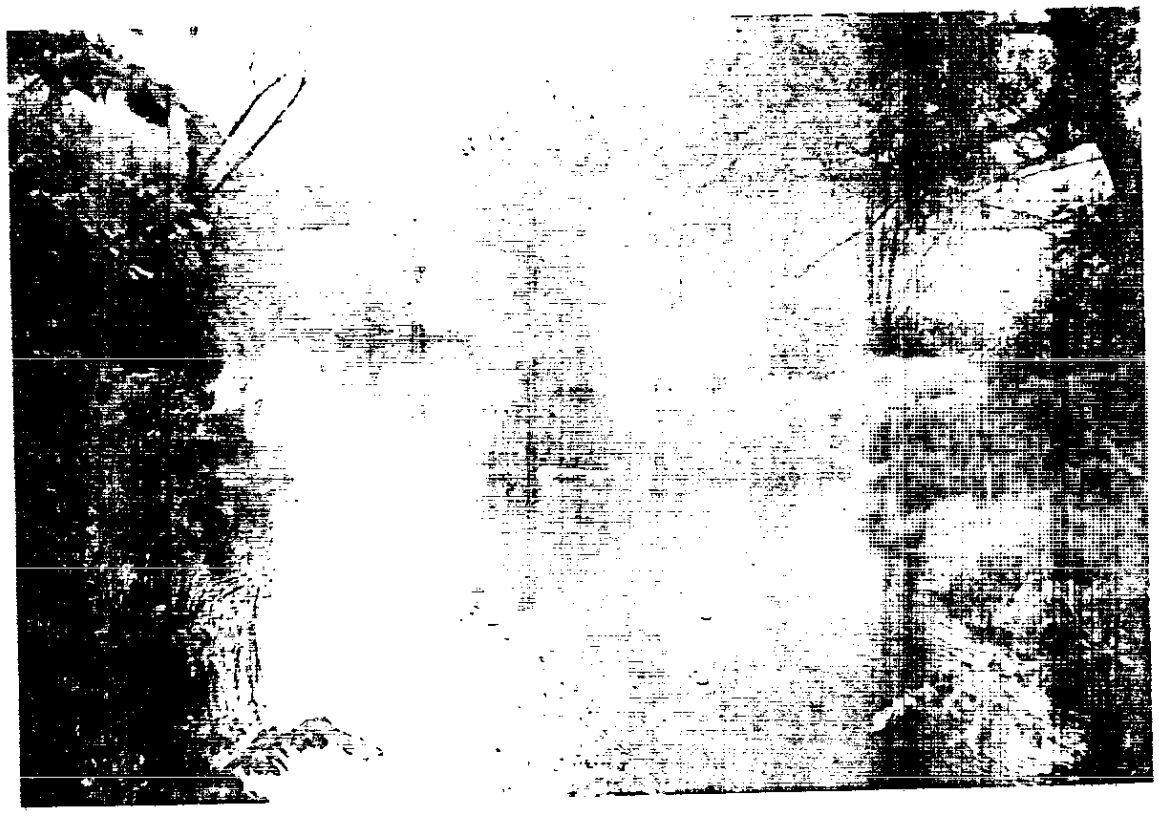
10 Sorrell, Richard C., SCS WD-21 Method, Michigan Department of Natural Resources, Engineering-Water Management Division, February 1985

11. U. S. Geological Survey, Statistical Model for Estimating Flow Characteristics of Michigan Streams, Water Resources Investigations Report 84-4207, 1984

12. Federal Emergency Management Agency, Township of Dexter Flood Insurance Study, Washtenaw County Michigan, Unpublished

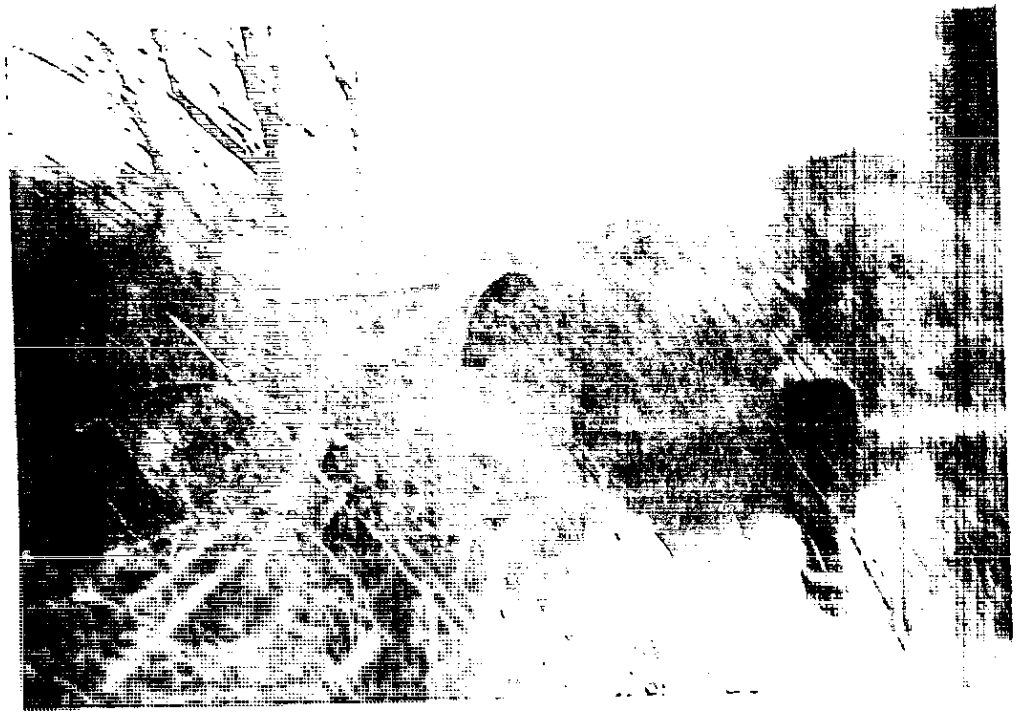
13. U. S. Department of the Interior, Geological Survey, Compilation of Data for Michigan Lakes, Lansing, Michigan, June 1970.

Looking upstream from Farm Lane



Looking Downstream From Farm Lane

Farm Lane Rd - Honey Creek



Upstream from Farm Lane Rd

Looking downstream - Darwin Rd

Downstream face - Darwin Rd

Honey [illegible]

Darwin Road

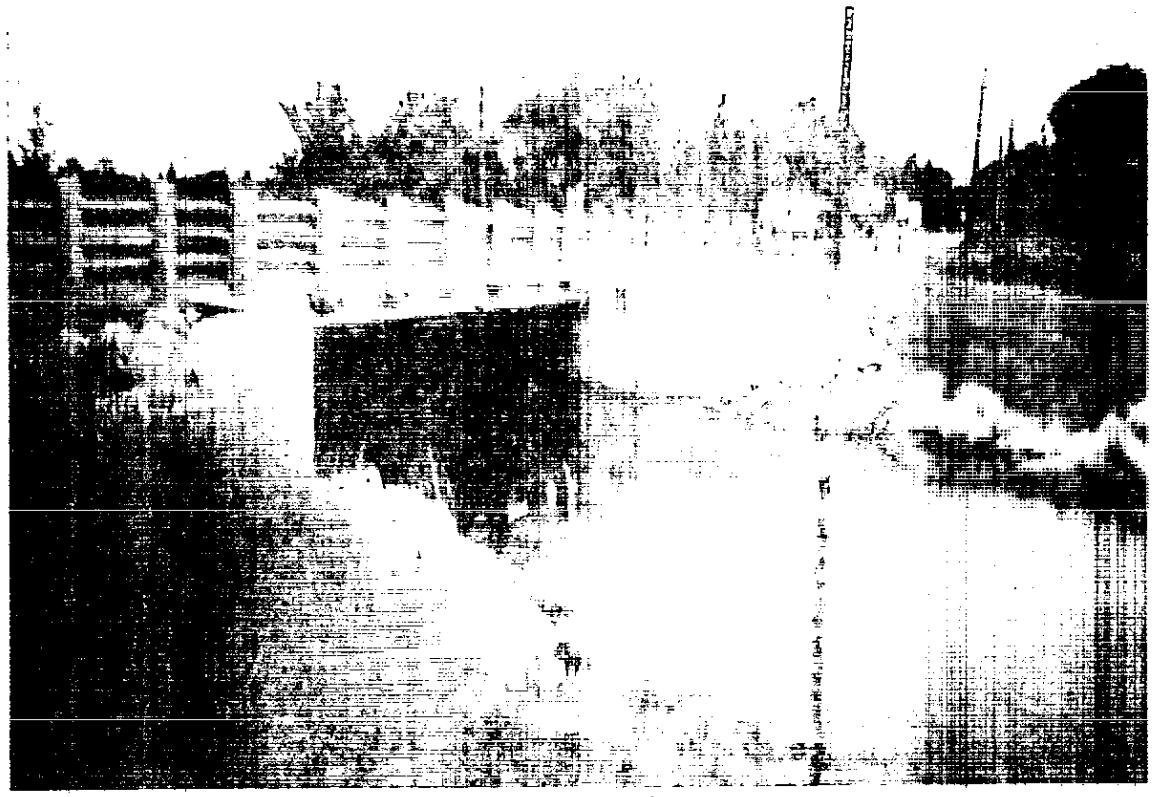
Looking upstream at XSEC F

Horse Creek

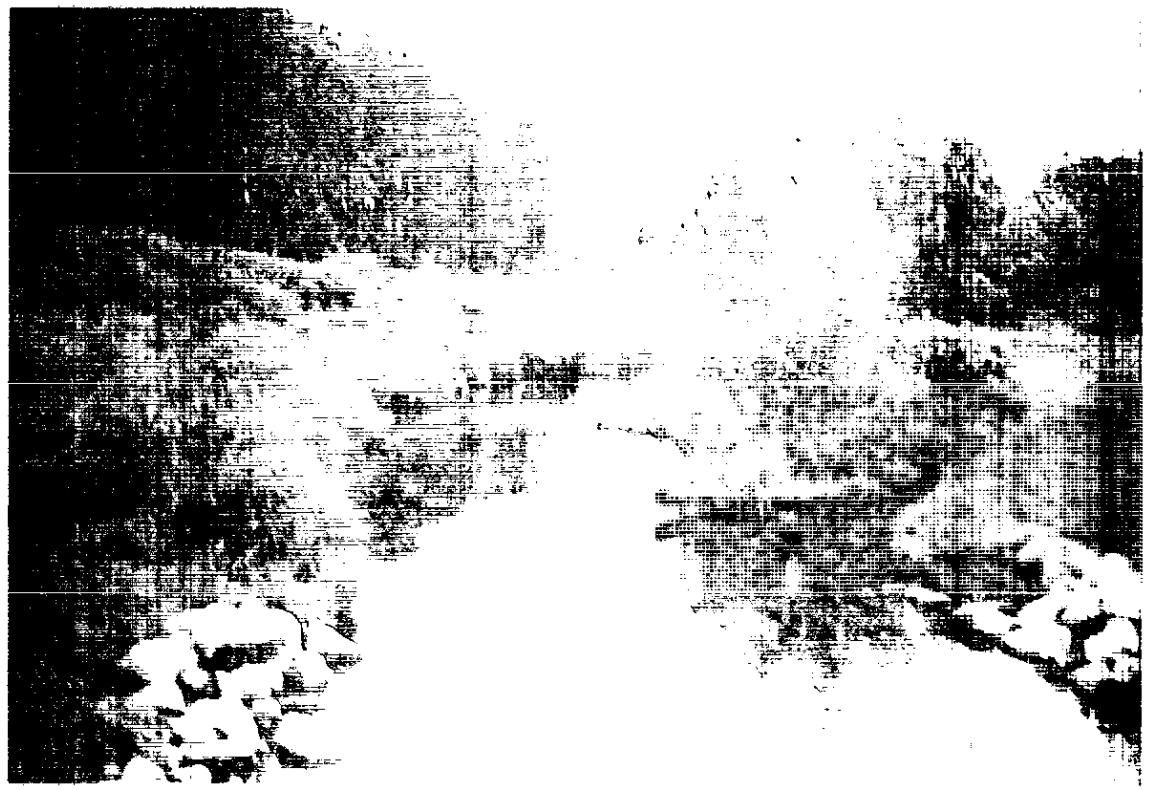
Upstream from Darwin

Looking Upstream from Darwin

[illegible]

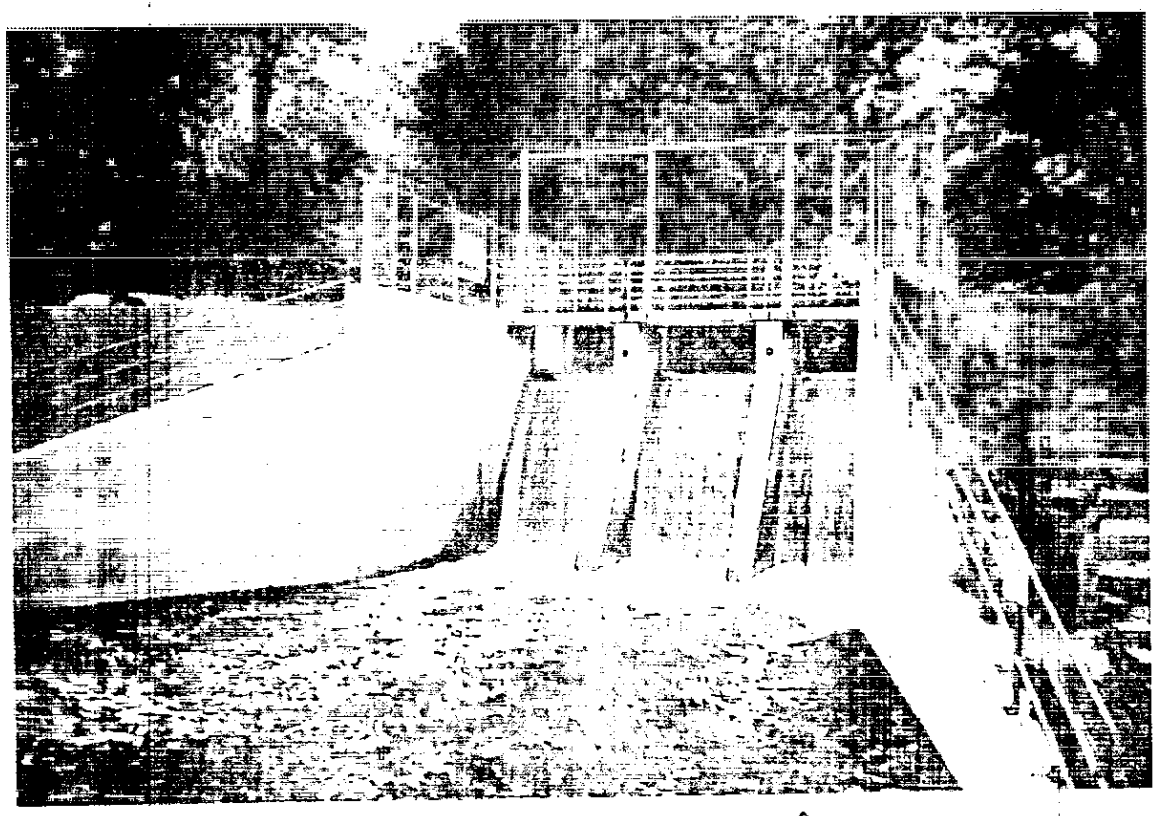


Downstream [illegible] Road

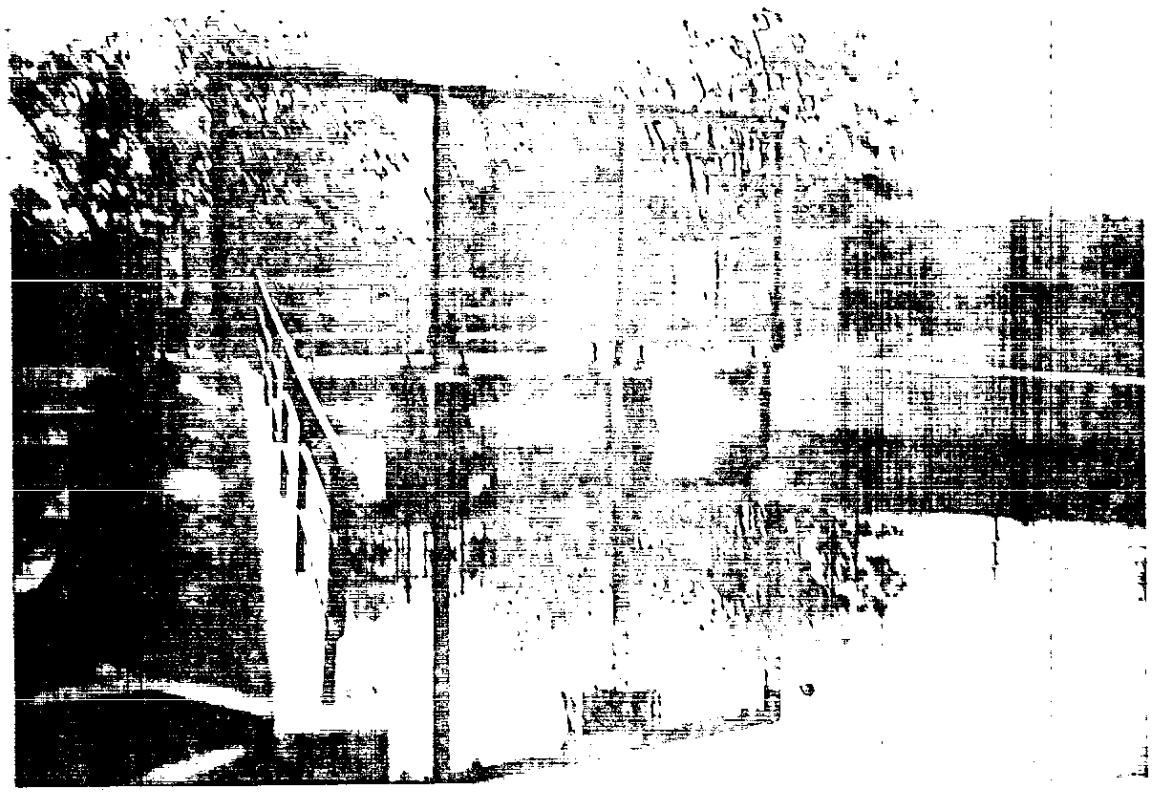


Looking Downst[illegible] Road

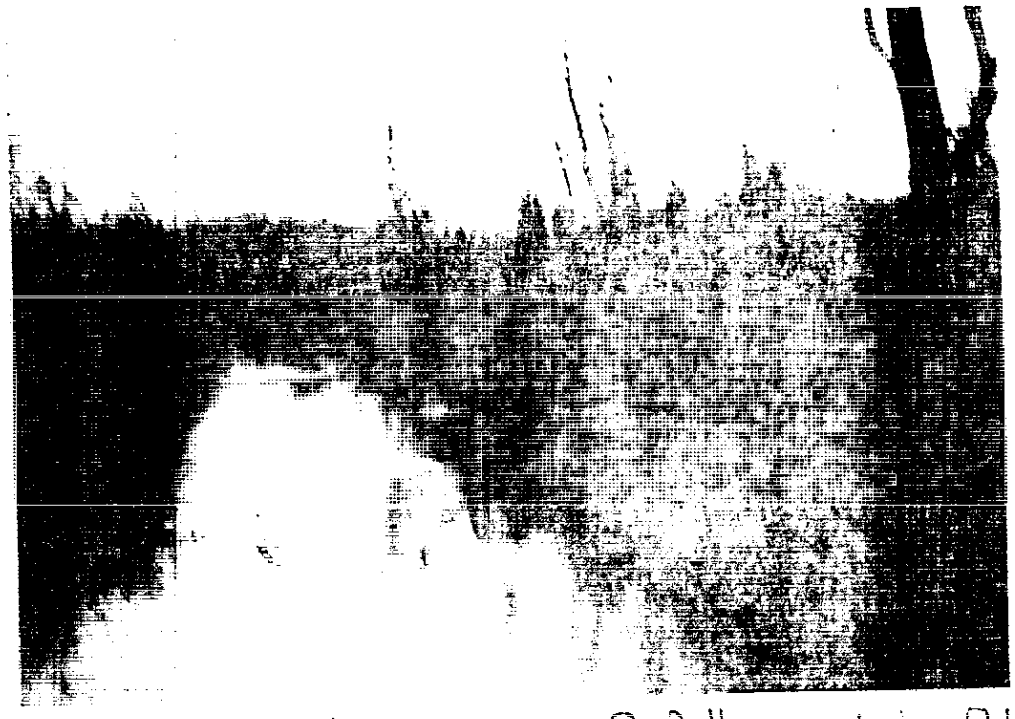
Pinckney Road
Honey Creek



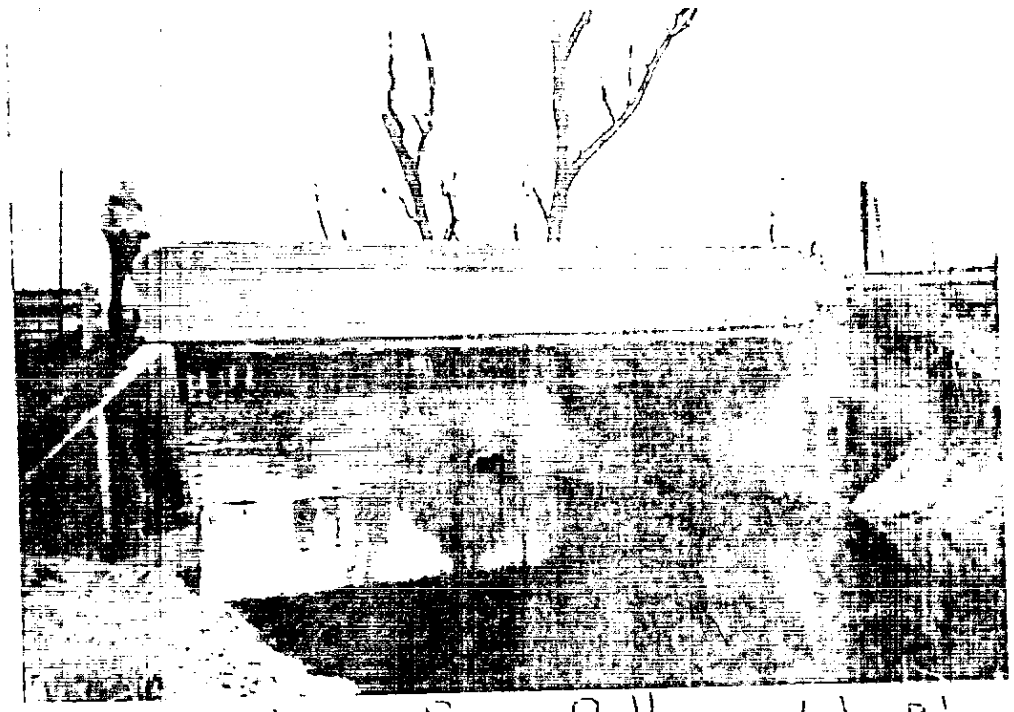
[illegible] Dam



Portage [illegible]



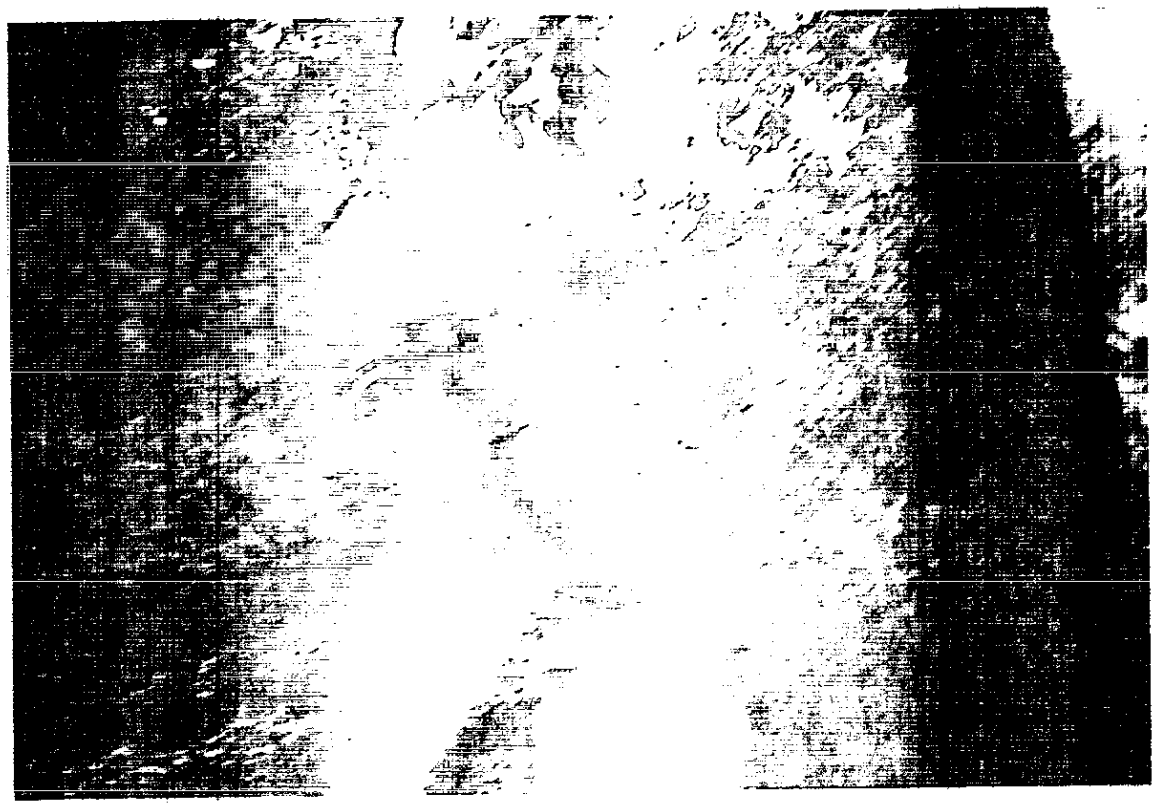
Looking downstream of Patterson Lake Rd
XSEC A



Upstream face - Patterson Lake Rd
XSEC C+D

Portage River

Between



Looking

Looking

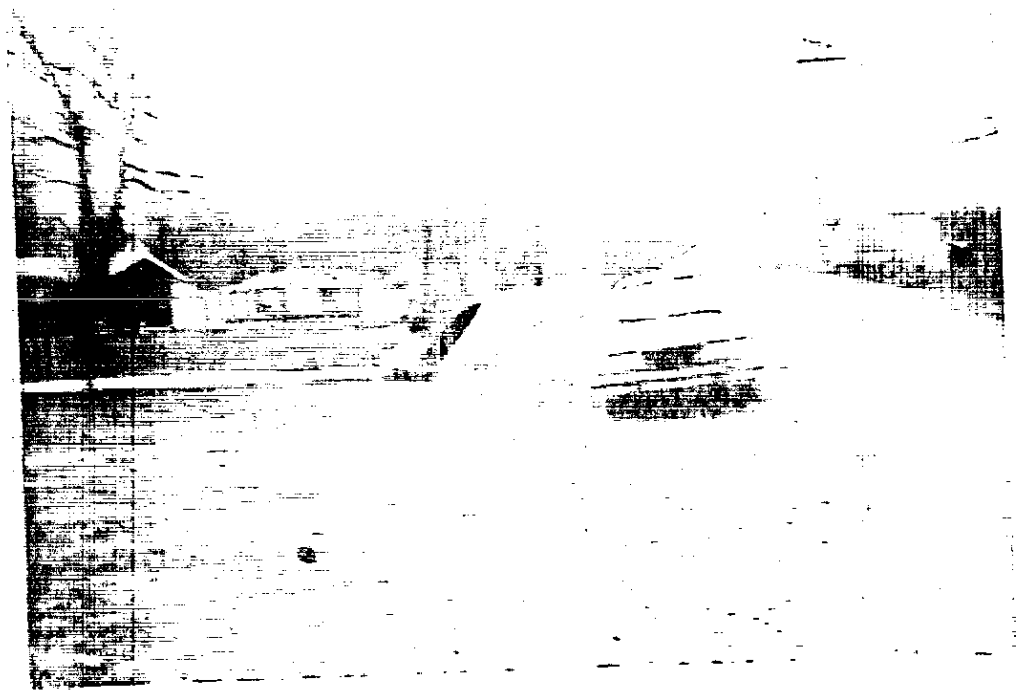
Patterson Lake Rd

Portage

Looking upstream from Patterson Lake Rd

Portage River

Patterson Lake - Outlet Structure



Albert Street Pattenson Lake

Putnam Twp FIS

Patterson Lake - Livingston County

Gage Analysis - Weibul plot

Year	Gage Height	m	Gage Height	$\frac{100m}{n}$
45	5.0	1	6.9	4
46	4.6	2	6.05	8
47	6.4	3	5.65	12
48	5.45	4	5.65	16
49	5.05	5	5.45	20
50	6.05	6	5.25	24
51	5.0	7	5.05	28
52	4.8	8	5.0	32
53	4.2	9	5.0	36
54	4.15	10	4.9	40
55	4.45	11	4.8	44
56	5.65	12	4.8	48
57	4.0	13	4.8	52
58	4.05	14	4.8	56
59	4.9	15	4.75	60
60	5.25	16	4.7	64
61	4.8	17	4.6	68
62	4.8	18	4.45	72
63	4.45	19	4.45	76
64	3.9	20	4.2	80
65	4.8	21	4.05	84
66	4.0	22	4.0	88
67	4.7	23	4.0	92
68	5.65	24	3.9	96

Pettison Lake
Hibbard Twp

From Weibul Plot

Freq	Gage Height	Lake Level
10-yr	5.84	885.84
50-yr	6.42	886.42
100-yr	6.72	886.72
500-yr	6.96	886.96

Putnam Twp FIS
Patterson

Log Pearson Analysis

$\bar{X} = .6833$ $S = .0565$ $C_S = \frac{a}{S^3} = \frac{.000051}{(.0565)^3} = .282$

		10yr	50yr	100yr	500yr
	K	1.508	2.207	2.551	2.839
$X = \bar{X} + KS$	X	.7572	.8017	.8263	.8438
Gage Ht = 10^X		5.72	6.42	6.70	7.00
Lake Level = 880.0 + GH		885.7	886.4	886.7	887.0

The suggested flood elevations for Patterson Lake are:

Frequency	Gage Height	Lake Level
10-yr	5.7	885.7
50-yr	6.4	886.4
100-yr	6.7	886.7
500-yr	7.0	887.0

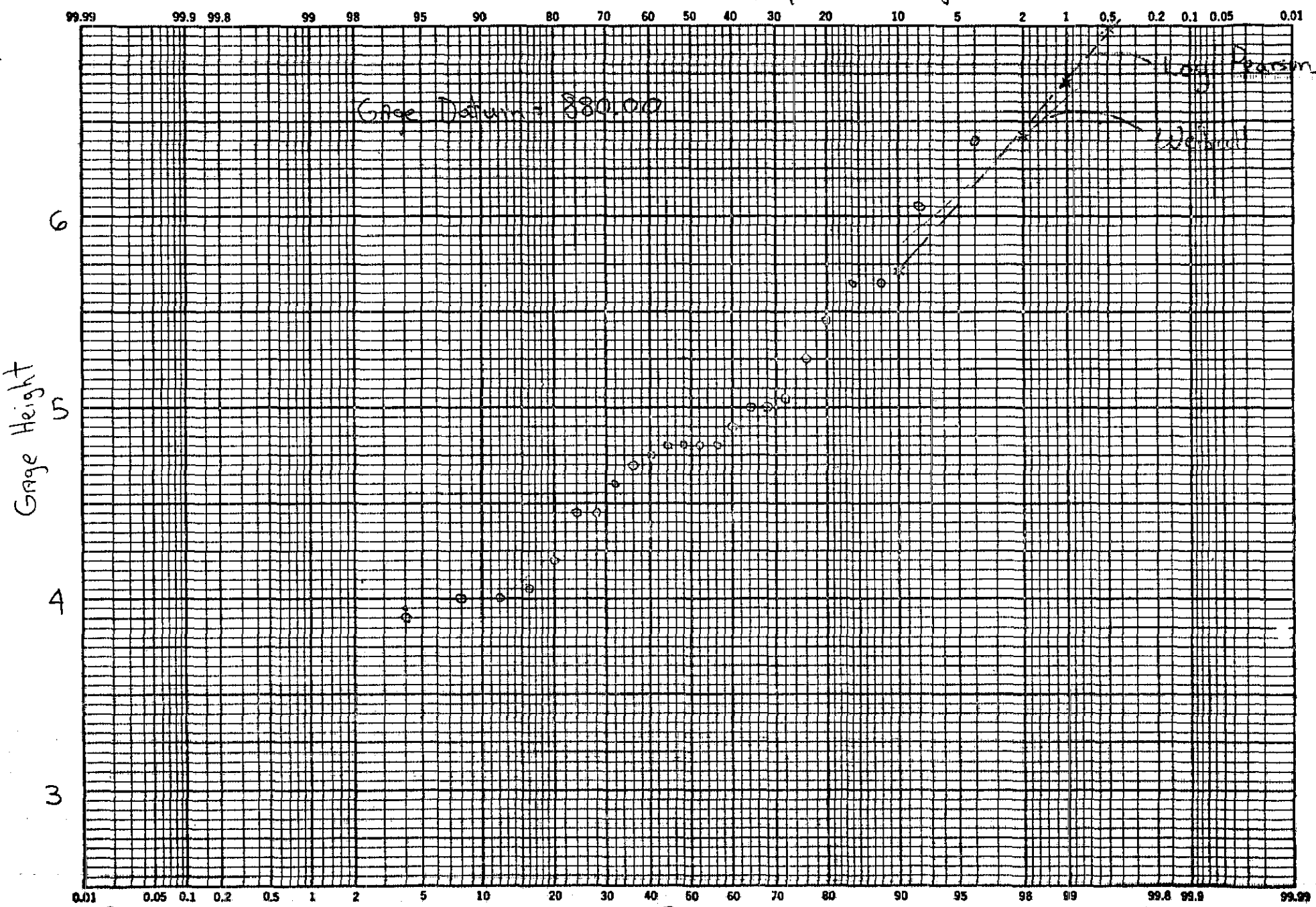
PROBABILITY X 90 DIVISIONS

Patterson Lake - Livingston County

4/4

R 4505

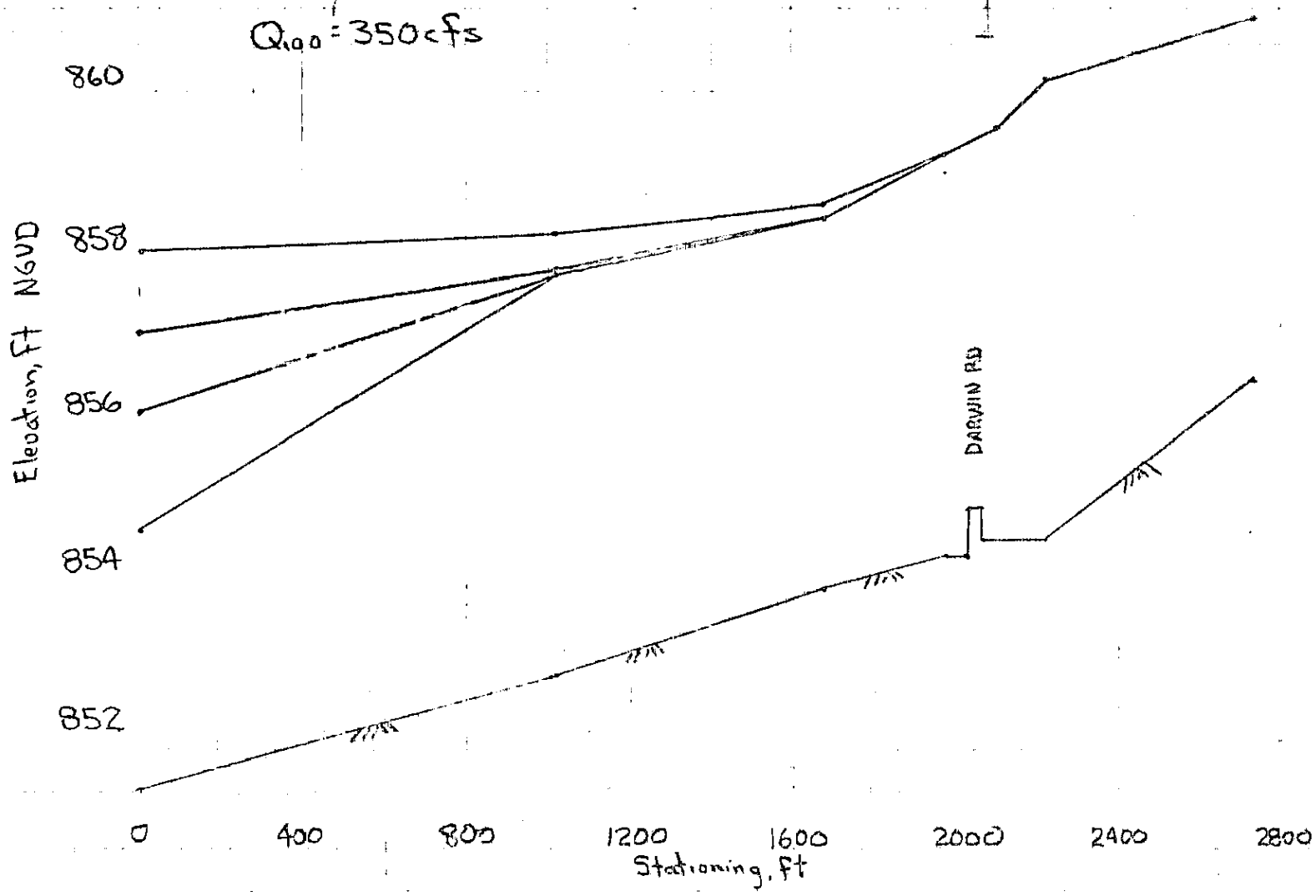
Percent, equal to or greater than



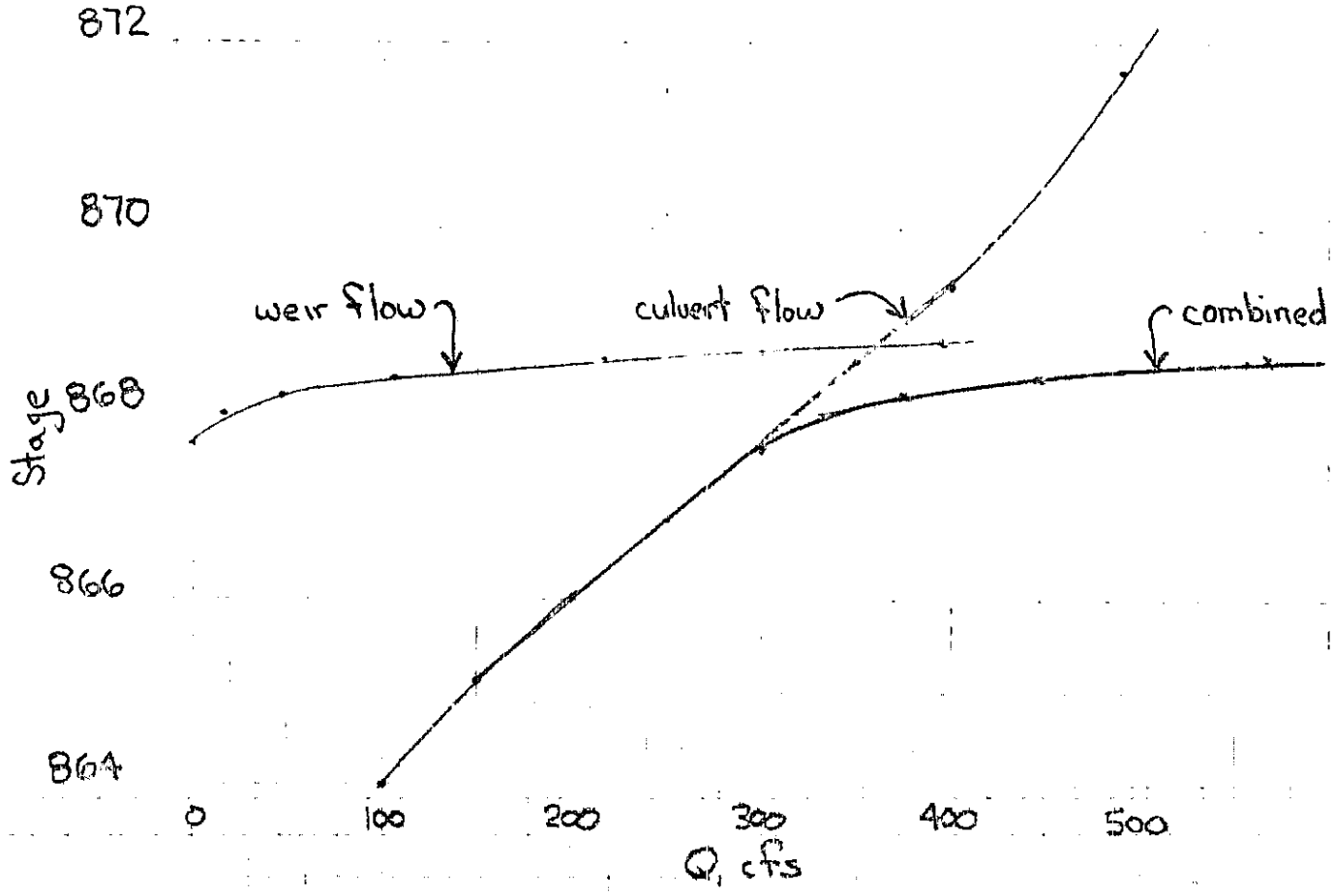
Putnam Twp FIS

Honey Creek - Convergence Profile

$Q_{100} = 350$ cfs



Putnam Twp FIS
Honey Creek
Farm Lane



Putnam Twp FIS

Honey Creek

Farm Lane Rating Curve

Inlet Control (Tailwater has no effect on upstream stage)

	Q	HW/D*	HW**	Elev***
	100	.48	3.60	864.0
	150	.63	4.73	865.13
10yr	200	.75	5.63	866.03
	250	.86	6.45	866.85
50yr	300	.96	7.20	867.60
100yr	350	1.03	7.73	868.58
	400	1.20	9.00	869.40
500yr	450	1.50	11.23	871.65

* HW/D - From Inlet Control Nomograph, Chart 5, pg. 5-25, Bureau of Public Roads, 1963

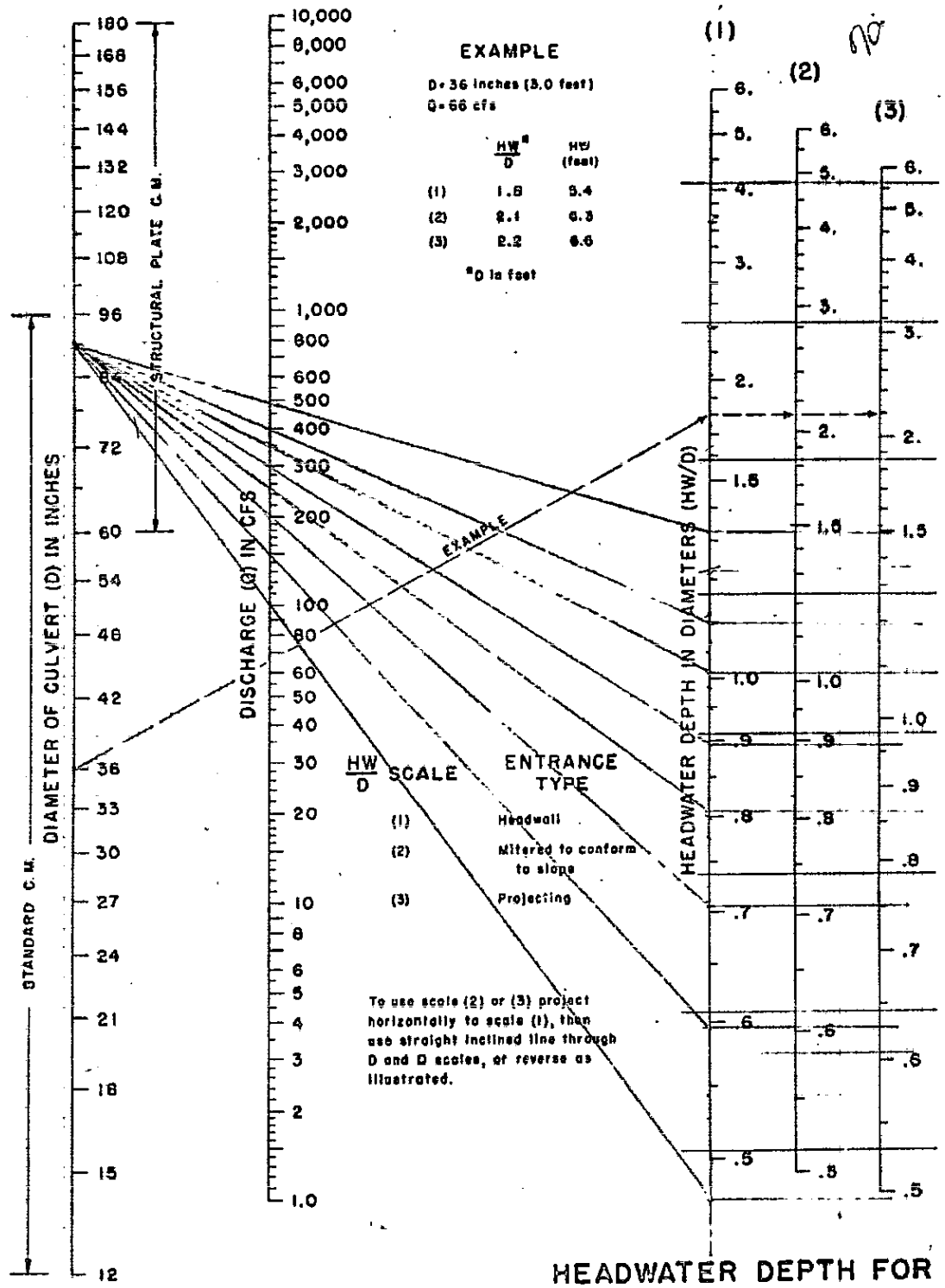
** HW = HW/D x D D - diameter of culvert = 7.5 feet

*** Elev = Invert + HW = 860.4 + HW

320	1.01	7.58	867.98
340	1.05	7.88	868.28
360	1.12	8.40	868.80

CHART 5

3/7



HEADWATER DEPTH FOR C. M. PIPE CULVERTS WITH INLET CONTROL

BUREAU OF PUBLIC ROADS JAN. 1963

Putnam Twp FIS
Honey Creek
Farm Lane Crossing
90" CMP L = 20 ft

$$XKOR = 1 + .9 + \frac{29.1\,(.032)^2\,20}{(7.5/4)^{4/3}} = 2.16 \qquad A = 44.18\,ft^2$$

Q_{100} = 350 TWEL = 865.63

Q	outlet control EG	Inlet Control
250	~866.7	866.85
300	867.18	867.60
320	867.39	868.10
350	867.74	868.58

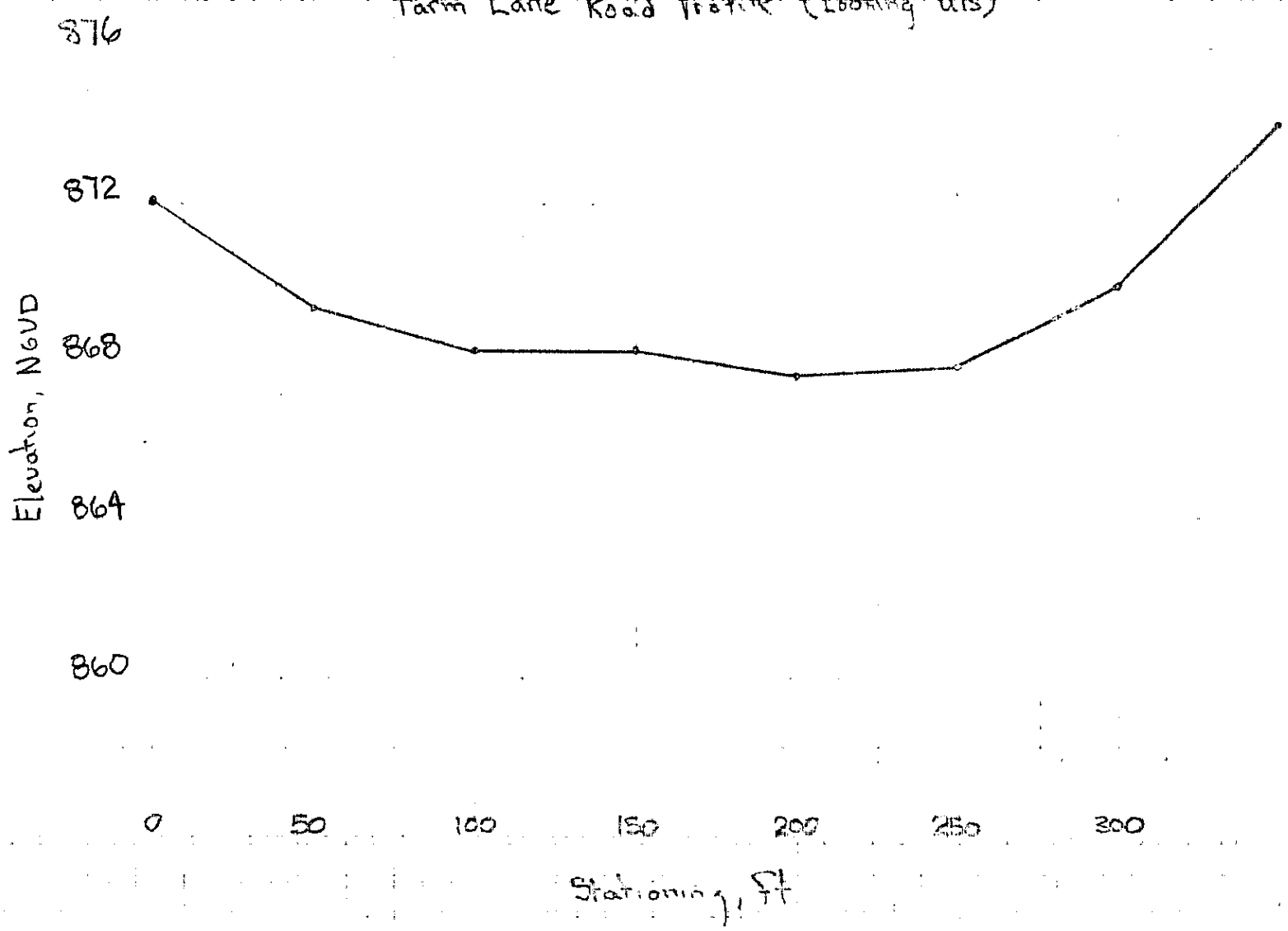
⇒ Inlet Control

Q_{500} = 490 cfs TWEL = 866.09

Q	EG	
300	867.64	867.60
320	867.85	868.10
350	868.20	868.58

⇒ Inlet Control

Honey Creek
Farm Lane Road Profile (looking u/s)



Putnam Twp FIS

Putnam Twp FIS - Honey Creek

Farm Lane
Weir Computations

Stage = 868

$$2.7(25)(.3/2)^{1.5} + 2.7(50)\left(\frac{.3+.1}{2}\right)^{1.5} = 16 \text{ cfs}$$

Stage = 868.2

$$2.7(40)(.5/2)^{1.5} + 2.7(50)\left(\frac{.5+.3}{2}\right)^{1.5} + 2.7(5)\left(\frac{.3}{2}\right)^{1.5} = 48 \text{ cfs}$$

Stage = 868.4

$$2.7\left[(5)(.1/2)^{1.5} + 50(.1)^{1.5} + 50\left(\frac{.1+.7}{2}\right)^{1.5} + 50\left(\frac{.7+.5}{2}\right)^{1.5} + 11\left(\frac{.5}{2}\right)^{1.5}\right.$$

$$= 105$$

Stage = 868.8

$$2.7\left(25\left(\frac{.5}{2}\right)^{1.5} + 50(.6)^{1.5} + 50\left(\frac{.6+1.2}{2}\right)^{1.5} + 50\left(\frac{1.2+1.0}{2}\right)^{1.5} + 20(1.0)^{1.5}\right.$$

$$= 396$$

Stage = 868.6

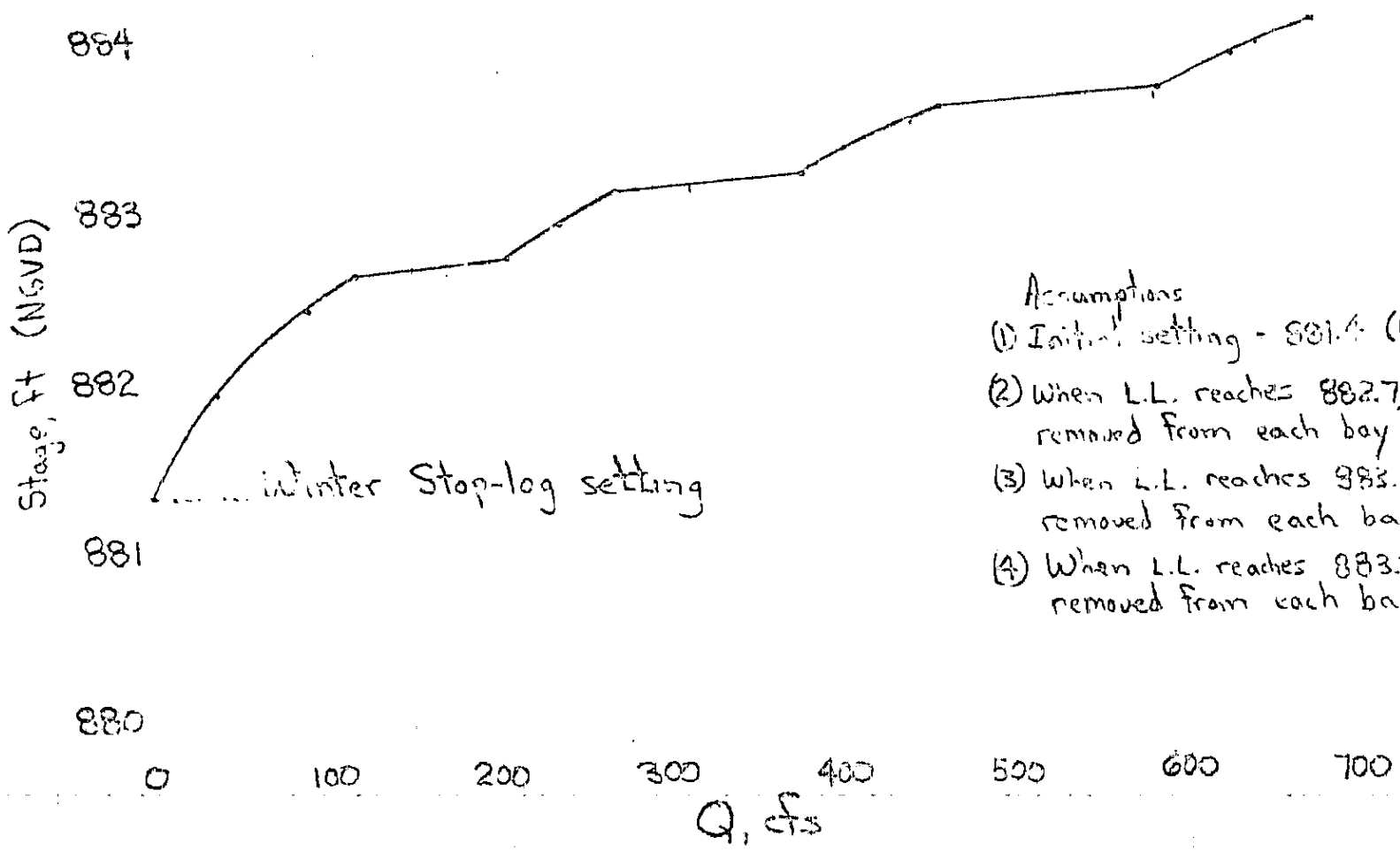
$$2.7\left(15\left(.3/2\right)^{1.5} + 50(.3)^{1.5} + 50\left(\frac{.3+1.0}{2}\right)^{1.5} + 50\left(\frac{1.0+.8}{2}\right)^{1.5} + 16\left(\frac{.7}{2}\right)^{1.5}\right.$$

$$= 219$$

Putnam Twp FIS — 7 7
Honey Creek

Freq.	Q	EG	Q_p	Q_{weir}
10	200	866.03	200	0
50	300	867.60	295	5
100	350	868.09	323	34
500	490	868.45	342	160

Hiland Lake Dam
Rating Curve



Assumptions
(1) Initial setting - 881.4 (Winter)
(2) When L.L. reaches 882.7, one log removed from each bay (crest = 880.9)
(3) When L.L. reaches 883.2, one log removed from each bay (crest = 880.4)
(4) When L.L. reaches 883.7, one log removed from each bay. (crest = 879.9)

4/2/1985

Outlet Structure

Freq.	Q, cfs	Hand Calc. EG	Hand Calc. Qpipe	HEC-2 Results EG	HEC-2 Results Qpipe
10	200	863.43	176	863.35	195
50	300	866.66	183	863.65	187
100	350	863.76	184	863.76	183
500	490	864.00	175	864.01	170

⇒ HEC-2 Result appear reasonable

$Q_{100} = 350$ cfs TWEL = 860.98

$Q_{Left} = .6(15.33)\sqrt{64.4(E6 - 860.98)}$ 860.98 > 860.87 use 860.98

$Q_{RIGHT} = .6(7.68)\sqrt{64.4(E6 - 860.98)}$

$Q_{weir} = 2.7(200)(Stage - 863.3)^{1.5}$

Stage	Q_L	Q_R	Q_W	Q_T
863.8	124	62	191	377
863.75	123	61	163	347
863.76	123	61	168	353

Use 863.76 u/s for Q = 350 cfs (Q = 378)

$Q_{500} = 490$ TWEL = 861.5

$Q_{left} = .6(15.33)\sqrt{64.4(E6 - 861.5)} =$

$Q_{RIGHT} = .6(7.68)\sqrt{64.4(E6 - 861.5)} =$

$Q_W = 2.7(200)(E6 - 863.3)^{1.5} =$

Stage	Q_L	Q_R	Q_W	Q_T
863.9	114	57	251	422
864.0	117	58	316	491

Use 864.00 u/s for Q = 490 cfs (Q = 500)

Note: The pipes are 6 ft dia RCCP, 17 feet long. The friction loss through the pipes would be minimal. ie. $\left(\frac{124\text{cfs}}{28.27\text{ft}^2}\right)^2 \times \frac{29.1(.013)^2 17}{(1.5)^{4/3}} = .01$ ft

$\bar{y}$ located @ 1.89' + 859.1 = 860.99

10-yr TWEL = 860.2

$$Q_{left} = \overset{C}{(.6)}\,\overset{A\,(ft^2)}{(15.33)}\sqrt{2g\,(Stage - 860.87)}$$

$$Q_{RIGHT} = .6\,(7.68)\sqrt{2g\,(Stage - 860.99)}$$

$$Q_{WEIR} = 2.7\,(200)\,(Stage - 863.3)^{1.5}$$

Stage	Q_L	Q_R	Q_W	Q_T
862.7	100	48	0	148
863.3	115	56	0	171
863.5	120	59	48	227
863.4	117	57	17	192
863.42	118	58	22	198
863.43	118	58	25	201

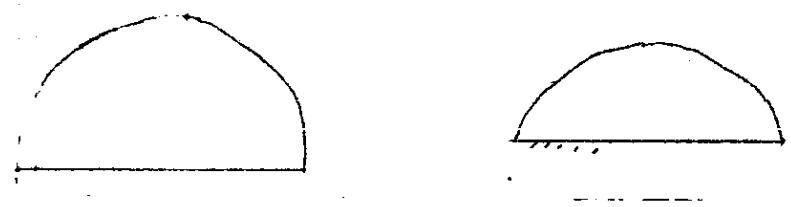
For 10-year flow = 200cfs, use Stage = 863.43 (3.13)

50-yr Q = 300 TWEL = 860.75

Stage	Q_L	Q_R	Q_W	Q_T
863.5	120	59	48	227
863.7	124	60	137	321
863.66	123	60	117	300

For 50-yr flow = 300cfs use u/s Stage = 863.66 (2.91)

Rating Curve for small impoundment structure
Outlet consists of two culverts, with plates on the upstream ends blocking a portion of the culvert.



No tailwater effects

$Q_{Left} = (.6)(15.33 ft^2)\sqrt{2g(Stage - 860.87)}$ (Stage ≤ 860.87)

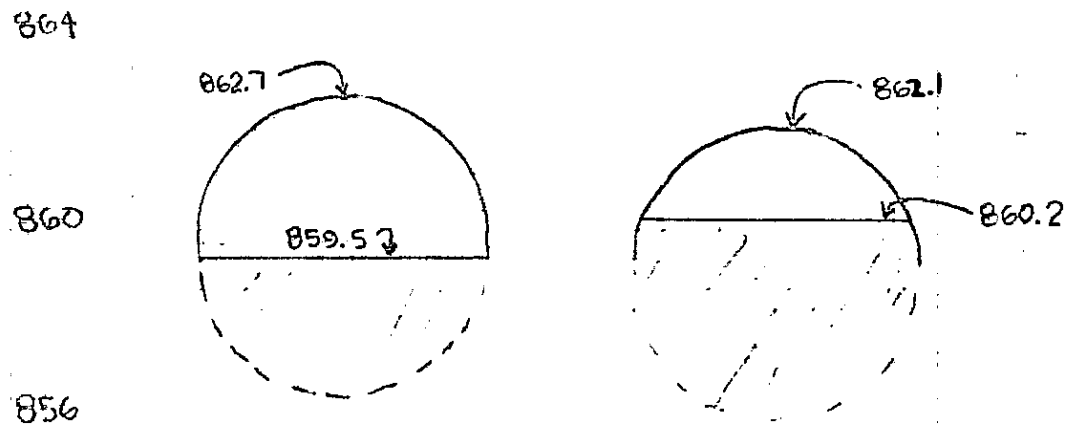
$Q_{Right} = (.6)(7.68 ft^2)\sqrt{2g(Stage - 861.03)}$ (Stage ≥ 86)

$Q_{weir} = (2.7)(200)(Stage - 863.3)^{1.5}$

Stage	Q_L	Q_R	Q_w	Q_T
862.7	100	48	0	148
862.9	105	51	0	156
863.3	115	56	0	171
863.5	120	58	48	226
863.7	124	60	137	321
863.8	126	62	191	379

Outlet Structure for small impoundment

Outlet consists of two culverts, with plates on the upstream ends blocking a portion of the culverts



Considering the sharp contraction for the entrance for each culvert, a discharge coefficient of .6 was selected. "The Design of Small Dams", pg 468, fig 309 was used as a reference.

Left Culvert

Unblocked Area - 15.33 ft^2

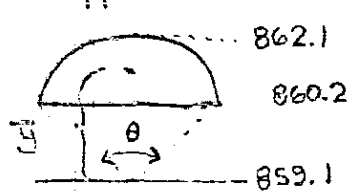
Approximate centroid = $\frac{4r}{3\pi} + \frac{859.7-859.5}{2} = \frac{4(3)}{3\pi} + .1 = \underline{1.37}$ ft

$859.5 + 1.37 = \underline{860.87}$

Right Culvert

Unblocked area = 7.68 ft^2

Approximate centroid =



$\theta = 4 \sin^{-1}\sqrt{\frac{1.9}{6}} = 137°$ $\quad 137° = \frac{\pi}{180}(137)$ radians

$\alpha = \theta/2$ (radians)

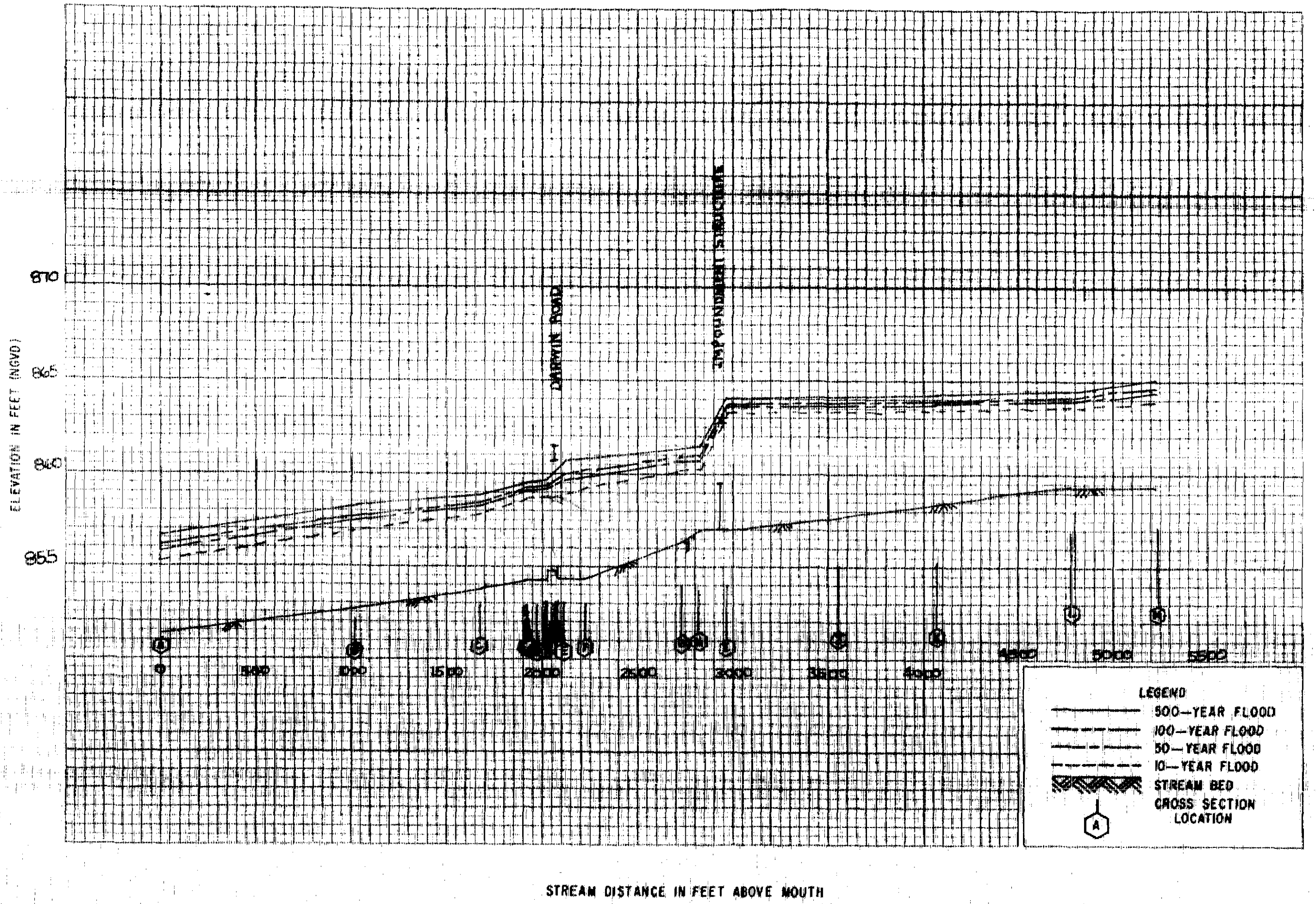
$A_{ARC} = \alpha r^2 = \left(\frac{1}{2}\right)\frac{\pi(137)}{180} 9 = 10.76$ ft^2 (arc)

$\bar{y} = \frac{2r \sin\alpha}{3\alpha} = 1.556$ (arc)

$A_{TRIANGLE} = \frac{1.1}{2}\left(6 \sin\frac{137°}{2}\right) = 3.07$

$\bar{y} = 1.1 \times \frac{2}{3} = .73$

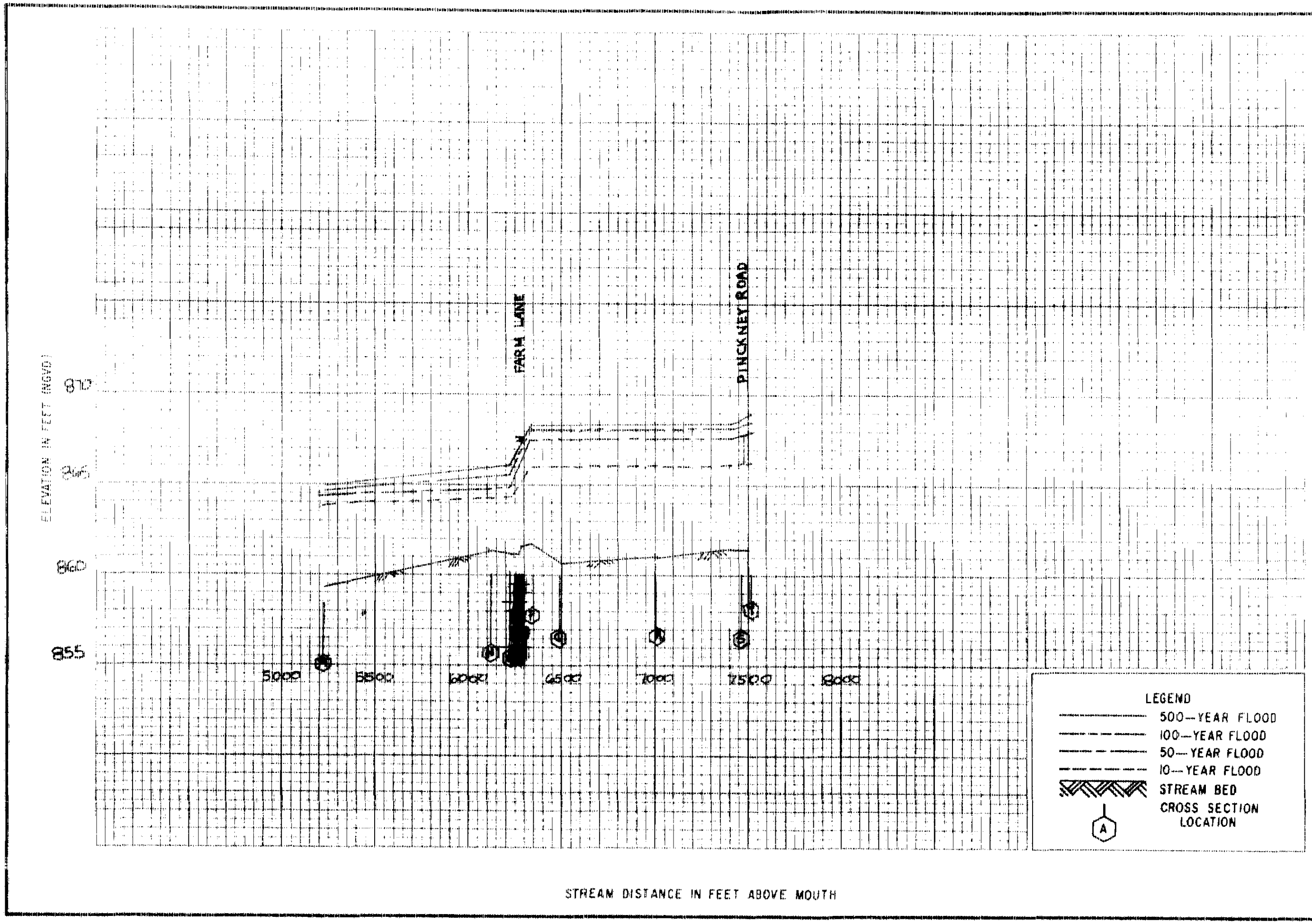
$A_{NET} = 10.76 - 3.07$ ft^2 = 7.69 ft^2 $\quad \bar{y} = \frac{10.76 \times 1.556 - 3.07 \times .73}{7.69} = \underline{1.89}$



FLOOD PROFILES

HONEY CREEK

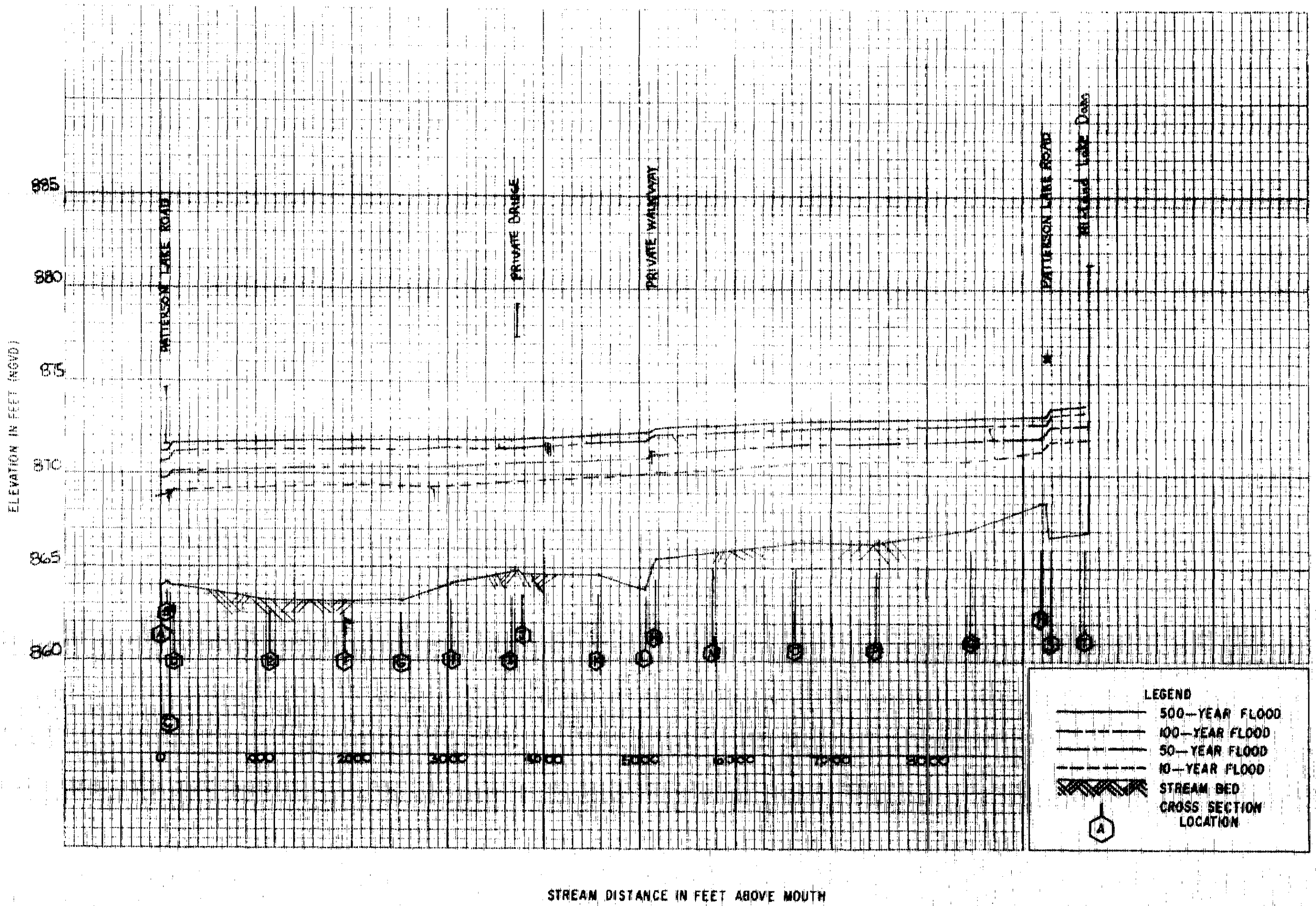
TOWNSHIP OF PUTNAM
(LIVINGSTON CO.)



TOWNSHIP OF PUTNAM
(LIVINGSTON CO.)

ELEVATION PROFILES

FIGURE ONE



FLOOD PROFILES

PORTAGE RIVER

TOWNSHIP OF PUTNAM
(LIVINGSTON CO.)

00BREAK00

1) COUNTY: LIVINGSTON

2) STUDY NAME: PUTNAM

3) WATERCOURSE: PORTAGE RIVER PATTERSON LK.
HONEY CK ALLEN LK

4) DOCUMENT TYPE: DOCUMENTATION - ANALYSIS

00BREAK00

TOWNSHIP OF PUTNAM FLOOD INSURANCE STUDY

Prepared For:

Federal Emergency Management Agency
Contract No.: EMW-84-C-1592

Prepared By:

Michigan Department of Natural Resources
Engineering-Water Management Division
Lansing, Michigan

June, 1986

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Appendix B - Water Surface Profiles
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HYDRAULIC ANALYSIS
Township of Putnam
Livingston County

Introduction

Hydraulic analyses were prepared for Honey Creek and the Portage River to develop the 10-, 50-, 100-, and 500-year flood profiles and delineations for Putnam Township. A floodway was computed, assuming a maximum surcharge of .1 foot. The analysis for Honey Creek begins downstream of Darwin Road and continues to the upstream corporate limit, a total length of about 5500 feet. The detailed study limits for the Portage River begins about 2,400 feet downstream of the Hi-Land Lake Dam and continues up to the dam.

The 10-, 50-, 100-, and 500-year flood levels will also be developed for Hi-Land Lake and Patterson Lake.

Background

The U. S. Army Corps of Engineers HEC-2 computer program (Reference #1) was used in developing the water surface profiles for Honey Creek and the Portage River.

The bridge and cross sectional information was obtained by the Survey Branch of the Engineering-Water Management Division of the Michigan Department of Natural Resources. The survey information was supplemented with 2-foot contour interval topography flown in March 1985, and obtained from Abrams Aerial Survey Corporation. (Reference #2)

Table 1 provides a cross reference between the HEC-2 model and the FIS mapping.

The channel and overbank distances between cross sections and structures were obtained from the topography which has a scale of 1" = 400 feet. Downstream of the detailed study limits of the Portage River, the distances were obtained from the Pinckney, Michigan U.S.G.S. Quadrangle. (Reference #3).

Honey Creek
Hydraulic Analysis

Starting Conditions

The profiles were begun about 2,000 feet downstream of Darwin Road. Convergence profiles were developed, which indicated that errors in the starting water surface elevation would be eliminated downstream of Darwin Road. As a result, the slope-area method of beginning the profiles provides a reasonable starting water surface elevation.

A plot of the convergence profiles is provided in Appendix D.

Coefficients

Based upon field inspections of the reaches analyzed, the following coefficients have been selected.

Manning's roughness coefficients (References #5 & #6) for the stream channel ranged from .03 to .05, and from .03 to .12 in the overbanks. These values were based upon late spring/early summer conditions.

Contraction and expansion coefficients (Reference #1) of .1 and .3, respectively, were used for smooth transitions. In the vicinity of obstructions, these values were increased to .3 and .5, respectively. At the farm lane culvert the values were increased to .6 and .8 to better define the loss occurring at this restriction.

Bridge Losses

The energy losses due to bridges and dams were computed using HEC-2 Special Bridge and Normal Bridge Routines (Reference #1). The results were verified by hand calculations.

In the vicinity of bridges and other obstructions, flow was considered to contract at a 1:1 ratio and expand at a rate of 4:1.

The farm lane culvert (Section 62.73-62.94) was determined to be functioning under inlet control. To obtain reasonable losses at the structure, it was necessary to increase the expansion and contraction coefficients to .8 and .6, respectively.

Farm Lane Crossing (Section 62.73-62.95)

The crossing consists of a 7.5 foot CMP, without a headwall. Due to the inlet configuration, the short culvert length, and the low tailwater, the culvert is functioning under inlet control. (References 7 & 8). A rating curve at the structure was computed by hand, and the special bridge coefficients input into HEC-2 were adjusted so results would compare with hand calculations. (See Appendix E).

For the 10-,50-, and 500-year flows, the water surface elevation upstream of the structure was calculated by hand and input at cross section 63-45, using the X5 card.

Impoundment Structure (Section 28.28-29.73)

The small impoundment upstream of Darwin Road has an outlet consisting of twin 6 foot diameter concrete pipes with plates on the upstream ends which control the impoundment level. The plates result in the pipes operating under inlet control (the pipe capacity being greater than the inlet capacity). The Special Bridge Routine was used to model the structure. A rating curve was developed by hand calculations, and the Special Bridge variables were adjusted to provide HEC-2 results matching the rating curve.

Appendix F contains the hand calculations used in analyzing the structure.

Past Flooding

There is currently little flood-prone development along Honey Creek, as a result, past flood damage has been minimal.

In June 1986, a severe thunderstorm front moved through Mid-Michigan. Lansing received 5 to 6 inches of rain in a 24-hour period, while portions of Macomb and Oakland county receive 3½ to 4 inches of rain. However, Hamburg about 8 miles east of Putnam Township, reported .48 inches of rain. Rainfall information was not available for Putnam Township. A field investigation of the area indicated minimal flows on Honey Creek, estimated to be about 30 to 40 cfs. It appears the intense storm system did not hit the Honey Creek basin.

Hydrology

The peak discharge-frequency relationships were established by hydrologic analyses using the Soil Conservation Service's method for computing flood discharges (Reference 10). In addition, the regional regression method (Reference 11) was used as a comparison.

Following are the discharges used in the hydraulic analysis.

Flooding Source and Location	Drainage Area (Sq Miles)	Peak Discharges (CFS)			
		10-yr	50-yr	100-yr	500-yr
Honey Creek d/s of Darwin Rd.	27.3	200	300	350	490

Structural Measures for Reducing Flood Stages

The culvert at the farm lane crossing of Honey Creek results in head loss of about 2½ feet during the 100-year flow of 350 cfs. If the road is ever improved or the culvert replaced, it would be advisable to replace the culvert with a structure that provides greater waterway area at relatively shallow depths of flow.

Table 1
Putnam Township Flood Insurance Study
Honey Creek
Cross Section Reference Table

HEC-2 Input	FIS Map Designation	Description
0	A	2070 ft. d/s of Darwin Rd.
10.2	B	Channel shape from XSEC A overbanks obtained from topo
16.8	C	350 ft. d/s of Darwin Rd., channel shape from XSEC D
19.8	D	50 ft. d/s of Darwin Road d/s limit of detailed study
20.3	-	Darwin Rd., twin 9 ft. 6 in. by 6 ft. 5 in. CMP, 37 ft. long
21.18	E	50 ft. u/s of Darwin Rd.
22.18	F	150 ft. u/s of Darwin Rd.
27.28	G	
28.28	H	d/s of impoundment structure twin 6 ft. RCCP, weirs at u/s end of pipes control outlet
29.73	I	u/s of impoundment structure
35.53	J	
40.63	K	
47.93	L	
52.23	M	
61.23	N	150 ft. d/s of Farm Lane
62.23	O	50 ft. d/s of Farm Lane
62.73	-	Farm Lane 7.5 ft. CMP 20 ft. long
63.45	P	50 ft. u/s of Farm Lane
64.95	Q	960 ft. d/s of Pinckney Rd.
70.05	R	450 ft. d/s of Pinckney Rd.
74.05	S	50 ft. d/s of Pinckney Rd.
75.1	T	u/s of Pinckey Rd., u/s limit of detailed study

Table 2
Summary of Flood Elevations
Township of Putnam Flood Insurance Study
Honey Creek

Cross Section Designation	Location	Flood Elevations, Feet Above NGVD 10-year	50-year	100-year	500-year
	DISCHARGE (cfs)	200	300	350	490
A	2070 ft. d/s of Darwin Rd.	855.2	855.9	856.1	856.7
B	960 ft. d/s of Darwin Rd.	856.9	857.5	857.7	858.2
D	50 ft. d/s of Darwin Rd.	858.6	859.0	859.2	859.6
E	50 ft. u/s of Darwin Rd.	858.9	859.6	860.0	860.9
G	710 ft. u/s of Darwin Rd.	860.1	860.7	860.9	861.6
H	d/s of Impoundment	860.2	860.8	861.0	861.6
I	u/s of Impoundment	863.3	863.7	863.8	864.0
K		863.4	863.7	863.8	864.1
M	1050 ft. d/s of Farm Lane	863.9	864.4	864.6	865.0
N	150 ft. d/s of Farm Lane	864.4	864.9	865.5	866.0
O	50 ft. d/s of Farm Lane	864.4	864.9	865.6	866.1
P	50 ft. u/s of Farm Lane	866.0	867.6	868.1	868.4
R	660 ft. u/s of Farm Lane	866.1	867.6	868.1	868.4
S	50 ft. d/s of Pinckney Rd.	866.2	867.7	868.2	868.5
T	u/s of Pinckney Rd.	866.3	867.9	868.5	868.9

Portage River
Hydraulic Analysis

Starting Conditions

The profiles were begun about 50 feet downstream of Patterson Lake Road, about 9,600 feet downstream of the Hi-Land Lake Dam. The starting water surface elevations were estimated using the slope-area method. The slope was estimated using the slope of the water-surface at the time of the survey.

Coefficients

Based upon field inspections of the reaches analyzed, the following coefficients have been selected.

Manning's roughness coefficients (References #5 & #6) for the stream channel was estimated to be .045, and .1 in the overbanks. These values were based upon late spring/early summer conditions.

Contraction and expansion coefficients (Reference #1) of .1 and .3, respectively, were used for smooth transitions. In the vicinity of obstructions, these values were increased to .3 and .5, respectively.

Bridge Losses

The energy losses due to bridges were computed using the HEC-2 Normal Bridge Routing (Reference #1).

In the vicinity of bridges and other obstructions, flow was considered to contract at a 1:1 ratio, and expand at a rate of 4:1.

Hi-Land Lake Dam

A rating curve was developed at the dam using the information obtained from the County Drain Commissioner. Since there is a legal lake level on Hi-Land Lake, the operator tries to maintain the level. From November 2 to March 14, the legal lake level is established as 882.2, from March 15 to November 1, the legal lake level is 883.0. The rating curve assumes an initial stop-log setting of 881.4 (NGVD) which maintains a water level of 882.2. When the water level reaches 882.7, one stoplog is removed from each of the three bays, which effectively lowers the crest of the dam .5 feet. For each .5 foot increase in the lake level, a stoplog (.5 feet wide) is removed from each bay.

The flood elevations for Hi-Land Lake were computed by two methods. First the rating curve was developed as noted above. Next, lake levels from the lake gage (Reference 13) were analyzed and a stage/frequency relationship was developed. For the 10-year flood elevation on Hi-Land Lake, the value obtained from the lake gage analysis was considered to be most reasonable. It is felt that the gage analysis best reflects how the lake has been regulated for the more frequent floods. The rating curve and the gage analysis are within .1 foot for the 50-, 100-, and 500-year flood elevations. The values from the rating curve have been selected for use.

In March 1982, the old dam at this site failed causing flooding problems downstream. The current dam was constructed with greater hydraulic capacity than the previous dam. The maximum lake level of 883.8 occurred in February 1968, before the construction of the new dam.

Past Flooding

As indicated above, the failure of the Hi-Land Lake Dam resulted in flooding problems downstream. The failure of the dam forced the evacuation of the trailer park immediately downstream of the dam. About 3.1 miles downstream a U.S.G.S. gaging station recorded the flood of record as a result of the failure. The rating curve for the gage indicated a discharge of about 600 cfs. Immediately downstream of the dam, the flood wave would have likely produced a discharge greatcr than the 100-year discharge.

In 1947, the maximum lake level was recorded on Patterson Lake. The flood produced a discharge of 529 cfs at the gage about 3.1 miles downstream of the dam. (The 100-year discharge has been estimated to be 570 cfs).

Hydrology

The peak discharge-frequency relationships for the Portage River were estimated using the gage analysis of gage #1725.

Following are the discharges used in the hydraulic analysis.

Flooding Source and Location	Drainage Area (Sq Miles)	Peak Discharges (CFS) 10-yr	50-yr	100-yr	500-yr
Portage River d/s of Hi-Land Lake Dam	77	310	440	570	640

Putnam Township Flood Insurance Study
Portage River
Cross Section Reference Table

HEC-2 Input	FIS Map Designation	Description
0.00	A	50 ft. d/s of Patterson Lake Rd.
.51	B	Patterson Lake Rd. Bridge, 20 ft. concrete slab
.71	C	u/s of Patterson Lake Rd. Bridge
1.22	D	50 ft. u/s of bridge
11.32	E	Cross Section cut from topography
19.12	F	
25.12	G	Repeat of F
30.42	H	
36.75	I	50 ft. d/s of private road bridge
37.86	J	50 ft. u/s of private road
45.66	K	830 ft. u/s of private road
50.66	L	50 ft. d/s of private walkway
51.76	M	50 ft. u/s of private walkway
57.76	N	650 ft. u/s of private walkway
66.11	O	d/s limit of detailed study
74.71	P	
84.41	Q	
91.71	R	50 ft. d/s of Patterson Lake Rd.
92.70	S	20 ft. u/s of Patterson Lake Rd.
96.30	T	d/s of Hi-Land Lake Dam

Table 4
Summary of Flood Elevations
Township of Putnam Flood Insurance Study
Portage River

Cross Section Designation	Location	Flood Elevations, Feet Above NGVD 10-year	50-year	100-year	500-year
A	d/s Patterson Lk. Rd.	868.9	869.9	870.7	871.2
D	50 ft. u/s Patterson Lake Rd.	869.1	870.2	871.1	871.6
F	1790 ft. u/s Patterson Lake Rd.	869.4	870.4	871.3	871.8
I	50 ft. d/s of private Rd.	869.6	870.6	871.5	871.9
J	50 ft. u/s of private Rd.	869.6	870.6	871.5	872.0
L	50 ft. d/s of private walkway	870.0	870.9	871.8	872.2
M	50 ft. u/s of private walkway	870.1	871.1	872.1	872.5
P		870.8	871.7	872.6	873.0
R	50 ft. d/s of Patterson Lake Rd.	871.3	872.0	872.7	873.1
S	20 ft. u/s of Patterson Lake Rd.	871.9	872.6	873.3	873.6
T	d/s of Hi-Land Lake Dam	872.0	872.7	873.5	873.8

Patterson Lake

The flood elevations for Patterson Lake were determined from analysis of 24-years of lake level records. (Reference 13). The record high on Patterson Lake occurred in April 1947, with a stage of 886.4. The 100-year floodplain elevation of the lake was computed to be 886.7.

Floodway Development

The floodway for Honey Creek and the Portage River was determined using the HEC-2 encroachment method #4 (Reference #1). This encroachment option eliminates conveyance from each side of the floodplain until a surcharge of no more than .1 foot is obtained. In some areas, due to manmade and natural restrictions, the floodway has been determined by delineating smooth curvilinear lines with 4:1 expansion of flow and a 1:1 contraction of flow.

Results

The hydraulic analysis has computed the 10-, 50-, 100-, and 500-year flood elevations for Honey Creek and the Portage River. When the 100-year and 500-year floodplain limits coincide, only the 100-year floodplain boundary has been delineated on the work maps in Appendix A. The floodway portion of the 100-year floodplain was developed and is also plotted on the work maps in Appendix A.

Tables 2 and 4 contain summaries of 10-, 50-, 100-, and 500-year flood elevations at selected cross-sections. The resulting flood profiles are plotted in Appendix B, and are based on unobstructed flow. The flood elevations on the profiles are considered valid only if hydraulic structures remain unobstructed, operate properly and do not fail.

The summary of the lake elevations are shown on Table 5.

Table 5 - Summary of Lake Elevations

Flooding Source and Location	Drainage Area (Sq Miles)	Peak Elevation (FEET NGVD[1]) 10-yr	50-yr-	100-yr	500-yr
Hi-Land Lake	77	883.6	883.7	883.8	884.0
Portage Lake[2]	522	851.5	852.0	852.5	853.6
Silver Lake[2]	1.1	875.3	875.4	875.5	875.6
Halfmoon Lake[2]	72	884.6	885.2	885.4	886.0
Patterson Lake	69	885.7	886.4	886.7	887.0

[1]National Geodetic Vertical Datum of 1929

[2]Peak Elevations from Dexter Township FIS (Reference 12)

Appenxix C

Elevation Reference Marks
Note: All Elevations Referenced to National Geodetic Vertical Datum of 1929

Elevation Reference Mark	Elevation (FEET, NGVD)	Description
#12	886.52	PK nail and tag in west face of power pole east side of Pinckney Road, 3/16 mile south of bridge over creek at village limits (first pole south of gravel drive to east).
#13	893.76	PK nail and tag in east face of power pole, west side of Darwood Road, 250 feet south of intersection of Darwood and Darwin.
#14	860.68	Top of nut and bolt of east twin culvert, south side of Darwin Road.
#15	867.65	120d spike with tag in north face 14-inch Oak, 100 feet west of centerline of driveway to house #1360 Darwin Road.
#16	867.81	Chiseled "X" on south end of corrugated metal pipe, Farm Lane.

Appenxix C

Elevation Reference Marks
Note: All Elevations Referenced to National Geodetic Vertical Datum of 1929

Elevation Reference Mark	Elevation (FEET, NGVD)	Description
#1	880.30	Chiseled "X" on top of eye bolt at west end of concrete bridge rail south side Patterson Lake Road.
#2	884.89	Chiseled square on northwest corner of southwest wingwall of Hi-Land Lake Dam.
#3	877.61	120D spike in north side of first power pole east of the intersection of Kelly Road and Patterson Lake Road, south side of the road.
#4	895.72	PK nail, nut and tag in north root of 12-inch Oak at the intersection of Patterson Lake Road and West Shore Drive.
#5	903.39	PK nail and tag in east side of campground sign on the west side of Glenbrook Road.
#6	892.35	Top bolt on west side of road at south end of steel guard rail at Glenbrook Road.
#7	886.10	PK nail and tag in west face of power pole, south of house at 12101 Max Drive.
#8	889.98	Chiseled "X" top-most northerly bolt on south end of corrugated metal pipe at Albert Street crossing of outlet to Patterson Lake.
#9	900.12	Top pipe in one-foot diameter cement post on Patterson Drive at house at #11106.
#10	926.86	Railroad spike in 16-inch Walnut at Patterson Drive and Patterson Lake Road.
#11	924.18	120d spike in west side of 40-inch Oak, 500 feet west of entrance to Fralicks Tree Farm, north side of Patterson Lake Road, east of Hell.

References and Bibliography

1. U. S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-2 Water Surface Profiles; Davis, California, September 1982

2. Abrams Aerial Survey Corporation, Aerial topographic Map: Pinckney, Michigan; Scale 1:4800, Contour Interval 2 feet, March 1985

3. U. S. Geological Survey, 7.5 Minute Series Topographic Maps, Contour Interval 10 feet, Pinckney, Michigan, 1965, photo-revised

4. U. S. Geological Survey, 7.5 Minute Series topographic Maps, Contour Interval 10 feet, Gregory, Michigan, 1973

5. Chow, Ven Te, Open-Channel Hydraulics, McGraw-Hill Book Company, New York, 1959

6. U. S. Department of Agriculture, Soil Conservation Service, Guide for Selecting Roughness Coefficient 'n' Values for Channels, Lincoln, Nebraska, December 1963

7. Bureau of Public Roads, Capacity Charts for the Hydraulic Design of Highway Culverts, Hydraulic Engineering Circular No. 10, Washington, D. C., March 1965

8. Bureau of Public Roads, Hydraulic Charts for the Selection of Highway Culverts, by L. A. Herr, Hydraulic Engineering Circular No. 5, Washington, D. C., U. S. Government Printing Office, December 1965

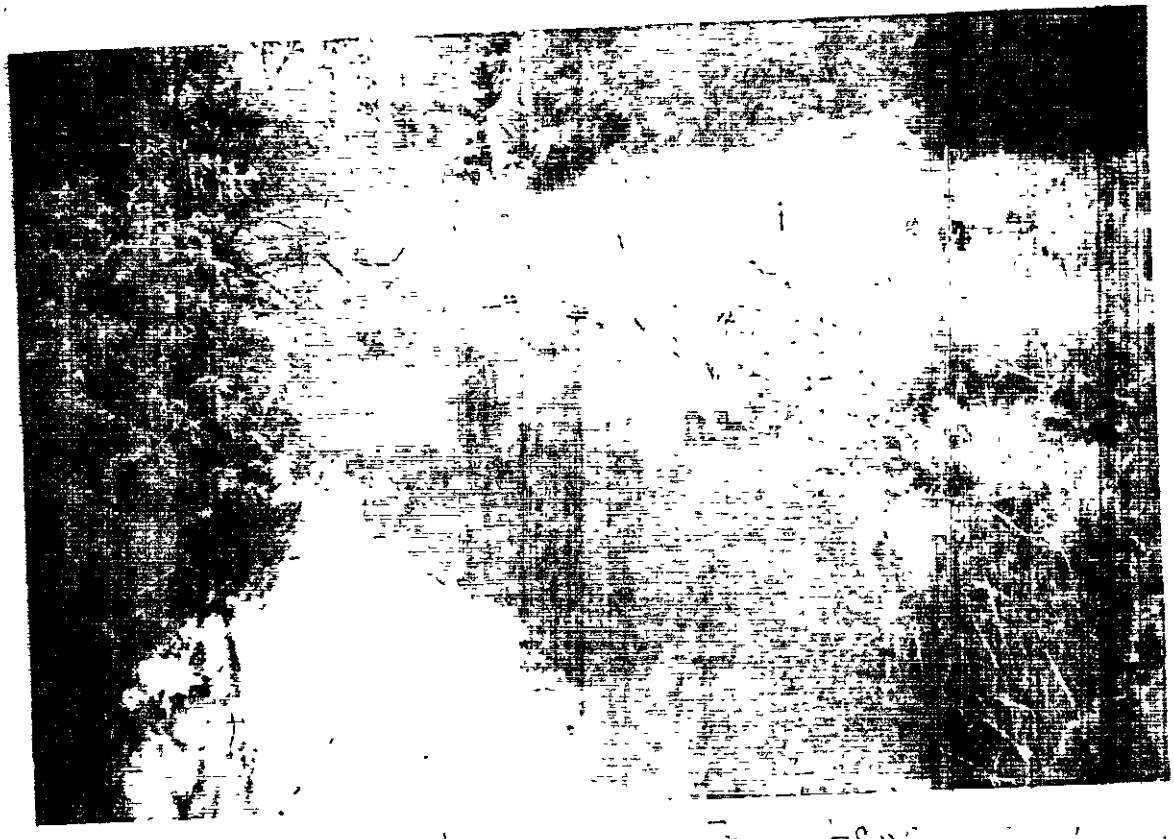
9. U. S. Geological Survey, Techniques of Water Resources Investigations of the United States, Measurement of Peak Discharge at Culverts by Indirect Methods, Book 3, Chapter A3, Washington, D. C., 1969

10 Sorrell, Richard C., SCS WD-21 Method, Michigan Department of Natural Resources, Engineering-Water Management Division, February 1985

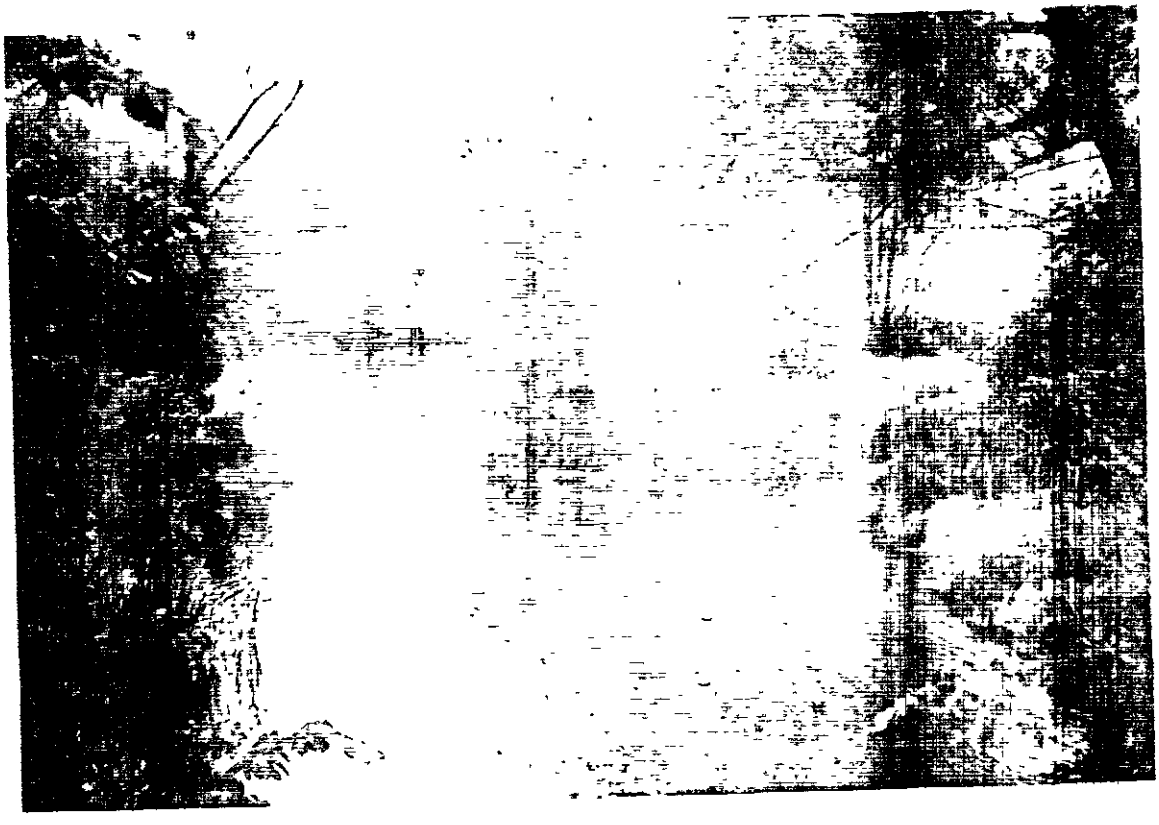
11. U. S. Geological Survey, Statistical Model for Estimating Flow Characteristics of Michigan Streams, Water Resources Investigations Report 84-4207, 1984

12. Federal Emergency Management Agency, Township of Dexter Flood Insurance Study, Washtenaw County Michigan, Unpublished

13. U. S. Department of the Interior, Geological Survey, Compilation of Data for Michigan Lakes, Lansing, Michigan, June 1970.



Looking upstream [illegible]



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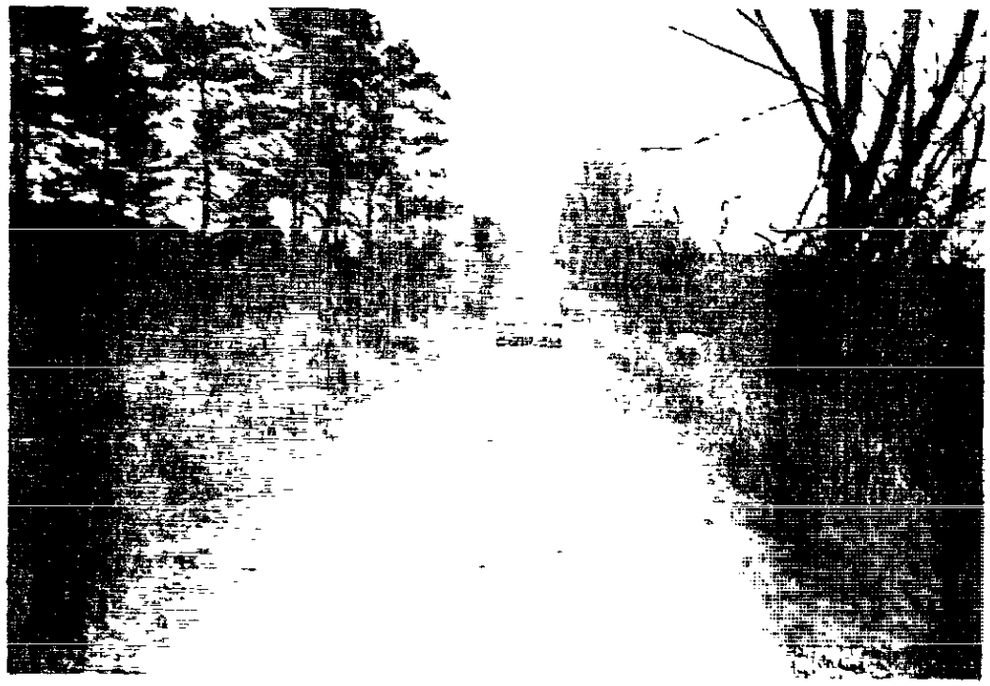
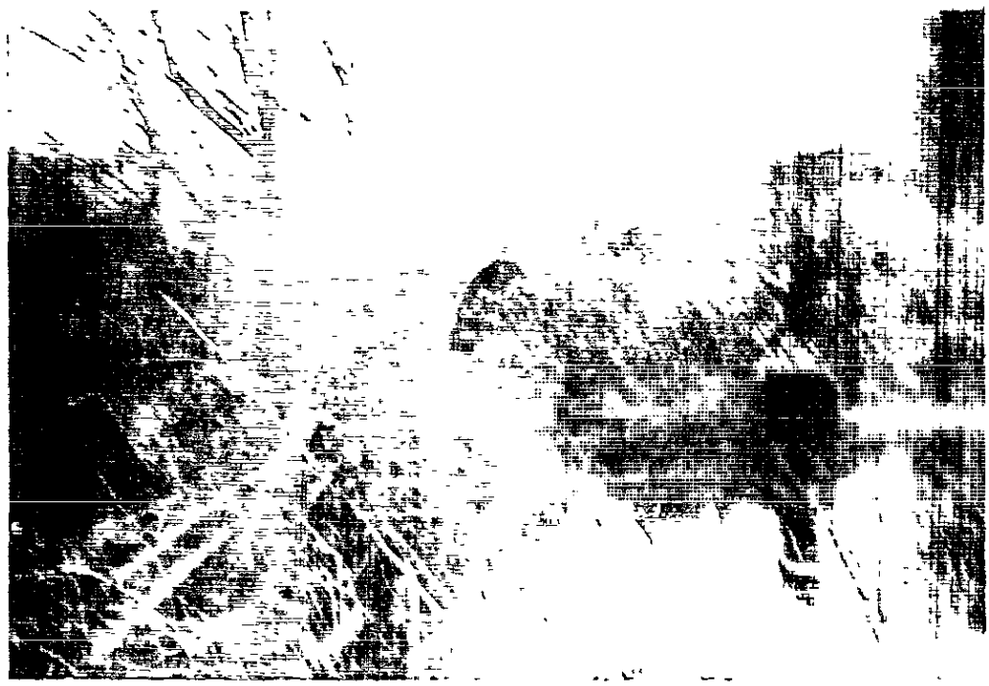


Farm Lane [illegible] -Honey [illegible]



Upstream [illegible] Farm Lane Rd

Looking downstream - Darwin Rd

Downstream face - Darwin Rd

Honey Creek

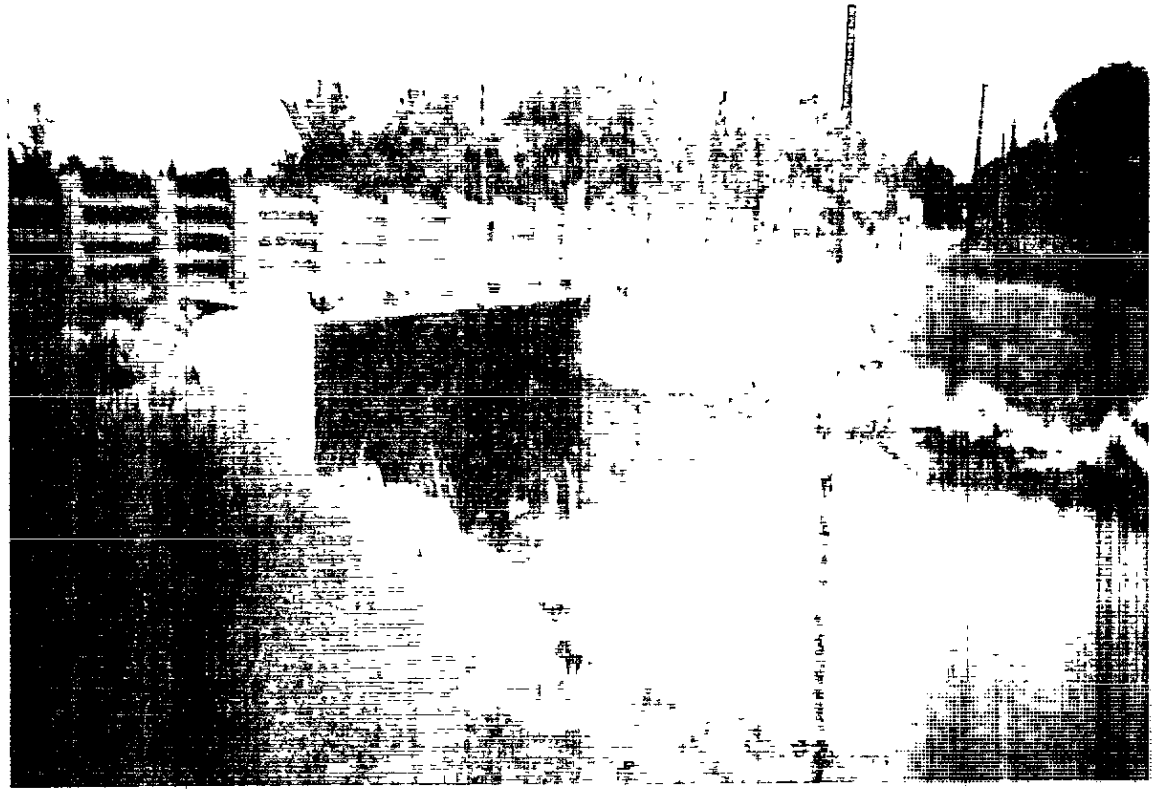
Darwin Road

Looking up [illegible] at XSEC F

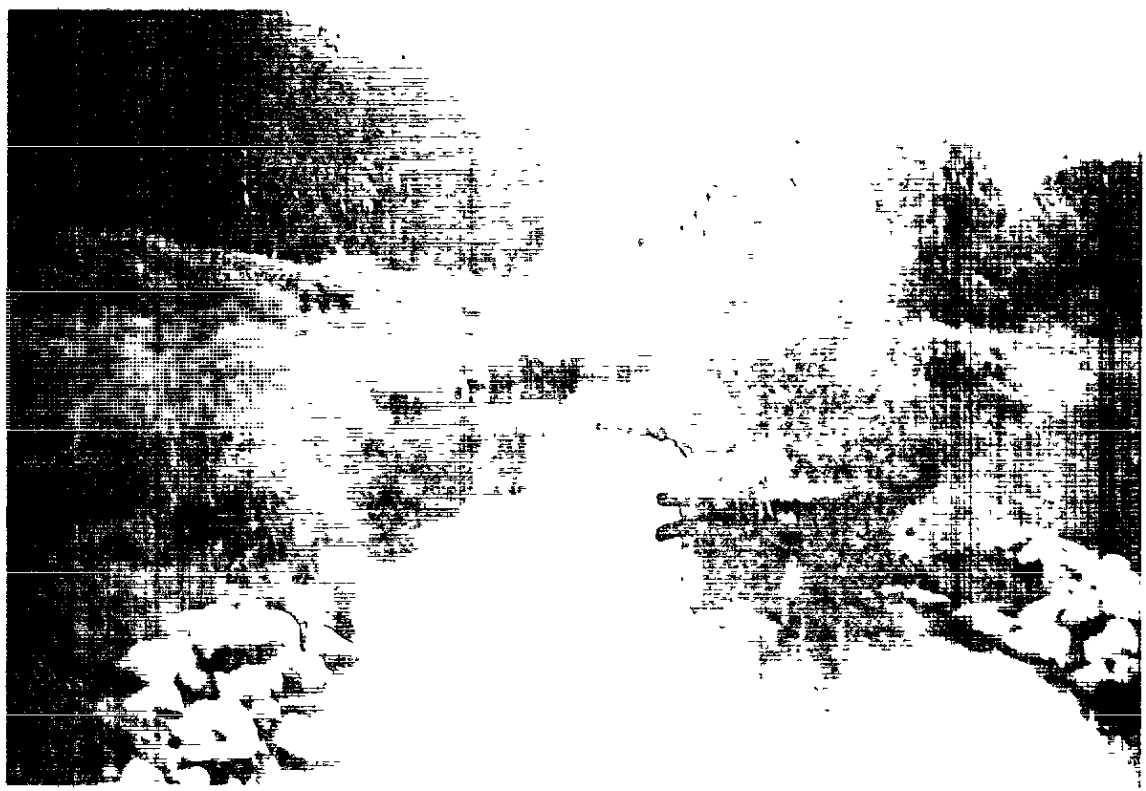
[illegible]

Upstream from Darwin

Looking Upstream from Darwin

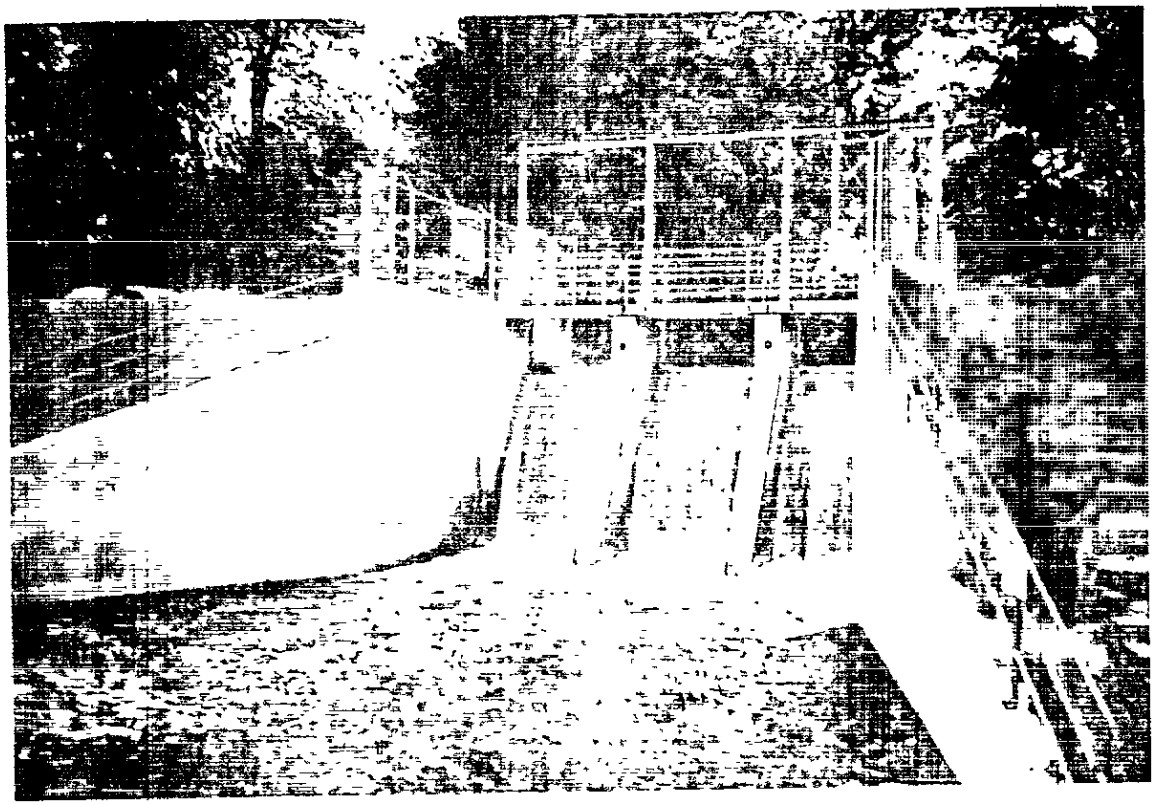


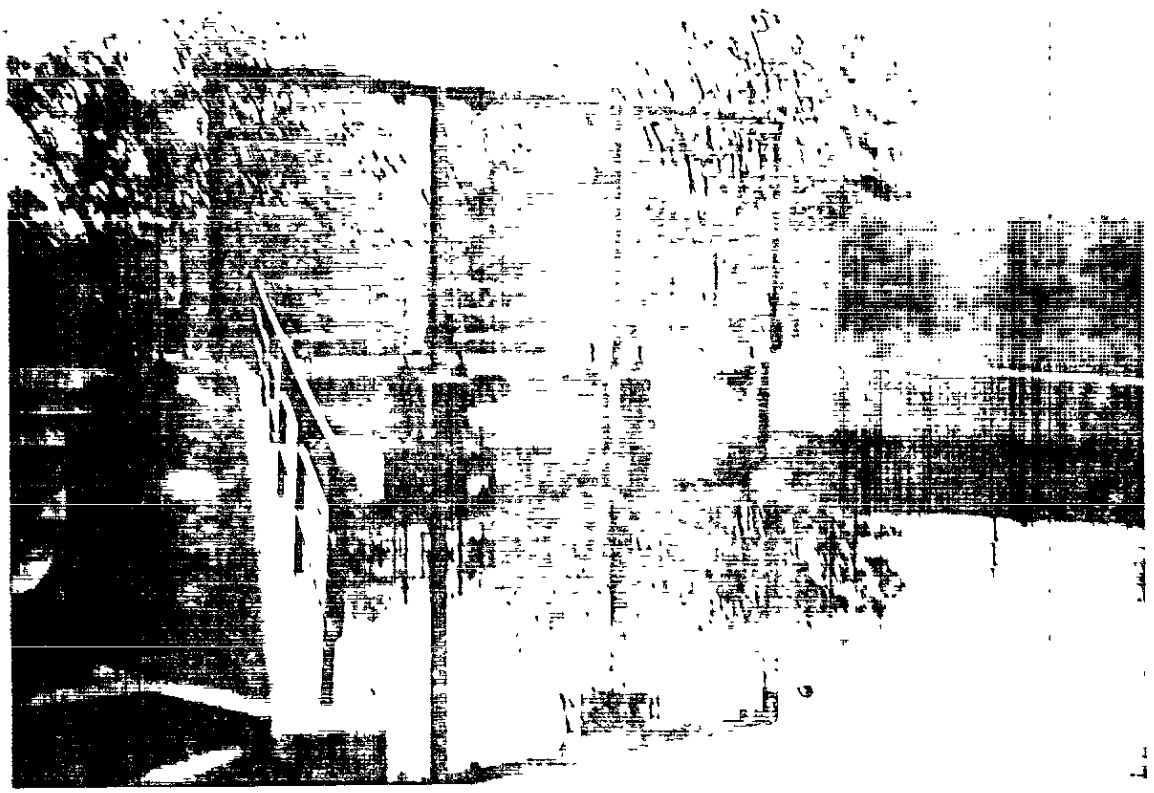
Downstream [illegible] Riney Road



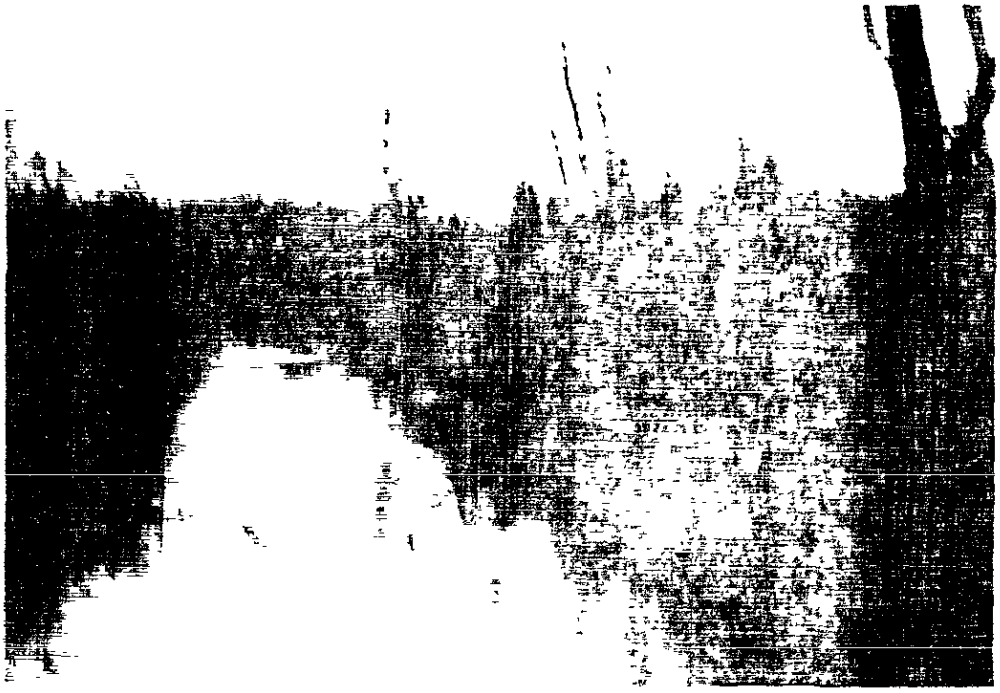
Looking Downst[illegible] Riney Road

Pinckney Road
Honey Creek

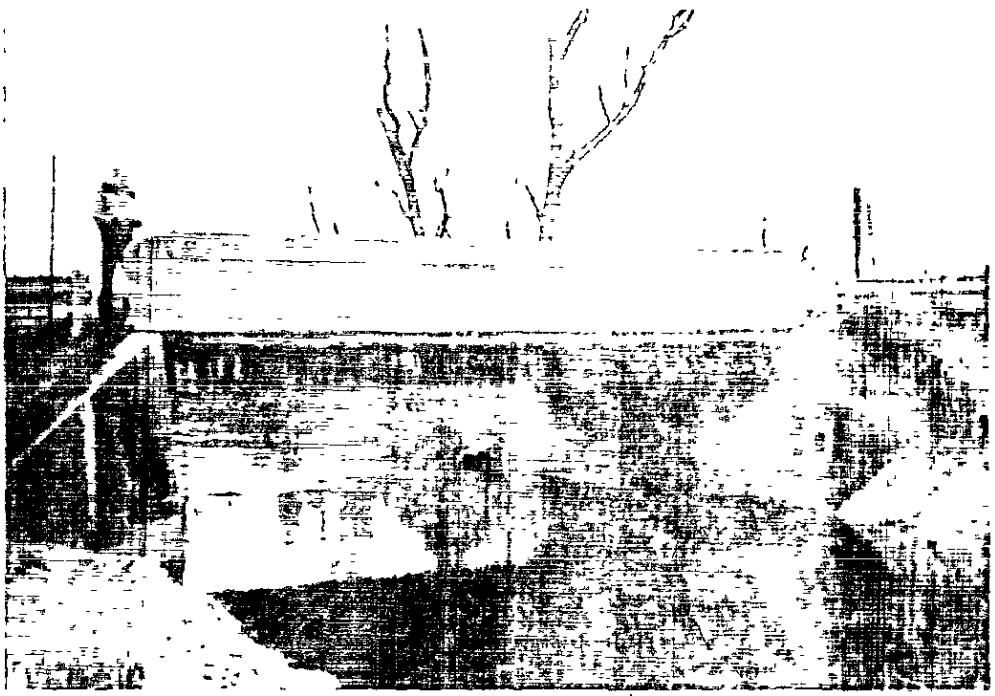




Portage



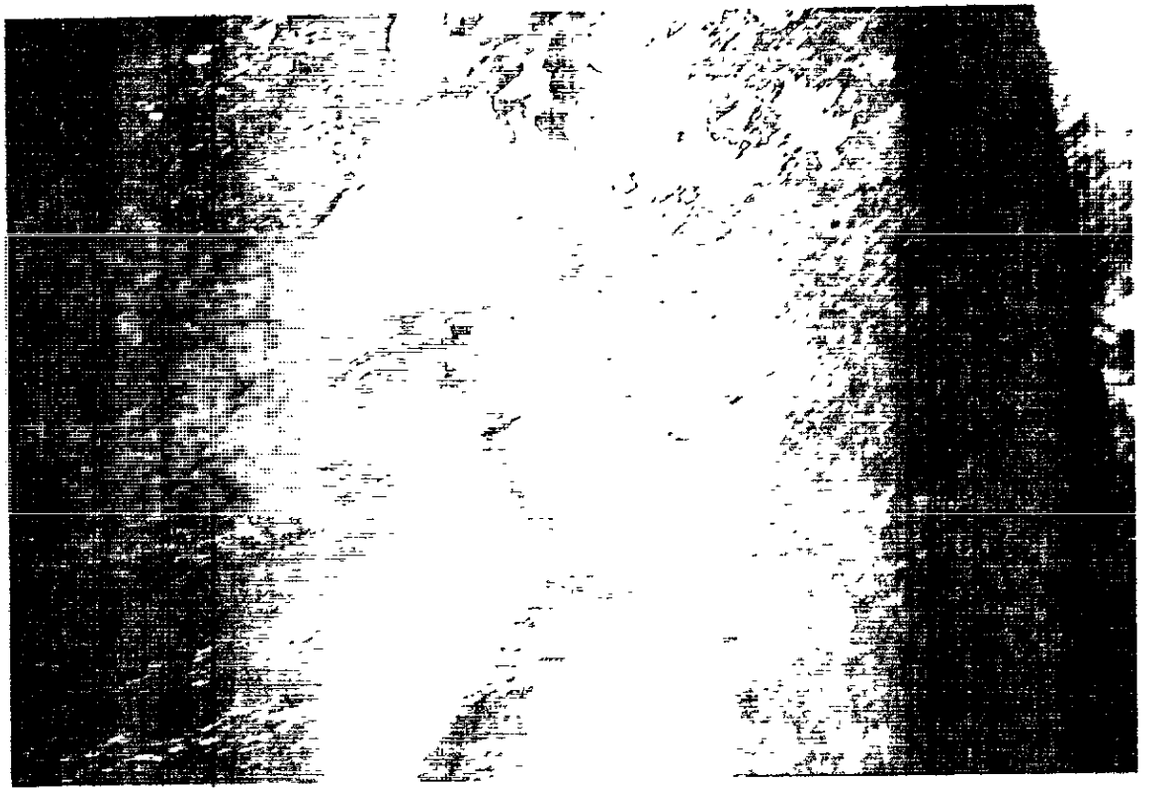
Looking downstream of Patterson Lake Rd
XSEC A



Upstream face - Patterson Lake Rd
XSEC C+D

Portage River

Between



Looking

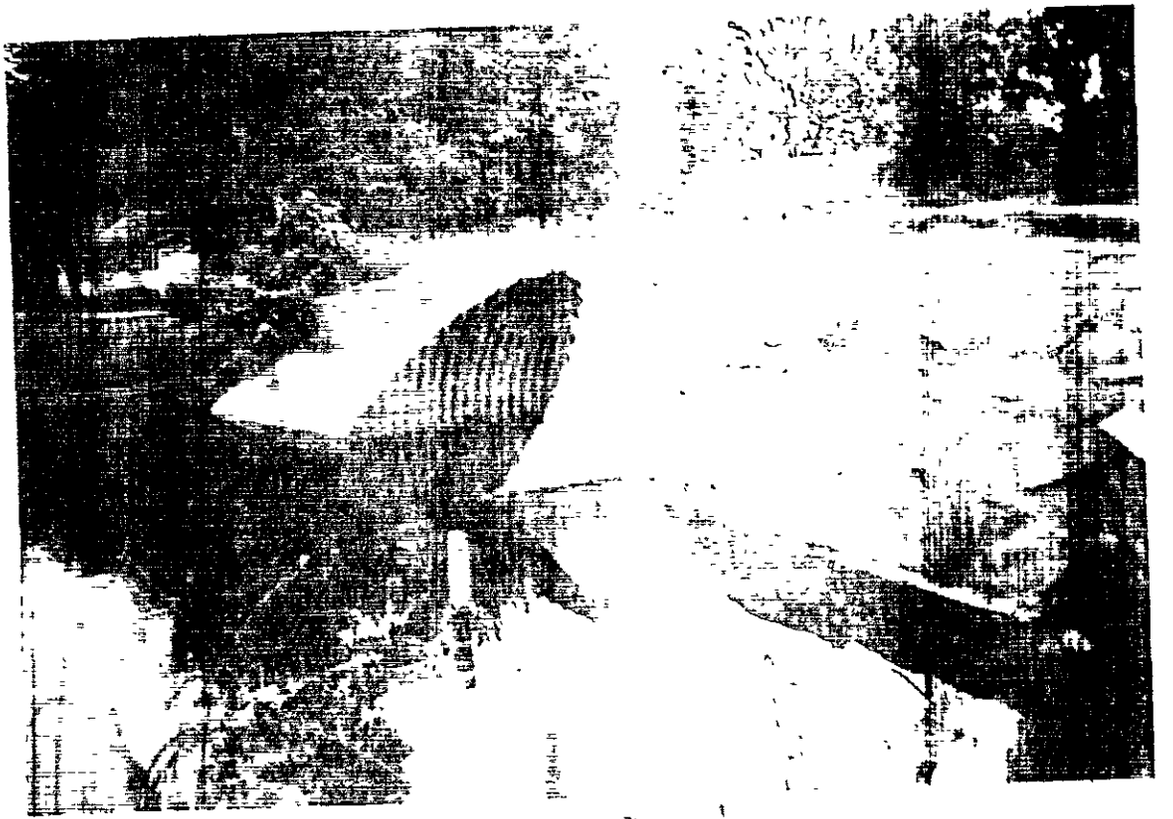
Looking

Patterson Lake Rd

Forward

Looking upstream from Patterson Lake Rd

Portage River



Falmouth Lake - Outlet Culvert

Albert Street Falmouth Lake

Putnam Twp FIS

Patterson Lake - Livingston County

Gage Analysis - Weibul plot

Year	Gage Height	m	Gage Height	$\frac{100m}{n}$
45	5.0	1	6.9	4
46	4.6	2	6.05	8
47	6.4	3	5.65	12
48	5.45	4	5.65	16
49	5.05	5	5.45	20
50	6.05	6	5.25	24
51	5.0	7	5.05	28
52	4.8	8	5.0	32
53	4.2	9	5.0	36
54	4.15	10	4.9	40
55	4.45	11	4.8	44
56	5.65	12	4.8	48
57	4.0	13	4.8	52
58	4.05	14	4.8	56
59	4.9	15	4.75	60
60	5.25	16	4.7	64
61	4.8	17	4.6	68
62	4.8	18	4.45	72
63	4.45	19	4.45	76
64	3.9	20	4.2	80
65	4.8	21	4.05	84
66	4.0	22	4.0	88
67	4.7	23	4.0	92
68	5.65	24	3.9	96

Patterson Lake
Brown Twp

From Weibul Plot

Freq	Gage Height	Lake Level
10-yr	5.84	885.84
50 yr	6.42	886.42
100-yr	6.72	886.72
500-yr	6.96	886.96

Putnam Twp FIS
Patterson

Log Pearson Analysis

$\bar{X} = .6833$ $S = .0565$ $C_S = \frac{a}{S^3} = \frac{.000051}{(.0565)^3} = .282$

		10yr	50yr	100yr	500yr
	K	1.308	2.202	2.551	2.839
$X = \bar{X} + KS$	X	.7572	.8017	.8263	.8438
Gage Ht = 10^X		5.72	6.42	6.70	7.00
Lake Level = 880.0 + GH		885.7	886.4	886.7	887.0

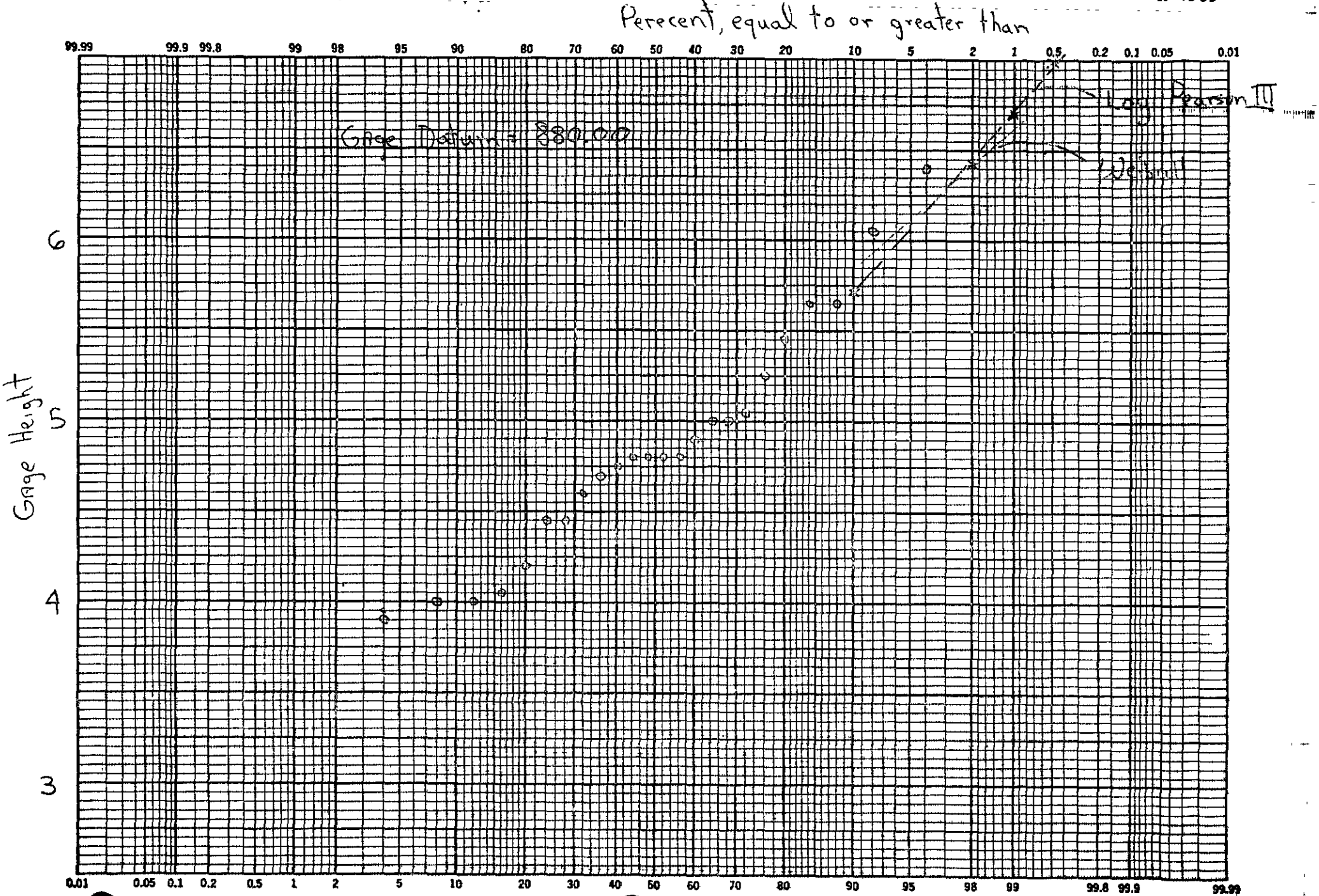
The suggested flood elevations for Patterson Lake are:

Frequency	Gage Height	Lake Level
10-yr	5.7	885.7
50-yr	6.4	886.4
100-yr	6.7	886.7
500-yr	7.0	887.0

PROBABILITY X 90 DIVISIONS

Patterson Lake - Livingston County

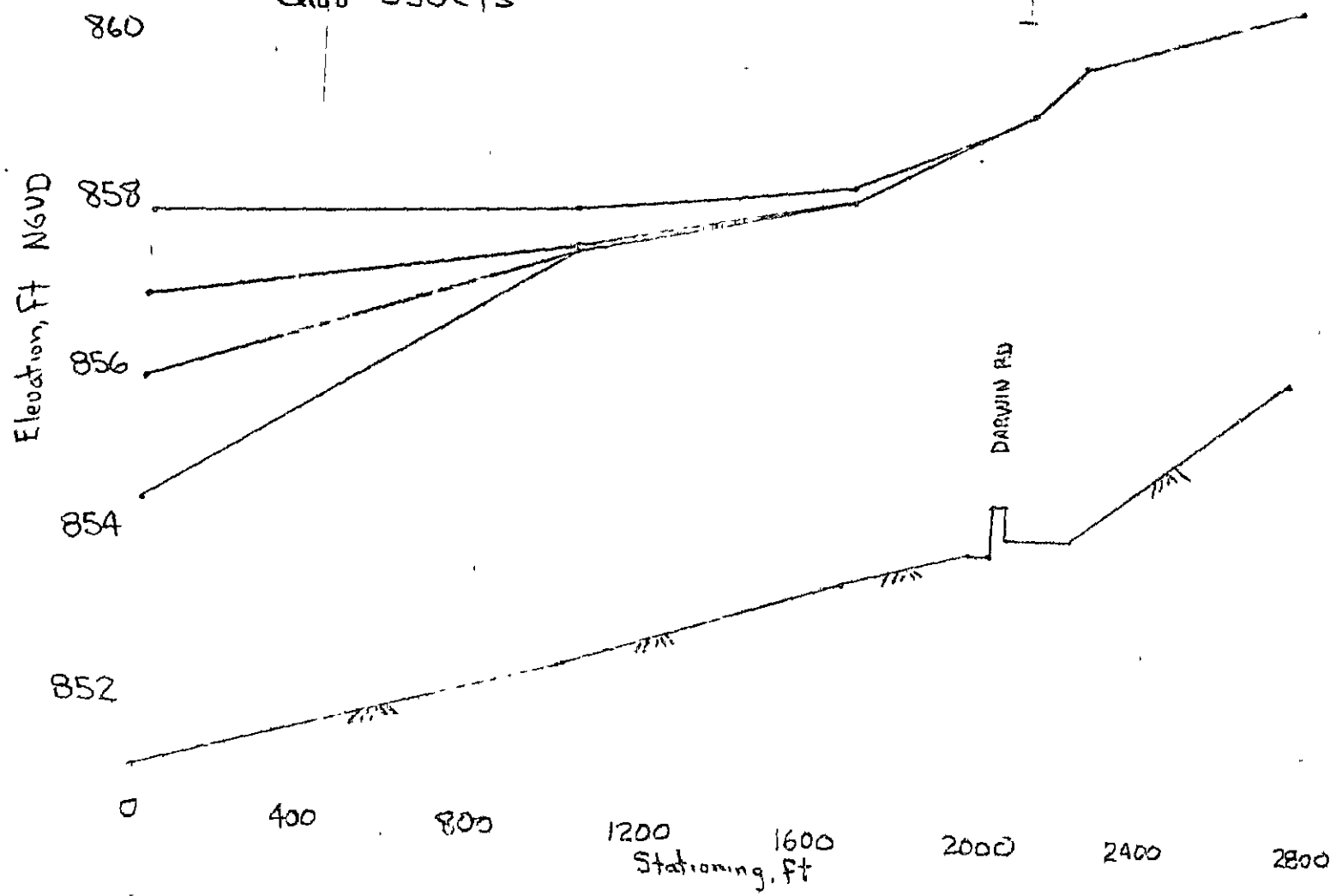
R 4505



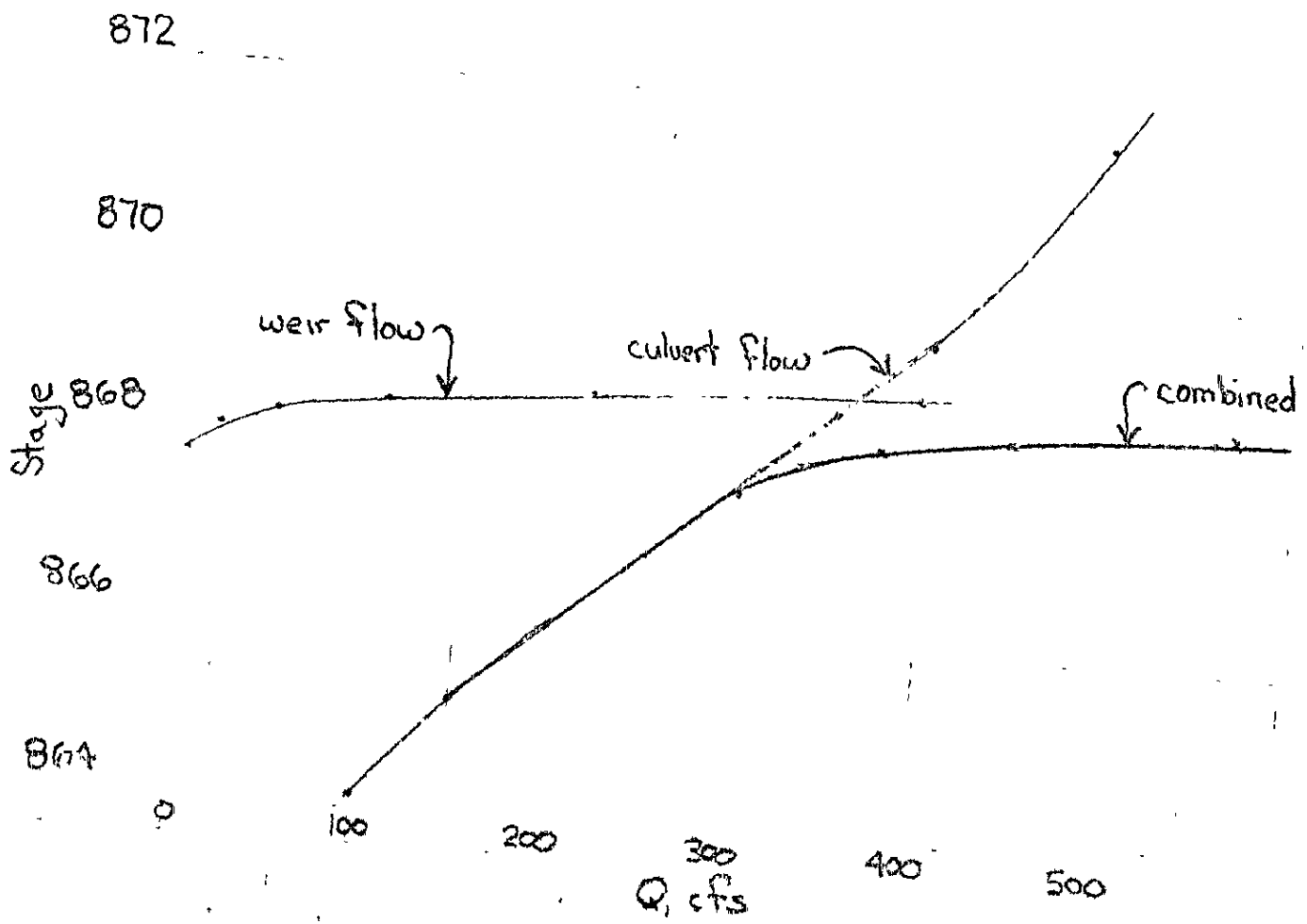
Putnam Twp FIS

Honey Creek - Convergence Profile

$Q_{100} = 350$ cfs



Putnam Twp FIS
Honey Creek
Farm Lane



Putnam Twp FIS

Honey Creek

Farm Lane Rating Curve

Inlet Control (Tailwater has no effect on upstream)

	Q	HW/D*	HW** (stage)	Elev***
	100	.48	3.60	864.0
	150	.63	4.73	865.13
10yr	200	.75	5.63	866.03
	250	.86	6.45	866.85
50yr	300	.96	7.20	867.60
100yr	350	1.03	7.73	868.53
	400	1.20	9.00	869.40
500yr	450	1.50	11.23	871.65

* HW/D - From Inlet Control Nomograph, Chart 5, pg 5-25, Bureau of Public Roads, 1963

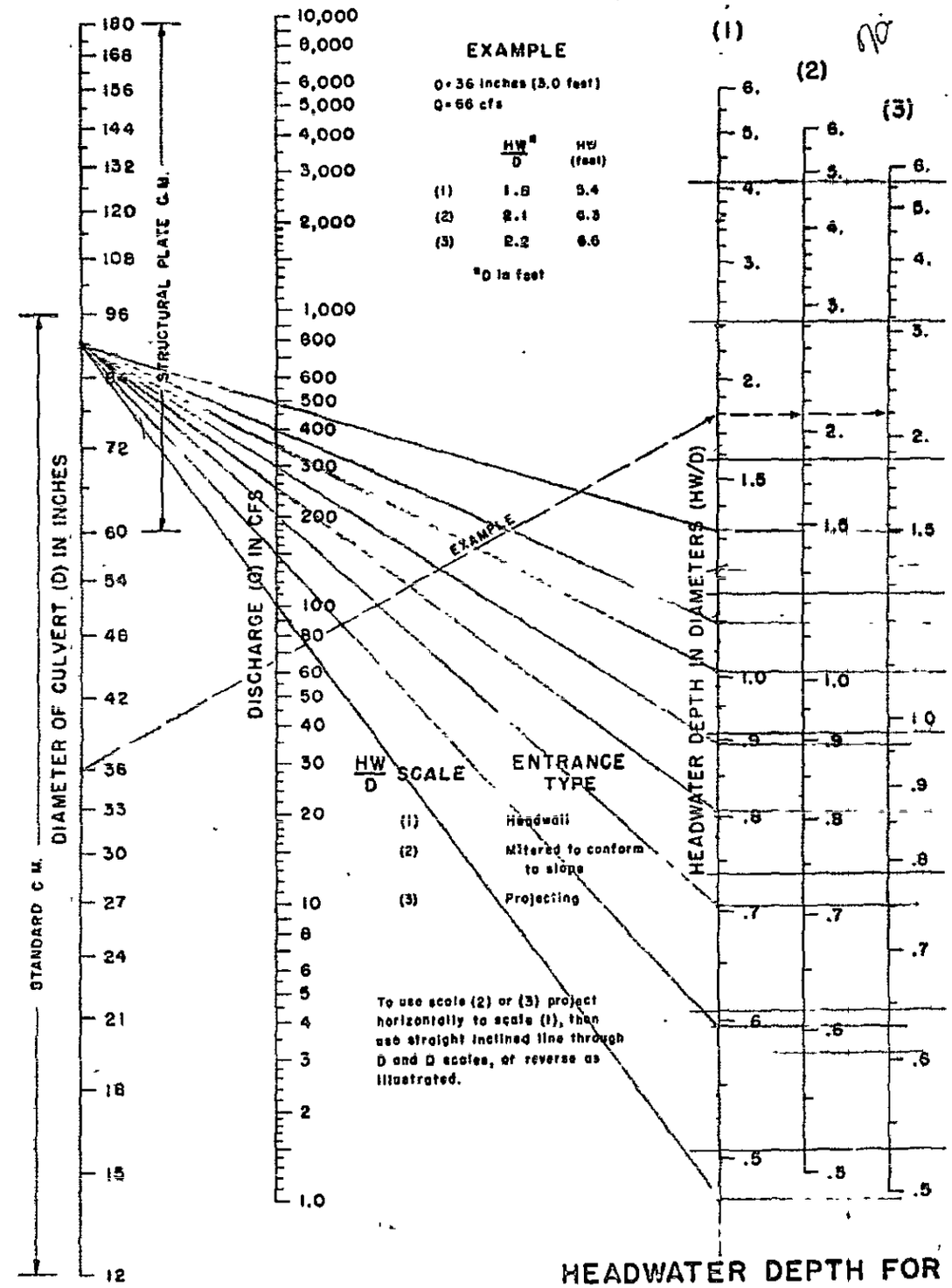
** HW = HW/D x D D - diameter of culvert = 7.5 feet

*** Elev = Invert + HW = 860.4 + HW

320	1.01	7.58	867.98
340	1.05	7.88	868.28
360	1.12	8.40	868.80

CHART 5

3/7



HEADWATER DEPTH FOR C. M. PIPE CULVERTS WITH INLET CONTROL

BUREAU OF PUBLIC ROADS JAN 1963

Putnam Twp FIS
Honey Creek
Farm Lane Crossing
90" CMP L = 20 ft

$$XKOR = 1 + .9 + \frac{29.1\,(.032)^2\,20}{(7.5/4)^{4/3}} = 2.16 \qquad A = 44.18\,ft^2$$

$Q_{100} = 350$ TWEL = 865.63

Q	outlet control EG	Inlet Control
250	~866.7	866.85
300	867.18	867.60
320	867.39	868.10
350	867.74	868.58

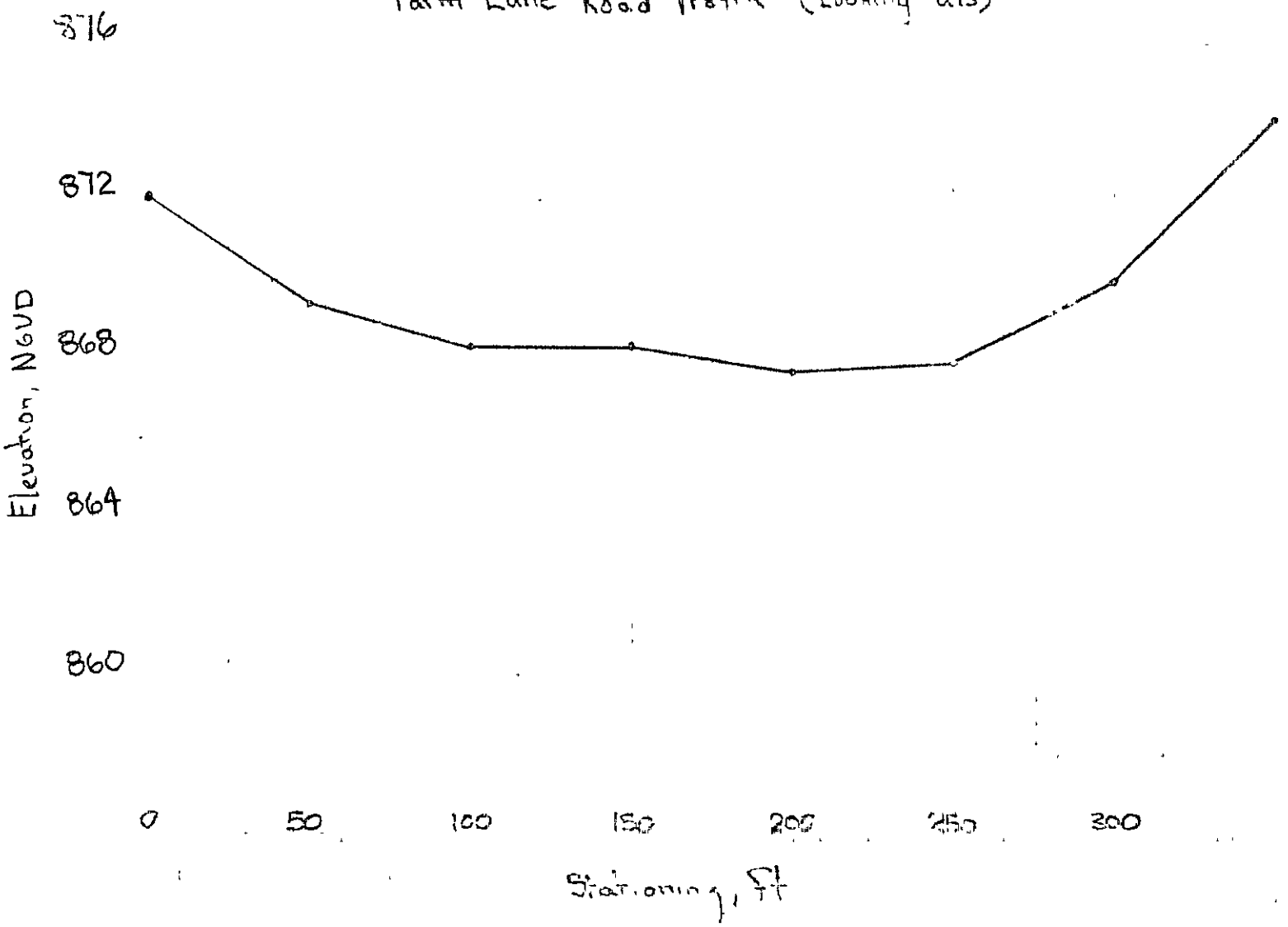
⇒ Inlet Control

$Q_{500} = 490\,cfs$ TWEL = 866.09

Q	EG	
300	867.64	867.60
320	867.85	868.10
350	868.20	868.58

⇒ Inlet Control

Honey Creek
Farm Lane Road Profile (looking u/s)



Putnam Twp FIS

5 7

Putnam Twp FIS - Honey Creek

Farm Lane
Weir Computations

Stage = 868

$$2.7(25)(.3/2)^{1.5} + 2.7(50)\left(\frac{.3+.1}{2}\right)^{1.5} = 16 \text{ cfs}$$

Stage = 868.2

$$2.7(40)(.5/2)^{1.5} + 2.7(50)\left(\frac{.5+.3}{2}\right)^{1.5} + 2.7(5)\left(\frac{.3}{2}\right)^{1.5} = 48 \text{ cfs}$$

Stage = 868.4

$$2.7\left[(5)(.1/2)^{1.5} + 50(.1)^{1.5} + 50\left(\frac{.1+.7}{2}\right)^{1.5} + 50\left(\frac{.7+.5}{2}\right)^{1.5} + 11\left(\frac{.5}{2}\right)^{1.5}\right.$$

$$= 105$$

Stage = 868.8

$$2.7\left(25\left(\frac{.5}{2}\right)^{1.5} + 50(.6)^{1.5} + 50\left(\frac{.6+1.2}{2}\right)^{1.5} + 50\left(\frac{1.2+1.0}{2}\right)^{1.5} + 20(1.0)^{1.5}\right.$$

$$= 396$$

Stage = 868.6

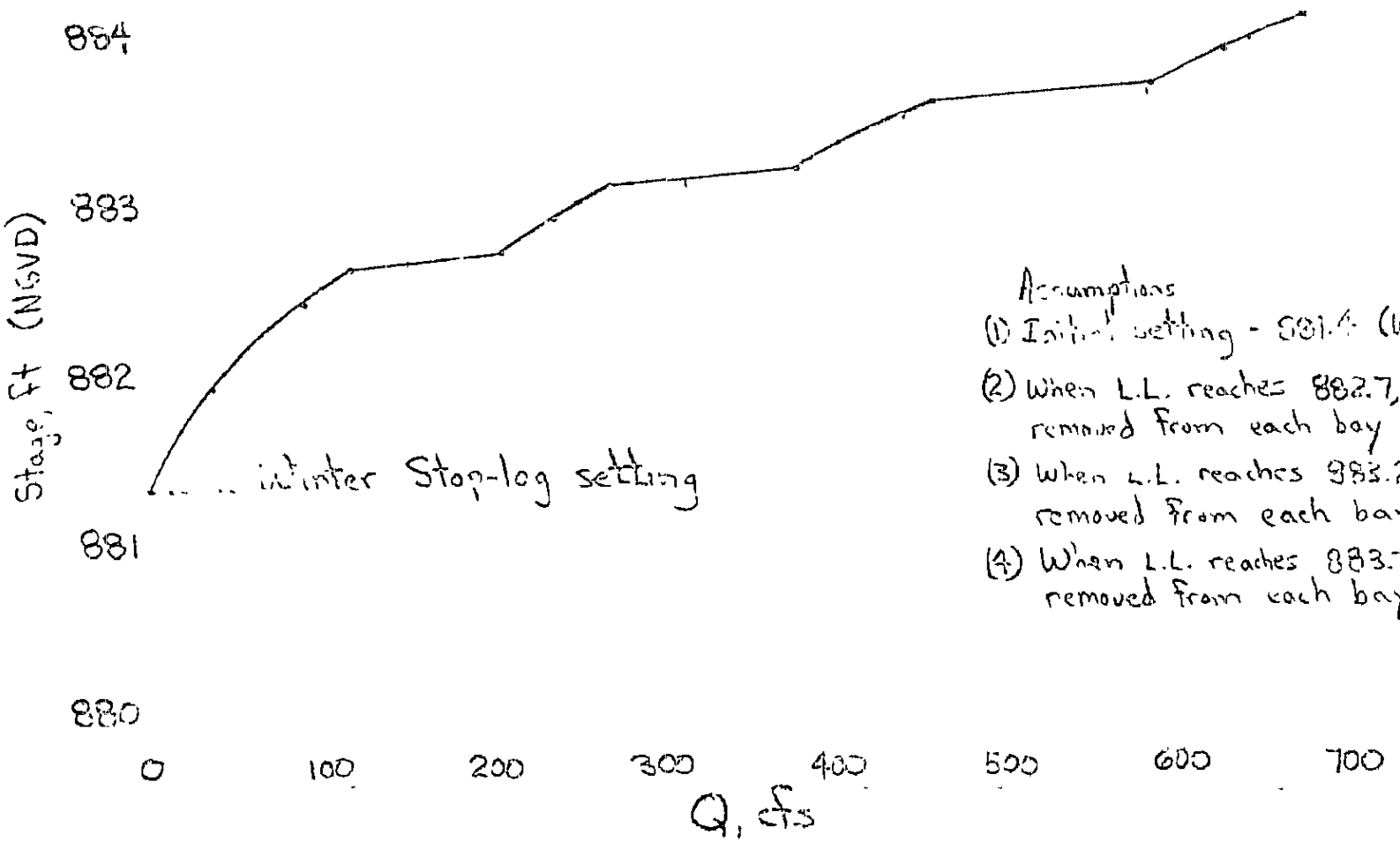
$$2.7\left(15\left(\frac{.3}{2}\right)^{1.5} + 50(.3)^{1.5} + 50\left(\frac{.3+1.0}{2}\right)^{1.5} + 50\left(\frac{1.0+.8}{2}\right)^{1.5} + 16\left(\frac{.7}{2}\right)^{1.5}\right.$$

$$= 219$$

Putnam Twp FIS -- 7 7
Honey Creek

Freq.	Q	EG	Qp	Qweir
10	200	866.03	200	0
50	300	867.60	295	5
100	350	868.09	323	34
500	490	868.45	342	160

Hiland Lake Dam
Rating Curve



Assumptions
(1) Initial setting - 881.4 (Winter)
(2) When L.L. reaches 882.7, one log removed from each bay (crest = 880.9)
(3) When L.L. reaches 883.2, one log removed from each bay (crest = 880.4)
(4) When L.L. reaches 883.7, one log removed from each bay. (crest = 879.9)

4/21/85

Outlet Structure

Freq.	Q, cfs	Hand Calc. EG	Hand Calc. Qpipe	HEC-2 Results EG	HEC-2 Results Qpipe
10	200	863.43	176	863.35	195
50	300	866.66	183	863.65	187
100	350	863.76	184	863.76	183
500	490	864.00	175	864.01	170

⇒ HEC-2 Result appear reasonable

$Q_{100} = 350$ cfs TWEL = 860.98

$Q_{Left} = .6(15.33)\sqrt{64.4(EG - 860.98)}$ 860.98 > 860.87 use 860.98

$Q_{RIGHT} = .6(7.68)\sqrt{64.4(EG - 860.98)}$

$Q_{WEIR} = 2.7(200)(Stage - 863.3)^{1.5}$

Stage	Q_L	Q_R	Q_W	Q_T
863.8	124	62	191	377
863.75	123	61	163	347
863.76	123	61	168	353

Use 863.76 w/s for Q = 350 cfs (?) = 78

$Q_{500} = 490$ TWEL = 861.5

$Q_{left} = .6(15.33)\sqrt{64.4(EG - 861.5)} =$

$Q_{RIGHT} = .6(7.68)\sqrt{64.4(EG - 861.5)} =$

$Q_W = 2.7(200)(EG - 863.3)^{1.5} =$

Stage	Q_L	Q_R	Q_W	Q_T
863.9	114	57	251	422
864.0	117	58	316	491

Use 864.00 w/s for Q = 490 cfs (?.??)

Note: The pipes are 6 ft dia RCCP, 17 feet long. The friction loss through the pipes would be minimal. i.e. $\left(\frac{124\text{cfs}}{28.27\text{ft}^2}\right)^2 \times \frac{29.1(.013)^2 17}{(1.5)^{4/3}} / 64.4 = .01$ ft

$\bar{y}$ located @ 1.89' + 859.1 = 860.99

10-yr TWEL = 860.2

$$Q_{left} = \overset{C}{(.6)}\,\overset{A\,(ft^2)}{(15.33)}\sqrt{2g\,(Stage - 860.87)}$$

$$Q_{RIGHT} = .6\,(7.68)\sqrt{2g\,(Stage - 860.99)}$$

$$Q_{WEIR} = 2.7\,(200)\,(Stage - 863.3)^{1.5}$$

Stage	Q_L	Q_R	Q_W	Q_T
862.7	100	48	0	148
863.3	115	56	0	171
863.5	120	59	48	227
863.4	117	57	17	192
863.42	118	58	22	198
863.43	118	58	25	201

For 10-year flow = 200cfs, use Stage = 863.43 (5.13)

50-yr Q = 300 TWEL = 860.75

Stage	Q_L	Q_R	Q_W	Q_T
863.5	120	59	48	227
863.7	124	60	137	321
863.66	123	60	117	300

For 50-yr flow = 300cfs use u/s Stage = 863.66 (2.91)

Rating Curve for small impoundment structure
Outlet consists of two culverts, with plates on the upstream ends blocking a portion of the culvert.

No tailwater effects

$Q_{Left} = (.6)(15.33 ft^2)\sqrt{2g(Stage - 860.87)}$ (Stage $\leq$ 860.87)

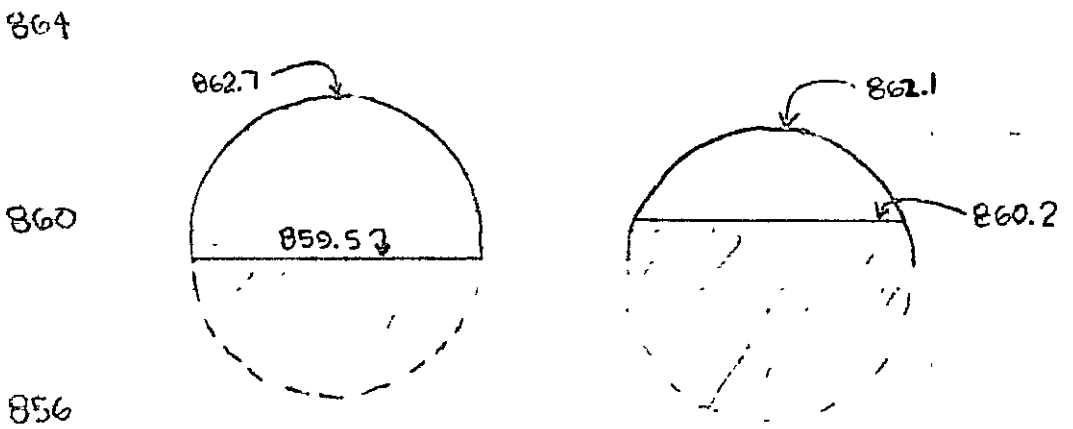
$Q_{RIGHT} = (.6)(7.68 ft^2)\sqrt{2g(Stage - 861.03)}$ (Stage $\geq$ 86)

$Q_{weir} = (2.7)(200)(Stage - 863.3)^{1.5}$

Stage	Q_L	Q_R	Q_W	Q_T
862.7	100	48	0	148
862.9	105	51	0	156
863.3	115	56	0	171
863.5	120	58	48	226
863.7	124	60	137	321
863.8	126	62	191	379

Outlet Structure for small impoundment

Outlet consists of two culverts, with plates on the upstream ends blocking a portion of the culverts



Considering the sharp contraction for the entrance for each culvert, a discharge coefficient of .6 was selected. "The Design of Small Dams", pg 468, fig 309 was used as a reference.

Left Culvert

Unblocked Area - $15.33 ft^2$

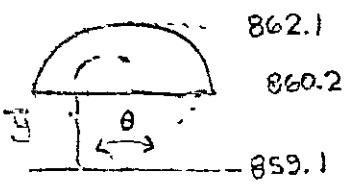
Approximate centroid = $\frac{4r}{3\pi} + \frac{859.7-859.5}{2} = \frac{4(3)}{3\pi} + .1 = \underline{1.37 ft}$

$859.5 + 1.37 = \underline{860.87}$

Right Culvert

Unblocked area = $7.68 ft^2$

Approximate centroid =



$\theta = 4 \sin^{-1}\sqrt{\frac{1.9}{6}} = 137°$ $\quad 137° = \frac{\pi}{180}(137)$ radians

$\alpha = \theta/2$ (radians)

$A_{ARC} = \alpha r^2 = \left(\frac{1}{2}\right)\frac{\pi(137)}{180} 9 = 10.76 ft^2$ (arc)

$\bar{y} = \frac{2r \sin\alpha}{3\alpha} = 1.556$ (arc)

$A_{TRIANGLE} = \frac{1.1}{2}\left(6 \sin\frac{137°}{2}\right) = 3.07$

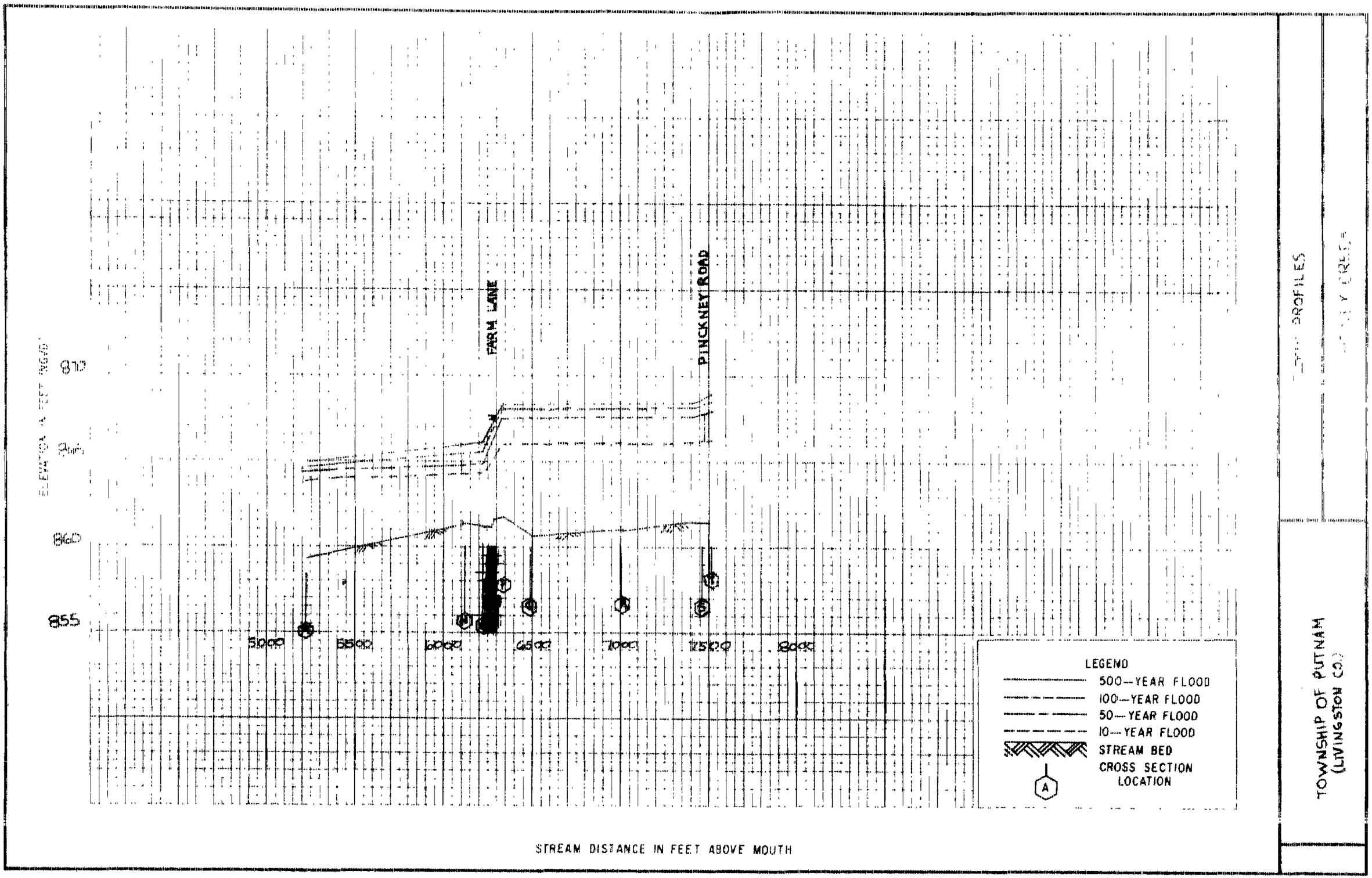
$\bar{y} = 1.1 \times \frac{2}{3} = .73$

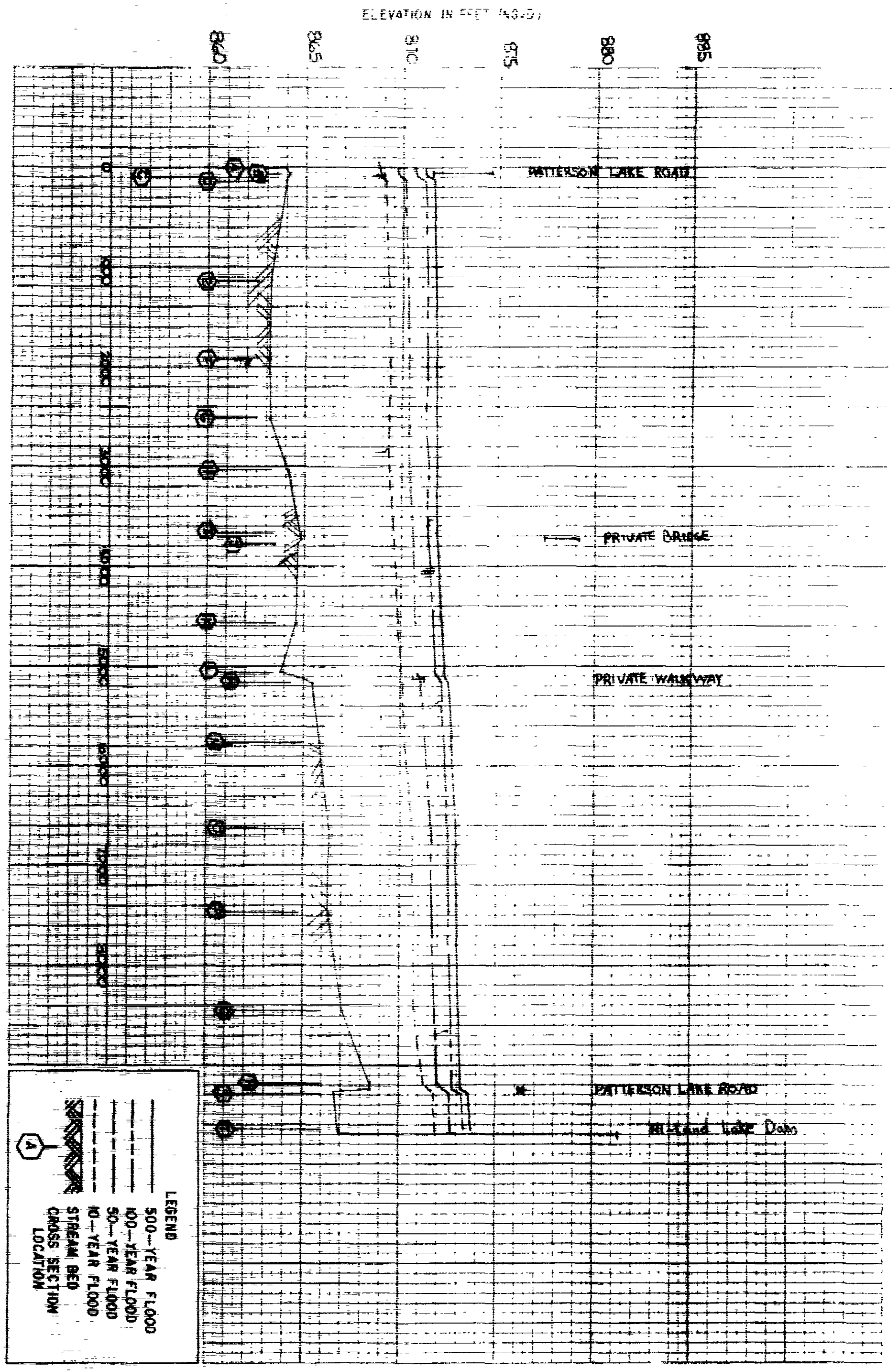
$A_{NET} = 10.76 - 3.07 ft^2 = 7.69 ft^2$ $\quad \bar{y} = \frac{10.76 \times 1.556 - 3.07 \times .73}{7.69} = \underline{1.89}$

FLOOD PROFILES

HONEY CREEK

TOWNSHIP OF PUTNAM (LIVINGSTON CO.)


ELEVATION IN FEET
865
860
855
5000
5500
6000
6500
7000
7500
8000
FARM LANE
PINCKNEY ROAD
LEGEND
500—YEAR FLOOD
100—YEAR FLOOD
50—YEAR FLOOD
10—YEAR FLOOD
STREAM BED
CROSS SECTION LOCATION
A
STREAM DISTANCE IN FEET ABOVE MOUTH
PROFILES
TOWNSHIP OF PUTNAM
(LIVINGSTON CO.)



TOWNSHIP OF PUTNAM
(LIVINGSTON CO.)

FLOOD PROFILES

PORTAGE RIVER

00BREAK00

1) COUNTY: Livingston

2) STUDY NAME: Putnam Twp.

3) WATERCOURSE: Honey Ck

4) DOCUMENT TYPE: 100 yr Encroached

00BREAK00

THIS RUN EXECUTED 06/20/86 08:05:25

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*************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55,56
  IBM-PC-XT VERSION 1.1
*************************************************

C
T1      PUTNAM TOWNSHIP FIS
T2      LIVINGSTON CO.          100YR FLOOD
T3      HONEY CREEK             ENCROACHED CONDITIONS

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     O         WSEL      FQ

      0.        2.        0.        0.    .003000     .00       .0      350.    855.000     .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    .000      .000    -1.000      .000      .000      .000      .000      .000      .000      .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

  150.000   200.000      .000      .000      .000      .000      .000      .000      .000      .000


NC      .120      .120      .040      .300      .500      .000      .000      .000      .000      .000
ET      .000      .000      .000     1.400      .000      .000      .000      .000      .000      .000
                2070FT DS OF DARWIN RD  XSEC A
X1      .000    11.000   215.000   241.000      .000      .000      .000      .000      .000      .000
GR   860.000      .000   858.000    15.000   856.000   165.000   855.800   215.000   854.100   218.000
GR   851.300   230.000   852.900   238.000   855.700   241.000   856.000   261.000   858.000   561.000
GR   862.000   581.000      .000      .000      .000      .000      .000      .000      .000      .000

NC      .000      .000      .000      .000      .000      .000      .000      .000      .000      .000
ET      .000     6.100      .000     1.400      .000   135.000   395.000      .000      .000      .000
                OB CUT FROM TOPO  CHANNEL SHAPE FROM XSEC A    XSEC B
X1    10.200    11.000   235.000   283.000   530.000   610.000  1020.000      .000      .000      .000
GR   864.000      .000   860.000    35.000   858.000    75.000   856.000   235.000   855.300   253.000
GR   852.700   262.000   854.300   270.000   856.000   283.000   858.000   450.000   860.000   480.000
GR   870.000   520.000      .000      .000      .000      .000      .000      .000      .000      .000

NC      .000      .000      .000      .000      .000      .000      .000      .000      .000      .000
ET      .000     6.100      .000     1.400      .000   260.000   520.000      .000      .000      .000
                OB CUT FROM TOPO  CHANNEL SHAPE FROM XSEC D    XSEC C
X1    16.800    12.000   368.000   385.000   520.000   550.000   660.000      .000      .000      .000
GR   862.000      .000   862.000   200.000   860.000   223.000   858.000   240.000   857.400   368.000
GR   855.800   370.000   857.800   376.000   854.300   384.000   857.600   385.000   858.000   550.000
GR   860.000   560.000   870.000   600.000      .000      .000      .000      .000      .000      .000
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                 150FT US OF DARWIN RD      XSEC F
X1      22.180      .000      .000      .000    100.000    100.000    100.000      .000      .000      .000

ET        .000     6.100      .000     6.100      .000    375.000    575.000      .000      .000      .000
                         XSEC G
X1      27.280    10.000   483.000   503.000   650.000   530.000   610.000      .000      .000      .000
GR     870.000      .000   866.000    80.000   864.000   110.000   862.000   251.000   859.500   483.000
GR     856.400   485.000   856.400   496.000   857.300   503.000   862.000   575.000   870.000   607.000

NC        .000      .000      .030      .000      .000      .000      .000      .000      .000      .000
ET        .000     6.100      .000     6.100      .000   140.000   340.000      .000      .000      .000
          DS OF IMPOUNDMENT  OUTLET TWIN 6FT RCCP WITH INLET CONTROL  XSEC H
X1      28.280    11.000   238.000   260.000    80.000    95.000   100.000      .000      .000      .000
GR     870.000      .000   864.000    58.000   862.000   148.000   859.500   238.000   857.000   240.000
GR     857.000   251.000   857.700   258.000   859.000   260.000   862.000   325.000   864.000   372.000
GR     870.000   420.000      .000      .000      .000      .000      .000      .000      .000      .000

SB        .000     2.780     2.700   200.000     5.000      .000    22.800      .000      .000      .000
ET        .000     6.100      .000     6.100      .000    90.000   290.000      .000      .000      .000
                         XSEC I   LOSS CHECKED BY HAND CALCULATIONS
X1      29.730     8.000   112.000   340.000   145.000   145.000   145.000      .000      .000      .000
X2        .000      .000     1.000   860.000   863.300      .000      .000      .000      .000      .000
GR     870.000      .000   864.000    60.000   862.000    90.000   860.700   112.000   857.000   116.000
GR     857.000   230.000   857.000   340.000   860.700   350.000   870.000   380.000      .000      .000

NC        .100      .100      .040      .000      .000      .000      .000      .000      .000      .000
ET        .000     6.100      .000     6.100      .000   130.000   320.000      .000      .000      .000
                 US OF IMPOUNDMENT     XSEC J
X1      35.530    13.000   210.000   298.000   460.000   550.000   580.000      .000      .000      .000
GR     870.000      .000   864.000    40.000   861.400   210.000   861.200   235.000   860.200   236.000
GR     858.800   245.000   857.700   252.000   858.500   258.000   861.200   298.000   864.000   378.000
GR     866.000   422.000   868.000   474.000   870.000   516.000      .000      .000      .000      .000

ET        .000      .000      .000     1.400      .000      .000      .000      .000      .000      .000
                 XSEC K
X1      40.630    14.000   235.000   293.000   500.000   500.000   510.000      .000      .000      .000
GR     870.000      .000   868.000    35.000   866.000    50.000   864.000   130.000   861.300   235.000
GR     860.900   237.000   858.500   246.000   858.400   253.000   859.200   259.000   862.000   293.000
GR     864.000   390.000   866.000   447.000   868.000   550.000   870.000   626.000      .000      .000

ET        .000      .000      .000     1.400      .000      .000      .000      .000      .000      .000
                 XSEC L
X1      47.930    11.000   197.000   221.000   510.000   460.000   730.000      .000      .000      .000
GR     870.000      .000   866.000    55.000   864.000    70.000   862.900   197.000   859.400   205.000
GR     859.300   207.000   859.400   209.000   861.900   221.000   864.000   302.000   866.000   328.000
GR     870.000   373.000      .000      .000      .000      .000      .000      .000      .000      .000

NC        .070      .070      .040      .000      .000      .000      .000      .000      .000      .000
ET        .000      .000      .000     1.400      .000      .000      .000      .000      .000      .000
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NC      .000      .000      .000      .000      .000      .000      .000      .000      .000      .000
ET      .000     6.100      .000     1.400      .000    30.000   270.000      .000      .000      .000
                XSEC R
X1    70.050    11.000   102.000   130.000   440.000   410.000   510.000      .000      .000      .000
GR   870.000      .000   866.000    60.000   864.000    90.000   863.400   102.000   862.700   104.000
GR   861.100   115.000   862.000   127.000   863.000   130.000   864.000   225.000   868.000   313.000
GR   870.000   326.000      .000      .000      .000      .000      .000      .000      .000      .000

NC      .100      .100      .040      .000      .000      .000      .000      .000      .000      .000
ET      .000     6.100      .000     1.400      .000   190.000   370.000   295.000   355.000      .000
                XSEC S
X1    74.050     7.000   310.000   349.000   470.000   310.000   400.000      .000      .000      .000
GR   866.000      .000   865.400   310.000   862.500   319.000   861.400   333.000   862.500   345.000
GR   864.100   349.000   866.000   500.000      .000      .000      .000      .000      .000      .000

ET      .000     6.100      .000     1.400      .000   190.000   370.000   308.000   342.000      .000
X1    74.550     6.000   310.000   340.000    50.000    50.000    50.000      .000      .000      .000
GR   866.000      .000   865.000   310.000   861.400   315.000   861.400   335.500   864.100   340.000
GR   866.000   500.000      .000      .000      .000      .000      .000      .000      .000      .000

ET      .000     6.100      .000     8.100      .000   190.000   370.000   195.000   365.000      .000
                DS OF PINCHNEY RD  20.3FT BRIDGE WITH CONC WINGWALLS
X1    74.560     7.000   311.000   321.500     1.000     1.000     1.000      .000      .000      .000
X2      .000      .000      .000   866.400   867.800      .000      .000      .000      .000      .000
GR   867.800      .000   867.800   300.000   861.400   301.000   861.400   311.000   861.400   321.500
GR   867.800   325.000   867.800   500.000      .000      .000      .000      .000      .000      .000

NC      .000      .000      .000      .000      .000      .000      .000      .000      .000      .000
ET      .000     6.100      .000     8.100      .000   190.000   370.000   195.000   355.000      .000
X1    75.050      .000      .000      .000    49.000    49.000    49.000      .000      .000      .000
X2      .000      .000      .000   866.400   867.800      .000      .000      .000      .000      .000

NC      .000      .000      .000      .000      .000      .000      .000      .000      .000      .000
ET      .000     6.100      .000     8.100      .000   240.000   430.000   210.000   370.000      .000
                XSEC T     US OF PINCHNEY RD
X1    75.100     6.000   310.000   340.000    10.000    10.000    10.000      .000      .000      .000
GR   866.000      .000   865.000   310.000   861.400   315.000   861.400   335.500   864.100   340.000
GR   866.000   500.000      .000      .000      .000      .000      .000      .000      .000      .000
ET      .000      .000      .000      .000      .000      .000      .000      .000      .000      .000
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   SECNO     DEPTH     CWSEL     CRIWS     WSELE     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=     157.0     180.0  TYPE=     1  TARGET=      23.000
                DARWIN RD TWIN 9FT6IN BY 6FT5IN CMP 37LF  NO HEADWALL
    20.30     5.15   859.35      .00       .00   859.70      .34       .14       .03   857.80
     350.       3.      344.       3.        5.      73.       4.        9.        7.   858.00
      .24      .69     4.74      .65      .120     .040     .120      .000    854.20   157.00
  .002997      50.      50.      50.         2        0        0       .00     23.00   180.00


*SECNO 20.310

3370 NORMAL BRIDGE,NRD= 27 MIN ELTRD=  861.50 MAX ELLC=  860.70


3470 ENCROACHMENT STATIONS=     365.0     388.0  TYPE=     1  TARGET=      23.000
    20.31     4.54   859.34      .00       .00   859.71      .37       .00       .01   854.80
     350.       0.      350.       0.        0.      72.       0.       10.        7. 100000.00
      .24      .00     4.88      .00      .120     .040     .120      .000    854.80   365.00
  .007051       1.       1.       1.         1        0        0    -23.16     23.00   388.00


*SECNO 20.680

3370 NORMAL BRIDGE,NRD= 27 MIN ELTRD=  861.50 MAX ELLC=  860.70


3470 ENCROACHMENT STATIONS=     365.0     388.0  TYPE=     1  TARGET=      23.000
                UPSTREAM FACE OF CULVERTS
    20.68     4.78   859.58      .00       .00   859.92      .34       .20       .01   854.80
     350.       0.      350.       0.        0.      75.       0.       10.        7. 100000.00
      .24      .00     4.69      .00      .120     .032     .120      .000    854.80   365.00
  .004124      37.      37.      37.         2        0        0    -25.39     23.00   388.00


*SECNO 20.690

3470 ENCROACHMENT STATIONS=     527.0     550.0  TYPE=     1  TARGET=      23.000
    20.69     5.18   859.58      .00       .00   859.93      .35       .00       .00   858.00
     350.       3.      345.       2.        5.      72.       4.       10.        7.   858.20
      .24      .56     4.77      .52      .120     .032     .120      .000    854.40   527.00
  .001943       1.       1.       1.         0        0        0       .00     23.00   550.00
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   SECNO     DEPTH     CWSEL     CRIWS     WSELH     EG        HV        HL        OLOSS    BANK ELEV
   D         OLOB      OCH       OROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST


SPECIAL BRIDGE

5070,VARIABLE ELCHU OR ELCHD ON CARD SB NOT SPECIFIED
SB  XK          XKOR       COFO       RDLEN      BWC        BWP        BAREA      SS         ELCHU      ELCHD
      .00        2.78       2.70     200.00       5.00       .00       22.80       .00     857.00     857.00

*SECNO 29.730
3280 CROSS SECTION      29.73 EXTENDED       3.06 FEET

PRESSURE AND WEIR FLOW


 EGPRS       EGLWC       H3        OWEIR       OPR        BAREA    TRAPEZOID       ELLC      ELTRD
                                                                      AREA
    871.17     861.00       .00       168.       183.        23.        15.      860.00     863.30


3470 ENCROACHMENT STATIONS=       90.0      290.0  TYPE=      1  TARGET=      200.000
                        XSEC I    LOSS CHECKED BY HAND CALCULATIONS
    29.73      6.76    863.76       .00       .00    863.76       .00      2.55       .00    860.70
     350.        2.      348.        0.       53.     1196.        0.       18.       12. 100000.00
      .49       .04       .29       .00      .120      .030      .000      .000    857.00     90.00
  .000003      145.      145.      145.         0         0         6       .00    200.00    290.00


*SECNO 35.530

3470 ENCROACHMENT STATIONS=      130.0      320.0  TYPE=      1  TARGET=      190.000
                US OF IMPOUNDMENT     XSEC J
    35.53      6.06    863.76       .00       .00    863.77       .01       .00       .01    861.40
     350.       31.      307.       12.      140.      332.       48.       29.       14.    861.20
      .68       .22       .93       .25      .100      .040      .100      .000    857.70    170.00
  .000107      460.      580.      550.         2         0         0       .00    190.00    320.00


*SECNO 40.630
                XSEC K
    40.63      5.43    863.83       .00       .00    863.85       .02       .08       .01    861.30
     350.       33.      300.       17.      124.      220.       81.       35.       17.    862.00
      .80       .26      1.76       .21      .100      .040      .100      .000    858.40    176.69
  .000230      500.      510.      500.         2         0         0       .00    244.97    381.66
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SECNO D TIME SLOPE	DEPTH DLOB VLOB XLOBL	CWSEL DLCH VCH XLCH	CRIWS DROB VROB XLOBR	WSELI ALOB XNL ITRIAL	EG ACH XNCH IDC	HV AROB XNR ICONT	HL VOL WTN CORAR	DLOSS TWA ELMIN TOPWID	BANK ELEV LEFT/RIGHT SSTA ENDST
62.73	4.38	865.58	.00	.00	865.60	.02	.01	.00	862.80
350.	0.	318.	32.	0.	264.	71.	47.	24.	862.70
1.10	.00	1.20	.46	.070	.040	.070	.000	861.20	169.00
.000174	50.	50.	50.	2	0	0	.00	100.00	269.00

SPECIAL BRIDGE

5070,VARIABLE ELCHU OR ELCHD ON CARD SB NOT SPECIFIED

SB	XI	XLOR	COFD	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.00	3.03	2.70	.00	7.50	.00	44.18	.00	861.20	861.20

*SECNO 62.950
PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
868.53	865.60	.00	29.	323.	44.	28.	865.00	867.70

3470 ENCROACHMENT STATIONS= 169.0 269.0 TYPE= 1 TARGET= 100.000

62.95	6.49	868.09	.00	.00	868.09	.01	2.50	.00	862.80
350.	0.	306.	44.	0.	409.	156.	48.	24.	862.70
1.11	.00	.75	.28	.000	.032	.070	.000	861.60	169.00
.000025	22.	22.	22.	0	0	3	.00	100.00	269.00

*SECNO 63.450

3470 ENCROACHMENT STATIONS= 119.0 319.0 TYPE= 1 TARGET= 200.000

XSEC P

63.45	6.39	868.09	.00	.00	868.10	.00	.00	.00	862.90
350.	49.	250.	51.	221.	402.	256.	49.	25.	862.80
1.14	.22	.62	.20	.100	.045	.100	.000	861.70	119.00
.000032	50.	50.	50.	0	0	0	.00	196.92	315.92

CCHV= .100 CEHV= .300
*SECNO 64.950

XSEC D

64.95	7.40	868.10	.00	.00	868.10	.01	.01	.00	867.00
750.	117.	170.	62.	409.	187.	211.	51.	25.	862.70
1.20	.29	.91	.30	.100	.045	.100	.000	860.70	9.52
.000062	115.	150.	90.	0	0	0	.00	210.38	219.91

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

*SECNO 75.050
3280 CROSS SECTION      75.05 EXTENDED        .56 FEET

3370 NORMAL BRIDGE,NRD=  0 MIN ELTRD=  867.80 MAX ELLC=  866.40

3470 ENCROACHMENT STATIONS=      190.0      370.0  TYPE=      1  TARGET=      180.000
    75.05      6.96    868.36      .00       .00    868.48      .12       .25       .01    861.40
     350.      120.      207.      23.      120.      58.       34.       66.       29.     861.40
     1.57      1.00      3.55      .67      .100      .040      .100      .000    861.40    190.00
  .004017       49.       49.      49.         2         0         0    -34.31    180.00    370.00

*SECNO 75.100
3280 CROSS SECTION      75.10 EXTENDED       2.49 FEET

3470 ENCROACHMENT STATIONS=      240.0      430.0  TYPE=      1  TARGET=      190.000
                XSEC T      US OF FINCHNEY RD
    75.10      7.09    868.49      .00       .00    868.49      .01       .00       .01    865.00
     350.      60.       193.      97.      236.      197.      347.      66.       29.     864.10
     1.57      .25       .98      .28      .100      .040      .100      .000    861.40    240.00
  .000061      10.       10.      10.         2         0         0       .00    190.00    430.00
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   SECNO     DEPTH     CWSEL     CRIWS     WSELP     EG        HV        HL        OLOSS   BANK ELEV
   Q         OLOB      OCH       QROB      ALOB      ACH       AROB      VOL       TWA   LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLORL     XLCH      XLORR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST


*PROF 2

CCHV=    .300 CEHV=    .500
*SECNO  .000
 2800 NAT Q1=     63.86  WSEL=    856.13  ENC Q1=     66.31  WSEL=    856.23  RATIO=  -.0383
 NAT Q1=     68.  RATIOS LOB,CH,ROB=   .0155   .9754   .0092  WSEL=    856.23

3470 ENCROACHMENT STATIONS=     215.0     241.0  TYPE=     4  TARGET=        .025
                2070FT DS OF DARWIN RD  XSEC A
      .00      4.92   856.23      .00   856.13   856.49      .26      .00      .00   855.80
     350.       0.     350.       0.       0.      85.       0.       0.       0.    855.70
      .00      .00     4.12      .00     .120     .040     .120     .000   851.30   215.00
  .002924       0.       0.       0.        0        0        0      .00    26.00   241.00


*SECNO 10.200
 2800 NAT Q1=    128.69  WSEL=    857.70  ENC Q1=    128.69  WSEL=    857.80  RATIO=   .0000
 NAT Q1=    138.  RATIOS LOB,CH,ROB=   .1081   .7790   .1129  WSEL=    857.80

3470 ENCROACHMENT STATIONS=     191.9     329.1  TYPE=     4  TARGET=        .065
                OB CUT FROM TOPO  CHANNEL SHAPE FROM XSEC A    XSEC B
    10.20      5.09   857.79      .00   857.70   857.84      .06     1.29      .06   856.00
     350.      29.     291.      30.      66.     141.      70.       4.       1.    856.00
      .15      .44     2.06      .44     .120     .040     .120     .000   852.70   191.87
  .000740     530.    1020.     610.        2        0        0      .00   137.21   329.08


*SECNO 16.800
 2800 NAT Q1=     66.95  WSEL=    858.47  ENC Q1=     66.95  WSEL=    858.53  RATIO=   .0000
 NAT Q1=     76.  RATIOS LOB,CH,ROB=   .1542   .6856   .1601  WSEL=    858.53

3470 ENCROACHMENT STATIONS=     307.3     471.6  TYPE=     4  TARGET=        .116
                OB CUT FROM TOPO  CHANNEL SHAPE FROM XSEC D    XSEC C
    16.80      4.72   858.52      .00   858.43   858.74      .22      .82      .08   857.40
     350.      38.     272.      40.      60.      65.      71.       7.       3.    857.60
      .20      .64     4.21      .57     .120     .040     .120     .000   853.80   307.30
  .002761     520.     660.     550.        2        0        0      .00   164.31   471.61


*SECNO 19.800

3470 ENCROACHMENT STATIONS=     144.0     197.0  TYPE=     1  TARGET=      49.000
                50FT DS OF DARWIN RD      XSEC D
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   SECNO     DEPTH     CWSEL     CRIWS     WSELP     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=     527.0     550.0  TYPE=     1  TARGET=      23.000
    20.69      5.24    859.64      .00    859.58    859.98      .34       .00       .00    858.00
     350.        3.      345.       2.        5.       73.       4.        8.        4.    858.20
      .23       .55      4.70      .52      .120      .032     .120      .000    854.40    527.00
  .001853        1.        1.       1.         0         0        0       .00     23.00    550.00


*SECNO 21.180

3470 ENCROACHMENT STATIONS=     477.0     600.0  TYPE=     1  TARGET=     123.000
                 50FT US OF DARWIN ROAD  CHANNEL SHAPE FROM XSEC D   XSEC E
    21.18      5.63    860.03      .00    859.98    860.14      .10       .09       .07    858.00
     350.       71.      244.      35.       96.       80.      62.        8.        4.    858.20
      .24       .74      3.05      .56      .120      .050     .120      .000    854.40    477.00
  .001691       49.       49.      49.         2         0        0       .00    123.00    600.00


*SECNO 22.180
 2800 NAT QI=     107.83  WSEL=     860.18  ENC QI=     107.83  WSEL=     860.28  RATIO=    .0000
 NAT QI=     116.  RATIOS LOB,CH,ROB=    .3490    .5553    .0957  WSEL=     860.28

3470 ENCROACHMENT STATIONS=     417.6     568.7  TYPE=     4  TARGET=        .073
                 150FT US OF DARWIN RD     XSEC F
    22.18      5.82    860.22      .00    860.18    860.28      .06       .14       .01    858.00
     350.      116.      212.      22.      195.       83.      38.        9.        5.    858.20
      .25       .59      2.55      .58      .120      .050     .120      .000    854.40    417.58
  .001127      100.      100.     100.         2         0        0       .00    151.15    568.73


*SECNO 27.280

3470 ENCROACHMENT STATIONS=     375.0     575.0  TYPE=     1  TARGET=     200.000
                          XSEC G
    27.28      4.57    860.97      .00    860.93    861.06      .08       .76       .01    859.50
     350.       41.      236.      72.       96.       85.     103.       13.        7.    857.30
      .33       .43      2.77      .70      .120      .050     .120      .000    856.40    375.00
  .001410      650.      610.     530.         2         0        0       .00    184.29    559.29


*SECNO 28.280

3470 ENCROACHMENT STATIONS-     140.0     340.0  TYPE=     1  TARGET=     200.000
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  SECNO     DEPTH     CWSEL     CRIWS     WSELI     EG        HV        HL        OLOSS   BANK ELEV
  D         OLOB      OCH       OROB      ALOB      ACH       AROB      VOL       TWA   LEFT/RIGHT
  TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
  SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO 47.930
 2800 NAT D1=      94.54  WSEL=     864.10  ENC D1=      94.54  WSEL=     864.20  RATIO=    .0000
 NAT D1=     103.  RATIOS LOB,CH,ROB=   .1140   .7156   .1703  WSEL=     864.20

3470 ENCROACHMENT STATIONS=      152.3      253.8  TYPE=      4  TARGET=         .078
                XSEC L
    47.93      4.83   864.13      .00   864.10   864.26      .13      .35      .05   862.90
     350.       27.     274.      49.      46.      85.      59.      36.      14.    861.90
      .85       .58     3.24      .83     .100     .040     .100     .000   859.30   152.31
  .001493      510.     730.     460.        2        0        0      .00   101.53   253.84

*SECNO 52.230
 2800 NAT D1=     120.15  WSEL=     864.59  ENC D1=     120.15  WSEL=     864.69  RATIO=    .0000
 NAT D1=     129.  RATIOS LOB,CH,ROB=   .1546   .6921   .1533  WSEL=     864.69

3470 ENCROACHMENT STATIONS=       51.4      142.0  TYPE=      4  TARGET=         .066
                XSEC M
    52.23      5.35   864.65      .00   864.59   864.74      .09      .47      .01   862.30
     350.       45.     260.      45.      55.      96.      51.      38.      14.    862.50
      .90       .82     2.71      .87     .070     .040     .070     .000   859.30    51.38
  .000879      340.     430.     420.        2        0        0      .00    90.57   141.95

*SECNO 61.230

3470 ENCROACHMENT STATIONS=       60.0      210.0  TYPE=      1  TARGET=      150.000
                XSEC N
    61.23      4.13   865.53      .00   865.47   865.59      .06      .84      .01   862.80
     350.      167.     183.       0.     169.      74.       0.      42.      17. 100000.00
     1.04       .99     2.49      .00     .070     .040     .070     .000   861.40    76.40
  .001018      850.     900.     940.        2        0        0      .00   133.60   210.00

CCHV=     .600 CEHV=     .800
*SECNO 62.230

3470 ENCROACHMENT STATIONS=      169.0      269.0  TYPE=      1  TARGET=      100.000
                XSEC O
    62.23      4.43   865.67      .00   865.57   865.65      .02      .03      .02   862.80
     350.        0.     317.      33.       0.     268.      73.      43.      17.    862.70
     1.07       .00     1.18      .45     .070     .040     .070     .000   861.20   169.00
  .000166       90.     100.     130.        0        0        0      .00   100.00   269.00
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   SECNO     DEPTH     CWSEL     CRIWS     WSELF     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=    .100 CEHV=    .300
*SECNO 64.950
 2800 NAT 01=    444.79  WSEL=    868.10  ENC 01=    444.79  WSEL=    868.20  RATIO=    .0000
 NAT 01=    460.  RATIOS LOB,CH,ROB=   .3383   .4821   .1796  WSEL=    868.20

3470 ENCROACHMENT STATIONS=      37.2     201.8  TYPE=     4  TARGET=        .034
                XSEC Q
    64.95     7.40   868.10      .00   868.10   868.11      .01      .01      .00   863.00
     350.     116.     176.      59.     377.     187.     186.      47.      18.    862.70
     1.17      .31      .94      .32     .100     .045     .100     .000   860.70    37.17
  .000066     115.     150.      90.        0        0        0      .00   164.65   201.82


*SECNO 70.050
 2800 NAT 01=    420.76  WSEL=    868.13  ENC 01=    420.76  WSEL=    868.23  RATIO=    .0000
 NAT 01=    499.  RATIOS LOB,CH,ROB=   .1188   .4056   .4756  WSEL=    868.23

3470 ENCROACHMENT STATIONS=      89.0     232.4  TYPE=     4  TARGET=        .158
                XSEC R
    70.05     7.03   868.13      .00   868.13   868.14      .01      .03      .00   863.40
     350.      19.     169.     162.      57.     177.     469.      54.      19.    863.00
     1.37      .33      .95      .35     .100     .045     .100     .000   861.10    88.96
  .000073     440.     510.     410.        0        0        0      .00   143.44   232.40


*SECNO 74.050
 2800 NAT 01=    367.91  WSEL=    868.15  ENC 01=    367.91  WSEL=    868.25  RATIO=    .0000
 NAT 01=    633.  RATIOS LOB,CH,ROB=   .3452   .4106   .2442  WSEL=    868.25
3280 CROSS SECTION     74.05 EXTENDED      2.15 FEET


3470 ENCROACHMENT STATIONS=     201.2     364.1  TYPE=     4  TARGET=        .419
                XSEC S
    74.05     6.76   868.16      .00   868.15   868.18      .02      .03      .00   865.40
     350.      80.     251.      19.     288.     219.      60.      59.      21.    864.10
     1.49      .28     1.15      .32     .100     .040     .100     .000   861.40   201.19
  .000099     430.     400.     310.        0        0        0      .00   162.89   364.08


*SECNO 74.550
 2800 NAT 01=    373.88  WSEL=    868.16  ENC 01=    373.88  WSEL=    868.26  RATIO=    .0000
 NAT 01=    646.  RATIOS LOB,CH,ROB=   .3847   .3610   .2543  WSEL=    868.26
```

SECNO	DEPTH	CWSEL	CRIWS	WSELI	EG	HV	HL	OLOSS	BANK ELEV
D	DLOB	DCH	DROB	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= 210.0 370.0 TYPE= 1 TARGET= 160.000

XSEC T US OF PINCHNEY RD

75.10	7.10	868.50	.00	868.49	868.51	.01	.00	.01	865.00
350.	94.	216.	39.	333.	198.	127.	60.	21.	864.10
1.52	.28	1.09	.31	.100	.040	.100	.000	861.40	210.00
.000076	10.	10.	10.	2	0	0	00	160.00	370.00

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
28.280	100.00	.00	.00	857.00	350.00	860.99	.00	861.21	12.46	3.95	163.40	99.16
28.280	100.00	.00	.00	857.00	350.00	861.04	.00	861.25	11.87	3.89	168.59	101.57
29.730	145.00	863.30	860.00	857.00	350.00	863.76	.00	863.76	.03	.29	1248.74	2057.57
29.730	145.00	863.30	860.00	857.00	350.00	863.76	.00	863.76	.03	.29	1249.22	2058.81
35.530	580.00	.00	.00	857.70	350.00	863.76	.00	863.77	1.07	.93	519.08	337.77
35.530	580.00	.00	.00	857.70	350.00	863.76	.00	863.77	1.07	.93	519.56	338.19
40.630	510.00	.00	.00	858.40	350.00	863.83	.00	863.85	2.30	1.36	425.47	230.79
40.630	510.00	.00	.00	858.40	350.00	863.83	.00	863.86	2.50	1.42	321.94	221.51
47.930	730.00	.00	.00	859.30	350.00	864.10	.00	864.21	13.71	3.09	260.17	94.54
47.930	730.00	.00	.00	859.30	350.00	864.13	.00	864.26	14.93	3.24	190.11	90.58
52.230	430.00	.00	.00	859.30	350.00	864.59	.00	864.66	8.49	2.63	234.90	120.15
52.230	430.00	.00	.00	859.30	350.00	864.65	.00	864.74	8.79	2.71	201.73	118.05
61.230	900.00	.00	.00	861.40	350.00	865.47	.00	865.53	11.12	2.57	233.79	104.95
61.230	900.00	.00	.00	861.40	350.00	865.53	.00	865.59	10.18	2.49	242.55	109.67
62.230	100.00	.00	.00	861.20	350.00	865.57	.00	865.59	1.75	1.20	334.55	264.44
62.230	100.00	.00	.00	861.20	350.00	865.63	.00	865.65	1.66	1.18	340.89	271.87
62.730	50.00	.00	.00	861.20	350.00	865.58	.00	865.60	1.74	1.20	335.19	265.18
62.730	50.00	.00	.00	861.20	350.00	865.63	.00	865.65	1.66	1.18	340.94	271.94
62.950	22.00	867.70	865.00	861.60	350.00	868.09	.00	868.09	.25	.75	565.23	696.40
62.950	22.00	867.70	865.00	861.60	350.00	868.09	.00	868.10	.25	.75	565.76	697.39
63.450	50.00	.00	.00	861.70	350.00	868.09	.00	868.10	.32	.62	879.67	618.77
63.450	50.00	.00	.00	861.70	350.00	868.10	.00	868.10	.34	.64	816.37	602.89
64.950	150.00	.00	.00	860.70	350.00	868.10	.00	868.10	.62	.91	807.03	444.79
64.950	150.00	.00	.00	860.70	350.00	868.10	.00	868.11	.66	.94	750.55	432.17
70.050	510.00	.00	.00	861.10	350.00	868.13	.00	868.13	.69	.93	774.75	420.76
70.050	510.00	.00	.00	861.10	350.00	868.13	.00	868.14	.73	.95	703.28	408.85
74.050	400.00	.00	.00	861.40	350.00	868.15	.00	868.17	.91	1.10	616.95	367.91
74.050	400.00	.00	.00	861.40	350.00	868.16	.00	868.18	.99	1.15	566.25	352.12
74.550	50.00	.00	.00	861.40	350.00	868.16	.00	868.17	.88	1.13	659.47	373.88
74.550	50.00	.00	.00	861.40	350.00	868.17	.00	868.18	.95	1.18	616.89	359.30
74.560	1.00	867.80	866.40	861.40	350.00	868.02	.00	868.23	64.29	4.31	151.80	43.65
74.560	1.00	867.80	866.40	861.40	350.00	868.03	.00	868.24	63.84	4.30	151.28	43.80
75.050	49.00	867.80	866.40	861.40	350.00	868.36	.00	868.48	40.17	3.55	212.32	55.22
75.050	49.00	867.80	866.40	861.40	350.00	868.36	.00	868.49	41.57	3.62	201.96	54.29

HONEY CREEK

SUMMARY PRINTOUT TABLE 150

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFWS	TOPWID	XLCH
.000	350.00	856.13	.00	.00	1.13	126.03	.00
.000	350.00	856.23	.10	.00	.10	26.00	.00
10.200	350.00	857.70	.00	1.56	.00	260.00	1020.00
10.200	350.00	857.79	.09	1.56	.09	137.21	1020.00
16.800	350.00	858.43	.00	.73	.00	260.00	660.00
16.800	350.00	858.52	.09	.74	.09	164.31	660.00
19.800	350.00	859.24	.00	.81	.00	49.00	300.00
19.800	350.00	859.32	.08	.79	.08	49.00	300.00
20.300	350.00	859.35	.00	.12	.00	23.00	50.00
20.300	350.00	859.42	.07	.11	.07	23.00	50.00
20.310	350.00	859.34	.00	-.01	.00	23.00	1.00
20.310	350.00	859.41	.07	-.01	.07	23.00	1.00
20.680	350.00	859.58	.00	.23	.00	23.00	37.00
20.680	350.00	859.64	.06	.23	.06	23.00	37.00
20.690	350.00	859.58	.00	.00	.00	23.00	1.00
20.690	350.00	859.64	.06	.00	.06	23.00	1.00
21.180	350.00	859.98	.00	.40	.00	123.00	49.00
21.180	350.00	860.03	.05	.39	.05	123.00	49.00
22.180	350.00	860.18	.00	.20	.00	220.00	100.00
22.180	350.00	860.22	.04	.19	.04	151.15	100.00
27.280	350.00	860.93	.00	.74	.00	183.54	610.00
27.280	350.00	860.97	.05	.75	.05	184.29	610.00
28.280	350.00	860.99	.00	.07	.00	118.95	100.00
28.280	350.00	861.04	.04	.06	.04	121.45	100.00
29.730	350.00	863.76	.00	2.76	.00	200.00	145.00
29.730	350.00	863.76	.00	2.72	.00	200.00	145.00
35.530	350.00	863.76	.00	.00	.00	190.00	580.00
35.530	350.00	863.76	.00	.00	.00	190.00	580.00
40.630	350.00	863.83	.00	.07	.00	244.97	510.00
40.630	350.00	863.83	.00	.07	.00	110.09	510.00
47.930	350.00	864.10	.00	.27	.00	234.08	730.00
47.930	350.00	864.13	.03	.30	.03	101.53	730.00

06/20/86 08:05:19

SUMMARY OF ERRORS AND SPECIAL NOTES

THIS RUN EXECUTED 06/20/86 08:18:41

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*****************************************
  HECD RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55,56
  IBM-PC-XT VERSION 1.1
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ET      .000     6.100     6.100     6.100     6.100   144.000   193.000      .000      .000      .000
                50FT DS OF DARWIN RD      XSEC D
X1    19.800    10.000   160.000   177.000   300.000   390.000   300.000      .000      .000      .000
GR   862.000      .000   858.000    45.000   857.800   160.000   856.200   162.000   854.200   167.000
GR   854.700   176.000   858.000   177.000   858.000   293.000   860.000   347.000   862.000   377.000

NC      .000      .000      .000      .000      .000      .000      .000      .000      .000      .000
ET      .000     6.100     6.100     6.100     6.100   157.000   180.000      .000      .000      .000
                DARWIN RD TWIN 9FT6IN BY 6FT5IN CMP 37LF  NO HEADWALL
X1    20.300      .000      .000      .000    50.000    50.000    50.000      .000      .000      .000

NC      .000      .000      .000      .000      .000      .000      .000      .000      .000      .000
ET      .000     6.100     6.100     6.100     6.100   365.000   388.000      .000      .000      .000
X1    20.310    29.000   365.000   388.000     1.000     1.000     1.000      .000      .000      .000
X2      .000      .000      .000   860.700   861.500      .000      .000      .000      .000      .000
BT    27.000      .000   864.000      .000   190.000   862.000      .000   365.000   861.500   854.800
BT   365.200   861.500   857.600   366.200   861.500   859.500   367.400   861.500   860.400   369.000
BT   861.500   860.900   369.800   861.500   861.000   370.600   861.500   860.900   371.900   861.500
BT   860.400   373.200   861.500   859.500   374.200   862.500   857.900   374.400   861.500   855.200
BT   378.600   861.500   855.300   378.800   861.500   857.600   379.600   861.500   859.100   380.900
BT   861.500   860.100   382.200   861.500   860.600   383.300   861.500   860.700   384.400   861.500
BT   860.600   385.600   861.500   860.100   386.600   861.500   859.200   387.700   861.500   857.600
BT   388.000   861.500   855.700   400.000   861.500      .000   525.000   862.000      .000   583.000
BT   864.000      .000      .000      .000      .000      .000      .000      .000      .000      .000
GR   864.000      .000   862.000   190.000   861.500   360.000   854.800   365.000   854.800   365.200
GR   854.800   366.200   854.900   367.400   854.900   369.000   855.000   369.800   855.000   370.600
GR   855.100   371.900   855.100   373.200   855.100   374.200   855.200   374.400   855.300   378.600
GR   855.300   378.800   855.300   379.600   855.300   380.900   855.400   382.200   855.500   383.300
GR   855.600   384.400   855.600   385.600   855.600   386.600   855.700   387.700   855.700   388.000
GR   860.000   395.000   861.500   400.000   862.000   525.000   864.000   583.000      .000      .000

NC      .000      .000      .032      .000      .000      .000      .000      .000      .000      .000
ET      .000     6.100     6.100     6.100     6.100   365.000   388.000      .000      .000      .000
                UPSTREAM FACE OF CULVERTS
X1    20.680      .000      .000      .000    37.000    37.000    37.000      .000      .000      .000
X2      .000      .000      .000   860.700   861.500      .000     1.000      .000      .000      .000

ET      .000     6.100     6.100     6.100     6.100   527.000   550.000      .000      .000      .000
X1    20.690     9.000   530.000   547.000     1.000     1.000     1.000      .000      .000      .000
GR   866.000      .000   862.000    70.000   858.000   530.000   856.400   532.000   854.400   538.000
GR   854.900   546.000   858.200   547.000   862.000   700.000   866.000   755.000      .000      .000

NC      .000      .000      .050      .000      .000      .000      .000      .000      .000      .000
ET      .000     6.100     6.100     6.100     6.100   477.000   600.000      .000      .000      .000
                50FT US OF DARWIN ROAD  CHANNEL SHAPE FROM XSEC D   XSEC E
X1    21.180      .000      .000      .000    49.000    49.000    49.000      .000      .000      .000

ET      .000     6.100     6.100     6.100     6.100   330.000   600.000      .000      .000      .000
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                XSEC M
X1      52.230   12.000   88.000  117.000  340.000  420.000  430.000     .000     .000     .000
GR     870.000     .000  864.000   28.000  863.100   78.000  862.700   88.000  859.400   96.000
GR     859.300   98.000  859.400  100.000  862.500  112.000  864.000  162.000  866.000  188.000
GR     868.000  240.000  870.000  267.000     .000     .000     .000     .000     .000     .000

NC        .000     .000     .000     .000     .000     .000     .000     .000     .000     .000
ET        .000    6.100    6.100    8.100    8.100  161.000  245.000   60.000  210.000     .000
                XSEC N
X1      61.230   13.000  190.000  256.000  850.000  940.000  900.000     .000     .000     .000
GR     870.000     .000  868.000   31.000  866.000   60.000  864.000  130.000  862.800  190.000
GR     861.600  200.000  861.200  220.000  861.200  242.000  862.700  256.000  864.000  322.000
GR     866.000  340.000  868.000  358.000  870.000  382.000     .000     .000     .000     .000

NC        .000     .000     .000     .600     .800     .000     .000     .000     .000     .000
ET        .000    6.100    6.100    8.100    8.100  186.000  220.000  169.000  269.000     .000
                XSEC O
X1      62.230   12.000  169.000  235.000   90.000  130.000  100.000     .000     .000     .000
GR     870.000     .000  868.000   30.000  866.000   60.000  864.000  130.000  862.800  169.000
GR     861.600  179.000  861.200  199.000  861.200  221.000  862.700  235.000  864.000  263.000
GR     866.000  300.000  870.000  332.000     .000     .000     .000     .000     .000     .000

NC        .000     .000     .000     .600     .800     .000     .000     .000     .000     .000
ET        .000    6.100    6.100    8.100    8.100  206.000  214.000  169.000  269.000     .000
                DS OF FARM ROAD 7.5CMP  20LF NO HEADWALLS
                ELLC IS 867.5  ELTRD IS 867.7   10 YR STAGE COMP BY HAND
X1      62.730     .000     .000     .000   50.000   50.000   50.000     .000     .000     .000

NC        .000     .000     .032     .000     .000     .000     .000     .000     .000     .000
SB        .000    3.020    2.700     .000    7.500     .000   44.180     .000     .000     .000
ET        .000    6.100    6.100    8.100    8.100  206.000  214.000  169.000  269.000     .000
NC        .000     .000     .040     .000     .000     .000     .000     .000     .000     .000
X1      62.950   12.000  169.000  235.000   22.000   22.000   22.000     .000     .000     .000
X2        .000     .000    1.000  864.000  867.700     .000     .000     .000     .000     .000
BT       6.000     .000  870.000     .000  100.000  868.300     .000  150.000  868.300     .000
BT     200.000  867.700     .000  250.000  867.900     .000  300.000  870.000     .000     .000
GR     870.000     .000  868.000   30.000  866.000   60.000  864.000  130.000  862.800  169.000
GR     862.000  179.000  861.600  199.000  861.600  221.000  862.700  235.000  864.000  263.000
GR     866.000  300.000  870.000  332.000     .000     .000     .000     .000     .000     .000

NC        .100     .100     .045     .000     .000     .000     .000     .000     .000     .000
ET        .000    6.100    6.100    8.100    8.100  184.000  236.000  119.000  319.000     .000
                XSEC P
X1      63.450     .000     .000     .000   50.000   50.000   50.000     .000     .100     .000
X5       4.000  866.020  867.590     .000  868.390     .000     .000     .000     .000     .000

NC        .000     .000     .000     .100     .300     .000     .000     .000     .000     .000
ET        .000     .000     .000     .000     .000     .000     .000     .000     .000     .000
                XSEC Q
X1      64.950   13.000  131.000  159.000  115.000   90.000  150.000     .000     .000     .000
GR     870.000     .000  868.000   10.000  866.000   33.000  864.000   75.000  863.000  131.000
GR     861.900  133.000  860.700  144.000  861.600  156.000  862.700  159.000  864.000  189.000
GR     866.000  207.000  868.000  219.000  870.000  238.000     .000     .000     .000     .000
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   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

*PROF 1

CCHV=    .300 CEHV=    .500
*SECNO  .000
                 2070FT DS OF DARWIN RD  XSEC A
      .00      3.86   855.16      .00   855.00   855.35      .19      .00      .00   855.80
     200.        0.     200.       0.       0.      58.       0.       0.       0.   855.70
      .00       .00     3.47      .00     .120     .040     .120     .000   851.30   216.13
  .002999        0.       0.       0.        0        0        5      .00    24.29   240.42

*SECNO 10.200

3470 ENCROACHMENT STATIONS=     135.0     395.0  TYPE=     1  TARGET=     260.000
                 OB CUT FROM TOPO  CHANNEL SHAPE FROM XSEC A    XSEC B
    10.20      4.21   856.91      .00      .00   856.96      .05     1.58      .04   856.00
     200.        8.     184.       8.      33.      99.      35.       2.       2.   856.00
      .16       .23     1.86      .23     .120     .040     .120     .000   852.70   161.81
  .000966      530.    1020.     610.        3        0        0      .00   197.59   359.40

*SECNO 16.800

3470 ENCROACHMENT STATIONS=     260.0     520.0  TYPE=     1  TARGET=     260.000
                 OB CUT FROM TOPO  CHANNEL SHAPE FROM XSEC D    XSEC C
    16.80      4.03   857.83   856.22      .00   858.03      .20      .99      .08   857.40
     200.        5.     194.       2.      20.      53.      11.       4.       4.   857.60
      .21       .23     3.67      .15     .120     .040     .120     .000   853.80   275.65
  .002731      520.     660.     550.        4       11        0      .00   205.42   481.08

*SECNO 19.800

3470 ENCROACHMENT STATIONS=     144.0     193.0  TYPE=     1  TARGET=      49.000
                 50FT DS OF DARWIN RD      XSEC D
    19.80      4.36   858.56      .00      .00   858.71      .16      .67      .01   857.80
     200.        5.     192.       3.      12.      59.       9.       5.       5.   858.00
      .24       .42     3.25      .35     .120     .040     .120     .000   854.20   144.00
  .001851      300.     300.     390.        2        0        0      .00    49.00   193.00

*SECNO 20.300
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   SECNO     DEPTH     CWSEL     CRIWS     WSELP     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    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO 21.180

3470 ENCROACHMENT STATIONS=      477.0      600.0  TYPE=      1  TARGET=      123.000
                 50FT US OF DARWIN ROAD  CHANNEL SHAPE FROM XSEC D   XSEC E
    21.18      4.50    858.90       .00       .00    859.03       .12       .08       .02    858.00
     200.       16.      181.        3.       36.      61.       10.        5.        6.    858.20
      .25       .46      2.98       .30      .120      .050      .120      .000    854.40    477.00
  .002331       49.       49.       49.         2         0         0       .00     98.24    575.24

*SECNO 22.180

3470 ENCROACHMENT STATIONS=      330.0      600.0  TYPE=      1  TARGET=      270.000
                 150FT US OF DARWIN RD      XSEC F
    22.18      4.74    859.14       .00       .00    859.23       .09       .19       .01    858.00
     200.       26.      169.        5.       75.      65.       18.        5.        6.    858.20
      .26       .34      2.60       .30      .120      .050      .120      .000    854.40    398.76
  .001635      100.      100.      100.         2         0         0       .00    186.14    584.90

*SECNO 27.280

3470 ENCROACHMENT STATIONS=      375.0      575.0  TYPE=      1  TARGET=      200.000
                          XSEC G
    27.28      3.69    860.09       .00       .00    860.16       .07       .93       .00    859.50
     200.        3.      162.       35.       16.      67.       60.        7.        8.    857.30
      .35       .21      2.40       .59      .120      .050      .120      .000    856.40    428.50
  .001438      650.      610.      530.         2         0         0       .00    117.20    545.70

*SECNO 28.280

3470 ENCROACHMENT STATIONS=      140.0      340.0  TYPE=      1  TARGET=      200.000
             DS OF IMPOUNDMENT  OUTLET TWIN 6FT RCCP WITH INLET CONTROL  XSEC H
    28.28      3.18    860.18       .00       .00    860.32       .15       .12       .04    859.50
     200.        2.      194.        4.        8.      62.       15.        7.        8.    859.00
      .35       .20      3.12       .29      .120      .030      .120      .000    857.00    213.68
  .001091       80.      100.       95.         2         0         0       .00     71.79    285.47
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   SECNO     DEPTH     CWSEL     CRIWS     WSELI     EG        HV        HL        OLOSS    BANK ELEV
   Q         OLOB      OCH       OROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO 47.930
                XSEC L
    47.93     4.24    863.54      .00       .00    863.62      .08       .19       .03    862.90
     200.      5.      172.      22.       24.       71.      52.       28.       16.     861.90
     1.12     .23      2.44      .43      .100      .040     .100      .000    859.30    122.85
  .001080    510.      730.     460.         2         0        0       .00    161.49    284.34

*SECNO 52.230
                XSEC M
    52.23     4.64    863.94      .00       .00    864.00      .06       .37       .01    862.30
     200.      14.      170.      16.       32.       79.      34.       29.       17.     862.50
     1.18     .45      2.15      .46      .070      .040     .070      .000    859.30     31.50
  .000723    340.      430.     420.         2         0        0       .00    128.40    159.90

*SECNO 61.230

3470 ENCROACHMENT STATIONS=      161.0      245.0  TYPE=      1  TARGET=      84.000
                XSEC N
    61.23     3.16    864.36      .00       .00    864.38      .02       .36       .01    862.80
     200.      14.      186.       0.       37.      159.       0.       33.       19. 100000.00
     1.41     .39      1.17      .00      .070      .040     .070      .000    861.20    161.00
  .000259    850.      900.     940.         2         0        0       .00     84.00    245.00

CCHV=    .600 CEHV=    .800
*SECNO 62.230

3470 ENCROACHMENT STATIONS=      186.0      220.0  TYPE=      1  TARGET=      34.000
                XSEC O
    62.23     3.19    864.39      .00       .00    864.44      .05       .04       .03100000.00
     200.       0.      200.       0.        0.      107.       0.       33.       19. 100000.00
     1.42     .00      1.87      .00      .070      .040     .070      .000    861.20    186.00
  .000684     90.      100.     130.         1         0        0       .00     34.00    220.00

CCHV=    .600 CEHV=    .800
*SECNO 62.730

7391 HV CHANGED MORE THAN HVINS
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   SECNO     DEPTH     CWSEL     CRIWS     WSELR     EG        HV        HL        OLOSS    BANK ELEV
   Q         OLOB      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=    .100 CEHV=    .300
*SECNO 64.950
                XSEC D
    64.95      5.34    866.04      .00       .00    866.05       .01       .02       .00    863.00
     200.       48.      124.      28.      184.      130.      100.       34.       19.    862.70
     1.50       .26       .96      .28      .100      .045      .100      .000    860.70     34.47
  .000112      115.      150.      90.         2         0         0       .00    172.79    207.26

*SECNO 70.050

3470 ENCROACHMENT STATIONS=      30.0      220.0  TYPE=      1  TARGET=      190.000
                XSEC R
    70.05      5.00    866.10      .00       .00    866.11       .01       .05       .00    863.40
     200.       14.      114.      72.       62.      120.      236.       38.       21.    863.00
     1.70       .23       .95      .31      .100      .045      .100      .000    861.10     58.51
  .000120      440.      510.     410.         0         0         0       .00    161.49    220.00

*SECNO 74.050
3280 CROSS SECTION     74.05 EXTENDED        .14 FEET

3470 ENCROACHMENT STATIONS=     295.0      355.0  TYPE=      1  TARGET=       60.000
                XSEC S
    74.05      4.75    866.15      .00       .00    866.18       .03       .07       .01    865.40
     200.        2.      194.       4.       11.      140.       12.       41.       22.    864.10
     1.77       .19      1.39      .32      .100      .040      .100      .000    861.40    295.00
  .000260      430.      400.     310.         0         0         0       .00     60.00    355.00

*SECNO 74.550
3280 CROSS SECTION     74.55 EXTENDED        .16 FEET

3470 ENCROACHMENT STATIONS=     308.0      342.0  TYPE=      1  TARGET=       34.000
    74.55      4.76    866.16      .00       .00    866.19       .04       .01       .00    865.00
     200.        0.      199.       1.        2.      128.        4.       41.       22.    864.10
     1.78       .20      1.55      .25      .100      .040      .100      .000    861.40    308.00
  .000276       50.       50.      50.         0         0         0       .00     34.00    342.00
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THIS RUN EXECUTED 06/20/86 08:28:16

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  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55,56
  IBM-PC-XT VERSION 1.1
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T1       PUTNAM TWP FIS
T2                      50YR FLOWS
T3       HONEY CREEK

J1  ICHECK     INQ       NINV      IDIR      STRT      METRIC    HVINS     D         WSEL      FD

       0.        3.        0.        0.   .003000       .00        .0      300.   855.000      .000

J2  NPROF      IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

      2.000      .000    -1.000      .000      .000      .000      .000      .000      .000      .000
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   SECNO     DEPTH     CWSEL     CRIWS     WSELI     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=     157.0     180.0  TYPE=     1  TARGET=      23.000
                DARWIN RD TWIN 9FT6IN BY 6FT5IN CMP 37LF  NO HEADWALL
    20.30     4.95   859.15      .00   858.65   859.43      .28      .13      .02   857.80
     300.       2.     296.       2.       4.      69.       3.       8.       7.   858.00
      .24      .60     4.27      .56     .120     .040     .120     .000   854.20   157.00
 .002600      50.      50.      50.        2        0        0      .00    23.00   180.00

*SECNO 20.310

3370 NORMAL BRIDGE,NRD= 27 MIN ELTRD=  861.50 MAX ELLC=  860.70

3470 ENCROACHMENT STATIONS=     365.0     388.0  TYPE=     1  TARGET=      23.000
    20.31     4.35   859.15      .00   858.65   859.44      .29      .00      .01   854.80
     300.       0.     300.       0.       0.      69.       0.       8.       7. 100000.00
      .24      .00     4.35      .00     .120     .040     .120     .000   854.80   365.00
 .005679       1.       1.       1.        0        0        0   -21.39    23.00   388.00

*SECNO 20.680

3370 NORMAL BRIDGE,NRD= 27 MIN ELTRD=  861.50 MAX ELLC=  860.70

3470 ENCROACHMENT STATIONS=     365.0     388.0  TYPE=     1  TARGET=      23.000
                UPSTREAM FACE OF CULVERTS
    20.68     4.53   859.33      .00   858.75   859.61      .27      .16      .01   854.80
     300.       0.     300.       0.       0.      71.       0.       8.       7. 100000.00
      .24      .00     4.20      .00     .120     .032     .120     .000   854.80   365.00
 .003342      37.      37.      37.        2        0        0   -22.99    23.00   388.00

*SECNO 20.690

3470 ENCROACHMENT STATIONS=     527.0     550.0  TYPE=     1  TARGET=      23.000
    20.69     4.93   859.33      .00   858.74   859.62      .29      .00      .01   858.00
     300.       2.     297.       1.       4.      68.       3.       8.       7.   858.20
      .24      .49     4.36      .45     .120     .032     .120     .000   854.40   527.00
 .001758       1.       1.       1.        1        0        0      .00    23.00   550.00
```

SECNO	DEPTH	CWSEL	CRIWS	WSELI	EG	HV	HL	OLOSS	BANK ELEV
D	DLOB	DCH	DROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SPECIAL BRIDGE

5070,VARIABLE ELCHU OR ELCHD ON CARD SB NOT SPECIFIED

SB	XP	XLOR	COFO	RDLEN	RWC	BWP	BAREA	SS	ELCHU	ELCHD
	.00	2.78	2.70	200.00	5.00	.00	22.80	.00	857.00	857.00

*SECNO 29.730
3280 CROSS SECTION 29.73 EXTENDED 2.95 FEET

PRESSURE AND WEIR FLOW

EGPRS	EGLWC	HJ	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
868.22	860.75	.00	113.	187.	23.	15.	860.00	863.30

3470 ENCROACHMENT STATIONS= 90.0 290.0 TYPE= 1 TARGET= 200.000

XSEC I LOSS CHECKED BY HAND COMPS

29.73	6.65	863.65	.00	863.34	863.65	.00	2.71	.00	860.70
300.	2.	298.	0.	51.	1177.	0.	15.	12.	100000.00
.51	.03	.25	.00	.120	.030	.000	.000	857.00	90.00
.000002	145.	145.	145.	0	0	6	.00	200.00	290.00

*SECNO 35.530

3470 ENCROACHMENT STATIONS= 140.0 320.0 TYPE= 1 TARGET= 180.000

US OF IMPOUNDMENT XSEC J

35.53	5.95	863.65	.00	863.34	867.66	.01	.00	.00	861.40
300.	24.	266.	10.	120.	322.	45.	27.	14.	861.20
.72	.20	.83	.22	.100	.040	.100	.000	857.70	140.00
.000089	460.	580.	550.	2	0	0	.00	180.00	320.00

*SECNO 40.630

XSEC K

40.63	5.21	863.71	.00	863.38	863.73	.02	.06	.01	861.30
300.	26.	260.	13.	113.	213.	71.	32.	16.	862.00
.85	.23	1.22	.19	.100	.040	.100	.000	858.40	141.28
.000193	500.	510.	500.	2	0	0	.00	234.66	375.94

```
   SECNO     DEPTH     CWSEL     CRIWS     WSELH     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=     206.0     214.0  TYPE=     1  TARGET=       8.000
                DS OF FARM ROAD 7.5CMP  20LF NO HEADWALLS
                ELLC IS 867.5  ELTRD IS 867.7   10 YR STAGE COMP BY HAND
    62.73      3.54   864.74   864.71   864.30   866.48      1.74       .14      1.72100000.00
     300.        0.     300.       0.       0.      28.        0.       43.       23. 100000.00
     1.18       .00    10.59      .00     .070     .040      .070      .000   861.20   206.00
  .035039      50.      50.      50.        4       11         0       .00      8.00   214.00


SPECIAL BRIDGE

5070,VARIABLE ELCHU OR ELCHD ON CARD SB NOT SPECIFIED
SB  XI        XI OR      COFO      RDLEN      BWC       BWP       BAREA     SS        ELCHU     ELCHD
      .00       3.02      2.70        .00      7.50       .00      44.18       .00    861.20    861.20

*SECNO 62.950
 PRESS FLOW BECAUSE EGLWC OF    866.96  EXCEEDS 1.5 DEPTH
PRESSURE FLOW


 EGPRS      EGLWC       H3        QWEIR       QPR       BAREA   TRAPEZOID      ELLC      ELTRD
                                                                   AREA
    866.90    866.96      .00         0.      300.       44.       21.      864.00    867.70


3470 ENCROACHMENT STATIONS=     206.0     214.0  TYPE=     1  TARGET=       8.000
    62.95      3.76   865.36      .00   864.28   866.90      1.54       .42       .00100000.00
     300.        0.     300.       0.       0.      30.        0.       43.       23. 100000.00
     1.19       .00     9.97      .00     .000     .040      .000      .000   861.60   206.00
  .029812      22.      22.      22.        5        0         0       .00      8.00   214.00


*SECNO 63.450
 WATER EL=X5 CARD=   867.590

3470 ENCROACHMENT STATIONS=     184.0     236.0  TYPE=     1  TARGET=      52.000
                XSEC P
    63.45      5.89   867.59      .00   866.02   867.61       .02       .02       .92100000.00
     300.        0.     299.       1.       0.     290.        0.       43.       23.    862.80
     1.20       .00     1.03      .14     .100     .045      .100      .000   861.70   184.00
  .000110      50.      50.      50.        0        0         0       .00     52.00   236.00
```

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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

*SECNO 74.560

3370 NORMAL BRIDGE,NRD=  0 MIN ELTRD=  867.80 MAX ELLC=  866.40

3470 ENCROACHMENT STATIONS=      190.0      370.0  TYPE=      1  TARGET=      180.000
                DS OF PINCHNEY RD  20.3FT BRIDGE WITH CONC WINGWALLS
    74.56      6.15    867.55      .00    866.04    867.74      .19       .00       .05    861.40
     300.       82.      213.       5.       52.       53.       7.       58.       27.     861.40
     1.63      1.58      4.05      .77      .100      .040     .100      .000    861.40    300.04
  .003510        1.        1.       1.         2         0        0    -28.11     24.83    324.86

*SECNO 75.050

3370 NORMAL BRIDGE,NRD=  0 MIN ELTRD=  867.80 MAX ELLC=  866.40

3470 ENCROACHMENT STATIONS=      190.0      370.0  TYPE=      1  TARGET=      180.000
    75.05      6.32    867.72      .00    866.11    867.91      .19       .17       .00    861.40
     300.       82.      213.       5.       52.       53.       7.       58.       27.     861.40
     1.63      1.58      4.05      .77      .100      .040     .100      .000    861.40    300.01
  .003510       49.       49.      49.         2         0        0    -32.39     24.95    324.96

*SECNO 75.100
3280 CROSS SECTION      75.10 EXTENDED       1.93 FEET

3470 ENCROACHMENT STATIONS=      240.0      430.0  TYPE=      1  TARGET=      190.000
                XSEC T      US OF PINCHNEY RD
    75.10      6.53    867.93      .00    866.30    867.94      .01       .00       .02    865.00
     300.       47.      175.      78.      197.      181.     296.       58.       27.     864.10
     1.64      .24       .97      .26      .100      .040     .100      .000    861.40    240.00
  .000067       10.       10.      10.         2         0        0       .00    190.00    430.00
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   SECNO     DEPTH     CWSEL     CRIWS     WSELI     EG        HV        HL        OLOSS   BANK ELEV
   O         OLOB      OCH       OROB      ALOB      ACH       AROB      VOL       TWA   LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*PROF 3

CCHV=     .300 CEHV=     .500
*SECNO  .000
                 2070FT DS OF DARWIN RD  XSEC A
      .00      4.84    856.14       .00    856.00    856.40       .27       .00       .00    855.80
     350.        3.       345.        2.       12.       83.        7.        0.        0.    855.70
      .00       .25      4.18       .26      .120      .040      .120      .000    851.30    154.83
  .002996        0.        0.        0.         0         0         5       .00    126.51    201.34

*SECNO 10.200

3470 ENCROACHMENT STATIONS=      135.0      395.0  TYPE=      1  TARGET=      260.000
                 OB CUT FROM TOPO  CHANNEL SHAPE FROM XSEC A    XSEC B
    10.20      5.00    857.70       .00    856.91    857.75       .05      1.28       .07    856.00
     350.        37.       274.       39.      106.      136.      114.        4.        3.    856.00
      .16       .35      2.01       .34      .120      .040      .120      .000    852.70    135.00
  .000740      530.     1020.      610.         2         0         0       .00    260.00    395.00

*SECNO 16.800

3470 ENCROACHMENT STATIONS=      260.0      520.0  TYPE=      1  TARGET=      260.000
                 OB CUT FROM TOPO  CHANNEL SHAPE FROM XSEC D    XSEC C
    16.80      4.63    858.43       .00    857.83    858.63       .20       .81       .07    857.40
     350.        46.       260.       44.       84.       63.       90.        8.        6.    857.60
      .22       .55      4.12       .49      .120      .040      .120      .000    853.80    260.00
  .002734      520.      660.      550.         2         0         0       .00    260.00    520.00

*SECNO 19.800

3470 ENCROACHMENT STATIONS=      144.0      193.0  TYPE=      1  TARGET=       49.000
                 50FT DS OF DARWIN RD      XSEC D
    19.80      5.04    859.24       .00    858.56    859.52       .29       .85       .04    857.80
     350.        18.       318.       14.       23.       71.       20.        9.        7.    858.00
      .24       .78      4.50       .72      .120      .040      .120      .000    854.20    144.00
  .002807      300.       300.      390.         2         0         0       .00     49.00    193.00

*SECNO 20.300
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   SECNO     DEPTH     CWSEL     CRIWS     WSELI     EG        HV        HL        OLOSS    BANK ELEV
   Q         OLOB      OCH       OROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO 21.180

3470 ENCROACHMENT STATIONS=     477.0     600.0  TYPE=     1  TARGET=     123.000
                 50FT US OF DARWIN ROAD  CHANNEL SHAPE FROM XSEC D   XSEC E
    21.18      5.58   859.98      .00   858.90   860.09      .11      .09      .07   858.00
     350.       70.      247.      34.      93.      79.      60.      10.       8.    858.20
      .25       .75     3.11      .56     .120     .050     .120     .000   854.40   477.00
  .001793       49.      49.      49.        2        0        0      .00   123.00   600.00

*SECNO 22.180

3470 ENCROACHMENT STATIONS=     330.0     600.0  TYPE=     1  TARGET=     270.000
                150FT US OF DARWIN RD     XSEC F
    22.18      5.79   860.19      .00   859.14   860.24      .05      .13      .02   858.00
     350.      122.      196.      32.     262.      82.      70.      10.       8.    858.20
      .27       .47     2.38      .46     .120     .050     .120     .000   854.40   330.00
  .000989      100.      100.     100.        1        0        0      .00   270.00   600.00

*SECNO 27.280

3470 ENCROACHMENT STATIONS=     375.0     575.0  TYPE=     1  TARGET=     200.000
                         XSEC G
    27.28      4.51   860.91      .00   860.09   861.00      .09      .74      .02   859.50
     350.       38.      240.      72.      89.      84.     100.      15.      11.    857.30
      .35       .43     2.87      .72     .120     .050     .120     .000   856.40   375.00
  .001538      650.      610.     530.        2        0        0      .00   187.25   558.25

*SECNO 28.280

3470 ENCROACHMENT STATIONS=     140.0     340.0  TYPE=     1  TARGET=     200.000
            DS OF IMPOUNDMENT  OUTLET TWIN 6FT RCCP WITH INLET CONTROL  XSEC H
    28.28      3.98   860.98      .00   860.18   861.20      .22      .14      .07   859.50
     350.       14.      317.      19.      39.      80.      42.      16.      12.    859.00
      .35       .76     3.97      .44     .120     .030     .120     .000   857.00   184.84
  .001269       80.      100.      95.        2        0        0      .00   117.99   302.83
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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

*SECNO 47.930
                XSEC L
    47.93      4.80    864.10      .00    867.54    864.21      .11       .32       .04    862.90
     350.       34.      259.      56.       83.       84.      93.       40.       20.     861.90
      .87       .41      3.09      .60      .100      .040     .100      .000    859.30     69.24
  .001371      510.      730.     460.         2         0        0       .00    234.08    303.32

*SECNO 52.230
                XSEC M
    52.23      5.29    864.59      .00    863.94    864.66      .08       .44       .01    862.30
     350.       51.      249.      51.       71.       94.      69.       42.       21.     862.50
      .93       .71      2.62      .73      .070      .040     .070      .000    859.30     25.27
  .000849      340.      430.     420.         2         0        0       .00    144.34    169.61

*SECNO 61.230

3470 ENCROACHMENT STATIONS=      60.0      210.0  TYPE=      1  TARGET=      150.000
                XSEC N
    61.23      4.07    865.47      .00    864.36    865.53      .06       .86       .00   862.80
     350.      164.      186.       0.      161.       72.       0.       47.       24. 100000.00
     1.06      1.01      2.57      .00      .070      .040     .070      .000    861.40     78.72
  .001112      850.      900.     940.         2         0        0       .00    131.28    210.00

CCHV=    .600 CEHV=    .800
*SECNO 62.230

3470 ENCROACHMENT STATIONS=     169.0      269.0  TYPE=      1  TARGET=      100.000
                XSEC O
    62.23      4.37    865.57      .00    864.39    865.59      .02       .04       .02    862.80
     350.        0.      318.      32.        0.      264.      71.       47.       25.     862.70
     1.09       .00      1.20      .46      .070      .040     .070      .000    861.20    169.00
  .000175       90.      100.     130.         0         0        0       .00    100.00    269.00

CCHV=    .600 CEHV=    .800
*SECNO 62.730

3470 ENCROACHMENT STATIONS=     169.0      269.0  TYPE=      1  TARGET=      100.000
                DS OF FARM ROAD 7.5CMP  20LF NO HEADWALLS
                ELLOC IS 867.5  ELTRD IS 867.7   10 YR STAGE COMP BY HAND
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   SECNO     DEPTH     CWSEL     CRIWS     WSELI     EG        HV        HL        DLOSS    BANK ELEV
   O         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO 70.050

3470 ENCROACHMENT STATIONS=      30.0      220.0  TYPE=      1  TARGET=      190.000
                XSEC R
    70.05     7.02    868.12      .00    866.10    868.13      .01       .03       .00    863.40
     350.      47.      164.     140.      180.      177.     418.       59.       27.    863.00
     1.41      .26       .93      .33      .100      .045     .100      .000    861.10     30.00
  .000069     440.      510.     410.         0         0        0       .00    190.00    220.00

*SECNO 74.050
3280 CROSS SECTION      74.05 EXTENDED       2.15 FEET

3470 ENCROACHMENT STATIONS=     190.0      370.0  TYPE=      1  TARGET=      180.000
                XSEC S
    74.05     6.75    868.15      .00    866.15    868.16      .01       .03       .00    865.40
     350.      84.      240.      26.      316.      218.      82.       65.       29.    864.10
     1.54      .27      1.10      .31      .100      .040     .100      .000    861.40    190.00
  .000091     430.      400.     310.         0         0        0       .00    180.00    370.00

*SECNO 74.550
3280 CROSS SECTION      74.55 EXTENDED       2.15 FEET

3470 ENCROACHMENT STATIONS=     190.0      370.0  TYPE=      1  TARGET=      180.000
    74.55     6.75    868.15      .00    866.16    868.17      .01       .00       .00    865.00
     350.     100.      213.      37.      355.      188.     116.       66.       29.    864.10
     1.56      .28      1.13      .32      .100      .040     .100      .000    861.40    190.00
  .000088      50.       50.      50.         0         0        0       .00    180.00    370.00

*SECNO 74.560
3280 CROSS SECTION      74.56 EXTENDED        .22 FEET

3370 NORMAL BRIDGE.NRD=  0 MIN FLTRD=  867.80 MAX ELLC=  866.40

3470 ENCROACHMENT STATIONS=     190.0      370.0  TYPE=      1  TARGET=      180.000
              DS OF PINCHNEY RD  20.3FT BRIDGE WITH CONC WINGWALLS
    74.56     6.62    868.02      .00    866.04    868.22      .20       .00       .06    861.40
     350.     102.      237.      11.       79.       55.      18.       66.       29.    861.40
     1.56     1.30      4.32      .63      .100      .040     .100      .000    861.40    190.00
  .006463       1.        1.       1.         2         0        0    -34.31    180.00    370.00
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THIS RUN EXECUTED 06/20/86 08:36:59

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*************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55,56
  IBM PC-XT VERSION 1.1
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T1 500 YR FLOWS
T2
T3

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0.	5.	0.	0.	.003000	.00	.0	490.	857.000	.000
J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	15.000	.000	-1.000	.000	.000	.000	.000	.000	.000	.000

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   SECNO     DEPTH     CWSEL     CRIWS     WSELI     EG        HV        HL        OLOSS    BANK ELEV
   O         OLOB      OCH       OROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO 20.310

3370 NORMAL BRIDGE,NRD= 27 MIN ELTRD=  861.50 MAX ELLC=  860.70

3470 ENCROACHMENT STATIONS=     365.0     388.0  TYPE=     1  TARGET=      23.000
    20.31      4.94    859.74      .00   858.65   860.37      .64       .01       .04   854.80
     490.        0.      490.       0.       0.      77.       0.       14.       10. 100000.00
      .24       .00      6.40      .00     .120     .040     .120      .000   854.80   365.00
  .012017        1.        1.       1.        2        0        0    -27.06    23.00   388.00

*SECNO 20.680

3370 NORMAL BRIDGE,NRD= 27 MIN ELTRD=  861.50 MAX ELLC=  860.70

3470 ENCROACHMENT STATIONS=     365.0     388.0  TYPE=     1  TARGET=      23.000
                 UPSTREAM FACE OF CULVERTS
    20.68      5.36    860.16      .00   858.75   860.72      .57       .33       .02   854.80
     490.        0.      490.       0.       0.      81.       0.       14.       10. 100000.00
      .24       .00      6.04      .00     .120     .032     .120      .000   854.80   365.00
  .006978       37.       77.      37.        2        0        0    -32.21    23.00   388.00

*SECNO 20.690

3470 ENCROACHMENT STATIONS=     527.0     550.0  TYPE=     1  TARGET=      23.000
    20.69      5.84    860.24      .00   858.74   860.75      .51       .00       .02   858.00
     490.        5.      481.       4.       7.      84.       6.       14.       10.    858.20
      .24       .71      5.76      .68     .120     .032     .120      .000   854.40   527.00
  .002341        1.        1.       1.        2        0        0       .00    23.00   550.00

*SECNO 21.180

3470 ENCROACHMENT STATIONS=     477.0     600.0  TYPE=     1  TARGET=     123.000
                 50FT US OF DARWIN ROAD  CHANNEL SHAPE FROM XSEC D   XSEC E
    21.18      6.46    860.86      .00   858.90   860.96      .09       .09       .12   858.00
     490.      120.      292.      78.      140.      94.     107.       15.       11.    858.20
      .25       .86      3.10      .73     .120     .050     .120      .000   854.40   477.00
  .001407       49.       49.      49.        2        0        0       .00   123.00   600.00
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   SECNO     DEPTH     CWSEL     CRIWS     WSELR     EG        HV        HL        OLOSS    RANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST


3470 ENCROACHMENT STATIONS=      90.0      290.0  TYPE=      1  TARGET=      200.000
                          XSEC I    LOSS CHECKED BY HAND COMPS
    29.77      7.01    864.01      .00    863.34    864.01      .00      2.15      .00    860.70
     490.        3.      487.       0.      59.      1241.       0.       27.      16.  100000.00
      .46       .05       .39      .00      .120      .030     .000      .000   857.00     90.00
  .000005      145.      145.     145.         0         0        6       .00   200.00    290.00


*SECNO 35.570

3470 ENCROACHMENT STATIONS=     140.0      320.0  TYPE=      1  TARGET=      180.000
                US OF IMPOUNDMENT     XSEC J
    35.53      6.31    864.01      .00    863.34    864.03      .02       .01      .01    861.40
     490.       45.      428.      17.      145.      354.      57.       39.      18.     861.20
      .61       .31      1.21      .33      .100      .040     .100      .000   857.70    140.00
  .000168      460.      580.     550.         2         0        0       .00   180.00    320.00


*SECNO 40.670
                XSEC K
    40.63      5.72    864.12      .00    863.38    864.15      .04       .12      .01    861.30
     490.       54.      405.      31.      154.      237.     108.       45.      21.     862.00
      .71       .35      1.71      .29      .100      .040     .100      .000   858.40    125.36
  .000329      500.      510.     500.         2         0        0       .00   267.94    393.31


*SECNO 47.930
                XSEC L
    47.93      5.18    864.48      .00    863.54    864.60      .12       .40      .04    862.90
     490.       76.      319.      94.      132.       93.     125.       51.      24.     861.90
      .78       .58      3.43      .75      .100      .040     .100      .000   859.30     66.40
  .001477      510.      730.     460.         2         0        0       .00   241.83    308.24


*SECNO 52.230
                XSEC M
    52.23      5.70    865.00      .00    863.94    865.10      .09       .49      .01    862.30
     490.       89.      314.      87.       98.      104.      94.       54.      26.     862.50
      .83       .91      3.01      .92      .070      .040     .070      .000   859.30     23.33
  .000970      340.      430.     420.         2         0        0       .00   151.70    175.02
```

```
   SECNO     DEPTH     CWSEL     CRIWS     WSELP     EG        HV        HL        OLOSS    BANK ELEV
   Q         OLOB      OCH       OROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST


 EGPRS      EGLWC       HI        OWEIR       QPR        BAREA   TRAPEZOID      ELLC      ELTRD
                                                                    AREA
    871.86    866.12       .00       172.       321.        44.       21.      864.00    867.70


3470 ENCROACHMENT STATIONS=      169.0      269.0  TYPE=      1  TARGET=      100.000
    62.95      6.95   868.55      .00   864.28   868.56      .01      2.44      .00   862.80
     490.        0.     412.      78.       0.     439.     172.       61.      29.   862.70
     1.00       .00      .94      .45     .000     .040     .070      .000   861.60   169.00
  .000057       22.      22.      22.        1        0        5       .00   100.00   269.00


*SECNO 63.450
 WATER EL=X5 CARD=   868.390

3470 ENCROACHMENT STATIONS=      119.0      319.0  TYPE=      1  TARGET=      200.000
                XSEC P
    63.45      6.69   868.39      .00   866.02   868.40      .01       .00      .00   862.90
     490.       69.     346.      74.     236.     422.     281.       62.      29.   862.80
     1.02       .29      .82      .26     .100     .045     .100      .000   861.70   119.00
  .000052       50.      50.      50.        0        0        0       .00   199.32   318.32


CCHV=     .100 CEHV=     .300
*SECNO 64.950
                XSEC O
    64.95      7.70   868.40      .00   866.04   868.41      .01       .01      .00   863.00
     490.      169.     232.      89.     445.     196.     230.       64.      30.   862.70
     1.06       .38     1.19      .39     .100     .045     .100      .000   860.70     8.02
  .000099      115.     150.      90.        0        0        0       .00   214.75   222.77


*SECNO 70.050
                XSEC R
    70.05      7.34   868.44      .00   866.10   868.45      .01       .04      .00   863.40
     490.       60.     194.     236.     204.     186.     684.       74.      32.   863.00
     1.27       .29     1.05      .34     .100     .045     .100      .000   861.10    23.45
  .000082      440.     510.     410.        1        0        0       .00   292.39   315.84
```

```
   SECNO     DEPTH     CWSEL     CRIWS     WSELI     EG        HV        HL        OLOSS   BANK ELEV
   Q         OLOB      OCH       OROB      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=  867.80 MAX ELLC=  866.40


3470 ENCROACHMENT STATIONS=      190.0      370.0  TYPE=      1  TARGET=      180.000
    75.05      7.35    868.75       .00    866.11    868.88       .13       .29       .01    861.40
     490.      195.      245.       50.      167.       62.       53.       83.       35.    861.40
     1.39      1.17      3.92       .94      .100      .040      .100      .000    861.40    190.00
  .004472       49.       49.       49.         2         0         0    -34.31    180.00    370.00


*SECNO 75.100
3280 CROSS SECTION      75.10 EXTENDED       2.88 FEET


3470 ENCROACHMENT STATIONS=      240.0      430.0  TYPE=      1  TARGET=      190.000
                XSEC T      US OF FINCHNEY RD
    75.10      7.48    868.88       .00    866.30    868.89       .01       .00       .01    865.00
     490.       88.      262.      139.      264.      209.      382.       83.       35.    864.10
     1.39       .33      1.25       .37      .100      .040      .100      .000    861.40    240.00
  .000093       10.       10.       10.         2         0         0       .00    190.00    430.00
```

SECNO	XI CH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01H
20.690	1.00	.00	.00	854.40	200.00	858.74	.00	858.92	13.33	3.42	61.96	54.77
20.690	1.00	.00	.00	854.40	300.00	859.33	.00	859.62	17.58	4.36	75.32	71.54
20.690	1.00	.00	.00	854.40	350.00	859.58	.00	859.93	19.43	4.77	81.13	79.39
20.690	1.00	.00	.00	854.40	490.00	860.24	.00	860.75	23.41	5.76	96.23	101.28
21.180	49.00	.00	.00	854.40	200.00	858.90	.00	859.03	23.31	2.98	106.25	41.43
21.180	49.00	.00	.00	854.40	300.00	859.64	.00	859.76	19.87	3.12	190.25	67.30
21.180	49.00	.00	.00	854.40	350.00	859.98	.00	860.09	17.93	3.11	231.96	82.66
21.180	49.00	.00	.00	854.40	490.00	860.86	.00	860.96	14.07	3.10	340.77	130.63
22.180	100.00	.00	.00	854.40	200.00	859.14	.00	859.23	16.35	2.60	157.57	49.46
22.180	100.00	.00	.00	854.40	300.00	859.87	.00	859.93	11.90	2.49	329.75	86.97
22.180	100.00	.00	.00	854.40	350.00	860.19	.00	860.24	9.89	2.38	413.94	111.30
22.180	100.00	.00	.00	854.40	490.00	861.03	.00	861.07	6.28	2.11	647.78	195.57
27.280	610.00	.00	.00	856.40	200.00	860.09	.00	860.16	14.38	2.40	143.00	52.74
27.280	610.00	.00	.00	856.40	300.00	860.67	.00	860.76	15.41	2.76	229.66	76.42
27.280	610.00	.00	.00	856.40	350.00	860.91	.00	861.00	15.38	2.87	272.57	89.25
27.280	610.00	.00	.00	856.40	490.00	861.56	.00	861.64	13.97	3.01	431.79	131.08
28.280	100.00	.00	.00	857.00	200.00	860.18	.00	860.32	10.91	3.12	85.39	60.56
28.280	100.00	.00	.00	857.00	300.00	860.75	.00	860.95	12.11	3.72	136.01	86.22
28.280	100.00	.00	.00	857.00	350.00	860.98	.00	861.20	12.69	3.97	161.42	98.23
28.280	100.00	.00	.00	857.00	490.00	861.60	.00	861.86	12.82	4.44	245.95	136.85
29.730	145.00	863.30	860.00	857.00	200.00	863.34	.00	863.34	.01	.18	1165.88	1851.38
29.730	145.00	863.30	860.00	857.00	300.00	863.65	.00	863.65	.02	.25	1227.45	2003.79
29.730	145.00	863.30	860.00	857.00	350.00	863.76	.00	863.76	.03	.29	1248.54	2057.07
29.730	145.00	863.30	860.00	857.00	490.00	864.01	.00	864.01	.05	.39	1299.21	2187.27
35.530	580.00	.00	.00	857.70	200.00	863.34	.00	863.35	.55	.61	432.55	270.72
35.530	580.00	.00	.00	857.70	300.00	863.65	.00	863.66	.89	.83	487.87	318.60
35.530	580.00	.00	.00	857.70	350.00	863.76	.00	863.77	1.09	.93	506.80	335.74
35.530	580.00	.00	.00	857.70	490.00	864.01	.00	864.03	1.68	1.21	552.20	378.39
40.630	510.00	.00	.00	858.40	200.00	863.38	.00	863.39	1.25	.92	324.72	178.80
40.630	510.00	.00	.00	858.40	300.00	863.71	.00	863.73	1.93	1.22	397.18	216.21
40.630	510.00	.00	.00	858.40	350.00	863.83	.00	863.85	2.30	1.36	425.41	230.76
40.630	510.00	.00	.00	858.40	490.00	864.12	.00	864.15	3.29	1.71	499.51	270.34
47.930	730.00	.00	.00	859.30	200.00	863.54	.00	863.62	10.80	2.44	146.43	60.86
47.930	730.00	.00	.00	859.30	300.00	863.94	.00	864.05	13.02	2.92	223.88	83.14
47.930	730.00	.00	.00	859.30	350.00	864.10	.00	864.21	13.71	3.09	260.09	94.51
47.930	730.00	.00	.00	859.30	490.00	864.48	.00	864.60	14.77	3.43	350.14	127.52
52.230	430.00	.00	.00	859.30	200.00	863.94	.00	864.00	7.23	2.15	145.17	74.39
52.230	430.00	.00	.00	859.30	300.00	864.41	.00	864.48	8.02	2.48	209.36	105.97
52.230	430.00	.00	.00	859.30	350.00	864.59	.00	864.66	8.49	2.63	234.89	120.14
52.230	430.00	.00	.00	859.30	490.00	865.00	.00	865.10	9.70	3.01	296.50	157.35

SECND	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*S	VCH	AREA	.01Q
75.050	49.00	867.80	866.40	861.40	200.00	866.11	.00	866.31	12.88	3.75	69.64	55.74
75.050	49.00	867.80	866.40	861.40	300.00	867.72	.00	867.91	25.10	4.05	111.29	50.64
75.050	49.00	867.80	866.40	861.40	350.00	868.36	.00	868.48	40.30	3.56	211.93	55.14
75.050	49.00	867.80	866.40	861.40	490.00	868.75	.00	868.88	44.72	3.92	282.65	73.28
75.100	10.00	.00	.00	861.40	200.00	866.30	.00	866.32	2.47	1.50	138.84	127.18
75.100	10.00	.00	.00	861.40	300.00	867.93	.00	867.94	.67	.97	673.94	365.69
75.100	10.00	.00	.00	861.40	350.00	868.48	.00	868.49	.61	.98	779.84	447.14
75.100	10.00	.00	.00	861.40	490.00	868.88	.00	868.89	.93	1.25	854.66	508.76

SECNO	Q	CWSEL	DIFWCP	DIFWSX	DIFWS	TOPWID	XLCH
22.180	200.00	859.14	.00	.24	.00	186.14	100.00
22.180	300.00	859.87	.72	.22	.72	270.00	100.00
22.180	350.00	860.19	.32	.21	1.05	270.00	100.00
22.180	490.00	861.03	.85	.17	1.89	270.00	100.00
27.280	200.00	860.09	.00	.95	.00	117.20	610.00
27.280	300.00	860.67	.58	.80	.58	179.63	610.00
27.280	350.00	860.91	.24	.72	.82	183.25	610.00
27.280	490.00	861.56	.65	.52	1.47	276.01	610.00
28.280	200.00	860.18	.00	.09	.00	71.79	100.00
28.280	300.00	860.75	.57	.08	.57	104.84	100.00
28.280	350.00	860.98	.23	.07	.80	117.99	100.00
28.280	490.00	861.60	.62	.04	1.42	153.85	100.00
29.730	200.00	863.34	.00	3.17	.00	200.00	145.00
29.730	300.00	863.65	.31	2.90	.31	200.00	145.00
29.730	350.00	863.76	.11	2.78	.41	200.00	145.00
29.730	490.00	864.01	.25	2.41	.66	200.00	145.00
35.530	200.00	863.34	.00	.00	.00	180.00	580.00
35.530	300.00	863.65	.31	.00	.31	180.00	580.00
35.530	350.00	863.76	.11	.00	.41	180.00	580.00
35.530	490.00	864.01	.25	.00	.66	180.00	580.00
40.630	200.00	863.38	.00	.04	.00	205.92	510.00
40.630	300.00	863.71	.33	.06	.33	234.66	510.00
40.630	350.00	863.83	.12	.07	.45	244.95	510.00
40.630	490.00	864.12	.29	.11	.73	267.94	510.00
47.930	200.00	863.54	.00	.16	.00	161.49	730.00
47.930	300.00	863.94	.40	.23	.40	223.46	730.00
47.930	350.00	864.10	.16	.27	.56	234.08	730.00
47.930	490.00	864.48	.38	.36	.94	241.83	730.00
52.230	200.00	863.94	.00	.40	.00	128.40	430.00
52.230	300.00	864.41	.47	.46	.47	141.19	430.00
52.230	350.00	864.59	.18	.49	.65	144.34	430.00
52.230	490.00	865.00	.42	.52	1.06	151.70	430.00
61.230	200.00	864.36	.00	.42	.00	84.00	900.00
61.230	300.00	864.89	.54	.49	.54	84.00	900.00
61.230	350.00	865.47	.57	.88	1.11	131.28	900.00
61.230	490.00	865.97	.50	.97	1.61	148.97	900.00
62.230	200.00	864.39	.00	.03	.00	34.00	100.00
62.230	300.00	864.93	.54	.04	.54	34.00	100.00
62.230	350.00	865.57	.64	.10	1.18	100.00	100.00
62.230	490.00	866.08	.51	.11	1.69	100.00	100.00

SUMMARY OF ERRORS AND SPECIAL NOTES

```
CAUTION  SECNO=    62.950  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    62.950  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL

NOTE     SECNO=    63.450  PROFILE= 1  WSEL BASED ON X5 CARD
NOTE     SECNO=    63.450  PROFILE= 2  WSEL BASED ON X5 CARD
NOTE     SECNO=    63.450  PROFILE= 4  WSEL BASED ON X5 CARD
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CONTINUOUS FLOOD HAZARD FACTORS BY EVEN INCREMENTS

INC NO.	TOTAL LENGTH	AVG ELEVATION DATA 10	1	DIFF.	WTD. AVG.	FHF	PERCENT WITHIN
	0.				SEC.		.000
1	100.	855.24	856.21	-.97	-.97	010	100.
2	200.	855.42	856.37	-.95	-.96	010	100.
3	300.	855.59	856.52	-.93	-.95	010	100.
4	400.	855.76	856.67	-.91	-.94	010	100.
5	500.	855.93	856.82	-.89	-.93	010	100.
6	600.	856.10	856.98	-.88	-.92	010	100.
7	700.	856.28	857.13	-.85	-.91	010	100.
8	800.	856.45	857.28	-.83	-.90	010	100.
9	900.	856.62	857.44	-.82	-.89	010	100.
10	1000.	856.79	857.59	-.80	-.88	010	100.
	1020.				SEC.		10.200
11	1100.	856.95	857.73	-.78	-.87	010	100.
12	1200.	857.09	857.84	-.75	-.86	010	100.
13	1300.	857.23	857.95	-.72	-.85	010	100.
14	1400.	857.37	858.06	-.69	-.84	010	100.
15	1500.	857.51	858.17	-.66	-.83	010	100.
16	1600.	857.65	858.29	-.64	-.82	010	100.
	1680.				SEC.		16.800
17	1700.	857.80	858.41	-.61	-.80	010	100.
18	1800.	858.00	858.62	-.62	-.79	010	100.
19	1900.	858.24	858.89	-.65	-.79	010	100.
	1980.				SEC.		19.800
20	2000.	858.48	859.15	-.67	-.78	010	100.
	2030.				SEC.		20.300
	2031.				SEC.		20.310
	2068.				SEC.		20.680
	2069.				SEC.		20.690
21	2100.	858.72	859.56	-.84	-.78	010	100.
	2118.				SEC.		21.180
22	2200.	858.97	859.99	-1.02	-.79	010	100.
	2218.				SEC.		22.180
23	2300.	859.18	860.22	1.04	-.81	010	100.
24	2400.	859.35	860.34	-.99	-.81	010	100.
25	2500.	859.50	860.46	-.96	-.82	010	100.
26	2600.	859.66	860.58	-.92	-.82	010	100.
27	2700.	859.81	860.70	-.89	-.83	010	100.
28	2800.	859.97	860.81	-.84	-.83	010	100.
	2828.				SEC.		27.280
29	2900.	860.10	860.92	-.82	-.83	010	100.
	2928.				SEC.		28.280
30	3000.	860.95	861.66	-.71	-.82	010	100.
	3073.				SEC.		29.730
31	3100.	862.55	863.06	-.51	-.81	010	100.
32	3200.	863.34	863.76	-.42	-.80	010	100.
33	3300.	863.34	863.76	-.42	-.79	010	100.
34	3400.	863.34	863.76	-.42	-.78	010	100.

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        7556.                                          SEC.      74.560
 76     7600.  866.13  868.24   -2.11        -.95    010          70.
        7605.                                          SEC.      75.050
        7615.                                          SEC.      75.100
```

THIS REACH CAN BE SUBDIVIDED BY INC NO. TO MEET FIA REQUIREMENTS
INPUT 20N WHERE N IS THE NUMBER OF REACHES AND THEN INPUT THE END
OF EACH REACH BY INC NO. FOR EXAMPLE 202 74 76
A NEGATIVE INC NO. WILL SUPPRESS INTERMEDIATE INC OUTPUT.

CONTINUOUS FLOOD HAZARD FACTORS BY EVEN INCREMENTS

INC NO.	TOTAL LENGTH	WEIGHTED AVG DIFFERENCE BETWEEN BASE FLOOD AND 10	2	0.2
74	7400.	-.92	-.29	.43

FHF FOR REACH 1 = 010 WITH 84. PERCENT OF THE REACH WITHIN .5 FEET
ZONE FOR THE REACH = A 2
==========

76	7600.	-2.06	-.52	.33

FHF FOR REACH 2 = 020 WITH 100. PERCENT OF THE REACH WITHIN 1.0 FEET
ZONE FOR THE REACH = A 4
==========

00BREAK00

1) COUNTY: Livingston

2) STUDY NAME: Putnam Twp

3) WATERCOURSE: Portage Creek

4) DOCUMENT TYPE: 100 yr Natural & Encroached

00BREAK00

THIS RUN EXECUTED 06/20/86 08:49:05

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*************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55,56
  IBM-PC-XT VERSION 1.1
*************************************************


C
T1                PUTNAM TWP FIS
T2       NATURAL CONDITIONS      100 YR FLOW
T3       PORTAGE CREEK

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FD

      0.        3.        0.        0.    .000600      .00       .0      570.    870.000     .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     .000      .000    -1.000      .000      .000      .000      .000      .000      .000      .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

   150.000   200.000      .000      .000      .000      .000      .000      .000      .000      .000


NC      .100      .100      .045      .300      .500      .000      .000      .000      .000      .000
                50FT DS OF PATTERSON LAKE RD.   XSEC A
X1      .000     7.000    88.000   120.000      .000      .000      .000      .000      .000      .000
X3      .000      .000      .000    81.000      .000   128.000      .000      .000      .000      .000
GR    876.000      .000   866.100    88.000   864.500    92.000   864.000   105.000   864.200   115.000
GR    866.900   120.000   876.900   332.000      .000      .000      .000      .000      .000      .000

NC      .000      .000      .000      .000      .000      .000      .000      .000      .000      .000
X1      .500      .000      .000      .000    50.000    50.000    50.000      .000      .000      .000
X3      .000      .000      .000    94.000      .000   116.000      .000      .000      .000      .000

                DS PATTERSON LAKE RD CONCRETE BRIDGE 20FT LONG 20 FT WIDE
X1      .510     4.000      .000    20.000     1.000     1.000     1.000      .000      .000      .000
X2      .000      .000      .000   871.500   874.600      .000      .000      .000      .000      .000
GR    875.000      .000   864.200      .000   864.200    20.000   875.000    20.000      .000      .000

                US OF BRIDGE    XSEC C
X1      .710      .000      .000      .000    20.000    20.000    20.000      .000      .000      .000
X2      .000      .000      .000   871.500   874.600      .000      .000      .000      .000      .000

NC      .000      .000      .000      .000      .000      .000      .000      .000      .000      .000
X1      .720     7.000    88.000   120.000     1.000     1.000     1.000      .000      .000      .000
X3      .000      .000      .000    94.000      .000   116.000      .000      .000      .000      .000
GR    876.000      .000   866.100    88.000   864.500    92.000   864.000   105.000   864.200   115.000
GR    866.900   120.000   876.900   332.000      .000      .000      .000      .000      .000      .000
```

NC	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	37.360	7.000	08.000	136.000	1.000	1.000	1.000	.000	.000	.000
X3	.000	.000	.000	88.000	.000	136.000	.000	.000	.000	.000
GR	876.000	.000	867.500	88.000	865.000	101.000	864.600	111.000	865.500	119.000
GR	867.500	136.000	880.000	350.000	.000	.000	.000	.000	.000	.000

50 FT US OF PRIVATE RD XSEC J

X1	37.860	.000	.000	.000	50.000	50.000	50.000	.000	.000	.000
X3	.000	.000	.000	38.000	.000	186.000	.000	.000	.000	.000
NC	.000	.000	.000	.100	.300	.000	.000	.000	.000	.000
ET	.000	.000	6.100	1.400	.000	390.000	620.000	.000	.000	.000

830 FT US OF PRIVATE RD XSEC K

X1	45.660	15.000	490.000	527.000	770.000	650.000	780.000	.000	.000	.000
GR	880.000	.000	870.000	80.000	868.000	120.000	868.000	255.000	870.000	303.000
GR	873.000	353.000	868.000	448.000	867.000	490.000	866.000	493.000	864.600	505.000
GR	866.300	516.000	867.000	527.000	868.000	587.000	870.000	667.000	900.000	697.000
NC	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

50 FT DS OF PRIVATE WALKWAY XSEC L

X1	50.660	13.000	130.000	172.000	500.000	540.000	500.000	.000	.000	.000
X3	.000	.000	.000	126.000	.000	176.000	.000	.000	.000	.000
GR	880.000	.000	870.000	100.000	868.000	120.000	867.300	130.000	866.700	135.000
GR	865.700	138.000	867.900	150.000	865.500	161.000	866.700	172.000	868.000	184.000
GR	870.000	276.000	872.000	300.000	880.000	360.000	.000	.000	.000	.000
X1	51.160	.000	.000	.000	50.000	50.000	50.000	.000	.000	.000
X3	.000	.000	.000	139.000	.000	163.000	.000	.000	.000	.000
X1	51.170	9.000	120.000	143.000	1.000	1.000	1.000	.000	.000	.000
X2	.000	.000	.000	870.700	871.300	.000	.000	.000	.000	.000
X3	.000	.000	.000	120.000	.000	143.000	.000	.000	.000	.000
BT	6.000	.000	880.000	.000	90.000	872.000	.000	120.000	871.300	870.700
BT	143.000	871.300	870.700	208.000	872.000	.000	318.000	880.000	.000	.000
GR	880.000	.000	872.000	90.000	871.300	120.000	866.200	120.100	865.000	132.000
GR	865.600	142.900	870.700	143.000	872.000	208.000	880.000	318.000	.000	.000
NC	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	51.250	.000	.000	.000	8.000	8.000	8.000	.000	.000	.000
X2	.000	.000	.000	870.700	871.300	.000	1.000	.000	.000	.000
X3	.000	.000	.000	120.000	.000	143.000	.000	.000	.000	.000
NC	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	51.260	12.000	130.000	184.000	1.000	1.000	1.000	.000	.000	.000
X3	.000	.000	.000	139.000	.000	163.000	.000	.000	.000	.000
GR	880.000	.000	870.000	90.000	868.000	120.000	867.300	130.000	866.700	135.000
GR	865.700	138.000	865.700	150.000	865.500	161.000	866.700	172.000	868.000	184.000
GR	870.000	228.000	880.000	302.000	.000	.000	.000	.000	.000	.000

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X1      92.490      .000      .000      .000    27.000    27.000    27.000      .000      .000      .000
X2        .000      .000      .000   876.100   876.400      .000     1.000      .000      .000      .000

                US OF PATTERSON LAKE RD
X1      92.500      .000      .000      .000     1.000     1.000     1.000      .000      .000      .000

                XSEC 5
X1      92.700     9.000    93.000   128.000    20.000    20.000    20.000      .000      .000      .000
GR     876.400      .000   876.000    50.000   872.000    90.000   871.000    93.000   867.100    96.000
GR     867.500   110.000   866.700   125.000   872.000   128.000   880.000   148.000      .000      .000

NC       .000      .000      .000      .000      .000      .000      .000      .000      .000      .000
ET       .000      .000      .000     1.400      .000      .000      .000      .000      .000      .000
                DS OF HI-LAND LAKE DAM     XSEC T
X1      96.300     8.000    30.000   125.000   330.000   380.000   360.000      .000      .000      .000
GR     882.000      .000   880.000    10.000   871.000    30.000   867.100    33.000   867.500    37.000
GR     867.000   120.000   871.000   125.000   880.000   148.000      .000      .000      .000      .000
EJ       .000      .000      .000      .000      .000      .000      .000      .000      .000      .000
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   SECNO     DEPTH     CWSEL     CRIWS     WSELP     EG        HV        HL        OLOSS    BANK ELEV
   D         OLOB      OCH       OROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO  .720

3470 ENCROACHMENT STATIONS=      94.0      116.0  TYPE=      1  TARGET=      22.000
     .72      6.82    870.82      .00       .00    871.06      .24       .00       .02100000.00
    570.        0.      570.       0.        0.     146.       0.        0.        0. 100000.00
     .00       .00      7.90      .00      .100     .045     .100      .000    864.00     94.00
  .002038       1.        1.       1.         2        0        0       .00     22.00    116.00

*SECNO 1.220

3470 ENCROACHMENT STATIONS=      44.0      166.0  TYPE=      1  TARGET=     122.000
                 50FT US OF BRIDGE        XSEC D
    1.22      7.10    871.10      .00       .00    871.15      .05       .03       .06    866.10
    570.       55.      434.       80.      111.     210.     143.        1.        0.     866.90
     .01       .50      2.07      .56      .100     .045     .100      .000    864.00     44.00
  .000333      50.       50.       50.         2        0        0       .00    122.00    166.00

CCHV=    .100 CEHV=    .300
*SECNO 11.320
                 XSEC CUT FROM TOPO       XSEC E
   11.32      8.08    871 28      .00       .00    871.30      .01       .14       .00    868.00
    570.        2.      484.       84.       13.     492.     267.       14.        3.     867.00
     .32       .15       .98      .32      .100     .045     .100      .000    863.20     68.02
  .000082    1095.     1010.     835.         2        0        0       .00    172.07    240.09

*SECNO 19.120

3470 ENCROACHMENT STATIONS=     145.0      320.0  TYPE=      1  TARGET=     175.000
                 XSEC F
   19.12      8.13    871.33      .00       .00    871.34      .01       .04       .00    867.00
    570.       43.      498.       28.      207.     612.     126.       29.        6.     867.00
     .61       .21       .81      .23      .100     .045     .100      .000    863.20    145.00
  .000041     925.      780.     550.         2        0        0       .00    175.00    320.00

*SECNO 25.120

3470 ENCROACHMENT STATIONS=     145.0      320.0  TYPE=      1  TARGET=     175.000
                 XSEC G
   25.12      8.16    871.36      .00       .00    871.36      .01       .02       .00    867.00
    570.       44.      498.       29.      209.     615.     127.       42.        9.     867.00
     .84       .21       .81      .22      .100     .045     .100      .000    863.20    145.00
  .000041     615.      600.     490.         1        0        0       .00    175.00    320.00
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   SECNO     DEPTH     CWSEL     CRIWS     WSELI     EG        HV        HL        OLOSS   BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA   LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO 37.350

3265 DIVIDED FLOW

3770 NORMAL BRIDGE,NRD=  0 MIN ELTRD=  879.10 MAX ELLC=  877.40

    37.35     6.87   871.47      .00       .00   871.55      .08       .01       .00   867.50
     570.       3.     566.       2.        9.     244.       7.       61.       13.    867.50
     1.12      .29     2.31      .26      .100     .045     .100      .000   864.60    58.48
  .000475      12.      12.      12.         0        0        0       .00    49.77   116.49

*SECNO 37.360

3470 ENCROACHMENT STATIONS=      88.0      136.0  TYPE=      1  TARGET=      48.000
    37.36     6.89   871.49      .00       .00   871.56      .07       .00       .00   867.50
     570.       0.     570.       0.        0.     271.       0.       61.       13. 100000.00
     1.12      .00     2.10      .00      .100     .045     .100      .000   864.60    88.00
  .000501       1.       1.       1.         1        0        0       .00    48.00   136.00

*SECNO 37.860

3470 ENCROACHMENT STATIONS=      38.0      186.0  TYPE=      1  TARGET=     148.000
                50 FT US OF PRIVATE RD          XSEC J
    37.86     6.94   871.54      .00       .00   871.58      .04       .02       .01   867.50
     570.      33.     478.      59.       85.     274.     129.       62.       13.    867.50
     1.13      .79     1.74      .46      .100     .045     .100      .000   864.60    46.13
  .000276      50.      50.      50.         2        0        0       .00   139.87   186.00

CCHV=    .100 CEHV=    .300
*SECNO 45.660

3470 ENCROACHMENT STATIONS=     390.0      620.0  TYPE=      1  TARGET=     230.000
               830 FT US OF PRIVATE RD          XSEC K
    45.66     7.12   871.72      .00       .00   871.74      .01       .15       .00   867.00
     570.     123.     285.     162.      305.     218.     362.       73.       16.    867.00
     1.37      .40     1.31      .45      .100     .045     .100      .000   864.60   390.00
  .000150     770.     780.     650.         2        0        0       .00   230.00   620.00
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   SECNO     DEPTH     CWSEL     CRIWS     WSELF     EG        HV        HL        OLOSS   BANK ELEV
   O         OLOB      OCH       OROB      ALOB      ACH       AROB      VOL       TWA   LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOWL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO 51.260

3470 ENCROACHMENT STATIONS=      139.0      163.0  TYPE=      1  TARGET=      24.000
    51.26      6.32    871.82      .00       .00    872.05      .23       .00       .01100000.00
     570.        0.      570.       0.        0.     148.       0.       80.       18. 100000.00
     1.44       .00      3.84      .00      .100     .045     .100      .000    865.50    139.00
  .002071       1.        1.       1.         2        0        0       .00     24.00    163.00

*SECNO 51.760

3470 ENCROACHMENT STATIONS=       92.0      225.0  TYPE=      1  TARGET=     133.000
                50 FT US OF PRIVATE WALKWAY      XSEC M
    51.76      6.57    872.07      .00       .00    872.10      .03       .02       .02    867.30
     570.       61.      455.      54.      132.     313.     129.       81.       18.     868.00
     1.45       .46      1.45      .42      .100     .045     .100      .000    865.50     92.00
  .000188       50.       50.      50.         2        0        0       .00    133.00    225.00

*SECNO 57.760
                650FT US OF WALKWAY              XSEC N
    57.76      6.30    872.20      .00       .00    872.30      .10       .19       .02    868.00
     570.       51.      519.       0.       73.     196.       0.       86.       19.     868.00
     1.52       .70      2.65      .00      .100     .045     .100      .000    865.90    137.95
  .000618      550.      600.     570.         2        0        0       .00     67.06    205.01

*SECNO 66.110

3470 ENCROACHMENT STATIONS=      115.0      345.0  TYPE=      1  TARGET=     230.000
                XSEC O
    66.11      6.08    872.48      .00       .00    872.49      .01       .18       .01    868.00
     570.      335.      215.      20.      789.     191.      58.       98.       21.     868.00
     1.84       .42      1.13      .34      .100     .045     .100      .000    866.40    115.00
  .000114      730.      835.     650.         2        0        0       .00    228.96    343.96

*SECNO 74.710
                XSEC P
    74.71      6.16    872.56      .00       .00    872.57      .01       .08       .00    869.30
     570.        4.      567.       3.       20.     606.      15.      113.       25.     868.90
     2.09       .18       .93      .19      .100     .045     .100      .000    866.40     27.82
  .000082      720.      860.     730.         2        0        0       .00    130.57    158.39
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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


3370 NORMAL BRIDGE,NRD=  6 MIN ELTRD=  876.40 MAX ELLC=  876.10

    92.49      6.10    873.20       .00       .00    873.45       .25       .07       .00    878.60
     570.        0.      570.        0.        0.      143.        0.      137.       32.    878.60
     2.42       .00      3.98       .00      .100      .045      .100      .000    867.10    223.00
  .002384       27.       27.       27.         2         0         0       .00     26.00    249.00


*SECNO 92.500
                US OF PATTERSON LAKE RD
    92.50      6.11    873.21       .00       .00    873.45       .25       .00       .00    878.60
     570.        0.      570.        0.        0.      143.        0.      137.       32.    878.60
     2.42       .00      3.98       .00      .100      .045      .100      .000    867.10    223.00
  .002381        1.        1.        1.         0         0         0       .00     26.00    249.00


*SECNO 92.700
                XSEC S
    92.70      6.67    873.37       .00       .00    873.49       .12       .03       .01    871.00
     570.        7.      563.        1.       15.      204.        2.      137.       32.    872.00
     2.43       .43      2.76       .31      .100      .045      .100      .000    866.70     76.26
  .000793       20.       20.       20.         2         0         0       .00     55.18    131.44


*SECNO 96.300
                DS OF HI-LAND LAKE DAM      XSEC T
    96.30      6.55    873.55       .00       .00    873.57       .01       .07       .01    871.00
     570.        1.      568.        1.        7.      584.        8.      141.       32.    871.00
     2.53       .15       .97       .15      .100      .045      .100      .000    867.00     24.33
  .000080      330.      360.      380.         2         0         0       .00    107.19    131.52
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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS   BANK ELEV
   Q         OLOB      OCH       OROB      ALOB      ACH       AROB      VOL       TWA   LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     TTRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*PROF 2

CCHV=    .300 CEHV=    .500
*SECNO  .000

3470 ENCROACHMENT STATIONS=      81.0      128.0  TYPE=      1  TARGET=      47.000
                 50FT DS OF PATTERSON LAKE RD.   XSEC A
      .00      6.82   870.82      .00   870.82   870.92      .10      .00      .00   866.10
     570.       21.     529.      20.      30.     201.      30.       0.       0.    866.90
      .00       .70     2.63      .67     .100     .045     .100     .000   864.00    81.00
  .000570        0.       0.       0.        0        0        0      .00    47.00   128.00


*SECNO  .500

3470 ENCROACHMENT STATIONS=      94.0      116.0  TYPE=      1  TARGET=      22.000
      .50      6.80   870.80      .00      .00   871.04      .24      .05      .07100000.00
     570.        0.     570.       0.       0.     146.       0.       0.       0. 100000.00
      .00       .00     3.91      .00     .100     .045     .100     .000   864.00    94.00
  .002057       50.      50.      50.        2        0        0      .00    22.00   116.00


*SECNO  .510

3370 NORMAL BRIDGE,NRD=  0 MIN ELTRD=  874.60 MAX ELLC=  871.50

                 DS PATTERSON LAKE RD CONCRETE BRIDGE 20FT LONG 20 FT WIDE
      .51      6.58   870.78      .00      .00   871.07      .29      .00      .03   875.00
     570.        0.     570.       0.       0.     132.       0.       0.       0.    875.00
      .00       .00     4.33      .00     .100     .045     .100     .000   864.20      .00
  .002747        1.       1.       1.        2        0        0      .00    20.00    20.00


*SECNO  .710

3370 NORMAL BRIDGE,NRD=  0 MIN ELTRD=  874.60 MAX ELLC=  871.50

                 US OF BRIDGE     XSEC C
      .71      6.64   870.84      .00      .00   871.12      .29      .05      .00   875.00
     570.        0.     570.       0.       0.     133.       0.       0.       0.    875.00
      .00       .00     4.70      .00     .100     .045     .100     .000   864.20      .00
  .002681       20.      20.      20.        1        0        0      .00    20.00    20.00
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   SECNO     DEPTH     CWSEL     CRIWS     WSELP     EG        HV        HL        OLOSS   BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA   LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO 25.120
 2800 NAT Q1=     894.85  WSEL=     871.36  ENC Q1=     894.85  WSEL=     871.46  RATIO=    .0000
 NAT Q1=     974.  RATIOS LOB,CH,ROB=    .0861    .8189    .0950  WSEL=     871.46

3470 ENCROACHMENT STATIONS=      178.5      324.6  TYPE=      4  TARGET=         .082
                XSEC G
    25.12      8.24    871.44       .00    871.36    871.45       .01       .02       .00    867.00
     570.       28.      509.       34.      119.      621.      147.       39.        7.    867.00
      .81       .23       .82       .23      .100      .045      .100      .000    863.20    178.53
  .000041      615.      600.      490.         0         0         0       .00    146.08    324.62


*SECNO 30.420
 2800 NAT Q1=     580.08  WSEL=     871.38  ENC Q1=     580.08  WSEL=     871.48  RATIO=    .0000
 NAT Q1=     840.  RATIOS LOB,CH,ROB=    .2016    .3525    .4459  WSEL=     871.48

3470 ENCROACHMENT STATIONS=      152.7      374.9  TYPE=      4  TARGET=         .309
                XSEC H
    30.42      7.27    871.47       .00    871.38    871.48       .01       .03       .00    867.00
     570.       37.      292.      241.      105.      266.      643.       49.        9.    867.00
      .99       .35      1.10       .37      .100      .045      .100      .000    864.20    152.70
  .000099      430.      500.      430.         0         0         0       .00    222.21    374.91


CCHV=     .300 CEHV=     .500
*SECNO 36.720

3470 ENCROACHMENT STATIONS=       75.0      148.0  TYPE=      1  TARGET=        73.000
                XSEC I 50 FT DS OF PRIVATE RD BRIDGE
    36.72      6.65    871.55       .00    871.46    871.60       .05       .10       .02    867.50
     570.       24.      521.       25.       44.      271.       44.       58.       11.    867.50
     1.09       .54      1.92       .55      .100      .045      .100      .000    864.90     75.00
  .000379      270.      630.      590.         2         0         0       .00     73.00    148.00


*SECNO 37.220

3470 ENCROACHMENT STATIONS=       88.0      136.0  TYPE=      1  TARGET=        48.000
    37.22      6.66    871.56       .00    871.47    871.63       .07       .02       .01    867.50
     570.        0.      570.        0.        0.      272.        0.       59.       11. 100000.00
     1.09       .00      2.10       .00      .100      .045      .100      .000    864.90     88.00
  .000496       50.       50.       50.         0         0         0       .00     48.00    136.00
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   SECNO     DEPTH     CWSEL     CRIWS     WSELO     EG        HV        HL        OLOSS   BANK ELEV
   Q         OLOB      OCH       OROB      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=    .100 CEHV=    .300
*SECNO 45.660
 2800 NAT Q1=    465.29  WSEL=    871.72  ENC Q1=    465.29  WSEL=    871.82  RATIO=   .0000
 NAT Q1=    779.  RATIOS LOB,CH,ROB=   .4754   .3069   .2176  WSEL=    871.82

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS=     205.3     534.2  TYPE=     4  TARGET=        .402
                 830 FT US OF PRIVATE RD          XSEC 1
    45.66     7.21   871.81      .00   871.72   871.82      .02      .15      .00   867.00
     570.     262.     295.      13.     670.     221.      34.      72.      15.   867.00
     1.35      .39     1.34      .37     .100     .045     .100     .000   864.60   205.33
  .000153     770.     780.     650.        2        0        0      .00   286.48   534.24

*SECNO 50.660

3470 ENCROACHMENT STATIONS=     126.0     176.0  TYPE=     1  TARGET=      50.000
                 50 FT DS OF PRIVATE WALKWAY      XSEC 2
    50.66     7.99   871.89      .00   871.80   871.95      .06      .11      .01   867.30
     570.       8.     553.       9.      18.     269.      20.      79.      17.   866.70
     1.41      .45     2.05      .47     .100     .045     .100     .000   863.90   126.00
  .000330     500.     500.     540.        2        0        0      .00    50.00   176.00

*SECNO 51.160

3470 ENCROACHMENT STATIONS=     139.0     163.0  TYPE=     1  TARGET=      24.000
    51.16     7.94   871.84      .00   871.75   872.01      .18      .03      .03100000.00
     570.       0.     570.       0.       0.     169.       0.      79.      17. 100000.00
     1.42      .00     7.37      .00     .100     .045     .100     .000   863.90   139.00
  .001255      50.      50.      50.        2        0        0      .00    24.00   163.00

*SECNO 51.170

3370 NORMAL BRIDGE,NRD=  6 MIN ELTRD=  871.30 MAX ELLC=  870.70

3470 ENCROACHMENT STATIONS=     120.0     143.0  TYPE=     1  TARGET=      23.000
    51.17     6.75   871.75      .00   871.66   872.05      .30      .00      .04   871.30
     570.       0.     570.       0.       0.     130.       0.      79.      17. 100000.00
     1.42      .00     4.37      .00     .100     .045     .100     .000   865.00   120.00
  .009025       1.       1.       1.        2        0        0   -13.80    23.00   143.00
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   SECNO     DEPTH     CWSEL     CRIWS     WSELI     EG        HV        HL        OLOSS   BANK ELEV
   O         OLOB      OCH       OROB      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

*SECNO 66.110
 2800 NAT 01=    533.74  WSEL=    872.48  ENC 01=    533.74  WSEL=    872.58  RATIO=   .0000
 NAT 01=    594.  RATIOS LOB,CH,ROB=   .6172   .3496   .0331  WSEL=    872.58

3470 ENCROACHMENT STATIONS=     114.3     324.0  TYPE=     4  TARGET=        .101
                XSEC O
    66.11      6.19   872.59      .00   872.48   872.60      .01      .20      .01   868.00
     570.      360.     210.       0.     811.     195.       0.      96.      20.   868.00
     1.82       .44     1.08      .00     .100     .045     .100     .000   866.40   114.27
  .000121      730.     835.     650.        0        0        0      .00   209.73   324.00

*SECNO 74.710
 2800 NAT 01=    629.71  WSEL=    872.56  ENC 01=    641.46  WSEL=    872.66  RATIO=  -.0187
 NAT 01=    649.  RATIOS LOB,CH,ROB=   .0067   .9880   .0053  WSEL=    872.66

3470 ENCROACHMENT STATIONS=      40.0     150.0  TYPE=     4  TARGET=        .012
                XSEC P
    74.71      6.27   872.67      .00   872.56   872.68      .01      .08      .00   869.30
     570.        0.     570.       0.       0.     618.       0.     111.      23.   868.90
     2.07       .00      .92      .00     .100     .045     .100     .000   866.40    40.00
  .000086      720.     860.     720.        0        0        0      .00   110.00   150.00

*SECNO 84.410
 2800 NAT 01=    400.79  WSEL=    872.67  ENC 01=    400.79  WSEL=    872.77  RATIO=   .0000
 NAT 01=   1006.  RATIOS LOB,CH,ROB=   .0937   .2082   .6981  WSEL=    872.77

3470 ENCROACHMENT STATIONS=     255.0     461.1  TYPE=     4  TARGET=        .602
                XSEC O
    84.41      5.68   872.78      .00   872.67   872.79      .02      .11      .00   869.60
     570.        0.     292.     278.       0.     218.     568.     124.      26.   869.20
     2.73       .00     1.34      .49     .100     .045     .100     .000   867.10   255.00
  .000212      970.     970.     650.        2        0        0      .00   206.10   461.10

*SECNO 91.710

3470 ENCROACHMENT STATIONS=     200.0     251.0  TYPE=     1  TARGET=      51.000
                XSEC R
    91.71      4.47   872.97      .00   872.85   873.25      .28      .38      .08   871.00
     570.       21.     542.       7.      19.     124.      10.     132.      28.   871.30
     2.38      1.10     4.37      .72     .100     .045     .100     .000   868.50   200.00
  .002861      830.     730.     700.        2        0        0      .00    51.00   251.00
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                US OF PATTERSON LAKE RD
    92.50      6.20   873.30      .00   873.21   873.53      .24      .00      .00   878.60
     570.        0.     570.       0.       0.     145.       0.     132.      28.   878.60
     2.39      .00     3.92      .00     .100     .045     .100     .000   867.10   223.00
  .002271       1.       1.       1.        0        0        0      .00    26.00   249.00


*SECNO 92.700
 2800 NAT Q1=     202.39  WSEL=     873.37  ENC Q1=     205.54  WSEL=     873.47  RATIO=  -.0156
 NAT Q1=     209.  RATIOS LOB,CH,ROB=   .0127   .9858   .0015  WSEL=     873.47

3470 ENCROACHMENT STATIONS=       93.0      128.0  TYPE=      4  TARGET=         .014
                XSEC S
    92.70      6.76   873.46      .00   873.37   873.57      .12      .03      .01   871.00
     570.        0.     570.       0.       0.     207.       0.     132.      28.   872.00
     2.39      .00     2.75      .00     .100     .045     .100     .000   866.70    93.00
  .000880      20.      20.      20.        2        0        0      .00    35.00   128.00


*SECNO 96.300
 2800 NAT Q1=     635.69  WSEL=     873.55  ENC Q1=     650.43  WSEL=     873.65  RATIO=  -.0232
 NAT Q1=     653.  RATIOS LOB,CH,ROB=   .0020   .9956   .0024  WSEL=     873.65

3470 ENCROACHMENT STATIONS=       30.0      125.0  TYPE=      4  TARGET=         .004
                DS OF HI-LAND LAKE DAM      XSEC T
    96.30      6.64   873.64      .00   873.55   873.65      .01      .07      .01   871.00
     570.        0.     570.       0.       0.     592.       0.     136.      29.   871.00
     2.49      .00      .96      .00     .100     .045     .100     .000   867.00    30.00
  .000083     330.     360.     380.        1        0        0      .00    95.00   125.00
```

SECND	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10H*S	VCH	AREA	.01H
37.220	50.00	.00	.00	864.90	570.00	871.47	.00	871.54	5.21	2.13	267.63	249.82
37.220	50.00	.00	.00	864.90	570.00	871.56	.00	871.63	4.96	2.10	271.90	255.97
37.230	1.00	879.10	877.40	864.60	570.00	871.46	.00	871.55	4.75	2.31	260.15	261.61
37.230	1.00	879.10	877.40	864.60	570.00	871.55	.00	871.63	5.79	2.30	248.05	236.82
37.350	12.00	879.10	877.40	864.60	570.00	871.47	.00	871.55	4.75	2.31	260.15	261.61
37.350	12.00	879.10	877.40	864.60	570.00	871.56	.00	871.64	5.79	2.30	248.03	236.78
37.360	1.00	.00	.00	864.60	570.00	871.49	.00	871.56	5.01	2.10	270.88	254.74
37.360	1.00	.00	.00	864.60	570.00	871.58	.00	871.65	4.74	2.07	275.72	261.73
37.860	50.00	.00	.00	864.60	570.00	871.54	.00	871.58	2.76	1.74	487.90	343.01
37.860	50.00	.00	.00	864.60	570.00	871.63	.00	871.67	2.60	1.71	500.50	353.83
45.660	780.00	.00	.00	864.60	570.00	871.72	.00	871.74	1.50	1.31	884.79	465.29
45.660	780.00	.00	.00	864.60	570.00	871.81	.00	871.83	1.53	1.34	925.60	460.23
50.660	500.00	.00	.00	863.90	570.00	871.80	.00	871.86	3.46	2.08	302.43	306.55
50.660	500.00	.00	.00	863.90	570.00	871.89	.00	871.95	3.30	2.05	306.82	313.71
51.160	50.00	.00	.00	863.90	570.00	871.75	.00	871.93	14.04	3.41	167.04	152.12
51.160	50.00	.00	.00	863.90	570.00	871.84	.00	872.01	13.55	3.37	169.16	154.85
51.170	1.00	871.30	870.70	865.00	570.00	871.66	.00	871.97	95.02	4.44	128.34	58.47
51.170	1.00	871.30	870.70	865.00	570.00	871.75	.00	872.05	90.25	4.37	130.46	60.00
51.250	8.00	871.30	870.70	865.00	570.00	871.75	.00	872.04	90.65	4.38	130.27	59.87
51.250	8.00	871.30	870.70	865.00	570.00	871.83	.00	872.12	86.38	4.31	132.29	61.33
51.260	1.00	.00	.00	865.50	570.00	871.82	.00	872.05	20.71	3.84	148.27	125.25
51.260	1.00	.00	.00	865.50	570.00	871.91	.00	872.13	19.92	3.79	150.30	127.72
51.760	50.00	.00	.00	865.50	570.00	872.07	.00	872.10	1.88	1.45	573.57	415.72
51.760	50.00	.00	.00	865.50	570.00	872.15	.00	872.17	1.79	1.43	583.90	426.33
57.760	600.00	.00	.00	865.90	570.00	872.20	.00	872.30	6.18	2.65	268.84	229.37
57.760	600.00	.00	.00	865.90	570.00	872.28	.00	872.39	7.44	2.71	237.95	208.98
66.110	835.00	.00	.00	866.40	570.00	872.48	.00	872.49	1.14	1.13	1038.38	533.74
66.110	835.00	.00	.00	866.40	570.00	872.59	.00	872.60	1.21	1.08	1006.05	518.32
74.710	860.00	.00	.00	866.40	570.00	872.56	.00	872.57	.82	.93	641.37	629.71
74.710	860.00	.00	.00	866.40	570.00	872.67	.00	872.68	.86	.92	617.83	616.33
84.410	970.00	.00	.00	867.10	570.00	872.67	.00	872.68	2.02	1.35	869.34	400.79
84.410	970.00	.00	.00	867.10	570.00	872.78	.00	872.79	2.12	1.34	785.65	391.86
91.710	730.00	.00	.00	868.50	570.00	872.85	.00	873.15	31.92	4.52	146.66	100.90
91.710	730.00	.00	.00	868.50	570.00	872.97	.00	873.25	28.61	4.37	152.97	106.56

PORTAGE CREEK

SUMMARY PRINTOUT TABLE 150

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
.000	570.00	870.72	.00	.00	.72	47.00	.00
.000	570.00	870.82	.10	.00	.00	47.00	.00
.500	570.00	870.71	.00	-.02	.00	22.00	50.00
.500	570.00	870.80	.09	-.02	.00	22.00	50.00
.510	570.00	870.68	.00	-.03	.00	20.00	1.00
.510	570.00	870.78	.10	-.02	.00	20.00	1.00
.710	570.00	870.74	.00	.06	.00	20.00	20.00
.710	570.00	870.84	.09	.06	.00	20.00	20.00
.720	570.00	870.82	.00	.08	.00	22.00	1.00
.720	570.00	870.91	.09	.08	.00	22.00	1.00
1.220	570.00	871.10	.00	.27	.00	122.00	50.00
1.220	570.00	871.18	.08	.27	.00	122.00	50.00
11.320	570.00	871.28	.00	.19	.00	172.07	1010.00
11.320	570.00	871.37	.08	.19	.08	138.37	1010.00
19.120	570.00	871.33	.00	.05	.00	175.00	780.00
19.120	570.00	871.41	.08	.05	.08	144.87	780.00
25.120	570.00	871.36	.00	.02	.00	175.00	600.00
25.120	570.00	871.44	.08	.02	.08	146.08	600.00
30.420	570.00	871.38	.00	.03	.00	240.00	500.00
30.420	570.00	871.47	.08	.03	.08	222.21	500.00
36.720	570.00	871.46	.00	.07	.00	73.00	630.00
36.720	570.00	871.55	.09	.08	.09	73.00	630.00
37.220	570.00	871.47	.00	.01	.00	48.00	50.00
37.220	570.00	871.56	.09	.01	.09	48.00	50.00
37.230	570.00	871.46	.00	-.01	.00	49.77	1.00
37.230	570.00	871.55	.09	-.01	.09	41.80	1.00
37.350	570.00	871.47	.00	.01	.00	49.77	12.00
37.350	570.00	871.56	.09	.01	.09	41.80	12.00
37.360	570.00	871.49	.00	.02	.00	48.00	1.00
37.360	570.00	871.58	.09	.02	.09	48.00	1.00
37.860	570.00	871.54	.00	.06	.00	139.87	50.00
37.860	570.00	871.63	.09	.05	.09	140.80	50.00

SECNO	Q	CWSEL	DIFWSF	DIFWSX	DIFWS	TOPWID	XLCH
96.300	570.00	873.55	.00	.18	.00	107.19	360.00
96.300	570.00	873.64	.09	.18	.09	95.00	360.00

FLOODWAY DATA. PORTAGE CREEK
PROFILE NO. 2

STATION	FLOODWAY WIDTH	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WITHOUT FLOODWAY	DIFFERENCE
.000	47.	261.	2.2	870.8	870.7	.1
.500	22.	146.	3.9	870.8	870.7	.1
.510	20.	132.	4.3	870.8	870.7	.1
.710	20.	133.	4.3	870.8	870.7	.1
.720	22.	148.	3.8	870.9	870.8	.1
1.220	122.	474.	1.2	871.2	871.1	.1
11.320	138.	724.	.8	871.4	871.3	.1
19.120	145.	880.	.6	871.4	871.3	.1
25.120	146.	887.	.6	871.5	871.4	.1
30.420	222.	1014.	.6	871.5	871.4	.1
36.720	73.	360.	1.6	871.6	871.5	.1
37.220	48.	272.	2.1	871.6	871.5	.1
37.230	42.	248.	2.3	871.6	871.5	.1
37.350	42.	248.	2.3	871.6	871.5	.1
37.360	48.	276.	2.1	871.6	871.5	.1
37.860	141.	500.	1.1	871.6	871.5	.1
45.660	329.	926.	.6	871.8	871.7	.1
50.660	50.	307.	1.9	871.9	871.8	.1
51.160	24.	169.	3.4	871.8	871.7	.1
51.170	23.	130.	4.4	871.8	871.7	.1
51.250	23.	132.	4.3	871.8	871.7	.1
51.260	24.	150.	3.8	871.9	871.8	.1
51.760	133.	584.	1.0	872.2	872.1	.1
57.760	42.	238.	2.4	872.3	872.2	.1
66.110	210.	1006.	.6	872.6	872.5	.1
74.710	110.	618.	.9	872.7	872.6	.1
84.410	206.	786.	.7	872.8	872.7	.1
91.710	51.	153.	3.7	872.9	872.8	.1
92.220	26.	116.	4.9	873.1	873.0	.1
92.220	26.	144.	4.0	873.2	873.1	.1
92.490	26.	145.	3.9	873.3	873.2	.1
92.500	26.	145.	3.9	873.3	873.2	.1
92.700	35.	207.	2.8	873.5	873.4	.1
96.300	95.	592.	1.0	873.7	873.6	.1

THIS RUN EXECUTED 06/20/86 09:12:12

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  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55,56
  IBM-PC-XT VERSION 1.1
*************************************************


C
T1              PUTNAM TWP FIS
T2      MULTIPLE RUN            10 YR FLOW
T3      PORTAGE CREEK

J1  ICHECK     INQ       NINV      IDIR      STRT      METRIC    HVINS     D         WSEL      FD

      0.        3.        0.        0.    .000600      .00       .0      310.    868.000     .000

J2  NPROF     IPLOT     PRNTS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     .000      .000    -1.000      .000      .000      .000      .000      .000      .000      .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

   150.000   201.000      .000      .000      .000      .000      .000      .000      .000      .000


NC      .100      .100      .045      .300      .500      .000      .000      .000      .000      .000
                50FT DS OF PATTERSON LAKE RD.   XSEC A
X1      .000     7.000    88.000   120.000      .000      .000      .000      .000      .000      .000
X3      .000      .000      .000    81.000      .000   128.000      .000      .000      .000      .000
GR    876.000      .000   866.100    88.000   864.500    92.000   864.000   105.000   864.200   115.000
GR    866.900   120.000   876.900   332.000      .000      .000      .000      .000      .000      .000

NC      .000      .000      .000      .000      .000      .000      .000      .000      .000      .000
X1      .500      .000      .000      .000    50.000    50.000    50.000      .000      .000      .000
X3      .000      .000      .000    94.000      .000   116.000      .000      .000      .000      .000

                DS PATTERSON LAKE RD CONCRETE BRIDGE 20FT LONG 20 FT WIDE
X1      .510     4.000      .000    20.000     1.000     1.000      .000      .000      .000      .000
X2      .000      .000      .000   871.500   874.600      .000      .000      .000      .000      .000
GR    875.000      .000   864.200      .000   864.200    20.000   875.000    20.000      .000      .000

                US OF BRIDGE    XSEC C
X1      .710      .000      .000      .000    20.000    20.000    20.000      .000      .000      .000
X2      .000      .000      .000   871.500   874.600      .000      .000      .000      .000      .000

NC      .000      .000      .000      .000      .000      .000      .000      .000      .000      .000
X1      .720     7.000    88.000   120.000     1.000     1.000     1.000      .000      .000      .000
X3      .000      .000      .000    94.000      .000   116.000      .000      .000      .000      .000
GR    876.000      .000   866.100    88.000   864.500    92.000   864.000   105.000   864.200   115.000
GR    866.900   120.000   876.900   332.000      .000      .000      .000      .000      .000      .000
```

NC	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	37.360	7.000	88.000	136.000	1.000	1.000	1.000	.000	.000	.000
X3	.000	.000	.000	88.000	.000	136.000	.000	.000	.000	.000
GR	876.000	.000	867.500	88.000	865.000	101.000	864.600	111.000	865.500	119.000
GR	867.500	136.000	800.000	350.000	.000	.000	.000	.000	.000	.000

50 FT US OF PRIVATE RD XSEC J

X1	37.860	.000	.000	.000	50.000	50.000	50.000	.000	.000	.000
X3	.000	.000	.000	38.000	.000	186.000	.000	.000	.000	.000
NC	.000	.000	.000	.100	.300	.000	.000	.000	.000	.000
ET	.000	.000	6.100	.000	.000	390.000	620.000	.000	.000	.000

830 FT US OF PRIVATE RD XSEC I

X1	45.660	15.000	490.000	527.000	770.000	650.000	780.000	.000	.000	.000
X3	.000	.000	.000	353.000	873.000	.000	.000	.000	.000	.000
GR	880.000	.000	870.000	80.000	868.000	120.000	868.000	255.000	870.000	303.000
GR	873.000	353.000	868.000	448.000	867.000	490.000	866.000	493.000	864.600	505.000
GR	866.300	516.000	867.000	527.000	868.000	587.000	870.000	667.000	900.000	697.000
NC	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

50 FT DS OF PRIVATE WALKWAY XSEC L

X1	50.660	13.000	130.000	172.000	500.000	540.000	500.000	.000	.000	.000
X3	.000	.000	.000	126.000	.000	176.000	.000	.000	.000	.000
GR	880.000	.000	870.000	100.000	868.000	120.000	867.300	130.000	866.700	135.000
GR	865.700	138.000	867.900	150.000	865.500	161.000	866.700	172.000	868.000	184.000
GR	870.000	276.000	872.000	300.000	880.000	360.000	.000	.000	.000	.000
X1	51.160	.000	.000	.000	50.000	50.000	50.000	.000	.000	.000
X3	.000	.000	.000	139.000	.000	163.000	.000	.000	.000	.000
X1	51.170	9.000	120.000	143.000	1.000	1.000	1.000	.000	.000	.000
X2	.000	.000	.000	870.700	871.300	.000	.000	.000	.000	.000
X3	.000	.000	.000	120.000	.000	143.000	.000	.000	.000	.000
BT	6.000	.000	880.000	.000	90.000	872.000	.000	120.000	871.300	870.700
BT	143.000	871.300	870.700	208.000	872.000	.000	318.000	880.000	.000	.000
GR	880.000	.000	872.000	90.000	871.300	120.000	866.200	120.100	865.000	132.000
GR	865.600	142.900	870.700	143.000	872.000	208.000	880.000	318.000	.000	.000
NC	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	51.250	.000	.000	.000	8.000	8.000	8.000	.000	.000	.000
X2	.000	.000	.000	870.700	871.300	.000	1.000	.000	.000	.000
X3	.000	.000	.000	120.000	.000	143.000	.000	.000	.000	.000
NC	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	51.260	12.000	130.000	184.000	1.000	1.000	1.000	.000	.000	.000
X3	.000	.000	.000	139.000	.000	163.000	.000	.000	.000	.000
GR	880.000	.000	870.000	90.000	868.000	120.000	867.300	130.000	866.700	135.000
GR	865.700	138.000	865.700	150.000	865.500	161.000	866.700	172.000	868.000	184.000
GR	870.000	228.000	880.000	302.000	.000	.000	.000	.000	.000	.000

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X1      92.490      .000      .000      .000    27.000    27.000    27.000      .000      .000      .000
X2        .000      .000      .000   876.100   876.400      .000     1.000      .000      .000      .000

                US OF PATTERSON LAKE RD
X1      92.500      .000      .000      .000     1.000     1.000     1.000      .000      .000      .000

                XSEC S
X1      92.700     9.000    93.000   128.000    20.000    20.000    20.000      .000      .000      .000
GR     876.400      .000   876.000    50.000   872.000    90.000   871.000    93.000   867.100    96.000
GR     867.500   110.000   866.700   125.000   872.000   128.000   880.000   148.000      .000      .000

NC       .000      .000      .000      .000      .000      .000      .000      .000      .000      .000
                DS OF HI-LAND LAKE DAM     XSEC T
X1      96.300     8.000    30.000   125.000   330.000   380.000   360.000      .000      .000      .000
GR     882.000      .000   880.000    10.000   871.000    30.000   867.100    33.000   867.500    37.000
GR     867.000   120.000   871.000   125.000   880.000   148.000      .000      .000      .000      .000
EJ       .000      .000      .000      .000      .000      .000      .000      .000      .000      .000
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   SECNO     DEPTH     CWSEL     CRIWS     WSELP     EG        HV        HL        OLOSS    BANK ELEV
   D         OLOB      OCH       OROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO  .720

3470 ENCROACHMENT STATIONS=      94.0      116.0  TYPE=      1  TARGET=      22.000
      .72      4.97    868.97      .00       .00    869.10      .13       .00       .01100000.00
     310.        0.     310.       0.        0.      106.       0.        0.        0. 100000.00
      .01       .00      2.94      .00      .100      .045     .100      .000    864.00     94.00
  .001541        1.        1.       1.         2         0        0       .00     22.00    116.00

*SECNO 1.220

3470 ENCROACHMENT STATIONS=      44.0      166.0  TYPE=      1  TARGET=     122.000
                 50FT US OF BRIDGE        XSEC D
     1.22      5.12    869.12      .00       .00    869.17      .05       .04       .03    866.10
     310.       17.      276.      18.       40.      147.      52.        0.        0.     866.90
      .01       .41      1.88      .34      .100      .045     .100      .000    864.00     61.19
  .000445       50.       50.      50.         2         0        0       .00    104.81    166.00

CCHV=    .100 CEHV=    .300
*SECNO 11.320
                 XSEC CUT FROM TOPO       XSEC E
    11.32      6.15    869.35      .00       .00    869.36      .01       .19       .00    868.00
     310.        0.      283.      27.        1.      334.     122.        8.        3.     867.00
      .37       .10       .85      .22      .100      .045     .100      .000    863.20     78.99
  .000101     1095.     1010.     835.         2         0        0       .00    153.69    232.69

*SECNO 19.120

3470 ENCROACHMENT STATIONS=     145.0      320.0  TYPE=      1  TARGET=     175.000
                 XSEC F
    19.12      6.19    869.39      .00       .00    869.40      .01       .04       .00    867.00
     310.       10.      291.      10.       83.      458.      66.       17.        6.     867.00
      .72       .12       .64      .14      .100      .045     .100      .000    863.20    145.00
  .000037      925.      780.     550.         2         0        0       .00    175.00    320.00

*SECNO 25.120

3470 ENCROACHMENT STATIONS=     145.0      320.0  TYPE=      1  TARGET=     175.000
                 XSEC G
    25.12      6.22    869.42      .00       .00    869.42      .01       .02       .00    867.00
     310.       10.      290.      10.       85.      460.      67.       26.        8.     867.00
     1.00       .12       .63      .14      .100      .045     .100      .000    863.20    145.00
  .000036      615.      600.     490.         1         0        0       .00    175.00    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       FLMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO 37.350

3265 DIVIDED FLOW

3370 NORMAL BRIDGE,NRD=  0 MIN ELTRD=  879.10 MAX ELLC=  877.40

    37.35      5.00    869.60       .00       .00    869.65       .05       .01       .00    867.50
     310.        0.      309.        0.        2.      166.        2.       37.       12.    867.50
     1.29       .20      1.86       .17      .100      .045      .100      .000    864.60     60.57
  .000514       12.       12.       12.         0         0         0       .00     46.01    114.89

*SECNO 37.360

3470 ENCROACHMENT STATIONS=       88.0      136.0  TYPE=      1  TARGET=       48.000
    37.36      5.01    869.61       .00       .00    869.65       .05       .00       .00    867.50
     310.        0.      310.        0.        0.      181.        0.       37.       12. 100000.00
     1.29       .00      1.71       .00      .100      .045      .100      .000    864.60     88.00
  .000520        1.        1.        1.         1         0         0       .00     48.00    136.00

*SECNO 37.860

3470 ENCROACHMENT STATIONS=       38.0      186.0  TYPE=      1  TARGET=      148.000
                 50 FT US OF PRIVATE RD            XSEC J
    37.86      5.04    869.64       .00       .00    869.68       .04       .02       .00    867.50
     310.        7.      291.       12.       24.      182.       39.       37.       12.    867.50
     1.70       .31      1.59       .31      .100      .045      .100      .000    864.60     65.90
  .000398       50.       50.       50.         0         0         0       .00    106.64    172.54

CCHV=    .100 CEHV=    .300
*SECNO 45.660

3470 ENCROACHMENT STATIONS=      353.0      697.0  TYPE=      1  TARGET=     -353.000
 ELENCL=     873.00  ELENCR= 100000.00
                 830 FT US OF PRIVATE RD            XSEC K
    45.66      5.29    869.89       .00       .00    869.91       .02       .23       .00    867.00
     310.       48.      189.       73.      134.      150.      215.       44.       15.    867.00
     1.53       .76      1.26       .34      .100      .045      .100      .000    864.60    412.07
  .000229      770.      780.      650.         2         0         0       .00    250.59    662.65
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   SECNO     DEPTH     CWSEL     CRIWS     WSELI     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

*SECNO 51.260

3470 ENCROACHMENT STATIONS=      139.0      163.0  TYPE=      1  TARGET=       24.000
    51.26      4.48    869.98       .00       .00    870.12       .14       .00       .00100000.00
     310.        0.      310.        0.        0.     104.        0.       48.       17. 100000.00
     1.67       .00      2.98       .00      .100      .045      .100      .000    865.50    139.00
  .001731        1.        1.        1.         0         0         0       .00     24.00    163.00

*SECNO 51.760

3470 ENCROACHMENT STATIONS=       92.0      225.0  TYPE=      1  TARGET=      133.000
                 50 FT US OF PRIVATE WALKWAY      XSEC M
    51.76      4.64    870.14       .00       .00    870.16       .02       .03       .01    867.30
     310.       20.      276.       14.       58.     208.       49.       48.       17.     868.00
     1.64       .35      1.33       .27      .100      .045      .100      .000    865.50     92.00
  .000268       50.       50.       50.         2         0         0       .00    133.00    225.00

*SECNO 57.760
                 650FT US OF WALKWAY              XSEC N
    57.76      4.45    870.35       .00       .00    870.42       .07       .25       .01    868.00
     310.       11.      299.        0.       23.     135.        0.       52.       18.     868.00
     1.72       .48      2.22       .48      .100      .045      .100      .000    865.90    152.40
  .000716      550.      600.      570.         2         0         0       .00     52.60    205.00

*SECNO 66.110

3470 ENCROACHMENT STATIONS=      115.0      345.0  TYPE=      1  TARGET=      230.000
                 XSEC O
    66.11      4.26    870.66       .00       .00    870.66       .01       .24       .01    868.00
     310.      167.      136.        7.      468.     131.       25.       58.       21.     868.00
     2.06       .36      1.04       .26      .100      .045      .100      .000    866.40    115.00
  .000161      730.      835.      650.         2         0         0       .00    225.31    340.31

*SECNO 74.710
                 XSEC P
    74.71      4.35    870.75       .00       .00    870.76       .01       .10       .00    869.30
     310.        0.      309.        1.        4.     408.        4.       68.       24.     868.90
     2.36       .11       .76       .13      .100      .045      .100      .000    866.40     34.57
  .000092      720.      860.      730.         2         0         0       .00    119.69    154.25
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  SECNO     DEPTH     CWSEL     CRIWS     WSELI     EG        HV        HL        OLOSS   BANK ELEV
  O         OLOB      OCH       OROB      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=  6 MIN ELTRD=  876.40 MAX ELLC=  876.10

    92.49     4.66    871.76       .00       .00    871.90       .13       .05       .00    878.60
     310.       0.      310.        0.        0.     106.        0.       82.       32.     878.60
     2.70      .00      2.94       .00      .100      .045      .100      .000    867.10    223.00
  .001741      27.       27.       27.         2         0         0       .00     26.00    249.00


*SECNO 92.500
                US OF PATTERSON LAKE RD
    92.50     4.66    871.76       .00       .00    871.90       .13       .00       .00    878.60
     310.       0.      310.        0.        0.     106.        0.       82.       32.     878.60
     2.70      .00      2.93       .00      .100      .045      .100      .000    867.10    223.00
  .001739       1.        1.        1.         0         0         0       .00     26.00    249.00


*SECNO 92.700
                XSEC S
    92.70     5.16    871.86       .00       .00    871.92       .07       .02       .01    871.00
     310.       0.      310.        0.        1.     151.        0.       82.       32.     872.00
     2.70      .21      2.05       .00      .100      .045      .100      .000    866.70     90.42
  .000651      20.       20.       20.         2         0         0       .00     37.50    127.92


*SECNO 96.300
                DS OF HI-LAND LAKE DAM      XSEC T
    96.30     4.98    871.98       .00       .00    871.98       .01       .05       .01    871.00
     310.       0.      310.        0.        1.     435.        1.       85.       32.     871.00
     2.84      .07       .71       .07      .100      .045      .100      .000    867.00     27.83
  .000064     330.      360.      380.         2         0         0       .00     99.66    127.49
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   SECNO     DEPTH     CWSEL     CRIWS     WSELI     EG        HV        HL        OLOSS   BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA   LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*PROF 2

CCHV=    .300 CEHV=    .500
*SECNO  .000

3470 ENCROACHMENT STATIONS=      81.0      128.0  TYPE=      1  TARGET=      47.000
                 50FT DS OF PATTERSON LAKE RD.    XSEC A
      .00      5.86    869.86      .00    869.00    869.94      .09      .00      .00    866.10
     440.       15.      412.      13.       24.      170.      22.       0.       0.    866.90
      .00      .64      2.42      .60      .100      .045     .100     .000   864.00     81.00
  .000602       0.        0.       0.         0         0        4      .00    47.00    128.00

*SECNO  .500

3470 ENCROACHMENT STATIONS=      94.0      116.0  TYPE=      1  TARGET=      22.000
      .50      5.85    869.85      .00       .00    870.05      .19      .05      .05100000.00
     440.        0.      440.       0.        0.      125.       0.       0.       0. 100000.00
      .00       .00      3.52      .00      .100      .045     .100     .000   864.00     94.00
  .001902       50.       50.      50.         2         0        0      .00    22.00    116.00

*SECNO  .510

3370 NORMAL BRIDGE,NRD=  0 MIN ELTRD=  874.60 MAX ELLC=  871.50

                 DS PATTERSON LAKE RD CONCRETE BRIDGE 20FT LONG 20 FT WIDE
      .51      5.63    869.83      .00       .00    870.07      .24      .00      .02    875.00
     440.        0.      440.       0.        0.      113.       0.       0.       0.    875.00
      .00       .00      3.91      .00      .100      .045     .100     .000   864.20       .00
  .002532        1.        1.       1.         2         0        0      .00    20.00     20.00

*SECNO  .710

3370 NORMAL BRIDGE,NRD=  0 MIN ELTRD=  874.60 MAX ELLC=  871.50

                 US OF BRIDGE     XSEC C
      .71      5.69    869.89      .00       .00    870.12      .23      .05      .00    875.00
     440.        0.      440.       0.        0.      114.       0.       0.       0.    875.00
      .01       .00      3.87      .00      .100      .045     .100     .000   864.20       .00
  .002469       20.       20.      20.         1         0        0      .00    20.00     20.00
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   SECNO     DEPTH     CWSEL     CRIWS     WSELH     EG        HV        HL        OLOSS   BANK ELEV
   Q         OLOB      OCH       OROB      ALOB      ACH       AROB      VOL       TWA   LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO 30.420

3470 ENCROACHMENT STATIONS=      80.0      320.0  TYPE=      1  TARGET=      240.000
                XSEC H
    30.42      6.27   870.47      .00   869.44   870.48      .01      .02      .00   867.00
     440.       94.     235.     112.     290.     223.     326.      43.      10.   867.00
     1.09       .32     1.05      .34     .100     .045     .100     .000   864.20    80.00
  .000114      430.     500.     430.        1        0        0      .00   240.00   320.00


CCHV=     .300 CEHV=     .500
*SECNO 36.720

3470 ENCROACHMENT STATIONS=      75.0      148.0  TYPE=      1  TARGET=       73.000
                XSEC I 50 FT DS OF PRIVATE RD BRIDGE
    36.72      5.66   870.56      .00   869.57   870.61      .05      .11      .02   867.50
     440.       15.     408.      17.      32.     224.      33.      49.      12.   867.50
     1.18       .49     1.82      .51     .100     .045     .100     .000   864.90    75.00
  .000794      270.     630.     590.        2        0        0      .00    73.00   148.00


*SECNO 37.220

3470 ENCROACHMENT STATIONS=      88.0      136.0  TYPE=      1  TARGET=       48.000
    37.22      5.68   870.58      .00   869.59   870.64      .06      .02      .01   867.50
     440.        0.     440.       0.       0.     225.       0.      50.      12. 100000.00
     1.19       .00     1.96      .00     .100     .045     .100     .000   864.90    88.00
  .000533       50.      50.      50.        0        0        0      .00    48.00   136.00


*SECNO 37.230

3265 DIVIDED FLOW


3370 NORMAL BRIDGE,NRD=  8 MIN ELTRD=  879.10 MAX ELLC=  877.40

    37.23      5.97   870.57      .00   869.59   870.64      .07      .00      .00   867.50
     440.        1.     438.       1.       5.     207.       4.      50.      12.   867.50
     1.19       .25     2.11      .22     .100     .045     .100     .000   864.60    59.48
  .000494        1.       1.       1.        0        0        0      .00    47.97   115.73
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   SECNO     DEPTH     CWSEL     CRIWS     WSELI     EG        HV        HL        OLOSS   BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA   LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO 50.660

3470 ENCROACHMENT STATIONS=     126.0     176.0  TYPE=     1  TARGET=      50.000
                 50 FT DS OF PRIVATE WALKWAY      XSEC L
    50.66     7.03    870.97      .00    870.01    870.98      .05       .12       .01    867.30
     440.       6.      427.       7.       14.      229.      16.       65.       18.    866.70
     1.53      .42      1.86      .44      .100      .045     .100      .000    863.90    126.00
  .000337     500.      500.     540.         2         0        0       .00     50.00    176.00

*SECNO 51.160

3470 ENCROACHMENT STATIONS=     139.0     163.0  TYPE=     1  TARGET=      24.000
    51.16     7.00    870.90      .00    869.99    871.04      .14       .03       .03100000.00
     440.       0.      440.       0.        0.      147.       0.       66.       18. 100000.00
     1.53      .00      3.00      .00      .100      .045     .100      .000    863.90    139.00
  .001211      50.       50.      50.         2         0        0       .00     24.00    163.00

*SECNO 51.170

3370 NORMAL BRIDGE,NRD=  6 MIN ELTRD=  871.30 MAX ELLC=  870.70

3470 ENCROACHMENT STATIONS=     120.0     143.0  TYPE=     1  TARGET=      23.000
    51.17     5.85    870.85      .00    869.96    871.06      .21       .00       .02    871.30
     440.       0.      440.       0.        0.      120.       0.       66.       18. 100000.00
     1.53      .00      3.67      .00      .100      .045     .100      .000    865.00    120.01
  .004406       1.        1.       1.         2         0        0     -3.50     22.99    143.00

*SECNO 51.250

3370 NORMAL BRIDGE,NRD=  6 MIN ELTRD=  871.30 MAX ELLC=  870.70

3470 ENCROACHMENT STATIONS=     120.0     143.0  TYPE=     1  TARGET=      23.000
    51.25     5.89    870.89      .00    869.98    871.10      .21       .04       .00    871.30
     440.       0.      440.       0.        0.      120.       0.       66.       18. 100000.00
     1.53      .00      3.67      .00      .100      .045     .100      .000    865.00    120.01
  .004406       8.        8.       8.         1         0        0     -4.17     22.99    143.00
```

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

*SECNO 84.410

3470 ENCROACHMENT STATIONS=      55.0      500.0  TYPE=     1  TARGET=     445.000
                XSEC 0
    84.41      4.68    871.78      .00    870.89    871.80      .01       .12       .00    869.60
     440.       45.      206.     189.      202.      174.     496.      105.       30.    869.20
     2.55       .22      1.18      .38      .100      .045     .100      .000    867.10     69.27
  .000201      970.      970.     650.         1         0        0       .00    430.73    500.00

*SECNO 91.710

3470 ENCROACHMENT STATIONS=     200.0      251.0  TYPE=     1  TARGET=      51.000
                XSEC R
    91.71      3.47    871.97      .00    871.34    872.29      .32       .40       .09    871.00
     440.        9.      431.       1.        9.       94.       2.      114.       34.    871.30
     2.59       .91      4.59      .48      .100      .045     .100      .000    868.50    200.00
  .004566      830.      730.     700.         2         0        0       .00     44.61    244.61

*SECNO 92.220

3470 ENCROACHMENT STATIONS=     212.0      238.0  TYPE=     1  TARGET=      26.000
                DS OF PATTERSON LANE RD  DS OF HI-LAND LANE
    92.22      3.69    872.19      .00    871.58    872.53      .35       .24       .01100000.00
     440.        0.      440.       0.        0.       93.       0.      114.       34. 100000.00
     2.59       .00      4.74      .00      .100      .045     .100      .000    868.50    212.00
  .004967       50.       50.      50.         2         0        0       .00     26.00    238.00

*SECNO 92.220

3370 NORMAL BRIDGE,NRD=  6 MIN ELTRD=  876.40 MAX ELLC=  876.10

    92.22      5.25    872.35      .00    871.71    872.55      .21       .00       .01    878.60
     440.        0.      440.       0.        0.      121.       0.      114.       34.    878.60
     2.59       .00      3.64      .00      .100      .045     .100      .000    867.10    223.00
  .002343        1.        1.       1.         2         0        0       .00     26.00    249.00

*SECNO 92.490
```

THIS RUN EXECUTED 06/20/86 09:22:21

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*************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55,56
  IBM-PC-XT VERSION 1.1
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```

T1 100 YEAR FLOW
T2
T3

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0.	3.	0.	0.	.000600	.00	.0	570.	870.000	.000
J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	3.000	.000	-1.000	.000	.000	.000	.000	.000	.000	.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

*SECNO  .720

3470 ENCROACHMENT STATIONS=      94.0      116.0  TYPE=      1  TARGET=      22.000
      .72      6.82    870.82      .00       .00    871.06      .24       .00       .02100000.00
     570.        0.      570.       0.        0.      146.       0.        0.        0. 100000.00
      .00       .00      7.90      .00      .100      .045     .100      .000    864.00     94.00
  .002038        1.        1.       1.         2         0        0       .00     22.00    116.00

*SECNO 1.220

3470 ENCROACHMENT STATIONS=      44.0      166.0  TYPE=      1  TARGET=     122.000
                 50FT US OF BRIDGE        XSEC D
     1.22      7.10    871.10      .00       .00    871.15      .05       .03       .06    866.10
     570.       55.      434.      80.      111.      210.     143.        1.        0.     866.90
      .01       .50      2.07      .56      .100      .045     .100      .000    864.00     44.00
  .000333       50.       50.      50.         2         0        0       .00    122.00    166.00

CCHV=    .100 CEHV=    .300
*SECNO 11.320
                 XSEC CUT FROM TOPO       XSEC E
    11.32      8.08    871.28      .00       .00    871.30      .01       .14       .00    868.00
     570.       2.      404.      84.       13.      492.     267.       14.        3.     867.00
      .32       .15       .98      .32      .100      .045     .100      .000    863.20     68.02
  .000082     1095.     1010.     835.         2         0        0       .00    172.07    240.09

*SECNO 19.120

3470 ENCROACHMENT STATIONS=     145.0      320.0  TYPE=      1  TARGET=     175.000
                 XSEC F
    19.12      8.13    871.33      .00    869.39    871.34      .01       .04       .00    867.00
     570.       43.      498.      28.      207.      612.     126.       29.        6.     867.00
      .61       .21       .81      .23      .100      .045     .100      .000    863.20    145.00
  .000041      925.      780.     550.         2         0        0       .00    175.00    320.00

*SECNO 25.120

3470 ENCROACHMENT STATIONS=     145.0      320.0  TYPE=      1  TARGET=     175.000
                 XSEC G
    25.12      8.16    871.36      .00    869.42    871.36      .01       .02       .00    867.00
     570.       44.      498.      29.      209.      615.     127.       42.        9.     867.00
      .84       .21       .81      .22      .100      .045     .100      .000    863.20    145.00
  .000041      615.      600.     490.         1         0        0       .00    175.00    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       WIN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO 37.350

3265 DIVIDED FLOW

3370 NORMAL BRIDGE,NRD=  0 MIN ELTRD=  879.10 MAX ELLC=  877.40

    37.35      6.87   871.47      .00   869.60   871.55      .08      .01      .00   867.50
     570.        3.     566.       2.       9.     244.       7.      61.      13.   867.50
     1.12      .29     2.31      .26     .100     .045     .100     .000   864.60    58.48
  .000475       12.      12.      12.        0        0        0      .00    49.77   116.49

*SECNO 37.760

7470 ENCROACHMENT STATIONS=      88.0      136.0  TYPE=     1  TARGET=      48.000
    37.36      6.89   871.49      .00   869.61   871.56      .07      .00      .00   867.50
     570.        0.     570.       0.       0.     271.       0.      61.      13. 100000.00
     1.12      .00     2.10      .00     .100     .045     .100     .000   864.60    88.00
  .000501        1.       1.       1.        1        0        0      .00    48.00   136.00

*SECNO 37.860

7470 ENCROACHMENT STATIONS=      78.0      186.0  TYPE=     1  TARGET=     148.000
                50 FT US OF PRIVATE RD            XSEC J
    37.86      6.94   871.54      .00   869.64   871.58      .04      .02      .01   867.50
     570.       33.     478.      59.      85.     274.     129.      62.      13.   867.50
     1.13      .29     1.74      .46     .100     .045     .100     .000   864.60    46.13
  .000276       50.      50.      50.        2        0        0      .00   139.87   186.00

CCHV=    .100 CEHV=    .300
*SECNO 45.660

7470 ENCROACHMENT STATIONS=     753.0      697.0  TYPE=     1  TARGET=    -753.000
 ELENCL=    873.00  ELENCR= 100000.00
                870 FT US OF PRIVATE RD            XSEC K
    45.66      7.12   871.72      .00   869.89   871.73      .01      .14      .00   867.00
     570.      114.     269.     187.     308.     217.     472.      74.      16.   867.00
     1.39      .37     1.24      .40     .100     .045     .100     .000   864.60   377.41
  .000135      770.     780.     650.        2        0        0      .00   291.30   668.71
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   SECNO     DEPTH     CWSEL     CRIWS     WSELI     EG        HV        HL        OLOSS    BANK ELEV
   Q         DLOB      DCH       DROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO 51.260

3470 ENCROACHMENT STATIONS=      139.0      163.0  TYPE=      1  TARGET=      24.000
    51.26      6.31    871.81      .00    869.98    872.04      .23       .00       .01100000.00
     570.        0.      570.       0.        0.      148.       0.       82.       18. 100000.00
     1.46       .00      3.85      .00      .100      .045     .100      .000    865.50    139.00
  .002085        1.        1.       1.         2         0        0       .00     24.00    163.00

*SECNO 51.760

3470 ENCROACHMENT STATIONS=       92.0      225.0  TYPE=      1  TARGET=     133.000
                 50 FT US OF PRIVATE WALKWAY      XSEC M
    51.76      6.56    872.06      .00    870.14    872.08      .03       .02       .02    867.30
     570.       61.      455.       54.      132.      312.     128.       82.       18.     868.00
     1.48       .46      1.46      .42      .100      .045     .100      .000    865.50     92.00
  .000190       50.       50.       50.         2         0        0       .00    133.00    225.00

*SECNO 57.760
                 650FT US OF WALKWAY              XSEC N
    57.76      6.29    872.19      .00    870.35    872.29      .10       .19       .02    868.00
     570.       51.      519.       0.       72.      196.       0.       88.       20.     868.00
     1.54       .70      2.65      .00      .100      .045     .100      .000    865.90    138.07
  .000627      550.      600.      570.         2         0        0       .00     66.93    205.01

*SECNO 66.110

3470 ENCROACHMENT STATIONS=      115.0      345.0  TYPE=      1  TARGET=     230.000
                 XSEC O
    66.11      6.07    872.47      .00    870.66    872.48      .01       .18       .01    868.00
     570.      335.      216.       20.      787.      191.      58.       99.       22.     868.00
     1.86       .43      1.13      .34      .100      .045     .100      .000    866.40    115.00
  .000115      730.      835.      650.         2         0        0       .00    228.94    343.94

*SECNO 74.710
                 XSEC P
    74.71      6.15    872.55      .00    870.75    872.56      .01       .08       .00    869.30
     570.        4.      564.       3.       20.      605.      15.      114.       26.     868.90
     2.11       .18       .93      .19      .100      .045     .100      .000    866.40     27.86
  .000082      720.      860.      730.         2         0        0       .00    130.51    158.37
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  SECNO     DEPTH     CWSEL     CRIWS     WSELI     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       EL MIN       SSTA
  SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID       ENDST


3370 NORMAL BRIDGE,NRD=  6 MIN ELTRD=  876.40 MAX ELLC=  876.10

    92.49      5.99    873.09       .00    871.76    873.35       .26       .07       .00    878.60
     570.        0.      570.        0.        0.      140.        0.      145.       36.    878.60
     2.55       .00      4.07       .00      .100      .045      .100      .000    867.10    223.00
  .002535       27.       27.       27.         2         0         0       .00     26.00    249.00

*SECNO 92.500
                 US OF PATTERSON LAKE RD
    92.50      5.99    873.09       .00    871.76    873.35       .26       .00       .00    878.60
     570.        0.      570.        0.        0.      140.        0.      145.       36.    878.60
     2.55       .00      4.07       .00      .100      .045      .100      .000    867.10    223.00
  .002532        1.        1.        1.         0         0         0       .00     26.00    249.00

*SECNO 92.700
                 XSEC S
    92.70      6.57    873.27       .00    871.86    873.39       .12       .03       .01    871.00
     570.        6.      564.        1.       13.      200.        2.      145.       36.    872.00
     2.56       .43      2.81       .30      .100      .045      .100      .000    866.70     77.32
  .000846       20.       20.       20.         2         0         0       .00     53.85    131.17

*SECNO 96.300
                 DS OF HI-LAND LAKE DAM      XSEC T
    96.30      6.46    873.46       .00    871.98    873.47       .02       .07       .01    871.00
     570.        1.      568.        1.        7.      575.        8.      149.       36.    871.00
     2.66       .15       .99       .15      .100      .045      .100      .000    867.00     24.54
  .000085      330.      360.      380.         2         0         0       .00    106.73    131.27
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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS   BANK ELEV
   O         OLOB      OCH       OROB      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

*FROF 4

CCHV=     .300 CEHV=     .500
*SECNO  .000

3470 ENCROACHMENT STATIONS=      81.0      128.0  TYPE=      1  TARGET=      47.000
                 50FT DS OF PATTERSON LAKE RD.   XSEC A
      .00      7.15   871.15      .00   871.00   871.26      .11      .00      .00   866.10
     640.       24.     593.      23.      33.     212.      32.       0.       0.    866.90
      .00      .74     2.80      .71     .100     .045     .100     .000   864.00    81.00
  .000604       0.       0.       0.        0        0        3      .00    47.00   128.00

*SECNO  .500

3470 ENCROACHMENT STATIONS=      94.0      116.0  TYPE=      1  TARGET=      22.000
      .50      7.12   871.12      .00      .00   871.39      .27      .05      .08100000.00
     640.       0.     640.       0.       0.     153.       0.       0.       0. 100000.00
      .00      .00     4.19      .00     .100     .045     .100     .000   864.00    94.00
  .002269      50.      50.      50.        2        0        0      .00    22.00   116.00

*SECNO  .510

3370 NORMAL BRIDGE,NRD=  0 MIN ELTRD=  874.60 MAX ELLC=  871.50

                 DS PATTERSON LAKE RD CONCRETE BRIDGE 20FT LONG 20 FT WIDE
      .51      6.89   871.09      .00      .00   871.43      .33      .00      .03   875.00
     640.       0.     640.       0.       0.     128.       0.       0.       0.    875.00
      .00      .00     4.64      .00     .100     .045     .100     .000   864.20      .00
  .003029       1.       1.       1.        2        0        0      .00    20.00    20.00

*SECNO  .710

3370 NORMAL BRIDGE,NRD=  0 MIN ELTRD=  874.60 MAX ELLC=  871.50

                 US OF BRIDGE    XSEC C
      .71      6.96   871.16      .00      .00   871.49      .33      .06      .00   875.00
     640.       0.     640.       0.       0.     139.       0.       0.       0.    875.00
      .00      .00     4.60      .00     .100     .045     .100     .000   864.20      .00
  .002957     .20.      20.      20.        1        0        0      .00    20.00    20.00
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   SECNO     DEPTH     CWSEL     CRIWS     WSELF     EG        HV        HL        OLOSS    BANK ELEV
   Q         OLOB      OCH       OROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO 30.420

3470 ENCROACHMENT STATIONS=      80.0      320.0  TYPE=      1  TARGET=      240.000
                XSEC H
    30.42      7.64    871.84      .00    869.44    871.85      .01       .03       .00    867.00
     640.      155.      308.     177.      422.      282.     463.       57.       11.    867.00
      .99       .37      1.09      .38      .100      .045     .100      .000    864.20     80.00
  .000091      430.      500.     430.         0         0        0       .00    240.00    320.00

CCHV=    .300 CEHV=    .500
*SECNO 36.720

3470 ENCROACHMENT STATIONS=      75.0      148.0  TYPE=      1  TARGET=       73.000
                XSEC I 50 FT DS OF PRIVATE RD BRIDGE
    36.72      7.00    871.90      .00    869.57    871.96      .06       .09       .02    867.50
     640.       28.      583.      29.       49.      289.      49.       66.       13.    867.50
     1.08       .58      2.02      .59      .100      .045     .100      .000    864.90     75.00
   000346      270.      630.     590.         2         0        0       .00     73.00    148.00

*SECNO 37.220

3470 ENCROACHMENT STATIONS=      88.0      136.0  TYPE=      1  TARGET=       48.000
    37.22      7.02    871.92      .00    869.59    871.99      .08       .02       .01    867.50
     640.        0.      640.       0.        0.      289.       0.       67.       13. 100000.00
     1.08       .00      2.21      .00      .100      .045     .100      .000    864.90     88.00
  .000519       50.       50.      50.         0         0        0       .00     48.00    136.00

*SECNO 37.230

3265 DIVIDED FLOW

3370 NORMAL BRIDGE,NRD=  8 MIN ELTRD=  879.10 MAX ELLC=  877.40

    37.23      7.31    871.91      .00    869.59    872.00      .09       .00       .01    867.50
     640.        3.      634.       2.       11.      263.       9.       67.       13.    867.50
     1.08       .31      2.41      .27      .100      .045     .100      .000    864.60     57.99
  .000467        1.        1.       1.         0         0        0       .00     50.66    116.87
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   SECNO     DEPTH     CWSEL     CRIWS     WSELI     EG        HV        HL        OLOSS    BANK ELEV
   O         OLOB      OCH       OROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO 50.660

3470 ENCROACHMENT STATIONS=      126.0      176.0  TYPE=      1  TARGET=       50.000
                 50 FT DS OF PRIVATE WALKWAY      XSEC L
    50.66      8.31    872.21       .00    870.01    872.28       .07       .10       .02    867.30
     640.        9.      621.       10.       19.      283.       21.       90.       19.    866.70
     1.43       .47      2.19       .49      .100      .045      .100      .000    863.90    126.00
  .000253      500.      500.      540.         2         0         0       .00     50.00    176.00

*SECNO 51.160

3470 ENCROACHMENT STATIONS=      139.0      163.0  TYPE=      1  TARGET=       24.000
    51.16      8.25    872.15       .00    869.99    872.36       .20       .03       .04100000.00
     640.        0.      640.        0.        0.      177.        0.       90.       19. 100000.00
     1.43       .00      3.62       .00      .100      .045      .100      .000    863.90    139.00
  .001509       50.       50.       50.         2         0         0       .00     24.00    163.00

*SECNO 51.170

3370 NORMAL BRIDGE,NRD=  6 MIN ELTRD=  871.30 MAX ELLC=  870.70

3470 ENCROACHMENT STATIONS=      120.0      143.0  TYPE=      1  TARGET=       23.000
    51.17      7.06    872.06       .00    869.96    872.40       .34       .00       .04    871.30
     640.        0.      640.        0.        0.      138.        0.       90.       19. 100000.00
     1.43       .00      4.65       .00      .100      .045      .100      .000    865.00    120.00
  .009638        1.        1.        1.         2         0         0    -13.80     23.00    143.00

*SECNO 51.250

3370 NORMAL BRIDGE,NRD=  6 MIN ELTRD=  871.30 MAX ELLC=  870.70

3470 ENCROACHMENT STATIONS=      120.0      143.0  TYPE=      1  TARGET=       23.000
    51.25      7.15    872.15       .00    869.98    872.48       .33       .08       .00    871.30
     640.        0.      640.        0.        0.      140.        0.       90.       19. 100000.00
     1.43       .00      4.59       .00      .100      .045      .100      .000    865.00    120.00
  .009218        8.        8.        8.         2         0         0    -13.80     23.00    143.00
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   SECNO     DEPTH     CWSEL     CRIWS     WSELI     EG        HV        HL        OLOSS    BANK ELEV
   Q         OLOB      OCH       OROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO 84.410

3470 ENCROACHMENT STATIONS=      55.0      500.0  TYPE=      1  TARGET=      445.000
                XSEC O
    84.41      5.97    873.07      .00    870.89    873.07      .01       .08       .00    869.60
     640.      122.      239.     278.      457.      230.     755.      147.       32.    869.20
     2.48       .27      1.04      .37      .100      .045     .100      .000    867.10     55.00
  .000108      970.      970.     650.         0         0        0       .00    445.00    500.00

*SECNO 91.710

3470 ENCROACHMENT STATIONS=     200.0      251.0  TYPE=      1  TARGET=       51.000
                XSEC R
    91.71      4.56    873.06      .00    871.34    873.40      .34       .27       .10    871.00
     640.       25.      606.       9.       20.      127.      11.      161.       36.    871.30
     2.52      1.22      4.79      .82      .100      .045     .100      .000    868.50    200.00
  .003328      830.      730.     700.         2         0        0       .00     51.00    251.00

*SECNO 92.220

3470 ENCROACHMENT STATIONS=     212.0      238.0  TYPE=      1  TARGET=       26.000
                DS OF PATTERSON LANE RD  DS OF HI-LAND LANE
    92.22      4.69    873.19      .00    871.58    873.64      .45       .20       .03100000.00
     640.        0.      640.       0.        0.      119.       0.      161.       36. 100000.00
     2.52       .00      5.38      .00      .100      .045     .100      .000    868.50    212.00
  .005004       50.       50.      50.         2         0        0       .00     26.00    238.00

*SECNO 92.220

3370 NORMAL BRIDGE,NRD=  6 MIN ELTRD=  876.40 MAX ELLC=  876.10

    92.22      6.26    873.36      .00    871.71    873.66      .29       .00       .02    878.60
     640.        0.      640.       0.        0.      147.       0.      161.       36.    878.60
     2.52       .00      4.35      .00      .100      .045     .100      .000    867.10    223.00
  .002763        1.        1.       1.         2         0        0       .00     26.00    249.00

*SECNO 92.490
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THIS RUN EXECUTED 06/20/86 09:29:52

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*************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55,56
  IBM-PC-XT VERSION 1.1
*************************************************
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

PORTAGE CREEK

SUMMARY PRINTOUT TABLE 150

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*S	VCH	AREA	.01K
.000	.00	.00	.00	864.00	310.00	868.88	.00	868.95	6.03	.11	170.06	126.25
.000	.00	.00	.00	864.00	440.00	869.86	.00	869.94	6.02	2.42	215.92	179.40
.000	.00	.00	.00	864.00	570.00	870.72	.00	870.83	6.01	2.67	256.70	232.52
.000	.00	.00	.00	864.00	640.00	871.15	.00	871.26	6.04	2.80	276.66	260.40
.500	50.00	.00	.00	864.00	310.00	868.89	.00	869.03	16.05	2.98	104.04	77.37
.500	50.00	.00	.00	864.00	440.00	869.85	.00	870.05	19.02	3.52	124.96	100.89
.500	50.00	.00	.00	864.00	570.00	870.71	.00	870.95	21.43	3.97	143.73	123.14
.500	50.00	.00	.00	864.00	640.00	871.12	.00	871.39	22.69	4.19	152.90	134.35
.510	1.00	874.60	871.50	864.20	310.00	868.88	.00	869.05	21.36	3.31	93.71	67.07
.510	1.00	874.60	871.50	864.20	440.00	869.83	.00	870.07	25.32	3.91	112.66	87.44
.510	1.00	874.60	871.50	864.20	570.00	870.68	.00	870.98	28.58	4.40	129.61	106.63
.510	1.00	874.60	871.50	864.20	640.00	871.09	.00	871.43	30.29	4.64	137.88	116.28
.710	20.00	874.60	871.50	864.20	310.00	868.92	.00	869.09	20.98	3.29	94.30	67.69
.710	20.00	874.60	871.50	864.20	440.00	869.89	.00	870.12	24.69	3.87	113.65	88.54
.710	20.00	874.60	871.50	864.20	570.00	870.74	.00	871.04	27.89	4.36	130.73	107.93
.710	20.00	874.60	871.50	864.20	640.00	871.16	.00	871.49	29.57	4.60	139.08	117.69
.720	1.00	.00	.00	864.00	310.00	868.97	.00	869.10	15.41	2.94	105.51	78.97
.720	1.00	.00	.00	864.00	440.00	869.95	.00	870.14	18.11	3.46	127.12	103.41
.720	1.00	.00	.00	864.00	570.00	870.82	.00	871.06	20.38	3.90	146.31	126.27
.720	1.00	.00	.00	864.00	640.00	871.25	.00	871.51	21.56	4.11	155.71	137.83
1.220	50.00	.00	.00	864.00	310.00	869.12	.00	869.17	4.45	1.88	239.03	146.98
1.220	50.00	.00	.00	864.00	440.00	870.16	.00	870.21	3.78	1.99	353.56	226.23
1.220	50.00	.00	.00	864.00	570.00	871.10	.00	871.15	3.33	2.07	467.93	312.32
1.220	50.00	.00	.00	864.00	640.00	871.56	.00	871.61	3.14	2.10	520.17	361.41
11.320	1010.00	.00	.00	863.20	310.00	869.35	.00	869.36	1.01	.85	457.86	307.85
11.320	1010.00	.00	.00	863.20	440.00	870.37	.00	870.38	.90	.92	618.88	464.43
11.320	1010.00	.00	.00	863.20	570.00	871.28	.00	871.30	.82	.98	772.19	629.68
11.320	1010.00	.00	.00	863.20	640.00	871.74	.00	871.75	.79	1.01	851.50	719.95

SECND	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
50.660	500.00	.00	.00	863.90	310.00	870.01	.00	870.05	3.11	1.58	213.07	175.67
50.660	500.00	.00	.00	863.90	440.00	870.93	.00	870.98	3.37	1.86	259.11	239.57
50.660	500.00	.00	.00	863.90	570.00	871.78	.00	871.85	3.49	2.09	301.66	305.31
50.660	500.00	.00	.00	863.90	640.00	872.21	.00	872.28	3.53	2.19	323.17	340.87
51.160	50.00	.00	.00	863.90	310.00	869.99	.00	870.09	9.54	2.48	124.98	100.34
51.160	50.00	.00	.00	863.90	440.00	870.90	.00	871.04	12.11	3.00	146.67	126.42
51.160	50.00	.00	.00	863.90	570.00	871.77	.00	871.91	14.13	3.42	166.66	151.63
51.160	50.00	.00	.00	863.90	640.00	872.15	.00	872.36	15.09	3.62	176.76	164.77
51.170	1.00	871.30	870.70	865.00	310.00	869.96	.00	870.11	16.70	3.01	103.11	75.86
51.170	1.00	871.30	870.70	865.00	440.00	870.85	.00	871.06	44.06	3.67	120.00	66.29
51.170	1.00	871.30	870.70	865.00	570.00	871.65	.00	871.95	95.89	4.45	127.97	58.21
51.170	1.00	871.30	870.70	865.00	640.00	872.06	.00	872.40	96.38	4.65	137.54	65.19
51.250	8.00	871.30	870.70	865.00	310.00	869.98	.00	870.12	16.58	3.00	103.35	76.13
51.250	8.00	871.30	870.70	865.00	440.00	870.89	.00	871.10	44.06	3.67	120.00	66.29
51.250	8.00	871.30	870.70	865.00	570.00	871.73	.00	872.03	91.43	4.39	129.92	59.61
51.250	8.00	871.30	870.70	865.00	640.00	872.15	.00	872.48	92.18	4.59	139.51	66.66
51.260	1.00	.00	.00	865.50	310.00	869.98	.00	870.12	17.31	2.98	104.01	74.51
51.260	1.00	.00	.00	865.50	440.00	870.91	.00	871.10	19.62	3.48	126.39	99.34
51.260	1.00	.00	.00	865.50	570.00	871.81	.00	872.04	20.85	3.85	147.93	124.83
51.260	1.00	.00	.00	865.50	640.00	872.23	.00	872.49	21.75	4.05	158.03	137.24
51.760	50.00	.00	.00	865.50	310.00	870.14	.00	870.16	2.68	1.33	316.22	189.24
51.760	50.00	.00	.00	865.50	440.00	871.12	.00	871.14	2.23	1.41	446.74	294.54
51.760	50.00	.00	.00	865.50	570.00	872.06	.00	872.08	1.90	1.46	571.79	413.90
51.760	50.00	.00	.00	865.50	640.00	872.50	.00	872.53	1.80	1.49	632.04	477.27
57.760	600.00	.00	.00	865.90	310.00	870.35	.00	870.42	7.16	2.22	158.09	115.89
57.760	600.00	.00	.00	865.90	440.00	871.29	.00	871.38	6.82	2.49	210.84	168.47
57.760	600.00	.00	.00	865.90	570.00	872.19	.00	872.29	6.23	2.65	268.02	228.45
57.760	600.00	.00	.00	865.90	640.00	872.63	.00	872.73	6.02	2.74	298.08	260.78
66.110	835.00	.00	.00	866.40	310.00	870.66	.00	870.66	1.61	1.04	623.76	244.44
66.110	835.00	.00	.00	866.40	440.00	871.58	.00	871.59	1.34	1.09	833.12	379.66
66.110	835.00	.00	.00	866.40	570.00	872.47	.00	872.48	1.15	1.13	1036.02	531.86
66.110	835.00	.00	.00	866.40	640.00	872.90	.00	872.91	1.09	1.15	1136.36	614.18
74.710	860.00	.00	.00	866.40	310.00	870.75	.00	870.76	.92	.76	415.71	322.52
74.710	860.00	.00	.00	866.40	440.00	871.67	.00	871.68	.89	.86	527.67	467.53
74.710	860.00	.00	.00	866.40	570.00	872.55	.00	872.56	.82	.93	640.07	627.78
74.710	860.00	.00	.00	866.40	640.00	872.97	.00	872.99	.81	.97	696.45	712.92
84.410	970.00	.00	.00	867.10	310.00	870.89	.00	870.91	3.38	1.30	526.67	168.50
84.410	970.00	.00	.00	867.10	440.00	871.78	.00	871.80	2.01	1.18	872.70	310.42
84.410	970.00	.00	.00	867.10	570.00	872.64	.00	872.65	1.28	1.07	1256.05	504.25
84.410	970.00	.00	.00	867.10	640.00	873.07	.00	873.07	1.08	1.04	1442.10	614.54

PORTAGE CREEK

SUMMARY PRINTOUT TABLE 150

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFLWS	TOPWID	XLCH
.000	310.00	868.88	.00	.00	.88	47.00	.00
.000	440.00	869.86	.98	.00	.86	47.00	.00
.000	570.00	870.72	.87	.00	.72	47.00	.00
.000	640.00	871.15	.42	.00	.15	47.00	.00
.500	310.00	868.89	.00	.01	.00	22.00	50.00
.500	440.00	869.85	.96	.00	.00	22.00	50.00
.500	570.00	870.71	.85	-.02	.00	22.00	50.00
.500	640.00	871.12	.42	-.03	.00	22.00	50.00
.510	310.00	868.88	.00	-.01	.00	20.00	1.00
.510	440.00	869.83	.96	-.02	.00	20.00	1.00
.510	570.00	870.68	.85	-.03	.00	20.00	1.00
.510	640.00	871.09	.41	-.03	.00	20.00	1.00
.710	310.00	868.92	.00	.05	.00	20.00	20.00
.710	440.00	869.89	.97	.06	.00	20.00	20.00
.710	570.00	870.74	.86	.06	.00	20.00	20.00
.710	640.00	871.16	.42	.07	.00	20.00	20.00
.720	310.00	868.97	.00	.05	.00	22.00	1.00
.720	440.00	869.95	.98	.06	.00	22.00	1.00
.720	570.00	870.82	.87	.08	.00	22.00	1.00
.720	640.00	871.25	.43	.09	.00	22.00	1.00
1.220	310.00	869.12	.00	.15	.00	104.81	50.00
1.220	440.00	870.16	1.05	.21	.00	114.11	50.00
1.220	570.00	871.10	.93	.27	.00	122.00	50.00
1.220	640.00	871.56	.46	.31	.00	122.00	50.00
11.320	310.00	869.35	.00	.23	.00	153.69	1010.00
11.320	440.00	870.37	1.02	.20	.00	161.97	1010.00
11.320	570.00	871.28	.92	.19	.00	172.07	1010.00
11.320	640.00	871.74	.45	.18	.00	177.07	1010.00
19.120	310.00	869.39	.00	.05	.00	175.00	780.00
19.120	440.00	870.42	1.02	.05	1.02	175.00	780.00
19.120	570.00	871.33	.92	.05	1.94	175.00	780.00
19.120	640.00	871.78	.45	.05	2.39	175.00	780.00
25.120	310.00	869.42	.00	.02	.00	175.00	600.00
25.120	440.00	870.44	1.02	.02	1.02	175.00	600.00
25.120	570.00	871.36	.92	.02	1.94	175.00	600.00
25.120	640.00	871.81	.45	.02	2.39	175.00	600.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFWS	TOPWID	XLCH
51.170	310.00	869.96	.00	-.03	.00	22.96	1.00
51.170	440.00	870.85	.89	-.05	.89	22.99	1.00
51.170	570.00	871.65	.79	-.09	1.68	23.00	1.00
51.170	640.00	872.06	.42	-.09	2.10	23.00	1.00
51.250	310.00	869.98	.00	.01	.00	22.96	8.00
51.250	440.00	870.89	.91	.04	.91	22.99	8.00
51.250	570.00	871.73	.84	.09	1.75	23.00	8.00
51.250	640.00	872.15	.42	.09	2.17	23.00	8.00
51.260	310.00	869.98	.00	.00	.00	24.00	1.00
51.260	440.00	870.91	.93	.03	.93	24.00	1.00
51.260	570.00	871.81	.90	.08	1.83	24.00	1.00
51.260	640.00	872.23	.42	.08	2.25	24.00	1.00
51.760	310.00	870.14	.00	.15	.00	133.00	50.00
51.760	440.00	871.12	.98	.20	.98	133.00	50.00
51.760	570.00	872.06	.94	.25	1.92	133.00	50.00
51.760	640.00	872.50	.45	.27	2.37	133.00	50.00
57.760	310.00	870.35	.00	.21	.00	52.60	600.00
57.760	440.00	871.29	.94	.17	.94	59.65	600.00
57.760	570.00	872.19	.91	.14	1.85	66.93	600.00
57.760	640.00	872.63	.43	.12	2.28	71.28	600.00
66.110	310.00	870.66	.00	.31	.00	225.31	835.00
66.110	440.00	871.58	.93	.30	.93	227.16	835.00
66.110	570.00	872.47	.89	.28	1.82	228.94	835.00
66.110	640.00	872.90	.43	.28	2.25	229.82	835.00
74.710	310.00	870.75	.00	.10	.00	119.69	860.00
74.710	440.00	871.67	.91	.09	.91	125.21	860.00
74.710	570.00	872.55	.88	.08	1.79	130.51	860.00
74.710	640.00	872.97	.43	.07	2.22	133.09	860.00
84.410	310.00	870.89	.00	.14	.00	355.55	970.00
84.410	440.00	871.78	.89	.12	.89	430.73	970.00
84.410	570.00	872.64	.86	.10	1.75	445.00	970.00
84.410	640.00	873.07	.42	.09	2.17	445.00	970.00
91.710	310.00	871.34	.00	.45	.00	40.31	730.00
91.710	440.00	871.97	.63	.18	.63	44.61	730.00
91.710	570.00	872.68	.71	.04	1.34	49.53	730.00
91.710	640.00	873.06	.38	.00	1.72	51.00	730.00
92.220	310.00	871.58	.00	.24	.00	26.00	50.00
92.220	440.00	872.19	.60	.22	.60	26.00	50.00
92.220	570.00	872.84	.65	.16	1.26	26.00	50.00
92.220	640.00	873.19	.35	.12	1.61	26.00	50.00

THIS RUN EXECUTED 06/20/86 09:33:39

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  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55,56
  IBM-PC-XT VERSION 1.1
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6504 - 03 - 1
FIS - Hamburg Township
Huron River & Camachog Lakes

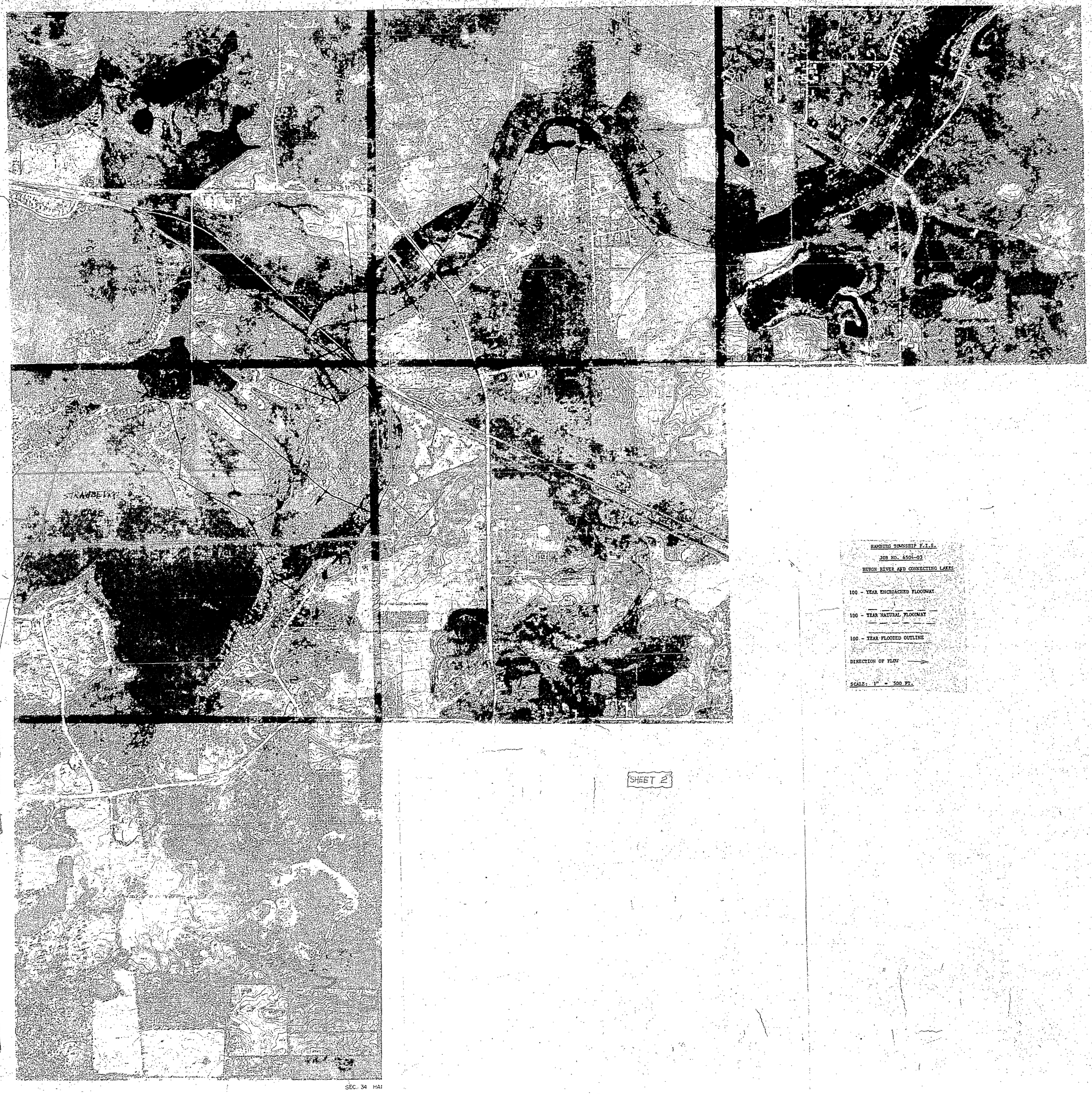
SCALE: 1" = 500 ft.

N

SEC 13 HAM

Sheet # 5

RECEIVED
JUL 02 1981
WATER MANAGEMENT



HAMBURG TOWNSHIP F.I.S.

JOB NO. 6504-03

HURON RIVER AND CONNECTING LAKES

100 - YEAR ENCROACHED FLOODWAY

100 - YEAR NATURAL FLOODWAY

100 - YEAR FLOODED OUTLINE

DIRECTION OF FLOW

SCALE: 1" = 500 FT.

SHEET 2

RECEIVED
JUL 02 1981
WATER MANAGEMENT

RECEIVED
JUL 2 1981
WATER MANAGEMENT

HAMBURG TOWNSHIP F.I.S.

JOB NO. 6504-03

HURON RIVER AND CONNECTING LAKES

100 - YEAR ENCROACHED FLOODWAY

100 - YEAR NATURAL FLOODWAY

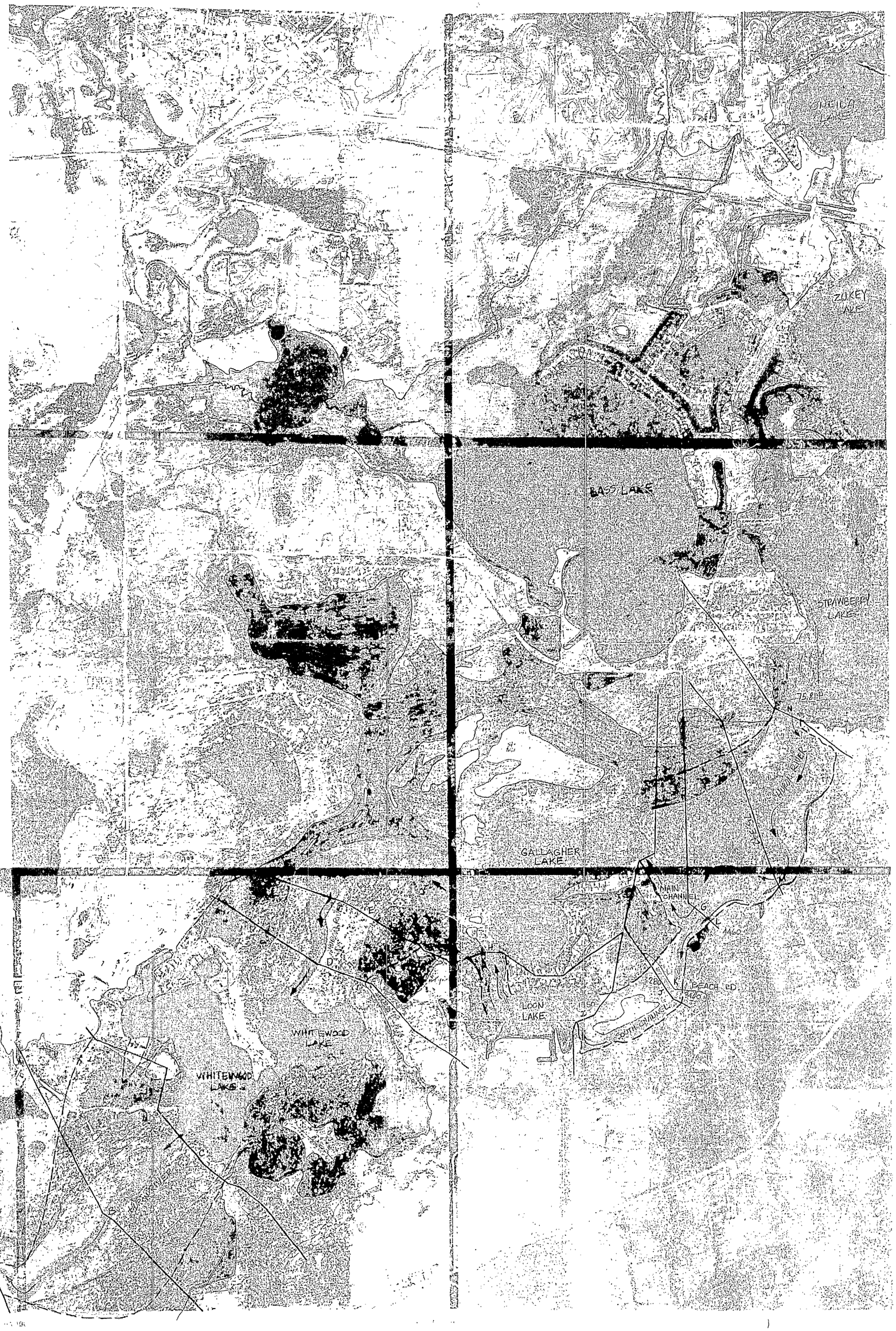
100 - YEAR FLOODED OUTLINE

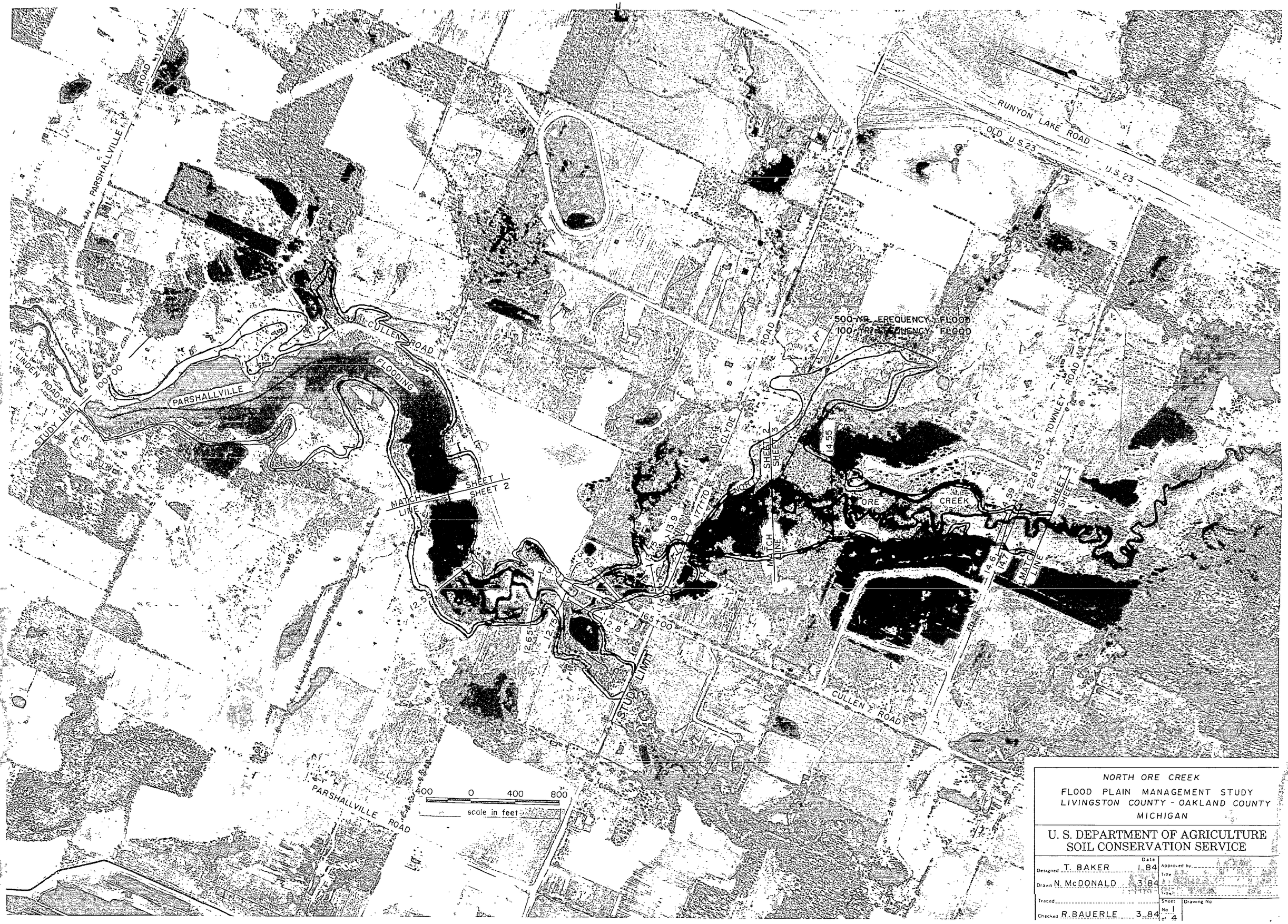
DIRECTION OF FLOW

SCALE: 1" = 500 FT.

N

SHEET 1





NORTH ORE CREEK

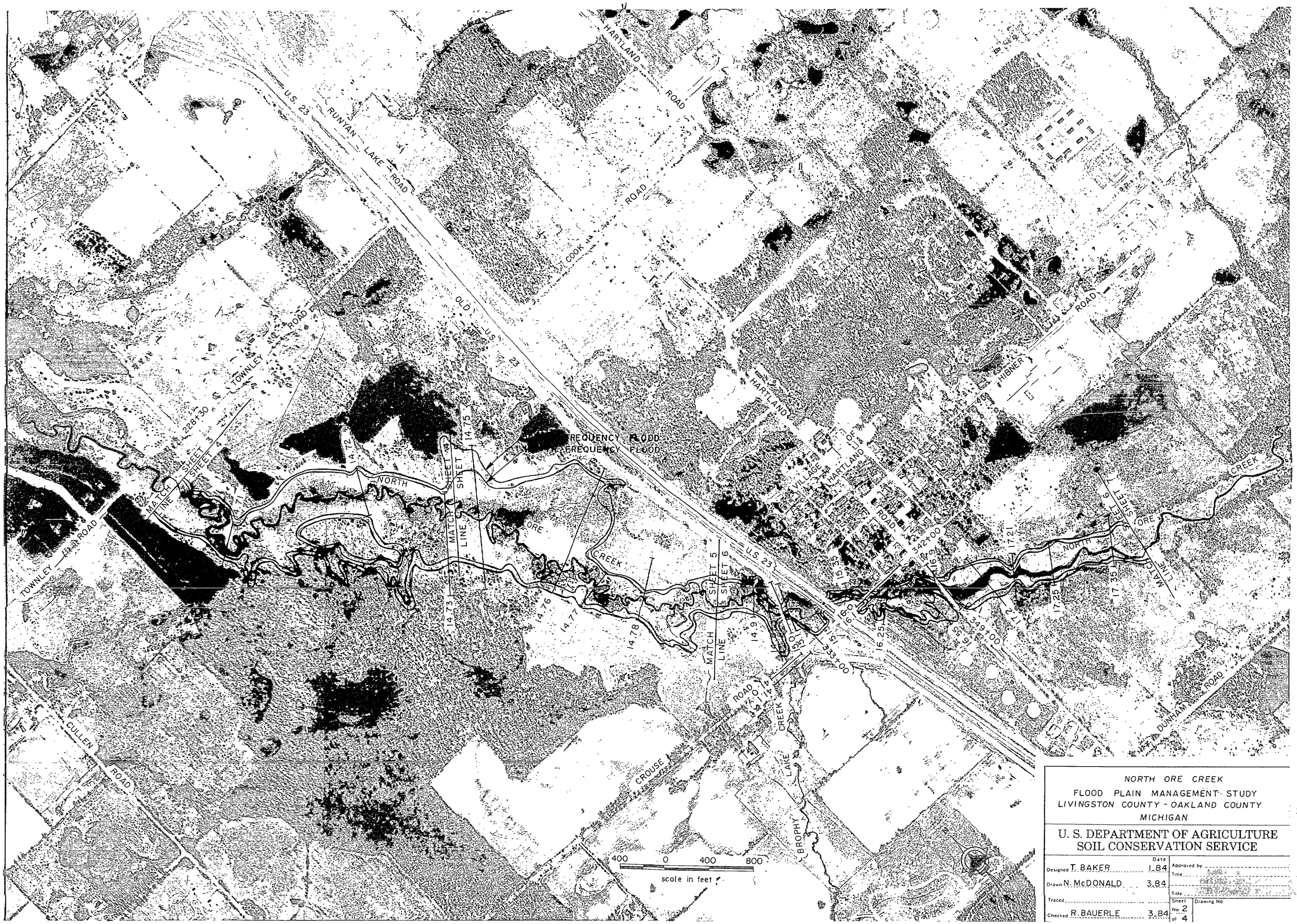
FLOOD PLAIN MANAGEMENT STUDY

LIVINGSTON COUNTY - OAKLAND COUNTY

MICHIGAN

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed T. BAKER	Date 1-84	Approved by	
Drawn N. McDONALD	3-84	Title	
Traced		Title	
Checked R. BAUERLE	3-84	Sheet No. 1 of 4	Drawing No



NORTH ORE CREEK

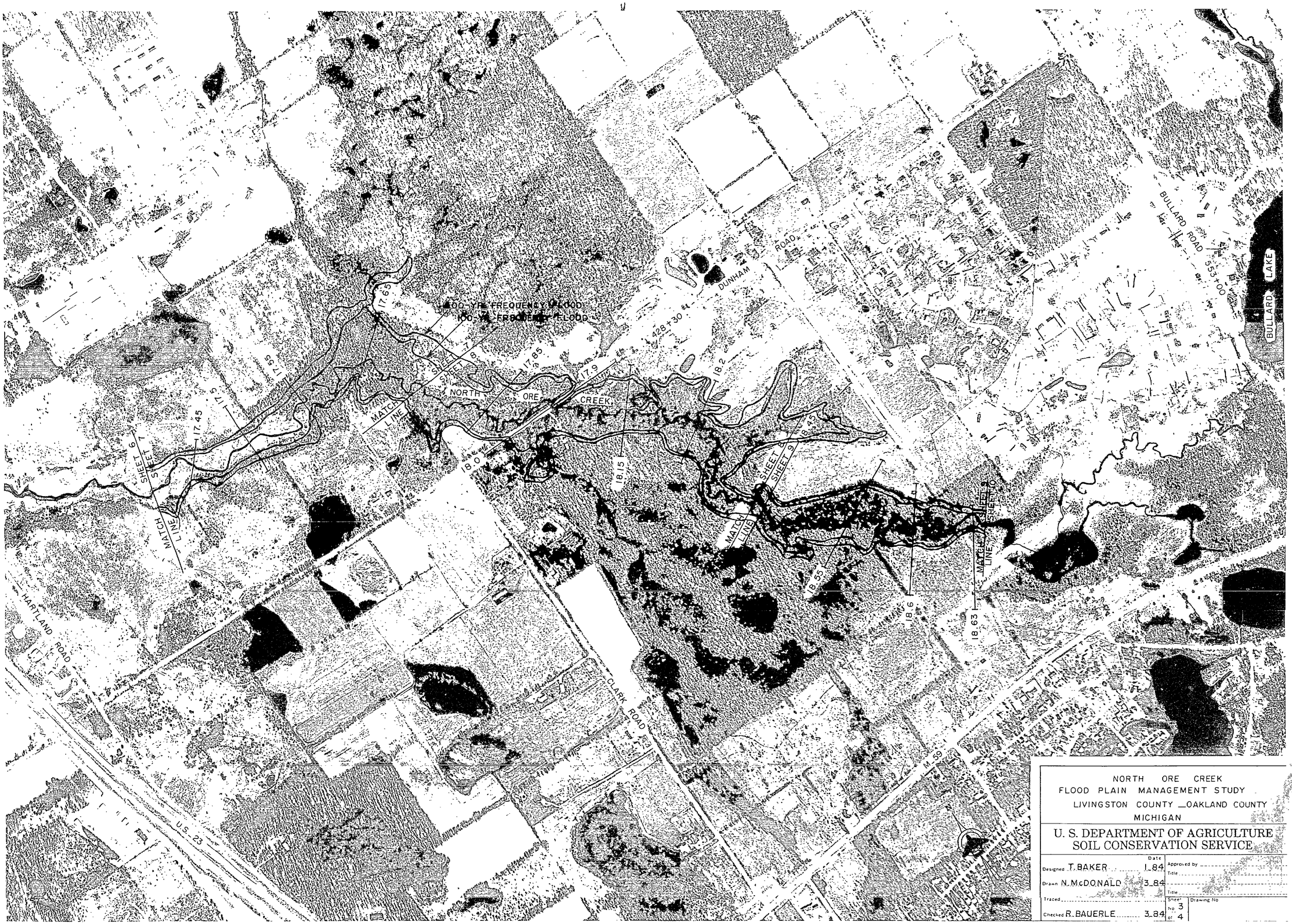
FLOOD PLAIN MANAGEMENT STUDY

LIVINGSTON COUNTY - OAKLAND COUNTY

MICHIGAN

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

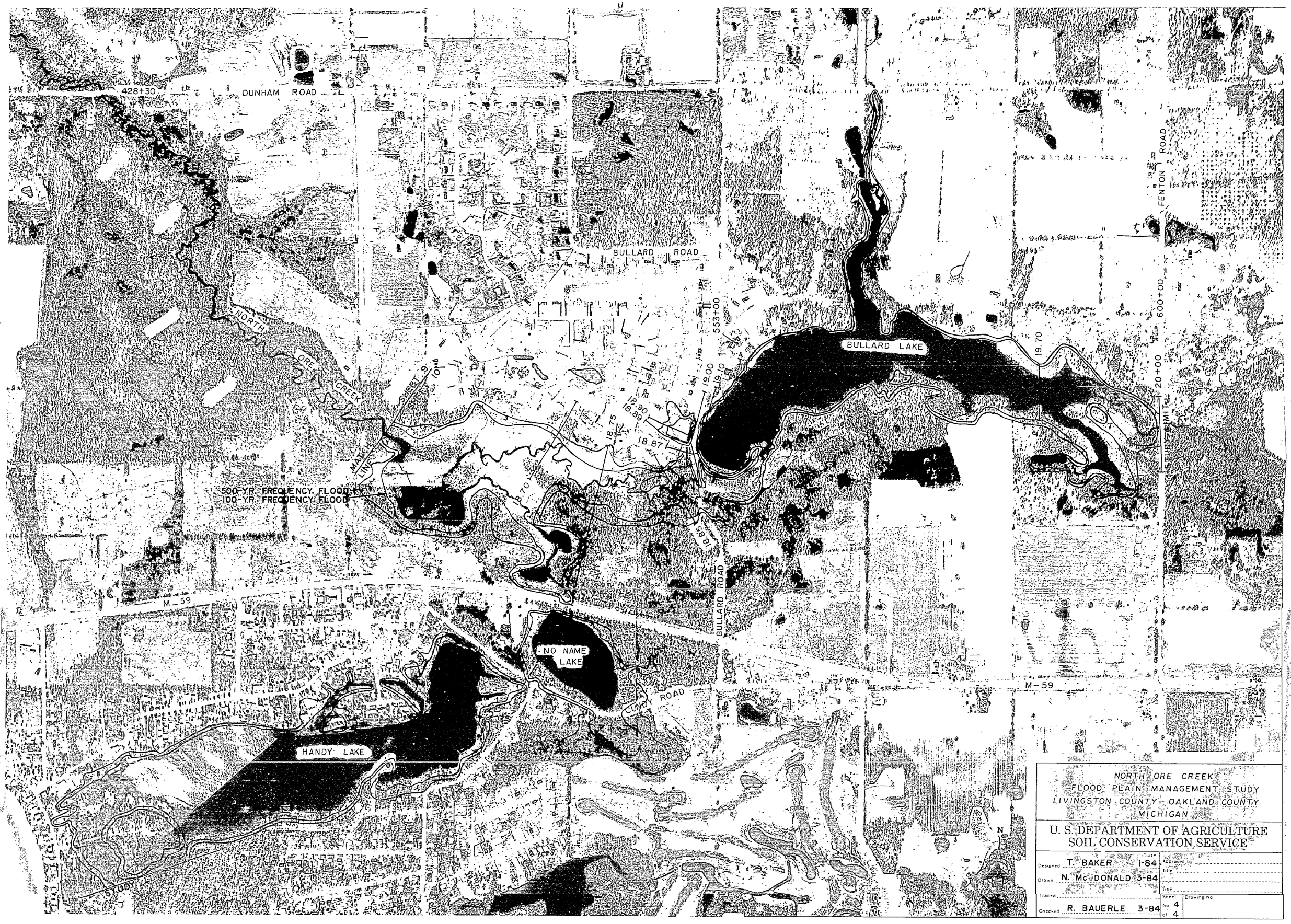
Designed T. BAKER	Date 1.84	Approved by	
Drawn N. McDONALD	3.84	Title	
Traced		Title	
Checked R. BAUERLE	3.84	Sheet No. 2 of 4	Drawing No



NORTH ORE CREEK
FLOOD PLAIN MANAGEMENT STUDY
LIVINGSTON COUNTY _OAKLAND COUNTY
MICHIGAN

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

		Date		
Designed	T. BAKER	1-84	Approved by	
Drawn	N. McDONALD	3-84	Title	
Traced			Title	
Checked	R. BAUERLE	3-84	Sheet No. 3 of 4	Drawing No



NORTH ORE CREEK
FLOOD PLAIN MANAGEMENT STUDY
LIVINGSTON COUNTY - OAKLAND COUNTY
MICHIGAN

U. S. DEPARTMENT OF AGRICULTURE
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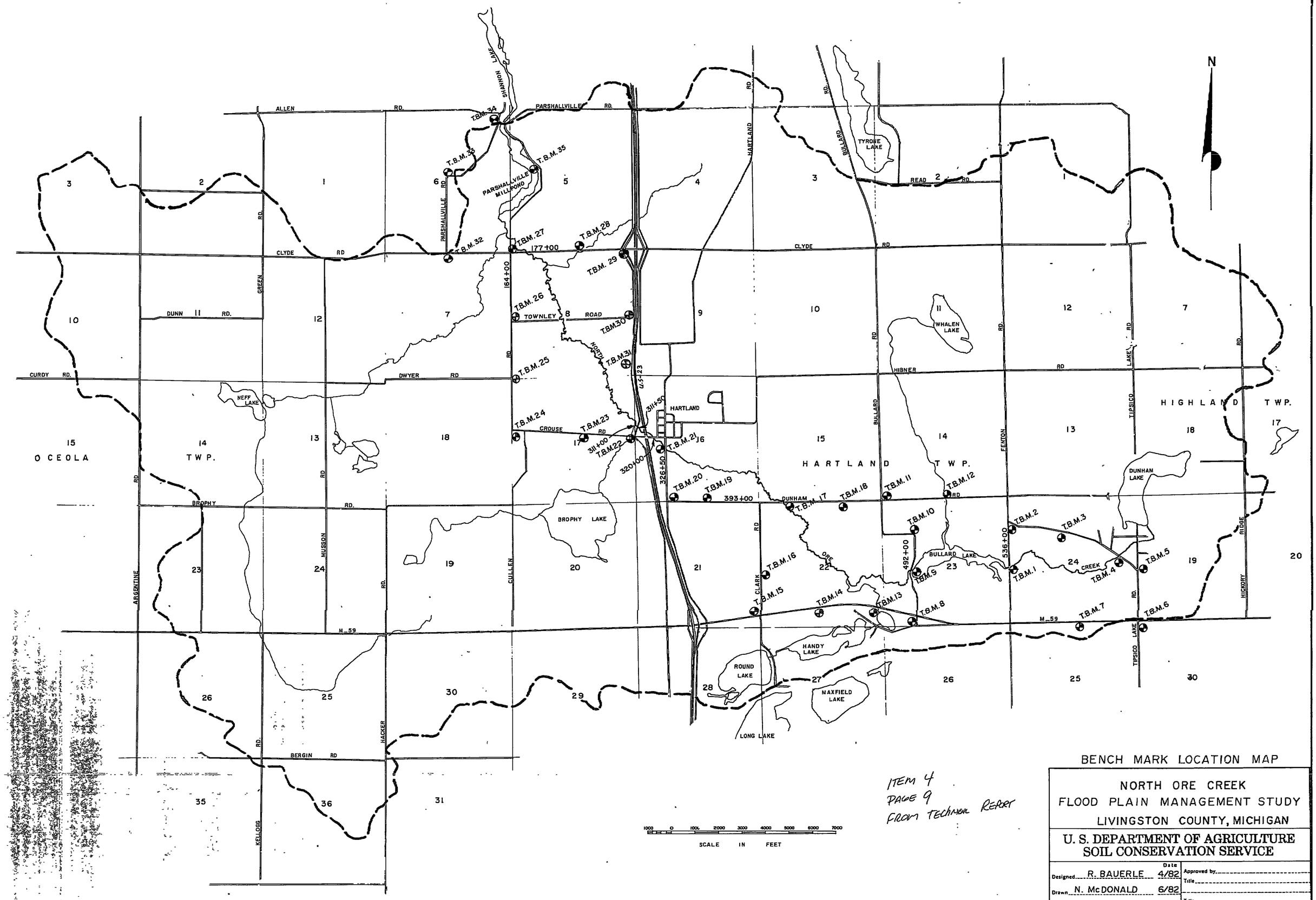
Designed T. BAKER	Date I-84	Approved by	
Drawn N. Mc DONALD	3-84	Title	
Traced		Title	
Checked R. BAUERLE	3-84	Sheet no 4 of 4	Drawing No



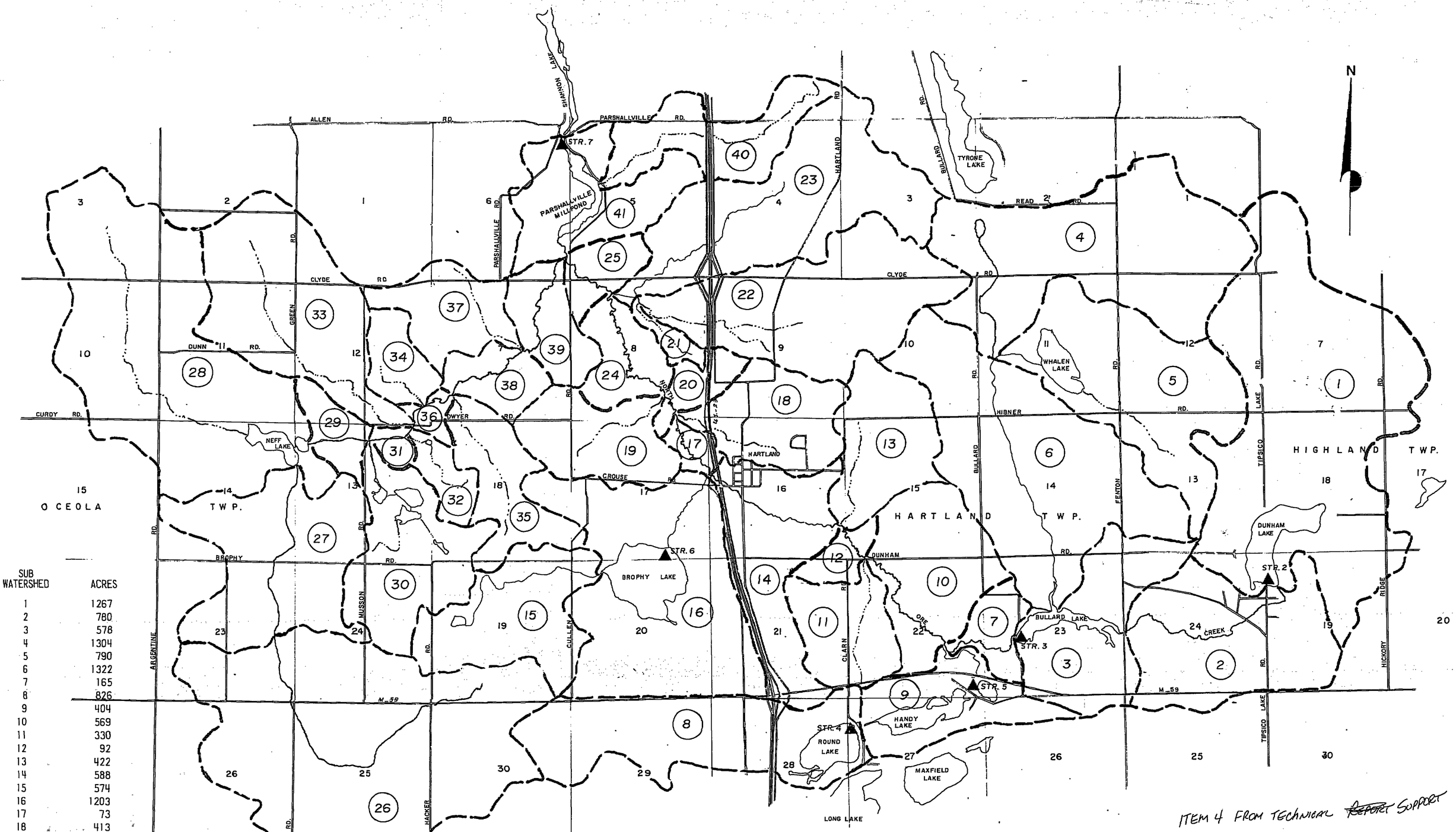
ITEM 4
PAGE 9
FROM TECHNICAL REPORT

BENCH MARK LOCATION MAP

NORTH ORE CREEK
FLOOD PLAIN MANAGEMENT STUDY
LIVINGSTON COUNTY, MICHIGAN

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

		Date	
Designed	R. BAUERLE	4/82	Approved by
Drawn	N. McDONALD	6/82	Title
Traced	N. McDONALD	6/82	Title
Checked	T. BAKER	6/83	Sheet No of / Drawing No.



SUB WATERSHED	ACRES
1	1267
2	780
3	578
4	1304
5	790
6	1322
7	165
8	826
9	404
10	569
11	330
12	92
13	422
14	588
15	574
16	1203
17	73
18	413
19	285
20	119
21	64
22	937
23	982
24	230
25	147
26	2158
27	926
28	1855
29	138
30	698
31	46
32	119
33	854
34	185
35	349
36	46
37	312
38	230
39	248
40	413
41	515

ITEM 4 FROM TECHNICAL ~~REPORT~~ SUPPORT

SUB_WATERSHED MAP W/STRUCTURES

NORTH ORE CREEK
FLOOD PLAIN MANAGEMENT STUDY
LIVINGSTON COUNTY, MICHIGAN

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

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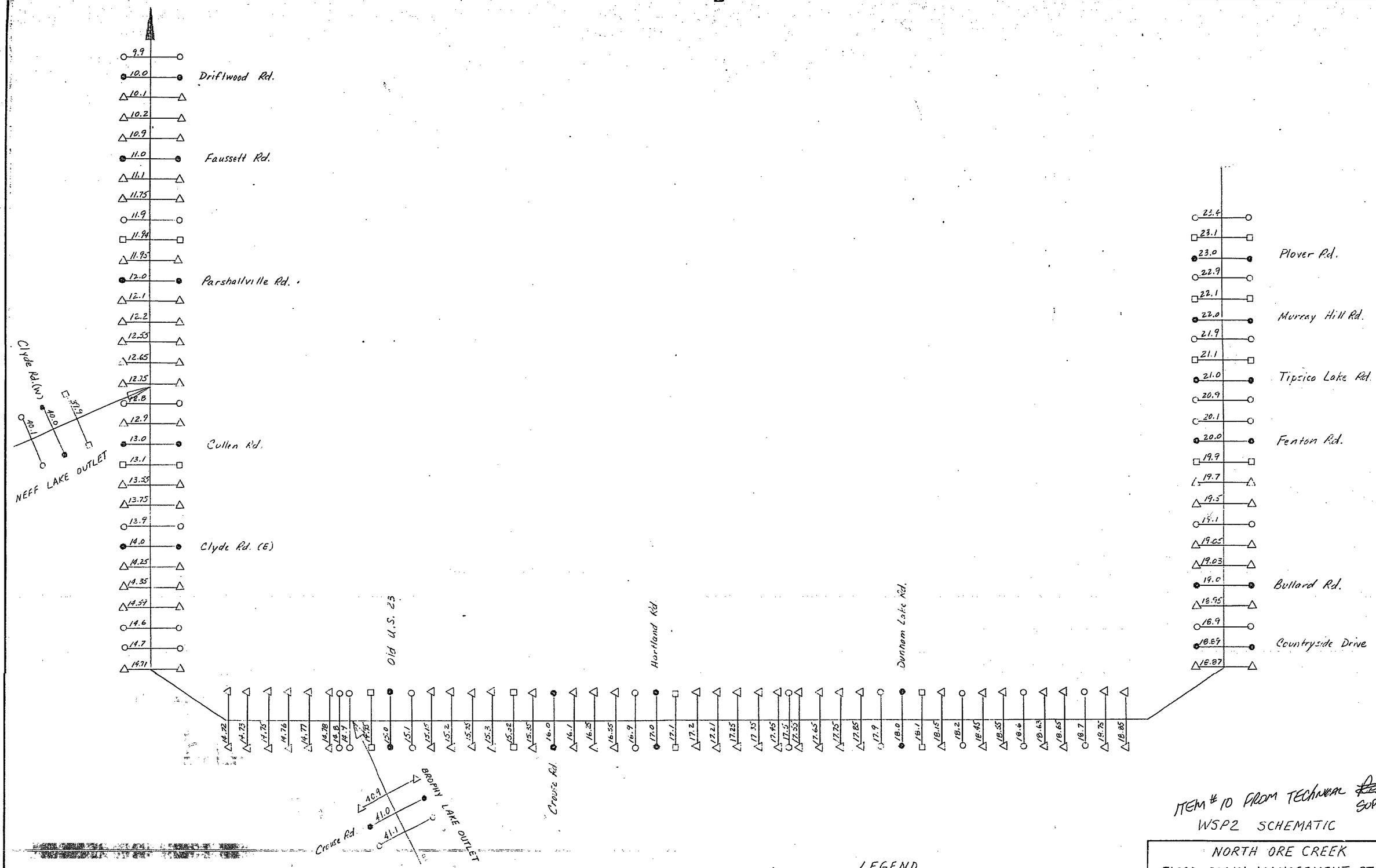
Traced	N. McDONALD	6/82	Title
Checked	T. BAKER	6/83	Sheet No of / Drawing No.



ITEM #10 FROM TECHNICAL ~~REPORT~~ SUPPORT
WSP2 SCHEMATIC

LEGEND

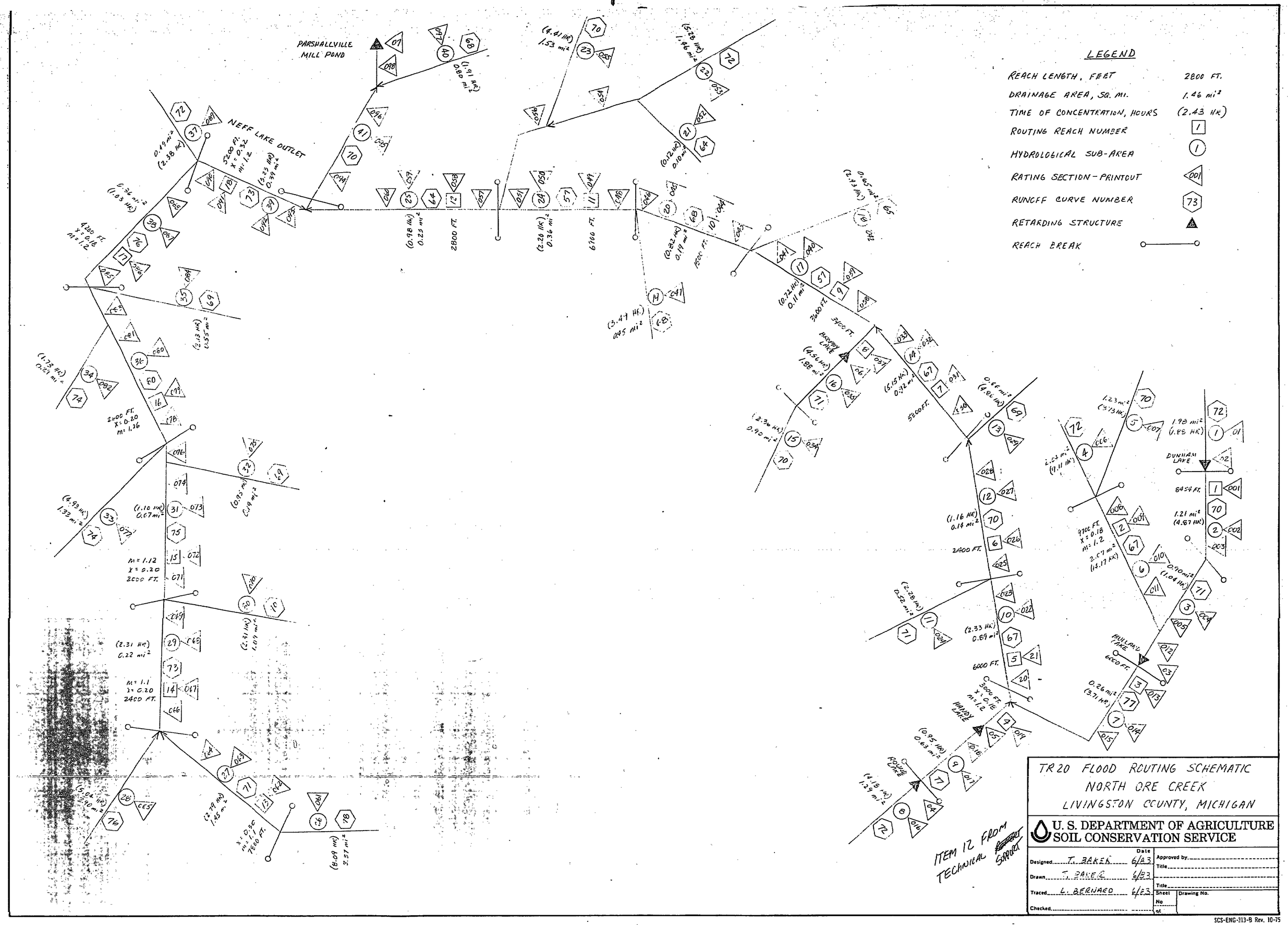
- SURVEYED ROAD SECTION
- SURVEYED VALLEY SECTION
- SECTION FROM TOPOGRAPHIC MAP
- TRANSPOSED VALLEY SECTION
- 9.9 SECTION NUMBER

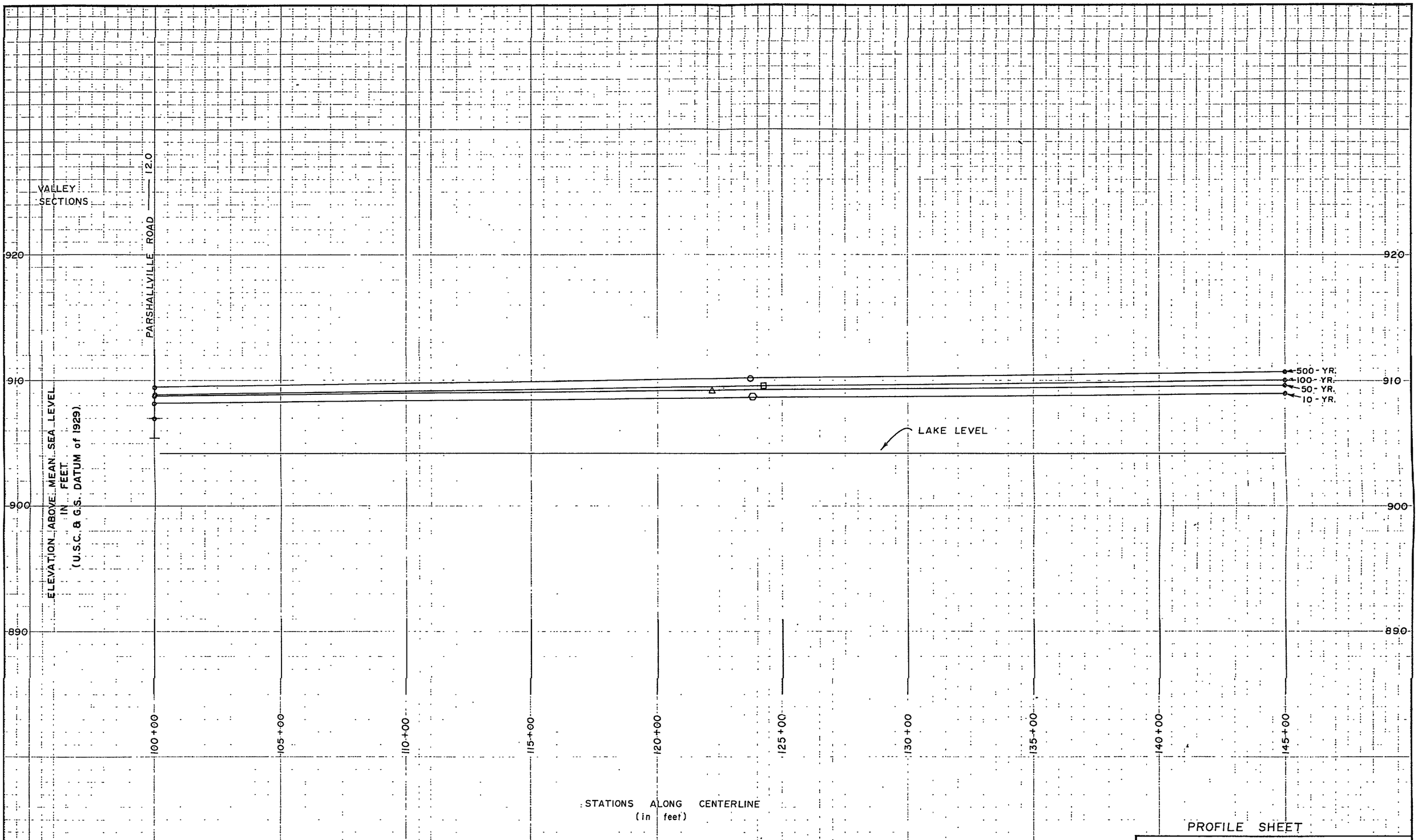
NORTH ORE CREEK
FLOOD PLAIN MANAGEMENT STUDY
LIVINGSTON COUNTY, MICHIGAN

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

		Date		
Designed	T. BAKER	6/83	Approved by	
Drawn	L. BERNARD	6/83	Title	
Traced	L. BERNARD	6/83	Title	
Checked			Sheet No. of	Drawing No.

SCS-ENG-313-B Rev. 10-75


LEGEND
REACH LENGTH, FEET 2800 FT.
DRAINAGE AREA, SQ. MI. 1.46 mi²
TIME OF CONCENTRATION, HOURS (2.43 HR)
ROUTING REACH NUMBER
HYDROLOGICAL SUB-AREA
RATING SECTION - PRINTOUT
RUNOFF CURVE NUMBER
RETARDING STRUCTURE
REACH BREAK
PARSHALLVILLE MILL POND
NEFF LAKE OUTLET
DUNHAM LAKE
FULLER'S LAKE
HANDY LAKE
ROUND LAKE
ITEM 12 FROM TECHNICAL SUPPORT
TR 20 FLOOD ROUTING SCHEMATIC
NORTH ORE CREEK
LIVINGSTON COUNTY, MICHIGAN
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
Designed T. BAKER 6/83
Drawn T. BAKER 6/83
Traced L. BERNARD 6/83
Checked
Date
Approved by
Title
Sheet No of
Drawing No.
SCS-ENG-313-B Rev. 10-75



PROFILE SHEET

NOTE:
Additional field measured cross-sections may be needed to verify the water surface profile between the cross-sections used in this report. When the difference in the elevation of the channel bottom between cross-sections exceeds 2/3 the depth of flood flows, variations in the channel bottom can cause significant changes in the flood profiles.

HIGH WATER PROFILES
FLOOD PLAIN MANAGEMENT STUDY
NORTH ORE CREEK
LIVINGSTON CO., OAKLAND CO., MICHIGAN

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

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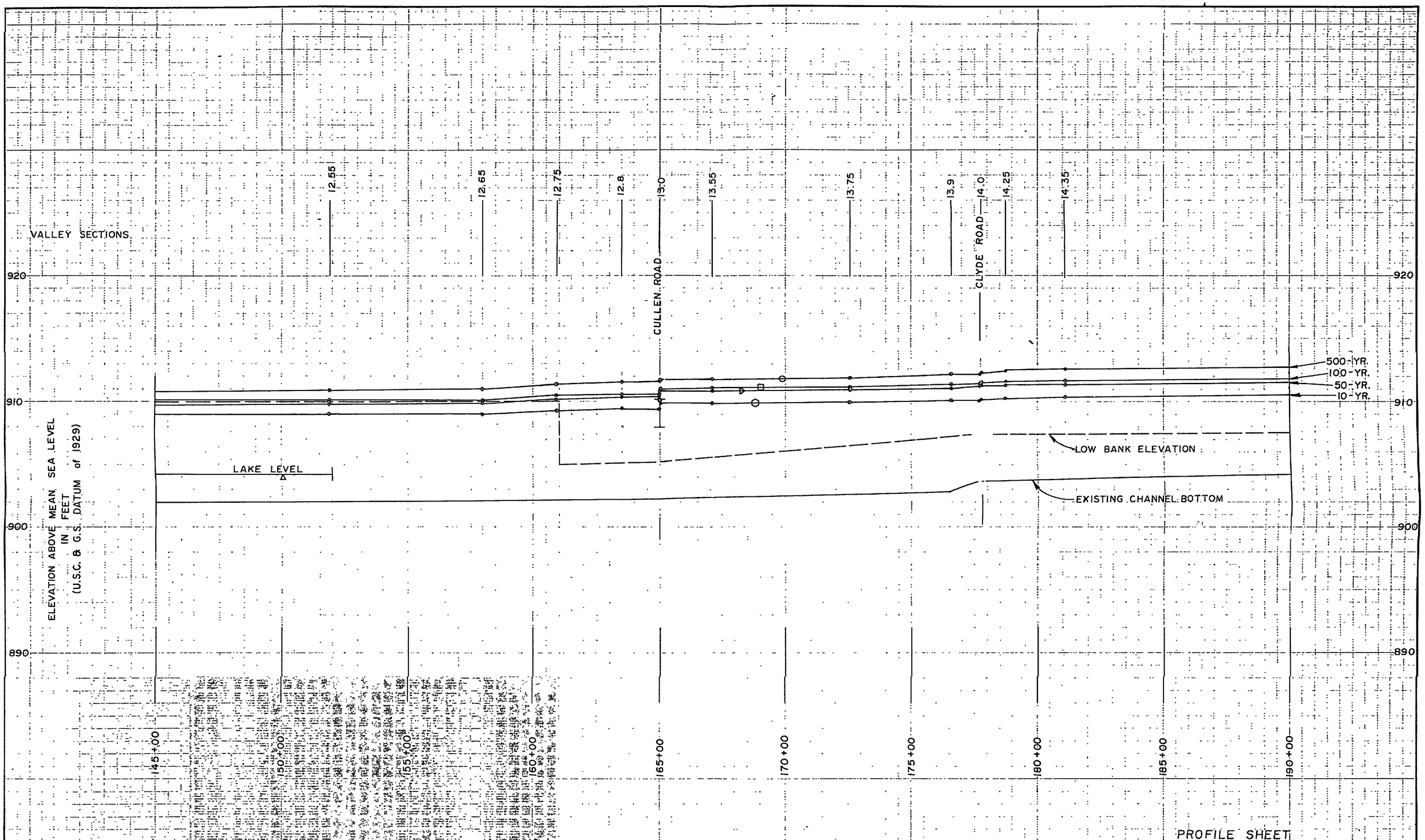
Drawn	N. McDONALD	8/83	Title
Traced	L. BERNARD	8/83	Title
Checked	R. BAUERLE	3/84	Sheet No 1 of 11 — Drawing No



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FLOOD PLAIN MANAGEMENT STUDY
NORTH ORE CREEK
LIVINGSTON CO., OAKLAND CO., MICHIGAN

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

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Drawn	N. Mc DONALD	8/83	Title	
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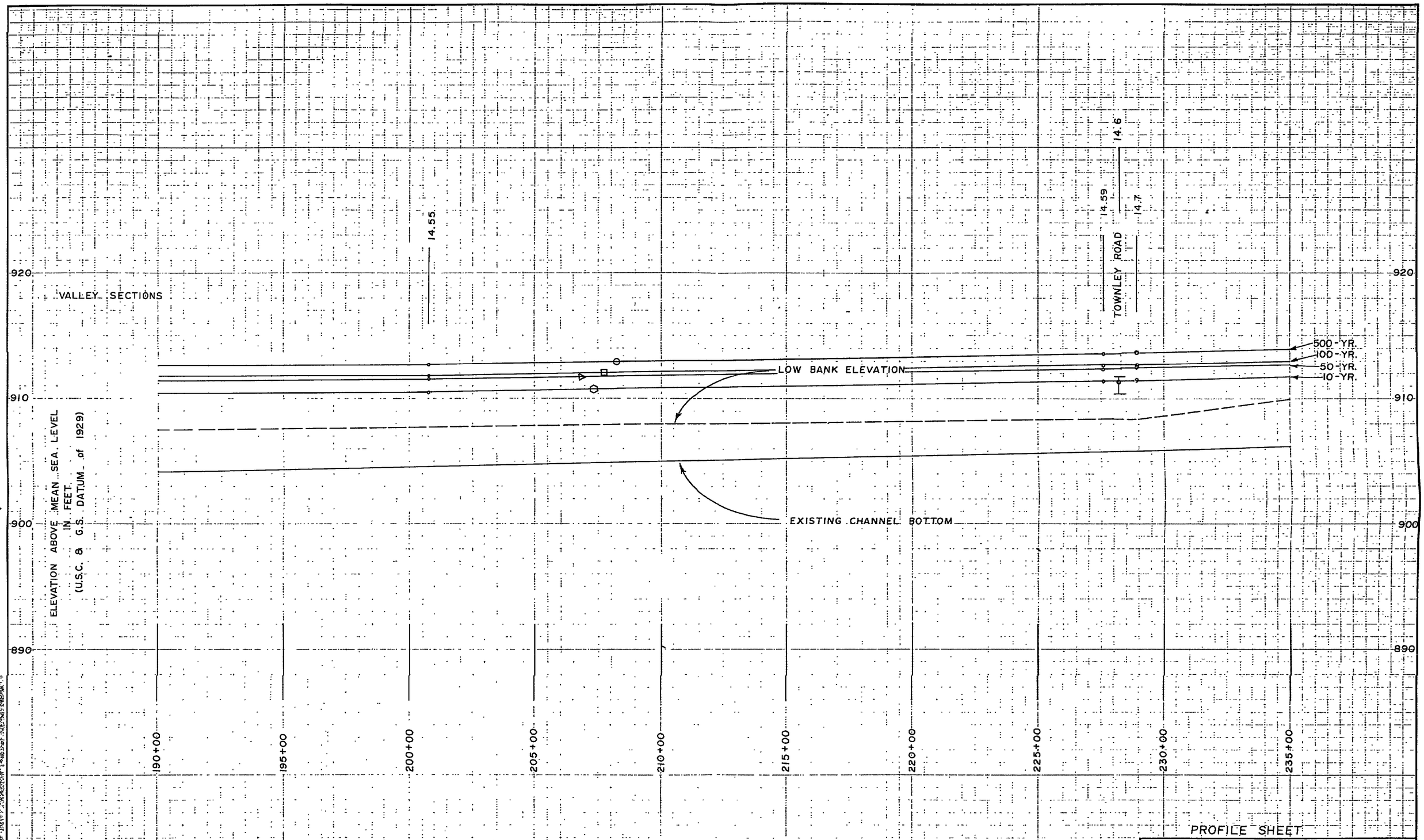
Checked	R. BAUERLE	3/84	Sheet No. 2 of 11	Drawing No

SCS-ENG-316 (Rev. 6-75)



PROFILE SHEET

HIGH WATER PROFILES
FLOOD PLAIN MANAGEMENT STUDY
NORTH ORE CREEK
LIVINGSTON CO., OAKLAND CO., MICH.

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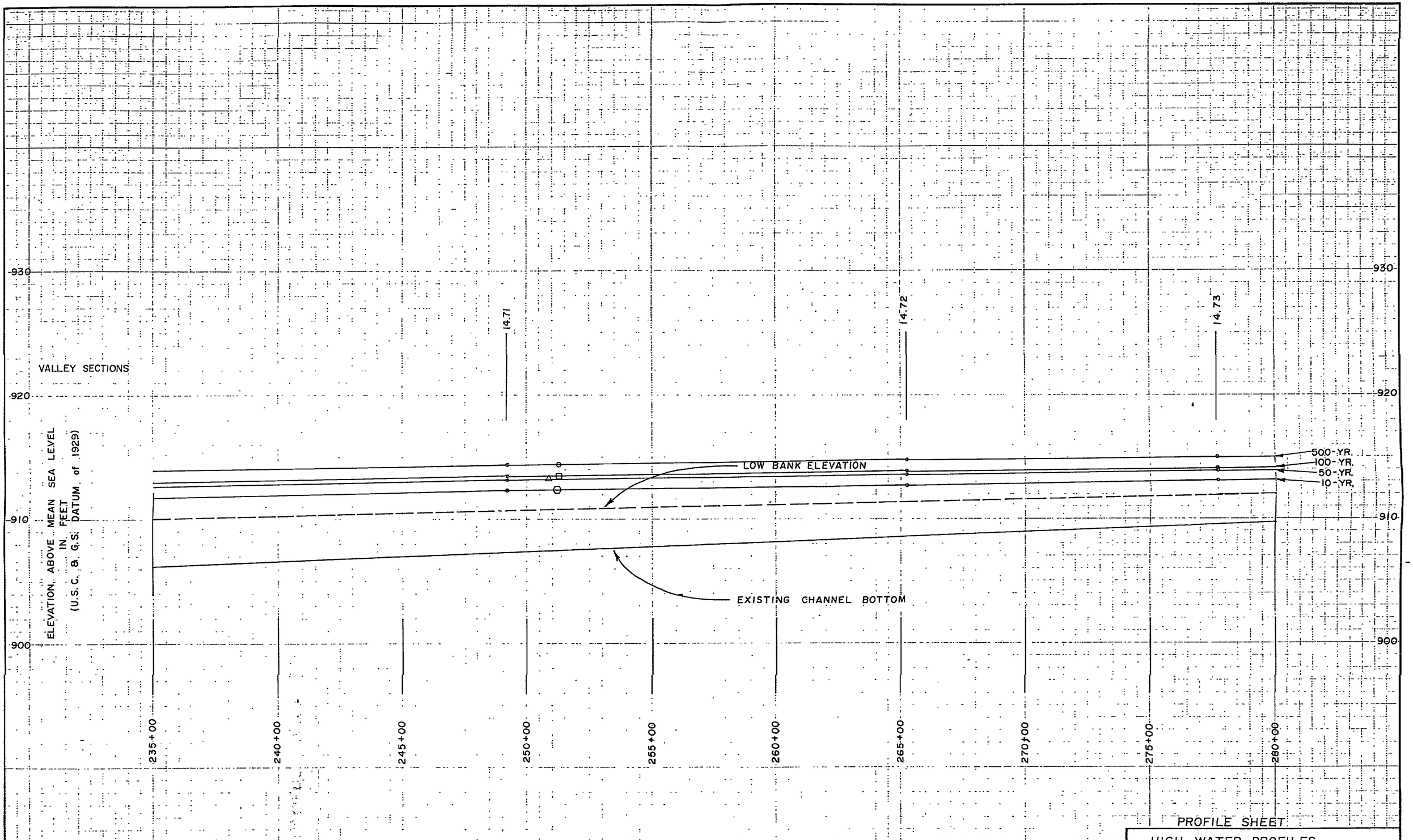

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HIGH WATER PROFILES
FLOOD PLAIN MANAGEMENT STUDY
NORTH ORE CREEK
LIVINGSTON CO., OAKLAND CO., MICH.

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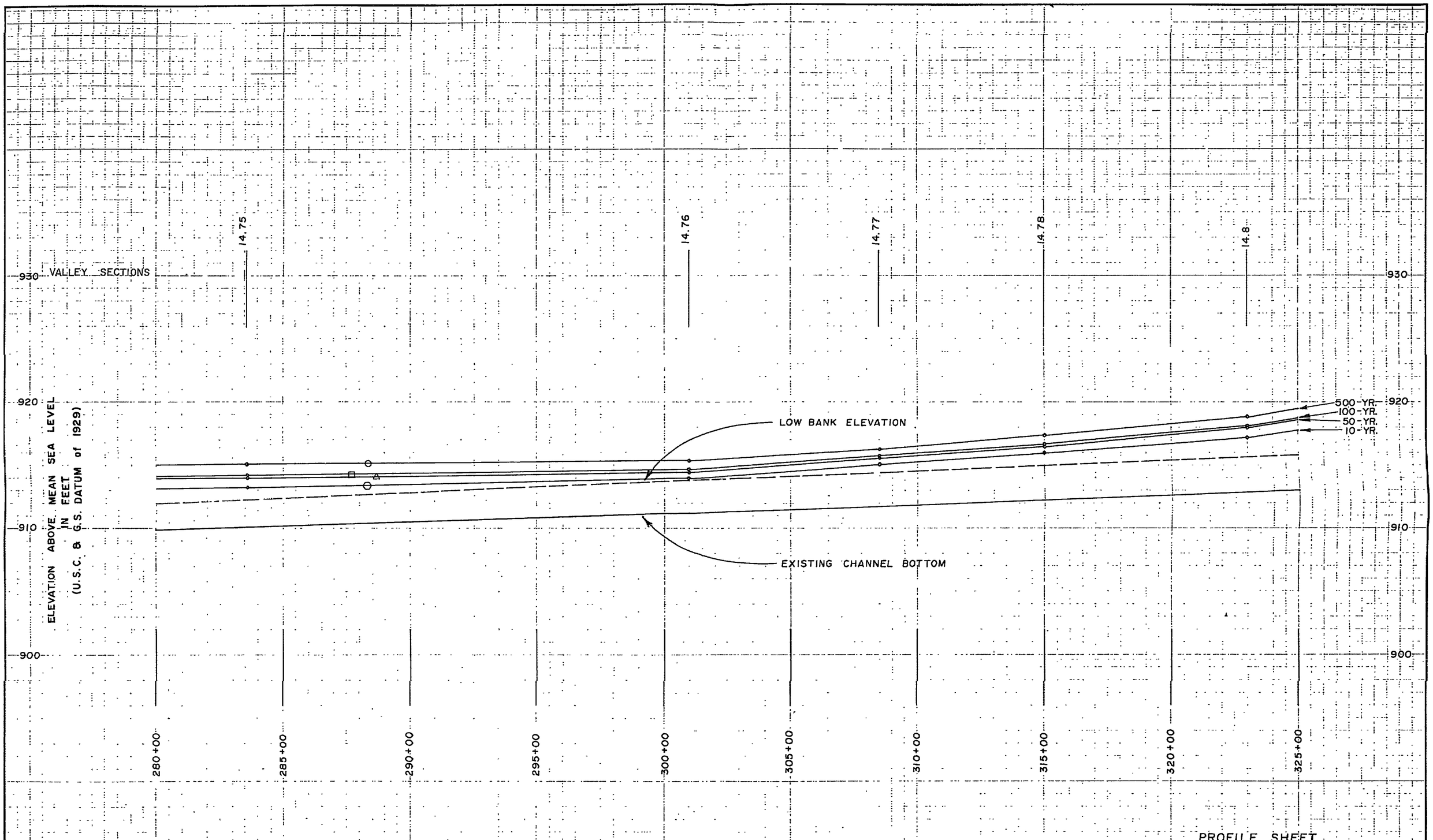

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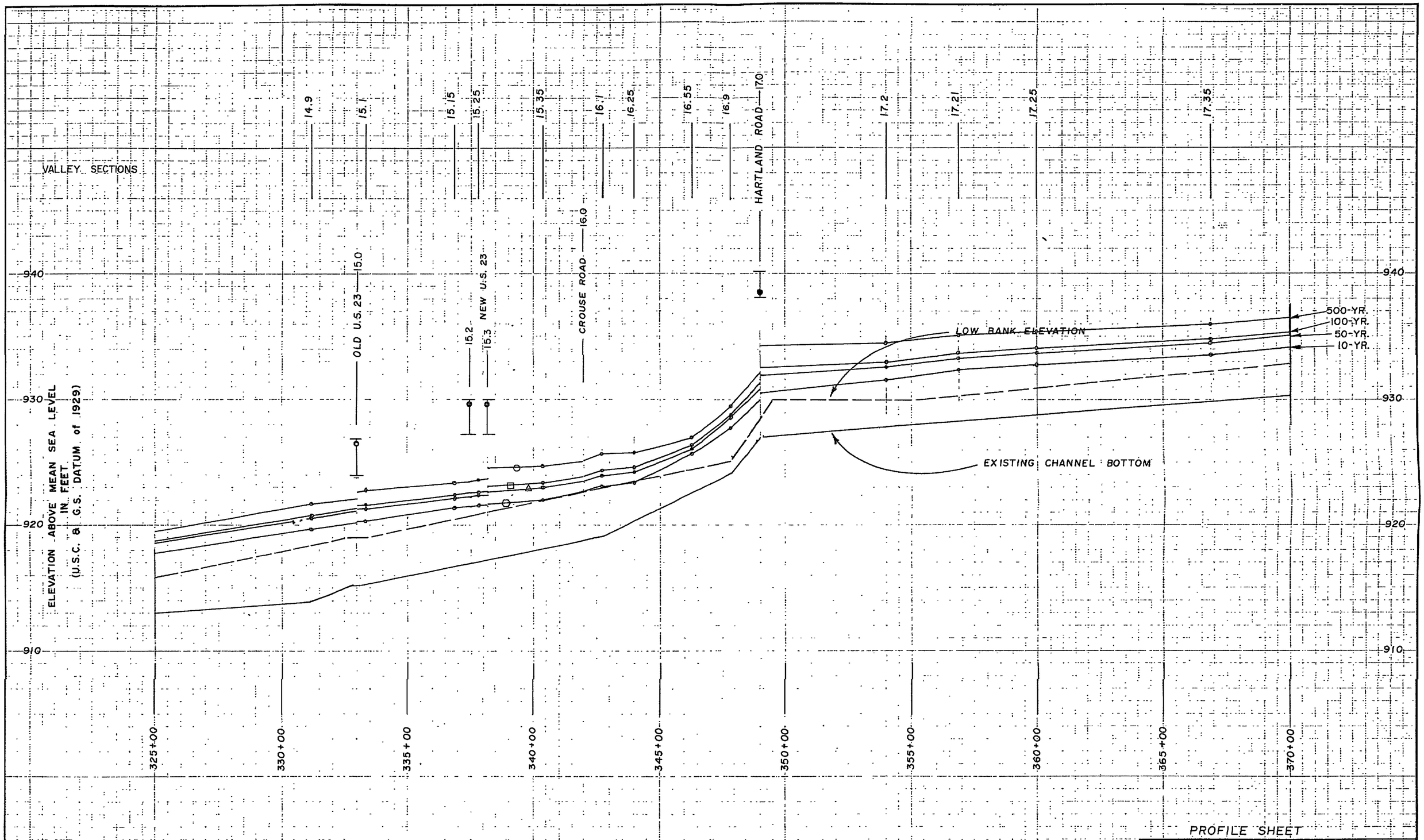
SCS-ENG-316 (Rev. 6-75)



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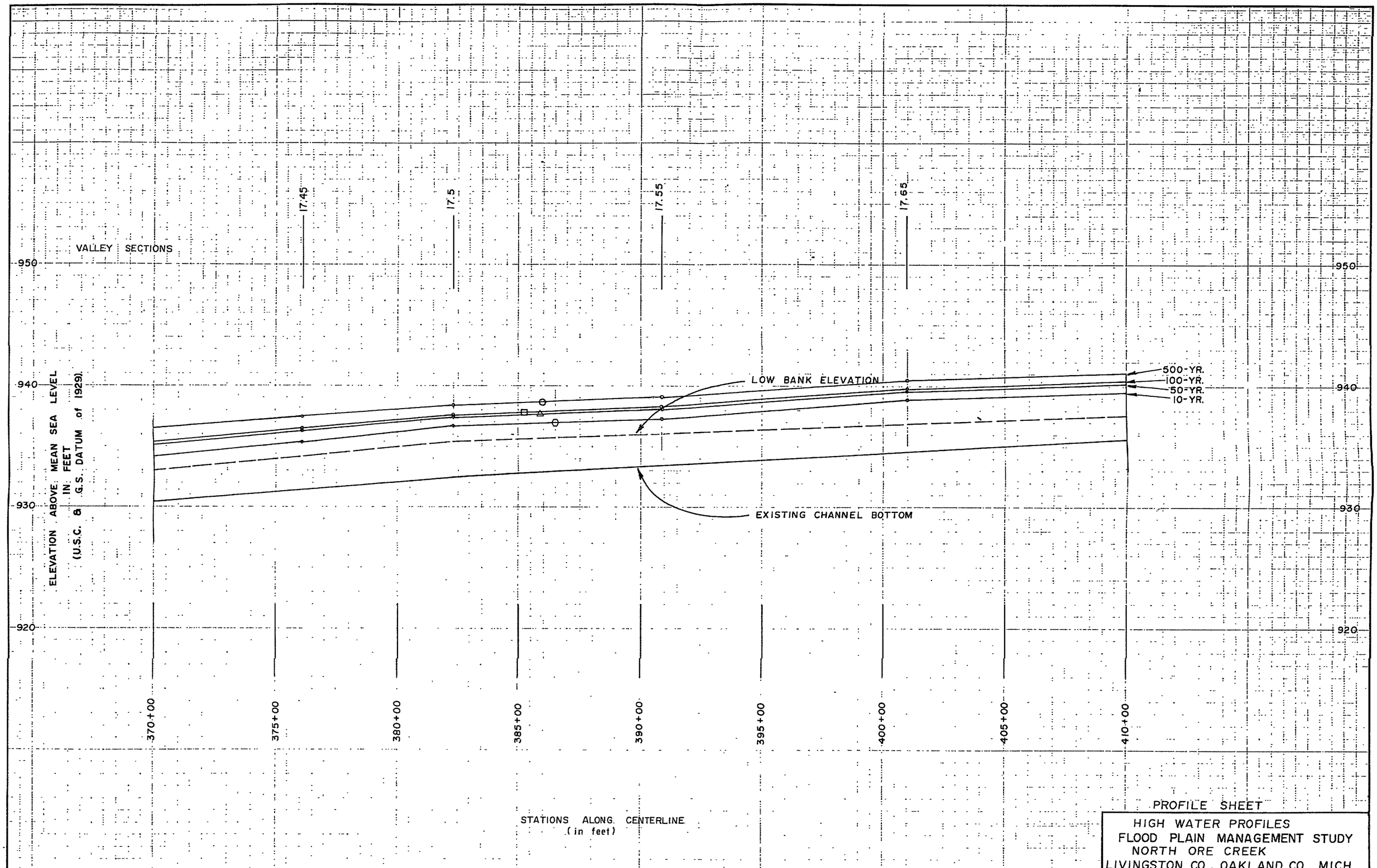
SCS-ENG-316 (Rev. 6-75)



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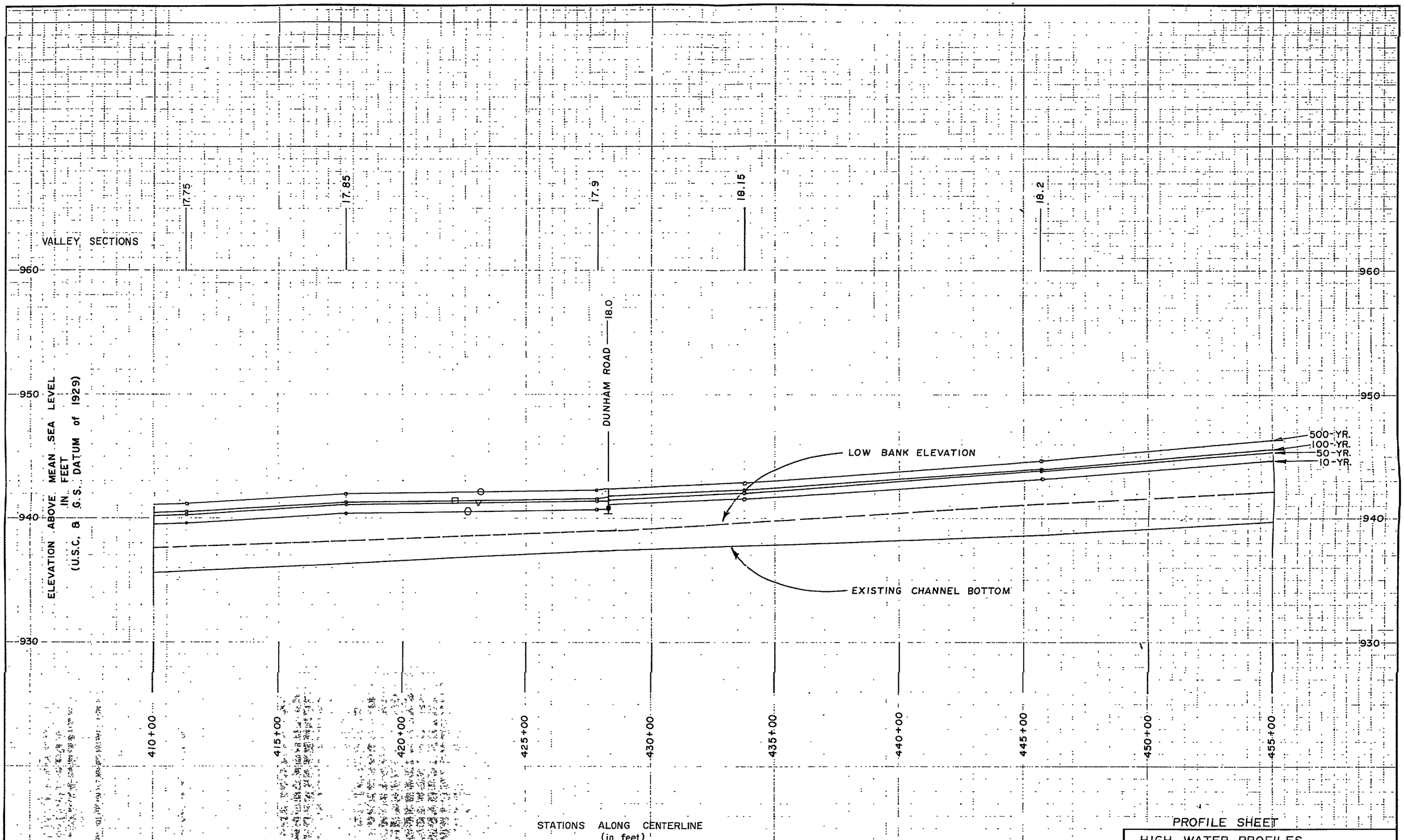
SCS-ENG-316 (Rev. 6-75)



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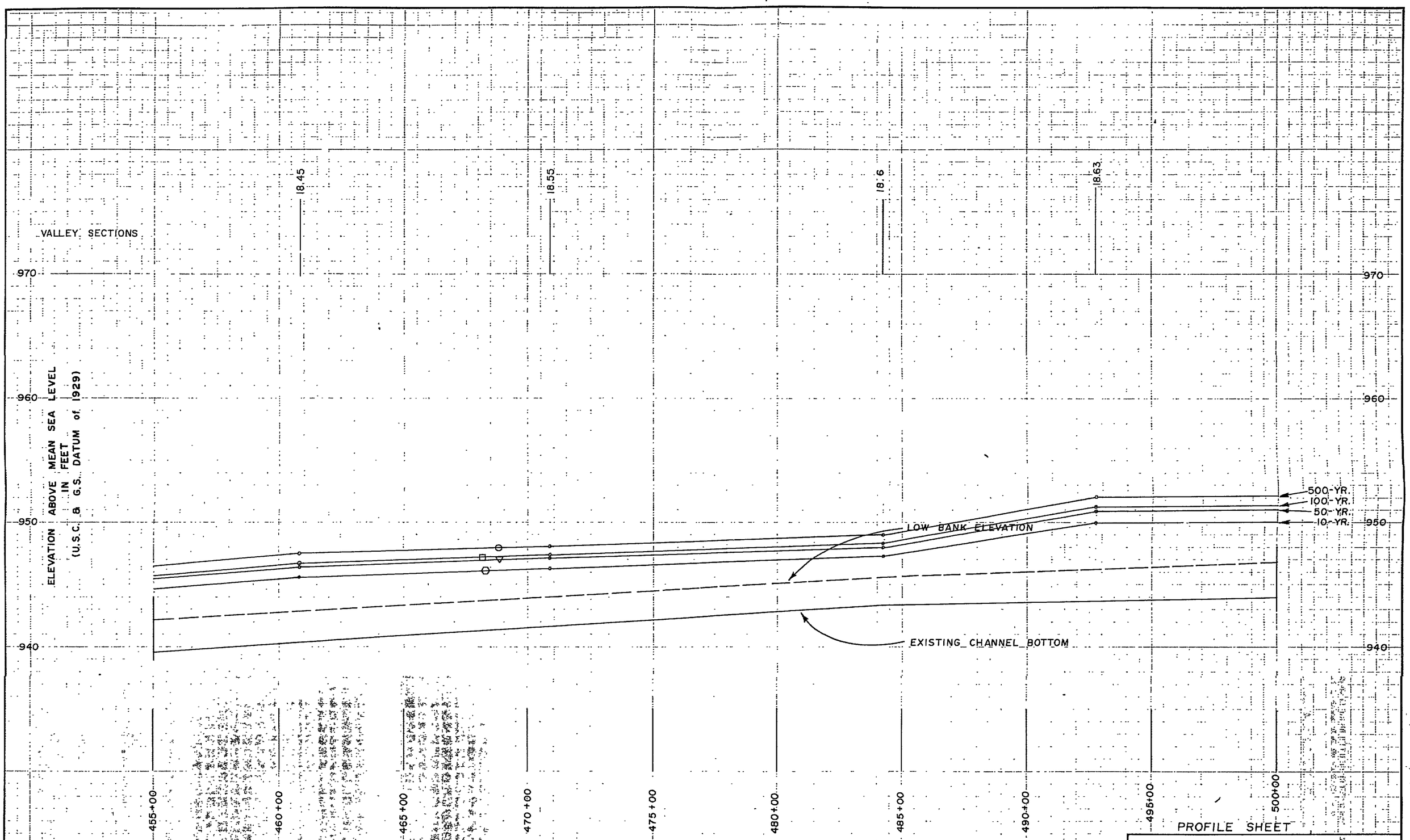
SCS-ENG-316 (Rev. 6-75)



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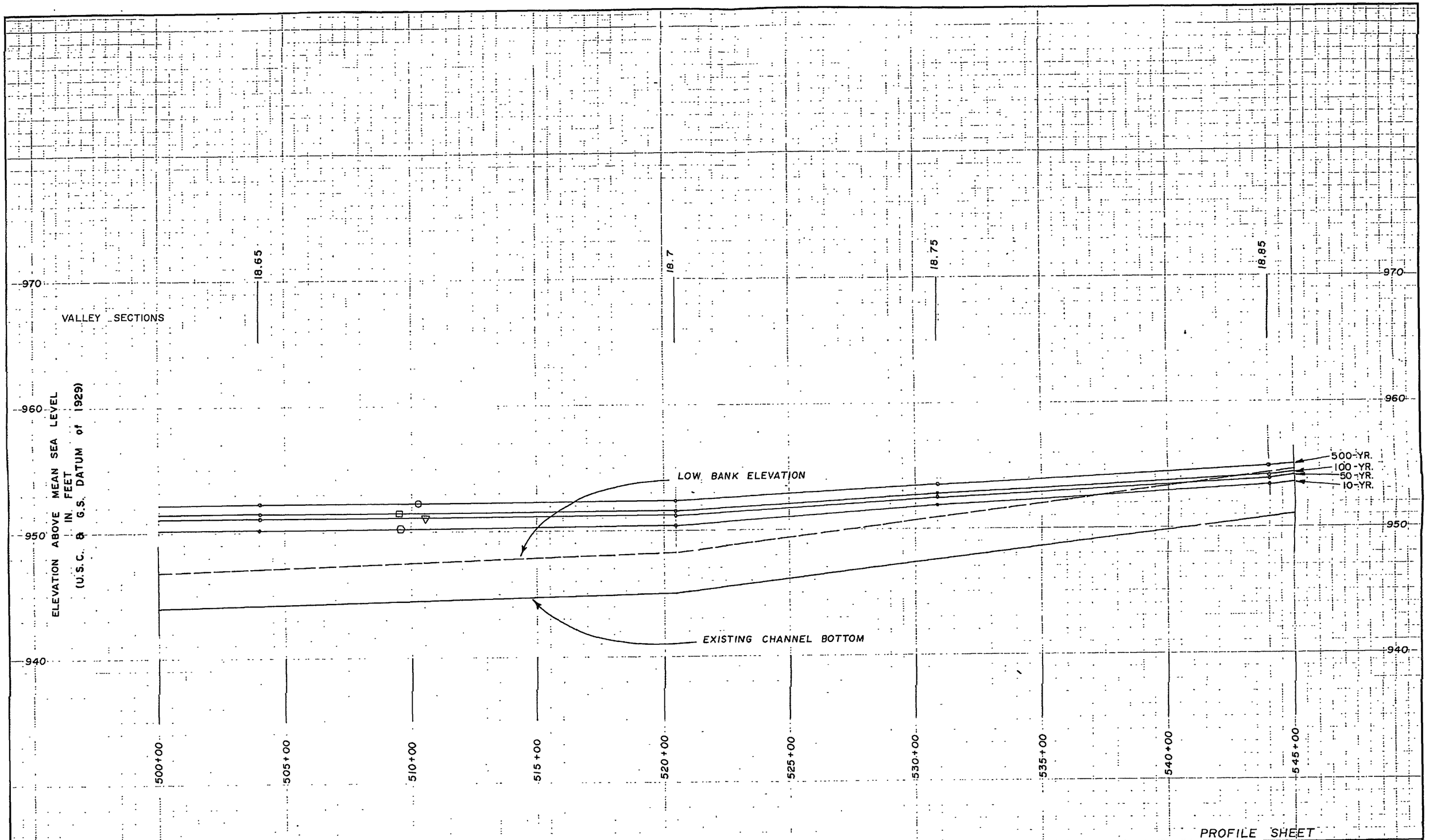
SCS-ENG-316 (Rev. 6-75)



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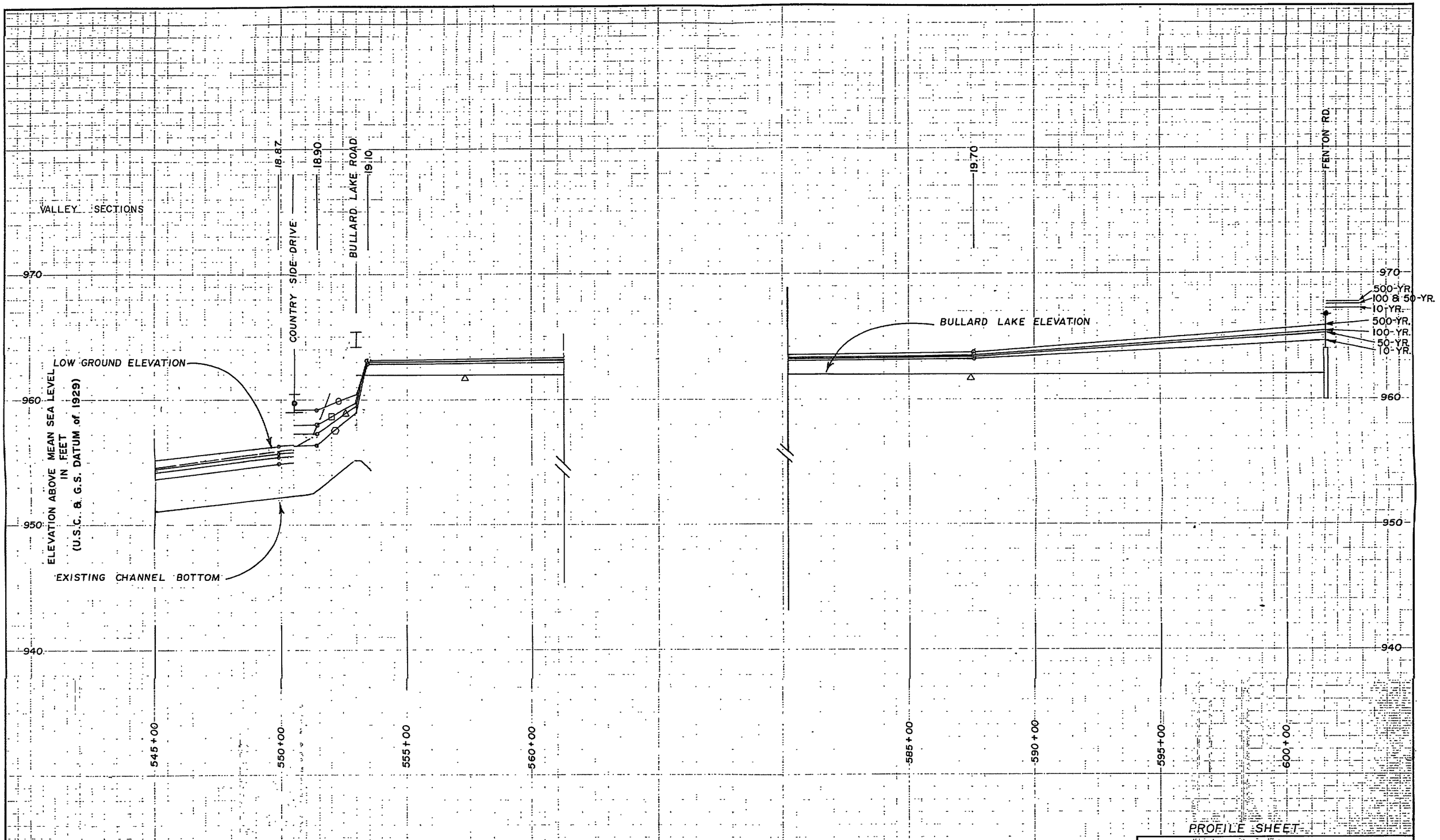
SCS-ENG-316 (Rev. 6-75)



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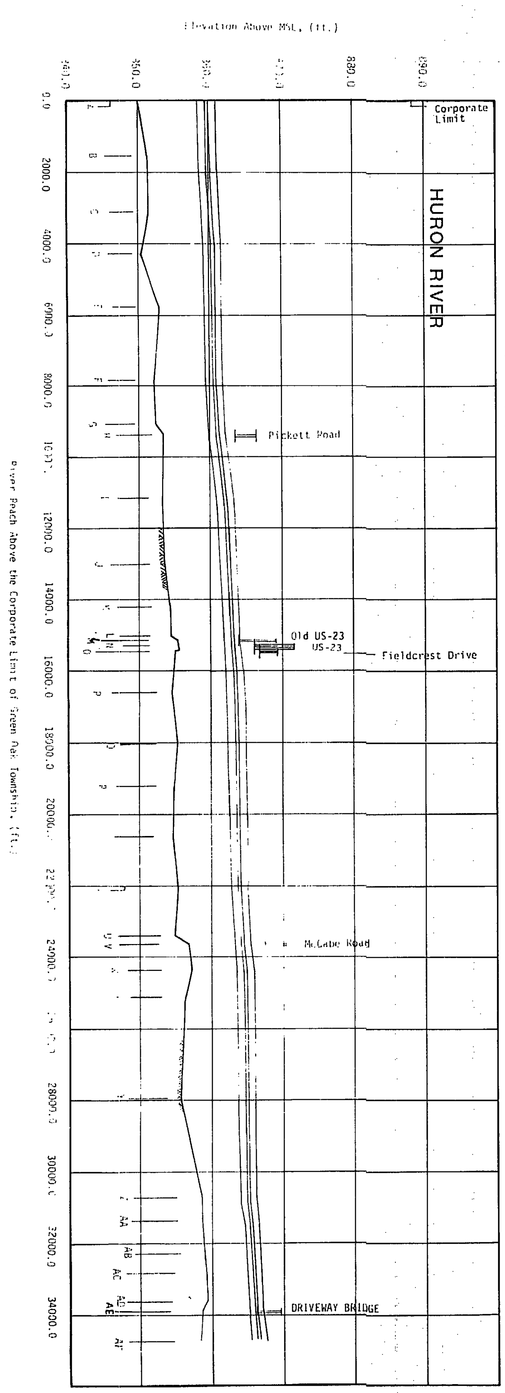
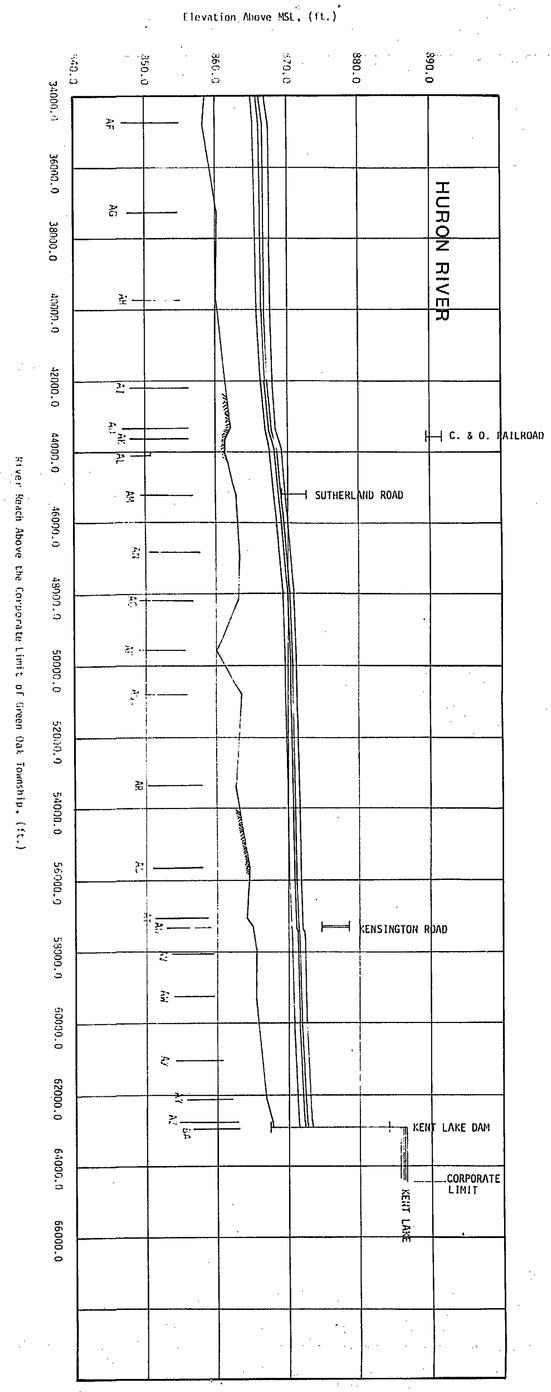
SCS-ENG-316 (Rev. 6-75)

CORPORATE LIMITS
CORPORATE LIMITS
CORPORATE LIMITS
CORPORATE LIMITS
CORPORATE LIMITS
RED CEDAR RIVER
FOWLERVILLE RD
N
A
B
C
D
E
F
G
H
I
J
K
1
2
3
*NOTE: Sections 1 – 3 used for convergence analysis.
STS Consultants Ltd.
Consulting Engineers
500 YEAR FLOOD BOUNDARY
100 YEAR FLOOD BOUNDARY
FLOODWAY BOUNDARY
FLOODWAY
FLOODWAY BOUNDARY
100 YEAR FLOOD BOUNDARY
500 YEAR FLOOD BOUNDARY
CORPORATE LIMITS
CROSS SECTION
CLIENT/PROJECT
RED CEDAR RIVER & COUNTY DRAIN NO. 2
FLOOD INSURANCE STUDY
VILLAGE OF FOWLERVILLE, LIVINGSTON COUNTY, MICHIGAN
SCALE: 1" = 400'
DRAWN BY: DEC
APPROVED BY: WJW
REVISED 4–15–85
DATE: 3–08–85
STS JOB NO. 1054F
DRAWING NO. 1

A & E SUPPLY CO. 55504





SHEET NO.

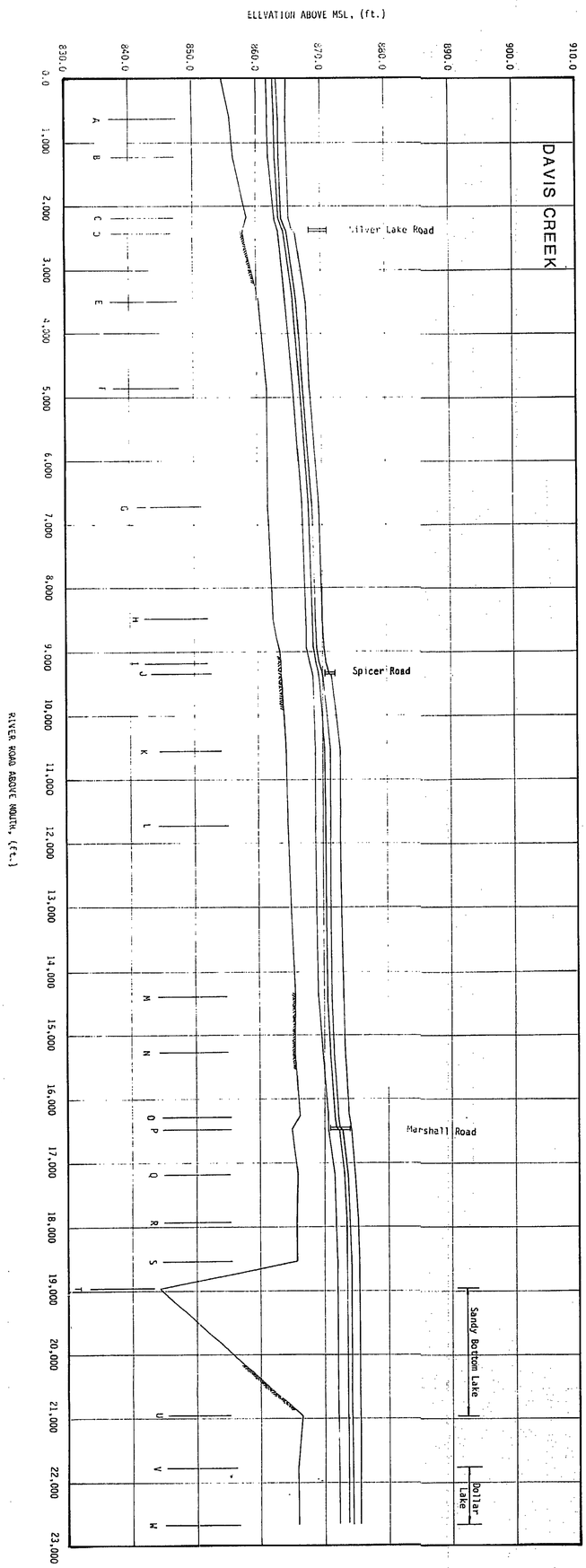
FLOOD INSURANCE STUDY

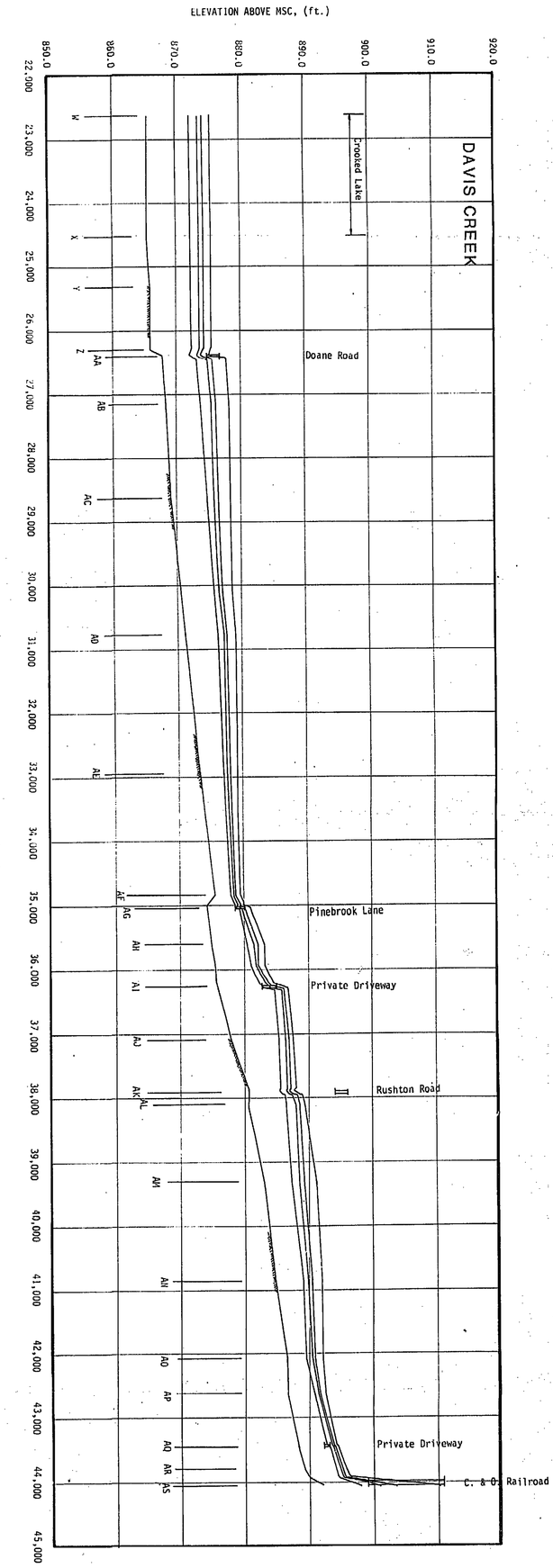
Green Oak, Livingston, Michigan

HURON RIVER
FLOOD PROFILES

Johnson & Anderson
of Virginia, Inc.
Architects
Engineers
Planners
Ashland-Hanover Office Bldg.
201 N. Washington Hwy.-Suite 301
Ashland, Virginia 23005
(804) 798-1618

A & E SUPPLY CO. 55504





SHEET NO.

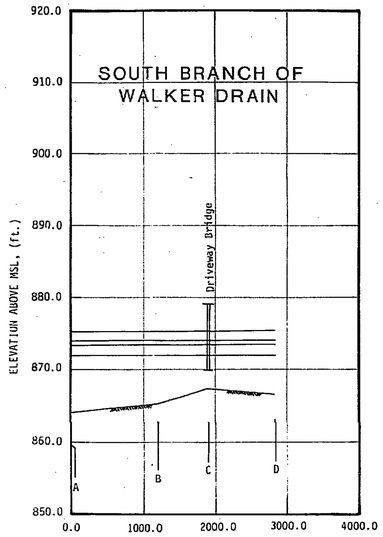
FLOOD INSURANCE STUDY

Green Oak Livingston Michigan

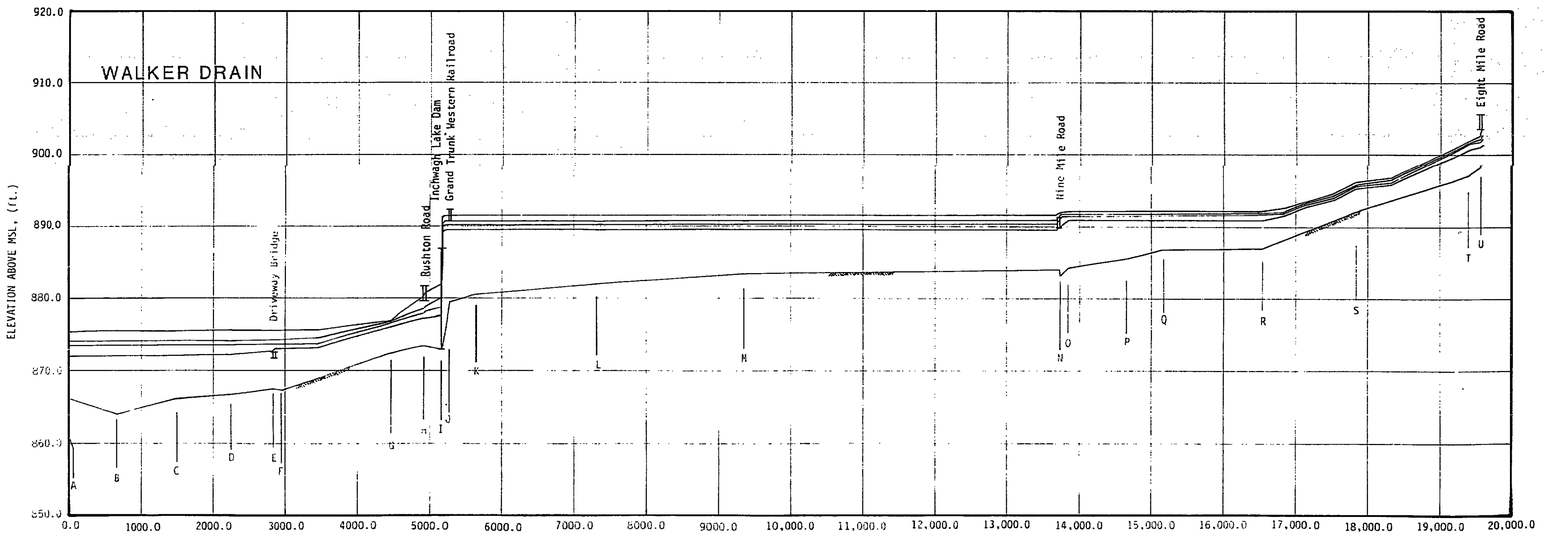
DAVIS CREEK

FLOOD PROFILES

Johnson & Anderson of Virginia, Inc.
Architects Engineers Planners
Ashland-Hanover Office Bldg.
P.O. Box 568
Ashland, Virginia 23005
(804) 798-1618



Stream Distance in Feet Above the Mouth of South Branch of Walker Drain at Sandy Bottom Lake.



Stream Distance in Feet Above the Mouth of Walker Drain at Sandy Bottom Lake.

Johnson & Anderson of Virginia, Inc.
Architects
Engineers
Planners
Ashland-Hanover Office Bldg.
P.O. Box 568
Ashland, Virginia 23005
(804) 798-1618

WALKER DRAIN
FLOOD PROFILES

FLOOD INSURANCE STUDY
Green Oak, Livingston, Michigan

SHEET NO.

A & E SUPPLY CO. 55504

REV	DESCRIPTION	BY	DATE	CHK'D
△				
△				
△				
△				
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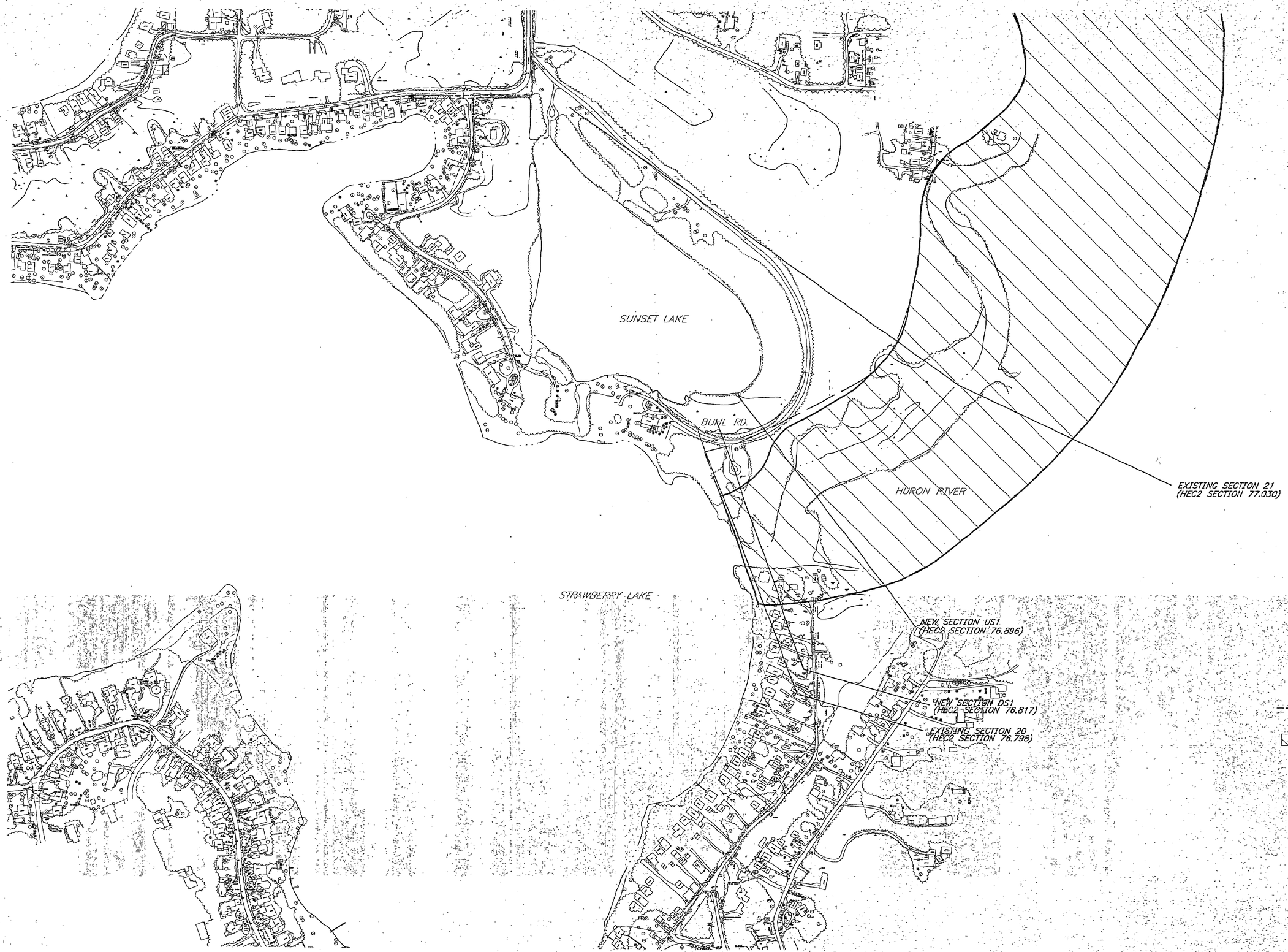

EXISTING FIS FLOODWAY BOUNDARY

PROPOSED FIS FLOODWAY BOUNDARY

Ann Arbor, Michigan
Detroit, Michigan
Escanaba, Michigan
Grand Rapids, Michigan
Lansing, Michigan
Livingston County, Michigan

McNAMARA
ENGINEERING TODAY, INC.
SINCE 1964

DESIGNED T. SMITH	CHECKED
SCALE 1" = 200'	CADD DATE 03-15-96 SBK S
PART Q:/MPS/1067/0010/B/R-FPLAN.DWG	

HAMBURG TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN
JOSEPH MCGUIRE FLOODWAY
DELINEATION

REVISED

FLOODWAY BOUNDARY
HURON RIVER/
STRAWBERRY LAKE AREA

DIVISION	CONTRACT	SHEET 7 OF 7

REV	DESCRIPTION	BY	DATE	CHK'D
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△				

EXISTING FIS FLOODWAY BOUNDARY

PROPOSED FIS FLOODWAY BOUNDARY

Ann Arbor, Michigan
Detroit, Michigan
Escanaba, Michigan
Grand Rapids, Michigan
Lansing, Michigan
Livingston County, Michigan

McNAMEE, PORTER & SEELEY, INC.
ENGINEERING EXCELLENCE SINCE 1904

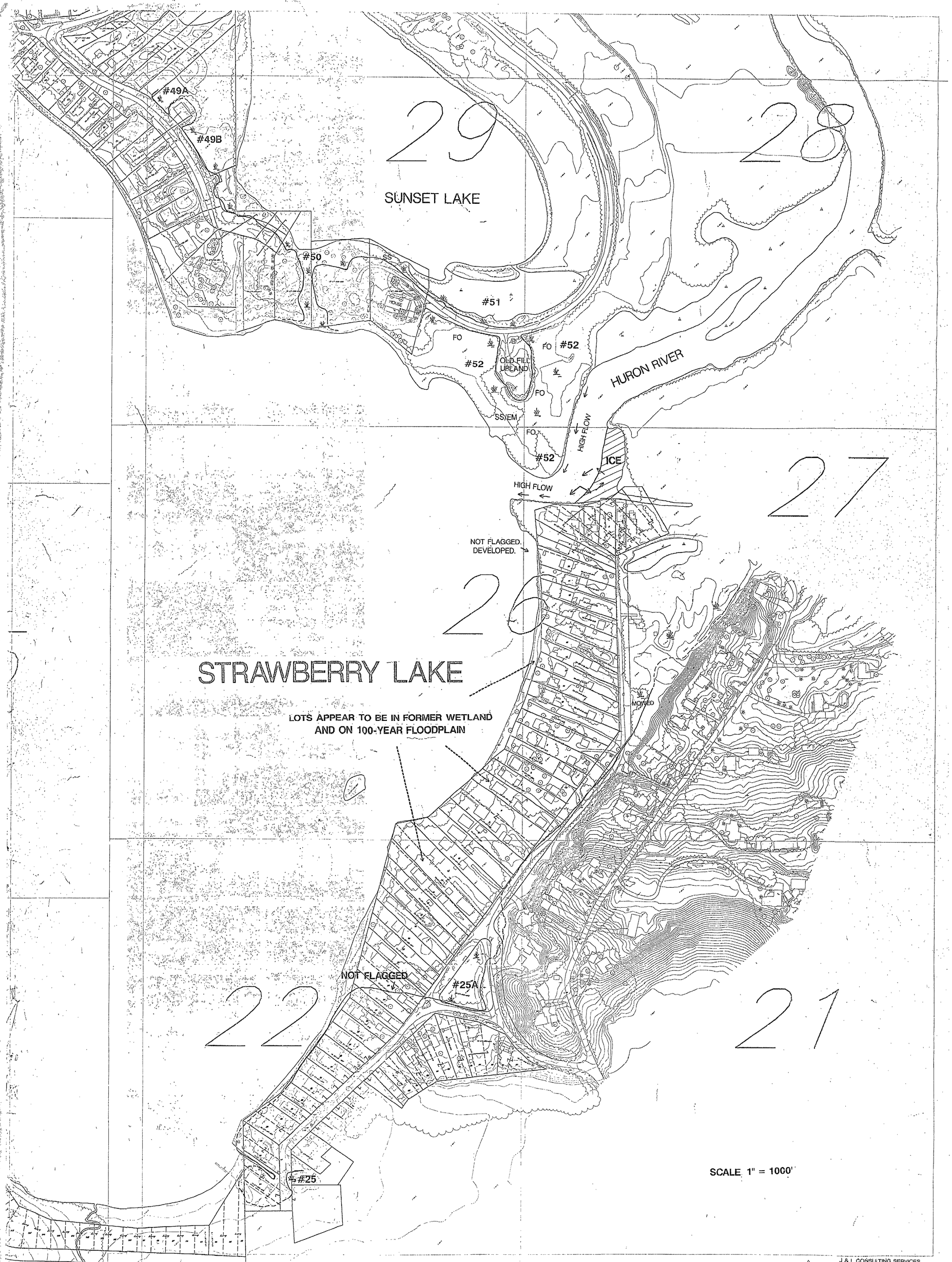
DESIGNED T. SMITH	CHECKED
SCALE 1" = 200'	CADD DATE 12-06-95 WSF 3
PART 1 G:/NPS/1057/20101/R/R-FPLAN.DWG	

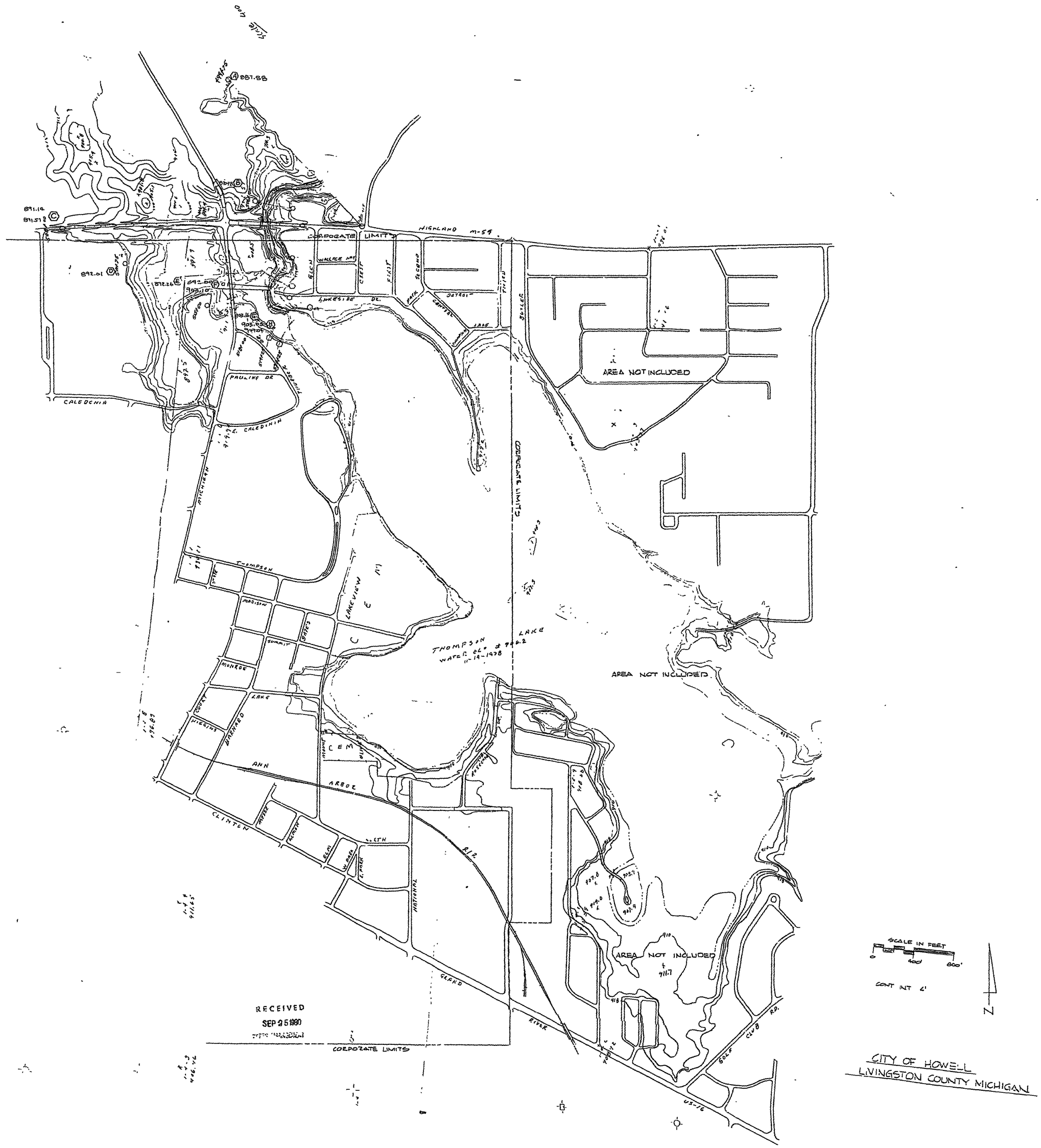
HAMBURG TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN

REVISED

100 YEAR FLOOD PLAN HURON RIVER/ STRAWBERRY LAKE AREA

DIVISION	CONTRACT	SHEET
-	-	1 OF 1


#49A
#49B
29
28
SUNSET LAKE
#50
SS
#51
HOUSE
FO
#52
OLD FILL UPLAND
HURON RIVER
SS/EM
HIGH FLOW
ICE
27
NOT FLAGGED. DEVELOPED.
26
STRAWBERRY LAKE
MOWED
LOTS APPEAR TO BE IN FORMER WETLAND AND ON 100-YEAR FLOODPLAIN
NOT FLAGGED
#25A
22
21
#25
SCALE 1" = 1000'
J & L CONSULTING SERVICES



CITY OF HOWELL
LIVINGSTON COUNTY MICHIGAN